
Security of Gas Supply in South Eastern Europe
Potential Contribution of Planned Pipelines, LNG, and Storage

Anastasios Giamouridis and Spiros Paleoyannis

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Preface

Despite the considerable debate on European gas security which followed the Russia-Ukraine crisis of January 2009, the only significant impact – in terms of consumers which actually lost their gas, power or heat supply – was in a relatively limited number of countries in South Eastern Europe. This was the principal motivation for asking Anastasios Giamouridis and Spiros Paleoyannis to carry out this study on security of supply of the countries that were most impacted by the events of January 2009, and measures which could be taken to ensure that, in the event of another interruption of gas supplies, the South East European region would be able to cope significantly better. The countries under consideration in this study account for only a few percentage points of European gas demand, but this is outweighed by the importance of ensuring that their future gas supplies can be assured through a mix of diversified pipeline and LNG supplies, pipeline interconnections, gas storage and efficiency measures. There is a strong energy – not to speak of a political and humanitarian – imperative to ensure that, in the event of similar supply problems, the citizens of these countries find themselves in a much better position than was the case in 2009.

One of the difficulties of writing about this subject in the wake of the European recession of 2008-09 is that a combination of reduced energy demand and financial crisis has rendered future gas and energy demand prospects, as well as financial capacity to support large scale capital investments, particularly uncertain for many countries in this region. However, the small scale demand of these countries also provides them with opportunities to consider similar sized supply diversification and demand management solutions. While multi-billion Euro pipelines bringing 10-30 Bcm/year of Caspian gas to and through the region have tended to grab the headlines, smaller scale solutions such as interconnectors (with reverse flow), floating LNG regasification facilities, and additional storage – which could be shared between a number of countries – could provide more immediate and affordable solutions. In this region a facility which can deliver (the daily equivalent of) 500 million cubic metres of gas/year on a flexible basis can make a major difference to countries with modest annual demand.

I am very grateful to Tassos and Spiros for the time and effort they have put into this very substantial study despite their busy full time jobs. The study is a major contribution to the Gas Programme's work on south east Europe and greatly illuminates the future gas options facing this complex region.

Jonathan Stern

Oxford, July 2011

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Research Focus and Rationale

Security of supply has been defined as the ability of an energy system (national or regional) to meet demand in events of supply disruption, as well as to cope with normal fluctuations in demand patterns. Supply security is therefore a considerably wider notion than the need to achieve a diversified supply portfolio and as such includes aspects such as switchability to other fuels (electricity, oil, biomass); efficiency gains; and interruptible contracts. Particularly with regard to European security of supply for natural gas in the course of the current decade, Anouk Honore has drawn attention to the importance of natural gas source, transit, and facility dependence; the timing of needed investments; actual deliveries of natural gas volumes and the contracted volumes to fill available import capacity; and the specific price levels including transparency of price formation.¹

This study will focus on the ability to substitute directly any missing gas volumes by means of additional gas import capacities and storage for the region of South Eastern Europe (SEE) and will not include examination of potential contributors to supply security other than those mentioned above. For the purposes of the study, SEE includes the countries / markets of Albania, Bulgaria, Greece, and those in former Yugoslavia with the exception of Slovenia: namely, Bosnia & Herzegovina, Croatia, Montenegro, Serbia, UNMIK / Kosovo, and the former Yugoslav Republic of Macedonia (FYROM). In contrast, Romania is excluded from our analysis and it is instead treated here as an ex-SEE country. This exclusion is admittedly in violation of geographical proximity and of other common definitions of the SEE region, but it stems from the fact that the fundamentals of the Romanian gas market tend to weigh heavily on conclusions of SEE analyses which include the country in their definition of SEE. Indeed, Romania produces, consumes, and stores more natural gas than the wider SEE as a whole. Our omission is therefore aimed at shifting the focus to the smaller gas markets in the broader Balkans, and facilitating understanding of their specific nature, vulnerabilities, and future prospects.²

This region suffers from an overdependence on non-direct Russian natural gas inflows which reach it through three independent (unconnected) pipeline routes: from Ukraine it reaches the eastern Balkans, namely Romania, Bulgaria, Greece, and also the former Yugoslav Republic of Macedonia; from Ukraine via Hungary it reaches the central Balkans, namely Serbia and Bosnia & Herzegovina; and,

¹ See Anouk Honore (2010), *European Natural Gas Demand, Supply, and Pricing: Cycles, Seasons, and the Impact of LNG Price Arbitrage*, Oxford: Oxford University Press for the Oxford Institute for Energy Studies ; also Florent Silve and Pierre Noël, *Cost curves for gas supply security: the case of Bulgaria*, Electricity Policy Research Group Working Paper 1031 (Cambridge Working Paper in Economics 1056), September 2010, University of Cambridge, www.eprg.group.cam.ac.uk.

² SEE is used interchangeably with the term Balkan / Balkans unless otherwise stated.

finally, via Austria and Slovenia it reaches the north western part of the Balkan peninsula (Croatia).³ The degree of vulnerability of the SEE region, in terms of security of supply, became painfully evident in the wake of the gas crisis of January 2009 between Moscow and Kiev, during which disruptions took a heavy toll on local economies, and even caused a humanitarian crisis in the context of residential heating. Supply difficulties at the time were further aggravated by serious inadequacies of the regional transport infrastructure, notably in capacities, reverse flow capabilities, unusual routes, and insufficient integration of the natural gas networks of central Europe and SEE.⁴

These shortcomings in fact constrained available intra-European natural gas flows which could otherwise have completely offset the impact of the disruption of Russian gas supplies on the Balkan region, as was the case elsewhere in the European Union (EU), where the impact of the Russian gas supply cuts remained limited. Should the necessary natural gas infrastructure have been in place at the time, the European shortfall of some 300 mcm/d could have been fully compensated by increased imports from alternative sources and also withdrawal from gas storage; the latter alone (spare storage) was estimated at approximately 800 mcm/d at the time.⁵

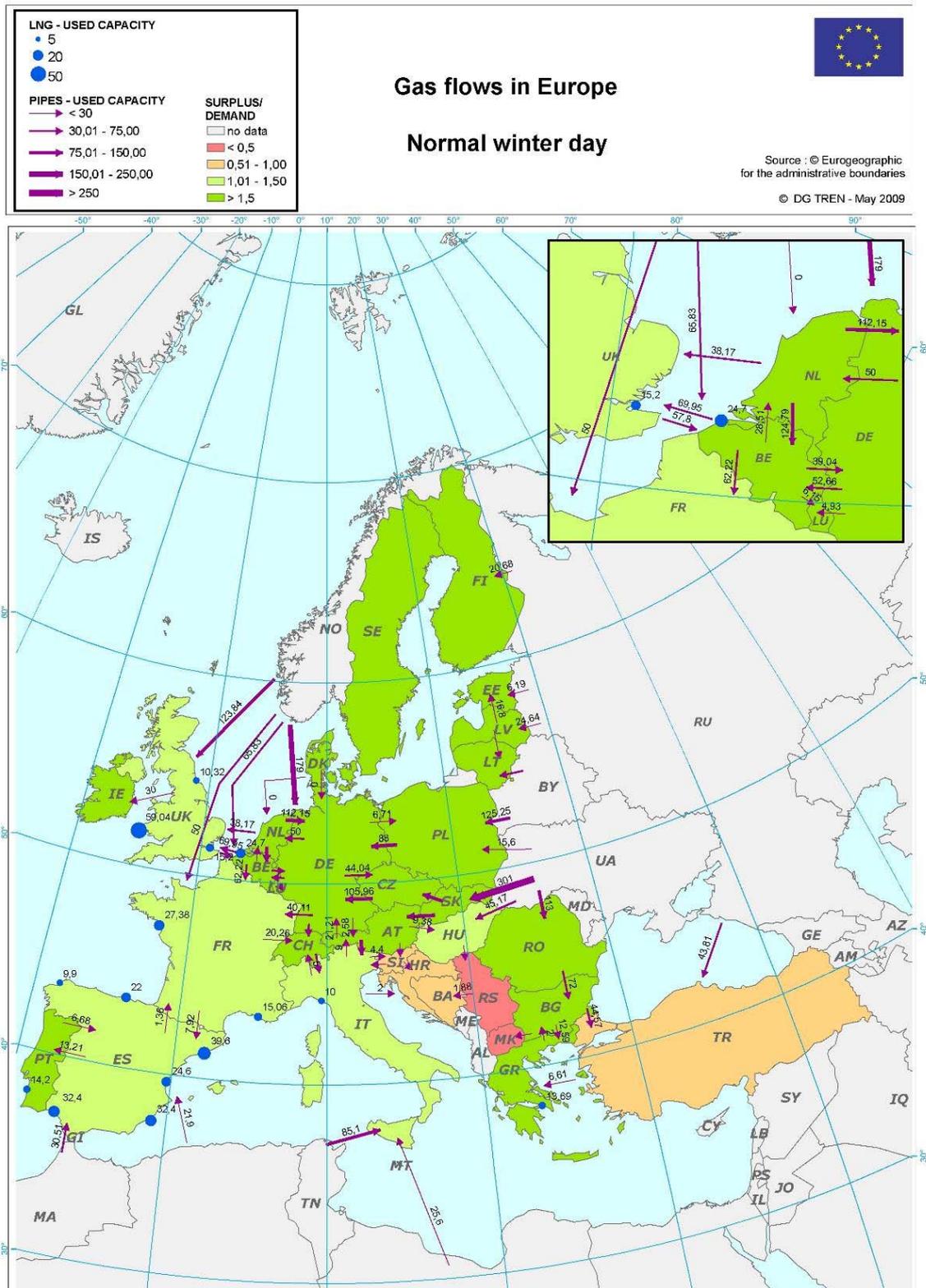
Maps 1 – 3 give a graphic representation of current European and Balkan gas supply arrangements, including their response during the gas crisis of January 2009.

³ Russian supply to Croatia was terminated at end-2010 and Croatian import needs are now covered by a new contract with Italian player ENI. This supply is to be complemented by another new gas contract with E.ON Ruhrgas (*see sections below*). In any event, capacities of existing international pipeline infrastructure in SEE are as follows: pipeline Romania – Bulgaria, ~27.6 bcm/y; pipeline Bulgaria – Greece, ~3.3 bcm/y; pipeline Bulgaria – the former Yugoslav Republic of Macedonia, ~0.8 bcm/y; pipeline Hungary – Serbia, ~6.1 bcm/y; pipeline Serbia – Bosnia & Herzegovina, ~0.7 bcm/y; and the pipeline Slovenia – Croatia is about 1.8 bcm/y; see Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

⁴ For more information see European Commission, *The January 2009 gas supply disruption to the EU: an assessment*, July 2009, <http://eur-lex.europa.eu> ; and Aleksandar Kovacevic, *The Impact of the Russia – Ukraine Gas Crisis in South Eastern Europe*, March 2009, Oxford Institute for Energy Studies, www.oxfordenergy.org

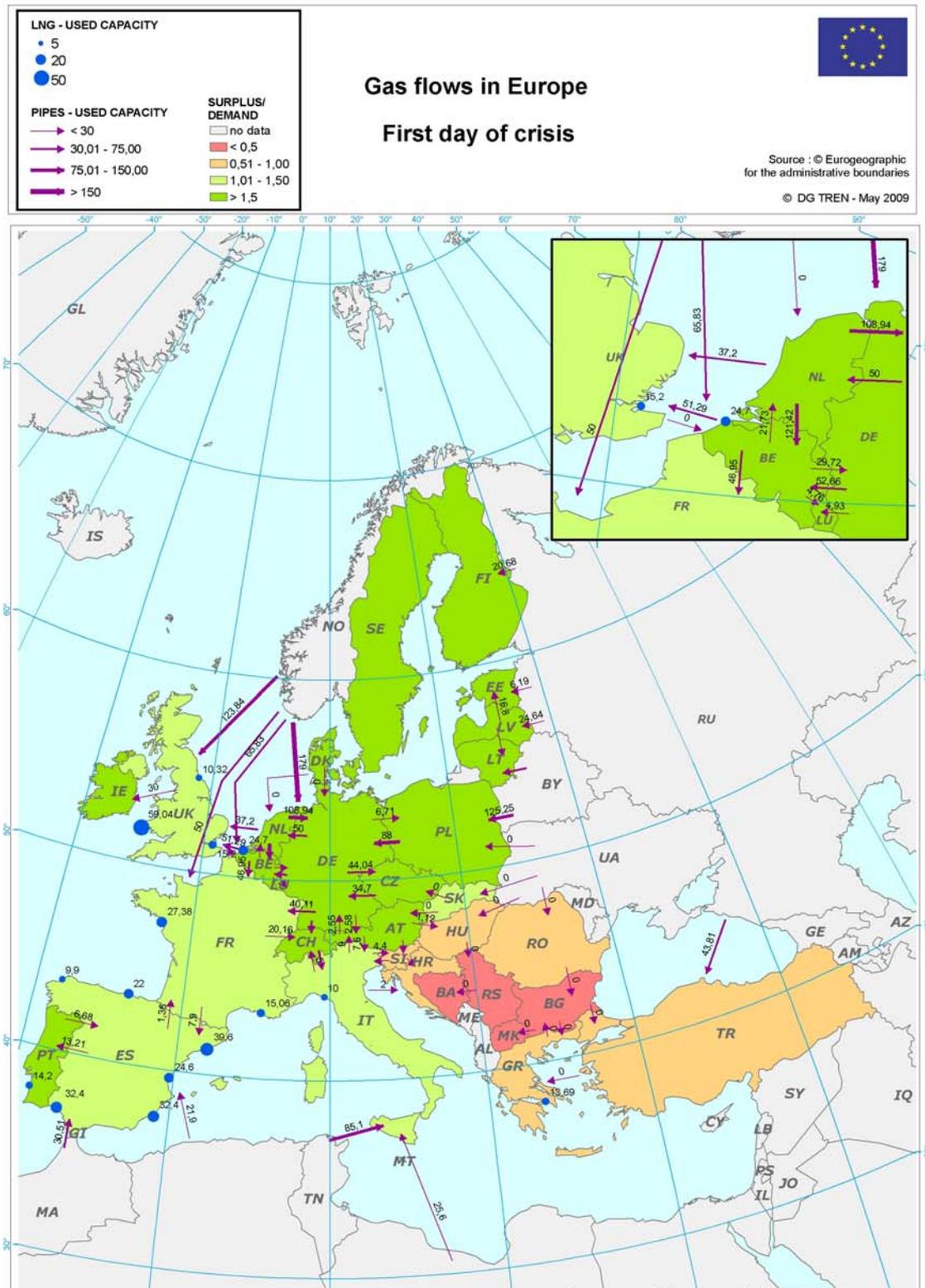
⁵ Ibid.

Map 1: Natural gas flows into the European Union – normal winter day



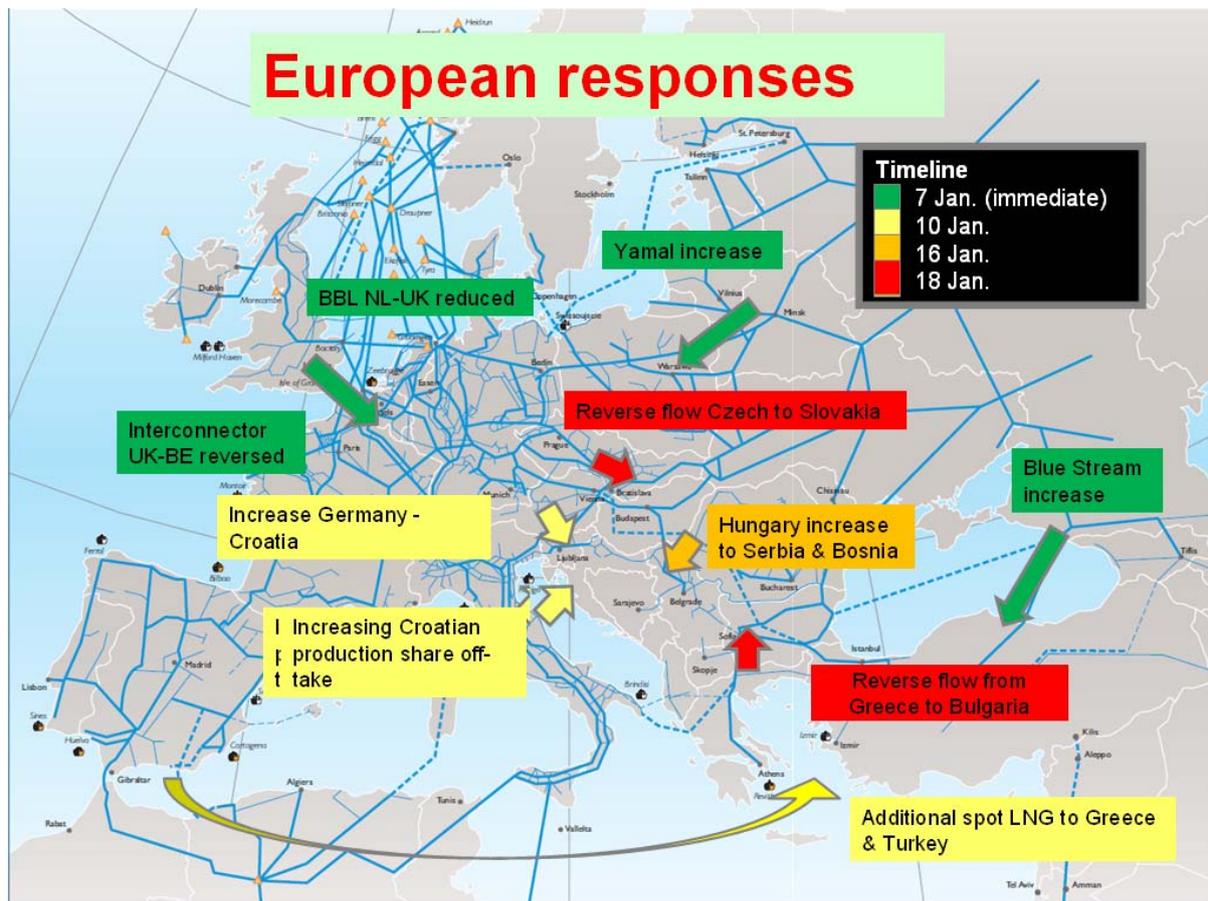
Source: European Commission, *Impact assessment*, p.42, July 2009, <http://eur-lex.europa.eu>

Map 2: Natural gas flows into the European Union – first day of crisis



Source: European Commission, *Impact assessment*, p.43, July 2009, <http://eur-lex.europa.eu>

Map 3: European Union response to the gas supply crisis of January 2009



Source: Analysis of gas crisis presented to Gas Coordination Group by IEA, cited in European Commission, *The January 2009 gas supply disruption to the EU: an assessment*, p.23, July 2009, <http://eur-lex.europa.eu>

Furthermore, SEE as a whole (and even more so individual markets within this region) has only limited access to indigenous supply and storage: indigenous supply is essentially limited to Croatia. What is more, access to the resources (including storage) of the other major producer in the region, Romania, is not possible due to lack of interconnectors; while, access to north European fields and storage is equally difficult due to pipeline limitations, as became evident in the January 2009 crisis. Furthermore, domestic natural gas supply in other Balkan states such as Serbia and Bulgaria is small, and for this reason unable to enhance national and regional security of supply in any meaningful way.

Meanwhile, access to alternative supplies such as Liquefied Natural Gas (LNG) and Caspian pipeline gas remains limited at best and, for most of the individual countries in this region, not an option at all. Current non-Russian supply in the wider region is limited to Greek LNG imports through its (southern) Revithoussa terminal, to Greek pipeline imports from Turkey, and (as of January 2011) to Croatian pipeline imports from Italy (to be complemented by Hungarian supply from E.ON Ruhrgas).

However, at the moment, these diversified volumes are not shared with the Balkan hinterland in any systematic way and in this vein they cannot be considered a contributor to regional supply security.

What is more, under a business-as-usual supply scenario, the region's precarious position vis-à-vis meeting its energy needs in natural gas is expected to be exacerbated in the future, as the Balkan peninsula moves towards increased energy demand levels due to macroeconomic gains as well as substitution of other inefficient and polluting fuels, in line with the relevant EU rules and regulations. For example, electricity, which is currently inefficiently used for water and space heating purposes, could be gradually replaced by the direct use of natural gas; by the same token, wasteful heat-only boilers in old district heating systems could be substituted with either direct use of gas or with more efficient gas-fired Combined Cycle Gas Turbines (CCGT). Importantly, a penetration of natural gas into the region's heat and power sectors offers the added benefit of providing investors with the necessary anchor loads to support such capital-intensive infrastructure development.

SEE is thus in urgent need of investments which target improvements in the long-term quality and reliability of local natural gas infrastructure, e.g. by expanding its available import capacity through construction of new LNG terminals and pipelines, so that it can support projected gas demand levels. But it also needs to develop regional reverse-flow pipeline and storage infrastructure which can help the region cope with emergency supply crises. As in the crisis of January 2009, these may not be the result of an aggregate lack of supply, but rather of poor integration and exchanges in the wider region. Steps in this direction would also be in accordance with EU targets and prioritization on this matter.⁶ The long-term energy strategy of the EU has reaffirmed the importance of natural gas in the future European energy mix and has accordingly drawn attention to the need for diversified gas supply through avenues like the ones mentioned above.⁷

⁶ According to Article 3 of Decision No 1364/2006/EC of the European Parliament and of the Council of 6 September 2006 laying down guidelines for trans-European energy networks: "*The Community shall promote the interconnection, interoperability and development of trans-European energy networks and access to such networks in accordance with Community law in force, with the aim of: (a) encouraging the effective operation and development of the internal market in general and of the internal energy market in particular, while encouraging the rational production, transportation, distribution and use of energy resources and the development and connection of renewable energy resources, so as to reduce the cost of energy to the consumer and contribute to the diversification of energy sources; (b) facilitating the development and reducing the isolation of the less-favoured and island regions of the Community, thereby helping to strengthen economic and social cohesion; (c) reinforcing the security of energy supplies, for example by strengthening relations with third countries in the energy sector in the mutual interest of all parties concerned, in particular in the framework of the Energy Charter Treaty and cooperation agreements concluded by the Community; (d) contributing to sustainable development and protection of the environment, inter alia by involving renewable energies and reducing the environmental risks associated with the transportation and transmission of energy.*" The above refer to all pipeline interconnections, storage, and LNG.

⁷ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the

There is evidence to suggest that SEE governments (with EU support) are moving in this direction, even though national reactions – as well as availability of resources / options – are far from uniform. For example, attitudes towards grand international (pipeline) projects, the successful realization of which cannot be directly influenced by local policy-makers, tend to vary significantly between regional players and are generally dealt with in a hedging strategy context. Concurrent participation in rival projects such as Nabucco and South Stream is the usual framework for debate. This seeming ambivalence in reality represents a rational policy response which can help enhance national security of supply, as well as allow states in the SEE region to accrue some geopolitical gains, in a context where the relatively small SEE state and commercial entities suffer from asymmetries of dependency with their much larger gas suppliers and, therefore, retain limited bargaining power towards them.⁸ This imbalance in turn limits the ability of local SEE players to influence to any substantial degree decisions pertaining to proposed gas transit infrastructure of direct interest to them and forces them towards adoption of the abovementioned hedging strategies.⁹

But in contrast to the remote decision-making mechanisms associated with the large intercontinental pipeline projects mentioned above, local state and commercial players retain much more substantial influence over a number of regional policy responses: for example, over construction of an adequate network of regional interconnectors that will allow local players to access a wider pool of supply assets, and hence boost their own as well as the regional supply (and potentially also price) security; development of LNG import capacity and diversified supply portfolios; expansion of storage capacity; and better demand side management to limit the impact of potential supply disruptions.¹⁰

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

⁸ For more on the significance of symmetry of dependency between gas suppliers and consumers see Brenda Shaffer (2009), *Energy Politics*, Philadelphia: University of Pennsylvania Press.

⁹ The CEO of Plinacro, Croatia's state-owned gas pipeline operator, made his company's strategy with regard to international pipelines passing through or near the country explicit when he stated: *of course, it's unlikely that all planned projects will take roots, but we want to be ready to react quickly and join those that will be implemented*; quoted in Upstream Online, *Croatia eyes gas pipe projects*, 14 June 2010, www.upstreamonline.com

¹⁰ Indeed, security of supply in the region is further undermined by the fact that the bulk of SEE countries have yet to implement successful demand side management measures, which could allow them to overcome inefficiencies inherited from the communist past. Seasonal fluctuations and winter peak demand thus continue to take their toll on energy systems, exacerbating import dependence and overall system vulnerability. Extreme seasonal fluctuations in the Balkans have the power to turn even relatively mild supply disruptions into major economic - and even humanitarian – crises. This proved indeed to be the case in January 2009. Potential solutions in this context include regulating building construction so as to reduce energy demand peaks (thereby rendering related fluctuations much easier to handle); fundamentally overhauling district heating systems in order to make them much more efficient; and considering heat pumps as a major source of heat. More details on these aspects of SEE supply security are available in Aleksandar Kovacevic, *The Impact of the Russia – Ukraine Gas Crisis in South Eastern Europe*, March 2009, Oxford Institute for Energy Studies, www.oxfordenergy.org

The importance of access to funding for such a development plan cannot be overemphasized, especially in a time of global recessionary pressures and tight credit. The EU is already supporting SEE natural gas investments through a number of financial tools, but probably even more is needed. Gas pricing on the import as well as the distribution level is of importance in this problematic milieu, and it includes the notion of affordability and price security. This is a result of the relevance of (relatively high) pricing in helping markets attract the necessary volumes from foreign suppliers. However, large sections of the population in this region are unable to bear the burden of high prices, and this may hinder access of a substantial part of regional markets to natural gas, especially at times of emergency when supply security is most at risk and prices may rise further.

This study aims at contextualizing the notion of gas supply security and how it fits into the broader energy security debate in SEE; at discussing gas demand trends and how market evolution may affect supply security in the region; at describing the immediate and longer term policy responses, rationale, and limitations of state and commercial actors; at evaluating the relevance and adequacy of proposed road maps towards increased supply security, notably pipeline interconnections, LNG terminals, storage; and, finally, at examining the contribution of other potentially important factors such as access to funding and local pricing policies.

1. Energy security as a government priority in South Eastern Europe

Perception of energy security and dash for gas in SEE

SEE countries have in recent years become increasingly alert to the need to improve a largely unreliable and inefficient energy infrastructure – often the result of years of communist inertia and economic mismanagement - and accordingly to secure affordable and (as much as possible) environmentally-friendly energy. Their goal is both to fuel future economic growth, as well as to meet EU-mandated environmental targets. Thus in the wake of the global financial and economic crisis, SEE governments have sought ways to combine the need to offer fiscal stimuli to their economies, with the urgent need to improve their energy systems, notably through trying to attract foreign donor as well as private capital to help realise ambitious investment plans.

Efforts have focused on the need to modernize old and inefficient energy infrastructure in the region; to end the inefficient use of electricity for heating purposes in the residential sector of the wider SEE; to limit overdependence on “dirty” fuels such as coal and oil for heating and power generation; and on the need to meet growing electricity demand in individual SEE markets and in this region as whole.¹¹ In 2010, the World Bank estimated that up to USD 82 billion of investment in power generation, transmission, and distribution would be required in south-eastern Europe by 2030 (in 2008 prices). Another study (REBIS and GIS 2004; PwC Atkins MWH Consortium 2007) concluded that approximately 9,300 megawatt (MW) of generation capacity could be rehabilitated in SEE by 2020, in accordance with least-cost development principles; partially completed and committed plants, including 2,320 MW of new nuclear power generation capacity in Bulgaria and Romania and 1,440 MW of lignite-fired capacity in Bulgaria and Serbia, could be completed by that time. The study also identified almost 12,700 MW of new generation capacity which will be required under its base-case scenario, including: 4,800 MW utilising domestically-procured lignite in Kosovo; 2,500 MW using imported coal; and 2,100 MW of CCGT plants using imported gas. The cost of this rehabilitation and new capacity was estimated at EUR 16.7 billion in 2006 prices.¹²

Although absolute consensus between the international community, local governments, and private investors may be lacking on these numbers and wider issues, on the whole natural gas seems to enjoy broad support as a relatively clean and efficient energy source that should play a more important role

¹¹ IEA (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org

¹² Study and results cited in World Bank, *Lights out? The outlook for energy in eastern Europe and the former soviet union*, 2010, www.worldbank.org, p.111

in an increasingly interconnected Balkan energy system using a range of diversified energy sources.¹³ Adequate levels of investment in the development of gas-fired heat and power generation in the SEE region is thus often seen as a developmental precondition. In fact, besides inherent efficiency and other environmental benefits, it can provide public and private investors with necessary anchor loads. These can in their turn legitimize the substantial upfront costs that they will have to incur in order to be able to develop capital-intensive natural gas infrastructure, notably transmission and distribution.¹⁴

But the ability of SEE to offer these anchor loads and hence facilitate the emergence of a secure gas supply system is not yet obvious because this market remains relatively small (11 bcm in 2009). Indeed, uncertainties are high as SEE gas markets are expected to be defined both by the strength of the expected economic recovery, as well as by wider political (including institutional) considerations. On the economic level, the International Monetary Fund (IMF) anticipates divergent growth rates, which range for period 2011-2015 from below 1.1% Year on Year (Y/Y) for deeply affected Greece, to up to 4.8% Y/Y for Serbia (constant prices). Nevertheless, due to radically different starting points, Greece will continue to have the highest Gross Domestic Product (GDP) per capita in SEE in 2015, with almost United States Dollars (USD) 28,500 in current prices. Next highest is Croatia at some USD 17,150; and lowest is Albania, which will stand at less than USD 4,800.

On the political / institutional level, support for gasification in the wider region even though strong is far from unconditional, due to the persistence of (not unreasonable) funding and pricing concerns. Importantly, SEE gas demand in the past two decades suggests a non-linear correlation with GDP, which reflects the region's turbulent political and economic history, as shaped in the aftermath of the regime collapse and conflicts of the 1990s; and also of the economic recession which started in 2008. In this context, the demand centre has shifted from Bulgaria to Greece, which now leads the region. Figures 1 to 4 below offer more details as well as a graphic representation of the above trends.¹⁵

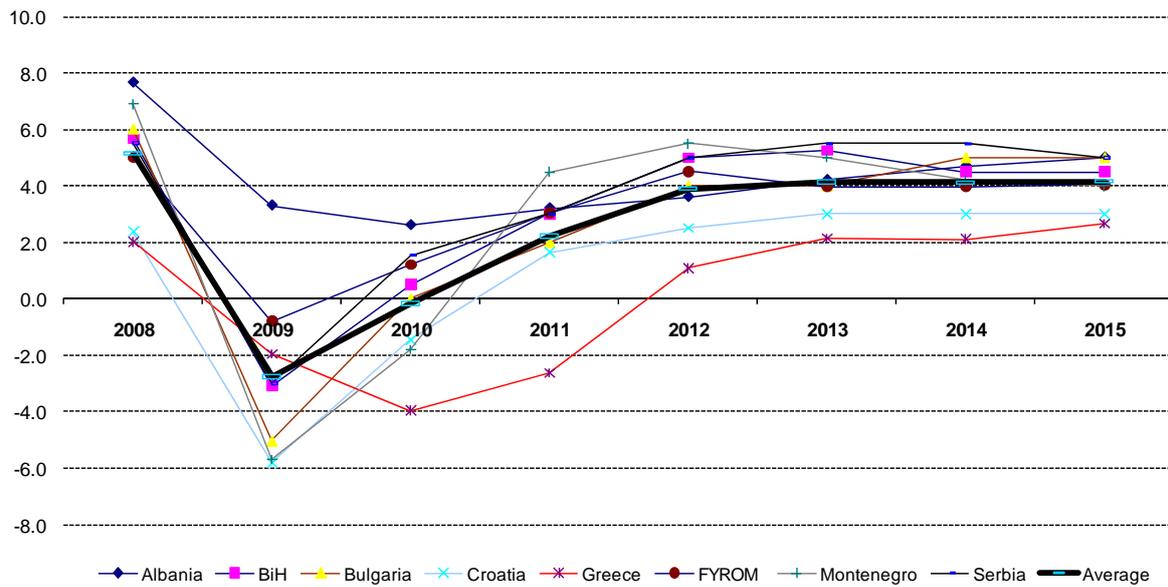
Against this backdrop, it is to the efforts towards energy reliability of individual SEE countries that we now turn, including their march towards substantial gasification and its likely evolution.

¹³ IEA (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org

¹⁴ Penetration of natural gas in the region's power generation mix on environmental grounds will depend on relevant European and national regulation, as well as on the actual economics that result from such usage compared to alternatives. Indeed, mandatory environmental targets and / or high carbon prices will obviously improve prospects for gas in the region. More details on these issues can be found in Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; and also in Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

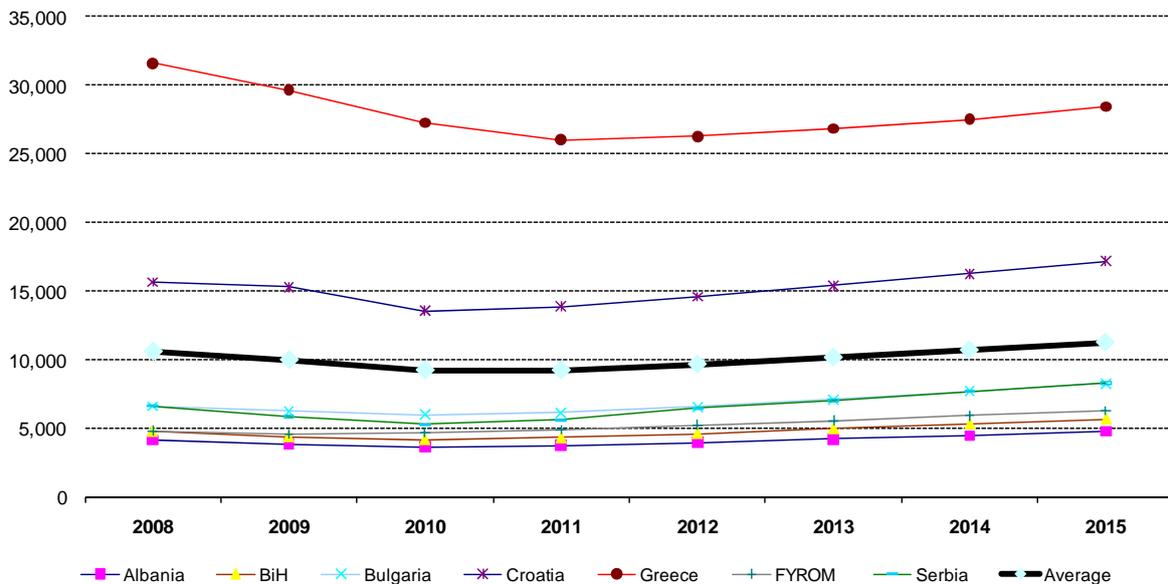
¹⁵ International Monetary Fund (2010), *World economic outlook database*, October 2010, www.imf.org

Figure 1: GDP change % in SEE between 2008 and 2015 (constant prices)



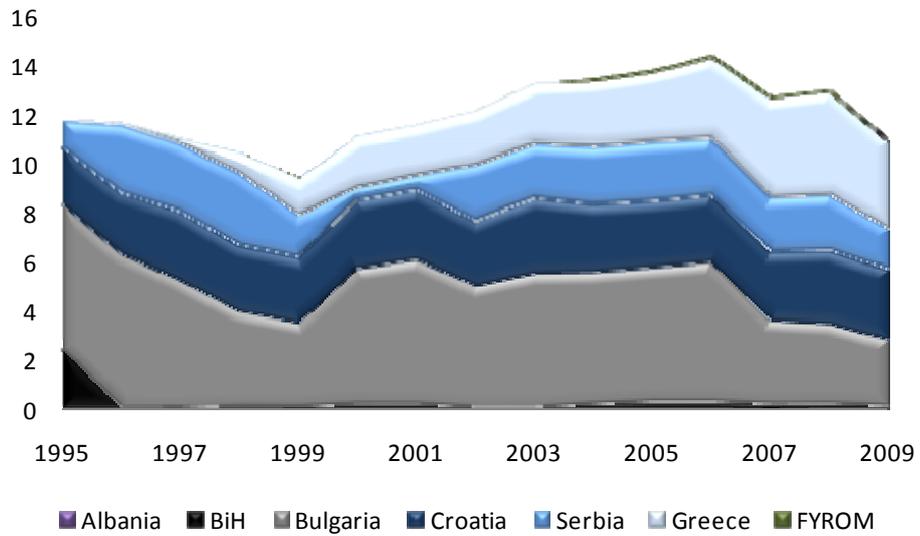
Source: International Monetary Fund (2010), *World economic outlook database*, October 2010, www.imf.org

Figure 2: GDP per capita USD in SEE between 2008 and 2015 (current prices)



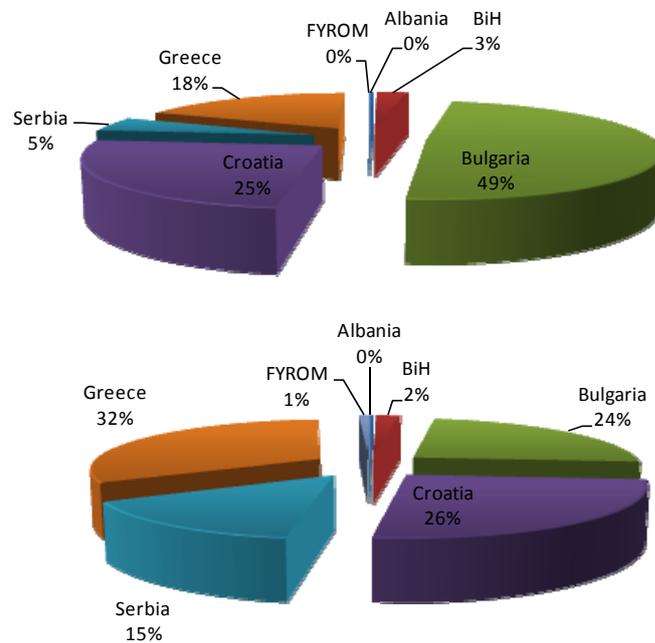
Source: International Monetary Fund (2010), *World economic outlook database*, October 2010, www.imf.org

Figure 3: Demand for natural gas in the SEE region between 1995 and 2009 (bcm/y)



Source: US Energy Information Administration, *International Energy Statistics*, accessed March 2011, www.eia.doe.gov

Figure 4: Relative weighting of natural gas markets in the SEE in 2000 and 2009



Source: US Energy Information Administration, *International Energy Statistics*, accessed March 2011, www.eia.doe.gov

Country responses and regional gas prospects¹⁶

Albania has been pushing for some time with upgrades in its largely dilapidated energy system, in an effort to diversify (hydro-dominated) power generation towards thermal power generation, and thus improve its currently problematic security of energy supply. Against this background, Italian company Ente Nazionale per l'Energia e Lettrica (ENEL) in collaboration with Albanian partners has reportedly proposed construction by 2014 of a new, export-oriented, coal-fired plant with a capacity of up to 1,600 MW at Porto Romano on Albania's Adriatic coast. The move is opposed by a number of environmental groups due to emissions concerns. ENEL's project includes the construction of a 400 Kilovolt (KV) link from the Thermal Power Plant (TPP) of Porto Romano to the local power grid, as well as a 500 KV sub-sea cable that will link it to the more profitable Italian energy market. Nonetheless, licensing now seems to be on hold for unspecified reasons, with local sources suggesting the investment plan may have been all but abandoned.¹⁷

In addition, June 2009 saw completion of the 97 MW Vlorë TPP with the support of the World Bank. Vlorë TPP is a gasoil-fuelled unit, which has the ability to switch to gas when it becomes available in the country. However, test operations in August 2010 showed a serious failure in the plant's cooling system, with local sources warning against possibly highly unfavourable electricity production costs compared to import prices. Still, the government insists there is strong evidence to support development of gas-fired power generation also in the central-eastern region of Semanit. Additionally, in August 2010 the Albanian government approved a draft law on the regulation of natural gas infrastructure development and usage, including relevant licensing procedures.¹⁸

¹⁶ With regard particularly to power generation, this section will examine only thermal units (notably gas-fired ones) as they are of more direct interest to this study. Still, essentially all of the countries in the region are currently engaged in an effort towards expansion of their non-thermal power generation capacity too, notably hydro but also wind, solar, and geothermal. What's more, alternatives such as small scale renewables and biomass could prove cheaper than imported gas in certain cases. For a detailed examination of general power generation (thermal and non-thermal) and its potential contribution in the region see for example International Energy Agency (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org ; and also Aleksandar Kovacevic, *The potential contribution of natural gas to sustainable development to South Eastern Europe*, March 2007, Oxford Institute for Energy Studies, www.oxfordenergy.org.

¹⁷ Information from The Embassy of Greece in Tirana, *E/Φ Shqip*: "Ξεχνιέται ο θερμοηλεκτρικός σταθμός με άνθρακα στο Πόρτο Ρομάνο", Bulletin (Ενημερωτικό Δελτίο) of July – August 2010 ; and ISI Emerging Markets, *NGOs oppose coal-fired power plant construction in Porto Romano*, 28 April 2010, www.securities.com

¹⁸ See The Embassy of Greece in Tirana, *Απέτυχε η δοκιμή λειτουργίας του θερμοηλεκτρικού σταθμού Αυλώνας*, Bulletin (Ενημερωτικό Δελτίο) of July – August 2010 ; The Embassy of Greece in Tirana, *Δηλώσεις Πρωθυπουργού Μπερίσα για το φυσικό αέριο*, Bulletin (Ενημερωτικό Δελτίο) of July – August 2010 ; ISI Emerging Markets, *Albania to promote development of gas network*, 26 August 2010, www.securities.com ; Balkans Business News, *Launch of Albania's Vlore thermal power plant delayed to mid-February for tests*, 10 February 2010, www.balkans.com ; and also Balkans Business News, *Albania's Vlore thermal power plant to launch \$ 40 m tender for fuel acquisition in July*, 15 June 2010, www.balkans.com

Taking into account the country's broader macroeconomic context, the revised National Energy Strategy of Albania projects local demand at between 1.5 billion cubic metres per year (bcm/y) and 1.8 bcm/y by 2020.¹⁹ In contrast, a study on the prospects of the regional natural gas market in SEE which was conducted on behalf of the World Bank projected a more conservative 1 bcm/y for 2025.²⁰ This is probably more realistic than the official Albanian estimate, but it is still based on a number of problematic assumptions, i.e. availability of gas from international pipelines and/or LNG terminals; the relatively rapid expansion of the local gas-fired power generation sector; and the upgrading/extension of the country's decrepit pipeline infrastructure to reach all major industrial customers in the country. Indigenous upstream natural gas resources are insignificant and unable to influence the Albanian supply and demand picture, even though there has been speculation on potentially commercially viable deposits in the northern part of the country.²¹

Bosnia & Herzegovina: In May 2010, state-owned BH-Gas, KTG Zenica – a joint venture (JV) between Kazakh utility KazTransGas and Zenica local authorities - and Swiss company KTG Lugano signed an agreement for construction of a gas-fired CHP by 2013/2014 in the Federation of Bosnia & Herzegovina (FBiH), the Croat – Bosniak / Muslim sector of Bosnia & Herzegovina and main user of gas in the country. In July 2010, it emerged that multinational conglomerate General Electric (GE) was interested in the construction of Zenica CHP. The latter is to have a combined capacity of 234 MW / 170 MW for power and heat respectively, while envisaged costs stand at EUR 230 million. Annual gas consumption at the greenfield plant will likely reach 350 mcm. Interest in moving the project forward was most recently reiterated in January 2011.²²

In the same month, FBiH authorities issued a pre-qualification tender for the selection of a strategic partner concerning construction of a 300 MW coal-fired TPP at Banovici, north-eastern Bosnia.²³

¹⁹ Cited in Stavri Dhima, *Prospects for the introduction of natural gas in Albania*, Paper presented at 'Greek–Albanian Cooperation in the Energy Sector', Tirana, January 2009, www.iene.gr

²⁰ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

²¹ The Embassy of Greece in Tirana, *Ρώσικο ενδιαφέρον για πετρέλαιο και φυσικό αέριο στην Αλβανία*, Bulletin (Ενημερωτικό Δελτίο) of October 2010.

²² ISI Emerging Markets, *Bosnia: EUR 200 mn to be invested in new thermal power plant Zenica*, 13 January 2011, www.securities.com ; Energetika.net, *Preparation of the gas-steam power plant project in Zenica* , 11 January 2011, www.energetika.net ; SeeNews, *General Electric wants to equip cogeneration facility in Zenica*, 7 July 2010, www.seenews.com ; ISI Emerging Markets, *GE to equip Zenica power station*, 7 July 2010, www.securities.com ; Energetika.net, *Construction of power plant in Zenica to begin by the end of this year*, 2 June 2010, www.energetika.net ; ISI Emerging Markets, *BH Gas, KTG Zenica, KTG Lugano sign cogeneration power plant accord*, 31 May 2010, www.securities.com ; & ISI Emerging Markets, *Gas supplier BH Gas, KTG Zenica to sign long-term gas deliveries accord*, 26 May 2010, www.securities.com

²³ Limun.hr, *Plenty of interest in thermal power station project*, 29 July 2010, www.limun.hr

Additionally, in December 2010 state-owned utility Elektroprivreda BiH secured a permit from the FBiH government for the construction of a new 450 MW block (Unit 7) at the adjacent Tuzla TPP. Development of Unit 7, which will be coal-fired, is planned as replacement for older blocks. Construction is to begin in 2012 and to be completed by end-2017, at an estimated USD 1.1 billion. However, the management of Elektroprivreda BiH has raised some serious doubts concerning compliance and due process in the selection of Alpiq as strategic partner in its planned development. Some delay thus now looks inevitable because of continuing political instability in the country and the opposition of Elektroprivreda BiH. In May 2011, it became known that the China National Electric Equipment Corporation (CNEEC) had also expressed its interest in the Tuzla TPP project.²⁴

Furthermore, in November 2010 Elektroprivreda completed the preliminary permitting process for the modernisation of a 300 MW block (Unit 8) at coal-fired Kakanj TPP, the country's largest (450 MW). As with Tuzla TPP above, CNEEC is reportedly interested in development of this project as well. Modernisation of Kakanj Unit 8 is to begin by end-2014 and to be completed within a 5-year period, at an estimated cost of EUR 544 million to EUR 680 million. In this context, Elektroprivreda is to develop a new 100 MW gas-fired block at Kakanj by 2017, at an envisaged cost of EUR 120 million. A preliminary agreement between Elektroprivreda and BH-Gas provides for the supply of the new Kakanj unit with some 180 mcm/y of gas, which will be worth approximately USD 80 million.²⁵

In a similar vein, the government of northern Bosnia (Republika Srpska) has pledged a total EUR 5.9 billion in its energy sector by 2030, and is working towards expansion of its power generation base.²⁶ Among other issues, the strategy refers to the construction of a lignite-fuelled unit at Stanari by end-

²⁴ See ISI Emerging Markets, *China's CNEEC eyes Bosnia's \$ 584 mln coal-fired unit*, 31 May 2011, www.securities.com ; ISI Emerging Markets, *Elektroprivreda BiH wins environmental permit to build block 7 at Tuzla plant.*, 7 December 2010, www.securities.com ; ISI Emerging Markets, *Elektroprivreda BiH to open Alpiq's offer on Tuzla power bloc on Oct 1*, 22 September 2010, www.securities.com ; Energetika.net, *Chairman of supervisory board of Elektroprivreda BiH requested annulment for selection of unit 7 in Tuzla TPP*, 15 September 2010, www.energetika.net ; ISI Emerging Markets, *Swiss Alpiq presents vision on new block of Tuzla thermal power plant*, 9 September 2010, www.securities.com ; and, finally, Balkans Business News, *Swiss Alpiq's \$1.1 bln investment in Bosnian coal-fired plant may be halted*, 7 May 2010, www.balkans.com.

²⁵ Elektroprivreda BiH invested about EUR 90 million towards needed upgrades in 2010, up by approximately EUR 10 million compared to equivalent figures from the previous year (2009). In February 2011, it emerged that aluminium company Aluminij Mostar would also be making a gradual switch to gas, and was in advanced negotiations to that end; see ISI Emerging Markets, *China's CNEEC eyes Bosnia's \$ 584 mln coal-fired unit*, 31 May 2011, www.securities.com ; ISI Emerging Markets, *Aluminij and BH Gas heads on natural gas use in production process of the Mostar company*, 2 February 2011, www.securities.com ; ISI Emerging Markets, *Bosnia EPBiH secures gas for new plant*, 27 January 2011, www.securities.com ; SeeNews, *Bosnia's power utility EPBiH agrees gas supplies for future power unit*, 26 January 2011, www.seenews.com ; Energetika.net, *Elektroprivreda BiH and BH Gas in joint business worth 80 million dollars a year*, 25 January 2011, www.energetika.net ; Balkans Business News, *Top Bosnian utility Elektroprivreda BiH 2010 profit slumps on falling prices*, 31 December 2010, www.balkans.com ; Energetika.net, *Activities of Elektroprivreda BiH related to the SEEWIND project and to the environmental permit for TPP Kakanj*, 11 November 2010, www.energetika.net ; Energetika.net, *Public debate on block 8 of thermal power plant Kakanj*, 1 April 2010, www.energetika.net

²⁶ Approximately half of this amount is planned to be invested within the next five years; for more details see ISI Emerging Markets, *RS plans to invest EUR 5.9 bn in power sector by 2030*, 1 March 2010, www.securities.com

2014, in collaboration with regional player EFT Group and also Chinese company Donfang Electric. Stanari TPP will have a power generation capacity of 300 MW and a gross efficiency of about 38.5%. Total development costs are estimated at EUR 500 million, with EFT financing 25% from own equity. The remaining 75% is to be covered from a consortium comprising both Chinese and European banks. In addition, there are some preliminary plans to expand capacity at the 300-MW coal-fired Ugljevik TPP by constructing a new unit there (up to 600 MW at a cost of EUR 400 million).²⁷

The transmission network of Bosnia & Herzegovina consists of only some 191-km of gas pipelines, with a 16-inch diameter and a maximum current working pressure of 30-bar. The max design pressure stands at 50-bar and has a carrying capacity which is in excess of 1 bcm/y.²⁸ Hence in October 2009, Republika Srpska commenced operations aimed at expansion of the natural gas grid in its territory, with the construction of a 260-km gas pipeline in the municipality of Bijeljina. Upon completion, this will connect either to Zvornik – Sarajevo or to the (planned) Sava natural gas pipeline. According to local sources, the project is to be completed by a Public – Private Partnership (PPP) consortium between the local Bosnian municipality of Bijeljina and Serbian company Novi Sad Gas. Development costs are to be shared on a 20/80 basis, while this gasification project forms part of the municipality's medium-term development strategy until 2015.²⁹

FBiH has similarly been working towards gasification of its local economy, with BH-Gas and Energoinvest already pushing for the construction of a 130-km pipeline between Bosanski Brod in northern Bosnia (Republika Srpska) and Zenica in Zenica-Doboj Canton in central Bosnia (FBiH).³⁰ Completion is envisaged by 2014, at a cost of EUR 45 - EUR 57 million, depending on specifications. Its target is to help secure necessary supplies and gasify transit areas, the latter through construction of an additional 120 km of distribution infrastructure. The project received a boost in January 2010,

²⁷ Stanari is located 50-km east of Banja Luka. In May 2010, the EFT Group reached an agreement with Donfang Electric. According to it, Stanari TPP will have a capacity of 300 MW (compared with the original 410 MW) and gross efficiency of about 38.5%. Plant operations will be in line with EU emission directives, while Stanari will utilize adjacent lignite reserves to support energy affordability in the country. For more information see for example ISI Emerging Markets, *Comsar Energy to build thermal power plant for EUR 400 mn in Serb Republic*, 25 March 2011, www.securities.com ; Balkan Business News, *Serbia, China sign \$345 mln power plant deal- Agreement is part of a \$1.25 bln deal*, 9 December 2010, www.balkans.com ; ISI Emerging Markets, *Chinese company to build Stanari power plant*, 6 May 2010, www.securities.com ; and EFT Group, *EFT and Dongfang Electric Corporation in EPC deal for Stanari TPP*, 5 May 2010, www.eft-stanari.net

²⁸ BH-Gas, *High-pressure gas pipeline projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org

²⁹ ISI Emerging Markets, *Construction of EUR 23 mn Bijeljina gas pipeline system starts*, 20 October 2009, www.securities.com

³⁰ Possible technical specifications under consideration for this project refer to a construction of natural gas pipeline with a diameter of 16- to 20-inch; a working pressure of 50 to 75-bar; and a transmission capacity of 1 bcm/y to 2 bcm/y.

when the European Bank for Reconstruction and Development (EBRD) expressed an interest in financing it and also gave its initial approval.³¹

In addition, the administration of FBiH is to receive a EUR 17 million loan from EBRD, in support of a wider EUR 23.5 million project aimed at the gasification of the adjacent Central Bosnia Canton. Hence, in July 2010 the Ministry of Environmental Planning of FBiH gave BH-Gas its approval for the construction of a 40-km / 16-inch / 1 bcm/y gas pipeline between Zenica and Travnik in 2011.³² Gasification there will be achieved upon completion of the new natural gas-fired unit at Kakanj TPP, which for now remains exclusively coal-fired (*see above*). BH-Gas considers Kakanj's anchor load highly instrumental with regard to its gas distribution network development programme, notably the Brod – Zenica and Split – Central Bosnia Canton sections. Kakanj's connection to the Bosnian gas grid will also necessitate construction of an extra compressor, at an estimated cost of EUR 7 million.³³

In September 2010 EBRD also gave its initial approval for another EUR 32.5 million loan to BH-Gas, to support construction of a 92-km gas link (including distribution branches) in Una – Sana Canton, located in north-western Bosnia. The loan has yet to be finalised and continues under negotiation. Preliminary technical specifications refer to construction of a 20-inch / 50-bar / 1 bcm/y gas pipeline. The project is to form part of a broader interconnection plan between Bosnian and Croatia and as such presupposes successful completion by Croatian operator Plinacro of a 30-km pipeline, which will extend the national gas grid of Croatia to the border of Bosnia & Herzegovina. It has been included in the investment plan of Plinacro for the period of 2010 to 2014. BH-Gas will be tasked with extending the Croatian pipeline from its point of entry (possibly, Trzac) to the city of Bosanska Krupa, with

³¹ BH-Gas, *High-pressure gas pipeline projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; ISI Emerging Markets, *EBRD may finance project to link Bosnia and Croatia's gas networks*, 29 January 2010, www.securities.com

³² More specifically Zenica 7.2 km (Zenica-Doboj Canton); Busovaca 9.3 km (Central Bosnia Canton); Vitez 10.1 km (Central Bosnia Canton); Novi Travnik 1.8 km (Central Bosnia Canton); and Travnik 13 km (Central Bosnia Canton). Information from SeeNews, *Bosnia's BH-Gas hires Turkey's Umran Steel Pipe to supply 3.4 Mln Euro pipeline equipment* , 30 May 2011, www.seenews.com ; EBRD, *Gasification of Central Bosnian Canton*, updated 22 July 2010, www.ebrd.com ; ISI Emerging Markets, *Central Bosnian Canton okays construction of gas line*, 5 July 2010, www.securities.com ; and from ISI Emerging Markets, *EBRD, BH Gas invite interested suppliers, contractors for gasification project*, 9 April 2010, www.securities.com

³³ ISI Emerging Markets, *BH Gas, Elektroprivreda BiH ink pre-investment contract*, 25 January 2011, www.securities.com ; ISI Emerging Markets, *Elektroprivreda BiH and BiH-Gas to sign pre-investment contract for natural gas delivery*, 21 January 2011, www.securities.com ; Energetika.net, *The government of the Federation of Bosnia and Herzegovina addressed energy matters*, 31 December 2010, www.energetika.net ; BH-Gas, *High-pressure gas pipeline projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; SeeNews, *Bosnian gas monopoly sees consumption tripling after network expansion*, 26 August 2010, www.seenews.com ; ISI Emerging Markets, *EBRD lends EUR 17 mn for gasification project*, 28 January 2010, www.securities.com ; and ISI Emerging Markets, *FBiH to launch EUR 23.5 mn gasification project*, 26 January 2010, www.securities.com

branches also to the main cities of Velika Kladuša and Bihać. Feasibility studies are to be completed by end-2011, with project completion expected by 2013.³⁴

BH-Gas also maintains ambitious (albeit not necessarily as realistic) plans for the construction of additional natural gas pipelines to facilitate ultimate connection to the southern Croatian gas network, when / if the latter is completed. A letter of intent was signed to that end in April 2011 (*see below*). BH-Gas has in any event already announced plans for construction by 2014 of a 107-km line between Posusje and Bugojno, with 16- to 20-inch diameter, 50- to 75-bar pressure, and 1 bcm/y - 2 bcm/y gas transport capacity, at an estimated EUR 55 million. It also plans to complete by 2017 a 175-km gas line between Ploče – Mostar – Sarajevo with a similar capacity and a cost of EUR 59 - 73 million. BH-Gas has also been considering low-pressure CNG as a potential means of serving industrial customers outside the reach of its network, even after expansion.³⁵

Significant potential for natural gas in Bosnia & Herzegovina as a whole is attested by its penetration in areas which have been gasified, and where the fuel is already the most attractive option for residential customers. In view of that, the World Bank has estimated gas demand potential in the main cities of Banja Luka, Zenica, and Mostar at a combined 1 bcm/y. International donor agency studies suggest gasification would be commercially sound in up to an additional 8-10 urban locations, provided the gas transmission pipeline passed nearby (albeit the exact distance has not been clarified). BH-Gas accordingly estimates national gas demand at levels between 1.2-1.5 bcm/y, once all relevant transmission and distribution networks have been completed. However, this may be too optimistic in the face of the generally slow pace of implementation in SEE, combined with recessionary pressures. Against this backdrop, the World Bank and others partners have calculated a much more moderate (and probably at the same time more realistic) average national consumption of 1.4 bcm/y by 2025. According to local sources, Bosnia & Herzegovina may hold some upstream oil & gas reserves which could impact on the supply and demand picture, but their overall relevance and commercial viability

³⁴ BH-Gas, *High-pressure gas pipeline projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; SeeNews, *Bosnia's BH-Gas eyes 32.5 mln euro EBRD loan for pipeline project*, 7 September 2010, www.seenews.com ; ISI Emerging Markets, *Bosnia: EBRD approves EUR 32.5mn to BH Gas*, 7 September 2010, www.securities.com ; BH Gas, *Gasification of Una Sana Canton*, 6 August 2009, www.bh-gas.ba

³⁵ In September 2010, BH-Gas signed a preliminary agreement with US-Israeli company Energetek, which specialises in Adsorbed Natural Gas (ANG). In March 2011 BH-Gas followed up by signing an agreement with Energetek for a supply of up to 14 mcm/year, aimed at meeting the needs of the aluminium industry in the area of Mostar as of September 2011 (SeeNews, *Croatia's Plinacro, Bosnia's BH-Gas confirm intent to link gas grids*, 11 April 2011, www.seenews.com ; ISI Emerging Markets, *BH Gas, Croatia's Plinacro ink cooperation accord*, 8 April 2011, www.securities.com ; SeeNews, *Bosnia's BH-Gas signs 10-year deal with US Energetek worth up to 36 mln Euro*, 4 March 2011, www.seenews.com ; ISI Emerging Markets, *BH Gas and Energetek sign agreement on natural gas deliveries*, 3 March 2011, www.securities.com ; Limun.hr, *BH Gas, Energetek sign preliminary agreement*, 30 September 2010, www.limun.hr ; BH-Gas, *High-pressure gas pipeline projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org).

in the current market context has to be proven. The Bosnian gas market stood at 220 mcm in 2009, compared with approximately 310 mcm in 2008 (*see above*). Map 4 locates current and planned infrastructure in Bosnia & Herzegovina and the Adriatic coastline.³⁶

Map 4: Current and planned gas infrastructure in Bosnia & Herzegovina



Source: BH-Gas, *High-pressure gas pipeline projects*, Paper presented at the Gas Forum of Energy Community, Ljubljana, September 2010, www.energy-community.org

³⁶ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; The Embassy of Greece in Tirana, *Ρώσικο ενδιαφέρον για πετρέλαιο και φυσικό αέριο στην Αλβανία*, Bulletin (Ενημερωτικό Δελτίο) of October 2010 ; SeeNews, *Bosnian gas monopoly sees consumption tripling after network expansion*, 26 August 2010, www.seenews.com ; IEA (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org ; and Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

Bulgaria: The Bulgarian power generation sector has seen both expansion as well as restructuring in past years, as part of a wider effort to boost profitability and also enhance security of supply in the country. Sofia's long-term strategy targets the preservation of Bulgaria's current status as a net power exporter, and even the expansion of this commercial advantage by a total 1,500 MW by the end of this decade. Governmental support for gas-fired power generation is relatively strong in Bulgaria, which relates also to the country's need to meet EU environmental targets and balance the intermittency of its future wind power generation.³⁷ In this context, in August 2010 the local subsidiary of Austrian Energieversorgung Niederösterreich (EVN) launched construction of a gas-fired CHP plant on the site of the existing Plovdiv North TPP. The new CHP plant is expected to be completed by the end of 2011, at an estimated cost of EUR 51 million. Its capacity will be ~50 MW power and ~54 MW heat; its project manager is reportedly Siemens.³⁸

But in contrast to the expansionary government and EVN plans, in June 2010 major Czech investor CEZ decided to put indefinitely on hold its plans for the construction of an 880 MW gas-fired plant, which had an estimated cost of approximately USD 1.1 billion. The new plant was aimed at replacing the company's ageing coal-fired units at Varna, which have a combined capacity of some 1,260 MW (6 blocks of 210 MW). The company's investment plan was shelved amid concerns over the reliability / security of supply and suitability of the country's regulatory framework, notably pricing. In addition, CEZ has now decided not to move forward with modernization of its Varna assets, even though, according to EU legislation, this is a prerequisite for them to remain operational. As a result, one unit has already ceased operations, and CEZ sees only 3 of them remaining active by 2015. However, rumours of a possible divestment from Varna have been denied by management.³⁹

Another important international investor in Bulgaria, the Italian Group ENEL, has been looking into divesting its stake at the lignite-fired Maritsa Iztok 3 TPP, which is located close to Plovdiv, due to a reported lack of integration of this asset with the company's strategic priorities in the wider region; and also because of the global economic crisis and the resulting financial difficulties for the company.

³⁷ Traycho Traykov, *The energy strategy until 2020: a new vision for the future of energy in Bulgaria*, 18 June 2010, Ministry of Economy, Energy and Tourism, www.mi.government.bg

³⁸ SeeNews, *Bulgaria revises energy plan, eyes 1,500 MW in extra export power capacity by 2020*, 20 January 2011, www.seenews.com ; ISI Emerging Markets, *Austria's EVN groundbreaking for new plant in Bulgaria*, 13 September 2010, www.securities.com ; ISI Emerging Markets, *EVN launches construction of EUR 51.1 mn cogeneration unit in Plovdiv*, 31 August 2010, www.securities.com ; Energetika.net, *A new thermal power plant for 50 million Euro will be considered*, 24 March 2010, www.energetika.net

³⁹ For more information SeeNews, *Interview – Czech CEZ to invest 36.3 mln Euro in Bulgaria in 2010, freezes project for new capacity in Varna power plant*, 26 August 2010, www.seenews.com ; ISI Emerging Markets, *Thermal power plant seeks extension of units operation by 2015*, 26 August 2010, www.securities.com ; Reuters, *CEZ shelve plans for gas-fired plant in Bulgaria*, 10 June 2010, www.reuters.com ; and Reuters, *CEZ likely to freeze Bulgaria gas plant project*, 23 March 2010, www.reuters.com

The Bulgarian government has announced analogous divestment plans with regard to its minority stake there, as the National Electricity Company (NEC) owns a 27% share at Maritsa Iztok 3 TPP. This announcement came in the immediate aftermath of the announcement by ENEL, and can be seen in light of its effort to slash its deficit and also reduce its exposure to the negative economic context.⁴⁰ On the contrary, in October 2010 Bulgarian Energy Holding (BEH) completed upgrades at one of the units of its Maritsa Iztok 2 TPP, which is the largest such power plant in the SEE region (1,556 MW). As a result, the company managed to raise production capacity in that unit from 210 MW to 230 MW; and also extended its operational lifetime by 25 years, at a cost of approximately EUR 35 million.⁴¹ Furthermore, following its official commissioning by operator AES Corporation in June 2011, streaming of the total 670 MW capacity of fully renovated Maritsa Iztok 1 is expected by end-2011. Development costs for this project have reportedly reached the level of EUR 1.2 billion.⁴²

Meanwhile, Sofia has so far proved unsuccessful in its bid for a 2,000 MW export-oriented greenfield Nuclear Power Plant (NPP) at Belene, some 60-km north-east of Pleven on the border with Romania, in which Bulgaria is to hold the majority 51%. The centre-right administration of Prime Minister Boyko Borisov, which took over in July 2009, has already voiced concerns as to its business rationale, and it also remains ambivalent over relations with Moscow (Russian AtomStroyExport is to build it). In October 2009, minority 49% partner RWE withdrew from the Belene NPP, while a more recent tentative interest from some Balkan neighbours, notably Serbia, will likely not be enough on its own to help lead this project towards its completion. The relative warming up seen in relations between Sofia and Moscow in the second half of 2010, including on matters such as the technical design of Belene NPP and possibly even its price tag, leaves room for optimism, even though it is not yet concrete enough to move the project forward. Hence, there is a real threat that Belene may fail to realize altogether, adding to the abovementioned unreliability of the planned expansion of the power generation sector in Bulgaria.⁴³

⁴⁰ Energetika.net, *Tpp Maritsa Iztok 3 may be put up for sale*, 24 March 2010, www.energetika.net

⁴¹ PennEnergy, *Power plant Maritsa East II completes unit upgrade*, 12 October 2010, www.pennenergy.com

⁴² Energetika.net, *AES Galabovo important for energy balance in Bulgaria*, 13 June 2011, www.energetika.net ; Sofia Echo, *AES set to launch operations of Bulgarian thermal plant subsidiary*, 3 June 2011, www.sofiaecho.com ; ISI Emerging Markets, *Bulgaria opens its first new power plant since 1981*, 3 June 2011, www.securities.com

⁴³ With regard to the potential inclusion of Balkan partners in Belene NPP, Zagreb has already declined Bulgaria's offer. Further information on Belene can be found in Energy Press, *Σόφια: Τα βρίσκει με τον Πούτιν για τον South Stream, το αέριο, ίσως και για το Μπέλενε...*, 16 November 2010, www.energypress.gr; ISI Emerging Markets, *Bulgaria, Russia establish South Stream JV year*, 15 November 2010, www.securities.com ; Balkan Insight, *Croatia PM says 'no' to Bulgaria's Belene nuclear plant*, 9 November 2010, www.balkaninsight.com; World Nuclear News, *Bulgaria bags additional decommissioning funds*, 20 May 2010, www.world-nuclear-news.org; and World Nuclear News, *Bulgaria seeks new financial model for Belene*, 6 April 2010, www.world-nuclear-news.org

At the same time, the largest Bulgarian gas retailer Overgas, which is co-owned by Gazprom, has been planning to expand its network in the country by approximately 50-km in 2010, of which 22-km is in the capital Sofia. The company already operates a 2,000-km natural gas network in Bulgaria.⁴⁴ The expansion seems to fall within the wider strategy of Overgas and parent company Gazprom, which aims at increasing direct gas marketing to industrial customers in Bulgaria by ~1 bcm/y from 2011 onwards, at the expense of former state monopoly Bulgargaz.⁴⁵ This development came in the aftermath of calls to redefine the role of Russian export subsidiaries in Bulgaria and other countries towards more direct marketing. It is expected to impact negatively on the market share of state-owned player Bulgargaz.⁴⁶ Overgas added an extra 3,200 customers to its network in 2010 (+8%). For 2011, it targets construction of an extra 75-km, about half of which will be in Sofia.⁴⁷

But, despite these points of potential friction, gas grid expansion remains one of the top priorities of Bulgarian energy strategy, with state-owned transmission operator Bulgartransgaz already planning to connect Dobrich with Silistra in north-eastern Bulgaria, in an attempt to support gasification.⁴⁸ Construction works are expected to begin in September 2011, and to be completed the following year; related costs will likely be in the order of EUR 12.4 million and 75% will be provided by EBRD, under the provision though that the project does not fall behind schedule as has been the case so far. Furthermore, Bulgartransgaz is to connect the north-west towns of Orvahovo, Kozloduy, and Chiren; and construct high-pressure lines to the south-west towns of Bansko, Simitli, and Razlog by 2013.⁴⁹

⁴⁴ ISI Emerging Markets, *Overgas subsidiaries to build 50 km pipelines this year*, 8 February 2010, www.securities.com

⁴⁵ ISI Emerging Markets, *Overgas to start supplying natural gas to large companies*, 28 May 2010, www.securities.com ; at the same time, Gazprom was working towards direct access to the Bulgarian power market in order to trade ~50,000 GWh per year (and up to ~350,000 GWh in the longer term) in the local market. In February 2010, the company was granted a 20-year marketing and trading license by the Bulgarian authorities, including a license to operate in the local carbon quotas market. However, these arrangements have since encountered serious difficulties due to lack of proper national regulation and oversight in Bulgaria; for more information see Energetika.net, *Gazprom marketing & trading to trade on Bulgarian electricity market*, 18 February 2010, www.energetika.net

⁴⁶ Information from Upstream Online, *Bulgargaz in direct talks with Gazprom*, 31 May 2010, www.upstreamonline.com ; and also from ISI Emerging Markets, *Gazprom to audit gas export subsidiaries*, 5 March 2010, www.securities.com

⁴⁷ More info in Novinite.com, *Overgas to persist in expanding Bulgaria's gas network*, 6 March 2011, www.novinite.com ; ISI Emerging Markets, *Customers of natural gas retailer Overgas increase 8% last year*, 18 February 2011, www.securities.com ; ISI Emerging Markets, *Natural gas users up 8% in 2010 - Overgas*, 18 February 2011, www.securities.com

⁴⁸ Traycho Traykov, *The energy strategy until 2020: a new vision for the future of energy in Bulgaria*, 18 June 2010, Ministry of Economy, Energy and Tourism, www.mi.government.bg

⁴⁹ ISI Emerging Markets, *Energy minister on shale gas prospecting, negotiations with Gazprom, gas interconnectors*, 28 May 2011, www.securities.com ; Standart, *Gas pipe to link Simitli and Bansko*, 28 January 2011, <http://paper.standartnews.com> ; ISI Emerging Markets, *Gas transportation track to be constructed from Simitli to Razlog, Bansko by 2013*, 27 January 2011, www.securities.com ; ISI Emerging Markets, *Bulgartransgaz to construct gas pipeline to Silistra*, 19 November 2010, www.securities.com

In January 2010, the EBRD also announced it is considering providing a EUR 30 million senior loan to Citygas Bulgaria, which is controlled by Italian Gruppo Societa Gas Rimini with a 90.22% share. Citygas Bulgaria holds a 35-year license for the development and operation of the gas distribution network in the broader Thrace region (Trakia) in the southern part of the country. The company targets construction and operation of some 1,700 km of pipeline and associated infrastructure, which will provide natural gas to a total of 1,000 industrial clients; 1,500 commercial clients; and 96,000 residential users. Approximately 20-km of the planned pipeline infrastructure crosses NATURA 2000 sites but the Bulgarian government is favourable and has already issued an opinion which allows construction due to “negligible environmental effects”. Costs are estimated at some EUR 125 million. In this framework, in May 2010 the EBRD approved a EUR 30 million loan towards construction of 833-km of the gas distribution network and related infrastructure by 2012 in a total 27 municipalities. In addition, there are currently plans in Bulgaria which are aimed at upgrading the compressor station infrastructure, specifically moving forward with a modernisation of its automatic management aggregator systems and compressor workshops at Valchi Dol and Polski Senovets; and completing maintenance and repair works of turbo compressor aggregate No.3 at Kardam compressor station.⁵⁰

Furthermore in December 2010, RilaGas, a local subsidiary of Italian company Acegas Aps, announced plans to invest some EUR 7 million in the construction of a 57-km gas grid in Radomir, south-western Bulgaria. RilaGas expects this project to be completed by end-2012 in two phases, allowing it to reach another 6,900 residential and 100 commercial clients in that catchment area. Overall the company has been fairly ambitious in its planning, undertaking contractual obligations to construct and operate 870-km worth of gas distribution pipelines in the area of Zapad in four phases, at an estimated cost of EUR 130 million. With this, RilaGas reportedly targets a client portfolio of 110,000 residential, 430 commercial, and 280 industrial customers in the wider south-western region. Besides Radomir, the first development phase (which is now almost complete) of RilaGas’ expansion project also includes connection of Vratza; Pernik; Ihtiman; Dupnitsa; Blagoevgrad; Sandanski. RilaGas has so far invested only EUR 23.5 million and developed 134-km of the proposed network.

⁵⁰ For more details see EBRD, *Gas Rimini – Trakia gasification*, updated 16 July 2010, www.ebrd.com ; ISI Emerging Markets, *EBRD approves EUR 30 mn loan to gas distributor Citygas Bulgaria*, 10 May 2010, www.securities.com ; Balkans Business News, *EBRD: € 30 million to Citygas Bulgaria to expand gas distribution network*, 7 May 2010, www.balkans.com ; Energetika.net, *EBRD considers Eur 30 million loan to Citygas Bulgaria AD*, 25 January 2010, www.energetika.net ; ISI Emerging Markets, *EBRD considers EUR 30 mn senior loan to gas distributor Citygas Bulgaria*, 19 January 2010, www.securities.com ; and SEWRC / DKER, *National report to the European Commission*, July 2009, www.dker.bg

As a result of this relative inactivity, the Bulgarian energy watchdog had fined it EUR 20,000; and also threatened to revoke its relevant licences if it continued to fail to accelerate construction.⁵¹

Despite inevitable minor setbacks such as the above, gasification of the Bulgarian residential sector is expected to make relatively good progress and reach 30% by 2030, from only ~1.5% at the moment. Residential penetration will be driven by the substitution of (largely inefficient) electricity in heating. Electricity generation is similarly expected to rise to substantial levels, but relevant growth rates may be somewhat contained by cheaper conventional alternatives and Renewable Energy Sources (RES). In light of the above trends, the Bulgarian State Energy and Water Regulatory Commission (SEWRC/DKER) sees natural gas demand levels in the country to reach some 4.6 bcm/y by 2015. This roughly corresponds to projections in the World Bank study, which refer to 6.3 bcm/y by 2025. However, other official sources have much higher figures of 7-8 bcm/y by end of the current decade, and as much as 10 bcm/y by 2030. Indigenous upstream gas supply will cover a part of this incremental national demand for natural gas, but on the whole its role is likely to remain limited, unless a substantial portion of recent unconventional gas discoveries in the country prove commercially viable.⁵² Bulgarian gas demand stood at some 2.65 bcm in 2009, down from roughly 3.21 bcm the year before. Maps 5 below locates current gas pipeline infrastructure in Bulgaria.⁵³

⁵¹ The Sofia Echo, *RilaGas to invest 56M euro in southwestern Bulgaria's gas supply network*, 31 March 2011, www.sofiaecho.com ; SeeNews, *RilaGas to complete gas grids deployments in western Bulgaria by 2020*, 31 March 2011, www.seenews.com ; RilaGas, *Home*, accessed 4 December 2010, www.rilagas.bg ; ISI Emerging Markets, *EBRD Italy's Acegas to invest EUR 7 mn in Radomir gas distribution network*, 3 December 2010, www.securities.com ; and also SeeNews, *RilaGas To Invest 7.05 Mln Euro in Bulgarian Town's Gas Distribution Network by 2012*, 2 December 2010, www.seenews.com

⁵² In May 2011, Chevron offered USD 30 million to the Bulgarian government for securing a license to carry out shale gas exploration in the area of Novi Pazar, in north-eastern Bulgaria. Shale gas reserves in the wider region are estimated to stand at between 300 and 1,000 bcm; but this figure (as well as its commercial viability) will have to be confirmed by research. Another two tenders are underway in the same location, and offers for those were expected until the end of June 2011. Shale gas production could theoretically start in 7 to 10 years, provided it overcomes opposition on environmental grounds (information from ISI Emerging Markets, *Socialists call for moratorium in shale gas prospecting in Bulgaria*, 10 June 2011, www.securities.com ; ISI Emerging Markets, *Chevron wins tender to explore Bulgaria's shale gas deposits*, 30 May 2011, www.securities.com ; Novinite.com, *Shale gas provokes doubts, controversy in Bulgaria*, 30 May 2011, www.novinite.com ; Reuters Africa, *Chevron picked to test for shale gas in Bulgaria*, 28 May 2011, <http://af.reuters.com/> ; and Balkan Business News, *300 billion cubic meters of shale gas has been discovered untapped in central northern Bulgaria*, 4 October 2010, www.balkans.com).

⁵³ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; Traycho Traykov, *The energy strategy until 2020: a new vision for the future of energy in Bulgaria*, 18 June 2010, Ministry of Economy, Energy and Tourism, www.mi.government.bg ; ISI Emerging Markets, *Bulgaria Energy Report*, December 2009, www.securities.com ; SEWRC / DKER, *National report to the European Commission*, July 2009, www.dker.bg ; Ministry of Economy, Energy and Tourism, *Bulgarian energy strategy by 2020: draft version*, November 2008, www.mi.government.bg ; Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

Map 5: Current natural gas transmission infrastructure in Bulgaria



Source: Bulgartransgaz, *About us: gas infrastructure map*, accessed 13 February 2011, www.bulgartransgaz.bg

Croatia: The Croatian government has promised to attract a total of up to EUR 15 billion of private funds into the country's energy sector by 2020, amounting to approximately 2% of GDP in the period. This investment will prove necessary as a total of 1,100 MW of current thermal power generation capacity will likely need to be replaced by 2,400 MW of new thermal capacity by 2020 due to required modernization, growing power demand, and need for reserve capacity, according to the country's energy strategy. Roughly half of this capacity is to be gas-fired (with some 800 MW to be developed by 2013) and the remainder coal-fired. A greenfield NPP was also on the cards with construction to start by 2012, albeit such planning in this and other related projects in the region may be reversed in light of the recent disaster in Fukushima, Japan.⁵⁴

In this context, Croatian utility Hrvatska Elektroprivreda (HEP) has been planning to expand its power generation base at Sisak, where it currently operates two blocks of a combined 420 MW, through the construction of a new gas-fired CHP unit by 2012. The unit is to produce 230 MW power and 50 MW heat and will boost security of electricity supply (up to 400 mcm/y demand expected). Development costs for the Sisak CHP are estimated at about EUR 205 million, and the bulk is going to be provided by the Russian Federation in the form of direct investment in return for outstanding

⁵⁴ Ministry of Economy, Labour and Entrepreneurship, *Energy Strategy of the Republic of Croatia: draft*, June 2009, www.mingorp.hr

(Soviet) debt from the communist era.⁵⁵ In collaboration with German player RWE, HEP has also been pushing for construction of a 500 MW coal-fired block at Plomin TPP (Plomin 3), located 50-km south-west of Rijeka. Plomin 3 is to replace older units (Plomin 1) at an envisaged cost of EUR 800 million. A final decision concerning the strategic investor in this project is expected in the second half of 2011. Even though the country does not itself produce any significant volumes of coal, Croatian authorities increasingly view this fuel as a cheap and secure complement to the indigenous oil & gas resources, which are anyway declining.⁵⁶

The Croatian natural gas transmission system already includes approximately 2,100-km of high-pressure pipelines, 9 input metering stations, and 132 metering stations on delivery points. Estimated current capacity stands at some 5.4 bcm/y. State-owned logistics operator Plinacro is implementing an ambitious gasification plan, having already invested EUR 210 million in 2007-2010; while it also intends to invest some EUR 370 million towards adding an extra 2,775-km by end-2014. The aim is to respond adequately to currently unreliable and inefficient energy supply in the country, including by reducing dependence on expensive energy sources such as diesel, fuel oil, and electricity. The main pillars of its investment plan are the construction of a new gas pipeline to Hungary (*see below*), and an extension of the country's natural gas grid to its insufficiently gasified southern part. These are to be financed equally by its own funds and European Investment Bank (EIB) loans.⁵⁷

The plan for the gasification of southern Croatia includes development of a 290-km network from Bosiljevo located 20-km east of Vrbovsko, to Split and as far south as the Bosnian border (*see above*), where EVN and Plinacro are developing a distribution network for natural gas aimed at serving the regions of Lika and Dalmatia. The pipeline section to Josipdol (10-km south of Ogulin) is complete. But there have been accusations of not moving fast enough, notably in the key region of Dalmatia; and of not paying attention to supplementary projects such as gas storage development in Benicanci. Nonetheless, in May 2011 Plinacro succeeded in securing a relevant license for this grid expansion. Moreover, Plinacro has already invested a total EUR 175 million towards such gas upgrades in 2010, and plans to invest an extra EUR 55 million during 2011, primarily aimed at construction of gas links

⁵⁵ Energetika.net, *Hep to add a new 230 MW power generation block in thermal power plant Sisak*, 24 March 2010, www.energetika.net; and Energetika.net, *15 Billion Euros for Investments in Croatia's Energy Sector*, 1 March 2010, www.energetika.net

⁵⁶ SeeNews, *Croatia unveils energy sector projects worth 9.4 bln kuna (1.28 bln Euro) total*, 18 March 2011, www.seenews.com; Limun.hr, *Plomin 3 power plant will cost EUR 800 m, RWE back as partner*, 26 March 2010, www.limun.hr

⁵⁷ Limun.hr, *New gas supply pipeline will end the final phase of construction*, 8 November 2010, www.limun.hr; Plinacro, *Plinacro Ltd.*, Paper presented at the Gas Forum of the Energy Community by Goran Frančić, Ljubljana, September 2010, www.energy-community.org; Upstream Online, *Croatia eyes gas pipe projects*, 14 June 2010, www.upstreamonline.com; Energetika.net, *Croatian Plinacro plans to complete gasification of major part of Croatia in 2011*, 18 January 2010, www.energetika.net

between Umag – Vodnjan (Pula); and of the second phase of Bosiljevo - Split (i.e. Josipdol - Gospic). The above section consists of an 84-km pipeline for natural gas, and it was completed in April 2011. The Gospic - Benkovac section is under construction and completion was expected by April 2011 (distribution network works already in progress in Zadar county to facilitate supply dissemination); construction of the Benkovac - Split pipeline section is expected to come online by mid-2013. Plinacro also plans to connect the port of Omisalj on Krk with Kukuljanovo (Rijeka) on the mainland, in order to facilitate planned construction of a Greenfield LNG terminal in this location (*see below*). Upon completion of the above upgrades in 2014 (Plinacro estimate), the Croatian natural gas network will consist of a total 2,700-km from current levels of 2,400-km, an expansion of approximately 13%. The expanded gas network will cover almost the whole of Croatia, except some regions in the south.⁵⁸

The Croatian market is already relatively advanced, comprising some 650,000 residential customers, and the Croatian government sees the local natural gas market growing by up to 4.7% Y/Y to 2020, compared to 3.1% Y/Y for total energy demand in the country. This will likely be driven by the expansion of gas-fired power generation, and increased demand in the industrial, commercial and residential sectors, resulting in a more substantial natural gas market. In contrast to these official forecasts, the World Bank and others remain considerably less optimistic and see Croatian demand as growing only to some 4.2 bcm/y in 2025. At the moment, the country uses approximately 3 bcm/y, with roughly 60% coming from own (but declining) upstream production, with the rest of demand covered through gas imports via Slovenia, previously from Russia and now from Italy (*see below*).⁵⁹ Map 6 below shows current and planned gas infrastructure in Croatia.

⁵⁸ More details in Energetika.net, *Plinacro moves forward in extending national gas grid*, 1 June 2011, www.energetika.net ; ISI Emerging Markets, *Croatian PM says construction of gas supply network proceeds as planned*, 18 April 2011, www.securities.com ; ISI Emerging Markets, *EVN Croatia Plin starts gas network construction in Zadar county*, 13 April 2011, www.securities.com ; SeeNews, *EVN Croatia Plin starts work on gas network in Zadar county*, 12 April 2011, www.seenews.com ; SeeNews, *Croatia unveils energy sector projects worth 9.4 bln kuna (1.28 bln Euro) total*, 18 March 2011, www.seenews.com ; ISI Emerging Markets, *Plinacro to fully meet this year's investment plan*, 27 December 2010, www.securities.com ; ISI Emerging Markets, *LNG terminal falls through* , 25 December 2010, www.securities.com ; SeeNews, *Croatia's Plinacro to invest 400 mln Kuna (54 Mln Euro) in 2011*, 23 December 2010, www.seenews.com ; ISI Emerging Markets, *Plinacro's total investment to reach HRK 1.3 bn in 2010*, 22 December 2010, www.securities.com ; ISI Emerging Markets, *Ina will keep gas, raise its price by 13%* , 2 December 2010, www.securities.com ; Energetika.net, *Croatian gas association sees deficiencies in the gasification project*, 21 January 2010, www.energetika.net

⁵⁹ Information and figures taken from Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; Upstream Online, *Croatia eyes gas pipe projects*, 14 June 2010, www.upstreamonline.com; Energetika.net, *15 billion Euros for investments in Croatia's energy sector*, 1 March 2010, www.energetika.net ; Ministry of Economy, Labour and Entrepreneurship, *Energy Strategy of the Republic of Croatia: draft*, June 2009, www.mingorp.hr ; and Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

Map 6: Current and planned natural gas infrastructure in Croatia



Source: Domagoj Jeić on behalf of Ministry of Economy, Labour and Entrepreneurship, *Gas sector in Croatia*, Paper presented at the Gas Forum of Energy Community, Maribor, April 2008, www.energy-community.org

Greece: In Greece, which until recently had been suffering from electricity supply shortages at peak demand, but has now been hit hard by the global credit crunch, the investment picture is mixed. Infrastructure development in the country – power generation, import capacity for natural gas, and transmission lines - is at least partially being driven by the ongoing liberalization of the Greek market. This is a direct corollary of the pressure applied on Athens by the European Commission, the European Central Bank (ECB), and the IMF, which have placed their financial support to debt-ridden Greece within the framework of the proposed Economic Adjustment Programme (EAP).⁶⁰ This

⁶⁰ Following a formal request for financial assistance by Athens in April 2010, in early May (Eurozone-member) Greece successfully reached an agreement with the European Commission, the ECB, and the IMF on a focused programme to stabilize its economy, become more competitive, and restore market confidence with the support of a joint EUR 110 billion financing package (EUR 80 billion EU, EUR 30 billion IMF). An additional such package seemed likely as of June 2011. See European Commission, *Euro area and IMF agreement on financial support programme for Greece*, 3 May 2010,

changing context is in turn leading market players into an exploratory repositioning of their business along the value chain, e.g. by taking advantage (notably in 2010, but also 2011) of cheap spot LNG through direct imports, as a means of minimizing costs for key demand outlets such as power generation and industry.⁶¹

Expansion of local power generation in Greece is also driven by the planned decommissioning of a number of old (mainly lignite-fuelled) units in compliance with European environmental regulations. For example, out of a total 16 lignite-fired units in the Greek industrial area of western Macedonia, 10 were expected to face serious difficulties with the EU's Large Combustion Plants Directive and other related environmental regulations. In May 2010, the European Parliament adopted a more favourable position that could allow transition until 2020 or even later for such (polluting) units, therefore reducing previously applied pressure for them to be decommissioned as early as 2016. Nevertheless, Athens is now examining the possibility of ordering the shutdown of an unspecified number of lignite units before that time. The aim is to loosen PPC's (Public Power Corporation of Greece) tight grip over the power sector and comply with EU competition law, while supporting ongoing efforts at environmental compliance.⁶²

Taking into consideration the wider macro-context, a number of key energy players in the country have decided not to make substantial revisions and proceed as planned with earlier investment plans. Hence, in December 2010 (i.e. the midst of the serious Greek debt crisis and ensuing deep recession) a JV between dominant local refiner Hellenic Petroleum and regional player Edison commenced commercial operations at their 421 MW natural gas-fired greenfield CCGT in Viotia, central Greece. In December 2010, the TERNA Group in collaboration with GDF-Suez similarly started commercial operations in their 435 MW greenfield CCGT Heron II at the same location (Viotia, central Greece). The Mytilineos Group brought a 444 MW greenfield CCGT at Aghios Nikolaos (Viotia) into operation in June 2011, albeit with a small delay compared to its original timetable. Mytilineos and Motor Oil Hellas (MOH) are also pushing forward with implementation of their earlier plans for the construction of a 437 MW CCGT at the Aghii Theodori location near Corinth, which is now expected to enter commercial operations sometime during the fourth quarter of 2011. The situation is comparable also at PPC, which has decided to proceed as planned with its envisaged 417 MW CCGT

http://ec.europa.eu/index_en.htm; and International Monetary Fund, *IMF Reaches Staff-level Agreement with Greece on €30 Billion Stand-By Arrangement*, 2 May 2010, www.imf.org

⁶¹ Energia.gr, *Σε δοκιμαστική λειτουργία η Ήρων II*, 12 April 2010, www.energia.gr

⁶² Kathimerini, *Σχεδιάζουν απόσυρση λιγνιτικών μονάδων της ΔΕΗ πριν το 2020*, 9 October 2010, www.kathimerini.gr; Reporter.gr, *ΔΕΗ: «Φιλί» ζωής για 10 λιγνιτικές της μονάδες- εντός του έτους αναπροσαρμογή τιμολογίων*, 6 May 2010, www.reporter.gr

at Aliveri, Euboea. As in the above cases, local energy players have decided not to shy away from their earlier investment plans in the face of the current recession but only delay them. However, such decisions towards project implementation which seem to fly in the face of the current negative economic context in Greece should be at least partially attributed to their relatively advanced completion status, rather than an unambiguous investment strategy to capture value in the recession. Indeed, Mytilineos has announced it will not be moving forward with any new investments in 2011. In any event, in December 2010 it emerged that the Greek government would unblock delayed licensing rounds for the development of gas-fired cogeneration units costing roughly EUR 65 million, at large commercial customers. The latter group includes industrial production units and hospitals.⁶³

On the other hand, less advanced greenfield projects in power generation have now been put on hold indefinitely as a result of the deep impact and ensuing uncertainties created by the Greek debt crisis. They include Prometheus' (Copelouzos Group), Enel's planned CCGT in Livadia, central Greece, and PPC's and Halyvourgiki's planned CCGT unit at Eleusis, western Attica; while other planned PPC units are correspondingly expected to follow suit due to financing issues. Even projects that are currently moving forward are increasingly targeting export markets.⁶⁴

The Greek gas grid currently consists of a 512 km high-pressure trunk line of 70-bar design pressure; almost 700 km of high-pressure branch lines and 4,500 km of medium and low-pressure networks.⁶⁵ The low-pressure distribution system in Attica (stands at roughly 3,000-km and is Greece's largest. Thessaloniki has approximately 900-km, while the (new) region of Thessaly has more than 100-km.⁶⁶ In addition, DESFA (Diacheiristis Ethnikou Systimatos Fysikou Aeriou), the Greek system operator is implementing a EUR 1.3 billion investment programme (2010-2014) in natural gas infrastructure; moreover, up to EUR 3 billion are to be invested by the operator to that end by end of the decade. Among other projects, DESFA has been pushing towards construction of a high-pressure pipeline to

⁶³ Energy Press, *Επίσημη «πρώτη» από το Μυτιληναίο για την πιο σύγχρονη μονάδα ηλεκτρισμού*, 6 June 2011, www.energypress.gr ; Energy Press, *«Ξεκολλάνε» επενδύσεις 65 εκατ. ευρώ στη συμπαραγωγή*, 21 December 2010, www.energypress.gr ; GDF-Suez, *GDF SUEZ and GEK TERNA start commercial operations of Heron II, their new power plant in Greece*, 15 December 2010, www.gdfsuez.com ; Energia.gr, *Προς υλοποίηση η θερμική μονάδα του ομίλου Μυτιληναίου στη Βοιωτία*, 9 December 2010, www.energia.gr ; Energia.gr, *Σε λειτουργία η δεύτερη μονάδα της Elpedison στη Θιάβη Βοιωτίας*, 9 December 2010, www.energia.gr ; Energia.gr, *Ψάχνουν πελάτες στο εξωτερικό οι ηλεκτροπαραγωγοί*, 12 July 2010, www.energia.gr ; Kathimerini, *Πώς η οικονομική κρίση χτύπησε και την εγχώρια αγορά ενέργειας*, 6 June 2010, www.kathimerini.gr.

⁶⁴ Kathimerini, *Πώς η οικονομική κρίση χτύπησε και την εγχώρια αγορά της ενέργειας*, 6 June 2010, www.kathimerini.gr ; for a list of greenfield projects in Greek power generation see Anastasios Giamouridis, *Natural gas in Greece and Albania: supply and demand prospects to 2015*, December 2009, Oxford Institute for Energy Studies, www.oxfordenergy.org

⁶⁵ In addition, there are dozens of metering and regulating stations; the dispatching and control centre (DCC); the control centre and load distribution centre; operation and maintenance centres in Athens, Thessaloniki, Larissa, and Xanthi; and a modern nationwide telecommunication system, including an integrated SCADA system

⁶⁶ Information from DESFA, *The National Natural Gas System*, www.desfa.gr; RAE, *Report on the Security of Natural Gas Supply in Greece*, 2009, www.rae.gr; and other local sources.

Aliveri on Euboea, to supply a gas-fired CCGT which is to be developed by PPC there. Development of this new link will likely require the investment of EUR 75 million, part of which will be covered by funds made available under the Greek National Strategic Reference Framework (NSRF) for the period between 2007 and 2013.⁶⁷

In the medium term, DESFA is also planning to move forward with construction of a 7-km / 14-inch pipeline to feed the planned 880 MW greenfield power plant of Halyvourgiki at Eleusis (*see above*). Similarly, it wants to construct a link between Aghii Theodori and Megalopolis in the Peloponnese. This will require construction of a 30-inch / 16-km pipeline, and a 24-inch / 144-km one, to be completed by mid-2012 at an envisaged cost of EUR 130 million with financial support from the NSRF (and potentially also the EIB). Its aim is to facilitate gasification of the Peloponnesian regions of Corinth, Argolis, and Arcadia, including planned 811 MW greenfield Megalopolis V (*see above*). The Aghii Theodori – Megalopolis natural gas line will create the basis for expansion of the national gas grid to the rest of the Peloponnese, namely to the regions of Laconia, Messenia, Elis, and Achaia (the latter being potentially quite profitable, thanks to inclusion of the major city of Patrai).⁶⁸

Finally, DESFA has also been working towards construction of a compressor station at the northern town of Nea Mesimbria, outside Thessaloniki. It will comprise 2 x 7.7 MW units, and is expected to contribute significantly to increased hydraulic stability of the National Natural Gas System (NNGS) when it comes online in 2011. Moreover, it will allow a near doubling of capacity at the system's eastern (Turkey – Greece) gas entry point, from current $2.7 \times 10^3 \text{ Nm}^3/\text{hr}$ to almost $5.2 \times 10^3 \text{ Nm}^3/\text{hr}$. Likewise, upon Nea Mesimbria's completion the country's northern entry point (Bulgaria – Greece)

⁶⁷ However, this project has suffered multiple delays due to a combination of environmental, budget, and procedural objections from various parties (most recently, a need to retender due to irregularities). In any event, at the time of its planned completion in 2011/2012, it will be 72-km in length, with some 14-km of it offshore (20-inch diameter). For more info see Energy Press, *Επενδύσεις 3 δις. ευρώ δρομολογεί ο ΔΕΣΦΑ μέχρι το 2019*, 6 June 2011, www.energypress.gr ; Energy Press, *Σε ποιες περιοχές επεκτείνεται το δίκτυο φυσικού αερίου*, 8 March 2011, www.energypress.gr ; Energy Press, *ΔΕΣΦΑ: έργα 1.3 δις. Ευρώ ως το 2014 πήραν "πράσινο φώς" από τη ΠΑΕ*, 8 March 2011, www.energypress.gr ; Energia.gr, *Ενεργειακές επενδύσεις 1 δις ευρώ εντάχθηκαν στο πρόγραμμα δημόσιων επενδύσεων*, 4 March 2011, www.energia.gr ; DESFA, *Νέα έργα: υλοποίηση έργων*, accessed 8 January 2011, www.desfa.gr ; Energy Press, *Στον αέρα ο διαγωνισμός για τον υποθαλάσσιο αγωγό του Αλιβερίου*, 24 November 2010, www.energypress.gr ; DESFA, *Greek National Natural Gas System (NNGS): developments and prospects*, Paper presented by Nikos Katsis at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org

⁶⁸ See Energy Press, *Επενδύσεις 3 δις. ευρώ δρομολογεί ο ΔΕΣΦΑ μέχρι το 2019*, 6 June 2011, www.energypress.gr ; also Energy Press, *Σε ποιες περιοχές επεκτείνεται το δίκτυο φυσικού αερίου*, 8 March 2011, www.energypress.gr ; Energy Press, *ΔΕΣΦΑ: έργα 1.3 δις. Ευρώ ως το 2014 πήραν "πράσινο φώς" από τη ΠΑΕ*, 8 March 2011, www.energypress.gr ; DESFA, *Νέα έργα: υλοποίηση έργων*, accessed 8 January 2011, www.desfa.gr ; Energy Press, *Αναβαθμίζει το διεθνή του ρόλο μέσω ... Ρεβυθούσας*, 6 October 2010, www.energypress.gr ; Energia.gr, *Επιτάχυνση της αναβάθμισης της Ρεβυθούσας και εκδήλωση ενδιαφέροντος από Τουρκία και Βουλγαρία για χρήση των εγκαταστάσεων*, 5 October 2010, www.energia.gr ; Energy Press, *Προκηρύσσεται ο διαγωνισμός για τον αγωγό αερίου Κόρινθος - Μεγαλόπολη*, 16 September 2010, www.energypress.gr ; and DESFA, *Greek National Natural Gas System (NNGS): developments and prospects*, Paper presented by Nikos Katsis at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org

will increase from almost 9.8×10^3 Nm³/hr to up to 12×10^3 Nm³/hr. The Greek NSRF is to provide for associated costs estimated at EUR 61 million for this project.⁶⁹

Despite serious setbacks such as the ongoing economic crisis and the withdrawal of Duke Energy from the natural gas supply company Etaireia Parochis Aeriou (EPA) of Attica, which is a JV with state-owned gas operator Dimosia Epicheirisi Aeriou DEPA (the other private investor being Shell), substitution of oil products in the Greek capital continued strong in 2010. This was facilitated even further by a tax hike which impacted negatively on consumer end-prices for competing heating gasoil, as well as by a number of favourable packages for gas grid connection offered by the EPA of Attica. The capital region saw an impressive 130% jump Y/Y in new contracts signed during October 2010, when these developments (i.e. new tax rates, completion of EPA offers) were reaching their climax. The gas distribution network of EPA Attica therefore currently covers roughly 230,000 households, as well as some 5,500 commercial, and 400 large commercial and industrial clients.⁷⁰

The picture has been similar in the other EPAs too (Thessaloniki and Thessaly), which are co-owned by Greek operator DEPA and Italian oil & gas major ENI. As in the case of EPA Attica, DEPA has a majority 51% stake but investor ENI manages the JVs, which saw a more moderate - yet still significant - 27% jump in new contracts in October 2010, reaching a household client base of some 138,600 and 43,800 respectively. This came on the heels of a positive 2009, which saw both total gas demand as well as its client base grow despite the economic crisis (~14,300 new customers added).⁷¹

In this framework, the EPA partners have agreed to push forward with gas network expansion in Thessaloniki and Thessaly. For example, the EPA of Thessaloniki is planning to invest approximately EUR 68 million towards expanding its distribution network in new areas by a total 200-km by 2014, increasing its client base to 200,000 while increasing its penetration rate from 39% now to some 54%. In January 2011, it announced additional discounts in offered connection rates, as part of its ongoing

⁶⁹ Ibid.; and also ΥΠΕΚΑ, *Μετατροπή του υπό εξάντληση κοιτάσματος φυσικού αερίου «Νότιος Καβάλα» (South Kavala) σε αποθηκευτικό χώρο φυσικού αερίου*, December 2010, www.ypeka.gr

⁷⁰ See Energia.gr, *Παγωμένος ο διαγωνισμός για το 49% της ΕΠΑ Αττικής*, 5 April 2011, www.energia.gr; Energy Press, *Αυξάνει πάνω από 20% η ΕΠΑ Αττικής τη διαφορά αερίου με το πετρέλαιο θέρμανσης...*, 4 March 2011, www.energypress.gr; EPA of Attica, *Εταιρεία*, accessed 9 November 2010, www.aerioattikis.gr; Energy Press, *Αύξηση 130% στα συμβόλαια της ΕΠΑ Αττικής*, 2 November 2010, www.energypress.gr; Kathimerini, *Μετά την Duke Energy και η Shell εγκαταλείπει την ΕΠΑ Αττικής*, 14 January 2010, www.kathimerini.gr; and Naftemporiki, *Αποχωρεί από την ΕΠΑ Αττικής η Duke Energy*, 28 December 2009, www.naftemporiki.gr

⁷¹ Imerisia, *Αυξήθηκαν οι πωλήσεις σε Θεσσαλονίκη - Θεσσαλία*, 8 February 2010

effort at supporting penetration of gas in its catchment area. Sales are consequently expected to rise to almost 300 mcm in 2014, from roughly 187 mcm in 2009.⁷²

Likewise, the EPA of Thessaly (again a 51/49 JV between DEPA and ENI) has been taking advantage of gas demand trends to push forward with an expansion of the gas network and its related client base; it targets 68,000 customers (from about 40,000 in 2009), or a penetration rate of above 30% by 2014. In 2010, it managed to register some 2,680 new customers in its distribution network, albeit this was in fact lower than the approximately 4,600 added during the course of 2009. Still, EPA Thessaly continues to work towards a 160-km pipeline expansion in its region under a 5-year plan; e.g., in 2011 the company is planning to construct a further 11-km in Trikala and 8-km in Karditsa. Finally, investments in cooling cogeneration and autogas / Compressed Natural Gas (CNG) are also being actively examined by both DEPA and the EPAs in Thessaloniki and Thessaly.⁷³

An additional 150,000 customers are envisaged to be connected in the new EPA areas, namely in EPA Central Greece (including Euboea), EPA Central Macedonia, and EPA Eastern Macedonia–Thrace. Furthermore, there are plans to develop a new EPA in Western Macedonia and Epirus (NW Greece). These are aimed at taking advantage of all available synergies with the planned gas interconnection between Greece and Italy, and also allowing this region to benefit directly from it (*see below*). However, there have been considerable delays in EPA tendering due to complications in the EU approval process for exclusive 20 year access rights for the new operators, as originally requested. The gas operator was expecting connection of these areas during 2011 but this should be seen as too optimistic in light of the above predicament, which is of course aggravated further by the recession. Nonetheless, ENI (through its subsidiary Italgas), GDF-Suez, and Gas Natural have all expressed an initial interest in the new EPAs, but without any further commitments at this stage. Against this backdrop, EPA Attica has expressed its interest in EPA Central Greece, under the provision that the

⁷² Information from Energia.gr, *Θεσσαλονίκη: Δωρεάν σύνδεση στο δίκτυο φυσικού αερίου από την ΕΠΑ*, 11 January 2011, www.energia.gr; from Energy Press, *Αύξηση 27% τον Οκτώβριο για ΕΠΑ Θεσσαλονίκης και Θεσσαλίας*, 4 November 2010, www.energypress.gr; from Imerisia, *Επενδύσεις 68 εκατ. ευρώ στο δίκτυο φυσικού αερίου*, 2 June 2010, www.imerisia.gr; Macedonia, *ΕΠΑ Θεσσαλονίκης: δρομολογεί επενδύσεις 68 εκατ. ευρώ*, 2 June 2010, www.makthes.gr; Energy Press, *Στο 38.7% η χρήση φυσικού αερίου στη Θεσσαλονίκη*, 21 May 2010, www.energypress.gr; and also from the Imerisia, *10,000 νέα συμβόλαια ο στόχος της ΕΠΑ Θεσσαλονίκης*, 17 March 2010, www.imerisia.gr

⁷³ See Energy Press, *ΔΕΠΑ: η Θεσσαλονίκη εισέρχεται στην εποχή της αεριοκίνησης*, 9 May 2011, www.energypress.gr; Energy Press, *Επεκτείνεται το δίκτυο φυσικού αερίου στα Τρίκαλα*, 2 February 2011, www.energypress.gr; also in Energy Press, *Κατά 8 χλμ. επεκτείνεται το δίκτυο αερίου στην Καρδίτσα*, 31 January 2011, www.energypress.gr; Energy Press, *Αεριοκίνηση οχημάτων από το 2011 στη Μαγνησία*, 20 December 2010, www.energypress.gr; Energy Press, *«Ανοιγμα» στο συμπιεσμένο φυσικό αέριο από την ΕΠΑ Θεσσαλονίκης*, 10 June 2010, www.energypress.gr; Naftemporiki, *Επενδύει και επιμένει η ΕΠΑ Θεσσαλίας παρά την κρίση*, 2 June 2010, www.naftemporiki.gr; and finally also in Imerisia, *Αυξήθηκαν οι πωλήσεις σε Θεσσαλονίκη - Θεσσαλία*, 8 February 2010, www.imerisia.gr

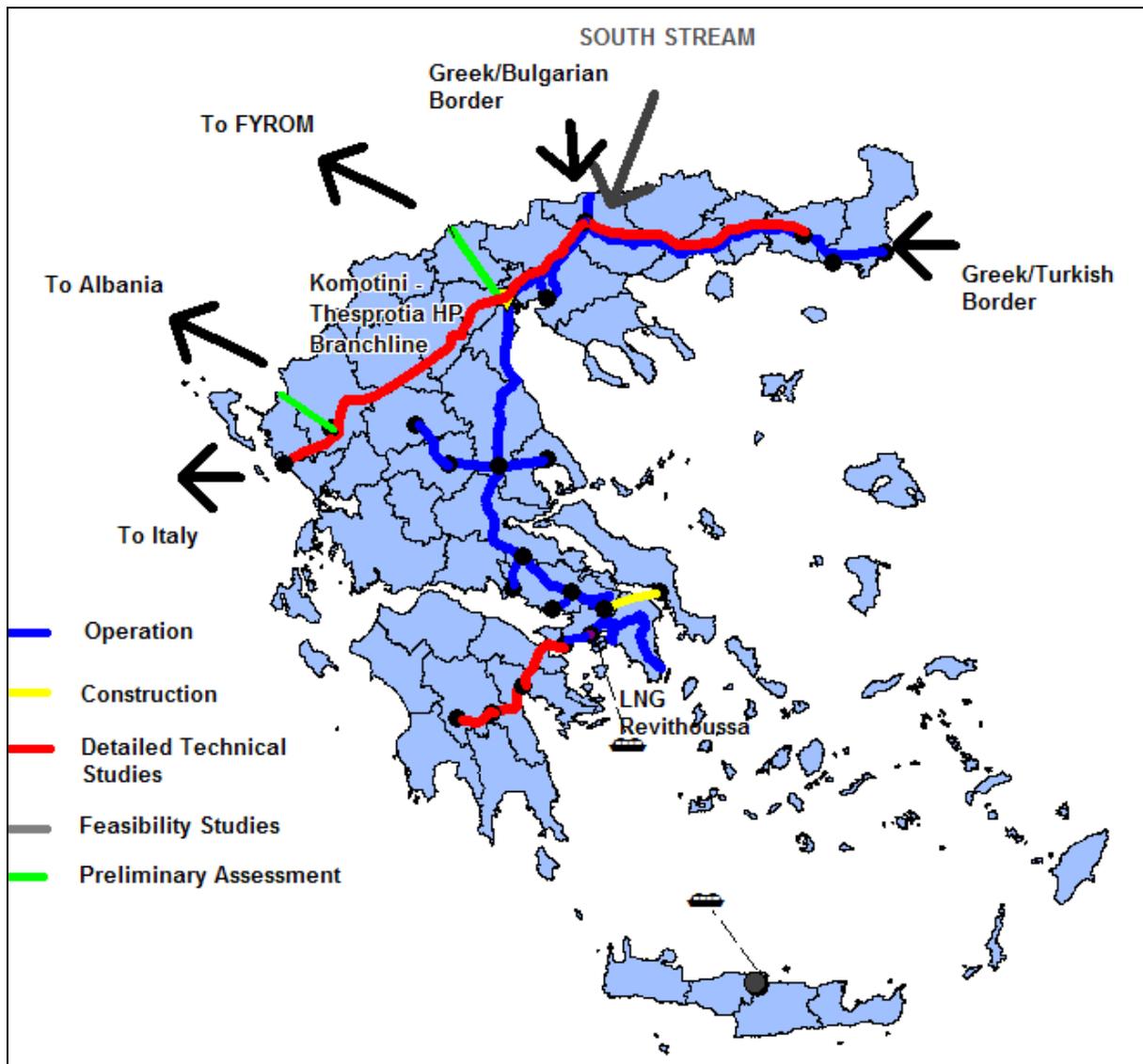
government puts in place incentives for consumers to switch to natural gas from their current use of oil products.⁷⁴

In 2009, the Greek gas market contracted as a result of the impact of the debt crisis in the power and industrial sectors. However, strong structural growth is still envisaged thanks to an expanding power sector and national gas grid, which will support penetration in the commercial and residential sectors. Local sources project a near doubling of gas demand by the end of the decade, i.e. to 6 to 7 bcm/y. Peak demand for natural gas is similarly expected to rise, from marginally above $16 \times 10^3 \text{ Nm}^3/\text{hr}$ in 2009 to above $30 \times 10^3 \text{ Nm}^3/\text{hr}$ in the same time frame.⁷⁵ Map 7 in the following page contextualises current and planned transmission and other natural gas infrastructure in Greece.

⁷⁴ Energy Press, *Γ. Μανιάτης: νομοθετική ρύθμιση για την ίδρυση ΕΠΑ Ηπείρου και Δ. Μακεδονίας*, 6 June 2011, www.energypress.gr ; Kathimerini, *Κ. Χατζηδάκης: «Φυσικό αέριο σε 250,000 νοικοκυριά μέχρι το 2010»*, 28 May 2009, www.kathimerini.gr ; and Energia.gr, *Ενδιαφέρον της ΕΠΑ Αττικής για την Στερεά Ελλάδα*, 11 March 2009, www.energia.gr

⁷⁵ ΥΠΕΚΑ, *Μετατροπή του υπό εξάντληση κοιτάσματος φυσικού αερίου «Νότιος Καβάλα» (South Kavala) σε αποθηκευτικό χώρο φυσικού αερίου*, December 2010, www.ypeka.gr ; DESFA, *Greek National Natural Gas System (NNGS): developments and prospects*, Paper presented by Nikos Katsis at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org

Map 7: Current and planned gas transmission and other infrastructure in Greece



Source: DESFA, *Greek National Natural Gas System (NNGS): developments and prospects*, Paper presented by N. Katsis at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org

Montenegro: The *Energy Development Strategy to 2025* of Montenegro (which was published in 2007) envisages substantial investments in increased electricity supply from its lignite-fired Pljevlja TPP. However, this could impact negatively both on the country's environmental record, as well as on its security of supply, as a result of depletion of high-quality and / or easily obtainable local lignite reserves. Natural gas is not currently in use in the country, but the Montenegrin energy strategy envisages its introduction to the country's energy mix - via pipeline and / or LNG imports - as a means of boosting supply security and economic competitiveness. In this framework, a 1,200 MW, export-oriented CCGT in the port of Bar is now being planned. However, these remain in the early

pre-feasibility phases, and no serious planning aimed at facilitating project implementation seems to be taking place. Therefore, Montenegrin gasification does not presently look realistic until mid-decade or even later. The World Bank study projects 0.7 bcm/y of demand for 2025, with bulk demand coming online shortly after gasification, in the form of anchor loads in power generation (this was initially estimated by 2010). Finally, Gazprom is reportedly seeking to gain production rights in the area of Cermnica which it believes may hold oil & gas reserves worth a combined USD 27 billion. If they are proved right, Cermnica could have an impact on gas supply & demand balances in SEE.⁷⁶

Serbia: In December 2009, the Serbian government announced plans to direct some EUR 9 billion of combined public and private funds towards the country's energy sector until the middle of this decade, including in the strategic areas of refining, mining, power generation, and also of natural gas. The latter includes gas grid upgrades at an estimated cost of EUR 400 million to EUR 600 million. These investments aim at improving the overall reliability and efficiency of energy supply in Serbia, as well as contributing to the competitiveness of Serbia's national economy.⁷⁷ Against this backdrop, local utility Elektroprivreda Srbije (EPS), which has already invested some EUR 3 billion since 2006, claimed that it alone could invest this amount by 2015 (including both greenfield and grid upgrades). In September 2010, the company inaugurated a EUR 35 million system for the collection, storing, and transport of ash and dross at its lignite-fired Kostolac B power generation plant (with EBRD support). This project formed part of a wider overhaul of the Kostolac B TPP, which seeks both to extend its operational lifetime, and to increase output capacity by ~10% from its current 640 MW level. Total investment for the modernization / expansion of Kostolac B TPP, including development of the adjacent Drmno coal mines, is estimated at some EUR 950 million; it should be completed by 2014. The project will possibly be realised in collaboration with the National Machinery and Equipment Import & Export Corporation of China (CMEC) and the support of the Chinese Export-Import bank.⁷⁸

⁷⁶ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; The Embassy of Greece in Tirana, *Ρώσικο ενδιαφέρον για πετρέλαιο και φυσικό αέριο στην Αλβανία*, Bulletin (Ενημερωτικό Δελτίο) of October 2010 ; SeeNews, *Bosnian gas monopoly sees consumption tripling after network expansion*, 26 August 2010, www.seenews.com ; IEA (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org ; Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

⁷⁷ Balkan Business News, *Serbia to invest between €400 and €600 million on gasification of the country within the next five to six years*, 4 October 2010, www.balkans.com ; Energetika.net, *Skundrić – 9 Billion Euro to be invested in Serbia's energy sector in the forthcoming 5-7 years*, 21 December 2009, www.energetika.net

⁷⁸ In December 2010, EPS and the National Machinery and Equipment Import & Export Corporation of China (CMEC) signed a phase 1 project agreement worth about EUR 260 million. This includes modernisation of units 1 and 2, as well as construction of associated desulphurization units. More information on this issue is available in Energetika.net, *EPS's investments are substantial but insufficient for the new power plants*, 5 January 2011, www.energetika.net ; ISI Emerging Markets, *Power utility EPS eyes 9 bn expansion by 2015*, 4 January 2011 www.securities.com ; Balkan Business News, *Serbia: Contract worth \$344 million on reconstruction of thermoelectric power plant Kostolac B signed*, 9 December 2010, www.balkans.com ; Balkan Business News, *Serbia, China sign \$345 mln power plant deal - Agreement is part of a \$1.25*

Furthermore, in June 2011 EPS entered with a 36.4% stake into a JV with Italian company Edison towards completion of similarly lignite-fired Kolubara B (2 x 350 MW). Construction of Kolubara B had begun in the 1980s but was disrupted during the disastrous Yugoslav conflicts of the 1990s. Construction of a third block is also planned in lignite-fired N. Tesla B in Obrenovac near Belgrade. During 2010, the latter saw investment of about EUR 115 million in support of Block 6 operations, which represented the largest single investment in the country in that year. A EUR 2 billion tender for this project was announced in early 2009, and related documents were expected by September 2010. However, this bid has so far failed to attract the interest of any potential investors.⁷⁹

In August 2010, Belgrade also confirmed its interest in acquiring a stake of up to 20% in Belene NPP in Bulgaria, provided it proves successful in attracting necessary capital from international institutions.⁸⁰ Serbian involvement would arguably breathe new life into the troubled Bulgarian project (*see above*); nevertheless, it is not necessarily realistic in the current economic and energy context of the region. According to state-owned natural gas operator Srbijagas, there are plans to construct new gas-fired power plants, in Subotica, Zrenjanin, Sremska Mitrovica, Kragujevac, and Nis (now such plants only exist in Belgrade and Novi Sad). These new units will offer the Serbian energy system a combined 950 MW of capacity, therefore improving its overall reliability and efficiency.⁸¹

There are also ongoing efforts aimed at improvement of the Serbian natural gas network. Presently, it has a maximum capacity of some 6.1 bcm/y (maximum pressure of 50-bar), approximately 2,135-km of high-pressure natural gas pipeline, and a total 533 metering stations of a wide capacity range.⁸² Srbijagas plans construction of a EUR 2 million / 5-km natural gas pipeline to the country's main refinery site at Pancevo, the conversion capacity of which is currently being upgraded. Consumption will hover at 30,000 cu.m/hour in 2011, and 80,000 cu.m./hr in 2013. Furthermore, in April 2010 the local integrated downstream oil player Naftna Industrija Srbije (NIS), the operator of Pancevo,

bln deal, 9 December 2010, www.balkans.com ; Balkan Business News, *Environmental upgrade at Kostolac thermal power plant*, 7 September 2010, www.balkans.com ; and Tanjug, *Kostolac thermal power plant to get new block*, 6 September 2010, www.tanjug.rs

⁷⁹ Energetika.net, *EPS accepts bid from Edison on strategic partnership in construction of TPP Kolubara B*, 7 June 2011, www.energetika.net ; Ekapija, *EPS accepts Edison's offer for construction of Kolubara B*, 6 June 2011, www.ekapija.com ; PennEnergy, *EPS extends bid deadline for power plants construction*, 2 March 2011, www.pennenergy.com ; EPS, *Development: new facilities*, no date, www.eps.rs ; Tanjug, *Tender documents for two thermal power plants by month's end*, 10 August 2010, www.tanjug.rs; Balkan Business News, *Sector Review: energy in Serbia*, 13 April 2010, www.balkans.com

⁸⁰ The Sofia Echo, *Serbian share in Bulgaria's Belene nuke could exceed 20 per cent*, 12 August 2010, www.sofiaecho.com; ISI Emerging Markets, *Serbia confirms intention to invest in Belene nuclear project*, 9 August 2010, www.securities.com

⁸¹ Energetika.net, *EPS's investments are substantial but insufficient for the new power plants*, 5 January 2011, www.energetika.net ; ISI Emerging Markets, *Serbia to build gas plants with combined capacity of 950 MW*, 3 November 2010, www.securities.com

⁸² Milan Zdravković, *Republic of Serbia: perspective of interconnection Serbia - Bulgaria*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2009, www.energy-community.org

announced completion of a two-way 42-km link between storage under development in Banatski Dvor and Gospodjinci in Novi Sad (its other refinery site) costing EUR 1.1 million. According to local media sources, the project was financed by the Serbian National Investment Plan.⁸³

Additionally, a consortium of Slovak companies led by Euroframe is to work with Srbijagas for the construction of a 131-km pipeline between Aleksandrovac - Novi Pazar – Tutin (south Serbia).⁸⁴ Moreover, in September 2010 Belgrade and Moscow begun construction of a new pipeline aimed at connecting the (currently ungasified) south Serbian cities of Nis and Vranje to the national gas grid.⁸⁵ Finally, a 23.5-km high-pressure pipeline between Kula and Odzaci is also under development in Central Serbia; total envisaged investment costs are thought to be about EUR 4 million.⁸⁶

Pre-crisis estimates by the Serbian government saw a return to the relatively strong demand levels seen before the dissolution of Yugoslavia and the interethnic violence that followed it in the 1990s in the short term. Specifically, Belgrade projected demand levels of approximately 3.4 bcm by 2012. The World Bank study forecasts 3.6 bcm/y by 2025.⁸⁷ But these projections (especially the former) now seem less likely to materialize, due to the impact of the global financial and economic crisis on the Serbian gas market, (which fell from 2.25 in 2008 to 1.64 bcm in 2009; *see above*) and the economy as a whole. Still, growing substitution of less efficient fuels in the country's fuel mix, which

⁸³ More details available in ISI Emerging Markets, *Srbijagas starts building a gas pipeline for refinery in Pancevo*, 28 June 2010, www.securities.com ; and ISI Emerging Markets, *Oil firm NIS completes construction of EUR 1.1 mn gas pipeline*, 27 April 2010, www.securities.com

⁸⁴ The planned pipeline is to pass through Brus with potential gas spurs also to the town of Raska, and even to Leposavic in northern Kosovo / UNMIK (where there is a majority Serb population). Its diameter will be between 9-inch and 11-inch, and it will have a capacity of more than 800 mcm/y. The pipeline is expected to be completed by end-2013, at a cost of approximately EUR 45 million. The adjacent Kopaonik winter resort as well as other local distribution grids could also be connected to the Aleksandrovac - Novi Pazar – Tutin gas pipeline link at an extra cost of about EUR 15 million, while this Serbian – Slovak cooperation may also extend to gas storage at Itebej (*see below*). For more see ISI Emerging Markets, *Memorandum on building a primary gas pipeline signed*, 14 September 2011, www.securities.com ; Balkan Business News, *Serbia: agreement for construction gas pipeline signed*, 9 February 2011, www.balkans.com ; Bloomberg, *Slovak companies to develop gas pipeline in south-western Serbia*, 8 February 2011, www.bloomberg.com ; B92, *Serbia and Slovakia in energy agreement*, 8 February 2011, www.b92.net ; and also Energetika.net, *Slovak companies to participate in building gas pipeline and storage in Serbia*, 23 March 2010, www.energetika.net

⁸⁵ Russian involvement stems from Serbia's inclusion in the planned South Stream project (*see below*). Phase 1 was expected to see construction of a 52-km stretch (Nis – Leskovac) by end-May 2011. Upon project completion at end-2012, Nis – Vranje will reach 120-km in length and USD 25 million in costs; an agreement was signed to that end between Vranje local authorities and Yugorosgaz in March 2011. More details on this matter can be found in Tanjug, *Nis – Leskovac – Vranje gas pipeline deal signed*, 1 April 2011, www.tanjug.rs ; ISI Emerging Markets, *Nis – Leskovac – Vranje gas pipeline to be completed by end-2012*, 1 April 2011, www.securities.com ; Balkan Business News, *Nis – Leskovac – Vranje main gas pipeline important for developing southern Serbia*, 8 September 2010, www.balkans.com ; Tanjug, *Cvetkovic opens works on gas pipeline through Serbia*, 7 September 2010, www.tanjug.rs ; and Energetika.net, *Koladin – administrative obstacles to the construction of gas pipeline in south Serbia*, 8 December 2009, www.energetika.net

⁸⁶ Tanjug, *Russians to start filling up Banatski Dvor gas storage in March*, 28 January 2011, www.tanjug.rs

⁸⁷ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

will be facilitated by the planned expansion of the local gas grid, is seen as having the potential to bring the use of gas to the level of 30% as of total primary energy demand by 2020, compared to only some 13% in 2007.⁸⁸

UNMIK / Kosovo: The *Energy Strategy 2005 – 2015* of the United Nations Interim Administration Mission in Kosovo - henceforward UNMIK / Kosovo - aims at both modernizing and expanding the local power generation base. Generation capacity, which is almost exclusively lignite-fired, is planned to increase from ~1,500 MW now, to ~1,800 MW. Unconfirmed reports have suggested that Pristina is currently in negotiations with Tirana over the joint development within the next 5 years of a new TPP in Prizren, southern Kosovo, at an estimated EUR 300 million. Furthermore, even though UNMIK / Kosovo remains ungasified, its *Energy Strategy* envisages connection of Prizren, Peja, and Mitrovica by 2012. This would be beneficial for the local economy, as it would improve reliability of energy supply and kick-start the substitution of less efficient and polluting fuel sources in all the power generation, industrial / commercial, and residential sectors.⁸⁹ The World Bank study sees the emergence of a 0.9 bcm/y gas market in Kosovo by 2025.⁹⁰

The former Yugoslav Republic of Macedonia: In March 2010, the World Bank warned the government of the former Yugoslav Republic of Macedonia against the risks posed to the country's energy security as well as national economy by the current state and structure of its energy system. The World Bank accordingly urged Skopje to take urgent action towards improving energy efficiency and reducing electricity imports, including through gasification of the local economy, expansion of hydro generation capacity, and modernization of existing assets.⁹¹ In April 2010, the government presented its long-term energy strategy which calls for investments of up to EUR 5 billion by 2030. The strategy assumes liberalization of energy prices to cost-reflective levels by 2015, and it projects demand growth rates of between 2.2% and 2.6% Y/Y by 2020. Furthermore, it prioritizes modernization of the country's power generation capacity, upgrades in its power and gas transmission networks, and more efficient use of energy sources on the consumer side. The strategy also highlights

⁸⁸ More information available in the International Energy Agency (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org

⁸⁹ See Energia.gr, *Συνομιλίες Αλβανίας – Κοσόβου για την κατασκευή θερμοηλεκτρικού σταθμού στο Πρίζρεν*, 18 August 2010, www.energia.gr; and also International Energy Agency (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org

⁹⁰ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org; Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

⁹¹ ISI Emerging Markets, *World Bank advises country to focus on power saving*, 23 March 2010, www.securities.com

the value of indigenous resources such as lignite, hydro, wind, and solar. Natural gas is promoted as the fuel of choice for substitution of oil and electricity wherever possible.⁹²

National authorities have thus sought to boost power generation capacity in the country and also to support gasification, which for the moment remains limited. Utility Elektrani na Makedonija (ELEM) is planning to invest roughly EUR 56 million towards upgrade works in its Bitola TPP unit by 2013, of which almost 55% (EUR 30 million) is to be provided by Greek-owned lender Stopanska Banka. The power plant at Bitola is coal-fired, and it consists of three production blocks of ~225-MW each. Modernization will extend its operational lifetime by 20 years, and also expand capacity by 25 MW.⁹³ Furthermore, in May 2009 the country witnessed the launch of its first CHP unit in its capital city; Skopje CHP cost a reported EUR 20 million, and has power generation capacity of roughly 57 MW.⁹⁴ Furthermore, in February 2010 ELEM successfully completed the upgrade and conversion of formerly oil-fired “Energetika” CHP to a gas-fired unit, with a capacity of about 300 MW and 150 MW.⁹⁵ Following this example, ELEM is now considering the possibility of converting coal-fuelled Oslomej ELEM’s second largest power producing asset, into a gas-fired unit.⁹⁶ Finally, Russian Sintez (80%) together with the local heating utility Toplifkacija AD–Skopje (20%), are near completion of the country’s first CCGT outside the capital Skopje, at an estimated cost of roughly EUR 150 million. The CCGT has been designed by the partners as a 230 MW power plant, including 160 MW heat. Approximately 70% of its power, and also 50% of its heat is destined for export to regional markets.⁹⁷

In June 2010, Skopje and Moscow signed an agreement (agreed in principle in November 2009) over clearing the latter’s outstanding debt accumulated during the communist era which stands at

⁹² ISI Emerging Markets, *Macedonian energy needs EUR 4-5 bn investments by 2030*, 22 April 2010, www.securities.com

⁹³ Electricity output at Bitola could increase to 200 GWh from 160 GWh now. Since 2005, ELEM has invested more than EUR 100 million or 60% of total investment into Bitola. For more details see ISI Emerging Markets, *Utility ELEM invests EUR 56 mn in upgrade of thermal power plant REK Bitola*, 12 August 2010, www.securities.com; Ministry of Foreign Affairs of the Hellenic Republic, General Secretariat of International Economic Relations and Development Cooperation, *Ο θερμοηλεκτρικός σταθμός REK Bitola πρόκειται να εκσυγχρονισθεί πλήρως*, 19 May 2010, www.agora.mfa.gr; and Ministry of Environment and Physical Planning of the former Yugoslav Republic of Macedonia, *The thermal power plant REK Bitola*, Paper presented at the Balkan Environmental Regulatory Compliance and Enforcement Network (BERCEN) Training on On-Site Inspection, Ohrid Lake, 9-12 September 2003, www.rec.org

⁹⁴ Balkans Business News, *FYROM’s first natural gas co-gen plant launched in Skopje*, 25 May 2009, www.balkans.com

⁹⁵ Envisaged annual production at Energetika CHP stands of 200 GWh and 500 GWh for power and heat respectively. More details are available in Macedonian Information Agency, *‘Energetika’ becomes part of Macedonia’s energy system*, 18 February 2010, www.mia.com.mk; Ministry of Economy of the former Yugoslav Republic of Macedonia, *Basic characteristics and current development projects in the gas pipeline system of the Republic of Macedonia*, Paper presented by Stanisha Nikolovski at the Gas Forum of the Energy Community, Maribor, April 2008, www.energy-community.org; and ELEM, *Combined cycle heat and power plant Energetika*, 2008, www.elem.com.mk

⁹⁶ ISI Emerging Markets, *Utility ELEM mulls converting coal-fuelled thermal plant to gas*, 5 May 2010, www.securities.com

⁹⁷ Trials were expected in August 2010, and commercial operations by October of the same year. See ISI Emerging Markets, *Teto to reduce electricity imports*, 16 August 2010, www.securities.com; and ISI Emerging Markets, *Heating utility Toplifkacija to launch new gas-fired power plant in April*, 21 August 2009, www.securities.com

approximately USD 60.5 million. The agreement included provisions for the extension of their cooperation to the construction of new power generation capacity, as well as the possible conversion of oil-fired Negotino TPP to gas. According to the agreement, debt is to be cleared through direct investment in the former Yugoslav Republic of Macedonia, principally through the development of the country's national gas network by Gazprom. Skopje is to provide an additional USD 15 million towards realization of network expansion. Furthermore, in November 2009 the government reached an agreement with European lender EBRD, for the investment of up to EUR 150 million in local infrastructure projects in 2010, including energy. The total contribution of EBRD to the Balkan nation's economy is expected to reach some EUR 450 million over the course of the coming years.⁹⁸

These expected inflows will help address a real need in the former Yugoslav Republic of Macedonia, as the national gas network there remains limited. Its main gas transmission line begins at Deve Bair in Kriva Palanka county on the border with Bulgaria, which represents the system's sole entry point. The local pipeline system for gas has an entry pressure of 40-bar and a working pressure of 54-bar. Maximum transmission capacity is estimated at 800 mcm/y; but could be extended up to 1.2 bcm/y.⁹⁹ In May 2009, the government of the former Yugoslav Republic of Macedonia identified the following projects as top priorities: a) completion of a first gas ring in Skopje; b) construction of a second ring; c) development of Veles – Stip natural gas transmission and of Veles & Stip natural gas distribution; d) construction of Skopje – Tetovo natural gas transmission and of Tetovo natural gas distribution; and e) construction of Stip – Negotino gas transmission.¹⁰⁰ In March 2010, seven local and foreign construction consortia expressed interest in a tender for such an expansion of the local gas network, which however had a somewhat different prioritization compared to the one mentioned just above. The new design referred to the development of natural gas lines Kumanovo-Negotino (100-km); Negotino-Bitola (100-km); Stip-Hamzali (60-km); and Hamzali–Stojakovo (50-km) on the borders.

⁹⁸ Information from Balkans Business News, *FYR Macedonia and Russia sign clearing debt agreement and ventures on to pipeline*, 21 June 2010, www.balkans.com ; ISI Emerging Markets, *EBRD mulls extending EUR 450 mn for projects in Macedonia*, 17 March 2010, www.securities.com ; ISI Emerging Markets, *Russia to return USD 60 mn clearing debt via gas pipeline construction*, 20 November 2009, www.securities.com ; and ISI Emerging Markets, *EBRD to invest EUR 150 mn in infrastructure, energy projects*, 16 November 2009, www.securities.com

⁹⁹ The line is complemented by a number of other high- and low-pressure gas pipelines which connect it to the main demand centres of Kriva Palanka, Ginovci, Kratovo, Kumanovo, and Skopje. The system's primary metering station is located in Zidilovo near Deve Bair, and has a reported capacity of 0.24 mcm / hr. There are also 5 regulating & metering stations in the high-pressure segment, namely in Kriva Palanka, Kratovo, Kumanovo, Skopje North, and Skopje South; also, a dispatching centre, 16 block valve stations, and 8 cathodic protection systems. Information from Gama, *Natural gas transmission system*, accessed 18 November 2010, www.gama.com.mk ; Ljubisha Jovanovski and Zoran Kontradenko, *Gas infrastructure in Republic of Macedonia*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; and (the former Yugoslav) Republic of Macedonia, *Statement on security of supply*, May 2009, www.energy-community.org.

¹⁰⁰ Respectively, 12.5-km / 12-bar pressure / investment of USD 6.3 million; 13-km / 12-bar / investment of USD 5.3 million; 92-km (82-km + 10-km), 54-bar of pressure, and an investment of approximately USD 37 million; 53-km (48-km + 5-km), 54-bar pressure, and investment of USD 20 million; and 32-km / 54-bar / USD 12 million. See (The former Yugoslav) Republic of Macedonia, *Statement on security of supply*, May 2009, www.energy-community.org.

In April 2010, the government announced that completion of related technical studies for Kumanovo (Klecovce)-Negotino had been awarded to local company Prima Inzenering; for Negotino-Bitola and Stip-Hamzali to Ukrainian Ukgazproekt; and for Hamzali-Stojakovo to DIWI Consulting International GmbH and its local subsidiary.¹⁰¹

In July 2010, the government and successful contractors of this tender signed the relevant agreements. Nevertheless, there have still been reports of delays in the country's ongoing gasification effort, particularly apropos the planned expansion of distribution in Kumanovo and some southern regions. Prospects seem to be more promising in the Skopje region though. The Government / Makpetrol JV Gama has been investing there in the expansion of its gas distribution grid by some 7-km.¹⁰² Additionally, in December 2010 the government announced that it had completed and submitted a feasibility study for the development of its gas distribution network to EBRD as well as EIB, which are reportedly going to part-finance it. Finally, the Strumica municipality has been pushing towards development of a 13-km gas grid, primarily targeted at benefitting from natural gas supply from Petrich in neighbouring Bulgaria. Strumica local authorities have already allocated some EUR 3.8 million towards that end for 2011. Construction commenced in April 2011.¹⁰³

The World Bank study sees gas demand rising to 1.2 bcm/y by 2025. Skopje cites an even more sanguine 2.5 bcm/y to 3 bcm/y in the 2030s, albeit this should probably be seen as part of an ongoing

¹⁰¹ The full list of interested parties in this tender comprised: local group Pumpi-Skopje; Ukraine's Institut Juzniigiprogas; Ukraine's Ukgazproekt. Germany's Diwi Consulting International and its local subsidiary, DIK Cakar-Partners with Gradezen Institut Makedonija and KAT Plus; Balkan Konsalting; Prima Inzenering; and IDOM Ingenieria y Consultoria. More info in ISI Emerging Markets, *Transport ministry signs gas pipeline contracts worth EUR 2.7 mn*, 19 July 2010, www.securities.com; ISI Emerging Markets, *Govt awards 4 supply documentation procurements worth 2.7mn*, 6 April 2010, www.securities.com; and ISI Emerging Markets, *Seven bidders show up for gas supply system*, 3 March 2010, www.securities.com.

¹⁰² Gama is a 50/50 JV between the government and dominant downstream operator Makpetrol. According to local sources, the ownership balance in Gama has now tilted in favour of the government, following the debt clearing agreement it reached with Moscow in November 2009 (*see above*).

In any event, several key potential consumers have reportedly already expressed interest for a connection, including local cogeneration unit Te-to; heating utility Toplana Zapad; the fair of Skopski Sajam; and commercial metal company Fakom, hence supporting the overall business rationale of this investment. Furthermore, the consortium maintains plans to expand its gas grid in Polog (Skopje), Tetovo, and Gostivar, which would bring it closer to the realization of the May 2009 strategy.

For more details see ISI Emerging Markets, *Government taking over gas pipeline*, 15 November 2010, www.securities.com; ISI Emerging Markets, *Gasification of Kumanovo going underway*, 3 November 2010, www.securities.com; ISI Emerging Markets, *Gama announces investments in 7 km gas pipe in Skopje*, 7 April 2010, www.securities.com.

¹⁰³ ISI Emerging Markets, *Gas network project in Strumica begins*, 13 April 2011, www.securities.com; SeeNews, *Macedonia's Strumica launches 3.8 mln gasification project*, 12 April 2011, www.seenews.com; ISI Emerging Markets, *Strumica looking for gas pipeline contractor*, 31 January 2011, www.securities.com; ISI Emerging Markets, *Macedonia: Gas supply network implementation in Macedonia*, 21 January 2011, www.securities.com; and also ISI Emerging Markets, *Macedonia: Gas pipeline project study submitted to EIB and EBRD*, 30 December 2010, www.securities.com.

government effort to promote the local gas market and attract international supply projects to the country. Local gas demand stood at 80 mcm in 2009 (*see above*).¹⁰⁴

Conclusions

The information presented above contributes towards the contextualization of the notion of gas supply security and how this fits the broader energy security debate in SEE. At the same time, it offers insights on the evolution of gas markets in the region and how this may affect natural gas supply. The following conclusions can be inferred:

- **first**, there is strong interest from governments, international donor agencies, and private investors in the region in upgrading energy infrastructure and improving reliability of (currently often problematic) supply;
- **second**, investment in the region's energy sector is perceived by the governments in the SEE region among others as a means of stimulating their respective national economies at a time of recession;
- **third**, gasification is increasingly perceived in the region as a means of displacing less efficient fuel sources and, wherever possible, also helping meet EU-mandated environmental targets;
- **fourth**, gasification of the power generation, industrial, and residential sectors is actively promoted by governments, international donor agencies, and private investors in the region; and it has the potential to provide investors with anchor loads needed to support capital-intensive infrastructure development;
- **fifth**, the regional market for gas in the SEE is relatively small and has been affected by the recession, but it is expected to start recovering in 2011 and could see strong (albeit erratic) gas demand growth; this exacerbates concerns about supply security but could at least theoretically succeed in rendering SEE more profitable, consequently boosting its ability to attract necessary natural gas volumes; and
- **sixth**, gasification is not an absolute priority due to price concerns; this is evident in the planned expansion of lignite-fired power generation, a cheaper albeit more polluting alternative to gas.

¹⁰⁴ See for example ISI Emerging Markets, *Almost secure entrance into South Stream*, 4 October 2010, www.securities.com; and also Economic Consulting Associates, Penspen, and Energy Institute Hrvoje Požar, *South East Europe: regional gasification study*, Draft Final Report, October 2007, www.stabilitypact.org

Given the growing importance of natural gas for both governments and investors in the region, the paper will next describe the immediate and longer term policy responses, as well as the rationales, of state and commercial players. It will also highlight the limitations in the available options for individual countries and the region as a whole in their efforts towards increased levels of security of supply for natural gas, notably regional pipeline interconnections, LNG terminals, and gas storage. Finally, it will evaluate the relevance and contribution of other potentially important factors such as access to funding and local pricing policies. The next section is dedicated to major and regional pipeline interconnections in the broader Balkan region.

2. Interconnectors as major contributors to gas supply security

European and regional context

Urgent action is required on the part of governments in the region to address problems stemming from the context described above and thus improve regional gas supply security, including price security. Acknowledging the painful lessons learned from past supply disruptions (particularly January 2009) Brussels has been pushing towards the establishment of a number of relevant solidarity clauses that will allow access of member states to each other's gas supply sources and reserves at times of crisis. In July 2010, the Committee on Industry, Research, and Energy of the European Parliament gave its assent to a compromise agreement reached a few days earlier with the Commission and Council. This tripartite agreement aimed at improving EU supply security through infrastructure development and increased cooperation between all member-states. With this end in mind, it specified the criteria for declaring a case of emergency; it defined priority consumers; and it introduced detailed obligations and targets for both energy companies and national governments.¹⁰⁵

Specifically, it included provisions which allow the European Commission to declare a state of regional and / or European emergency if at least two EU member-states request such a declaration (the Commission will also consider requests which have been submitted by only one member-state). Furthermore, it adds the residential sector to a list of protected consumers, and ranks it as the number one priority in cases of emergency. Under pressure from the European Council, essential public services and some Small and Medium Enterprises (SMEs) have also been added to this list, provided they do not account for more than 20% of total demand. Finally, the agreement places an obligation on natural gas companies to guarantee supplies to protected (as defined above) customers: a) for a 7-day period, in cases where temperatures are extremely low and gas demand therefore peaks; b) for a 30-day period, in cases of unusually high demand for natural gas; and c) for a 30-day period, in cases where the main natural gas supply infrastructure fails, during periods of average winter conditions. The extremely cold weather criterion included in the clauses described above, which triggers these demand levels, is defined as one which statistically occurs no more often than once every 20 years. Earlier proposals to impose a requirement on EU members to be able to cope with a 60-day disruption

¹⁰⁵ EurActiv, *EU agrees rules to secure gas supply*, 28 June 2010, www.euractiv.com ; Upstream Online, *EU pushes gas security rules*, 19 July 2009, www.upstreamonline.com

in their respective gas supply, was finally scaled down in March 2010, mostly due to concerns relating to the project's envisaged cost.¹⁰⁶

In September 2010, the European Parliament approved the above regulation on gas supply security; this then entered into force on 2nd December 2010 as Regulation 994/2010 of the European Parliament and the Council, repealing at the same time previous Council Directive under reference 2004/67/EC. In November 2010, the European Parliament also voted in favour of other complementary plans aimed at supporting security of energy supply in the EU, specifically the use of EUR 146 million of thus far unused EU funds to finance energy savings, efficiency and RES; and it also adopted a resolution which called for a more coordinated EU external energy policy. Finally, in December 2010 the European Parliament adopted another resolution which highlighted the need for revision of the EU's energy efficiency plan, asking for more action on its binding targets.¹⁰⁷

Despite complications stemming from inherently divergent energy systems and prioritization policies, this agreement places a very clear obligation on European governments to diversify their gas supply; to upgrade and expand their existing storage and transport capacities; and, finally, to introduce reverse-flow technology in all EU gas interconnections by end-2013 (minor exceptions apply).¹⁰⁸ Additionally, member-states of the EU are expected to conduct risk assessment studies as well as to develop preventive action planning and emergency supply disruption planning by the end of 2014. (The European Commission retains the right to ask for modifications if it considers them to be unfit). Finally, reverse gas flows are to take place primarily within a market framework, with non-market emergency actions retained only as an option / tool of last resort.¹⁰⁹ Indeed, the existence of a suitable

¹⁰⁶ For more information see European Commission, *Third package and other changes in gas regulation*, Paper presented by Csilla Bartók at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; EurActiv, *Europe steps up response to gas supply crises*, 14 July 2010, www.euractiv.com ; EurActiv, *EU agrees rules to secure gas supply*, 28 June 2010, www.euractiv.com ; Balkan Business News, *European Parliament panel approves gas security plan*, 18 March 2010, www.balkans.com ; European Commission, *Proposal for a regulation of the European Parliament and of the Council concerning measures to safeguard security of gas supply and repealing Directive 2004/67/EC*, 16 July 2009, <http://eur-lex.europa.eu> ; and European Commission, *Assessment report of Directive 2004/67/EC on security of gas supply*, 16 July 2009, <http://eur-lex.europa.eu>

¹⁰⁷ Information from European Parliament, *Energy policies: European citizens call for more EU solidarity*, 2 February 2011, www.europarl.europa.eu ; and the European Commission, *Regulation (EU) of the European Parliament and of the Council concerning measures to safeguard security of gas supply and repealing Directive 2004/67/EC*, 12 November 2010, <http://eur-lex.europa.eu>.

¹⁰⁸ For information on the European response on other supply fronts besides pipelines such as LNG terminals and natural gas storage depots, see sections below.

¹⁰⁹ EurActiv, *Europe steps up response to gas supply crises*, 14 July 2010, www.euractiv.com ; EurActiv, *EU agrees rules to secure gas supply*, 28 June 2010, www.euractiv.com ; European Commission, *Proposal for a regulation of the European Parliament and of the Council concerning measures to safeguard security of gas supply and repealing Directive 2004/67/EC*, 16 July 2009, <http://eur-lex.europa.eu> ; European Commission, *Assessment report of Directive 2004/67/EC on security of gas supply*, 16 July 2009, <http://eur-lex.europa.eu>

regulatory framework that will contribute to the ease of such natural gas flows between SEE markets is a precondition for achieving wider (regional) supply security benefits from this approach.¹¹⁰

This structure was confirmed in the EU Energy Strategy to 2020, which was published by the European Commission in November 2011.¹¹¹ These provisions could have a positive impact on the ability of European regions with relatively low natural gas price regimes, such as SEE, to attract the necessary gas volumes at times of supply emergency. This is especially true with regard to non-current EU members, which typically have even more limited supply options at their disposal. Therefore, if successful, this approach could help mitigate the impact of gas supply crises in SEE, which was in fact hit hard by the gas supply disruption of January 2009 (*see above*).¹¹²

Nevertheless, the European Commission's proposals on this matter have not been left without critics. For the most part, they focus on the so-called free-rider problem; namely the threat that state and / or other actors in the region will neglect taking necessary (but very capital-intensive) steps which could boost their supply security, including building pipelines, LNG terminals, and storage infrastructure. The rationale for such inertia would be the hope that their more efficient EU neighbours will in fact be under a strict legal, political, and institutional obligation to bail them out at the time of their need. Moreover, some critics have gone as far as to claim such solidarity clauses may not be in line with the EU's own *acquis communautaire*, and that they contribute towards establishing a *de facto* cartel. Other issues such as the potential impact of these provisions on gas pricing in aid-providing members, or on the negotiations of real long-term contracts - especially of countries most at risk of disruption - have similarly been raised, putting into question the ability to implement these proposals.¹¹³

¹¹⁰ For more information on the significance of a suitable regulatory framework for the realisation of the full regional potential of existing planned pipelines see Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org.

¹¹¹ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

¹¹² Such regulations will likely be applicable in the broader SEE region, albeit probably in varying degrees. Hence, they will be applicable in their entirety to Greece and Bulgaria, which are already full EU member states; they will be applicable to a substantial degree to Croatia and the former Yugoslav Republic of Macedonia, which are EU candidate countries; and to a lesser degree to Albania, Bosnia, Montenegro, Serbia, and UNMIK / Kosovo which are EU potential candidate countries and also Contracting Parties to the Energy Community Treaty.

¹¹³ Energetika.net, *Proposal for a regulation laying down measures to ensure the security of gas supply is in line with acquis communautaire*, 7 December 2009, www.energetika.net

Government and commercial players in SEE have accordingly been seeking ways to manage their supply uncertainties through participation in a number of supply projects and - wherever possible - with direct negotiations with upstream producers. Along with LNG and storage, international pipelines and (two-way) regional gas interconnectors are increasingly seen as key contributors to improved levels of natural gas supply and price security in the region. In February 2010, central and east European leaders from Hungary, Poland, the Czech Republic, Slovakia, Romania, Croatia, and Bulgaria met to discuss how best to diversify their natural gas supply, especially inflows from currently dominant supplier Russia. The leaders reiterated their support for the planned Nabucco pipeline, regional interconnectors, new LNG terminals, and storage.¹¹⁴

Balkan attitudes towards major international pipeline projects such as Nabucco and South Stream, the successful realization of which cannot be directly influenced by local policy-makers in any substantial degree, are generally dealt with within a hedging strategy framework. The latter includes participation in what may be considered rival supply projects, and occasionally also direct negotiation with producers. This seeming ambivalence in fact represents a rational policy response on behalf of local players which can help enhance their respective national security of supply, in a milieu where local state and commercial entities are only second-rate players with limited influence over the final outcome. However, multiple project participation by those players can complicate the market context and undermine business case certainty. By the same token, direct negotiations with upstream producers are often not credible, or even possible at all for the smaller countries.

However, the strategy of individual state and commercial players in SEE towards supply security is defined by the availability of real (as opposed to merely theoretical) gas supply options to them, which is far from uniform. Thus even within this relatively small region, there emerges a hierarchy of *rational actors* (based on availability of options) which seek to maximize individual energy security. Their respective ranking order is inescapably defined by extraneous factors such as their political relations with major gas suppliers like Russia, natural gas producers in the Caspian and Middle East, EU affiliation, geographic location (for example, access to regional markets, access to sea routes) etc. These factors have the power to undermine convergence towards a regional approach on this matter, with a more equal and efficient distribution of relevant costs and benefits across involved gas players.

¹¹⁴ Upstream Online, *Nabucco D-Day delayed again*, 8 October 2010, www.upstreamonline.com ; Upstream Online, *Leaders meet for energy diversity talk*, 14 June 2010, www.upstreamonline.com

It is to the examination of real gas pipeline supply options and related policies of players in the region that we will be turning our attention next.¹¹⁵

Maps 8 to 11 display current natural gas import and transmission infrastructure in parts of SEE, including Contracting Parties of the Energy Community and their Gas Ring initiative.

Map 8: Current and planned gas transmission in SEE - focus on TAP and IAP



Source: Trans-Adriatic Pipeline

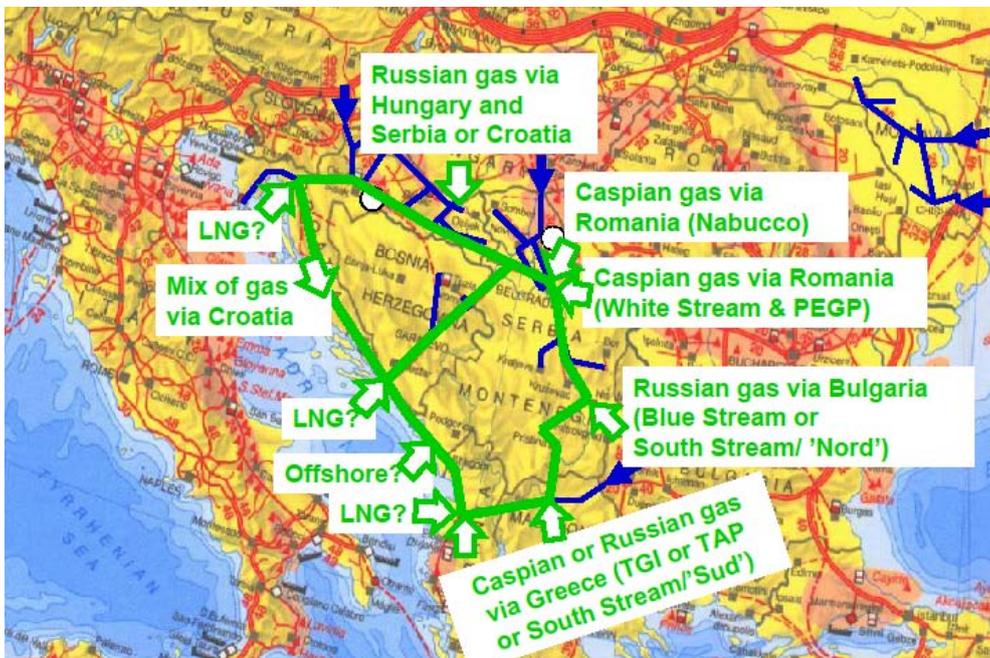
¹¹⁵ For more information on the *rational actor model* in the context of foreign policy decision-making, see for example Chris Brown (2001), *Understanding international relations*, Palgrave Macmillan, Basingstoke, UK

Map 9: Gas import and transmission infrastructure in Energy Community (SEE)



Source: Energy Community, *Progress report on gas projects – contracting parties neighbourhoods*, Paper presented at the Gas Forum of the Energy Community, Brdo, September 2010, www.energy-community.org

Map 10: Current & planned transmission pipelines - Energy Community Gas Ring



Source: Energy Community, *Progress report on gas projects – contracting parties neighbourhoods*, Paper presented at the Gas Forum of the Energy Community, Brdo, September 2010, www.energy-community.org

Map 11: Current & planned gas import and transmission pipelines –South SEE



Source: Oxford Institute for Energy Studies

International gas pipelines affecting SEE

By end-2010, **South Stream** had emerged as a truly regional project in the Balkans and beyond.^{116 117} This has in turn helped create a significant momentum in favour of the Russian-backed gas pipeline. For example, even though still nominally supportive of Nabucco, in November 2009 the Slovenian government reached an agreement with the Russian Federation for inclusion in the pipeline's route; feasibility study results have been encouraging and formation of a JV was expected by March 2011.¹¹⁸ What is more, Électricité de France (EDF) has expressed interest in entering the South Stream project as a minority partner, after the original agreement reached with existing partners in November 2009. EDF was expected to take a stake of at least 10% - and possibly up to 20% - in the pipeline's subsea section from ENI by end-2010. This prospect has now been pushed back towards the end of 2011. Furthermore, in March 2011 Wintershall signed an agreement with the two existing partners to join South Stream with a 15% stake. This will be taken from ENI's shares in the South Stream partnership, thereby leaving Gazprom as the majority shareholder in this project. Specifically, South Stream's ownership structure would change to Gazprom 50%; ENI 35%; and Wintershall 15%.¹¹⁹

¹¹⁶ For an overview of global and European supply and demand dynamics, transportation, and their relevance to the region, see for example Anouk Honore (2010), *European Natural Gas Demand, Supply, and Pricing: Cycles, Seasons, and the Impact of LNG Price Arbitrage*, Oxford: Oxford University Press for the Oxford Institute for Energy Studies ; Anastasios Giamouridis, *Natural gas in Greece and Albania: supply and demand prospects to 2015*, December 2009, Oxford Institute for Energy Studies, www.oxfordenergy.org ; and Spiros Paleoyannis, *The fourth corridor gas pipelines: perspectives, uncertainties, and implications for SE Europe and Greece*, IENE, Working Paper No. 10, July 2009, www.iene.gr.

For technical details of the planned international pipelines including recent developments see respective websites below. White Stream and AGRI are treated here as extra-SEE (as defined here) projects, due to their proposed landing in Romania. As such, they fall outside of the scope of the present study and are not examined in relevant sections as the current one. Nevertheless, successful realisation of either of these projects could indeed make a meaningful contribution to gas supply security in the wider SEE, provided of course necessary dissemination infrastructure is also in place (*see below*).

- <http://www.nabucco-pipeline.com>
- <http://south-stream.info>
- <http://www.igi-poseidon.com>
- <http://www.trans-adriatic-pipeline.com/>

¹¹⁷ Country-specific details of the international pipeline projects are covered in the next section on SEE gas interconnectors. The aim of this structure is to allow for a more straightforward presentation of synergies between these two types of projects. The conclusions of the authors concerning the role, relevance, and value of planned natural gas pipeline projects in the region are presented in the last section of this chapter.

¹¹⁸ Energia.gr, *Τον Μάρτιο η κοινοπραξία Ρωσίας-Σλοβενίας για τον South Stream*, 16 February 2011, www.energia.gr ; Energetika.net, *Feasibility study of the South Stream pipeline in Slovenia has been concluded, the results are encouraging*, 16 February 2011, www.energetika.net ; RIA Novosti, *Russia's Gazprom, Slovenia to create South Stream gas pipe JV in March 2011*, 16 February 2011, <http://en.rian.ru/> ; Upstream Online, *Slovenia finalizes South Stream pact*, 9 November 2009, www.upstreamonline.com

¹¹⁹ Info from ICIS Heren, *Germany's Wintershall to acquire 15% stake in South Stream*, 22 March 2011, www.icis.com ; Wintershall, *Wintershall intends to acquire a stake in the offshore section of the South Stream Pipeline*, 21 March 2011, www.wintershall.com ; ISI Emerging Markets, *Electricité de France to join officially South Stream project by year-end*, 18 February 2011, www.securities.com ; ISI Emerging Markets, *Gazprom: EDF to join South Stream project in 2011*, 17 February 2011, www.securities.com ; Energia.gr, *Ο South Stream δεν θα ενισχύσει την ενεργειακή εξάρτηση της Ευρώπης*

There has also been extensive speculation in recent months with regard to the potential entry of additional European gas players into the project, which would improve its bargaining position vis-à-vis the EU. Gazprom and RWE have denied reports that RWE will participate in South Stream and RWE is, in fact, a partner in the Nabucco consortium, which would place any such move firmly within a zero-sum game framework. Of equal importance would be the entry into South Stream of E.ON Ruhrgas, a member of the TAP consortium (*see below*). This prospect was openly discussed during a visit to Brussels by Gazprom in May 2011.¹²⁰

But in contrast to the above positive developments, the project has been facing difficulties with regard to offshore licensing in Turkey, while the consortium has also been complaining about an alleged lack of equal treatment with EU-supported projects (*see below*), asking for similar TPA exemptions. Furthermore, in March 2011 Russian PM Vladimir Putin called for an examination of the potential development of liquefaction on Russia's Black Sea shore, as part of the South Stream pipeline project. It remains unclear at this stage how this might fit with future Russian energy planning, as the move has been interpreted as anything from a first step towards cancellation of South Stream, to an effort to impede progress of the rival Azerbaijan – Georgia – Romania Interconnector (AGRI). However, these uncertainties have not really undermined its overall positive momentum.¹²¹

In this context, SEE state and commercial actors have taken pains to secure inclusion in South Stream. For example, in April 2011 Croatia reportedly confirmed its interest in participating in the project, while in August 2010 Albanian premier Sali Berisha, raised the possibility of a spur from the Greek section of South Stream (*see below*) linking Igoumenitsa or any other Greek location with Vlorë in Albania. However, for the moment Gazprom does not seem to have any immediate plans to include Albania in its planning, and no concrete progress has been reported on these fronts.¹²² Likewise, in September 2010, the PM of Republika Srpska and the Russian Energy Minister agreed to examine in more detail the potential of an extension of South Stream to Bosnia & Herzegovina. In March 2010,

από τη Μόσχα, 16 February 2011, www.energia.gr ; Upstream Online, *Wintershall shrugs off South Stream whisper*, 5 October 2010, www.upstreamonline.com ; IENE, *South – East Europe energy market watch*, Issue No. 26, July 2010, www.iene.gr ; Upstream Online, *EDF signed in as South Stream partner*, 21 June 2010, www.upstreamonline.com ; Upstream Online, *EDF gets South Stream nod*, 18 June 2010, www.upstreamonline.com ; Upstream Online, *EDF takes South Stream spot*, 27 November 2009, www.upstreamonline.com;

¹²⁰ Ibid.; and also Reuters, *Gazprom says E.ON could join South Stream - Agency*, 25 May 2011, www.reuters.com ;

¹²¹ Ibid. and Bloomberg, *Putin studies Black Sea LNG plant as part of South Stream*, 9 March 2011, www.bloomberg.com ; for more details on AGRI see for example the Turkish Weekly, *Minister: AGRI to supply gas to various European countries*, 13 September 2010, www.turkishweekly.net

¹²² SeeNews, *Croatia confirms intention to take part in South Stream project-Gazprom*, 13 April 2011, www.seenews.com ; ISI Emerging Markets, *Russian Gazprom has no plans to include Albania in South Stream project*, 2 September 2010, www.securities.com ; The Embassy of Greece in Tirana, *Διάμειψη της Gazprom για τον αγωγό South Stream*, Bulletin (Ενημερωτικό Δελτίο) of July – August 2010 ; SeeNews, *South Stream gas project may connect to Albania – PM Berisha*, 27 August 2010, www.seenews.com

Republika Srpska had signed an agreement with Moscow on the construction of a 480-km branch of South Stream along the river Sava in northern Bosnia, with capacity of some 1.5 bcm/y to 1.7 bcm/y. However, there have been reports of problems with FBiH (*see below*).¹²³

Meanwhile, speculation in the first quarter of 2010 that Romania might replace Bulgaria seems to have been intended as a means of applying pressure on Sofia to adopt a more accommodating stance on other issues, including the pricing of natural gas imports from Russia and Bulgarian transit fees.¹²⁴ But from as early as April 2010, Gazprom confirmed Bulgaria's central position in South Stream, acknowledging it would be next to impossible for Romania to replace it as its first onshore section.¹²⁵ Furthermore, in March 2010 Croatia and the Russian Federation agreed to establish a 50/50 JV for the construction and management of the EUR 300 million Croatian natural gas link to South Stream, despite initial reservations from Zagreb due to fears of growing dependence on Russia.¹²⁶

In June 2010, DESFA and Gazprom set up South Stream Greece *Soci t  Anonyme* (SA), a 50/50 JV tasked with development and management of an 11 bcm / EUR 1 billion Greek section. According to statements by the two companies, the scope of this JV includes engineering, funding, construction and operation of the pipeline on the territory of Greece. In October 2008, the Greek parliament had ratified an intergovernmental agreement on the matter.¹²⁷

Additionally, in October 2009 Srbijagas and Gazprom established a 51/49 JV (in favour of Gazprom) for the extension of South Stream to Serbia, while in November 2009 it emerged that its capacity would likely be raised to between 36 bcm/y and 41 bcm/y, from the previously envisaged 20 bcm/y.¹²⁸

¹²³ More details in ISI Emerging Markets, *Republika Srpska joins South Stream*, 17 September 2010, www.securities.com ; Energetika.net, *A new gas pipeline Sava is to be constructed from Serbia to BiH*, 20 April 2010, www.energetika.net ; Energetika.net, *Gas pipeline crossing Republika Srpska*, 21 October 2009, www.energetika.net ; Pipelines International, *Serbia looks to back Bosnian pipeline*, 20 October 2009, <http://pipelinesinternational.com> ; and Reuters, *Bosnia firm eyes gas pipeline bid with Serbia, Russia*, 19 October 2009, www.reuters.com

¹²⁴ Energetika.net, *Romania could take place of Bulgaria in the South Stream Pipeline*, 3 March 2010, www.energetika.net

¹²⁵ In June 2010 it emerged that Gazprom was in negotiations with the Romanian government over participation of that country in its South Stream project, including also possible development of gas storage and power generation infrastructure. See Balkans Business News, *Romania in talks with Gazprom to join South Stream pipeline project*, 17 June 2010, www.balkans.com ; and ISI Emerging Markets, *Gazprom abandons Romanian participation in South Stream*, 12 April 2010, www.securities.com.

¹²⁶ ISI Emerging Markets, *Croatia misses out on South Stream*, 17 December 2009, www.securities.com

¹²⁷ More details available in DESFA, *Ιδρύθηκε η South Stream Greece AE*, 30 June 2010, www.desfa.gr ; in Upstream Online, *Greece signs up for South Stream*, 7 June 2010, www.upstreamonline.com ; and in Gazprom Export, *South Stream: a project to ensure energy security in Europe*, 2009, www.gazpromexport.com

¹²⁸ ISI Emerging Markets, *Serbia wants to be first to start South Stream construction*, 20 September 2010, www.securities.com ; ISI Emerging Markets, *Feasibility study for Serbian part of South Stream gas pipeline set for end-2010*, 14 June 2010, www.securities.com ; ISI Emerging Markets, *Capacity of Serbian leg of South Stream pipeline to be raised to 41 bn cm*, 22 October 2009, www.securities.com ; ISI Emerging Markets, *Srbijagas, Gazprom ink deals on setting up joint venture for energy projects*, 21 October 2009, www.securities.com

In November 2010, Belgrade completed as planned a feasibility study on its section of South Stream, which was accordingly submitted to Russia. This made explicit reference to the prospect of wider natural gas supply opportunities for Serbia, as it discusses possible pipeline spurs.¹²⁹

In the same context, in September 2010 a high-ranking Gazprom delegation visited the former Yugoslav Republic of Macedonia to hold preliminary talks on this matter with Deputy PM Stavrevski. Gazprom has already agreed to consider the country's participation in the South Stream project, subject to timely completion of feasibility studies on the section's economic and technical viability. Future needs of neighbours Albania and Kosovo are likely to have an impact on this pipeline project (*for more SEE country-specific information regarding South Stream see the next section*).¹³⁰

Nabucco represents a 31 bcm/y natural gas pipeline project aimed at linking upstream fields in the Caspian region as well as in the Middle East with natural gas markets in eastern and central Europe. Nabucco is incorporated as an unbundled midstream company comprising of the following partners, each with an equal 16.67% share: Bulgarian Energy Holding, BOTAS (Turkey), MOL (Hungary), OMV (Austria), RWE (Germany), and Transgaz (Romania). Furthermore, there have been reports on potential entry of new partners into the project; most recently of major French operator GDF-Suez.¹³¹ In the Balkans, the project concerns directly only Bulgaria at the moment: in fact except for the BEH, no other local energy player currently participates in this project, despite interest from some countries. For example, Albania has lobbied partner Turkey for its support, but with no concrete results so far.¹³² Similarly, BH-Gas has been seeking support from BOTAS to help its bid for inclusion in Nabucco. But even if indeed forthcoming, such support may not be enough to achieve this ambitious goal.¹³³

In this context, Sofia has already announced its intention to shoulder financing costs of approximately EUR 400 million stemming from its membership in Nabucco JV, including through state guarantees;

¹²⁹ Tanjug, *Serbia completes South Stream feasibility study*, 30 November 2010, www.tanjug.rs

¹³⁰ ISI Emerging Markets, *Macedonia 'quite likely' to join South Stream gas pipeline*, 1 October 2010, www.securities.com ; ISI Emerging Markets, *Macedonia to connect to South Stream*, 6 September 2010, www.securities.com ; SeeNews, *South Stream through Macedonia to be signed in September*, 7 July 2010, www.seenews.com ; Balkans Business News, *Romania, FYR Macedonia in South Stream gas pipeline*, 21 June 2010, www.balkans.com ; ISI Emerging Markets, *Macedonia might participate in South Stream gas pipeline*, 18 June 2010, www.securities.com

¹³¹ See for example Upstream Online, *GDF asks for Nabucco serving*, 25 February 2010, www.upstreamonline.com

¹³² ISI Emerging Markets, *Russian Gazprom has no plans to include Albania in South Stream project*, 2 September 2010, www.securities.com ; The Embassy of Greece in Tirana, *Ανάμνηση της Gazprom για τον αγωγό South Stream*, Bulletin (Ενημερωτικό Δελτίο) of July – August 2010 ; SeeNews, *South Stream gas project may connect to Albania – PM Berisha*, 27 August 2010, www.seenews.com ; ISI Emerging Markets, *Albanian visit in Baku – Topalli urges recognition of Albania as transit country for gas and oil pipelines*, 30 June 2010, www.securities.com ; and from ISI Emerging Markets, *Turkish government favours expansion of Nabucco project in Albania*, 20 November 2009, www.securities.com

¹³³ A cooperation memorandum was indeed expected by end-September 2010 on that matter; for more information see Upstream Online, *Bosnia seeks Botas help*, 19 August 2010, www.upstreamonline.com

likewise in February 2010, parliament gave assent to the Nabucco project with cross-party support.¹³⁴ But as of May 2011 the original Nabucco cost estimate of some EUR 7.9 billion was under review, and there were unconfirmed media reports that this was being revised to as much as EUR 15 billion. What is more, EU Commissioner Günther Oettinger and BP reportedly both found this more realistic. In contrast, in June 2011 project partner RWE said that development costs were expected to increase, but not as much as rumoured, and only to allow for construction of an extra 500-km feeder from Iraq. Nonetheless, an overall increase in Nabucco development costs probably means that project partners including Bulgaria will have to bear part of this incremental burden.¹³⁵

Furthermore, in the same month (June 2011), the members of the Nabucco JV signed an agreement in Kayseri, Turkey which finalised the project's legal framework, offering regulatory clarity / stability, and facilitating project finance. Importantly, this agreement confirmed a previously discussed advantageous regulatory transit regime for Nabucco, under both EU and Turkish energy law.¹³⁶

But despite this progress, Nabucco continues to suffer from problems such as unconfirmed supply, multiple stakeholders / transit countries / priorities, rising costs, and potentially insufficient demand. As a result, that year saw the emergence of a growing consensus on ITGI / Nabucco complementarity including from key commercial and political players such as Edison, RWE, Brussels, and Ankara, given it is unlikely that both these supply projects would be able to move forward at the same time. However, the Nabucco consortium has been careful to highlight that a potential merger of its project with the ITGI gas pipeline is not impossible, but neither is it a necessary condition for its realisation (*for more on the country-specific impact / progress of Nabucco in the Balkans see below*).¹³⁷

¹³⁴ The Nabucco project was ratified by the other main transit country in the region, Turkey, a few weeks later in May 2010. For more info see The Sofia Echo, *Bulgaria to offer state guarantees for Nabucco gas pipeline - minister*, 20 January 2011, www.sofiaecho.com; Upstream Online, *Turkey gives Nabucco nod*, 5 March 2010, www.upstreamonline.com; and finally ISI Emerging Markets, *Economy minister ready to provide EUR 300 mn for gas pipeline Nabucco*, 3 November 2009, www.securities.com

¹³⁵ SeeNews, *RWE executive says Nabucco costs to rise only marginally – Dow Jones*, 8 June 2011, www.seenews.com; Upstream Online, *Supply, cost concerns hit Nabucco*, 9 May 2011, www.upstreamonline.com; Reuters Africa, *Nabucco says investment projections speculation*, 5 May 2011, <http://af.reuters.com/>

¹³⁶ Nabucco Gas Pipeline, *Nabucco legal framework finalised – project support agreement signed by each transit country*, 8 June 2011, www.nabucco-pipeline.com

¹³⁷ See Guardian, *European gas pipeline costs double*, 20 February 2011, www.guardian.co.uk; Reuters, *Nabucco upbeat on Azeri gas, shuns ITGI merger*, 18 February 2011, www.reuters.com; Today's Zaman, *Turkey mulls merging two major gas pipelines*, 18 February 2011, www.todayszaman.com; also Reuters, *EU pushes strategic gas pipelines to merge*, 17 February 2011, www.reuters.com; Energia.gr, *Σύνδεση του ITGI με τον Nabucco προτείνει ο επικεφαλής της Edison*, 29 December 2010, www.energia.gr; Energy Press, *Κοινή "πορεία" για τους αγωγούς ITGI και Nabucco προτείνει η Edison*, 29 December 2010, www.energypress.gr; Energy Press, *Πρόταση σε ΔΕΠΑ και Edison να ενταχθούν στο Nabucco – Αρνητική η κυβέρνηση*, 12 November 2010, www.energypress.gr; Upstream Online, *Turkey backs pipeline merger*, 7 October 2010, www.upstreamonline.com; Energy Press, *Edison: γιατί όχι σύνδεση ITGI - Nabucco*, 28 September 2010, www.energypress.gr; News.Az, *RWE offers to connect Italy-Turkey-Greece Interconnector to Nabucco*, 16 September 2010,

DEPA, a partner in **ITGI**, has pointed out its potential value as Phase I of the Southern Gas Corridor, as opposed to the prospect of being merged with Nabucco.¹³⁸ ITGI aims to link upstream producers of natural gas in the Caspian region, with gas-thirsty markets in Europe. The project is based on an extension of the existing Turkey – Greece Interconnector (TGI) to the Italian natural gas market.¹³⁹ Greece and Italy are considering ITGI as a reverse-flow natural gas link in line with EU requirements. In accordance with decision 1364/2006, ITGI has been included in the Projects of European Interest, and enjoys a proposed financing of the order of EUR 100 million from the European recovery plan. In the long-term energy strategy to 2020, which has been published by the European Commission, ITGI is also highlighted as a key project in the effort towards opening up the Southern Corridor.¹⁴⁰

Successful completion of ITGI will require construction of a 42-inch gas pipeline from Komotini in north-eastern Greece to Greece's Ionian coastline, crossing a total of 570 km – including the existing Greek segment of TGI – at a cost of some EUR 940 million. In addition, it will require construction of a 32-inch, 206-km underwater pipeline (1,370-metres deep) to Otranto in Italy at an estimated cost of EUR 800 million. Transport capacity will be initially 8 bcm/y, but will ultimately rise to 12 bcm/y. Construction costs associated with the above-ground part of the planned link in Greece are to be borne by system operator DESFA, possibly with support from funds available under the NSRF 2007-2013; construction of the underwater section of the interconnector will be borne by the two Poseidon partners, namely Edison and DEPA.¹⁴¹

In May 2010, the IGI Poseidon consortium awarded Front End Engineering and Design (FEED) to the INTECSEA / IV-Oil & Gas Consortium. To improve ITGI's chances, in June 2010 Poseidon signed a

www.news.az; and also Energy Press, *Ποδηματά: συμπληρωματικά έργα οι αγωγοί Nabucco και ITGI*, 21 September 2010, www.energypress.gr

¹³⁸ See for example Spiros Paleoyannis, *The pioneer role of Greece and DEPA SA towards a secure integrated gas market in SE Europe*, Paper presented at the 10th Turkish International Oil & Gas Conference, Ankara, March 2011 ; Energia.gr, *Χάρης Σαχίνης: Διαπραγματεύσεις σε όλα τα μέτωπα για τις εισαγωγές φυσικού αερίου*, 25 February 2011, www.energia.gr ; and Energy Press, *Χάρης Σαχίνης: Φέρνουμε, για πρώτη φορά, αέριο από το Αζερμπαϊτζάν χωρίς τη μεσολάβηση της Τουρκίας*, 21 February 2011, www.energypress.gr ;

¹³⁹ For more on TGI see Anastasios Giamouridis, *Natural gas in Greece and Albania: supply and demand prospects to 2015*, December 2009, Oxford Institute for Energy Studies, www.oxfordenergy.org

¹⁴⁰ See European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346} ; IGI Poseidon, *The project*, 2009, www.igi-poseidon.com ; Energia.gr, *Διπλής ροής και ο αγωγός IGI*, 21 July 2009, www.energia.gr

¹⁴¹ See Energy Press, *Επενδύσεις 3 δις. ευρώ δρομολογεί ο ΔΕΣΦΑ μέχρι το 2019*, 6 June 2011, www.energypress.gr ; and also DESFA, *Νέα έργα: υλοποίηση έργων*, accessed 8 January 2011, www.desfa.gr

Memorandum of Understanding (MoU) with BOTAS highlighting commitment to its implementation. In this context, the agreement included a number of provisions to improve business case certainty. First, the Turkish side committed to the allocation of the necessary capacity in its national gas grid. Second, it included safeguards on flows to Greece and other SEE destinations (through the planned IGB). Third, it raised formally the possibility of Turkish participation in the planned ITGI pipeline project. Fourth, it raised formally Greek participation in planned capacity upgrades in the Turkish grid.¹⁴² Following up on this, in July 2010 Poseidon partners and DESFA signed a cooperation agreement defining operational arrangements for securing proper coordination of related engineering activities. In September and August 2010, the project received positive preliminary environmental licenses in both Greece and Italy. And in October 2010, the Greek - Italian consortium awarded a design appraisal and verification contract to Det Norske Veritas.¹⁴³

Furthermore, in February 2011 it emerged that DEPA was in negotiations with Azerbaijan and Turkey on the transfer of its existing 0.75 bcm/y supply agreement with BOTAS (which sources Azeri gas), to either the State Oil Company of the Azerbaijan Republic (SOCAR), or to related export consortium Azerbaijan Gas Supply Company (AGSC). Successful transfer presupposes agreement of all three sides on a number of important issues, including clarification of the Turkish transit regime and fees. Due to the nature and wider implications of this negotiation, it probably also represents an important first step towards realisation of South Corridor natural gas supply projects such as ITGI and IGB (*more country-specific ITGI information is available in paragraphs below*).¹⁴⁴

The **Trans-Adriatic Pipeline (TAP)** aims at connecting Albania and Italy with upstream gas sources in the Caspian through neighbouring Greece. TAP wants to connect to TGI, in Thessaloniki, Greece; thence crossing to Albania, and finally reaching Brindisi, southern Italy through a subsea connection. The pipeline is designed with an initial 10 bcm/y transport capacity, and will be 48-inch in diameter. It will have a combined length of 500-km, with Greece accounting for approximately 186-km of it. Albania will account for another 180-km; offshore for a further 115-km; and, finally, Italy for 19-km.

¹⁴² IGI Poseidon, *Edison, Depa and Botas sign agreement for the transit in Turkey*, 21 June 2010, www.igi-poseidon.com; Bloomberg Business Week, *Botas, Edison, Depa agree Turkey-Greek-Italy pipeline*, 17 June 2010, www.businessweek.com; Energia.gr, *ΔΕΠΑ – Edison: Υπέγραψαν το μνημόνιο με την Botas για τον ITGI*, 17 June 2010, www.energia.gr

¹⁴³ Information from IGI Poseidon, *IGI Poseidon contract award notice for the design appraisal and verification services*, 25 October 2010, www.igi-poseidon.com ; IGI Poseidon, *Issue of the positive preliminary environmental impact assessment and evaluation for the Greek section of the Poseidon pipeline*, 17 September 2010, www.igi-poseidon.com ; IGI Poseidon, *Positive environmental impact assessment for the Italian section of the Poseidon pipeline*, 2 August 2010, www.igi-poseidon.com ; IGI Poseidon, *Cooperation agreement between IGI Poseidon SA and DESFA SA*, 16 July 2010, www.igi-poseidon.com ; and from IGI Poseidon, *IGI Poseidon FEED contract award*, 16 July 2010, www.igi-poseidon.com.

¹⁴⁴ Energia.gr, *Χάρης Σαχίνης: Διαπραγματεύσεις σε όλα τα μέτωπα για τις εισαγωγές φυσικού αερίου*, 25 February 2011, www.energia.gr ; Energy Press, *Χάρης Σαχίνης: Φέρνουμε, για πρώτη φορά, αέριο από το Αζερμπαϊτζάν χωρίς τη μεσολάβηση της Τουρκίας*, 21 February 2011, www.energypress.gr ;

TAP falls under the provisions of the EU's Trans-European Energy Networks and is considered by the EU to be a Priority Project.¹⁴⁵

In the first half of 2010, partners Elektrizitaets - Gesellschaft Laufenburg (EGL) and Statoil agreed to reduce their respective shares to 42.5% each, in order to give 15% to German giant E.ON Ruhrgas (this was confirmed and officially announced on 7 July 2010). The aim was to improve the rationale for TAP through E.ON's demand potential, and thus boost its credentials vis-à-vis key suppliers such as Azerbaijan. TAP has also drawn attention to the fact that financing can be provided by shareholder companies themselves, rather than having to resort to (uncertain and / or expensive) sources of funding from international financial institutions.¹⁴⁶

In the same vein, despite signing in 2008 a 5.5 bcm/y supply contract with the National Iranian Gas Export Company (NIGEC), in September 2010 TAP announced it would not be seeking Iranian gas. The move came in an apparent attempt to rid the project of unnecessary political risk and resistance from potentially useful governments and commercial players, which do not want to be perceived as undermining the international community in ongoing nuclear negotiations with the Islamic republic. Azerbaijani gas is thus now promoted by TAP as a primary and also adequate source for the project, even though this remains a rather questionable proposition given the delays and intense competition associated with supply from Shah Deniz II. Nonetheless, a speculated swap agreement with BOTAS could still allow TAP to access Iranian supply, while avoiding any negative political ramifications. Planned increased availability of Turkmen natural gas to Iran could further contribute to the relevance of such a swap agreement for TAP. On the other hand though, both Turkmenistan and Iran have plans to supply a growing number of gas markets in Asia, including China, India and Pakistan.¹⁴⁷

¹⁴⁵ Information from TAP, *Routing optimization: concluded in Albania, ongoing in Italy and Greece*, 28 September 2010, www.trans-adriatic-pipeline.com ; Naske Afezzoli, *Opening the Eurasia gas corridor: interconnecting Greece, Albania, and Italy*, Paper presented at the 'Greek-Albanian Cooperation in the Energy Sector', Tirana, January 2009, www.iene.gr; and Elias Karydogiannis, *Ο αγωγός αερίου TAP και η συμβολή του στη περιφερειακή ανάπτυξη*, Paper presented at the 'Ενέργεια και ανάπτυξη στην Ανατολική Μακεδονία και Θράκη' conference, April 2007, www.iene.gr.

¹⁴⁶ More details on this issue available in Upstream Online, *E.ON firms TAP stake*, 7 July 2010, www.upstreamonline.com ; Upstream Online, *E.ON Ruhrgas joins TAP*, 20 May 2010, www.upstreamonline.com ; ISI Emerging Markets, *Government signs memorandum on TAP project*, 19 May 2010, www.securities.com ; TAP, *Memorandum of understanding and cooperation with the Albanian government*, 19 May 2010, www.trans-adriatic-pipeline.com

¹⁴⁷ The interest of Turkmenistan in diverting substantial natural gas volumes towards a more diversified client portfolio became more acute in the aftermath of the failure of main buyer Gazprom to continue Turkmen gas imports after April 2009, when a major interconnector connecting the two countries exploded. Ashgabat believes that this was in reality sabotage aimed at saving the Russian Federation from its take-or-pay obligations, in the midst of a gas glut. See Hürriyet, *Turkmen push trans-Afghan pipeline to India with government accord*, 14 December 2010, www.hurriyet.com.tr ; Upstream Online, *Iran and Turkmenistan open gas pipeline*, 29 November 2010, www.upstreamonline.com ; Energy Press, *Σε συμφωνία swap μεταξύ BOTAS και TAP οδηγεί το ιρανικό αέριο*, 22 September 2010, www.energypress.gr ; ISI Emerging Markets, *TAP confirms gas supplies from Azeri Shah Deniz field*, 16 September 2010, www.securities.com ; TAP, *TAP reconfirms Shah Deniz II as the initial gas source for the pipeline*, 15 September 2010, www.trans-adriatic-pipeline.com ; Upstream Online, *TAP turns back on Iranian gas*, 15 September 2010, www.upstreamonline.com ; Upstream Online, *EU Team Heads to*

Furthermore, in June 2010 TAP announced they had entered negotiations with Greek counterparties, arguably in an effort to boost overall confidence in their project and therefore facilitate development. TAP management also revealed their desire for close cooperation with their main competitor ITGI, implying a merger / cooperation of these pipelines (as with ITGI and Nabucco above). In May 2011, the Greek government similarly called for an evaluation of potential synergies between these projects. This seems like a reasonable response in a milieu where both supply and demand for gas are limited, and there is consequently no real need of a multiplicity of midstream projects to deal with imbalances. But given the existence of strong downstream gas interests for some participants in both of these JVs, a possible outcome could see them all reduce to some extent their planned intake from Shah Deniz II. This could be a means of facilitating the emergence of an arrangement whereby they can all enjoy access to a part of ITGI transit infrastructure, to be able to reach downstream gas markets of choice. In April 2011, EGL signed an MoU with BOTAS on the general framework of transit through Turkey, specifically with regard to natural gas volumes which will flow westwards from the Caspian region, preparing the ground for direct and specific negotiations on gas transit issues through that country. Broader cooperation with BOTAS in the framework of TAP is reportedly also under examination. In May 2011, TAP kicked off its Environmental and Social Impact Assessment (ESIA) in Italy.¹⁴⁸

Finally, TAP offers a theoretical opportunity for additional interconnections with Balkan neighbours, notably through a discussed **Ionian – Adriatic Pipeline (IAP)**. This is planned as a 28-inch gas link, which is to run for a distance of approximately 400-km from Fieri in Albania, to Ploce in Croatia. Estimated construction costs for this project stand at between EUR 90 million and EUR 230 million, for its Albanian section only (roughly 170-km). IAP is to connect to TAP in Fieri, and as such falls within the framework of the broader Gas Ring of the Energy Community of South East Europe, particularly within its ongoing efforts to improve security of natural gas supply in the wider region. However, little progress had been achieved in real terms by end-2010 towards implementation of IAP. The most relevant landmarks so far have been the signing of a Ministerial Declaration by the governments of Albania, Montenegro, and Croatia in its support in September 2007; and also a joint declaration to the same purpose by the governments of Albania and Bosnia & Herzegovina in

Turkmenistan, 30 July 2009, www.upstreamonline.com. More detail on the political and strategic isolation of the Islamic Republic of Iran, including in the context of its energy sector, is available in Brenda Shaffer (2009), *Energy Politics*, Philadelphia: University of Pennsylvania Press.

¹⁴⁸ See Energia.gr, Γιάννης Μανιάτης: «να εξετασθούν οι συνέργιες ITGI και TAP», 31 May 2011, www.energia.gr ; also TAP, *Trans-Adriatic Pipeline begins ESIA submission process in Italy*, 16 May 2011, www.trans-adriatic-pipeline.com ; Gas Strategies, *EGL signs MoU with BOTAS over TAP gas transit rights through Turkey*, 26 April 2011, www.gasstrategies.com ; ISI Emerging Markets, *Greek government backs construction of Trans Adriatic Pipeline*, 25 November 2009, www.securities.com ; Energia.gr, *Συνομιλίες μεταξύ των κοινοπραξιών του TAP και του ITGI*, 30 September 2010, www.energia.gr ; Upstream Online, *TAP ready to join forces with ITGI*, 30 June 2010, www.upstreamonline.com

December 2008. In February 2011, TAP signed an MoU on cooperation with Plinacro of Croatia. This was repeated a couple of months later (May 2011) with the Ministry of Economy of Montenegro. Both of the aforementioned MoUs were aimed at the development of natural gas markets in SEE.¹⁴⁹ However, IAP seems to be in conflict with other comparable gas interconnectors now being planned. (*As in the case of the other international pipelines described above, more country-specific information concerning the TAP / IAP project is available in the paragraphs which follow*).¹⁵⁰

Country focus on gas pipeline projects¹⁵¹

Albania, which at the moment does not enjoy any international gas links and for that reason is unable to move forward with its gasification plan (*see above*), has sought support from main international natural gas suppliers such as Azerbaijan, in its bid to become a transit country for oil & gas volumes. The Albanian goal in this context has been to accrue geopolitical gains and fuel the Albanian economy with secure, efficient, and affordable energy supply. In this broader framework, Albania has sought (and secured) the support of major Nabucco partner and regional power Turkey. The latter has publicly stated its support for the inclusion of Albania in an expanded Nabucco project, even though of course on its own this Turkish support is not enough to secure Albanian participation. Furthermore, in August 2010 the Albanian premier, Sali Berisha, raised the possibility of constructing a natural gas branch from the Greek section of the Russian-backed South Stream pipeline project, linking Igoumenitsa – or any other point to its east along the Greek section - with Vlorë in Albania; while a connection to the planned Greece – Italy interconnection would also be relevant (*see above*). However, for the moment, the Nabucco partners and Gazprom do not have any immediate plans to include Albania in their projects, and thus no concrete progress has been reported on these fronts. Greece seems to be more welcoming, even though there is no firm commitment yet.¹⁵²

¹⁴⁹ TAP, *Trans-Adriatic Pipeline and the government of Montenegro sign MOUC on energy cooperation*, 20 May 2011, www.trans-adriatic-pipeline.com; TAP, *TAP and Croatia gas pipeline operator Plinacro sign South East Europe MOUC*, 25 February 2011, www.trans-adriatic-pipeline.com

¹⁵⁰ Information from Stavri Dhima, *Prospects for the introduction of natural gas in Albania*, Paper presented at the ‘Greek–Albanian Cooperation in the Energy Sector’, Tirana, January 2009, www.iene.gr; and from various local sources.

¹⁵¹ As mentioned above, country-specific details of international natural gas links affecting SEE are presented here alongside regional gas interconnectors; the aim is to allow for a more direct presentation of available synergies between these projects. In a similar vein, basic details and country-specific information on SEE interconnectors have been included in pertinent country sub-sections (with appropriate cross-references) to facilitate evaluation of their impact on the national level as well. Finally, the authors’ views concerning the role, relevance, and value on a national and regional level of projects discussed in this chapter are available in its final section.

¹⁵² ISI Emerging Markets, *SOCAR to closely examine the TAP project*, 12 March 2011, www.securities.com; ISI Emerging Markets, *Senior Albanian, Azerbaijani officials discuss bilateral energy projects*, 11 March 2011, www.securities.com; ISI Emerging Markets, *Russian Gazprom has no plans to include Albania in South Stream project*, 2 September 2010, www.securities.com; The Embassy of Greece in Tirana, *Διάμνηση της Gazprom για τον αγωγό South Stream*, Bulletin (Ενημερωτικό Δελτίο) of July – August 2010; SeeNews, *South Stream gas project may connect to Albania – PM Berisha*,

Tirana has also been following closely developments on the planned TAP natural gas connection to the existing TGI pipeline near the northern Greek city of Thessaloniki; thence crossing to Albania, and finally reaching Brindisi in south Italy (*see above for more details*). Concerning its Albanian section in particular, in collaboration with the international companies ILF and ERM, TAP completed successfully its Albanian gas route assessment survey in September 2010. This was specifically aimed at assessing five potential onshore routes based on technical, environmental, social, and cultural criteria. It resulted in a northern (yet shorter) redefinition of the originally proposed route, to avoid a number of problematic military as well as cultural heritage sites. A relevant ESIA process was launched by TAP in June 2011 and is to be finalised in the third quarter of 2011.¹⁵³

Besides being seen as important in Albania on its own merit (i.e. an international gas supply source), TAP also offers Tirana an opportunity for additional interconnections with neighbours, notably IAP. IAP is to connect with the TAP gas line in Fieri, Albania and as such falls within the supply security framework of the Gas Ring of the Energy Community of South East Europe (*see maps 8-11 above*). Nevertheless, relatively little progress has been achieved towards implementation of IAP until now. The Albanian government has been very active in lending political support to TAP/IAP, most recently by signing an MoU on this issue with the TAP consortium in May 2010.¹⁵⁴ But on the whole, Albanian influence over the TAP project has by any account remained marginal. Tellingly, the country with possibly the highest stake in the successful completion of the TAP project, has not succeeded in having any substantial involvement in the consortium's significant efforts to boost its credentials as described above, namely attracting new partners and / or securing project financing. What is more, Albania has even failed to influence to any substantial degree the government in neighbouring Greece, the support of which is necessary for successful project completion. The ability of Tirana to influence its supply context with regard to natural gas should thus be considered limited, with the initiative still resting with more sizeable commercial players and / or powerful neighbours (*more info on the international and Greek-specific aspects of TAP can be found in relevant sections*).

27 August 2010, www.seenews.com ; ISI Emerging Markets, *Albanian visit in Baku – Topalli urges recognition of Albania as transit country for gas and oil pipelines*, 30 June 2010, www.securities.com ; ISI Emerging Markets, *Turkish government favours expansion of Nabucco project in Albania*, 20 November 2009, www.securities.com

¹⁵³ TAP, *TAP organizes community meetings in Albania along the pipeline route*, 6 June 2011, www.trans-adriatic-pipeline.com ; ISI Emerging Markets, *TAP launches ESIA process for pipeline construction in Albania*, 12 April 2011, www.securities.com ; TAP, *Routing optimization: concluded in Albania, ongoing in Italy and Greece*, 28 September 2010, www.trans-adriatic-pipeline.com

¹⁵⁴ ISI Emerging Markets, *Government signs memorandum on TAP project*, 19 May 2010, www.securities.com ; and also TAP, *Memorandum of understanding and cooperation with the Albanian government*, 19 May 2010, www.trans-adriatic-pipeline.com

Bosnia & Herzegovina is a small gas market hit particularly hard during the Russo – Ukrainian crisis of January 2009. It is currently served through a single 0.75 bcm/y pipeline which connects it with Russian natural gas fields through Ukraine, Hungary, and finally Serbia.¹⁵⁵ Bosnia & Herzegovina ostensibly follows a diversification strategy with regard to both its supply sources as well as available pipeline routes. In this framework, it targets connection of its gas grid with Russia through South Stream via Serbia (but not Ukraine, as is currently the case) as well as with other non-Russian sources via neighbour Croatia (*see maps 4, 8, and 10 above*).

In September 2010, the PM of Republika Srpska and the Russian Energy Minister agreed to examine the potential of a South Stream extension to this Bosnian entity (*more details on South Stream above*). Earlier in March 2010, Republika Srpska and Moscow had agreed to a 480-km South Stream branch along the river Sava in northern Bosnia, with capacity of between 1.5 bcm/y and 1.7 bcm/y. Completion of the Sava branch is envisaged in four stages, i.e. from the border with Serbia to the autonomous Brčko district; from Brčko to local refining centre Bosanski Brod; from Bosanski Brod to Banja Luka (*de facto* capital of Republika Srpska); and finally, from Banja Luka to Prijedor and to Bosanski Novi. There are also thoughts of linking the new pipeline to the natural gas grid of FBiH in the area of Brod, but under the provision FBiH only receives a gas transit fee and has no resale option. In addition, Srbijagas has been discussing the possibility of an extension of the planned Sava pipeline to the official capital of Bosnia & Herzegovina, Sarajevo.¹⁵⁶

Bosnian-Serb and Russian firm Slavija Internacional reportedly holds a construction license for the Sava pipeline, and it is now trying to team up with Russian or Serbian partners in order to secure needed funding. Srbijagas intends to use a portion (about 17%) of a EUR 150 million senior corporate loan it has secured from EBRD with a sovereign guarantee to this end.¹⁵⁷ Finally, in November 2009 Srbijagas pledged its support to Bosnia & Herzegovina in cases of serious supply disruptions as in early 2009. Such support will likely include access to storage under development at Banatski Dvor,

¹⁵⁵ International Energy Agency (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org

¹⁵⁶ More details in ISI Emerging Markets, *Republika Srpska joins South Stream*, 17 September 2010, www.securities.com ; Energetika.net, *A new gas pipeline Sava is to be constructed from Serbia to BiH*, 20 April 2010, www.energetika.net ; Energetika.net, *Gas pipeline crossing Republika Srpska*, 21 October 2009, www.energetika.net ; Pipelines International, *Serbia looks to back Bosnian pipeline*, 20 October 2009, <http://pipelinesinternational.com> ; and Reuters, *Bosnia firm eyes gas pipeline bid with Serbia, Russia*, 19 October 2009, www.reuters.com

¹⁵⁷ EBRD, *Srbijagas*, updated 22 July 2010, www.ebrd.com ; ISI Emerging Markets, *Russians interested in local gas pipeline financing*, 19 October 2009, www.securities.com

where BH-Gas has been offered the opportunity to store natural gas, as well as to the Hungarian grid. Srbijagas has said it is not willing to participate on anything other than commercial terms.¹⁵⁸

FBiH has been less welcoming of the Sava project though, which it perceives as a part of an ongoing political (including party political) agenda by Republika Srpska aimed at continuing to exert control over gas flows to the country, without any regard for needed diversification away from Russia.¹⁵⁹ Authorities in FBiH have therefore been working towards connection of the entity's grid with Croatia, with an eye to securing diversified supply in the form of: a) pipeline natural gas from central Europe; and / or b) LNG from the planned Krk terminal in Croatia.¹⁶⁰ BH-Gas and Energoinvest with EBRD support have been pursuing construction of a 250-km pipeline between Bosanski Brod and Zenica in Central Bosnia Canton; of a 92-km gas link between Velika Kladuša and Bihać in Una – Sana Canton. A third pipeline is also on the cards, and a letter of intent was signed towards that end in April 2011 (Republika Srpska too seems to be positively inclined towards a Croatia – Bosnia interconnection).¹⁶¹ Following Albania's example, BH-Gas has also been seeking the support of key player BOTAS, which it hopes could support its bid for inclusion in the Nabucco project where BOTAS is a partner.¹⁶² But as the ability of BH-Gas to achieve this goal remains questionable, the Bosnian company has reportedly held preliminary discussions with the Shah Deniz II negotiating team on possible supply through Greece or Bulgaria. The latter implies use of the planned Bulgaria – Serbia interconnector, which probably represents a more realistic supply route option (*see below*). In April 2011, BH-Gas also signed an MoU aimed at the development of regional markets with the TAP consortium.¹⁶³

The ongoing expansion of the gas grid of FBiH, already by far the largest consumer in the country, is expected to create some attractiveness for this market for candidate natural gas supply projects, which

¹⁵⁸ Limun.hr, *Serbia pledges to help in case of gas crisis*, 4 November 2009, www.limun.hr

¹⁵⁹ Limun.hr, *BH Gas: Dodik is using South Stream for election campaign*, 21 September 2010, www.limun.hr

¹⁶⁰ Energetika.net, *Gas pipeline crossing Republika Srpska*, 21 October 2009, www.energetika.net

¹⁶¹ SeeNews, *Croatia's Plinacro, Bosnia's BH-Gas confirm intent to link gas grids*, 11 April 2011, www.seenews.com ; ISI Emerging Markets, *BH Ga, Croatia's Plinacro ink cooperation accord*, 8 April 2011, www.securities.com ; and also ISI Emerging Markets, *Bosnian-Serb leader says conditions created for joint projects with Croatia*, 2 March 2011, www.securities.com

¹⁶² A cooperation memorandum was indeed expected by end-September 2010 on that matter; for more information see Upstream Online, *Bosnia seeks Botas help*, 19 August 2010, www.upstreamonline.com

¹⁶³ ISI Emerging Markets, *BH-Gas signs memo with Trans Adriatic Pipeline 2*, 12 April 2011, www.securities.com ; ISI Emerging Markets, *Bosnia joins TAP pipeline Balkan net*, 11 April 2011, www.securities.com ; SeeNews, *Trans-Adriatic Pipeline, Bosnia's BH-Gas sign memorandum of understanding*, 11 April 2011, www.seenews.com ; ISI Emerging Markets, *Natural gas alternative sources to provide to provide to BiH – Shah Deniz 2*, 10 February 2011, www.securities.com

could boost its ability to secure new volumes and thus achieve diversification in its supply sources.¹⁶⁴ Working in the opposite direction though, in March 2010, Mladen Zirojevic, the Minister of Foreign Trade and Economic Relations of Bosnia & Herzegovina, faced allegations from BH-Gas that his department was obstructing construction of the planned gas link with Croatia, instead supporting the political objectives and business goals of the Serbian side. The minister vehemently denied any responsibility saying issues were dealt with at the legal level and that, despite his best efforts, the relevant gas acts had not been prepared.¹⁶⁵

The apparent diversification policy of Bosnia & Herzegovina hence in reality reflects the country's fragmented institutional arrangements between a Bosniak – Croat federation (FBiH) and a Serb-dominated state entity (Republika Srpska). These entities pursue divergent and often, as indeed here, conflicting foreign policy agendas. These are often in line (again, as here) with ethnic affiliation and as such they impact heavily on energy diplomacy strategies. In this framework, they end up undermining efforts at gas supply security for Bosnia & Herzegovina as a whole. Specifically, this happens because: a) they break down even further Bosnia's (anyway small) domestic market for gas, so rendering it even less attractive for potential investors; and b) they do not allow international donor agencies to concentrate financial support on a limited number of viable projects in order to maximize their impact, and / or force them to pick sides. The ability of Sarajevo to have any substantial influence on its gas supply context is consequently further diminished and thus becomes questionable. As in the case of Albania above, international commercial players and more powerful neighbours end up having a disproportionate influence on the Bosnian debate on supply security.

Bulgaria similarly took a heavy blow from the supply disruptions of January 2009. It is now trying to diversify its supply away from Russia and wants to cover at least 40% of its needs in natural gas from non-Russian pipeline sources such as TGI and Nabucco, and from the global LNG market by 2020.¹⁶⁶ Bulgaria is a much better endowed player compared to both Albania and Bosnia & Herzegovina, on all geographic, geopolitical, and economic criteria. It enjoys access to the Black Sea; it is a member of both the EU and the North Atlantic Treaty Organisation (NATO); finally it has (by regional standards)

¹⁶⁴ According to BH Gas data, natural gas consumption in Bosnia & Herzegovina reached almost 166 mcm in the first three quarters of 2010, rising by approximately 8% compared to the same period the year before. The bulk of that demand was found in FBiH, where demand stood at almost 140 mcm, compared to less than 134 mcm in the same period in 2009. The remaining volumes (approximately 26 mcm) were consumed in Republika Srpska, which saw relatively strong growth compared to consumption levels of ~20 mcm the year before. Natural gas accounts for roughly 8% of the country's energy mix. Information from ISI Emerging Markets, *BH-Gas: Gas consumption first nine months 2010 up 8 percent from 2009*, 4 October 2010, www.securities.com

¹⁶⁵ Energetika.net, *Ministry of foreign trade and economic relations not competent for gas projects in BiH*, 16 March 2010, www.energetika.net

¹⁶⁶ Imerisia, *Διπλό ενδιαφέρον για τον ελληνοιταλικό αγωγό*, 14 April 2009, www.imerisia.gr

a relatively large and growing natural gas market. Nevertheless, Sofia seems to have realized its lack of leverage to any significant degree on the broader geopolitical game concerning natural gas supply. As a result, it has been following a strategy of diversification and hedging its gas supply options, notably by lending support both to western-backed Nabucco as well as Russian-backed South Stream (*see above for more details regarding the international aspect and prospects of these two pipelines*). In this way, it hopes to improve supply security irrespective of the ultimate winner in this context.

Hence, Sofia has announced its intention to shoulder financing costs of roughly EUR 400 million stemming from its membership in the Nabucco consortium, including through use of state guarantees. In February 2010, the parliament of Bulgaria gave its assent to the project with cross-party support;¹⁶⁷ while in June 2010, Bulgarian officials went as far as to say Nabucco represents their project of choice because, unlike competitor South Stream, it allows diversification of both routes and sources. In July 2010, the cabinet gave approval to an earlier intergovernmental deal concluded in Ankara.¹⁶⁸ The open support lent by Sofia to Nabucco, rather than to its own South Stream, may have irked Russia, which naturally wants to protect the viability of its project from competition. Moreover, the current centre-right GERB (Citizens for the European Development of Bulgaria) administration has on the whole proven to be less favourably inclined towards Moscow than its socialist predecessors, including on energy matters such as Belene and Bourgas – Alexandroupolis.

However, these obstacles have not stopped PM Boyko Borisov and his government from pursuing a pragmatic strategy on South Stream; this has happened for three main reasons: a) although it does not offer Bulgaria source diversity, South Stream still saves it from unnecessary and potentially problematic gas transit intermediaries, as for example has been the case with Ukraine in recent years;

¹⁶⁷ The Nabucco project was ratified by the other main transit country in the region, Turkey, a few weeks later in May 2010. For more info see The Sofia Echo, *Bulgaria to offer state guarantees for Nabucco gas pipeline - minister*, 20 January 2011, www.sofiaecho.com; Upstream Online, *Turkey gives Nabucco nod*, 5 March 2010, www.upstreamonline.com; and finally ISI Emerging Markets, *Economy minister ready to provide EUR 300 mn for gas pipeline Nabucco*, 3 November 2009, www.securities.com

¹⁶⁸ In November 2010, Nabucco completed a first round of consultations with Bulgarian local authorities, and also commenced a second round of consultations with residents who live along the proposed route as well as with various Non-Governmental Organisations (NGOs) active in the environmental sector. The Bulgarian section of Nabucco will be 412-km in length and could cross a total of 9 regions, namely: Bourgas, Lovech, Pleven, Ruse, Shumen, Tarnovo, Veliko, Vratsa, and also Yambol.

Information from EU Business, *EIB to help Bulgaria with highways, Nabucco*, 21 January 2011, www.eubusiness.com; also from SeeNews, *EIB to help Bulgaria build motorways, Nabucco gas pipeline*, 21 January 2011, www.seenews.com; ISI Emerging Markets, *Nabucco has made progress in negotiating supplies, mapping pipeline route*, 13 November 2010, www.securities.com; SeeNews, *Bulgaria discusses Nabucco gas pipeline route with local authorities*, 12 November 2010, www.seenews.com; Standart, *Bulgaria's cabinet supports Nabucco*, 22 July 2010, <http://paper.standartnews.com>; ISI Emerging Markets, *Cabinet to approve support agreement for gas pipeline Nabucco*, 22 July 2010, www.securities.com; Upstream Online, *Sofia nod for Nabucco deal*, 21 July 2010, www.upstreamonline.com; Focus Information Agency, *Nabucco is a priority project for Bulgaria: Minister*, 28 June 2010, www.focus-fen.net; and ISI Emerging Markets, *Parliament approves multilateral government agreement for Nabucco gas pipeline*, 4 February 2010, www.securities.com

b) competitor pipeline project Nabucco continues to suffer from unconfirmed natural gas supply, multiple stakeholders / transit countries / priorities, and potentially insufficient gas market demand; and c) Sofia expects to see substantial benefits from its planned participation in South Stream, including a more than doubling of gas transit fees from Russia compared to current levels.¹⁶⁹

By the same token, Moscow has been happy to keep Sofia onboard South Stream despite setbacks, thanks to Bulgaria's suitable geography and promising gas market. Speculation in first quarter 2010 that Romania might replace Bulgaria therefore seems to have been intended mostly as a means of applying pressure on Sofia, in order for the latter to adopt a more realistic / accommodating stance; this likely included issues such as pricing of gas imports from Russia, and Bulgarian transit fees.¹⁷⁰ But from as early as April 2010, Gazprom confirmed Bulgaria's central position in South Stream, acknowledging it would be next to impossible for Romania to replace it as its first onshore section.¹⁷¹

Against this background, in July 2010 the two sides moved forward with accords on preliminary gas details, for example agreeing that roughly 25% of the total gas to be transported through South Stream will have to utilize existing, government-owned pipelines in Bulgaria; the remainder is to be transported by new pipelines which will be co-owned (on a 50/50 equal basis) between Sofia and Moscow. Furthermore, a few days later the two countries agreed to establish a 50/50 JV tasked with the construction of the Bulgarian section of South Stream, estimated to cost above EUR 600 million. An intergovernmental agreement was accordingly signed in November 2010, while a feasibility study on the Bulgarian section of the planned gas pipeline was expected to be awarded by March 2011. Bulgaria expects transit fees of up to USD 400 million/year from South Stream once it is operational. In contrast, transit fees from existing pipeline infrastructure stood at only USD 107 million in 2010, and were expected to reach USD 112 million in 2011.¹⁷²

¹⁶⁹ Standart, *Bulgaria to profit EUR 1 billion from South Stream*, 16 November 2010, <http://paper.standartnews.com>

¹⁷⁰ Energetika.net, *Romania could take place of Bulgaria in the South Stream Pipeline*, 3 March 2010, www.energetika.net

¹⁷¹ In June 2010 it emerged that Gazprom was in negotiations with the Romanian government over participation of that country in its South Stream project, including also possible development of gas storage and power generation infrastructure. See Balkans Business News, *Romania in talks with Gazprom to join South Stream pipeline project*, 17 June 2010, www.balkans.com; and ISI Emerging Markets, *Gazprom abandons Romanian participation in South Stream*, 12 April 2010, www.securities.com.

¹⁷² Saipem Spa.; ILF consulting engineers; Jacobs Consultancy UK; Giprogazcenter; and a consortium of Yuzhnigiprokaz and Gastec BG were shortlisted and invited to submit a full tender bid to that end. The latter (consortium of Yuzhnigiprokaz and Gastec BG) was awarded the project in February 2011. Information in this section comes from the following sources: Standart, *Research of South Stream layout to be launched*, 10 February 2011, <http://paper.standartnews.com>; Standart, *Bulgaria to reap \$ 400 m from South Stream*, 22 January 2011, <http://paper.standartnews.com>; SeeNews, *Bulgaria shortlists five candidates for South Stream feasibility study*, 13 December 2010, www.seenews.com; and SeeNews, *Update 1 - Bulgaria, Russia set up JV on South Stream gas pipeline*, 13 November 2010, www.seenews.com; see also ISI Emerging Markets, *BEH, Gazprom sign agreement for South Stream project in Bulgaria*, 25 October 2010, www.securities.com; SeeNews, *Moscow, Sofia sign agreement on South Stream feasibility study*, 25 October 2010, www.seenews.com; The

At the same time, the government has been careful not to undermine its balancing act with Nabucco, trying to keep European partners involved as much as possible during negotiations with the Russians. In this framework, it asked the European Commission to give an opinion on the compatibility of an earlier transit agreement on South Stream with Moscow, signed by its socialist predecessors in 2008. The European Commission found provisions on exclusive partner access which were contained there to be in breach of EU Third-Party Access (TPA) rules and regulations, and asked for modifications. Sofia now wants to negotiate a TPA exemption for up to 70% of gas capacity for the two partners, while the Russians seem to have adopted a harder line on this issue. In any event, in a context of serious supply uncertainties and high stakes, rationally enough Sofia works towards an arrangement whereby the worst outcome for it would be non-diversified gas (i.e. if only South Stream is realized). This compares very favourably with other proposed arrangements which could easily leave the Balkan nation with no supply at all (i.e. if it only supports Nabucco but then this fails to materialize).¹⁷³

In the meantime, Sofia has been trying to make the most of its transit position and growing gas market by developing direct links with potential suppliers, notably Azerbaijan, which is being courted by Nabucco, ITGI, South Stream (and TAP). For example, in November 2009 the Bulgarian president Georgi Parvanov and his Azerbaijani opposite number Ilhan Aliyev signed an MoU on the export of up to 1 bcm/y of Azeri gas to Bulgaria, once a Bulgarian link to ITGI (*see above*) has been completed. There have also been discussions on potential Azeri exports of LNG and / or CNG as early as 2012, with Sofia now targeting a combined 2 bcm/y from all available / possible transit sources. Illustrating the lack of any substantial Bulgarian influence over the matter, during this visit President Parvanov refused even to comment on Nabucco progress and timetable when prompted by reporters, saying only that this is a matter affecting many parties and no specific answer would be accurate.¹⁷⁴

To counter the relative lack of influence of Bulgaria over upstream producers and international pipeline projects as described above, Sofia has in recent years also been pushing forward with a more regional agenda, namely boosting natural gas interconnections with countries in the region, as a

Sofia Echo, *Gazprom agrees to launch feasibility study in Bulgaria*, 25 October 2010, www.sofiaecho.com ; Upstream Online, *Duo step up Bulgaria South Stream link plans*, 25 October 2010, www.upstreamonline.com ; IENE, *South – East Europe energy market watch*, Issue No. 26, July 2010, www.iene.gr ; and SeeNews, *Bulgaria, Russia sign road map on South Stream pipeline project*, 19 July 2010, www.seenews.com

¹⁷³ See EU business, *South Stream stakeholders to seek control of capacity*, 16 November 2010, www.eubusiness.com ; Standart, *Bulgaria to profit EUR 1 billion from South Stream*, 16 November 2010, <http://paper.standartnews.com> ; Energy Press, *Πρόσβαση τρίτων στο αέριο του South Stream ζητά η ΕΕ*, 16 November 2010, www.energypress.gr ; Energy Press, *Σόφια : Τα βρίσκει με τον Πούτιν για τον South Stream, το αέριο, ίσως και για το Μπέλενε...*, 16 November 2010, www.energypress.gr ; and ISI Emerging Markets, *Bulgaria consulted European Commission before signing South Stream accord*, 15 November 2009, www.securities.com

¹⁷⁴ Energia.gr, *Ενεργειακή συνεργασία Βουλγαρίας - Αζερμπαϊτζάν*, 14 November 2009, www.energia.gr ; Upstream Online, *Azerbaijan seals Bulgaria gas pact*, 13 November 2009, www.upstreamonline.com

means of improving its problematic supply security. As an EU and NATO member and also a relatively large gas market (by regional standards), Bulgaria naturally carries more clout within SEE and can influence developments there more directly than in the wider European – Caspian context. Sofia has for this reason been seeking ways to develop two-way natural gas links with neighbours Turkey, Romania, Greece, and Serbia.

In February 2010, Sofia and Ankara signed a number of intergovernmental agreements, aimed at lessening gas dependence on Moscow. The Bulgarian – Turkish agreement includes agreement for the construction of a new Turkey – Bulgaria pipeline which is to link Turkish LNG terminals in the Sea of Marmara (at either Marmara Ereğlisi or a potential 6 bcm/y greenfield terminal; *see LNG section*), with a gas compressor station in Lozenets, on Bulgaria's Black Sea coast (Bourgas). This project will be developed by state-owned natural gas and logistics companies Bulgargaz and BOTAS, with the estimated cost for this project for the Bulgarian side alone standing at approximately EUR 25 million. A joint pre-feasibility study by the two sides was expected to be completed in early 2011, while they have also agreed to proceed with an upgrade of their existing gas interconnection into a two-way line. The aim is to boost supply security in both markets; and also provide Bulgaria with access to planned Turkish LNG storage on its Aegean coastline. Bulgargaz is to co-finance these projects.¹⁷⁵

Furthermore, in July 2010, Sofia proposed that construction of the pipeline link with Turkey should accelerate by virtue of being a project of European significance which could form part of Nabucco.¹⁷⁶ In August 2010, the Bulgarian authorities through economy and energy minister Traycho Traykov went a step further and suggested the interconnector could be financed in the framework of the European Economic Recovery Plan (EERP). This idea received almost immediately a welcome boost, as it was embraced both by the Nabucco consortium, as well as the energy commissioner of the EU.¹⁷⁷ In September 2010 Bulgaria and Turkey agreed to apply jointly for EU financing for their pipeline as a Nabucco section, while PM Borisov suggested the EU should allocate up to EUR 65 million of an existing EUR 200 million Nabucco fund towards construction of this link.¹⁷⁸ However, in June 2011

¹⁷⁵ Energetika.net, *Bulgaria and Turkey to construct terminals for liquid gas and a new pipeline*, 2 February 2010, www.energetika.net

¹⁷⁶ ISI Emerging Markets, *Bulgaria – Turkey gas interconnector may start Nabucco project*, 20 July 2010, www.securities.com

¹⁷⁷ Dvevnik News, *EU could finance gas link between Bulgaria, Turkey*, 3 August 2010, <http://news.dvevnik.bg>

¹⁷⁸ ISI Emerging Markets, *"Bulgaria will raise issue of Nabucco project financing, prioritizing EU-wide" - PM*, 4 October 2010, www.securities.com; ISI Emerging Markets, *Bulgaria, Turkey to apply for European co-financing of gas link-up*, 30 September 2010, www.securities.com

the Bulgarian working expert group called for acceleration of the country's connection with Turkey without necessarily committing to relevant Nabucco specifications.¹⁷⁹

Bulgaria has also been pushing for construction of a new two-way gas interconnection with Romania, in an effort to benefit from the latter's indigenous production (including unconventional prospects); from its three-line and arguably more secure import capacity with a combined capacity of 26 bcm/y; and from its large storage capacity for natural gas. Bulgaria – Romania is designed as a 1.5 bcm/y (24-km) gas pipeline with 2 metering stations, and it has an envisaged completion date of mid-2012. Partners Bulgartransgaz and Transgaz plan to invest EUR 24 million in the project, which is also eligible for EERP funding in the order of EUR 10 million. In November 2010, Bulgaria and Romania signed an MoU on the construction of the new link, offering new momentum and possibly allaying fears relating to earlier delays that among others had impacted negatively on discussed EU funding. Preliminary works on this project were thus expected to start in June 2011, with actual construction commencing during the second quarter of 2012.¹⁸⁰

Sofia is also working towards completion of a planned gas interconnection with southern neighbour and Mediterranean Sea entry point, Greece (*see map 11 above for the proposed route of this pipeline*). On 4 March 2010, Bulgarian, Greek, and Italian partners signed in Thessaloniki a shareholders' agreement for the planning, construction, and operation of an Interconnector Greece – Bulgaria (IGB). In the same meeting, they set up Sofia-based *Asset Company*, a 50/50 JV between the Bulgarian Energy Holding and the Poseidon consortium (50/50 DEPA – Edison) which has been tasked with the construction of the planned interconnector. The partners also agreed to set up an Athens-based *Commercial Company* with a shareholder structure of 35/35/30 (DEPA, BEH, Edison respectively); to be responsible for IGB trading operations. In August and November 2010, Bulgarian and Poseidon partners signed additional agreements with regard to the planned pipeline's construction schedule, while the Bulgarian government also gave its official approval.¹⁸¹

¹⁷⁹ Balkan Insight, *Bulgaria, Turkey agree to speed up gas grid connection*, 10 June 2011, www.balkaninsight.com;

¹⁸⁰ ISI Emerging Markets, *Energy minister on shale gas prospecting, negotiations with Gazprom, gas interconnectors*, 28 May 2011, www.securities.com; ISI Emerging Markets, *Bulgaria, Greece, Romania launch interconnection of gas systems*, 3 December 2010, www.securities.com; SeeNews, *Bulgaria, Romania sign gas link agreement*, 30 November 2010, www.seenews.com; ISI Emerging Markets, *Romania, Bulgaria seek to build natural gas connection pipeline*, 2 November 2010, www.securities.com; The Sofia Echo, *Bulgaria could lose EU funding on gas link with Romania*, 1 November 2010, www.sofiaecho.com; Energetika.net, *Gas interconnections of Bulgaria with Serbia, Romania and Greece*, 4 March 2010, www.energetika.net; European Commission, *Impact assessment*, 16 July 2009, <http://eur-lex.europa.eu>

¹⁸¹ See ISI Emerging Markets, *Bulgaria, Greece, Romania launch interconnection of gas systems*, 3 December 2010, www.securities.com; Energia.gr, *Συμφωνία διασύνδεσης του δικτύου φυσικού αερίου της Ελλάδας και της Βουλγαρίας*, 1 December 2010, www.energia.gr; Energy Press, *Έπεσαν υπογραφές για τον αγωγό αερίου Ελλάδας – Βουλγαρίας*, 1 December 2010, www.energypress.gr; Energy Press, *Προχωρά η διασύνδεση των δικτύων αερίου Ελλάδας - Βουλγαρίας*, 25 November 2010, www.energypress.gr; ISI Emerging Markets, *Bulgaria signs deal to link up gas network with Greece*, 30

IGB is planned as a two way, 28-inch link with a transport capacity of between 3 bcm/y and 5 bcm/y. It aims at facilitating Caspian gas and LNG inflows from Greece to its northern neighbour, which can also be reversed at times of emergency for Greece. The initial development phase of this project, i.e. construction of the pipeline - but not of a relevant compressor station – will be completed by 2014. Nonetheless, the full capacity of IGB cannot be realized until completion of the compressor station; initial capacity is to stand at some 1.5 bcm/y. Local sources have suggested a pipeline route from Stara Zagora through Dimitrovgrad and Kurdjali in Bulgaria, to Komotini in Greece; i.e. basically following the route of the road link to Makaza Pass (170-km).¹⁸²

The IGB partners expect their project to complete at an envisaged cost of roughly EUR 150 million. The EERP is to contribute up to EUR 45 million to IGB, provided that project development makes progress according to plan. Besides the domestic Bulgarian natural gas market, IGB also targets the markets of Romania and Hungary. These two Central & Eastern European (CEE) countries expect to be able to tap into Caspian pipeline gas as well as diversified LNG that reaches Bulgaria through IGB, as soon as interconnectors Bulgaria – Romania and Romania – Hungary have been successfully developed and become operational.¹⁸³

In March 2010, the European Commission, Serbian gas operator Srbijagas and Bulgarian transmission operator Bulgartransgaz signed an agreement for the construction of a two-way pipeline that will connect the gas grids of the two Balkan neighbours. The main advantage for Bulgaria will be potential access to Serbian storage at Banatski Dvor (to be Gazprom-controlled, *see below*), while the gain for Serbia is access to the diversified supply that Bulgaria expects to secure through its interconnection projects with neighbours to its south and east, Greece and Turkey (*see map 11 and sections above*).

November 2010, www.securities.com; Upstream Online, *Bulgaria gives new pipe team nod*, 25 November 2010, www.upstreamonline.com ; Balkan Business News, *Greece and Bulgaria agree on development details for IGB*, 8 August 2010, www.balkans.com ; Energia.gr, *Τίνα Μπιρμπίλη: «Μήνυμα ανάπτυξης ο ελληνοβουλγαρικός αγωγός IGB»*, 4 March 2010, www.energia.gr ; ISI Emerging Markets, *BEH, IGI Poseidon to set up joint venture for gas link with Greece today*, 4 March 2010, www.securities.com ; and ISI Emerging Markets, *Construction of gas link to Greece to start next year*, 24 February 2010, www.securities.com

¹⁸² Marco Margheri, *ITGI and IGB: opening the Southern Corridor*, Paper presented at the CERi Sciences – Po Seminar, Paris, 20 May 2011, <http://sciencespo.fr/enerpol/> ; SeeNews, *Bulgaria – Greece gas link to be ready by end-2014*, 30 May 2011, www.seenews.com ; ISI Emerging Markets, *Energy minister in shale gas prospecting, negotiation with Gazprom, gas interconnectors* , 16 July 2009, www.securities.com ; ISI Emerging Markets, *Bulgaria and Greece sign memorandum on joint gas connections*, 16 July 2009, www.securities.com ; Rosen Simitchiev, *The Balkans as a corridor of energy supplies to Europe: contribution and role of Bulgaria*, Paper presented at the ‘3rd South-East Europe Energy Dialogue’, Thessaloniki, June 2009, www.iene.gr ; and various local sources.

¹⁸³ Spiros Paleoyannis, *Meeting the gas supply and market integration challenges in SE Europe*, Paper presented at the European Gas Conference, Vienna, January 2011 ; Energy Press, *Σόφια: Τα βρίσκει με τον Πούτιν για τον South Stream, το αέριο, ίσως και για το Μπέλενε...*, 16 November 2010, www.energypress.gr ; Energia.gr, *Τίνα Μπιρμπίλη: «Μήνυμα ανάπτυξης ο ελληνοβουλγαρικός αγωγός IGB»*, 4 March 2010, www.energia.gr ; ISI Emerging Markets, *BEH, IGI Poseidon to set up joint venture for gas link with Greece today*, 4 March 2010, www.securities.com ; ISI Emerging Markets, *Construction of gas link to Greece to start next year*, 24 February 2010, www.securities.com ; Naftemporiki, *Με γοργούς ρυθμούς προχωρά ο αγωγός Κομοτηνή – Χάσκοβο*, 14 July 2009, www.naftemporiki.gr

In this framework, each partner is to assume responsibility for their respective pipeline sections, without setting up a JV as is usually the norm in other comparable cases. However, the agreement provides for the establishment of a working group between partners Bulgartransgaz and Srbijagas, with the participation of representatives from the European Commission and also from the Secretariat of the Energy Community, who will work together on the project's preparation.¹⁸⁴

The Bulgarian government had in fact announced its plans to connect the country's gas grid with that of Serbia earlier in November 2009, as part of a broader effort aimed at supply diversification, improvements in energy security, and enhancement of its trade and political influence in the region; the Serbian government reportedly harbours similar ambitions.¹⁸⁵ Plans for the construction of a link between Bulgaria and Serbia are not new and have been around for the better part of the past decade. However, they failed to make any headway due to a slump in their national demand for natural gas.¹⁸⁶ The catalyst for developments in 2009/2010 in this context has been the disruption caused by the Russia – Ukraine crisis, which gave a powerful incentive to Sofia and Brussels to take urgent action. The fact that Serbia has in recent years come increasingly close to Brussels in political terms, combined with its dependence on only one supplier (Russia) and through only one point of entry in Horgos on its border with Hungary has had its own positive impact, arguably by breathing life into this two-way pipeline project for Belgrade as well.

The proposed link between the two Balkan neighbours was expected to start from the south – western city of Dupnitsa in Bulgaria, cross their common border in the area of Dimitrovgrad, and, finally, reach the south - eastern city of Nis in Serbia. Commencement of its feasibility study was pushed back to first half 2011, to be completed with financial support from the EU (EUR 2.5 million). Construction is not expected to begin before 2013/2014, and it will require one year for completion. The Bulgaria - Serbia interconnector is planned as a 150-km pipeline with a transport capacity of some 1.8 bcm/y (55-bar) and a EUR 120 million budget. It will be the first gas link between the two countries and is to form part of the wider Energy Community Gas Ring, aimed at boosting regional supply security. The EU has pledged EUR 60 million to Sofia from the European Regional Development Fund (ERDF); this sum is intended to cover part of the Bulgarian section's feasibility

¹⁸⁴ More information is available at Energetika.net, *After 10 years of delays, the agreement on building interconnection between Bulgaria's and Serbia's gas grids finally signed*, 10 March 2010, www.energetika.net ; Energetika.net, *Bulgaria and Serbia to build gas connection worth 120 million euro*, 9 March 2010, www.energetika.net ; The Sofia Echo, *Bulgaria, Serbia sign gas grids interconnection agreement*, 5 March 2010, www.sofiaecho.com ; ISI Emerging Markets, *Bulgartransgaz to sign agreement for reverse gas link with Serbia on Friday*, 4 March 2010, www.securities.com

¹⁸⁵ ISI Emerging Markets, *Cabinet mulls building natural gas link to Serbia*, 30 November 2009, www.securities.com

¹⁸⁶ Energetika.net, *After 10 years of delays, the agreement on building interconnection between Bulgaria's and Serbia's gas grids finally signed*, 10 March 2010, www.energetika.net

study and construction costs. In contrast, non-EU-member Serbia is to receive European financial support only towards costs for completion of its own feasibility study, by the Western Balkans Investment Framework (WBIF). Construction costs for the Serbian section will need to be borne in full by Belgrade, which considers this to be both unfair and an impediment to project development.¹⁸⁷ According to the EU long-term energy strategy, published by the Commission in November 2010, cross-border interconnectors should receive the same attention and policies as intra-EU projects.¹⁸⁸

In conclusion then, Bulgaria enjoys more options in its attempt to improve security of gas supply, compared to most other nations in the Balkan peninsula. But real Bulgarian influence over major upstream producers or transit projects such as Nabucco and South Stream remains very limited. Against this backdrop, Bulgaria has been following a *de facto* hedging strategy, subscribing to both of these major natural gas supply projects, and hoping to gain in security from the construction of either. Sofia has also been increasingly turning its attention to more regional approaches concerning supply, notably interconnections with Turkey, Romania, Greece, and Serbia with reverse flow capability, over which Bulgarian diplomacy can have some influence. The two-way design of these planned natural gas interconnectors could give both Bulgaria and its neighbours in the wider region major advantages, including multiple points of entry for imported gas, as well as access to regional LNG and gas storage. An example of the flexibility this infrastructure could offer Bulgaria became evident in May 2011, when the Bulgarian government signalled it would be unwilling to enter into anything but a short-term supply contract for natural gas with Russia (upon expiration of an existing contract at the end of 2011) if pricing in the latter's proposal was not right. Bulgaria could then be supplied by its neighbours.¹⁸⁹

The economic rationale for Bulgaria developing such gas interconnectors with neighbours Turkey and Greece has been questioned though, compared to other theoretical options; for example, securing TPA

¹⁸⁷ ISI Emerging Markets, *Serbia, Bulgaria to hook up natural gas grids*, 18 April 2011, www.securities.com ; SeeNews, *EU provides 2.5 mln Euro to Bulgaria for pre-feasibility study of gas link with Serbia* , 15 April 2011, www.seenews.com ; SeeNews, *Bulgaria tenders pre-feasibility study for gas link with Serbia* , 18 November 2010, www.seenews.com ; Milan Zdravković, *Interconnection Serbia – Bulgaria & Serbia UGS projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; Balkan and Black Sea Petroleum Association (BBSPA), *Monthly Bulletin*, 15 March 2010, www.bbspetroleum.com ; All Business, *Gas: Commission welcomes Bulgaria – Serbia gas interconnector*, 10 March 2010, www.allbusiness.com ; The Sofia Echo, *Bulgaria, Serbia sign gas grids interconnection agreement*, 5 March 2010, www.sofiaecho.com

¹⁸⁸ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

¹⁸⁹ SeeNews, *Bulgaria mulls short-term gas contracts with Russia*, 10 May 2011, www.seenews.com

and utilising the already existing gas pipeline links between Bulgaria and Greece and Turkey, as the main contributors to a diversified and secure energy supply for the country. However, these projects seem problematic in terms of their feasibility, due to a number of legal and other related constraints. Furthermore, they fail to provide Bulgaria with steady diversified gas flows through a permanent (contracted) supply route; and they also weaken the possibility of diversified natural gas supply in similar terms to other current and potential EU members in this region.¹⁹⁰

Finally, the threat of the abovementioned interconnector projects cancelling each other out due to insufficient demand for natural gas should not be overlooked; neither should the associated costs in the framework of the worst economic and financial crisis in Europe and wider since the early 1930s. In any case, the availability of (European) funding is a *sine qua non* in this context, as it improves business case certainty and ultimately facilitates development of all necessary infrastructures.

In March 2010, **Croatia** and the Russian Federation agreed to establish a 50/50 JV for the construction and management of the EUR 300 million Croatian link to South Stream (*see above*), despite initial reservations from Zagreb due to fears of growing energy dependence on Russia. Moreover, in April 2011 Croatia reportedly confirmed its interest in participating in the project.¹⁹¹ Pipeline development will be financed jointly by the local logistics operator Plinacro and Gazprom. Even though the specifics of how the country will link to South Stream are not yet defined as they have to wait until its Environmental Impact Assessment has been completed, it is likely this will be done through construction of a direct link to the Hungarian section of the Russian-backed pipeline. The feasibility study was scheduled to be completed by the end of 2010, while a final investment decision has to be reached within 24 months from that date. In June 2010, the Croatian parliament offered cross-party support to the government's agreement with Moscow. However, the opposition drew attention to the perceived shortcomings of this agreement, and accused the government of allowing Gazprom to bend market rules in its favour.¹⁹²

¹⁹⁰ See relevant sections in Florent Silve and Pierre Noël, *Cost curves for gas supply security: the case of Bulgaria*, Electricity Policy Research Group Working Paper 1031 (Cambridge Working Paper in Economics 1056), September 2010, University of Cambridge, www.eprg.group.cam.ac.uk

¹⁹¹ SeeNews, *Croatia confirms intention to take part in South Stream project-Gazprom*, 13 April 2011, www.seenews.com; ISI Emerging Markets, *Croatia misses out on South Stream*, 17 December 2009, www.securities.com

¹⁹² Croatian News Agency, *Parliamentary caucuses in favour of participation in South Stream project*, 30 June 2010, www.hina.hr; Energetika.net, *Feasibility study on Croatia's connection to South Stream will be done before end-2010*, 22 March 2010, www.energetika.net; Upstream Online, *Kosor and Putin sign for Croatia's connection to South Stream*, 3 March 2010, www.upstreamonline.com

In July 2010, Croatia and Hungary signed an intergovernmental agreement on the construction of a new 6.5 bcm/y (75-bar pressure) natural gas interconnector to link the two countries. The pipeline has now been completed and extends for 80-km from Donji Miholjac, on the border with Hungary, to Slobodnica, close to the border with Bosnia & Herzegovina. It also comprises an additional 210-km section crossing Hungarian territory to Városföld in central-southern Hungary (an EU member state). Plinacro and FGSZ Foldgaszallito, the natural gas transportation unit of Hungarian integrated MOL, acted respectively as project managers on behalf of the two neighbours. In December 2010, Plinacro formally obtained related gas transport rights. Total development costs for this project stood at almost EUR 400 million, of which some EUR 75 million was to be provided by the Croatian side (Plinacro). In November 2010, MOL signed a EUR 150 million long-term loan agreement with EIB to support construction. The project was eligible also for EERP funding, in the order of EUR 20 million.¹⁹³

The new gas pipeline was a priority for both countries, notably for Croatia, for three main reasons: first, it allows Croatia to end its 30-year dependence on exclusive natural gas supply via Slovenia; second, it offers relatively easy access for Croatia to the important Baumgarten gas hub in Austria, injecting more competition - and as a result also supply security - in the country's natural gas system; and, third, it establishes an extra sales outlet for potential LNG supply from Croatia (*see below*).¹⁹⁴ Finally, Hungary has also been working towards additional gas interconnectors with neighbours Romania, Slovakia, and Serbia, contributing further to Croatian and Balkan security of supply.¹⁹⁵

What is more, ongoing efforts aimed at expansion of the local natural gas grid in Croatia (*see above*) seem to run in parallel and synergistically with efforts aimed at developing gas interconnections with its former Yugoslav partners. Indeed, besides achieving gasification of its own national economy,

¹⁹³ ISI Emerging Markets, *Gas transport company obtains approval for use of Croatian sections of interconnecting pipeline*, 10 December 2010, www.securities.com ; Upstream Online, *MOL cashes up*, 29 November 2010, www.upstreamonline.com; European Commission, *Impact assessment*, 16 July 2009, <http://eur-lex.europa.eu>

¹⁹⁴ More information available at Nacional, *We are offering Croatia a secure supply of natural gas*, 3 August 2010, www.nacional.hr ; Emerging Markets, *Croatia / Hungary: countries sign gas cooperation agreement*, 26 July 2010, www.securities.com ; Emerging Markets, *Croatia, Hungary sign agreement on gas pipeline construction*, 26 July 2010, www.securities.com ; SeeNews, *Croatia, Hungary sign agreement on 100 mln euro interconnection gas pipeline* , 23 July 2010, www.seenews.com ; Croatian News Agency, *Hungarian PM says it is historical injustice that Croatia is not yet EU member*, 22 July 2010, www.hina.hr ; Energetika.net, *Hungarian - Croatian pipeline to be finished*, 19 January 2010, www.energetika.net ; and Energetika.net, *Croatian Plinacro plans to complete gasification of major part of Croatia in 2011*, 18 January 2010, www.energetika.net

¹⁹⁵ The two-way gas interconnector with Romania (Arad – Szeged), completed in October 2010, is arguably the most important of these projects for Hungary. This is a 109-km pipeline with transport capacity of 4.4 bcm /y, developed at a cost of EUR 68 million. It is designed both as a profitable export outlet for Romanian upstream production, thanks to the price differentials between the two markets; and also as a contributor to security of supply, at times when Russian gas is not readily available. At a later stage, it could also complement the AGRI project. More details on the Hungary – Romania pipeline are available in Balkan Insight, *New gas pipeline launched between Romania and Hungary*, 15 October 2010, www.balkaninsight.com ; ISI Emerging Markets, *Natural gas connection to Hungary to be commissioned within one month*, 21 May 2010, www.securities.com. For more information on the planned Serbia – Hungary link, see sections below.

Zagreb could use its southward grid expansion to extend supply influence to Bosnia & Herzegovina. By the same token, it could support development of additional interconnections with neighbours even further southwards, for example through the currently planned IAP / TAP gas interconnector projects. Hence, in February 2011 the TAP consortium reached a cooperation agreement with Plinacro. Specifically, this was aimed at allowing the two companies better to coordinate activities and exchange technical information on matters pertaining to the development of SEE markets (*see above*). The Croatians are reportedly also contemplating gas pipeline links with Slovenia, Serbia, and even Italy; and even though these are possibly only preliminary thoughts, successful realisation of a fragment of aforementioned discussed plans could further improve security of gas supply for Croatia. However, even without any progress on these additional projects, Croatian supply security should be considered to be already well advanced, given the existence of two points of entry and other assets (*see below*) which are aimed at covering the country's modest gas import needs.¹⁹⁶

In the framework of this now emerging virtuous circle in the domestic natural gas market of Croatia, a number of important European gas players have reportedly been considering avenues at market entry. In this context, in December 2010 INA awarded ENI a 3-year supply contract starting January 2011, in replacement of a previous 5-year contract with Gazprom which was expiring in the same month. Furthermore, in June 2011 German player E.ON Ruhrgas reached an agreement with local distribution company Prvo Plinarsko Društvo (PPD) for the supply of an undisclosed level of natural gas volumes. E.ON Ruhrgas has also commenced preliminary negotiations with various key consumers in the country such as utility HEP, petrochemicals company Dioki, and fertilizer company Petrokemija, which has expressed its intention to import natural gas from January 2012, when its existing gas supply contract with INA expires and the Croatian gas market as a whole becomes more liberalised. The above contribute even further to the perception that security of natural gas supply in Croatia has to a substantial degree already been achieved.¹⁹⁷

¹⁹⁶ See ISI Emerging Markets, *Plinacro to fully meet this year's investment plan*, 27 December 2010, www.securities.com ; Energetika.net, *Croatian Plinacro plans to complete gasification of major part of Croatia in 2011*, 18 January 2010, www.energetika.net

¹⁹⁷ INA and ENI have joint upstream assets in Croatia which they operate through subsidiary INAgip; namely Annamaria A, which produces almost 1 mcm of gas per day.

More info in ISI Emerging Markets, *E.ON Ruhrgas and PPD sign natural gas supply agreement in Croatia*, 14 June 2011, www.securities.com ; SeeNews, *Croatia's PPD, Germany's E.ON Ruhrgas sign gas supply contract*, 13 June 2011, www.seenews.com ; Reuters, *Germany's E.ON eyes supplying Croatia market*, 27 May 2011, www.reuters.com ; SeeNews, *Croatia's Petrokemija plans to enter gas, electricity sector*, 11 March 2011, www.seenews.com ; ISI Emerging Markets, *Petrokemija announces it will procure gas directly*, 10 February 2011, www.securities.com ; Upstream Online, *INA secures ENI gas supply deal*, 16 December 2010, www.upstreamonline.com ; ISI Emerging Markets, *Gazprom, E.ON, ENI reportedly invited to submit gas supply offers*, 22 November 2010, www.securities.com ; ISI Emerging Markets, *INA's gas import tender*, 22 November 2010, www.securities.com ; ISI Emerging Markets, *E.ON coming to Croatia?*, 13 September 2010, www.securities.com ; ENI, *ENI starts production on the Italian section of the "Annamaria" field, off the Marche coast*, 6 April 2010, www.eni.com

Maps 6, 8, 9, and 10 above give an indication of current and planned gas infrastructure in Croatia, including entry, transmission, and distribution of relevance to points discussed immediately above.

Greece has been pushing forward with a broad range of supply projects, including both large capacity pipelines crossing many countries, and regional interconnectors. With regard to the former category, in June 2010 DESFA and Gazprom set up the company South Stream Greece *Société Anonyme* (SA), a 50/50 JV tasked with the development and management of the Greek section of South Stream. According to statements of the two companies, the scope of this JV includes engineering, funding, construction and operation of the pipeline on the territory of Greece. Earlier in October 2008, the Greek parliament had ratified an intergovernmental agreement on the matter between the two sides.¹⁹⁸

South Stream represents one of the top priorities for Athens, as part of its ongoing efforts to improve security of natural gas supply and support gasification, as well as to become an international gas hub. The pipeline will likely have a transport capacity of ~11 bcm/y in Greece, of which half may be used to serve existing Gazprom contracts. Under such a scenario, the remainder will be at the disposal of new contractual obligations of the company. The Greek feasibility study has already been completed, while the two sides are now pushing forward with completion of the relevant environmental study. Meanwhile, local reports have suggested Sidirokastro as the most probable point of entry into Greece. Sidirokastro already serves as the point of entry into Greece for Russian gas through Bulgaria. A possible second entry option would be Komotini in the region of Thrace, in north-eastern Greece. In either case, South Stream is likely to run parallel to ITGI, at least with regard to its onshore section; while proposals for the routing of South Stream to Italy through Albania have been all but abandoned, in favour of a direct link between the two countries. A preliminary decision on technical capacities of the Greek section was expected by end-June (investment decision of overall project by the end-2011). In this context, construction costs for the onshore Greek section are estimated at ~EUR 600 million and the relevant agreement between the parties is expected to remain valid for a period of 30 years (*see above for more details on the international context of South Stream*).¹⁹⁹

In addition, DEPA is actively pursuing ITGI, which represents the other main strategic priority of Greece. Hence, in June 2008 DEPA and Edison signed an agreement for the establishment of a 50/50

¹⁹⁸ More information on this is available in DESFA, *Ιδρύθηκε η South Stream Greece AE*, 30 June 2010, www.desfa.gr ; also Upstream Online, *Greece signs up for South Stream*, 7 June 2010, www.upstreamonline.com ; and Gazprom Export, *South Stream: a project to ensure energy security in Europe*, 2009, www.gazpromexport.com

¹⁹⁹ Energy Press, *Επενδύσεις 3 δις: ευρώ δρομολογεί ο ΔΕΣΦΑ μέχρι το 2019*, 6 June 2011, www.energypress.gr ; Capital.gr, *Δύο διαφορετικά σενάρια για τον «ελληνικό» South Stream*, 20 May 2009, www.capital.gr ; DESFA, *Basic cooperation agreement signing between Gazprom and DESFA*, 14 May 2009, www.desfa.gr ; Ministry of Interior, *Η Ελλάδα κόμβος πετρελαίου και φυσικού αερίου*, 2 May 2008, www.minpress.gr

JV, namely the “Interconnector Greece – Italy (IGI) Poseidon” tasked with development of an underwater pipeline which will connect the Greek region of Epirus with Otranto in Italy (*see above*). But in contrast to generally positive developments for the ITGI project on the broad geopolitical level, the planned pipeline has experienced some difficulties from opposition on the local Greek level. Specifically, in 2007 the local councils of the tourist areas of Perdika and Syvota in the Epirus region on Greece’s Ionian coast, voted against allowing the pipeline to pass through their boundaries. Following almost a year of delays due to this obstructionism, DEPA decided to divert IGI and direct its route towards the adjacent town of Parga. However, Parga too is a key tourist hub in this region, and in August 2008 the local council of Parga followed the example of Perdika and Syvota and refused to allow the planned construction of a compressor station within its boundaries. The issue has not dissipated since and in September 2010 the local council of Perdika reiterated its strong opposition to the project, threatening even more forceful (including legal) actions. The latter was intended as a response to a licence which was granted at the time by the Greek Ministry for the Environment, Energy, and Climate Change (YPEKA) ²⁰⁰ to operator DEPA for that purpose. In December 2010, Perdika residents and local councillors reportedly prevented topographers from proceeding with their work on ITGI routing; the mayor of Parga similarly confirmed the region’s opposition in June 2011. Perdika, Syvota, and Parga all represent important tourist destinations as well as employment gateways in the Epirus region and hence opposition to project implementation does remain strong. However, as of June 2011 a compromise solution seems to have been found on this important matter, with the Greek government announcing Florovouni as the new location of the compressor station.²⁰¹

In any event, ITGI seems also to offer wider gas synergies, including in the form of IGB (*see above*). Therefore, in tandem with Sofia, the Greek side has been working towards an extension of IGB further northwards to Hungary, through Romania. Relevant planning includes integration of respective natural gas grids and storage capacities, wherever available. In this context, in June 2011 DEPA and Romanian operator Romgaz signed an MoU on potential cooperation in the wider SEE, while Greece is reportedly seeking such an agreement with Budapest as well. ²⁰² But in August 2010, Greek media reported that the EU and the IMF were putting pressure through their EAP assistance

²⁰⁰ Acronym from ministry’s designation in Greek: *Υπουργείο Περιvallontos, Energeias, kai Klimatikis Allagis*

²⁰¹ Energia.gr, *Όχι του δήμου Πάργας στο να περάσει ο αγωγός αερίου μέσα από τουριστικές περιοχές*, 7 June 2011, www.energia.gr ; Energy Press, *Άδεια από τη ΠΑΕ σε Statoil & E.ON Ruhrgas για φυσικό αέριο*, 7 June 2011, www.energypress.gr ; Energy Press, *Η Πέρδικα συνεχίζει να αντιδρά για τον αγωγό ITGI*, 28 December 2010, www.energypress.gr ; Energy Press, *Η... Πέρδικα αλλάζει τη γεωπολιτική σκακιέρα των αγωγών*, 1 October 2010, www.energypress.gr ; Energy Press, *Έτοιμοι για προσφυγές οι κάτοικοι της Πέρδικας για τον αγωγό αερίου*, 30 September 2010, www.energypress.gr ; Naftemporiki, *Αντιδράσεις για τον αγωγό φυσικού αερίου στην Πέρδικα Θεσπρωτίας*, 17 May 2010, www.naftemporiki.gr ; Energia.gr, *Όχι για το φυσικό αέριο από την Πάργα*, 15 October 2008, www.energia.gr

²⁰² Kathimerini, *ΔΕΠΑ: μνημόνιο συνεργασίας με τη ρουμανική Romgaz*, 7 June 2011, www.kathimerini.gr

scheme on the Greek government to return to earlier IGB plans (prepared by conservative predecessors), under which DESFA rather than DEPA would control the Greek IGB section, as well as any storage. This was seen as a means of protecting against the threat of a possible fragmentation of the NNGS.²⁰³ In any event, construction of gas interconnectors between Greece and neighbours in the Balkans has been actively supported also by Brussels, which officially considers them to be an EU priority.²⁰⁴

Meanwhile, Greece represents the indispensable transit country for the international TAP gas project, and the support of Athens largely remains a *sine qua non* for TAP if it is to achieve implementation. In this framework, and in collaboration with both international & local partners (Exergia, ERM, ILF), in November 2010 TAP (EGL, Statoil, E.ON Ruhrgas) commenced its Greek route refinement study. This was completed in March 2011 and was followed up in June 2011 with commencement of ESIA; submission of a preliminary environmental impact assessment was also expected by the end of July. Finally, in the same month (June 2011) TAP partners E.ON, Ruhrgas and Statoil were added by RAE to the registry of NNGS users, which means they will be able to reserve capacity in the Greek system (*see sections above for more on the international and Albania-specific framework of TAP*).²⁰⁵

Greece has also been seeking direct contacts with international gas producers with the double aim of: a) boosting the viability of the various midstream projects it supports, and b) improving security of natural gas supply in the domestic market. Local operator DEPA is therefore currently in negotiations with the consortium which operates the promising Shah Deniz II gas field in Azerbaijan. The target of the Greek company is to secure competitively priced contractual supply from this field, so as to be

²⁰³ Info from Energia.gr, *Κομισιόν: στην κατοχή του ΔΕΣΦΑ το ελληνικό τμήμα του IGB*, 3 August 2010, www.energia.gr ; ISI Emerging Markets, *Bulgaria and Greece sign memorandum on joint gas connections*, 16 July 2009, www.securities.com and Energia.gr, *Συνάντηση Κ. Χατζηδάκη με τον Ρουμάνο υπουργό οικονομικών για τους αγωγούς φυσικού αερίου*, 14 July 2009, www.energia.gr

²⁰⁴ See Decision No 1364/2006/EC of the European Parliament and of the Council of 6 September 2006 laying down guidelines for trans-European energy networks, 22 September 2006, <http://eur-lex.europa.eu>

²⁰⁵ More details in Energy Press, *Νορβηγοί και Γερμανοί στην ελληνική αγορά αερίου*, 9 June 2011, www.energypress.gr ; also in Energy Press, *Άδεια από τη PAE σε Statoil & E.ON Ruhrgas για φυσικό αέριο*, 7 June 2011, www.energypress.gr ; TAP, *Trans Adriatic Pipeline begins ESIA submission process in Greece*, 7 June 2011, www.trans-adriatic-pipeline.com ; Energetika.net, *TAP finalises route refinement study in Greece*, 29 March 2011, www.energetika.net ; Energy Press, *Προσδιορίστηκε η βέλτιστη διαδρομή του αγωγού TAP στην Ελλάδα*, 28 March 2011, www.energypress.gr ; TAP, *TAP begins route refinement study in northern Greece to minimize potential social, environmental & cultural heritage impacts*, 22 November 2010, www.trans-adriatic-pipeline.com ; Imerisia, *Φυσικό αέριο: προχωρεί η κατασκευή του αγωγού TAP*, 12 August 2010, www.imerisia.gr ; and in Energia.gr, *Προχωρούν για τον TAP οι Statoil, EGL, και E.ON*, 21 July 2010, www.energia.gr

able to cover gas marketing needs at home; as well as to facilitate the instigation of planned marketing activities in Italy, possibly in collaboration with a local downstream partner.²⁰⁶

What is more, in February 2011 it emerged that DEPA was negotiating with Azerbaijan and Turkey the transfer of its existing 0.75 bcm/y supply agreement with BOTAS (which sources Azeri gas), directly to Azeri commercial entities, namely either to SOCAR or to AGSC. Due to the nature and wider implications of this negotiation, it is considered as a key first step towards the realisation of South Corridor gas pipeline projects of importance to Greece such is ITGI and IGB (*see above*). Importantly, an MoU was signed to that end between DEPA and SOCAR in April 2011.²⁰⁷

Hence, like neighbour Bulgaria, Greece enjoys a more substantial degree of options in its effort to improve security of supply, compared to smaller and more isolated markets in SEE. Completion of South Stream, ITGI, or TAP could provide a major boost towards meeting future Greek needs, and improving its long-term supply security. This improves the natural gas supply potential for Greece. Finally, IGB increases Greek supply influence over SEE by acting as a hub for the diversion of LNG. By the same token, IGB will allow diversion of diversified pipeline gas from the Caspian region; and even Middle Eastern and North African (MENA) volumes via Italy through two-way ITGI flows. What is more, the two-way flow ability of IGB strengthens the hand of Greece in supply disruptions. Therefore, it represents a welcome boost for Greek natural gas supply security in such contexts.²⁰⁸

Maps 7 and 11 above show current and planned gas infrastructure in Greece, including points of entry; high-pressure transmission pipelines; and local distribution gas grids.

Serbia, a country looking increasingly westwards, but one continuing to have close political, economic, and cultural links to Russia, has been pursuing an analogous strategy to Balkan neighbours, targeting access to supply from both major international pipelines as well as regional interconnectors. In October 2009, Serbian natural gas operator Srbijagas and Russian major Gazprom established a 51/49 consortium (in favour of Gazprom) for extension of South Stream to Serbia. In November 2009, it emerged that the capacity of the Serbian section of South Stream would likely be raised to between

²⁰⁶ Harry Sachinis, *ΔΕΠΑ: Δημόσια / Διεθνής Επιχείρηση Αερίου*, Paper presented at the '15th Energy Conference', Athens, 22-23 November 2010, www.iene.gr; To Vima, *Αζέριο αέριο στην Ευρώπη μέσω Ελλάδας*, 5 June 2010, www.tovima.gr

²⁰⁷ More details available in Upstream Online, *Greece seals Azeri gas deal*, 5 April 2011, www.upstreamonline.com; in Energia.gr, *Χάρης Σαχίνης: Διαπραγματεύσεις σε όλα τα μέτωπα για τις εισαγωγές φυσικού αερίου*, 25 February 2011, www.energia.gr; and in Energy Press, *Χάρης Σαχίνης: Φέρνουμε, για πρώτη φορά, αέριο από το Αζερμπαϊτζάν χωρίς τη μεσολάβηση της Τουρκίας*, 21 February 2011, www.energypress.gr;

²⁰⁸ For more information on the planned ITGI and IGB links, as well as on the Greek strategy on natural gas transit issues in the wider region see Spiros Paleoyannis, *Meeting the gas supply and market integration challenges in SE Europe*, Paper presented at the European Gas Conference, Vienna, January 2011.

36 bcm/y and 41 bcm/y, from a previously envisaged 20 bcm/y. This capacity boost will naturally raise development costs above the initially envisaged budget, estimated at roughly EUR 750 million. At the same time though, gas transit fees to be received by Serbia will likely reach levels of EUR 500 million/year (*see above for international aspects of the planned South Stream pipeline*).²⁰⁹

The above agreement between Belgrade and Moscow on South Stream arguably formed part of a wider *quid pro quo*, which included the privatization of Serbian oil refining monopoly NIS in 2008; the favourable definition of the country's regulatory framework with regard to its downstream oil sector in the same year; the development of the natural gas storage at Banatski Dvor (*see below*); and, possibly also political support from the Russian Federation on a range of matters of importance to Serbia, notably the status of UNMIK / Kosovo. Serbian participation in South Stream will likely enhance its security of supply, as the country will no longer be dependent on Ukraine for receiving all of its imports from Russia. And it could also allow it to extend influence over Balkan neighbours, including Bosnia & Herzegovina which comprises a Serb-dominated component (Republika Srpska). In November 2010, Belgrade completed as planned a feasibility study on its section of South Stream, which was accordingly submitted to the Russians. This made explicit reference to the prospect of wider supply opportunities for the country, as it discusses possible pipeline offshoots starting from Serbia and extending to Bosnia & Herzegovina (including Republika Srpska) and even Croatia.²¹⁰

Earlier in August 2010, Belgrade secured the support of Sofia in its effort to establish Dimitrovgrad as South Stream's point of entry to the country so as to facilitate the gasification of southern Serbia too. In contrast, Russia supported Zajecar (to Dimitrovgrad's north) because the route was potentially cheaper. But the apparent Serbian attempt at cornering Gazprom through alliance-building with Bulgaria caused an immediate and angry response from the Russian company, which pointed out that a decision on the issue could only be reached once the feasibility study had been completed; and that it alone retained the final say on such matters.²¹¹ Srbijagas openly acquiesced to this stark demand in November 2010, by acknowledging Zajecar as the pipeline's point of entry in the feasibility study (Subotica on the Hungarian border was proposed as its exit point). The Dimitrovgrad debacle thus offers another clear reminder of the relative impotence of Balkan action – coordinated or otherwise -

²⁰⁹ ISI Emerging Markets, *Serbia wants to be first to start South Stream construction*, 20 September 2010, www.securities.com; ISI Emerging Markets, *Feasibility study for Serbian part of South Stream gas pipeline set for end-2010*, 14 June 2010, www.securities.com; ISI Emerging Markets, *Capacity of Serbian leg of South Stream pipeline to be raised to 41 bn cm*, 22 October 2009, www.securities.com; ISI Emerging Markets, *Srbijagas, Gazprom ink deals on setting up joint venture for energy projects*, 21 October 2009, www.securities.com

²¹⁰ Tanjug, *Serbia completes South Stream feasibility study*, 30 November 2010, www.tanjug.rs

²¹¹ Blic Online, *Gazprom decides about southern stream and not Borisov and Tadic*, 11 August 2010, www.blic.rs; Tanjug, *Tadic: South Stream pipeline should go through Dimitrovgrad*, 10 August 2010, www.tanjug.rs

on the level of natural gas, even with regard to problems on their own immediate periphery or of direct importance to them.²¹²

Finally, on 5 March 2010, the European Commission, Srbijagas, and Bulgartransgaz reached an agreement on the construction with EU support of a two-way interconnector between Nis (Serbia) and Dupnitsa (Bulgaria). This will be the first such link between the two countries and will form part of the broader Energy Community Gas Ring, aimed at boosting regional and European supply security. The project offers Serbia a new gas source – in contrast to only a new route with South Stream – namely Caspian gas inflows and LNG through Greece and / or Turkey (*see above for more details*). Srbijagas also harbours broader ambitions at regional leadership in the fields of transport, storage, and trade which go beyond the gas interconnectors with Bosnia & Herzegovina, Bulgaria, and Croatia. These include construction of a number of additional interconnections and ultimate market access to Romania (Mokrin – Arad) and former Yugoslav Republic of Macedonia (Leskovav – Kumanovo). However, no concrete progress on any of these preliminary projects has been reported so far.²¹³

UNMIK / Kosovo and **Montenegro** have failed to make any solid progress towards gas interconnections, despite gasification being a declared political and commercial target of their respective administrations. Nevertheless, they do enjoy some (at least) theoretical advantages which could allow such progress in the future. For example, Podgorica can benefit from the planned IAP, which aims at linking Croatia with Caspian upstream producers through Greece, Albania, and Montenegro (*see above*). UNMIK / Kosovo enjoys geographic proximity to existing natural gas grids in neighbouring countries (95-km to the former Yugoslav Republic of Macedonia, 135-km to Serbia), which suggests potential for an interconnection with them. However, difficulties remain and undermine prospects. Indicatively, IAP has failed to make any real progress and actual construction remains doubtful; serious political issues between the government in Serbia and UNMIK / Kosovo may continue to impact negatively on related commercial considerations; and the small size of the envisaged post-gasification markets in Montenegro and UNMIK / Kosovo in reality fails to incentivize construction of the (generally capital-intensive) pipelines that would be required for them. But to boost reliability / security of supply in these areas, their gasification may have to be actively supported by regional political organizations and / or funding bodies.

²¹² Tanjug, *Serbia completes South Stream feasibility study*, 30 November 2010, www.tanjug.rs. In September 2010, Belgrade and Moscow also began jointly construction of a Nis – Vranje natural gas section in southern Serbia (120-km), which forms part of the wider South Stream project. Please see previous chapter for more information on this matter.

²¹³ Milan Zdravković, *Interconnection Serbia – Bulgaria & Serbia UGS projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; Energetika.net, *Srbijagas ends 2009 in the red, incurring a loss of 97 million euros*, 4 January 2010, www.energetika.net

The former Yugoslav Republic of Macedonia, a similarly small (but growing) natural gas market with 100% dependence on Russian supply, has sought to benefit from South Stream in its attempt to promote gasification and support sustainable economic growth. In this framework, in September 2010 a high-ranking Gazprom delegation visited Skopje and held preliminary talks with Deputy PM Stavrevski. Earlier in June 2010, Stavrevski and President Ivanov had travelled to Moscow to meet with CEO Aleksei Miller and raised with him participation in the Russian pipeline. Gazprom agreed to consider their request, subject to timely completion of relevant feasibility studies. These will focus on economic and technical feasibility, and will likely take more than a year to complete. The needs of neighbours Albania and Kosovo will probably also have an impact on the country's connection to South Stream; this could be achieved either through inclusion in the planned pipeline's route along a new Bulgaria – Albania axis, or through construction of a gas offshoot from neighbouring Greece.²¹⁴ In the same meeting the two sides also discussed the issue of an outstanding Russian debt dating from the former Soviet / Yugoslav era, which has been agreed to be repaid in the form of direct investment in expansion of the country's natural gas grid (*see above*).²¹⁵

Hence at the moment there is no firm commitment allowing Skopje to diversify its natural gas supply. Even if South Stream were indeed to move forward and cross the territory of the former Yugoslav Republic of Macedonia, that would only perpetuate the country's dependence on Russian gas supply. The main gain for Skopje in this context would be that it would break its dependence on Ukraine, which contributed to the disruption of 2009. The existing interconnection with neighbouring Bulgaria supplies the country with Russian gas but at the moment remains underutilized and could therefore serve the local market with additional volumes of natural gas, if and when that would be required. Reports that the former Yugoslav Republic of Macedonia might actively seek to connect to Nabucco and ITGI to tap into differentiated supply has so far not been borne out by any substantial progress.²¹⁶ Nevertheless, the country could essentially enjoy the same diversification benefits, if Bulgaria proves successful in its ongoing efforts to connect to the natural gas grids of neighbours Greece and Turkey. Indeed, the latter would allow Skopje to import Caspian gas and LNG via these countries (*see above*).

²¹⁴ For more details in this context see SeeNews, *South Stream through Macedonia to be signed in September*, 7 July 2010, www.seenews.com; and also Balkans Business News, *Romania, FYR Macedonia in South Stream gas pipeline*, 21 June 2010, www.balkans.com

²¹⁵ ISI Emerging Markets, *Macedonia 'quite likely' to join South Stream gas pipeline*, 1 October 2010, www.securities.com; ISI Emerging Markets, *Macedonia to connect to South Stream*, 6 September 2010, www.securities.com; ISI Emerging Markets, *Macedonia might participate in South Stream gas pipeline*, 18 June 2010, www.securities.com

²¹⁶ ISI Emerging Markets, *Macedonia wants to join Nabucco*, 13 September 2010, www.securities.com; ISI Emerging Markets, *Macedonia to connect to South Stream*, 6 September 2010, www.securities.com

Maps 8, 9, 10, and 11 above describe some of the current and discussed natural gas supply options for the former Yugoslav Republic of Macedonia.

Conclusions: key projects for regional security of supply

In the absence of concrete progress in (potentially rival) major pipeline projects such as Nabucco, South Stream has been emerging as the only truly regional pipeline project in the Balkans and beyond. This has in turn helped create a significant momentum in favour of the Russian-backed gas pipeline. As a consequence, state and commercial actors in the region have taken pains to secure their inclusion in this project and so achieve gasification and supply security. Bulgaria, Croatia, Greece, and Serbia have already been included in its planning, while Republika Srpska of Bosnia & Herzegovina and also the former Yugoslav Republic of Macedonia similarly want to join it. For the most part, expected gains from participation in South Stream stem from its planned bypass of Ukraine as well as its incremental transport capacity. The fact that current partners Bulgaria, Croatia, and Greece also support competitors Nabucco, TAP, ITGI, and various LNG terminals which could end up undermining South Stream viability, is not contradictory and represents a rational way to keep all options open. This strategy aims at maximizing gas supply security, as well as accruing potential geopolitical gains, in a context where the countries are basically unable to influence major pipeline projects to any substantial degree (*see above*).²¹⁷

Even though South Stream offers route diversification and may even help bring to SEE additional volumes which are necessary for its gasification, the Russian-backed pipeline fails to make any meaningful contribution towards gas supply source diversification, which has become an EU priority. Some potential cooperation between ITGI and Nabucco (e.g. ITGI as Phase 1 of Southern Corridor) could help address this conundrum, by making the most of available synergies between them, while at the same time removing the problematic element of competition which currently hampers progress. An independent fourth gas corridor could thus be more easily realised, providing an alternative source of supply to Europe. Hence, preliminary discussions between interested parties need to continue.

But irrespective of any progress that is to be achieved on this front, the development of a sufficient two-way interconnector system for gas in the region has a very important role to play in its own right. It should thus be actively supported by all involved state as well as commercial actors. FBiH of Bosnia & Herzegovina, Bulgaria, Croatia, Greece, and Serbia are already working towards

²¹⁷ For more information on the political context of midstream gas projects including relative power (and gains) of transit states compared to suppliers and consumers, as well as on the importance of potential asymmetries of dependency between involved parties see for example Brenda Shaffer (2009), *Energy Politics*, Philadelphia: University of Pennsylvania Press.

construction of pipelines with these specifications with their neighbours in the Balkans and beyond. And Albania and the former Yugoslav Republic of Macedonia reportedly harbour similar ambitions, albeit with no concrete progress seen so far.

The potential benefits of currently planned interconnections in the region are multiple and include: greater control by SEE players over pipeline projects of direct importance to them; much more effective regional dissemination of any Southern Corridor supply (through Greece and / or Turkey); easier access to indigenous resources and emergency extra-SEE supply (notably Romania, Hungary); direct access to diversified gas supply in the form of LNG from Greece, Turkey, and/or from Croatia; the ability to tap into LNG and underground storage in the SEE region and even further afield; and increased negotiating power for SEE players vis-à-vis foreign gas suppliers.

Moreover, the inherently gradual character of developing a two-way regional interconnection system suggests these benefits may be easier to trickle down in this cash-strapped environment to the other Balkan nations as well. This could be achieved through the ultimate completion of a regional gas ring, in line with the declared objective of the Energy Community.²¹⁸ Additionally, funding of bilateral energy projects such as these proposed gas interconnectors should at least theoretically be easier to secure, by virtue of their being less complex compared to similar projects of a larger scale which transit many countries and / or have multiple stakeholders.²¹⁹ In any event, a suitable market-based regulatory framework contributing to ease of cross-border flows is in reality a precondition if SEE is indeed to improve its supply security in this context (*see above*).

Thanks to its location and planned interconnections with Romania, Serbia, Greece, and Turkey, Bulgaria stands to reap the bulk of the abovementioned advantages and is overall in a better position compared to its Balkan neighbours. The advantages include the ability to tap into indigenous production (notably Romanian); to access Caspian natural gas and LNG inflows through Turkey and / or Greece; and to reach LNG and underground storage, which is becoming increasingly available in the region. What is more, the two-way design of the planned interconnectors will allow Bulgaria and the region to tap into resources that lie even farther afield. For example, upon completion of all relevant links, Bulgaria will be in a position to access both LNG from Greece and / or Croatia, as well as central European piped gas through Croatia, Serbia, and Bosnia & Herzegovina. At the same time,

²¹⁸ RAE, *Regulatory framework for the development of the Energy Community Gas Ring: northern and southern branches*, Paper presented by Michael Thomadakis at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org

²¹⁹ See Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org.

Croatia will enjoy equal access to Greek / Turkish LNG, and Caspian gas through the same route; and maybe even Middle Eastern, North African and Bulgarian / Romanian (unconventional) gas.²²⁰

However, interested parties should guard against concentrating infrastructure on a single gas country, even an overall reliable EU member-state such as Bulgaria which has been moving in this direction. Furthermore, Croatian security of gas supply should be considered to be already well advanced, given the existence of two pipeline points of entry (i.e. Slovenia and Hungary) as well as of two new supply contracts with ENI and E.ON Ruhrgas, aimed at covering its relatively small gas import needs. Likewise, Greece already enjoys access to both Russian and Caspian natural gas flows by means of two independent pipeline routes.

²²⁰ See for example the preliminary planning by Turkey towards expanding its available LNG storage, as well as developing direct pipeline links with upstream producers such as Qatar and others in the MENA region. Such moves could indeed have a direct impact on the availability of diversified gas supply resources for markets in the broader region, including of course SEE. Further information on this matter is available at Platts, *Turkey, Qatar plan revolutionary gas link*, in Oilgram News, Vol. 87, No. 162, 19 August 2009, www.platts.com

3. Supply security dimension of Liquefied Natural Gas

LNG allows access to otherwise inaccessible suppliers and can hence improve gas supply security. During the late 2000s, LNG markets began to globalise with a growing spot trade supplementing the traditional long term contract business and creating new opportunities for all players involved in it.²²¹ With the exception of Greece, SEE lacks LNG import facilities and cannot benefit from availability of cargoes at what may be attractive prices. Development of LNG-related infrastructure would impose a substantial burden on already strained budgets in the wider Balkan peninsula, which may therefore be unable or unwilling to assume it. SEE countries are at an obvious disadvantage to competitors which are in a position to offer LNG suppliers both more sizeable gas markets and higher import prices. Nevertheless, the SEE region may still have a powerful incentive to develop LNG import capacities due to its persistent lack of supply diversification and ensuing vulnerability to disruptions (*see above*). Hence, in this section we turn our attention to the examination of specific actions, projects, and also prospects for SEE players in the LNG context.

*Country focus on LNG projects*²²²

As mentioned above, **Albania** does not currently have a gas industry. However, in recent years there has been a string of suggestions for the development of LNG infrastructure and associated projects aimed at supplying both the domestic Albanian market as well as its wider periphery, notably Italy. International players ASG Power, Trans-European Energy BV / Falcione Group, EGL, and even Qatar have expressed interest in constructing onshore LNG terminals of some 8-12 bcm/y each (Falcione is also considering floating regasification as a temporary substitute for an onshore terminal). Besides LNG terminals, these projects have tended to focus on the development of effective gas grids and interconnectors, and on gas-fired power plants for the development of export-oriented infrastructure. The geographic centre of attention in this context has been the area around the river Vjosa / Aoos in Fieri, roughly 100-km south-west of the capital Tirana (*see maps 8-11 above for its location and context*). The EU has generally been welcoming to these initiatives which it sees as a

²²¹ Examples of important recent developments in this context can be found in Upstream Online, *US LNG pumped into UK*, 19 November 2010, www.upstreamonline.com ; Upstream Online, *US noses into Russia's gas domain*, 10 November 2010, www.upstreamonline.com ; and Upstream Online, *IEA sees 10-year gas glut*, 9 November 2010, www.upstreamonline.com. For an analysis of the global LNG trading context and its likely evolution see Howard Rogers, *LNG trade-flows in the Atlantic basin: trends and discontinuities*, March 2010, Oxford Institute for Energy Studies, www.oxfordenergy.org.

²²² This chapter focuses on the commercial and gas supply security aspects of current & planned regasification in the region. The chapter starts by inspecting related LNG projects on a country-by-country basis, and then moves on in its final section to draw conclusions apropos the value and potential impact of the LNG option on security of gas supply in the wider region. More technical details and full bibliographic references with regard to LNG terminals in SEE are available in the Appendix.

good fit with its own ongoing efforts at boosting European security of supply. In October 2009, the European Commission reiterated its support for Albanian energy projects, including LNG terminals, through EBRD and EIB.

However, the Albanian LNG bid seems to suffer from a number of structural difficulties which render it problematic in its implementation. Besides a relative lack of experience of interested actors in the LNG business, the sheer multitude of investment proposals and regasification projects begs the question of where and how these volumes might be sold. There is no gas market in the country, nor is it reasonable to expect the emergence of one (at least not an attractive one) during this decade. Indeed, even though the revised National Energy Strategy of Albania projects demand levels of 1.5 bcm/y to 1.8 bcm/y by 2020, international studies have projected a much more conservative 1 bcm/y for 2025 (*see above*). This forecast is probably more realistic, but it is still insufficient to provide legitimacy for such large investments. Furthermore, it still implies a number of rather problematic assumptions for the country, including the relatively rapid expansion of the local gas-fired power generation sector; and the upgrading/extension of the country's decrepit pipeline infrastructure to reach all major industrial customers in the country.

What is more, any potential appeal of an Albanian natural gas market diminishes even more in the eyes of expensive LNG infrastructure developers (and LNG suppliers) due to its combination of high transmission losses and low offered prices. This negative context is in turn aggravated further by the country's lack of pipeline links with neighbouring Balkan countries, which could offer a useful export outlet for volumes that may not be able to be absorbed by the Albanian and / or Italian gas markets. But for as long as Albanian projects have to rely on Italy as their main *raison d'être*, they will be heavily exposed to the risks posed by competitor projects in that supply area including Italian LNG, Galsi, South Stream, ITGI / IGB, TAP etc. Consequently, Albanian LNG terminals have little chance of realization and cannot be considered effective contributors to SEE supply security.²²³

Bulgaria too has shown interest in independent non-pipeline supply solutions, as a means of breaking its current exclusive dependence on Russia. In April 2009, Sofia announced plans to construct an LNG receiving terminal on its Black Sea coast in cooperation with Qatar, which would also act as its main supplier. This intention was reiterated in a relevant MoU between the two sides in March 2010, as well as in a confidentiality deal in November 2010. However, a legally binding supply contract has yet to be signed, and there is reason to believe this may not change in the near future. Even though

²²³ For more on electricity transmission, pricing, and gas pipeline links in Albania see pricing and gas pipeline chapters. More technical details (including full references) on the planned Albanian greenfields are available in the Appendix.

Bulgaria is far ahead of Albania in gas market terms, it still lacks a premium character (size, pricing) to make it attractive to suppliers like Qatar, which may prefer to divert their cargoes to more profitable markets in Europe and Asia. An additional obstacle is also the fact that any Middle Eastern and / or North African LNG cargoes to Bulgaria would have to cross the congested Bosphorus, an expensive and potentially also problematic gateway in regulatory terms.²²⁴

Sofia has also been working towards securing gas supply from Azerbaijan, including in liquid form. In November 2009 the Bulgarian president Georgi Parvanov and his Azerbaijani counterpart Ilham Aliyev signed an MoU on the export of 1 bcm/y of Azeri gas to Bulgaria, once a Bulgarian link to ITGI has been completed; and also an MoU on the export of Azeri CNG to Bulgaria. Sofia is now working towards securing up to 2 bcm/y from Azerbaijan by 2012, which could flow to the Balkan country either in the form of pipeline gas through Turkey, or be shipped as LNG / CNG from a Georgian port. CNG deliveries in particular could be directed to Bulgaria's offshore Galata site near Varna on its Black Sea coast, while a greenfield LNG terminal could be located either there or in the industrial port of Bourgas, home also to the largest oil refining complex in the Balkans (LUKoil). Sofia is reportedly currently in negotiations with Baku and Tbilisi on this matter, while in the summer of 2010 it also raised the issue of EU funding for these projects in Brussels. However, the prospect of gas from Azerbaijan reaching Bulgaria by 2012 has encountered difficulties for a number of reasons: a) there is a question mark with regard to the ability of Azerbaijan to deliver these volumes so early; b) there is no sufficient pipeline infrastructure to allow Caspian natural gas imports through Turkey; d) the viability of transport of CNG across long distances has yet to be proven on a commercial scale; e) the Georgian network will require at least some upgrades to be able to transport the additional gas volumes for Bulgaria, raising overall project costs even further.²²⁵

Additional obstacles to Bulgarian LNG are that, firstly, it faces strong competition from potentially better placed Balkan neighbours such as Romania. For example, in April 2010 Bucharest signed an agreement on the construction of a 7 bcm/y terminal in Constanta by 2014, which is to form part of the broader AGRI project. Interestingly, Romania relies on the very same natural gas supply partners

²²⁴ Upstream Online, *Bulgaria and Qatar make LNG pact*, 19 November 2009, www.upstreamonline.com ; Novinite.com, *Qatar considers building LNG terminal in Bulgaria*, 23 March 2010, www.novinite.com ; and LNGpedia, *Qatar, Bulgaria discuss LNG terminal, sign cooperation agreements*, 21 April 2009, www.lngpedia.com

²²⁵ Information from News.Az, *Bulgaria interested in Azerbaijan's LNG*, 5 October 2010, www.news.az ; Georgian Daily, *Bulgaria, Georgia discuss compressed natural gas deliveries*, 5 October 2010, <http://georgiandaily.com> ; ISI Emerging Markets, *Bulgaria, Georgia discuss compressed natural gas deliveries*, 5 October 2010, www.securities.com ; ISI Emerging Markets, *Bulgartransgaz, Azerbaijani Socar discuss construction of gas terminal*, 16 August 2010, www.securities.com ; Standart, *Bulgaria launches construction of gas terminal in Burgas*, 11 July 2010, <http://paper.standartnews.com> ; Novinite.com, *Azerbaijan Bulgaria's real alternative to Russian Gas - Minister*, 3 July 2010, www.novinite.com ; Energia.gr, *Ενεργειακή συνεργασία Βουλγαρίας - Αζερμπαϊτζάν*, 14 November 2009, www.energia.gr ; Upstream Online, *Azerbaijan seals Bulgaria gas pact*, 13 November 2009, www.upstreamonline.com

as Bulgaria does for its own project, which if anything intensifies competition between them. Secondly, despite technological advances, LNG remains a more expensive option than pipeline gas in terms of capital investment required, which becomes even more important against the backdrop of economic recession.²²⁶

In light of these difficulties, Sofia has also been seeking access to LNG terminals in the wider region, which could allow it to benefit from differentiated supply while sharing development costs and risks. Bulgarian attention has thus focused on neighbours Greece and Turkey, as both of them enjoy the LNG option already and plan to develop it further in the near future. In this context, Sofia has been pushing for better access to Greece's Revithoussa LNG terminal, as well as for construction of a greenfield terminal in northern Greece (*see sections below*). Additionally, in February 2010 Sofia and Ankara agreed to move towards construction of a new Turkey – Bulgaria pipeline to link Turkish LNG terminals (at Marmara Ereğlisi and / or a potential 6 bcm/y greenfield terminal) with Bulgaria's compressor station in Lozenets on the Black Sea. The two sides also agreed to upgrade their existing link into a two-way pipeline. Among other things, this aims at providing SEE with access to planned LNG storage on Turkey's Aegean coastline, to be achieved through co-financing with Bulgargaz.²²⁷ Finally, the Bulgarian government has directly approached a number of LNG suppliers including Qatar, Egypt, and Yemen with supply requests, which have thus far yielded no concrete results.²²⁸

In conclusion, the abovementioned Bulgarian projects seem to suffer from weak fundamentals which are hindering real progress. What is more, Sofia has now thrown its weight behind a number of supply projects which could meet national and even regional gas demand many times over, including through grand pipeline projects like Nabucco and South Stream; and also regional projects such as proposed Bulgaria – Turkey, Bulgaria – Romania, Bulgaria – Greece, and Bulgaria – Serbia interconnectors. This overabundance of natural gas supply options for Bulgaria, which can of course not be all realised (nor is it necessary to), suggests the country is not really committed to any of these projects and could act opportunistically embracing whichever one seems to offer it the best return at a particular point.

This in turn creates uncertainty among Bulgaria's partners and may impact negatively on their project implementation. On the positive side, the existence of multiple supply / transit routes suggests that any diversified gas inflows to Bulgaria could easily be exported to the wider region. For the most part,

²²⁶ Upstream Online, *Romania signs up to LNG plan*, 13 April 2010, www.upstreamonline.com

²²⁷ See the paper's pipeline chapter above.

²²⁸ See for example Middle East Economic Survey, *Weekly Review*, Vol. LIII, No 15, 12 April 2010, www.mees.com ; LNGpedia, *Bulgaria inks deal to buy Egypt gas*, 27 April 2009, www.lngpedia.com ; and also Reuters, *Bulgaria eyes LNG imports from Yemen*, 17 October 2008, www.reuters.com

this would benefit Serbia and the former Yugoslav Republic of Macedonia which currently lack broad supply options. But its impact would be considerably less visible in Turkey, Romania, and Greece, which already enjoy relatively balanced supply, including LNG. On balance then, the potential contribution of Bulgarian LNG to national and SEE gas supply security remains questionable at best, while at worst it may even end up undermining regional efforts to that end.

Croatia is theoretically one of the best candidates for development of LNG infrastructure in SEE, thanks to its direct access to the Adriatic Sea as well as proximity to Italy and promising markets in SEE and CEE. Already enjoying diversified seaborne crude oil supply through its Omisalj import terminal on the island of Krk, political and commercial players in Croatia would like to see this flexibility extended to natural gas as well. Such flexibility would improve local gas supply security, while at the same time offering Croatia natural gas trading opportunities in the broader region of SEE.

Against this background, in October 2007 German companies E.ON Ruhrgas and RWE; French major Total; Austrian integrated OMV; and Slovenian state-owned operator Geoplin formed the Adria LNG consortium, which aims at developing Croatia's first import and regasification facility for LNG. As with the country's oil import infrastructure, the terminal is to be located on the island of Krk, and will have an average regasified output of about 8.5 bcm/y (envisaged full capacity of roughly 15 bcm/y). Adria LNG reportedly wants to utilize a third of this capacity towards supplying the domestic natural gas market in Croatia, with the remainder destined for Italy and other key markets in the broader CEE.

But despite strong support from the Croatian government, the Adria project has experienced substantial difficulties in attracting some key domestic natural gas partners into its stakeholder team. This has in turn led to institutional bickering, and also to the withdrawal of RWE in October of 2009. In this negative framework, completion of the Adria project has been postponed to 2017 (from 2014); while an investment decision on it is not expected before 2013. Adria has denied speculation this may be a first step towards ultimate project cancellation, invoking the recession as the source of this delay. But in December 2010, local media reported that the foreign partners had already abandoned Adria.

These complications and delays in Adria LNG have given rise also to discussions on alternate plans. These initially revolved around the possible construction of a 10 bcm/y greenfield LNG terminal (USD 700 million) approximately 400-km to the south of Omisalj, in Rogotin near the port of Ploce. The Croatian government has offered a cautious welcome to Ploce, which it arguably sees as a useful fallback if Adria LNG fails. However, Ploce LNG at the moment remains a project with no defined - or even realistically proposed - partner structure; with no secured natural gas supply; and with no real progress achieved so far on the relevant permitting process.

In light of the abovementioned difficulties for Adria and (even more) for its proposed substitute Ploče, in October 2010 it emerged that Plinacro was considering a Floating Storage and Regasification Unit (FSRU) for LNG instead. Local reports refer to the possible development of a 6 bcm/y to 8 bcm/y terminal off Omisalj on Krk, as an interim solution until the main Adria project has been completed. Plinacro is reportedly now in search of partners for Krk FSRU, preferring the Adria LNG partners. However, in April 2011 the Croatian government claimed there is preliminary interest in Krk LNG from four investor groups (including Israeli investors), with the onshore option still being on the table. At the same time though, Zagreb has suggested that a much smaller FSRU of 2.5 bcm/y capacity, aimed primarily at meeting the needs of the domestic market for gas, was also very much on the cards. In any event, advantages of the FSRU option are its lower cost and ability to move forward fast, which allows it to protect Croatia's competitive positioning against the adjacent Trieste LNG in Italy. The Croatian government has already as of December 2010 given its approval to Krk FSRU.

LNG greenfield terminal projects in Croatia are characterised by a number of important advantages. First, Croatia is a growing gas market, an obviously positive trend for gas importers which is made even better for them by a coincidental decline in Croatian upstream gas production (*see above*). Second, the proposed terminals in Croatia enjoy proximity and potential access to established and emerging natural gas markets in Italy, CEE, and SEE. This access is to be strengthened further by ongoing and planned investments including the Croatia – Hungary, the Croatia – FBiH, and even the Croatia – Serbia pipelines. Third, Croatian projects have already gained the attention of significant global and regional players with the power to bring along considerable benefits. For example, partners Total, E.ON Ruhrgas, and OMV of Adria LNG not only have enough brand appeal to lend it credibility vis-à-vis potential suppliers, but also the ability to guarantee at least some LNG supply to it from own / controlled liquefaction resources. Finally, the strong regional market positioning of these partners supports also the project's essential export dimension, as they will likely seek to protect their CEE positions against the dominance of Russian pipeline gas, through independent LNG inflows.

However, interested players may have overestimated the competitive advantages of Croatian LNG, while at the same time overlooking some of its drawbacks. First, competition is inevitably fierce and includes serious threats from gas supply projects like Nabucco, South Stream, ITGI / IGB, and LNG in Italy and the wider SEE, with which there is at least some overlap in terms of targeted markets. Second, the envisaged regasification capacities of between 10 bcm/y and 15 bcm/y seem too large for terminals that are to serve post-recessionary gas market segments in Croatia and part of its periphery. Third, the lack of a finalised partner structure has already taken a heavy toll on project implementation (e.g. RWE departure) and remains a difficult problem. Fourth, some of the involved partners have competing priorities, notably OMV which participates also in rival project Nabucco.

Fifth, Adria partners have yet to sign any binding contracts with suppliers, while they may also prove unwilling to divert cargoes of their own to it from more profitable arbitrage opportunities elsewhere. And sixth, following replacement of Gazprom by ENI (and also E.ON) as pipeline gas suppliers, Croatia could get pipeline gas and LNG from Italy at much lower cost compared to Croatian LNG, due the existence of a substantial current surplus in the downstream natural gas market of Italy. Hence, the rationale for an expensive greenfield LNG terminal in Croatia is considerably weakened.

Notwithstanding these limitations, the proposed (2.5 bcm/y to 8 bcm/y) FSRU seems a more realistic option in this context due to its combination of: a) its lower costs and smaller regasification capacity, both of which are probably a better fit for the emerging post-recessionary world; b) the shorter lead time leading to its completion, which will possibly allow it to benefit from potential cheap spot prices; c) its ability to protect Croatia's competitive positioning against Italian projects, notably Trieste LNG. Therefore, Krk FSRU is a more viable project compared to competitors in the Croatian LNG context. However, a serious threat still remains for regional supply security, namely that the bulk of Krk LNG will almost certainly be directed to the region's premium markets Italy and CEE (besides Croatia); rendering its potential contribution to SEE supply security real, but overall relatively limited.

Maps 6 and 10 above locate planned regasification projects in Croatia, and also show its interrelation with current and planned transmission and distribution infrastructure for gas in the wider region.²²⁹

Greece is the only country in SEE with LNG import capacity, which it has enjoyed since 2000. Specifically, Greece imports LNG through its Revithoussa terminal, located on the homonymous islet in the gulf of Megara, some 45-km west of Athens. The terminal is owned and operated by DESFA. However, the Greek terminal continues to be unable to realize its full theoretical regasification potential for a number of reasons, but notably because it lacks adequate levels of LNG storage. Therefore, the Greek Regulatory Authority for Energy (RAE) estimates real import capacity through Agia Triada / Revithoussa at some 2 bcm/y, which results in a very low utilization rate of about 45%. Against this backdrop, DESFA has decided to proceed with planned upgrades by 2014/1015 which will give the terminal a real capacity of some 5 bcm/y.

Importantly, the market relevance of Revithoussa capacities has increased substantially since 2010, during which time liberalisation allowed independent cargoes to reach the terminal for the first time; this trend was (and continued in 2011 to be) supported by favourable pricing in the spot LNG market.

²²⁹ More technical details and full references on Croatia LNG are available in the Appendix (*see below*).

According to local sources, there have already been expressions of interest from various (unnamed) Bulgarian and Turkish gas operators in capacity allocation at Revithoussa of roughly 0.5 bcm/y each. By the same token, local gas players have proposed that DESFA should lease Floating Storage Units (FSUs) as an interim solution until the completion of the abovementioned planned upgrades at Revithoussa, with the aim of injecting further flexibility into the terminal's ability to receive larger LNG cargoes.

Furthermore, DEPA is examining the possibility of forming an international JV including suppliers, which will work towards an export-oriented greenfield terminal in northern Greece (Aegean LNG). The export potential of the latter is to be realised through the utilisation of similarly export-oriented natural gas interconnectors IGB and ITGI, both of which pass close to the proposed terminal location. Additionally, DEPA has completed a pre-feasibility study on the relevance of an offshore concept. The Kavala area seems to retain its competitive advantage even in the offshore framework though, thanks to some scope for gas storage in the form of depleted fields, in and around Prinos in Thasos.

The main advantages of the offshore option compared to a conventional onshore LNG terminal refer particularly to its offered flexibility in terms of size and availability, as well as to its reduced cost. Such an option could also offer enough geographical mobility to allow DEPA provide gas feedstock to PPC for its power plants in Crete as a substitute for gasoil - its declared objective (*see below*). Regasification capacity at the new Aegean LNG terminal will likely stand at 4 bcm/y - 6.8 bcm/y. Project completion is envisaged by 2013/2014 at an estimated cost of USD 350 to USD 700 million, depending on the terminal's actual size, the specific type of project, and also its final configuration. Exemption from TPA obligations is considered to be a strong possibility for this project. Independent players like Mytilineos have also expressed interest in developing FSRU capacities.

DEPA's bid for greenfield onshore or offshore regasification capacity in northern Greece enjoys the advantage of coming from the only local SEE player with actual prior experience in the LNG market, a characteristic shared only by some of the partners (previously) involved in the construction of Adria. Another potentially significant advantage for the development of new capacity in northern Greece is the fact that neighbouring Bulgaria seems to stand firmly behind - and even actively encourage - this project. But Bulgarian attention and support for Aegean LNG continues to be unfocused and hence weakened, as Sofia persists in a policy of supporting a number of (what in reality are) competing supply projects. Therefore, it reduces business case certainty, which would otherwise have stemmed from its support.

In any event, if successfully developed and coupled with other existing and planned gas infrastructure, notably the existing Revithoussa terminal in southern Greece including planned logistical upgrades;

the existing import pipeline from Russia (via Bulgaria); the proposed interconnectors ITGI and IGB; and the discussed South Kavala underground store, a greenfield terminal in northern Greece could indeed inject enough liquidity into the Greek and regional gas systems to allow emergence of the first hub in SEE. This would contribute substantially to security of gas supply, including price security. Also at a later stage, Aegean LNG could provide additional gas supply to the wider Nabucco project, provided ITGI and IGB links are constructed as *de facto* phase I of the Southern Corridor.

Furthermore, in December 2009 state-owned Qatar Petroleum International (QPI) and other partners reportedly expressed interest to the Greek government in a major energy investment of up to EUR 10 billion at the western Greek port of Astakos, including construction of a 7 bcm/y LNG terminal. However, the Astakos project suffered from various drawbacks from its inception, in particular from: a) the problematic nature of LPG as planned feedstock for an envisaged greenfield thermal power plant (TPP) of 1,010 MW, notably safety, high CO₂ emissions and also a threat of *de facto* price dumping to make it competitive; b) the lack of a clear and binding LNG supply commitment from Qatar at regionally affordable prices; c) the large size of the proposed terminal (7 bcm/y) and excessive dependence on the Italian market; d) the current lack of a gas interconnection with Italy and project reliance on the development of one. Against this backdrop, in October 2010 the project fell through, as the two Qatari companies involved (QPI and QEWC) formally withdrew from this project due to concerns about its feasibility. In January 2011, Theodoros Pangalos, the Vice-President of Greece, claimed that Qatari interest in a potential major energy investment (including LNG) at the port of Astakos was still there, even though not necessarily in the form earlier discussed.

In addition, DESFA and PPC have been considering construction of a regasification terminal in Crete, as this relatively large island with corresponding demand levels remains unconnected to Greece's main electricity grid, and as such is dependent on expensive gasoil for its power generation. Therefore, PPC is examining the option of an LNG import and regasification terminal there; of a gas pipeline network; and of two CCGTs of a combined 500 MW to substitute gasoil generation. Following a period during which interest in this project had dissipated due to relatively low oil prices, in late 2010 PPC revived it and took some preliminary steps towards its ultimate implementation. Crete LNG aims at capturing a ready market through long-overdue substitution of - increasingly expensive - oil products in the island's power generation sector. However, developing a subsea cable connection to mainland Greece as a means of covering local needs in electricity now seems to be the government's preferred choice, as a result of envisaged cost and environmental benefits.

In parallel, the Greek government and PPC have reportedly been examining the possibility of direct imports of CNG from Egypt to Crete through MEDGAS. The latter, which is a 60–30–10 consortium

between Greek group Copelouzos, Egyptian EGAS, and Arabia Gas reportedly signed an MoU with PPC to that end in May 2009, namely to evaluate its proposal for direct CNG imports to the island. This could prove a cheaper alternative given it has no need for costly infrastructure development. However, the technology for CNG transport has not yet proven itself to be commercially viable and, if it were indeed to move forward, it could be the first such commercial application in the world. Against this backdrop, Athens has indicated to Cairo its willingness to assess its proposal on technical and economic grounds, and see if it would be interested to take it forward.

Finally, in January 2011 it emerged that Copelouzos was seeking to develop a 3 bcm/y floating terminal that will target export markets, and will be accompanied by two gas-fired greenfield TPPs. Preliminary information suggested that Alexandroupolis (north-east Greece) would be supplied by Copelouzos partner Gazprom, but this could only be achieved through trading due to distance from Russian liquefaction. Equally problematic is the proposed focus on exports to Bulgaria, which does not seem supported by current and planned logistical arrangements, including the fact IGB may receive TPA exemptions. Consequently, Alexandroupolis LNG does not look like a viable project.

In summary, Greece continues to be the only country with LNG import and regasification capacity in the SEE region, estimated at some 2 bcm/y in real terms with planned upgrades for some 5 bcm/y, which according to local sources is already attracting commercial interest from the broader region. What is more, main local gas operator DEPA has been examining options available to it with regard to a 4 bcm/y to 6.8 bcm/y greenfield LNG terminal near Kavala, in northern Greece (Aegean LNG). This project could be developed by DEPA as either a greenfield onshore terminal, or as an FSRU. There are important operational synergies concerning the proposed northern Greek location of Kavala, not least its ability to connect relatively easily with other export-oriented gas infrastructure of regional significance such as the planned IGB and ITGI pipeline projects (DEPA participates in both of them); its proximity to a depleted gas field now planned to be turned into underground storage (*see below*); and its flexibility (offshore option) to move as needed and capture peak demand opportunities. Furthermore, Aegean LNG benefits from the fact that DEPA is the only player in the region with prior experience in this market, including in LNG procurement and terminal management.

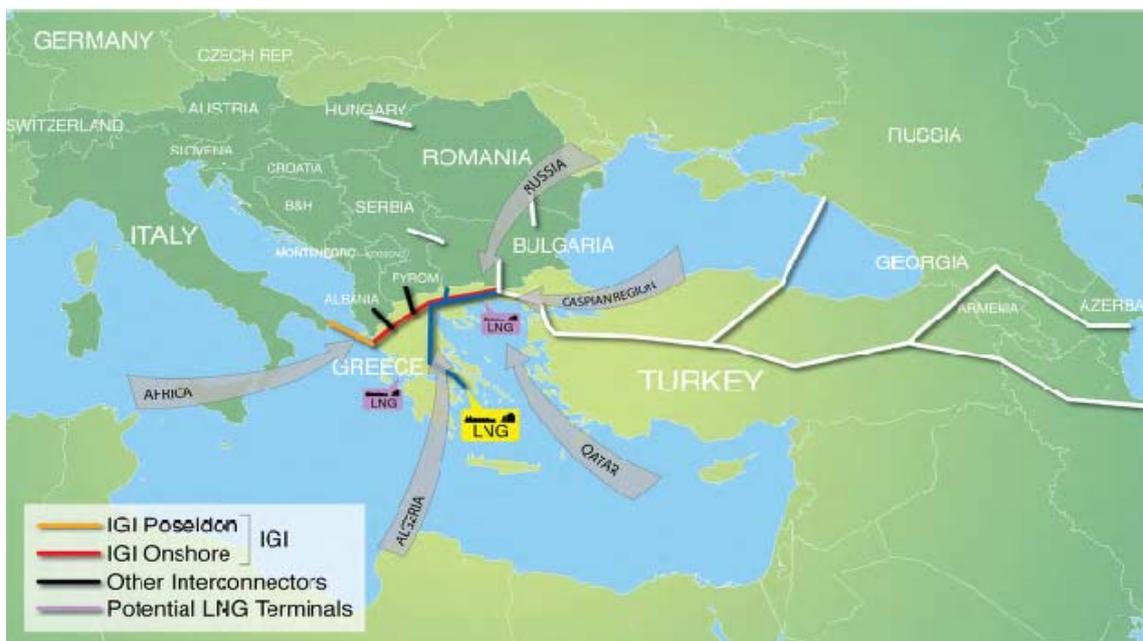
Hence if successfully developed and coupled with other existing and planned gas infrastructure, notably with the Revithoussa terminal in southern Greece including planned logistical upgrades there; with the existing natural gas connection between Greece and the Russian Federation via Bulgaria; with the proposed ITGI and IGB gas interconnectors; and with the planned underground gas storage; then a greenfield LNG terminal in northern Greece could also help inject enough liquidity into the Greek and regional natural gas system to allow emergence of the first gas hub in the broader region.

The latter would contribute substantially to natural gas supply security, including gas price security. At a later stage, it could also offer complementary supply to Nabucco with diversified gas volumes, provided as mentioned above that ITGI and IGB are constructed as phase I of the Southern Corridor.

Other related projects proposed such as Revithoussa FSU; independent FSRUs; Astakos LNG; Alexandroupolis LNG; and also Crete CNG seem to have fewer chances of achieving implementation, due to a relative lack of focus; weak market fundamentals; and continuing technological immaturity. In contrast though, a potential offshore Crete LNG project is a technologically sound proposition, targeted at capturing a ready and relatively large energy market through the long-due substitution of the increasingly expensive oil products in its isolated power generation business segment. This project could thus see implementation, unless of course a subsea cable is laid.

Map 12 in the next page contextualises existing and planned import & transit infrastructure in Greece, elucidating the synergies between Greek LNG terminals and natural gas pipeline interconnections.²³⁰

Map 12: Role of current and planned Greek natural gas infrastructure in SEE



Source: Spiros Paleoyannis, *Meeting the gas supply challenges in the Balkans and SE Europe*, Paper presented at the Hellenic – Bulgarian Cooperation in the Energy Sector, Sofia, April 2010, www.ienee.gr

²³⁰ For more details on the technical side as well as full bibliographic references on existing and proposed LNG capacities in Greece see the Appendix below.

Conclusions: the value of LNG flexibility for regional security of supply

The SEE region has a powerful incentive to develop LNG import and regasification capacities as a means of mitigating the region's proven susceptibility to disruptions in its pipeline gas inflows; moreover, LNG could also offer SEE access to (currently) competitively priced spot supplies. However, with the exception of Greece, the Balkans still lack LNG import capacity, while chances of developing this infrastructure are in reality hampered by significant development costs, which local players may be unwilling to assume at a time of economic hardship; by the strong competition coming from more attractive LNG markets and alternative pipeline projects; by *de facto* poor planning, as evidenced in the increasingly obvious mismatches between the envisaged regasification capacities and the size (including prospects) of relevant gas markets; by the substantial lack of adequate domestic gas infrastructure and of regional gas interconnections; by the reliance on an already saturated market (Italy) as main legitimating factor for implementation; and finally, by substantially competing partner priorities, and / or lack of relevant partner experience. Therefore, most of the proposed terminals in the region in fact stand little chance of implementation, and cannot be considered effective contributors to regional supply security.

But in any event, the SEE region is not in actual need of the multiplicity of LNG terminals proposed, with development of greenfield LNG capacities requiring a more targeted approach. The latter should really aim at achieving synergies which allow profitable use on commercial terms, such as partner access to capital; partner experience; support from SEE governments and the EU; existence of adequate domestic infrastructure (transmission / distribution) and ensuing market access; current or planned gas interconnectors to justify LNG import volumes, and maximise regional impact; and more economical and flexible deployment of LNG import and regasification assets in the region. This could be achieved through the employment of the FSRU option, which is characterised by lower development costs as well as shorter lead times; and also by FSRUs' flexibility to be employed only for as long as needed, and at the size that is actually needed. In terms of actual locations / projects, Krk and Aegean FSRUs seem to be the projects most likely to succeed.

Indeed, Croatia is a growing natural gas market, with its attractiveness as an import market supported further by the declining production in its upstream; furthermore, it enjoys growing access through a number of planned pipelines to both established as well as emerging markets in Italy, CEE, and SEE; while the currently envisaged 2.5 bcm/y to 8 bcm/y regasification capacities for the FSRU version are a better size for the market, compared to previously planned capacities for up to 15 bcm/y onshore. However, even this smaller unit may prove unnecessary if Croatia can get supplied with cheap surplus pipeline gas from Italy through its contract with ENI (as well as other pipeline supplies from E.ON), which has now replaced Gazprom in this role.

Meanwhile, Greece represents a growing natural gas market, with increasing access through various planned interconnectors to established and emerging markets in Italy, SEE, and even as far as CEE; its relatively small envisaged 4 bcm/y to 6.8 bcm/y capacity probably faces reduced redundancy risk; and there are a number of important operational synergies, including access to a greenfield gas storage. Finally, the Greek project benefits from the fact that DEPA remains the only player in the SEE region with prior experience in this market segment, including LNG procurement and terminal management (the latter assuming foreign partners do not participate in the Krk project; or its FSRU alternative).

Additionally, by virtue of its key geographic location including related planned gas interconnections, northern Greek regasification would primarily target markets in the SEE rather than Italy or CEE, hence allowing it to make a meaningful contribution to gas supply security. Moreover, if successfully developed and coupled with other related natural gas infrastructure, notably with Revithoussa LNG in south Greece including currently planned logistical upgrades there; with the existing gas pipeline connection between Greece and the Russian Federation via Bulgaria; with the proposed ITGI and IGB gas interconnectors; and also with the planned underground storage; then a greenfield LNG terminal in northern Greece could also help inject enough liquidity into the Greek and regional natural gas system to allow the emergence of the first natural gas hub in SEE. The latter would contribute substantially to gas supply security in SEE, including gas price security. At a later stage, it could also offer complementary supply with diversified gas volumes to Nabucco, provided of course ITGI and IGB are indeed constructed as phase I of the Southern Corridor.

4. Upgrading gas storage capacities

Global and regional context

Availability of natural gas storage capacities contributes to increased levels of supply security, to improved balancing of the natural gas system, and to more efficient servicing of peak gas demand. However, procurement and storage of gas entails a significant cost premium, and tends to be more expensive than storage options for other comparable energy products such as oil products. Additionally, not all countries have the ability to develop their own Underground Gas Storage (UGS) capacities due to inherent geological limitations in their territories, notably a lack of underground caverns which could relatively easily be converted to storage sites. Nevertheless, the idea of upgrading / establishing storage capacities for natural gas has been gaining prominence amongst member-states of both the International Energy Agency (IEA) as well as the EU. Indeed, gas storage is now seen as a suitable means of enhancing supply security against disruptions, as well as of taking advantage of profitable natural gas price fluctuations and demand seasonality.²³¹

In December 2010, Regulation 994/2010 of the European Parliament and Council entered into force, repealing at the same time previous Council Directive under reference 2004/67/EC. This regulation places an obligation on energy companies involved in EU markets to guarantee supply to protected customers for up to 30 days, (*see sections above for more details*) including through development of adequate storage. By the same token, the long-term energy strategy to 2020 of the EU underscores the value of storage as a means of improving security of supply.²³²

Importantly though, the cost of gas storage development should not exceed relevant opportunity costs. The World Bank has identified the following options, particularly with regard to gas markets in SEE:

²³¹ That would be in the absence of any US-style unconventional gas revolution in Europe; this could dramatically lessen European dependence on foreign supply. At the same time, an unconventional gas revolution in Europe would offer customers more flexibility in taking advantage of arbitrage opportunities, as well as allow them to deal more effectively with peak demand and other seasonality effects. For more details on the potential of such gas resources in Europe see Florence Gény, *Can unconventional gas be a game-changer for European gas markets*, December 2010, Oxford Institute for Energy Studies, www.oxfordenergy.org; for an analysis of the global gas market and its likely evolution, including an examination of ensuing arbitrage / trading opportunities see for example Howard Rogers, *LNG trade-flows in the Atlantic basin: trends and discontinuities*, March 2010, Oxford Institute for Energy Studies, www.oxfordenergy.org. Information presented in the section above come from Upstream Online, *IEA looks into gas security*, 11 March 2010, www.upstreamonline.com

²³² European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

a) using interruptible supply contracts (with or without alternate back-up fuels for power & industry);
b) maintaining additional line-pack by means of constructing larger diameter pipelines for natural gas;
c) developing / adjusting LNG supply levels, or injecting supply flexibility into pipeline contracts; and
d) maximising the seasonal dispatch of gas-fired power plants in the wider interconnected system.
However, most of the above options are not available in SEE in real terms at the moment; and they might be difficult to realise in a time frame compatible with UGS development lead times.²³³

In this broader framework, SEE countries Bulgaria, Croatia, Greece, and Serbia have already been planning upgrades in their UGS capacities, which are aimed both at improving servicing of their domestic natural gas markets, as well as boosting security of natural gas supply in the Balkan region. Theoretical UGS potential within the region exists also in Albania and in Bosnia & Herzegovina. Next we examine in detail the storage potential of the SEE, including both UGS and LNG storage.²³⁴ Map 13 locates existing SEE natural gas storage within the wider region.

²³³ See for example the case of interruptible gas supply contracts in Bulgaria in the paragraphs below. In any event however, a direct comparison of theoretically available options on capital and operational expenditure falls outside the scope of this study, and as such will not be examined. For details on the World Bank's estimated ranking order of available options in SEE (including relative assumptions) see Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org.

²³⁴ Turkey plans to double its available natural gas storage capacity by 2015 - and Gazprom is reportedly already looking into possible market entry in this context - as part of a wider energy strategy aimed at boosting reliability of energy supply; part of the Turkish storage capacity could then be used to supply the SEE region as well, provided adequate gas transmission infrastructure has been put in place by that time, notably with Bulgaria; for more details on this see ISI Emerging Markets, *Construction works for nuclear power plant to start until 2014*, 25 March 2010, www.securities.com ; and also Balkans Business News, *Gazprom makes a leap in Turkish market*, 16 March 2010, www.balkans.com

Map 13: Existing gas storage in SEE and its immediate periphery



Source: Tanguy Moulin-Fournier, *Russian gas crisis Q1 2009: what worked / what did not work – focus on SEE*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, Sep 2009, www.energy-community.org

Country focus on Underground Gas Storage (UGS) projects

Albania remains ungasified and, as such, does not have any active natural gas storage facilities. However, Tirana is now actively promoting development of UGS in its territory in a bid to strengthen its credentials as a transit country for international pipelines, thanks to its local geology which offers natural reservoirs in western and central parts of the country. The most notable example is a salt dome in Dumrea, with a working capacity in excess of 1 bcm and cushion natural gas needs of 800 mcm. However, developing the site's full gas storage capacity could take as much as 10 years to complete. Albania could also utilise a small depleted field in Divjaka (*see map 11*), with envisaged capacities of: 60 mcm working gas / 170 mcm cushion gas / injection rate 0.35 mcm/d / withdrawal rate 0.5 mcm/d.

Capital expenditure for full realisation of the Dumrea natural gas storage potential is estimated by the World Bank at about EUR 75 million; while for Divjaka it is almost EUR 40 million.²³⁵

The TAP consortium is currently examining development of natural gas storage capacity in Dumrea, in an attempt to pre-empt any potential upstream gas supply problems once its pipeline is operational. The proposed storage facility will reportedly comprise the following: a) three to five underground salt caverns (with storage capacity for natural gas of approximately 50 mcm each), production strings, and well-heads connected to the main processing facilities by intra-field natural gas pipelines; b) processing facilities, compression/expansion, heaters/coolers, flow measurement, control systems; c) pipeline links to TAP and potentially to other regional gas interconnectors (*see above*). The facility is expected to come online by the end of this decade.²³⁶

The theoretical capacity of Dumrea which is in excess of 1 bcm suggests it could ensure reliability of supply in Albania in the longer term, even when assuming strong gas demand growth in the country. In such a context, Albanian UGS will indeed be in a position to serve the regional market as claimed by its government, provided necessary interconnections with neighbouring countries are put in place. What is more, gas storage capacities in Albania could be boosted further by successful development of the currently envisaged Adriatic LNG terminals and their related storage infrastructure. However, these projects may fail to materialize altogether due to the lack of a current gas market in the country, as well as competition from other planned sites in the wider region which put in question the Albanian business rationale (*see above*).²³⁷

In a similar vein, even though **Bosnia & Herzegovina** does not have at the moment any operational natural gas storage, it retains a theoretical potential to develop such capacity in the future thanks to the availability of suitable salt caverns at Tuzla-Tetima. These caverns could be converted to a UGS with 60 mcm working capacity (12 mcm cushion gas), at a cost of between EUR 35 and EUR 44 million. The World Bank estimates slightly higher costs, around EUR 50 million. Maximum injection capacity is estimated at 0.5 mcm/d, and maximum withdrawal capacity at 1.9 mcm/d. However, envisaged

²³⁵ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org; Stavri Dhima, *Prospects for the introduction of natural gas in Albania*, Paper presented at ‘Greek–Albanian Cooperation in the Energy Sector’, Tirana, January 2009, www.iene.gr; and TAP, *StatoilHydro joins EGL in Trans Adriatic Pipeline gas project*, 13 February 2008, www.trans-adriatic-pipeline.com

²³⁶ TAP, *Key features: underground natural gas storage facility*, accessed 12 May 2011, www.trans-adriatic-pipeline.com; Energy Press, *Κατασκευή υπόγειας αποθήκης αερίου στην Αλβανία εξετάζει η κοινοπραξία TAP*, 12 May 2011, www.energypress.gr

²³⁷ More information on the Albanian storage potential is available in Stavri Dhima, *Prospects for the introduction of natural gas in Albania*, Paper presented at ‘Greek–Albanian Cooperation in the Energy Sector’, Tirana, January 2009, www.iene.gr; and also World Bank and KfW, *SEE regional gasification study*, Paper presented by the Economic Consulting Associates Ltd. at the Gas Forum of the Energy Community, Ljubljana, October 2008, www.energy-community.org

costs exclude pipeline infrastructure that would be needed to connect the site to the natural gas grid. This requires construction of a 55-km / 16-inch / 50-bar link between Kladanj and Tuzla–Tetima, at an estimated cost of EUR 16 million. Development of a 47-km / 16-inch / 50-bar pipeline between Tuzla and Doboj may also be required to allow connection with the Bosanski Brod – Zenica pipeline upon its completion (*see above*). BH-Gas has already submitted a proposal for Tuzla-Tetima with a construction time of roughly 4 years, excluding preliminary planning.²³⁸

Albeit small by international standards, the suggested 60 mcm capacity at Tuzla-Tetima should be enough to boost supply security and improve peak demand management in the small Bosnian market. However, its contribution on a regional level is likely to remain marginal and cannot be considered a priority on a wider level, especially if other regional options could serve the Bosnian market as well. In any case, no concrete progress has yet been reported, therefore putting into question the ability of Bosnia & Herzegovina to tap into this resource in the short- to medium-term.

In contrast to the difficulties faced with regard to gas storage by Albania and Bosnia & Herzegovina (and also by the smaller Balkan countries which lack even a theoretical potential),²³⁹ **Bulgaria** enjoys both strong geological potential, as well as already operational natural gas storage at Chiren. Specifically, UGS Chiren is owned and operated by Bulgarian gas transmission operator Bulgartransgaz, which is already planning to connect it to its wider natural gas distribution grid in north-western Bulgaria (*see above*). Capacity at UGS Chiren has traditionally been allocated to two main players: local operator Bulgargaz, and local gas trader Dexia Bulgaria. Commercial access is now less strictly regulated than in the past, with its customer list including large industrial consumers. On the technical level, UGS Chiren is equipped with a compressor station of some 9 MW capacity. Chiren has a working capacity of 450 mcm and a maximum withdrawal capacity of 4.3 mcm/d. Cushion gas volumes at the site are approximately 750 mcm.²⁴⁰

²³⁸ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; BH-Gas, *High-pressure gas pipeline projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; Eraldo Banovac, Darko Pavlović, and Tomo Galić, *South East Europe case study: impact of regulation on gas infrastructure investments in the regional gas market integration*, Paper presented at the 24th World Gas Conference, BGC B – Strategy, Economics, and Regulation, Argentina, 5–9 October 2009, www.igu.org ; also from BH Gas, *Table of development projects*, no date, www.bh-gas.ba ; and from BH Gas, *PTGS6: Underground natural gas storage facility in the Tetima salt mine including gas pipeline connection leading from Kladanj via Tuzla to Tetima*, no date, www.bh-gas.ba

²³⁹ Namely, the former Yugoslav Republic of Macedonia, UNMIK / Kosovo, and Montenegro, which have no commercially suitable locations that could allow them to host UGS sites. As a consequence, in the present analysis these markets are dealt with only indirectly, specifically how they could be served by other existing and / or planned UGS sites in the wider region.

²⁴⁰ SEWRC / DKER, *National report to the European Commission*, July 2009, www.dker.bg

On the policy level, the Bulgarian authorities aim to cover 90% of gas needs from Chiren, even during a serious supply emergency on the scale of January 2009; or, roughly 4 months of uninterrupted supply, when consumers such as gas-fired heating utilities have switched to other sources, notably to fuel oil.²⁴¹ To facilitate transition to these security levels, Sofia is now targeting upgrades at Chiren. For the most part, these are aimed at allowing it to reach a working capacity of roughly 850 mcm, and also include the possibility of a substantial increase to its natural gas withdrawal rate to 10 mcm/d. Sofia has secured a EUR 250 million loan from EBRD which may become available within 2011, while the government was expecting on-site construction works to commence in September 2010. Chiren withdrawal rates are to increase to some 5.5 mcm/d in this first stage of upgrades.²⁴²

Furthermore, in 2007 Bulgargaz and UK upstream operator Melrose Resources signed an MoU for completion of a feasibility study on the depleted offshore Galata gas field, which is 100% controlled by Melrose Resources through a subsidiary. Galata is located 23-km off the Black Sea coast at 35 metres depth. The main question of the feasibility study was to assess whether Galata could be converted to storage, to which it gave a positive response. The two partners have agreed to a 3-phase conversion plan which would ultimately lead to development of a 1.8 bcm site. Phase 1 is to bring online the first 700 mcm and will reportedly require EUR 23 million (2010 average exchange rate) to restore its compression; to tie back the suspended Galata east No 2 well; and to install metering

²⁴¹ It should be noted though that gas switchability at the moment remains very limited in Bulgaria. For example:

- There is a theoretical option for interruptible supply contracts in the context of the *gas-fired industrial sector*, which is by far the largest natural gas demand segment in the country (approximately half of it). Nonetheless, this option does not seem to have been exercised until now, at least not to any substantial degree.
- The *gas-fired district heating sector* in Bulgaria, which represents approximately 1/3 of the domestic gas market, is under an obligation to maintain enough volumes of backup fuel alternatives (oil distillates) for up to 2 weeks. However, its inability to respond to major supply crises became obvious in the context of the January 2009 crisis, when it took it almost a week to make this switch (and some plants were even forced to shut down completely).
- It is estimated that switching of the Bulgarian gas-fired heating sector to oil products could free up a total of some 5 mcm/d of natural gas demand in the country, hence contributing to security of energy supply.
- A part of Bulgarian *gas-fired power generation* – or in other words roughly 15% of the gas market in this country – is under an obligation for real switchability. But the extent to which this is actually enforced remains unknown.

More information on this matter is available in Florent Silve and Pierre Noël, *Cost curves for gas supply security: the case of Bulgaria*, Electricity Policy Research Group Working Paper 1031 (Cambridge Working Paper in Economics 1056), September 2010, University of Cambridge, www.eprg.group.cam.ac.uk

²⁴² See ISI Emerging Markets, *Energy minister on shale gas prospecting, negotiations with Gazprom, gas interconnectors*, 28 May 2011, www.securities.com ; ISI Emerging Markets, *EBRD may invest in Chiren natural gas storage expansion in 2011*, 25 October 2010, www.securities.com ; ISI Emerging Markets, *Capacity expansion at Chiren gas storage to start soon*, 3 August 2010, www.securities.com ; Standart, *Chiren's gas depot to be upgraded*, 3 August 2010, <http://paper.standartnews.com> ; Energia.gr, *Μέσω Ελλάδος η κάλυψη του 10% των βουλγαρικών αναγκών σε αέριο σε περίπτωση κρίσης*, 23 November 2009, www.energia.gr ; ISI Emerging Markets, *Energy regulator: natural gas reserves in Chiren facility at 647 million cbm*, 17 November 2009, www.securities.com ; ISI Emerging Markets, *BGEH to sign 250 m EBRD loan for gas storage facility by year-end*, 17 July 2009, www.securities.com ; and Rosen Simitchiev, *The Balkans as a corridor of energy supplies to Europe: contribution and role of Bulgaria*, Paper presented at the '3rd South-East Europe Energy Dialogue', Thessaloniki, June 2009, www.iene.gr

facilities. Phases 2 and 3 will each cost an additional EUR 23 million, and raise capacity to levels of 1.2 and 1.7 bcm respectively. Probably as a means of getting necessary funding, in December 2008 Melrose also entered into an additional agreement with Bulgargaz. The latter gives Bulgargaz the right to a 40% working interest in UGS Galata at the time of its first gas injection.²⁴³

To this end, Galata was shut down in January 2009 with roughly 240 mcm of gas left in the reservoir to form the basis of the cushion gas (the working capacity at Galata is expected to stand at 800 mcm). However, conversion has seen substantial delays since 2009, for example the first natural gas injection there was originally scheduled to take place in third quarter 2009, but has yet to materialize. These delays were for the most part attributable to the change in the Bulgarian administration and the resulting redefinition of priorities and agendas in Sofia. Additionally, the Galata project was not included in the long-term Bulgarian energy strategy, as presented by the minister responsible in June 2010. But in August 2010, the government of PM Boyko Borisov confirmed its decision to advance Galata and announced that it was in negotiations with Melrose Resources over this matter. Once completed, Galata will offer to the Bulgarian market the additional benefit of diversification of gas storage ownership and operation as, unlike Chiren, it will not be controlled by Bulgartransgaz.²⁴⁴

Successful expansion of Chiren and / or conversion of Galata would make a meaningful contribution to Bulgarian and regional supply security (0.8 bcm + 1.8 bcm respectively), both of which were severely tested during the Russia – Ukraine crisis of January 2009. On a regional level, the contribution of storage would be most felt in neighbouring former Yugoslav Republic of Macedonia, which currently remains dependent on only one supplier (Russia) and one route (through Bulgaria). Other potential beneficiaries would be Greece, Turkey, Serbia, and also Romania, with which Sofia is now planning construction of additional interconnections (*see above*). The fact that these countries either have already, or are planning to develop in the near term, substantial storage capacities of their own does not diminish the value of diversification, which could partially be achieved also through development of Chiren and / or Galata.²⁴⁵

²⁴³ Offshore Technology, *Galata Field, Bulgaria*, no date, www.offshore-technology.com

²⁴⁴ More information in Standart, *Chiren's gas depot to be upgraded*, 3 August 2010, <http://paper.standartnews.com> ; Traycho Traykov, *The energy strategy until 2020: a new vision for the future of energy in Bulgaria*, 18 June 2010, Ministry of Economy, Energy and Tourism, www.mi.government.bg ; and Offshore Technology, *Galata Field, Bulgaria*, no date, www.offshore-technology.com

²⁴⁵ The economic rationale for developing additional natural gas storage capacity in Bulgaria, compared to that of other theoretical options such as securing TPA and utilising the existing gas pipeline links with neighbours Greece and Turkey as the main contributors to a diversified and secure energy supply for this SEE country has been questioned. However, these proposals seem problematic both in terms of feasibility as well as actual contribution to SEE supply security. For more on this matter see sections above; and also Florent Silve and Pierre Noël, *Cost curves for gas supply security: the case of*

Croatia has likewise been looking into expanding its available energy storage infrastructure, as a means of enhancing security of supply and benefitting its struggling economy. In this framework, Croatian logistics operator Jadranski Naftovod (JANAF) is planning to invest EUR 55 million of its own funds in oil & gas storage refurbishment by 2011, including upgrades in the oil terminal at the Sisak refinery and construction of new oil depots at the terminals of Omisalj, Slavonski Brod, Zitnjak in Zagreb, and in Virje.²⁴⁶ On the gas front, 2010 saw completion of planned upgrades at UGS Okoli, a depleted natural gas field. UGS Okoli now enjoys a working gas capacity of some 630 mcm; maximum injection capacity of 3.8 mcm/d; and maximum withdrawal capacity of 6.7 mcm/d.²⁴⁷

UGS Okoli is operated by local company Podzemno Skladiste Plina (PSP), which was initially a subsidiary of state-owned oil & gas operator INA. However, in May 2009 national gas transmission operator Plinacro signed an agreement with EBRD on a EUR 70 million loan, aimed at supporting its planned acquisition of this storage site from INA, as the latter gradually came under the control of Hungarian integrated player MOL. Even though Okoli has traditionally been relatively open to third parties, notably Geoplin of Slovenia, the Croatian authorities have pledged to improve further non-discrimination standards and TPA through an overhaul of the relevant regulatory framework. Moreover, the new operator is planning modernization and expansion of gas storage infrastructure, in an attempt to boost supply security and benefit from commercial opportunities in the wider region. Importantly, a depleted gas field is available in a separate reservoir in the same location, with theoretical working capacity of 400 mcm / cushion gas 350 mcm / maximum withdrawal 4 mcm/d. Capital expenditure for this project is estimated by the World Bank at about EUR 155 million.²⁴⁸

Bulgaria, Electricity Policy Research Group Working Paper 1031 (Cambridge Working Paper in Economics 1056), September 2010, University of Cambridge, www.eprg.group.cam.ac.uk

²⁴⁶ ISI Emerging Markets, *More emphasis on energy projects*, 16 March 2010, www.securities.com

²⁴⁷ UGS Okoli was developed in the late 1980s, when the authorities of former socialist federal Yugoslavia decided to convert the partially depleted Okoli natural gas field and its three A series beds to storage, as a means of improving supply reliability in the broader region. Construction was completed in 1987 (i.e. shortly before the dissolution of Yugoslavia) and a total of 22 injection production wells were mounted on 6 drilling platforms. For more details see Energy Charter Secretariat (2010), *The role of underground gas storage for security of supply and gas markets*, Occasional Paper, www.encharter.org; Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org; Plinacro, *Plinacro Ltd.*, Paper presented at the Gas Forum of the Energy Community by Goran Frančić, Ljubljana, September 2010, www.energy-community.org; INA, *Okoli underground gas storage*, no date, www.ina.hr; ISI Emerging Markets, *Croatia needs more imported gas, lags behind international projects - experts*, 17 February 2010, www.securities.com; and Ministry of Economy, Labour and Entrepreneurship, *Energy Strategy of the Republic of Croatia: draft*, June 2009, www.mingorp.hr

²⁴⁸ See Energy Charter Secretariat (2010), *The role of underground gas storage for security of supply and gas markets*, Occasional Paper, www.encharter.org; Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org; INA, *Okoli underground gas storage*, no date, www.ina.hr; and Reuters, *Croatia gets EBRD loan to buy gas storage facility*, 13 May 2009, www.reuters.com

There are also plans to push forward with the development of two new gas storage sites, namely Grubisno Polje and Beničanci. The former is planned as a smaller reserve of about 550 mcm, and targets better management of Croatian peak gas demand. The project is to be completed by end-2013. In contrast, Beničanci working capacity would be 2 bcm; injection 4 mcm/d; withdrawal 6.2 mcm/d. Approximately 450 mcm will be needed as cushion gas in its initial development phase. Hence, Beničanci theoretically has the ability to meet both national as well as regional needs for natural gas. Capital expenditure for the development of Phase 1 of UGS Beničanci (550 mcm working capacity) has been estimated in a study by the World Bank (*see above*) at about EUR 83 million. However, Beničanci's development could take up to 15 years, as a result of its general technical complexity. At the moment, both Grubišno Polje and Beničanci are on the Priority Projects List in the Contracting Parties of the Energy Community Regulatory Board (ECRB) – Part B, which refers to projects in preparation looking for investors or financiers. Finally, Croatia may in the medium term benefit also from the development of additional storage capacities for gas in the form of LNG infrastructure, specifically if it proves successful in completing its Krk LNG terminal (*see above*).²⁴⁹

Storage prospects in Croatia thus place the country well both with regard to meeting the challenge of enhancing national supply security and improving peak demand management in its local gas market; as well as extending supply influence to markets in the wider region such as Bosnia & Herzegovina with which it is now developing pipeline interconnectors. These effectively multiply storage potential for Croatia, allowing it access to similar gas infrastructure in the wider periphery; notably in Hungary where E.ON Ruhrgas has already offered Zagreb access to its storage, while at the same time achieving market entry to Croatia (*see above*).²⁵⁰ But with the exception of some relatively minor upgrades at UGS Okoli, no concrete steps have been taken so far in the direction of substantially upgrading natural gas storage capacity in Croatia.

Maps 6, 10, and 12 (see above) show current and planned gas storage infrastructure in Croatia, as well as contextualising it with other entry, transmission, and distribution capacities for gas in the region.

²⁴⁹ Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; Domagoj Jelić, *Gas sector in Croatia*, no date, Ministry of Economy, Labour, and Entrepreneurship ; from Platts, *Energy in East Europe*, Issue 187, 9 April 2010, www.platts.com ; from Vjesnik Online, *Skladište plina u Grubišnom Polju proradit će već 2013*, 20 March 2010, www.vjesnik.hr ; and from ECRB, *Regulatory framework for the development of the energy community gas ring*, 10 March 2010, www.ecrb.eu

²⁵⁰ For more on natural gas storage in Hungary see for example the Energy Charter Secretariat (2010), *The role of underground gas storage for security of supply and gas markets*, Occasional Paper, www.encharter.org ; and Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org ; more information on the overtures of E.ON Ruhrgas to Croatia is available in Nacional, *We are offering Croatia a secure supply of natural gas*, 3 August 2010, www.nacional.hr.

Currently relatively diversified (in terms of foreign natural gas supply) **Greece** has in recent years been examining options available to it with regard to developing natural gas storage, including UGS. The country already operates LNG-related storage infrastructure, namely two tanks with a combined capacity of some 144,000 cu.m. at its Revithoussa terminal, of which 130,000 cu.m. is recoverable. Storage at Revithoussa currently suffices for approximately 5.5 days of peak gas demand, which now stands at above $16 \times 10^3 \text{ Nm}^3/\text{hr}$ (2009) but is on an upward trajectory ($>30 \times 10^3 \text{ Nm}^3/\text{hr}$ by 2020).²⁵¹ Revithoussa storage will be boosted by 2014 if plans to construct a 95,000 cu.m tank come to fruition; and / or if DEPA completes its planned Aegean LNG terminal in northern Greece, as the latter will likely require the development of additional on-site storage (*see above*).

Furthermore, there are ongoing deliberations on the possibility of converting a depleted offshore field in South Kavala, northern Greece (58 metres depth / remaining reserves 148 out of initial 995 mcm) to the country's first UGS. South Kavala lies close to the proposed location for DEPA's greenfield LNG terminal (Aegean LNG, *see above*), and it is owned by minor local oil & gas producer Energean, which is active in the management of a number of small oil & gas fields in the Prinos area.²⁵² Energean has already provided the Greek government with preliminary planning, according to which South Kavala will have a capacity of ~950 mcm, of which ~600 mcm recoverable; an injection rate of 5 mcm/d; and an extraction rate of 4 mcm/d, or roughly 40% of Greek natural gas needs for 90 days. The company estimates development costs for UGS South Kavala to stand at some EUR 400 million, which breaks down as follows: onshore facilities, EUR 187 million; pipelines, EUR 93 million; cushion gas, EUR 62 million; drilling, EUR 40 million; and platform modifications, EUR 18 million. Secondary infrastructure including basic platforms as well as relevant pipelines is already in place. UGS South Kavala has been characterized a priority project by the EU.²⁵³

YPEKA accordingly established a task force with the participation of executives from RAE, DEPA, and DESFA to look into relevant legal issues, including the compatibility of the proposed ownership and regulatory arrangements for UGS South Kavala with the Third Energy Package of the EU.

²⁵¹ Energy Press, «Εμφύλιος» στην Επιτροπή Εμπειρογνομόνων για την αποθήκη αερίου της Ν. Καβάλας, 4 January 2011, www.energypress.gr; and also YPEKA, Μετατροπή του υπό εξάντληση κοιτάσματος φυσικού αερίου «Νότιος Καβάλα» (South Kavala) σε αποθηκευτικό χώρο φυσικού αερίου, December 2010, www.ypeka.gr

²⁵² In October 2010, Aegean Energy (Ενεργειακή Αιγαίου) formally changed its name to Energean Oil & Gas, in an effort to facilitate its international development strategy. For consistency and easier reference, here we will refer to the company using only its new name. More information on the matter is available at Energia.gr, “Energean Oil & Gas”: Μετονομασία της Ενεργειακής Αιγαίου και εξωστρεφής στρατηγική, 18 October, www.energia.gr

²⁵³ See Konstantinos Nikolaou, Υπόγεια αποθήκη φυσικού αερίου Νότιας Καβάλας, Paper presented at the ‘15th Energy Conference’, Athens, 22-23 November 2010, www.iene.gr; Energy Press, Δεν δείχνει να βιάζεται το ΥΠΕΚΑ για την αποθήκη αερίου στην Νότια Καβάλα, 3 September 2010, www.energypress.gr; Naftemporiki, Αναζητείται χώρος για σταθμό φυσικού αερίου, 21 June 2010, www.naftemporiki.gr; and also Decisions No 1364/2006/EC of the European Parliament and of the European Council of 6 September 2006, laying down guidelines for trans-European energy networks, 22 September 2006, <http://eur-lex.europa.eu>

However, the legal team of YPEKA early on drew attention to a number of points of contention, including that Energean at the moment only holds an Exploration & Production (E&P) licence which expires in 2014; and that it has only now applied for a gas storage licence as is required by Greek law. It is also not yet clear whether South Kavala could be pursued in a rapid basic infrastructure development framework, i.e. such as is the case of the projects pursued by DESFA. Depending on the answers to these questions, the Greek authorities may have to tender the license, which could cause significant delays or, at the extreme, lead to the cancellation of this important project. The specific mode of development of South Kavala also stirred up controversy within the task force, with DESFA withdrawing in protest from it in December 2010 before the termination of its mandate, for what it considered to be improper recording in the relevant consultation process.²⁵⁴

DESFA deviated from the consensus by arguing that South Kavala should be developed as a public project, which would allow its co-financing from the EU and also other funds; that the requested operatorship of UGS South Kavala by the system operator is in line with EU norms, particularly regarding first storage sites, as will be South Kavala in Greece when finally developed; that DESFA's control over South Kavala will ensure TPA and protect the liberalized gas market in Greece; and that DESFA will as a result reduce its costs for balancing natural gas (now LNG), to the benefit of users. In contrast, DEPA with RAE and Energean argued that developing South Kavala as a private project would offer the public the opportunity not to bear any project risk, at this time of scarcity of capital; that DEPA and Energean indeed enjoy adequate access to capital required for project implementation; that private operatorship of such UGS sites is in reality the norm for most projects in the EU; that DEPA's long-term EPA supply and UGS TPA obligations offer significant additional guarantees; and that DEPA will make available to DESFA all necessary access for realisation of its market role.²⁵⁵

Furthermore, RAE has threatened to block UGS South Kavala if it is not developed in a suitable regulatory framework whereby its expenses are covered by actual users of the storage capacity, instead of the costs being spread indiscriminately across all general users of the network in Greece. RAE has even drawn attention to the negative example of the Revithoussa terminal in this context, where 95% of relevant construction and operating expenses were reportedly covered by non-users. Meanwhile, Energean has threatened to remove completely existing reserves of natural gas in Prinos, if the Greek government decides to move forward with investment plans that do not include it. Moreover, in March 2011 Energean signed an MoU with Edison, which paved the way for potential

²⁵⁴ Energy Press, *Αποχώρησε ο ΔΕΣΦΑ από την επιτροπή για την αποθήκη του Πρίνου*, 10 December 2010, www.energypress.gr; Imerisia, *ΔΕΠΑ: πιθανή συνεργασία με Ενεργειακή Αιγαίου*, 14 July 2010, www.imerisia.gr

²⁵⁵ See YPEKA, *Μετατροπή του υπό εξάντληση κοιτάσματος φυσικού αερίου «Νότιος Καβάλα» (South Kavala) σε αποθηκευτικό χώρο φυσικού αερίου*, December 2010, www.ypeka.gr

participation of the Italian company (which is also a partner of DEPA in IGB & ITGI) in the project. Finally, in May 2011 Energean launched a feasibility study for UGS South Kavala; while the Greek government announced it had hired HSBC and Eurobank Equities as financial advisors for a planned privatisation of the South Kavala field, which will impact on any UGS development there.²⁵⁶

In the context of the Greek bail-out package, the EU and IMF have reportedly been applying pressure on Athens to retain a strong role for DESFA over the bulk of the Greek system. The latter includes LNG and storage, with the South Kavala development preferably seen as part of the Greek National Natural Gas System (NNGS), instead of an Independent Natural Gas System (INGS). The rationale for this alleged pressure is to pre-empt gas system fragmentation and inefficiencies. Still, a partnership between commercial players Energean and DEPA arguably represents the most viable option for development of UGS capacities in Prinos, thanks to the local geological expertise, combined with the natural gas market positioning and commercial links of the players involved. Tellingly, other potential options have thus far failed to make any substantial progress. For example, even though TAP had in the past expressed an interest in developing UGS capacity in Greece in either Prinos or the western region of Epirus, there has been little if any reported activity on that front.²⁵⁷

In any event, if successfully developed, the location and size of the planned UGS South Kavala would offer Greece a number of important strategic and commercial benefits such as the ability: a) to shield the country's national gas system against unexpected disruptions in the supply of foreign natural gas; b) to balance its northern transmission system; c) to meet peak demand without necessarily having to resort to LNG supply and / or to reserve utilization (which has in fact often been the case until now); d) to allow better management of TOP provisions in cases of slowdowns in national demand for gas; e) to facilitate increased utilisation of Revithoussa and hence contribute to gas market liberalization; f) to reduce necessity for (otherwise underutilized) upgrades in Greek gas import infrastructure.²⁵⁸

UGS South Kavala would also provide DEPA (and any other players with access to it) with a more substantial degree of flexibility in choosing the most competitive natural gas supply options.

²⁵⁶ Energy Press, *Energean Oil & Gas: Μελέτη βιωσιμότητας για την αποθήκη αερίου στην Καβάλα*, 20 May 2011, www.energypress.gr ; Energy Press, *Τί "κρύβεται" στην αποθήκη φυσικού αερίου της Ν. Καβάλας*, 19 May 2011, www.energypress.gr ; Energy Press, *Στον αέρα και πάλι η η αποθήκη αερίου στον Πρίνο*, 24 March 2011, www.energypress.gr ; Energy Press, *Συνεργασία έκπληξη Edison – Energean για την αποθήκη του Πρίνου*, 11 March 2011, www.energypress.gr ; Energy Press, *ΡΑΕ: να μην πληρωθεί από τους καταναλωτές η αποθήκη στον Πρίνο*, 24 January 2011, www.energypress.gr

²⁵⁷ Energia.gr, *Κομισιόν: στην κατοχή του ΔΕΣΦΑ το ελληνικό τμήμα του IGB*, 3 August 2010, www.energia.gr ; Energia.gr, *Με το Joint Venture Μότορ Οίλ - Μυτιληναίου παίρνει φωτιά η αγορά φυσικού αερίου*, 30 November 2009 , www.energia.gr

²⁵⁸ Energy Press, *«Εμφύλιος» στην Επιτροπή Εμπειρογνομόνων για την αποθήκη αερίου της Ν. Καβάλας*, 4 January 2011, www.energypress.gr ; and also ΥΠΕΚΑ, *Μετατροπή του υπό εξάντληση κοιτάσματος φυσικού αερίου «Νότιος Καβάλα» (South Kavala) σε αποθηκευτικό χώρο φυσικού αερίου* , December 2010, www.ypeka.gr

Additionally, South Kavala could have a meaningful supply impact on the planned IGB pipeline, while there are also obvious synergies with bigger pipeline projects such as ITGI and even Nabucco, with preliminary negotiations and related planning reportedly already taking place in that direction.²⁵⁹ Finally, the availability of both UGS and LNG supply and storage would also improve the reliability of Greece in the eyes of potential clients in the region, as a supplier able to guarantee its gas outflows. This would obviously be a direct corollary of Greece being relatively free of constraints otherwise imposed on transit countries with comparable trading ambitions, such as supply disruptions and / or domestic market demand irregularities (*see above*).

Map 11 above locates for the reader the planned UGS South Kavala; as well as existing and planned LNG terminals in the country, which naturally include storage for liquid gas.

In late 2009 Srbijagas of **Serbia** signed a relevant agreement with E.ON Foldgaz Trade, the Hungarian trading subsidiary of German giant E.ON Ruhrgas, on storing approximately 200 mcm at the company's substantial gas storage installations in Hungary, as an emergency Serbian reserve. Additionally, Serbian authorities have been pushing towards substantial investment in storage, specifically development of UGS Banatski Dvor as well as of another storage site at nearby Itebej, both located in the autonomous region of Vojvodina in the northern part of the Republic of Serbia.²⁶⁰

Banatski Dvor is a former gas field which was depleted faster than expected during Serbia's political and commercial isolation in the 1990s. It is now in the early stages of cushion gas replenishment, which is an incremental process that could take up to 10 years to be fully completed (800 mcm). During this period some winter withdrawals will be possible, thereby contributing to supply security. Indicatively, for cushion gas levels of 250 mcm (current levels) it is estimated that the maximum daily injection rate could amount to about 1 mcm/d; and maximum withdrawal rate to roughly 2 mcm/d. Gas injection started in 2008 and first small-scale withdrawal commenced in the winter of 2008/2009. Once fully developed, Banatski Dvor will have a working gas capacity of approximately 800 mcm, maximum daily injection of 5 mcm/d to 7 mcm/d and maximum withdrawal of 7 mcm/d to 11 mcm/d.

²⁵⁹ Energia.gr, *Αποθήκη και για Nabucco στη Β. Ελλάδα, και ο TAP στον ITGI*, 11 October 2010, www.energia.gr ; Energia.gr, *Τεράστιο ενδιαφέρον για αποθήκη φυσικού αερίου – παρέλαση κολοσσών από τον Πρίνο*, 25 September 2010, www.energia.gr ; Energy Press, *Ποιες εκκρεμότητες ζητούν επίλυση στη Νότια Καβάλα*, 22 September 2010, www.energypress.gr

²⁶⁰ See Energy Charter Secretariat (2010), *The role of underground gas storage for security of supply and gas markets*, Occasional Paper, www.encharter.org ; Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org.; and ISI Emerging Markets, *Srbijagas to buy equipment for Banatski Dvor gas storage facility*, 10 November 2009, www.securities.com ;

ISI Emerging Markets, *Srbijagas to buy equipment for Banatski Dvor gas storage facility*, 10 November 2009, www.securities.com

The above will among other boost Serbia's ability to meet peak demand, which is now problematic. Capital expenditure for development of UGS Banatski Dvor have been estimated by the World Bank at slightly above EUR 100 million, with a substantial portion having already been invested.²⁶¹

On the commercial level, on 5 February 2010 Srbijagas and Gazprom signed an agreement on the establishment of a 49/51 JV in favour of Gazprom for the development and operation of Banatski Dvor in 2011. This came in the aftermath of a preliminary energy agreement between the two sides in October 2009, which was concluded with encouragement and in the presence of the respective political leadership.²⁶² That energy agreement in fact formed part of wider *quid pro quo* between the two governments, which also included the participation of Serbia in South Stream, of which UGS Banatski Dvor will form an integral part; the divestment of Serbian refining monopoly NIS to Gazprom Neft in 2008; the favourable definition of the country's regulatory framework with regard to the downstream oil sector (in the same year); and, arguably, political support from Moscow on a range of matters of importance to Serbia, notably the status of UNMIK / Kosovo (*see above*).

Indeed, the capacity of UGS Banatski Dvor was not seen as fit for purpose as it could in reality only meet emergency district heating needs in the country's residential and commercial sectors, but failed to cover the needs of the local industrial sector. It was therefore agreed to increase its capacity in time for the 2010/2011 winter to as much as 800 mcm, with gas injection and withdrawal rates improved to 3 mcm/d and 5 mcm/d respectively; but this planning was not necessarily very realistic (*see above*).²⁶³ In any event, in November 2009 Srbijagas concluded an agreement with US company AG Equipment for the supply of compressor engines at a cost of USD 7.4 million, and also signed a USD 2 million agreement with Austrian company Integral Montage for installation of a natural gas production line.²⁶⁴

²⁶¹ Energy Charter Secretariat (2010), *The role of underground gas storage for security of supply and gas markets*, Occasional Paper, www.encharter.org ; Franz Gerner (2010), *The future of the natural gas market in Southeast Europe*, Washington: World Bank Publications, www.worldbank.org

²⁶² B92, *Serbian, Russian FMs meet in Moscow*, 15 December 2010, www.b92.net ; Energetika.net, *Agreement on establishment of a joint venture of Srbijagas and Gazprom for Banatski Dvor underground gas storage*, 8 February 2010, www.energetika.net ; Upstream Online, *South Stream storage a done deal*, 5 February 2010, www.upstreamonline.com

²⁶³ For more information see Milan Zdravković, *Interconnection Serbia – Bulgaria & Serbia UGS projects*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; ISI Emerging Markets, *EBRD, Srbijagas sign EUR 150 mln loan deal*, 19 February 2010, www.securities.com ; Energetika.net, *Agreement on establishment of a joint venture of Srbijagas and Gazprom for Banatski Dvor underground gas storage*, 8 February 2010, www.energetika.net ; ISI Emerging Markets, *Srbijagas, Gazprom set up JV for Banatski Dvor construction*, 8 February 2010, www.securities.com ; and ISI Emerging Markets, *Srbijagas, Gazprom to set up JV for Banatski Dvor gas depot completion*, 5 February 2010, www.securities.com

²⁶⁴ Information from Tanjug, *Skundric: Higher gas prices being considered*, 26 August 2010, www.tanjug.rs ; Balkan Business News, *US-based AG Equipment to supply Serbia's Srbijagas with gas compressors*, 16 November 2009, www.balkans.com ; and ISI Emerging Markets, *Srbijagas to buy equipment for Banatski Dvor gas storage facility*, 10 November 2009, www.securities.com

In this framework, an extra 100 bcm were expected to be injected into Banatski Dvor in March 2011, as well as a further 250 bcm by May of the same year.²⁶⁵

With regard to Itebej, the plan is to start construction of a second greenfield UGS site with capacity of some 1 bcm by end-2011 (completion is envisaged by mid-2013). However, progress is currently hampered by an ownership dispute between Srbijagas and NIS apropos its natural gas deposits.²⁶⁶ Still, a call for proposals regarding its feasibility study has already been announced (September 2010). In February 2010, the EBRD had approved a EUR 75 million loan to Srbijagas to finance part of the associated project costs (remainder coming from Srbijagas funds), after initial reservations due to a perceived lack of adequate data and documentation from the Serbian company. This EBRD tranche forms part of a wider EUR 150 million sovereign loan, aimed at supporting the company's ongoing corporate and regulatory restructuring, and meeting short-term debt refinancing needs (*see above*). According to local sources, NSG Tehnologzi Gbeli and other Slovak companies will work together with Srbijagas on this project, including associated infrastructure development, which has an estimated cost of EUR 254 million. The latter probably includes construction of a related natural gas pipeline, with a completion deadline of end-2011.²⁶⁷

Of importance in this context is the fact that Serbia's two storage projects, i.e. UGS Banatski Dvor and UGS Itebej, unequivocally represent the competing priorities and political alliances of Belgrade. More specifically, UGS Banatski Dvor is to be completed in partnership with Russia's Gazprom, which also enjoys a controlling stake in the project. Meanwhile, Itebej enjoys the support of the EU, in the form of EBRD financing. In any event, and aside from the domestic Serbian gas market, development of gas storage capacity in any form in Serbia is expected to benefit also the wider region, to which it will offer an additional source of flexible gas supply (provided access to it is unrestricted). The latter is especially relevant for Bosnia & Herzegovina, which remains 100% dependent on Russian supply (through Serbia) and for that reason particularly vulnerable to major gas supply disruptions and related seasonality effects.

²⁶⁵ Tanjug, *Russians to start filling up Banatski Dvor gas storage in March*, 28 January 2011, www.tanjug.rs

²⁶⁶ ISI Emerging Markets, *Serbia to build gas plants with combined capacity of 950 MW*, 3 November 2010, www.securities.com

²⁶⁷ Information from New Balkan, *Construction of new gas storage in Itebej – feasibility study for Srbijagas*, 6 September 2010, www.newbalkan.com ; Energetika.net, *Slovak companies to participate in building gas pipeline and storage in Serbia*, 23 March 2010, www.energetika.net ; SeeNews, *Serbia to build 105 mln euro gas storage* , 15 March 2010, www.seenews.com ; ISI Emerging Markets, *Srbijagas, Gas infrastructure to be completed by 2015*, 15 March 2010, www.securities.com ; Balkan Business News, *Serbia mulls alliance options for construction of EBRD-funded gas depot*, 10 February 2010, www.balkans.com ; and B92, *EBRD approves loan to Srbijagas*, 9 February 2010, www.b92.net

Conclusions: potential impact of UGS on regional supply security

Development of strategic and commercial storage for gas is increasingly seen (including in SEE) as an appropriate means of boosting reliability, including the notion of security of natural gas supply, system balancing, servicing of peak gas demand, and management of relevant gas TOP obligations. As in the case of pipeline gas and LNG supply, real storage options for Balkan players remain both limited and far from uniform. Strategies are thus shaped within this specific framework, ultimately revealing a hierarchy of relevant actors, even though in the case of underground storage based on the existence of suitable underground geological formations. The former Yugoslav Republic of Macedonia, UNMIK / Kosovo, and Montenegro would lie at the bottom of such a classification, as they lack both actual (operational), as well as potential (theoretical) capacity for natural gas storage. In contrast, Albania and Bosnia & Herzegovina would be placed relatively higher in that list as, despite at the moment lacking operational gas storage, they nevertheless enjoy theoretical potential of developing such infrastructure in the future. Finally, Bulgaria, Croatia, and Greece would all occupy top positions in the same list as they already operate storage capacities for gas (UGS and / or LNG), while also planning additional upgrades which are aimed at further improvements in supply security; at balancing their national gas systems; and at improving management of peak demand and TOP.

Despite this inherently unequal distribution of geological resources and potential, benefits stemming from development of gas storage could in fact be shared across the region, provided necessary pipeline interconnectors are successfully developed. However, certain contractual withdrawal minima from storage sites and other regulatory safeguards (e.g. access, transmission) may have to be agreed in advance between all regulators, storage operators, and any third-party users, as a means of providing needed commercial certainty, thereby facilitating project development. Opportunity costs of equivalent options should also be taken into consideration, wherever available. In any event, natural gas storage assets do not necessarily have to be located within SEE to support its supply security. For example, besides its own and neighbouring Greek resources, Bulgaria could also tap into (extra-SEE) Turkish and Romanian storage. Croatia and Serbia could tap into Hungarian assets, which could similarly contribute to a significant strengthening of regional security of supply.

But as available investment resources remain inescapably limited in the present recessionary climate, effective project targeting and capital allocation (especially of EU funds, *see relevant section below*) becomes even more of a necessity. For example, smaller storage sites such as the discussed 60-mcm UGS Tuzla-Tetima in Bosnia & Herzegovina can be potentially useful for offering stability to the limited (and still relatively insular) Bosnian market. However, the site's regional contribution will likely remain marginal and as such should not be seen as a priority, particularly if Bosnia is offered the option to access other storage in the region. The Albanian bid faces difficulties of a different kind:

Albania in fact enjoys more meaningful potential which could be of interest to the wider region, thanks to its theoretical capacity in excess of 1 bcm (excluding LNG infrastructure). However, its complete lack of gasification and pipeline interconnections suggests utilization of these capacities will remain limited in the medium-term unless the TAP project is developed. For this reason, storage development in Albania should be postponed until necessary conditions (i.e. local gas demand and interconnector availability) have been sufficiently met, to the benefit of other more solid projects in the region.

Bulgarian storage projects are among the best candidates in this framework, as successful completion of upgrades at UGS Chiren and construction of greenfield UGS Galata could offer it a combined 2.6 bcm (respectively 0.8 bcm and 1.8 bcm). This capacity can serve both the important domestic gas market in Bulgaria, which is already sizeable and growing, as well as the broader Balkan region. Regional supply opportunities from Bulgaria are of particular relevance to neighbouring former Yugoslav Republic of Macedonia, which is currently dependent on only one supplier (Russia) and one pipeline route (through Bulgaria). Other potential winners from such moves could be Greece, Turkey, Serbia, and Romania, with which Sofia already has and / or is planning pipeline interconnections. Nevertheless, technical and financial challenges could take their toll on project implementation.

Croatia could add value to the regional storage context and hence support supply security, thanks to its existing and planned infrastructure. Croatian storage capacity at Okoli, Grubisno Polje and Beničanci could exceed 3 bcm in coming years (excluding LNG-related storage). If successful, Zagreb will then be in a position to meet both domestic market challenges, as well as make a meaningful contribution to the reliability of supply in the wider region. This will be the case particularly in neighbouring Bosnia & Herzegovina, which remains dependent on Russian supply through Serbia, and is as a result more vulnerable to supply disruption and seasonality effects; but also to any markets in the wider Balkan periphery which may be linked to the Croatian grid through the construction of a regional natural gas network. Working in the opposite direction though, local players may consider current supply arrangements (i.e. Croatia's two entry points) adequate for this market; or instead they may opt for supply from neighbouring storage, notably E.ON Ruhrgas in Hungary; or they may indeed move forward with construction of this infrastructure, but decide to target more profitable gas markets in CEE, thus possibly depriving SEE from (at least a part) of this new supply.

The planned conversion of the South Kavala gas field into a 950-mcm UGS in Greece similarly creates an important storage opportunity of regional significance. The availability of both UGS and LNG would likely improve Greece's reliability as a supplier to the broader region, as it will allow it to free itself from the threat of international cuts in natural gas supply, and also of seasonality effects.

Besides Greece itself, neighbouring Bulgaria probably stands to gain most from the development of South Kavala. The former Yugoslav Republic of Macedonia but also markets even further northwards could likewise benefit in the medium term from Greek gas storage, either directly through the construction of new pipelines, or indirectly by utilization of IGB and interconnections with Bulgaria. However, the bid for UGS South Kavala may face substantial delays due to bureaucratic obstacles, which could undermine regional efforts to improve security of supply in the medium term.

Finally, the suitable geography of Serbia which is located in the heart of the Balkan peninsula, coupled with its growing focus on developing necessary pipeline connections with its neighbours, suggests the country could become a much more important pillar of regional gas supply security. Likely winners from a Serbian emergence as a serious Balkan storage and transit point would be Bosnia & Herzegovina and (later) also the former Yugoslav Republic of Macedonia and Montenegro. UNMIK / Kosovo could also benefit from Serbian supply in the longer term, assuming that the current political issues between Belgrade and Pristina are successfully resolved. Additionally, albeit having sufficient (and growing) capacities of their own, neighbours of Serbia in eastern and central Europe (Bulgaria, Romania, Hungary, Croatia) could theoretically also benefit from the development of such capacities in the central Balkan country. The combined strength of the planned storage sites of Banatski Dvor and Itebej could exceed 2 bcm, offering an incentive to Serbian players to pursue potentially profitable gas trading opportunities with partners across the Balkan region and even wider. But Banatski Dvor's control by Gazprom could complicate matters, despite potentially favourable project economics. Indeed, a number of European institutional / commercial players are likely to remain suspicious of whether operational management there will fit well with EU policy.

In conclusion then: a) development of strategic and commercial natural gas storage is increasingly seen as a means of boosting reliability, with the latter notion including security of supply, balancing, peak demand servicing, and management of relevant gas TOP obligations; b) not all SEE countries have the necessary geology to support the development of necessary and / or useful UGS capacities; c) regional storage options for natural gas (including LNG storage), combined with a real availability of relevant gas pipeline assets could help offset / ease the inherently unequal distribution of resources; d) storage assets in the SEE periphery can make a meaningful contribution to supply security in SEE; e) legally-binding contractual withdrawal minima, regulatory safeguards, & project prioritization may be necessary to boost business case certainty and so to allow development of necessary infrastructure; f) opportunity costs of equivalent options should also be taken into consideration, wherever available; g) utilization of potential Albanian and Bosnian UGS capacities suffers from inherent difficulties and cannot represent a funding or other priority for the SEE region, at least in the short to medium term; h) in contrast, UGS in Bulgaria, Croatia, Greece, and Serbia seems to hold the most potential for SEE;

i) each of these projects is characterized by specific pros and cons and so a diversification policy across all Bulgarian, Croatian, Greek, and Serbian gas storage seems to be the best way forward; and j) of countries with no UGS capacity or potential, the former Yugoslav Republic of Macedonia and Bosnia & Herzegovina will likely enjoy the easiest access to any available storage sites in the region, by virtue of their geographic location and current pipeline interconnections.

However, development of such infrastructure (including pipelines, LNG terminals, and gas storage) represents a very capital-intensive process and can therefore prove problematic, especially during a severe economic downturn and credit crunch crisis such as the one now experienced on a global scale. Active support from international financial institutions and other donor agencies is thus in reality a prerequisite in order for investments described above to move forward and allow convergence with relevant EU rules and regulations. Of at least similar importance in this framework is the establishment of further appropriate regulatory safeguards (notably on the pricing / margin level) which will offer investors a real chance at profitability and return on their investment, prompting them to move forward with such necessary plans. It is to these issues that we now turn our attention.

5. The role of credit and pricing in SEE supply security

Availability of **credit** on favourable terms from regional and International Financial Institutions (IFIs) is a crucial factor in improving overall business case certainty and in supporting the gasification and overall improvements in natural gas supply security in the relatively impoverished post-communist Balkan nations and also Greece, which suffers from a very serious debt crisis. This is even truer now, in the midst of a global economic crisis with still poor credit availability, which continues to impact heavily on the respective national economies of the wider SEE region. Furthermore, countries in the region represent key transit points for inflows of natural gas to the EU, while at the same time themselves already being full members, or at least aiming to become so soon. Finally, there is a clear need to improve overall quality and reliability of energy supply in the region, which is again a precondition in the efforts of those countries to meet EU rules and regulations. Hence, there is evidently an increased role to be played by European lending organisations in the SEE.

To have a realistic shot at improving security of natural gas supply in SEE, the EU needs to continue to lend political and (especially) financial support to major infrastructure projects targeting upgrades in national natural gas grids; construction of additional pipeline interconnections; and expansion of regional storage capacities. Every available financial tool of the EU should be utilized in this context. Intra-regional links which have the potential to bring diversified gas supply are rightly prioritized over pipeline projects which offer only diversified routes, such as South Stream and its branches. Nevertheless, it would be a mistake to rule out in principle support to South Stream, especially in cases where the Russian-backed project may offer the only realistic option for gasification; or when Moscow might be willing to accept reciprocity of access to this and / or related gas infrastructure. Such financial support from the EU could also act as a necessary fiscal stimulus for the troubled economies in SEE, which continue to suffer from the serious regional fall-out from the global crisis.

Funding of bilateral energy projects such as the proposed interconnectors should, at least theoretically, be easier to secure, by virtue of their being less complex than similar larger-scale natural gas pipeline projects which have to transit many countries and / or which consist of multiple stakeholders. Importantly, access to EU funding should not discriminate against non-current member states; especially, when a given project can demonstrate it can contribute to regional security of supply for both current and prospective member-states, for example the Bulgaria – Serbia gas interconnector. This would be in line also with the EU's long-term energy strategy, which states explicitly that any cross-border interconnectors should receive the same attention and policies as intra-EU projects. European funding bodies should also guard vigorously against the possibility of unintentionally interfering with gas market rationalization, in cases where this might be reasonable or even necessary.

E.g. Bulgaria does not necessarily need access to Caspian gas and LNG from both Greece and Turkey, as is currently planned. However, there is a realistic chance European funding will become available to both projects; while other SEE countries (and also EU candidates) lack even basic infrastructure. Therefore, it is important not to create an artificial market framework whereby sub-optimal allocation of limited resources ends up undermining realization of potentially more essential projects.

For example, capital allocation to construction of gas interconnectors with under- / un-gasified markets such as the former Yugoslav Republic of Macedonia, UNMIK / Kosovo, Albania, and Montenegro is probably a preferable target in both human development and pure economic terms; thanks to its ability to support local economic development and also create a more substantial and profitable gas market in the broader region. What is more, EU support to gas supply projects could extend beyond the level of direct financial transfers, for example through offering TPA exemptions, when not contrary to EU rules and regulations. A debate on the potential costs and benefits of an implementation of this approach in the broader Balkan region, including issues such as Article 36 exemptions; cross-border reserve capacity allocation; and replication of missing / insufficient anchor loads is ongoing at the Energy Community and beyond, especially in terms of TPA's ability to facilitate project financing in this cash-strapped environment.

Meanwhile, **pricing** of energy products - notably natural gas, power, and heating - on both the import as well as the local distribution level is a real concern in essentially all SEE countries, and can have a direct impact on the region's gas supply security. This is a result of the relevance of (relatively high) pricing in helping markets attract the natural gas volumes they need from their foreign suppliers. However, large sections of the population in this region are unable to bear the burden of high prices. The contradiction for SEE players thus lies there. If they do not increase prices, they could experience difficulties in securing adequate gas supply from producers increasingly global in their outlook, especially at times of emergency when supply of this needed gas may come at a significant premium. Or they could decide to pay this premium at the expense of their own profitability and investment plans, hence again undermining (even if indirectly) supply security in the markets where they operate.

If, on the other hand, these players decide / succeed in pushing forward with gas, electricity, and heating price increases to cost-reflective levels, they might find themselves facing the prospect of less promising demand growth. This is particularly true in a region such as SEE, where substitution with oil products and also with locally-procured alternatives such as biomass continues to be relevant. Policy-makers in the SEE should be aware of this predicament and seek to optimise their energy mix. Natural gas prices need to be phased towards cost-reflective levels as soon as possible where this is most efficient, notably in the context of CHPs and CCGTs, even before the mandatory 2015 deadline.

Furthermore, parallel measures such as improving bill collection (with or without donor support) can also play a very useful role, as a means of increasing necessary revenue streams and discouraging inefficient energy uses. Finally, direct monetary transfers to selected vulnerable consumers can put in place a necessary aegis over the heads of those who would otherwise unfairly lose from this transition.

More details on the relation between availability of credit and energy pricing on the one hand, and supply security in the SEE are available in the Appendix below (including full references).

6. Conclusions

The degree of South Eastern Europe's (SEE) supply vulnerability became clear during the natural gas crisis of January 2009, when countries in this region suffered due to their lack of systemic access to diversified supply, demonstrating the necessity to develop a regional gas system.²⁶⁸ This could be made easier if SEE succeeds in realising its demand potential and grows substantially from its current low level of approximately 11 bcm (2009). However, uncertainties remain strong as local gas market growth is expected to be defined both by the strength of the ongoing economic recovery, as well as by wider political and institutional considerations. Indeed, on the economic level, the IMF forecasts very divergent growth rates for the broader SEE region; for 2011-2015, these range from below 1.1% per annum for deeply affected Greece, to 4.8% per annum for Serbia. On the political / institutional level, even though strong, support for gasification in SEE is far from unconditional, as a result of the persistence of significant funding and pricing concerns.

In spite of these uncertainties, boosting natural gas storage is a step in the right direction and could contribute towards increased supply security; improved balancing; and more efficient servicing peaks. Even though not every country has the necessary geology, potential storage in SEE and beyond is more than enough to cover regional demand, and could offset this unequal distribution of resources. About 8 bcm of new storage capacity (UGS) for gas has in fact already been proposed in the region, with only a fraction of this being really necessary. Geographical/geological constraints call for the development of an adequate pipeline network, as well as for an optimal allocation of limited resources towards project implementation. Furthermore, contractual withdrawal minima and regulatory safeguards (e.g. access, transmission) may have to be agreed in advance between regional regulators, storage operators, and any TPA users, as a means of ensuring commercial viability. Opportunity costs of equivalent options, wherever available, should also be taken into consideration.

The SEE region also has a powerful incentive to develop LNG import and regasification capacities, but it is not in need of the multiplicity of terminals now proposed (amounting to more than 67 bcm/y). Developers should thus aim at projects which can operate on commercial terms and enjoy advantages such as partner access to capital; partner experience; support from national governments and the EU. The existence of adequate domestic transmission and distribution infrastructure ensuring market access; sufficient interconnections (current/planned) to justify import volumes and maximise regional impact; and economic and flexible deployment of LNG import and regasification assets in the region

²⁶⁸ Note that in this study Romania is not included in SEE; for an explanation of this see Introduction.

will also be important. The latter could be achieved through the employment of the floating regasification and storage (FSRU) option, which is characterised by generally lower development costs and shorter lead times; and by its flexibility to be employed only for as long as needed, and at the size actually needed.

The above has drawn attention to the value of having in place adequate gas transport infrastructure. The potential benefits of currently planned interconnections in the region are multiple and include: greater control by SEE players over pipeline projects of direct importance to them; much more effective regional dissemination of any Southern Corridor supply (through Greece and / or Turkey); easier access to indigenous and emergency extra-SEE gas supply (notably Romania and Hungary); direct access to diversified supply in the form of LNG from Greece, Turkey, and, perhaps, Croatia; the ability to access LNG and underground storage in the SEE region and further afield; and increased negotiating power of players in the Balkan peninsula vis-à-vis foreign natural gas suppliers. Furthermore, the development of a regional interconnection system suggests benefits may trickle down easier to the rest of SEE in this cash-strapped environment. Funding of such projects should also be easier to secure, by virtue of being less complex compared to projects of a larger scale which transit many countries and/or have multiple stakeholders.

However, successful development and transit through SEE of major international pipelines could similarly offer the region advantages in terms of its supply, albeit these are far from being uniform. South Stream offers route diversification and could even help bring additional volumes of gas to SEE, but it fails to make any contribution towards source diversification, which has become an EU priority. Construction of the planned Southern Corridor pipelines could help SEE achieve this diversification, but a phased development (e.g. with ITGI as Phase 1) may be necessary to facilitate realisation. Such an approach could allow adaptation to the existing gas supply and demand framework, and also remove the problematic element of competition between projects which currently hampers progress.

In terms of project implementation including likely evolution and value for the wider SEE region, Greece already enjoys a diversified portfolio, giving access to Russian, Caspian and LNG supply. Moreover, it is planning to expand its flexibility by upgrades in LNG infrastructure (Revithoussa), and also by developing greenfield LNG and UGS (Aegean FSRU and South Kavala, respectively). Thanks to the potential of the abovementioned projects in both commercial and institutional terms, i.e. existence of a sizeable and growing market, expanding regional access, and supply diversification, they enjoy a good chance of completion, to the benefit of the national and regional gas market.

Croatia is similarly well-placed, having in 2010 commissioned a new 6.5 bcm/y pipeline with Hungary; upgraded Okoli underground storage (UGS) capacity at some 630 mcm; and made

headways towards gas grid expansion. Hence, the relatively small Croatian natural gas market of roughly 3 bcm/y now enjoys indigenous production; gas interconnections with Slovenia and Hungary, which gives it access to Italian and CEE gas supply; and upgrades in its natural gas storage capacities, which allow further flexibility and supply security. In fact, Croatia has gone from 100% gas supply dependency on Russia until 2010, to 0% in 2011. Therefore, as with Greece, gas supply security for Croatia should now be considered to be a reality, with the country not necessarily in need of additional pipeline gas or LNG supply sources.

Meanwhile, Bulgaria and through interconnection also the former Yugoslav Republic of Macedonia, are currently exposed to supply disruptions, but are relatively close to overcoming this through Interconnector Greece-Bulgaria (IGB), which is supported strongly by Sofia, Athens, and Brussels (and also enjoys EU financial backing). IGB will give Sofia and interconnected Skopje access to diversified Greek supplies. The planned gas interconnection between Bulgaria and Romania similarly stands a good chance of implementation, by virtue of allowing access to the considerable Romanian import, upstream, and storage resources. Planned upgrades at Bulgaria's Chiren UGS are also likely, as a consequence of the project's brownfield economics; strong political support; and EU funding. Hence, Sofia and Skopje will possibly overcome their current gas supply difficulties by mid-decade, even if Bulgaria fails to realise its other projects by that time (including LNG and storage), which in reality is very possible due to project overlap and challenging economics.

At a later stage, these benefits could be shared by means of a new interconnector with Serbia as well, albeit for the moment Belgrade is likely to remain dependent on Russia for its supply of natural gas. Substantial development of UGS Banatski Dvor by Russia and Serbia (which is already in progress) could be realised within the coming five years, and will contribute to Serbian security of supply, provided the wider South Stream gas pipeline project moves forward as planned in the SEE region. Still, the regional impact of Banatski Dvor will probably remain limited due to its Russian supply. The Itebej UGS may prove more difficult to build if Banatski Dvor is successfully developed, regardless of availability of EU funding. Moreover, in all probability, Itebej requires realisation of the aforementioned Bulgaria – Serbia gas interconnector, in order to provide it with non-Russian supply.

Bosnia & Herzegovina will most probably remain under threat until an even later stage of development, i.e. until after completion of the planned IGB and Bulgaria – Serbia interconnectors, which would allow it access to diversified gas supply from Greece, through neighbouring Serbia. Alternatively, Bosnia & Herzegovina could improve its gas supply security much more quickly by means of developing a planned interconnection with already well-diversified Croatia; this move would also offer Bosnia & Herzegovina access to the now expanded Croatian natural gas storage.

Montenegro, Albania, and UNMIK / Kosovo are unlikely to achieve gasification before mid-decade, and certainly not before other gas transportation projects, which allow supply synergies, come online; e.g. these countries developing and linking their local natural gas grids with offshoots of broader international gas pipeline projects such as South Stream, Nabucco, ITGI and TAP / IAP.

Because SEE will not be in a position to support such capital-intensive projects due to overall low gas demand levels, problematic ability to pay, and erratic demand growth patterns, policy-makers and researchers focusing on this region should also scrutinise potential alternative policy responses to its supply problems, including the role, nature, and prioritisation of EU funding; the relevance of unconventional gas; the value and potential of renewables penetration in the energy mix; and gas demand management options. Following up on the work of Aleksandar Kovacevic and others on this matter, the latter could comprise regulation of building construction to reduce demand peaks, rendering fluctuations much easier to handle; fundamentally overhauling district heating systems to make them much more efficient; and considering heat pumps as a major source of energy supply.

Appendix

Investment details of planned SEE regasification

As mentioned above, **Albania** does not currently have a gas industry. However, in recent years there has been a string of suggestions for the development of LNG infrastructure and associated projects aimed at supplying both the domestic Albanian market as well as its wider periphery, notably Italy. These have tended to focus on construction of LNG terminals, development of an effective gas grid and interconnectors, and on gas-fired power plants for development of export-oriented infrastructure. The geographic centre of attention in this context has been the area around river Vjosa / Aoos in Fieri, roughly 100-km south-west of the capital Tirana (*see maps 8-11 above for its location and context*). The EU has generally been welcoming to these initiatives which it sees as a good fit with its own ongoing efforts at boosting European security of supply. In October 2009, the European Commission reiterated support to Albanian energy projects, including LNG terminals, through EBRD and EIB.²⁶⁹

More specifically, in April 2006 ASG Power, an international consortium with no LNG experience, signed an MoU with the Albanian government on the investment of some EUR 1.5 billion in Seman, Fieri towards: a) construction of an LNG regasification terminal with an initial capacity of 10 bcm/y, which could be expanded to 20 bcm/y in the longer term; b) development of a 120-km subsea gas interconnection between Fieri and Brindisi, Italy with a transport capacity of approximately 8 bcm/y; c) building in phases a 1,200 MW natural gas-fired CCGT unit (some 400 MW capacity in phase 1); d) building electricity interconnections with third countries of up to 500 KV. The 2006 agreement between ASG Power and Tirana also laid out the principles for marketing the terminal's output, with approximately 80% of its envisaged 10 bcm/y destined for the more profitable Italian market through the planned Fieri - Brindisi pipeline. The remaining 20% was intended to feed the domestic Albanian gas market at below market prices, particularly the planned 1,200 MW CCGT.²⁷⁰

In terms of supply, ASG Power hoped to attract LNG cargoes from Qatar, Oman, and Algeria, but binding contractual agreements - or at least detailed negotiations - on this issue have yet to be seen. Moreover, despite the fact the Seman terminal was originally expected to come online by end-2009, so far the international consortium has invested only EUR 11 million in preliminary studies. As part

²⁶⁹ ISI Emerging Markets, *EU Pledges Support for Energy Sector Development*, 12 October 2009, www.securities.com ; Staffetta Quotidiana, *LNG, EGL-TEE-ASG Green Light in Albania*, 29 March 2007, www.staffettaonline.com

²⁷⁰ Information on Seman LNG from Balkans Business News, *The biggest LNG hub in Europe is scheduled to be presented in Albania today*, 6 May 2010, www.balkans.com ; LNG Unlimited, *Second contender comes to surface on Albanian coast*, 19 December 2008, www.lngunlimited.com ; Platt's LNG Daily, *Falcione says it has done proper studies for proposed Albanian terminal*, 16 December 2008, www.platts.com ; and Albanian Economy, *Our race is against time and bureaucracy, ASG Power CEO Says*, 2 March 2007, www.albanianeconomy.com;

of the latter, Italian oil & gas contractor Saipem has carried out the terminal's design and it has also been given right of first refusal for its Engineering, Procurement, and Construction (EPC). ASG Power now claims Seman LNG will be operational by end-2013. However, even this seems too optimistic as the project continues to suffer from serious gas supply problems; from uncertain demand and pricing patterns in Albania and wider; and from a lack of partner experience in the LNG business (albeit the latter could be solved by being taken over by a more experienced player at a later stage).²⁷¹

By the same token, in December 2008, Trans-European Energy BV / Falcione Group of Italy signed a EUR 1 billion agreement for the construction of an LNG terminal near the town of Levan in Fieri. Gruppo Energia Falcione has been active in the Italian natural gas market for approximately 20 years, where it distributes up to 1 bcm/y. Despite (like ASG Power) not having any direct LNG experience, Falcione brings the benefit of a long-term relationship with Algerian upstream operator Sonatrach. Since 2008, Falcione and Sonatrach have entered a contractual relationship which provides for the delivery of 500 mcm/y of Algerian gas to 2019, which could be extended for another 7 years to 2026. Other supply options are reportedly to be under consideration. The Levan LNG terminal is designed with a capacity of some 8 bcm/y (2-tank storage, 280,000 cu.m.) and could be expanded to as much as 12 bcm/y in the future through construction of a third tank. It will be able to receive ships of up to 140,000 cu.m and will be linked to the Italian gas market by means of a 120-bar subsea pipeline.²⁷²

In terms of regulatory and technical progress, Falcione has already signed a 30-year concession agreement with the Albanian government for the terminal and its associated marine infrastructure. Preliminary studies for the subsea pipeline have also been completed and the company is now pushing forward with securing all environmental permits for a related 17-km onshore pipeline section in Italy, as well as with its basic design study. As in the case of the ASG Power project above, the initial agreement of Gruppo Energia Falcione with Tirana provides for the supply of the domestic Albanian market with natural gas at below market prices. However, their agreed minimum of some 500 mcm/y is well below the 2 bcm/y pledged by its competitor. The rest of its output has unsurprisingly been agreed to head to the Italian downstream gas market.

²⁷¹ For more information on the Albanian and regional demand patterns and pricing environment see the introductory and pricing chapters of this paper respectively.

²⁷² Information from LNG Unlimited, *Falcione ponders quick fire-floater*, 23 April 2010, www.lngunlimited.com; Energia Falcione, *Gruppo Falcione signs a 1 bn Euro Agreement with the Albanian government for an onshore regasification terminal near Levan*, 9 January 2009, www.energiafalcione.com; LNG Unlimited, *Second contender comes to surface on Albanian coast*, 19 December 2008, www.lngunlimited.com; Platt's LNG Daily, *Falcione says it has done proper studies for proposed Albanian terminal*, 16 December 2008, www.platts.com; Albanian Economy, *Falcione ready to build 1 bn Euro re-gasification plant in Albania*, 3 December 2008, www.albanianeconomy.com; ICIS Heren, *Italian Gruppo Falcione signs deal for 8 Gm³/Yr LNG Site in Albania*, 2 December 2008, www.heren.com;

Importantly, in April 2010 it emerged that Falcione was actively considering an FSRU as a temporary substitute to its Levan onshore terminal, which it does not expect before 2014/2015 (probably still optimistic). In contrast, a FSRU could allow imports of diversified LNG cargoes to Albania from as early as 2012. In any event, Falcione claims that a final investment decision on the fate of its onshore terminal should be expected once the approval process in Italy has made sufficient progress.

Swiss company EGL also holds a licence for the construction a new regasification terminal in Fieri, and for linking it with the Italian market through its planned TAP. But like ASG Power and Falcione, EGL has failed to record real progress and to get this project off the ground. Against this backdrop, in March 2009 Albanian and Qatari officials discussed the possibility of a EUR 2.5 billion energy investment in Fieri including development of a greenfield LNG terminal; of a 1,200 MW CCGT; and of associated marine infrastructure. However, Qatar already enjoys regasification capacity in Italy and its commitment to an Albanian LNG project is far from assured.^{273 274}

Already enjoying diversified seaborne crude supply through its Omisalj import terminal on Krk, political and commercial players in **Croatia** would like to see this flexibility extended to gas as well. Such flexibility would improve supply security, while offering trading opportunities in the region. Against this background, in October 2007 German companies E.ON Ruhrgas and RWE; French major Total; Austrian integrated OMV; and Slovenian state-owned operator Geoplin formed the Adria LNG consortium, which aims at developing Croatia's first LNG import and regasification facility.

As with the country's crude oil import infrastructure, Adria LNG is to be located on the island of Krk. The greenfield terminal will be equipped with a jetty capable of receiving LNG tankers of up to 265,000 cu.m. and also with two aboveground, full-containment storage tanks of approximately 195,000 cu.m. each. This infrastructure will ultimately be complemented by the addition of a third tank of the same size, allowing the terminal to reach a combined storage capacity of roughly 585,000 cu.m. (3 x 195,000). Adria LNG expects its terminal to receive an average of 100 cargoes/year, of 140,000 cu.m each. If such planning proves realistic, this would give it an average regasified output of almost 8.5 bcm/y, and hence a utilization rate in excess of 55%, compared to its envisaged full capacity of 15 bcm/y. Adria LNG reportedly wants to utilize a third of this capacity towards supplying the domestic natural gas market in Croatia, with the remainder destined for Italy and other key markets in the broader CEE, notably Slovenia, Hungary, and Austria. Adria LNG has already received its environmental permit, and is now working towards obtaining a location permit (which it was

²⁷³ Balkans Business News, *Qatar Eyes Albanian LNG Regasification Project, Tirana to Open Embassy in Doha*, 12 March 2009, www.balkans.com

²⁷⁴ Full details on Bulgarian LNG projects are included in the relevant section above.

hoping to secure by end-2010). Additionally, in October 2009 the Adria partners awarded FEED to GDF-Suez subsidiary Sofregaz. Development costs for the Adria terminal are estimated at between EUR 600 and EUR 800 million, even though this price range looks relatively low for the project's envisaged size and capacities. Zagreb is hoping for partial EU funding to facilitate completion.²⁷⁵

Despite lacking a clear competitive advantage such as already contracted gas volumes, Adria theoretically stands in a better position than the abovementioned Albanian and Bulgarian projects. This is the result of the strong membership of the Adria consortium, which includes important energy players with global reach and experience in the LNG business. For example, Total is the world's fourth-largest listed gas producer and also boasts substantial LNG experience. Indeed, the French company enjoys supply from a global liquefaction base including LNG trains in Norway, Qatar, Yemen, Angola, and Nigeria. At the same time, it has access to a global regasification portfolio which ranges geographically from its native France (at Fos Cavau and the delayed Dunkirk), to the UK (South Hook), Mexico (Altamira), the US (Sabine Pass), India (Hazira), and China. Another important Adria partner, E.ON Ruhrgas, has now been selected as lead investor for an upstream project in Equatorial Guinea, which it wants to use as a basis for local liquefaction capacity. Additionally, the company has prequalified as a core investor in the south-eastern concession area of the Nigerian Gas Master Plan, with liquefaction infrastructure development once more in its sights. With regard to regasification capacity, E.ON Ruhrgas has faced delays but is now working towards realizing agreed access to the Isle of Grain (UK); to Gate Terminal (Netherlands); to the offshore LNG Toscana (Italy); and to Wilhelmshaven (Germany); albeit not necessarily all of these plans will finally materialise.²⁷⁶

The inclusion in Adria of such LNG players as Total and E.ON Ruhrgas, but also of important regional players like RWE, OMV, and even Geoplin, suggests that the consortium could draw on this combined brand appeal, as well as on its members' existing reach over liquefaction assets worldwide to strengthen the project's market positioning vis-à-vis both competitors and potential suppliers. Furthermore, the international composition of the Adria consortium facilitates and lends credibility to

²⁷⁵ Information from Upstream Online, *Croatia champs at LNG bid*, 9 December 2010, www.upstreamonline.com ; Upstream Online, *Croatia weighs FLNG option*, 18 October 2010, www.upstreamonline.com ; Energy Community, *Progress report on gas projects – contracting parties neighbourhoods*, Paper presented at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org ; Upstream Online, *Adria LNG team pushes for Croatia permit*, 21 May 2010, www.upstreamonline.com ; ISI Emerging Markets, *LNG terminal assessed as environmentally acceptable*, 26 March 2010, www.securities.com ; Energetika.net, *Are Croatian companies finally uniting for Adria LNG*, 16 March 2010, www.energetika.net ; ISI Emerging Markets, *LNG Terminal – Strategic Interest for Croatia*, 6 July 2009, www.securities.com

²⁷⁶ Information from Total, *About Total -our businesses: liquefied natural gas*, accessed 15 November 2010, www.total.com; and E.ON. Ruhrgas, *Strategy and key figures 2010: pan-European gas market unit*, www.eon.com

the terminal's significant export dimension, as Adria partners seek to protect existing CEE market positions against the dominance of Russian pipeline gas, through independent LNG supply.

However, the composition of the Adria LNG team can at the same time be a partial drawback for it. First, the abovementioned assured access of the Adria partners to regasification sites in Europe and wider suggests that these players retain substantial degrees of LNG marketing flexibility and, as a result, may opt to divert cargoes to more profitable markets outside SEE, or even Europe as a whole. Second, the international reach of the Adria partners can lead to conflicts of interest with other projects. For example, OMV is a key stakeholder also in the Nabucco pipeline project, which among other objectives seeks to market gas in the wider CEE, including to some of the very markets targeted by Adria LNG. Furthermore, the Croatian project is expected to face strong competition in its target markets from a number of supply projects, including South Stream, ITGI (and its branches), and TAP.

An additional potential weakness for Adria LNG is the fact that, despite strong support from Zagreb, the project has experienced difficulties in attracting key domestic gas partners in its stakeholder team. At the time of the consortium's formation in 2007/2008, Zagreb asked Industrija Nafta (INA), HEP, and Plinacro to form conglomerate Hrvatska LNG and thus enter Adria as a single bloc with a 25% stake. However, this has proven more difficult than anticipated, due to disagreements over the exact size (25% was seen as too low by INA) and also over its distribution between the three Croatian partners. This has in turn led to institutional bickering, causing serious delays in the project's implementation. In October 2009, RWE decided to withdraw, divesting its 16.69% stake to its former Adria partners; and in April 2010 the planned partnership between INA, HEP, and Plinacro formally fell through. INA was then considering the possibility of joining the Adria project with an independent 14% stake, while in June 2010 HEP and Plinacro formed a 50/50 JV and entered negotiations on a possible 11%. Completion has been postponed to 2017 from 2014, with final investment decision not before 2013. The consortium has denied speculation this may be a first step towards ultimate project cancellation, citing the negative market context due to the global economic crisis as the main cause of this delay. But in December 2010, local media reported that the foreign partners had already abandoned Adria, closing down their Zagreb office. The Croatian government has grown impatient with shareholder uncertainties and it has been suggested it will find new partners in case of failure to achieve progress. The ownership structure of Adria LNG is at the moment E.ON Ruhrgas 39.17%; OMV 32.47%; Total 27.36%; and Geoplin 1%.²⁷⁷

²⁷⁷ Information on matter from ISI Emerging Markets, *LNG terminal falls through*, 26 December 2010, www.securities.com; ISI Emerging Markets, *Adria LNG falls apart, Plinacro to build a platform for EUR 50 m*, 26 December 2010, www.securities.com; ISI Emerging Markets, *Adria LNG project abandoned?*, 23 December 2010, www.securities.com ;

These complications and delays in Adria LNG have also given rise to discussions on alternative plans. These initially revolved around the possible construction of a 10 bcm/y greenfield terminal (USD 700 million) some 400-km to the south of Omisalj, in Rogotin near the port of Ploce. The Croatian government has offered a cautious welcome to Ploce, which it arguably sees as a useful fallback in case the preferred Adria fails to pull through. The project has so far failed to finalise partner arrangements though. MOL/INA, HEP, Plinacro, and also Gas Natural have all been tipped as potential investors, with Algeria, Qatar, and Iran featuring as Ploce's potential suppliers and / or even as co-investors. However, Gas Natural has already denied any interest in this project, while in reality it remains very unlikely that Qatar and Iran will be able to supply and / or finance Ploce, for different reasons. Hence, Ploce LNG is a gas project with no defined, or even a realistically proposed, partner structure; a project which has not secured supply, nor is it likely that it will be able to do so in the near future; and which has failed even to start the relevant permitting process. Therefore, Ploce remains very far indeed from implementation and cannot be considered to pose any significant threat to Adria.²⁷⁸

In light of the abovementioned difficulties for Adria and (even more) for its proposed substitute Ploce, in October 2010 it emerged that Plinacro was considering proceeding with a FSRU for LNG instead. Local reports refer to the possible development of a 6 bcm/y to 8 bcm/y terminal off Omisalj on Krk, as an interim solution until the main Adria LNG project has been completed. Plinacro is reportedly now in search of partners for Krk FSRU, preferring those participating in the Adria LNG project. However, in April 2011 the Croatian government claimed there is preliminary interest in Krk LNG from four investor groups (including Israeli), with the onshore option still being on the table.

At the same time though, Zagreb has suggested that a much smaller FSRU of 2.5 bcm/y capacity, aimed primarily at meeting the needs of the domestic natural gas market, was also very much on the

Upstream Online, *Croatia champs at LNG bid*, 9 December 2010, www.upstreamonline.com ; ISI Emerging Markets, *Construction of LNG terminal to be delayed until 2017*, 2 July 2010, www.securities.com ; ISI Emerging Markets, *Construction of LNG terminal postponed for 2017*, 23 June 2010, www.securities.com ; Upstream Online, *Croatia eyes gas pipe projects*, 14 June 2010, www.upstreamonline.com ; ISI Emerging Markets, *Gas operator Plinacro, utility company HEP set up LNG Hrvatska*, 2 June 2010, www.securities.com ; Upstream Online, *Croatia talks down LNG delays*, 25 May 2010, www.upstreamonline.com ; Energetika.net, *INA, Plinacro, HEP finally joining Adria LNG*, 11 May 2010, www.energetika.net ; Limun.hr, *No government controlling stake in LNG Adria*, 2 April 2010, www.limun.hr ; ISI Emerging Markets, *Partners to negotiate separately on Adria LNG terminal*, 15 March 2010, www.securities.com ; ISI Emerging Markets, *PM Kosor dismisses rumour of delayed Adria LNG terminal construction*, 28 January 2010, www.securities.com ; ISI Emerging Markets, *Adria LNG project safe*, 16 December 2009, www.securities.com ; ISI Emerging Markets, *Adria LNG ownership structure changes after departure of RWE*, 11 December 2009, www.securities.com ; Upstream Online, *Adria LNG Shrugs Off RWE Exit*, 27 October 2009, www.upstreamonline.com

²⁷⁸ More information available in Croatian Times, *Spanish company denies being interested in building LNG terminal near Ploce*, 10 June 2010, www.croatiantimes.com ; in LNG World News, *Croatia: Spain and Iran planning to construct LNG plant near Ploce*, 8 June 2010, www.lngworldnews.com ; and in ISI Emerging Markets, *LNG terminal near Ploce*, 8 June 2010, www.securities.com

cards. In any event, advantages of the FSRU option are its lower cost and ability to move forward fast, which allows it to protect Croatia's competitive positioning against the adjacent Trieste LNG in Italy. The Croatian government already as of December 2010 has given its approval to Krk FSRU.²⁷⁹

Greece is the only country in the Balkans with LNG import capacity, which it has enjoyed since 2000. Specifically, Greece imports LNG through its Revithoussa terminal, located on the homonymous islet in the gulf of Megara, some 45-km west off Athens. The terminal is owned and operated by DESFA. It is equipped with a 14.5 MW co-generation unit aimed at covering its own power needs; maximum vessel tonnage / length / draft at 130,000 cu.m / 290-m / 11.8-m respectively. Revithoussa has two storage tanks with a capacity of 144,000 cu.m, (130,000 cu.m recoverable) and injects natural gas into the national gas system at the Agia Triada entry point, to which it is connected through two 20-inch subsea gas pipelines of 510-m and 620-m respectively. Theoretical entry capacity there stands at some 580×10^3 Nm³/hr; 12.5 million Nm³/d; 4.6 bcm/y; while theoretical regasification capacity at Revithoussa is roughly 1,000 Nm³/hr (1,250 Nm³/hr peak). Hence, theoretical import and regasification capacity at Revithoussa is in excess of some 5 bcm/y.²⁸⁰

However, Revithoussa continues to be unable to realize its full theoretical regasification potential for a number of reasons, but notably lack of adequate levels of LNG storage capacity. Therefore, RAE estimates real import capacity through Agia Triada / Revithoussa at some 2 bcm/y, which results in a very low utilization rate of about 45%. The RAE calculation tries to factor into its utilization estimate the abovementioned storage and other extraneous limitations such as weather. Therefore, it is built on the assumption that only a relatively small LNG tanker of some 75,000 cu.m capacity would be able to berth and unload at the Revithoussa terminal, and indeed no more often than once every eight days. But there are estimates which (plausibly) bring its import capacity and ensuing utilization higher, even though still far from its theoretical capacity.²⁸¹

Against this backdrop, in May 2009 DESFA assigned to GDF-Suez engineering subsidiary Sofregaz, a feasibility study on possible upgrades at Revithoussa, notably with regard to its storage capacity.

²⁷⁹ Info from LNG World News, *Croatia cannot wait for Adria LNG decision*, 28 April 2011, www.lngworldnews.com; Reuters, *Croatia says cannot wait for Adria LNG*, 28 April 2011, www.reuters.com; ISI Emerging Markets, *Adria LNG falls apart, Plinacro to build a platform for EUR 50 m*, 26 December 2010, www.securities.com; Bloomberg, *Croatia approves plan to install floating LNG terminal on Krk*, 21 December 2010, www.bloomberg.com; Upstream Online, *Croatia weighs FLNG option*, 18 October 2010, www.upstreamonline.com; ISI Emerging Markets, *We're building mini terminal because Italians were faster*, 18 October 2010, www.securities.com; and ISI Emerging Markets, *Plinacro preparing contingencies for LNG on Krk*, 27 September 2010, www.securities.com

²⁸⁰ ΥΠΕΚΑ, *Μετατροπή του υπό εξάντληση κοιτάσματος φυσικού αερίου «Νότιος Καβάλα» (South Kavala) σε αποθηκευτικό χώρο φυσικού αερίου*, December 2010, www.ypeka.gr; DESFA, *Το εθνικό σύστημα φυσικού αερίου*, www.desfa.gr; and RAE, *Report on the security of natural gas supply in Greece*, 2009, www.rae.gr; and other local sources

²⁸¹ RAE, *Report on the Security of Natural Gas Supply in Greece*, 2009, www.rae.gr

This study has now been completed and DESFA has decided: a) to construct a new 95,000 cu.m tank, hence bringing total available LNG storage capacity at the Revithoussa terminal up to 225,000 cu.m; b) to increase the send-out rates at the terminal by an extra 40%, i.e. to approximately 1,400 Nm³/hr; c) to adjust berthing facilities so that they can receive larger tankers with up to 180,000 cu.m tonnage; and d) to complement this upgrade by boosting Agia Triada capacity by ~ 55% to 19.5 million Nm³/d. These upgrade works are to be completed by 2014 / 2015 from an earlier envisaged deadline of 2013, at estimated costs of approximately EUR 160 million (with NSRF financial support and EIB loans).²⁸² Assuming that one 180,000 cu.m vessel is able to reach Revithoussa and unload its full cargo every eight days upon completion and streaming of the above upgrades, real send-out rates at Revithoussa could reach almost 1,000 Nm³/hr. That would give the terminal a real capacity of almost 5 bcm/y.

Importantly, the market relevance of Revithoussa capacities has increased substantially since 2010, during which time liberalisation has allowed independent cargoes to reach the terminal for the first time; this trend was (and continued in 2011 to be) supported by favourable pricing in the spot LNG market. According to local sources, there have already been expressions of interest from various (unnamed) Bulgarian and Turkish operators for capacity allocation of approximately 0.5 bcm/y each. By the same token, local gas players have proposed that DESFA should lease Floating Storage Units (FSUs) as an interim solution until the completion of the abovementioned upgrades at Revithoussa, with the aim of injecting further flexibility into the terminal's ability to receive larger LNG cargoes.²⁸³

Furthermore, DEPA is examining the possibility of forming an international JV including suppliers, which will work together towards an export-oriented greenfield terminal in N. Greece (Aegean LNG). The export potential of the latter is to be realised through the utilisation of similarly export-oriented natural gas interconnectors IGB and ITGI, both of which pass close to the proposed terminal location. Operator DEPA has already taken over about 33% of the local Phosphoric Fertilizers Industry (PFI), in partial fulfilment of an outstanding debt of PFI to the Greek gas operator worth EUR 50 million. Importantly, the fertiliser company owned a 250 hectare site in the northern Greek area of Kavala, which DEPA saw as a potentially suitable site for the construction of its new regasification terminal.

²⁸² Energia.gr, *Ενεργειακές επενδύσεις 1 δις ευρώ εντάχθηκαν στο πρόγραμμα δημόσιων επενδύσεων*, 4 March 2011, www.energia.gr ; ΥΠΕΚΑ, *Μετατροπή του υπό εξάντληση κοιτάσματος φυσικού αερίου «Νότιος Καβάλα» (South Kavala) σε αποθηκευτικό χώρο φυσικού αερίου*, December 2010, www.ypeka.gr ; Energy Press, *ΔΕΣΦΑ: αναβαθμίζει το διεθνή ρόλο του μέσω ... Ρεβυθούσας*, 6 October 2010, www.energypress.gr ; DESFA, *Δρομολογείται η κατασκευή νέας δεξαμενής στη Ρεβυθούσα*, 5 October 2010, www.desfa.gr ; DESFA, *Ανατέθηκε η μελέτη για την κατασκευή της τρίτης δεξαμενής στη Ρεβυθούσα*, 29 May 2009, www.desfa.gr

²⁸³ Kathimerini, *Πάνω από 50% της αγοράς φυσικού αερίου θα καλύψει η Ρεβυθούσα το 2011*, 24 November 2010, www.kathimerini.gr ; Energy Press, *Το ένα στα δύο φορτία φυσικού αερίου του 2011 θα είναι LNG*, 11 November 2010, www.energypress.gr ; Energy Press, *ΔΕΣΦΑ: αναβαθμίζει το διεθνή ρόλο του μέσω ... Ρεβυθούσας*, 6 October 2010, www.energypress.gr ; Energia.gr, *Επιτάχυνση της αναβάθμισης της Ρεβυθούσας και εκδήλωση ενδιαφέροντος από Τουρκία και Βουλγαρία για χρήση των εγκαταστάσεων*, 5 October 2010, www.energia.gr

What is more, the Greek operator has already completed with success a preliminary geological survey to determine suitability of the proposed site.²⁸⁴

Additionally, DEPA has completed a pre-feasibility study on the relevance of an offshore concept. The Kavala area seems to retain its competitive advantage even in the offshore framework though, thanks to some scope for gas storage in the form of depleted fields, in and around Prinios in Thasos. The main advantages of the offshore option compared to a conventional onshore LNG terminal are its offered flexibility in terms of size and availability, as well as its lower cost. Such an option could also offer enough geographical mobility to allow DEPA to provide natural gas feedstock to PPC for its power plants in Crete in substitution of gasoil, in line with its declared objective (*see below*). Regasification capacity at the new Aegean LNG terminal will likely stand at 4 bcm/y - 6.8 bcm/y. Project completion is envisaged by 2013/2014 at an estimated cost of USD 350 to USD 700 million, depending on the terminal's actual size, the specific type of project, and also its final configuration. Exemption from obligations for TPA is considered to be a strong possibility for this project. Independent players like Mytilineos have also expressed interest in developing FSRU capacities.^{285 286}

Furthermore, in December 2009 state-owned Qatar Petroleum International (QPI) and other partners reportedly expressed interest to the Greek government in a EUR 10 billion investment at Astakos port, including an LNG terminal. Parts of this Qatari interest were publicised in March 2010, under which QPI were to hold a 23% share; QEWG a 11% share; CCC subsidiary Shabbagh & Khoury 33%; and Rosebud Energie Deutschland 33%. In April 2010, Greek media speculated that GDF-Suez too might be interested in joining this project, while Athens was striving to speed up the permitting process in order to facilitate the investment.

Specifically, preliminary QPI plans referred to construction of a 7 bcm/y terminal at Astakos, including development of related storage and a gas pipeline link to ITGI to allow exports from it; upgrades at Astakos port; development of synergistic Carbon Capture and Storage (CCS) and of an algae-based biofuels plant; and construction a greenfield 1,010 MW export-oriented power plant and

²⁸⁴ More in Harry Sachinis, *Public Gas Corporation (DEPA) SA: business opportunities with DEPA*, Paper presented at the '15th Energy Conference', Athens, 22-23 November 2010, www.iene.gr; and also in Imerisia, *Διπλό ενδιαφέρον για τον ελληνικό αγωγό*, 14 April 2009, www.imerisia.gr

²⁸⁵ As above and also Global LNG Monitor, *Greece plans Aegean LNG terminal*, 31 March 2011, www.newsbase.com; Spiros Paleoyannis, *Meeting the gas supply and market integration challenges in SE Europe*, Paper presented at the European Gas Conference, Vienna, January 2011; Upstream Online, *DEPA eyes floating LNG terminal*, 22 June 2010, www.upstreamonline.com; and Energia.gr, *ΔΕΗ: Προχωρεί στην εισαγωγή υδροποιημένου φυσικού αερίου*, 9 June 2010, www.energia.gr

²⁸⁶ For the potential regional role of a new LNG terminal in northern Greece in commercial as well as security of supply terms see above and also Spiros Paleoyannis, *The pioneer role of Greece and DEPA SA towards a secure integrated gas market in SE Europe*, Paper presented at the 10th Turkish International Oil & Gas Conference, Ankara, March 2011.

relevant electricity interconnections. The power plant would target the profitable Italian market for 70% of its output, and use LPG as its feedstock. However, LPG represents an atypical feedstock for power plants, and there was wide speculation at the time that Qatar would offer it at a substantial discount as a result of its own excess production. Importantly, there was no firm commitment from the Qataris for the supply of Astakos LNG. Nevertheless, their preliminary interest was confirmed in a (non-binding) MoU in May 2010.²⁸⁷

The Astakos LNG project suffered from a number of drawbacks from its inception, and in particular: a) the problematic nature of LPG as a feedstock with regard to power plants (especially in the EU), notably safety, high CO₂ emissions and also a threat of *de facto* price dumping to make it competitive; b) the lack of a clear and binding LNG supply commitment from Qatar at regionally affordable prices; c) the large size of the proposed terminal (7 bcm/y) and excessive dependence on the Italian market; d) and project reliance on the development of a so far non-existent gas interconnection with Italy. Against this backdrop, in October 2010 the project fell through, as the two Qatari companies involved (QPI and QEWC) formally withdrew from the project due to concerns as to its feasibility.²⁸⁸ Nevertheless, in January 2011, Theodoros Pangalos, the Vice-President of Greece, claimed that Qatari interest in a potential major energy investment (including LNG) at the port of Astakos was still there, even though not necessarily in the form earlier discussed.²⁸⁹

In addition, DESFA and PPC have been considering construction of a regasification terminal in Crete, as this relatively large island with corresponding demand levels remains unconnected to Greece's main electricity grid, and as such is dependent on expensive gasoil for its power generation. Therefore, PPC is examining the option of an LNG import and regasification terminal there; of a gas pipeline network; and of two CCGTs of a combined 500 MW to substitute gasoil generation. Following a period during which interest in this project had dissipated due to relatively low oil prices, in late 2010 PPC revived it and took some preliminary steps towards its ultimate implementation. Crete LNG aims at capturing a ready market through long-overdue substitution of increasingly expensive oil products in power generation. However, developing a subsea cable connection to

²⁸⁷ Kathimerini, *Πως η επένδυση από το Κατάρ ναυάρησε ανοιχτά του Αστακού*, 24 October 2010, www.kathimerini.gr; Energy Press, «Σφραγίζεται» ο εξαγωγικός χαρακτήρας της μονάδας του Αστακού με την άδεια παραγωγής του ΥΠΕΚΑ, 14 October 2010, www.energypress.gr; Kathimerini, *Από «κόσκινο» περνάει το Υπ. Περιβάλλοντος την επένδυση σε Αστακό*, 6 October 2010, www.kathimerini.gr; Eleftherotypia, *Σκιές στην επένδυση του Αστακού*, 20 June 2010, www.enet.gr; Capital.gr, *LPG: το καύσιμο του Αστακού που αποφεύγουν οι Ευρωπαίοι*, 9 June 2010, www.capital.gr; Imerisia, *Χρόνοι ρεκόρ για την επένδυση του Κατάρ στον Αστακό*, 22 May 2010, www.imerisia.gr; Energia.gr, *Συζητήσεις για είσοδο της Gaz de France στο project του Αστακού*, 9 April 2010, www.energia.gr; Energia.gr, *Επαφές με το Κατάρ για επενδύσεις στις ελληνικές υποδομές φυσικού αερίου*, 4 March 2010, www.energia.gr

²⁸⁸ Imerisia, *Ναυάρησε η επένδυση του Κατάρ στον Αστακό*, 20 October 2010, www.imerisia.gr

²⁸⁹ Energia.gr, *Θ. Πάγκαλος: Ξανανοίγει το θέμα της επένδυσης του Κατάρ στον Αστακό*, 17 January 2011, www.energia.gr

mainland Greece as a means of covering local needs in electricity now seems to be the government's preferred choice, as a result of envisaged cost and environmental advantages.²⁹⁰

In parallel, the Greek government and PPC have reportedly been examining the possibility of direct imports of CNG from Egypt to Crete through MEDGAS. The latter, which is a 60–30–10 consortium between Greek group Copelouzos, Egyptian EGAS, and Arabia Gas reportedly signed an MoU with PPC to that end in May 2009, namely to evaluate its proposal for direct CNG imports to Crete.²⁹¹ This could prove a cheaper alternative given it has no need for costly infrastructure development. However, the technology for CNG transport has not yet proven itself to be commercially viable and, if it were indeed to move forward, it could be the first such commercial application in the world.²⁹² Against this backdrop, Athens has indicated to Cairo its willingness to assess its proposal on technical and economic grounds, and see if it would be interested to take it forward.

Finally, in January 2011 it emerged that Copelouzos was seeking to develop new export-oriented LNG import and regasification capacity in the vicinity of Alexandroupolis, in northern Greece. According to local sources, Copelouzos has already submitted an application for the establishment of an independent gas system to that end. Alexandroupolis LNG is reportedly planned as a 3 bcm/y floating terminal, with up to 145,000 cu.m in storage, and 500 Nm³ / hr in regasification capacity. The terminal is planned to be located roughly 12-km offshore, 22-km south-west of Alexandroupolis. Preliminary estimates refer to an envisaged cost of some EUR 380 million for Copelouzos's terminal. The project also includes construction of two gas-fired power generation units in the same location, which will target both the domestic market, as well as the growing market in neighbouring Turkey.²⁹³ However, preliminary information suggesting that Alexandroupolis would be supplied by partner Gazprom could only be proved right through trading due to distance from Russian liquefaction. Equally problematic is the proposed focus on exports to Bulgaria, which does not seem supported by current and planned logistical arrangements, including the fact IGB may receive TPA exemptions. Consequently, Alexandroupolis LNG does not look like a viable project.

²⁹⁰ Ethnos, *Γέφυρα ενέργειας μεταξύ Κρήτης και Αττικής*, 4 May 2011, www.ethnos.gr ; Kathimerini, *Το 2009 η μελέτη για την εγκατάσταση φυσικού αερίου στην Κρήτη*, 16 March 2009, www.kathimerini.gr

²⁹¹ Energia.gr, *Πρόταση Κοπελούζου και Αιγυπτίων στη ΔΕΗ για Συμπιεσμένο Αέριο στη Κρήτη*, 29 May 2009, www.energia.gr

²⁹² See Aleksandar Kovacevic, *The Potential Contribution of Natural Gas to Sustainable Development to South Eastern Europe*, March 2007, Oxford Institute for Energy Studies, www.oxfordenergy.org, for a discussion of the potential for CNG transportation in the Black Sea

²⁹³ Energy Press, *Πλωτό τερματικό LNG και δύο ηλεκτρικές μονάδες από τον Όμιλο Κοπελούζου στην Αλεξανδρούπολη*, 12 January 2011, www.energypress.gr

Availability of credit and business case certainty

Availability of credit on favourable terms from regional and international donor / lending agencies is a crucial factor in improving the business case certainty of gasification and overall improvements in natural gas supply security in the relatively impoverished post-communist Balkan nations and Greece, which continues to suffer from a serious debt crisis. This is even truer now, in the midst of a global economic crisis with still poor credit availability, which continues to impact heavily on the national economies of the wider SEE region. Furthermore, countries in the region represent key transit points for gas inflows to the EU, while at the same time themselves already being full members, or at least planning to become members soon. Finally, there is a clear need to improve overall quality and reliability of energy supply in the region, which is usually a precondition in their efforts to meet relevant EU rules and regulations. Hence, there is evidently an increased role to be played by European lending facilities in the SEE.

The basic financial instrument at the disposal of Brussels for supporting gas projects in Europe has so far been a scheme entitled Trans-European Networks for Energy Infrastructure (TEN-E). Nevertheless, there are several other instruments which are presently utilized in the same framework. For example, structural funds like the ERDF contribute to TEN-E and such funds have in fact already been allocated to that end from EU support frameworks, as well as from other community initiatives. Moreover, with regard to 2007-2013, ERDF has for the first time allowed the direct allocation of available resources to TEN-E. Category 35 "natural gas" typically supports development projects on distribution and UGS; while category 36 "TEN-E gas" focuses on large TEN-E gas pipeline projects. In any event, the EU is now planning to consolidate the energy finance tools it has at its disposal, notably by abolishing TEN-E (which is considered to have proven both small as well as inefficient) and replacing it with a better integrated Energy Security and Infrastructure Instrument (ESII).²⁹⁴

Tables 1 and 2 below give an indication of financial support offered by the EU in these frameworks. (source references included there apply also to the section immediately above).

²⁹⁴ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

Table 1: Allocated budget to gas projects from structural funds for the period 2007-13

Member State	Category 35 - Natural gas (EUR)	Category 36 - TEN-E gas (EUR)
Bulgaria	51,040,633	0
Lithuania	26,698,052	0
Poland	418,188,665	198,900,000
Romania	21,069,687	47,885,653
Greece	81,337,500	60,150,000
Italy	32,044,065	0
Portugal	18,067,152	0
Spain	9,835,957	55,012,432
Cross - border	304,687	0
Total	658,586,398	361,948,085

Source: Cited in European Commission, *Assessment report of Directive 2004/67/EC on security of gas supply*, p.37, 16 July 2009, <http://eur-lex.europa.eu>

Table 2: Allocated budget to gas projects from Trans – European Networks (Energy)

	Proposals funded	Works	Studies	Allocated (EUR)
2002	6	0	6	11,078,300
2003	6	0	6	12,364,700
2004	8	0	8	9,901,590
2005	6	0	6	11,543,140
2006	4	1	3	8,808,900
2007	5	1	4	6,024,500
2008	8	1	7	12,467,183

Source: European Commission, *Assessment report of Directive 2004/67/EC on security of gas supply*, p.36, 16 July 2009, <http://eur-lex.europa.eu>

Furthermore, in 2009 the EU put in place a European Energy Programme for Recovery (EEPR), which forms part of the wider efforts made under its EERP to mitigate the effects of the recession. The Programme aims at developing a fully integrated and securely supplied European energy market; and enjoys access to a total of EUR 4 billion, of which approximately EUR 2.4 billion is targeted towards development of all necessary natural gas and power infrastructure, and particularly interconnections. It generally utilizes criteria of the Second Strategic Energy Review for project identification, namely: a) progress achieved in the implementation of previous TEN-E programmes; b) geographical balance; c) adequate stakeholder consultation; c) availability (or not) of independent access to project finance; d) social, economic, and environmental impact; and e) success towards stimulating further investment. With regard to the latter, the EU expects up to EUR 22 billion to be mobilized and subsequently to become available by 2015, as a result of the deployment of its EUR 2.4 billion funds under EEPR.²⁹⁵

Funding for EU energy infrastructure development is made available also by some other schemes or institutions, notably the EBRD. Since its establishment in 1991, it has financed more than 200 projects, providing EUR 6.5 billion for the support of total investments in excess of EUR 22 billion. What is more, EBRD possibly has room to increase its involvement in this sphere (and notably gas) even further, as the sector is generally still underrepresented with regard to its overall funding activity. Similarly, EIB, the other main European creditor, directed a total of EUR 32 billion in energy (particularly electricity) between 1999 and 2007; possibly there is room for improvement there too. Funds can also reach extra-EU energy targets, as part of its European Neighbourhood Policy (ENP); they are made available through the European Neighbourhood and Partnership Instrument (ENPI). This Instrument has been allocated a budget of EUR 12 billion for the period between 2007 and 2013, and is aimed at investments in the oil, gas, electricity, renewables, and energy efficiency sectors. Additionally, a Neighbourhood Investment Facility (NIF) is expected to invest EUR 700 million in extra-EU energy projects in 2007–2013, and can be complemented by member–state contributions.²⁹⁶

²⁹⁵ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

²⁹⁶ For more information on this matter see for example European Commission, *Assessment report of Directive 2004/67/EC on security of gas supply*, 16 July 2009, <http://eur-lex.europa.eu>

Specific EU financial support for Balkan energy transition and supply security is summarised below. Sources and non-financial details of projects mentioned there are included in relevant chapters above.

On the gas network / distribution level, FBiH in **Bosnia & Herzegovina** will receive EBRD funding in the form of a 15-year (3-year grace period) EUR 17 million loan towards the planned gasification of its Central Bosnia Canton; and possibly an additional EUR 32.5 million for the gasification of the Una – Sana Canton as well as further funding for its planned Bosanski Brod – Zenica line. Concerning **Bulgaria**, EBRD is to offer 75% of the EUR 12.4 million funding required for the construction of the planned Silistra – Dobrich gas link, provided there are no further project delays. Furthermore, in May 2010 EBRD approved a EUR 30 million senior loan to local company Citygas towards construction of an 833-km section of the planned gas network and related infrastructure in 27 municipalities by 2012. Meanwhile, EIB has offered two loans, specifically of EUR 90 million and EUR 190 million respectively, to **Croatian** company Plinacro to support investment plans relating to the expansion of the local gas grid. Additionally, in February 2010 EBRD approved a EUR 150 million senior corporate loan secured with a sovereign guarantee to Srbijagas of **Serbia**, to support, among other things, corporate and regulatory restructuring, as well as short-term debt refinancing. And in November 2009, **the former Yugoslav Republic of Macedonia** followed the examples of its neighbours and reached an agreement with EBRD for infrastructure development financing of up to EUR 150 million in 2010, including support towards planned expansion of its distribution network. What is more, in May 2010 it emerged that the country would be awarded a total of EUR 450 million by EBRD for various development projects, again including funds for development of the gas grid. EIB may also contribute to this effort.

On the interconnection level, Poseidon has been recognised as a Project of European Interest in the European recovery plan, with a proposed financing of EUR 100 million. Srbijagas is planning to use part (some EUR 25 million) of a EUR 150 million loan secured with sovereign guarantee from EBRD, to finance the connection of Republika Srpska in Bosnia & Herzegovina with the Serbian section of South Stream. At the same time, construction of the Bulgaria – Serbia interconnector is to receive EUR 60 million from ERDF. Serbia is to receive support from WBIF only for its feasibility study with regard to the same project. Additionally, development of the planned Bulgaria – Romania gas link is eligible for EUR 10 million from EERP funds. IGB is expected to receive EUR 45 million towards projected EUR 150 million costs from the same funding source assuming there are no delays. In August 2010, Sofia suggested that its interconnection with Turkey could also be financed by EERP funds, an idea immediately embraced by both the Nabucco consortium and EU energy commissioner Guenther Oettinger. Finally, the Croatia – Hungary pipeline was eligible for EUR 20 million funding from EERP.

On the storage level, Bulgaria has proved successful in securing a EUR 250 million loan from EBRD for upgrade works in UGS Chiren, which target a working capacity of ~850 mcm and an extraction rate of ~10 mcm/d. In addition, in May 2009 Plinacro signed an agreement for a EUR 70 million loan with EBRD, to support its planned acquisition of UGS Okoli from INA, as the latter gradually came under the control of Hungarian integrated player MOL; and in February 2010, EBRD allocated 50% of a wider EUR 150 million loan it had offered Srbijagas (*see above*) to finance part of construction costs for the development of UGS Itebej; namely EUR 75 million, out of a total estimated construction cost of EUR 105 million. The remainder is to be covered by Srbijagas's own funds.²⁹⁷

To have a realistic shot at improving security of natural gas supply in SEE, the EU needs to continue to lend political and (especially) financial support to major infrastructure projects targeting upgrades in national gas grids; construction of additional pipeline interconnections; and expansion of regional storage capacities. Every available financial tool of the EU should be utilized in this context including funds from TEN-E, ERDF, EERP, EBRD, EIB, WBIF etc. Intra-regional links which have the potential to bring diversified gas supply are rightly prioritized over pipeline projects which offer only diversified routes, such as South Stream and its branches.²⁹⁸ Nevertheless, it would be a mistake to rule out in principle support to South Stream, especially in cases where the Russian-backed project may offer the only realistic option for gasification; or when Moscow might be willing to accept some level of reciprocity in terms of access to this (and / or other associated) natural gas infrastructure.²⁹⁹ Such financial support from the EU could also act as a necessary fiscal stimulus for the troubled

²⁹⁷ The EU has in recent years financed also a number of feasibility studies aimed at promoting security of gas supply. Indicatively, in 2005 it offered approximately EUR 2.1 million to EGL for basic engineering, environmental impact assessment, land acquisition and authority approval of its planned TAP project. In the same year, a total of EUR 3.4 million were offered to partners Edison and DEPA towards front-end engineering and design, environmental, and financial studies for their Poseidon sub-sea pipeline. In 2002 the EU offered the Greek operator EUR 4.3 million towards technical and environmental studies for the then planned TGI. And in 2001, it gave it EUR 0.8 million for basic, technical, environmental, and safety studies on the expansion of Revithoussa LNG. In 1998, DEPA had received some EUR 1 million towards a simulation study of the Greek natural gas system and basic design of a compressor station. And in 1996, roughly EUR 0.97 million towards feasibility, environmental, and other studies for the development of a natural gas network in Crete, including an LNG terminal. In the same year, PPC got almost EUR 0.2 million towards a technical and economic feasibility study of a Greek-Albanian gas interconnection, including gas demand definition, pipeline routing and design and financial viability. Finally, in 1995 the EU offered DEPA EUR 1 million for a feasibility study on Greek UGS; and an additional EUR 0.8 million for the extension of the country's main gas transmission system. For more information on the above see European Commission, *TEN-E financed projects 1995 - 2009*, 3 March 2010, <http://eur-lex.europa.eu>

²⁹⁸ With regard to these larger pipeline projects, in September 2010 EBRD, EIB, and the World Bank announced they had reached an agreement with the Nabucco consortium to perform due diligence of their project, with an eye to offering a combined EUR 4 billion loan towards its realization upon successful completion; see Upstream Online, *Finance giants run rule over Nabucco*, 5 September 2010, www.upstreamonline.com

²⁹⁹ Importantly, Moscow has announced plans to privatise state-owned assets worth a combined USD 32 billion over the next three years, and a (so far unspecified) part of these assets has already been reserved for potential swaps with foreign investors. The latter could open the way towards European access to Russian infrastructure, including energy. However, a Russian request to lift the so-called "Gazprom Clause" from the EU's energy liberalization package is now firmly on the table, and Moscow is likely to insist on it if such swaps with European companies are indeed to move forward. For more details see Reuters, *Putin says EU energy laws hurt investment*, 25 November 2010, www.reuters.com

economies in SEE, which continue to suffer from the serious regional fall-out from the global financial and economic crisis.

Funding of bilateral energy projects such as the proposed interconnectors should, at least theoretically, also be easier to secure, by virtue of their being less complex than similar larger-scale natural gas pipeline projects which have to transit many countries and / or consist of multiple stakeholders. Importantly, access to EU funding should not be discriminatory against non-current member states; especially, when a given project can demonstrate it can contribute to regional security of supply for both current and prospective member-states, for example the Bulgaria – Serbia gas interconnector. This would be in line also with the EU's long-term energy strategy, which states explicitly that any cross-border interconnectors should receive the same attention and policies as intra-EU projects.³⁰⁰ European funding bodies should also guard vigorously against the possibility of unintentionally interfering with gas market rationalization, in cases where this might be reasonable or even necessary. E.g., Bulgaria does not necessarily need access to Caspian natural gas and / or LNG from both Greece and Turkey, as is currently planned. However, there is a realistic chance EERP funding will become available to both of these projects; while other countries in SEE (which are also EU candidates) lack even basic gas infrastructure. It is therefore important not to create an artificial market framework whereby sub-optimal allocation of (anyway very limited) resources ends up indirectly undermining realization of potentially more essential projects elsewhere.

For example, capital allocation for construction of gas interconnectors with under- / un-gasified markets such as the former Yugoslav Republic of Macedonia, UNMIK / Kosovo, Albania, and Montenegro is probably a preferable target in both human development as well as pure economic terms; thanks to its ability to support local economic development and also create a more substantial and profitable gas market in the broader region. What is more, EU support to gas supply projects could extend beyond the level of direct financial transfers, for example through offering TPA exemptions, when not contrary to EU rules and regulations.³⁰¹ A debate on the potential costs and

³⁰⁰ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

³⁰¹ This is in fact the case with the planned ITGI natural gas pipeline, which is also a designated project of European interest. It is expected that this advantage will ease access to needed capital for the ITGI project, paving the way for its realization. What is more, such provisions may ultimately prove beneficial to a number of similar projects in the wider region of SEE. (information from Energia.gr, *Εμπλοκή στη χρηματοδότηση του ITGI*, 17 July 2010, www.energia.gr).

benefits of an implementation of this approach in the broader Balkan region, including issues such as Article 36 exemptions; cross-border reserve capacity allocation; and replication of missing / insufficient anchor loads is ongoing at the Energy Community and beyond, especially in terms of TPA's ability to facilitate project financing in this cash-strapped environment.³⁰²

Impact of pricing on gas supply security

Pricing is another important extraneous factor, which affects directly security of supply in SEE. Specifically, wholesale and retail pricing of natural gas in individual Balkan markets impacts on their ability to attract necessary volumes, as a result of being (or not) able to offer suitable import prices to producers and traders, including at times of emergency. Importantly, the region is under the obligation to avoid cross-subsidies and below-cost pricing, as well as complete planned market opening by 2015, due to SEE countries either already being EU members, or parties to the Energy Community.³⁰³ Adding to the importance of this priority, in its recently released long-term energy strategy to 2020, Brussels called for non-regulated and cost-reflective pricing in both current and prospective members; such a strategy is in fact seen as a necessary means for supporting European security of supply.³⁰⁴ However, it creates serious tensions with another parameter which forms part of the same difficult equation, namely the fact that ability to attract suppliers is also judged in terms of a market's capacity to sustain high enough demand levels. The contradiction thus lies there, as demand levels are more often than not defined in terms of the affordability (measured in domestic terms) of supply across main market segments. This is particularly true in the Balkans, where substitution with oil products and also with other locally-procured alternatives like biomass continues to be relevant.³⁰⁵

³⁰² RAE, *Regulatory framework for the development of the Energy Community Gas Ring: northern and southern branches*, Paper presented by Michael Thomadakis at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org; European Commission, *Directive 2009/73/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC*, 13 July 2009, <http://eur-lex.europa.eu>.

³⁰³ ECRB, *Study on regulation of tariffs and quality of the gas distribution service in the Energy Community*, Paper presented by Branislava Marsenic Maksimovic at the Gas Forum of the Energy Community, Ljubljana, September 2010, www.energy-community.org

³⁰⁴ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy*, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}; and also European Commission, Commission Staff Working Document: *State of Play in the EU Energy Policy*, Accompanying Document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Energy 2020: a Strategy for Competitive, Sustainable and Secure Energy, Brussels, 10.11.2010, COM(2010) 639 final, {SEC(2010) 1346}

³⁰⁵ Aleksandar Kovacevic, *The potential contribution of natural gas to sustainable development in South Eastern Europe*, March 2007, Oxford Institute for Energy Studies, www.oxfordenergy.org

Against this backdrop, local players in the Balkan region have been working towards securing more favourable supply terms from Russia, their main natural gas supplier. They have been following a wider trend in this respect, which also includes the example of major European gas buyers such as Germany's E.ON Ruhrgas and others. In recent months, these players have put pressure on their own main natural gas supplies, again notably the Russian Federation, for cheaper and more flexible pricing formulae so better to reflect the strong recessionary pressures on international spot gas prices. What is more, the downward effect of the global recession on spot prices has been made worse by the concurrent streaming in the same period of additional production capacity (upstream, liquefaction) which has fundamentally (even if temporarily) shifted the balance in the seller – buyer equilibrium.³⁰⁶

One of the region's most important players, Bulgaria, is already moving in that direction, in an effort to benefit from the abovementioned trends. Its centre-right administration has been pushing for a redefinition of the supply agreement with Moscow, negotiated by the previous Socialist government. Under the provisions of that agreement, the country accepted to pay European-level prices for the entirety of the natural gas volumes it imports from the Russian Federation by 2012, including for the 1.4 bcm/y Bulgaria has been receiving with a significant discount under the designation "transit gas". In the summer of 2010, Russian First Deputy PM Viktor Zubkov admitted that his country had been supplying Bulgaria at an average USD 339 / 1,000 cu.m., with some individual consumers paying as much as USD 576 / 1,000 cu.m., which was substantially higher than some other European countries. In view of that, Zubkov suggested a price review of Russian gas prices to Bulgaria might be in order.

In this context, in July 2010 PM Boyko Borisov announced his intention to refer the previous supply agreements with the Russian Federation to the Prosecutor General for his review. PM Borisov's move possibly came in part as a response to negative comments on his government's track record on the matter from former Socialist energy minister Roumen Ovcharov. In any event, on 17 July 2010 Sofia and Moscow reached an agreement which they claimed could reduce Bulgarian supply costs by between 4% and 7%, at the time envisaging purchases even at below USD 300 / 1,000 cubic metres. The latter was expected to bring savings of up to 15% in local retail gas prices, and also of some 7% in Sofia heating prices, as of October 2010. Additionally, it seems that Moscow has agreed to extend to Sofia another package offer on the price at which it sells its natural gas, envisaging a further 5% to

³⁰⁶ See for example Upstream Online, *E.ON calls to revamp gas deals*, 25 August 2010, www.upstreamonline.com; and Upstream Online, *E.ON lines up new Russian gas price*, 19 February 2010, www.upstreamonline.com. For an analysis of European pricing formulas and their likely evolution see Jonathan Stern, *Continental European long-term gas contracts: is a transition away from oil-product linked pricing inevitable and imminent*, September 2009, Oxford Institute for Energy Studies, www.oxfordenergy.org.

7% reduction before the end of 2012. Finally, in January 2011 it emerged that Bulgaria was pushing towards a redefinition of its pricing formula between Bulgargaz and Gazprom as of 2013.³⁰⁷

Furthermore, in February 2010 Sofia reportedly asked Gazprom higher transit fees for transferring its natural gas volumes to neighbours Turkey, Greece, and the former Yugoslav Republic of Macedonia. Bulgaria at the moment receives approximately USD 1.7 / 1,000 cu.m. / 100-km as a transit fee. Revenues stemming from this fee stood at approximately USD 107 million in 2010 for Bulgaria, and were expected to rise moderately in 2011 and reach up to USD 112 million in 2011 (*see above*). Bulgaria has also asked for the removal of hitherto dominant (Russian-controlled) intermediaries, namely Overgas, Wintershall and even Gazprom Export. However, negotiations with the Russian side on this matter are not expected to be concluded before mid-2011, and / or to take effect before 2012. So far, there have been conflicting reports on progress achieved in these negotiations.³⁰⁸

Figures 5 and 6 below offer a definition of Bulgarian “transit” and “entrance” gas, as well as a more detailed breakdown of Bulgarian import, transit, local, and end-user prices based on data from Bulgargaz and the local regulator SEWRC / DKER, as these were analysed and presented in the Monthly Bulletin of January 2010 of the Balkan and Black Sea Petroleum Association (BBSPA).³⁰⁹

³⁰⁷ Standart, *New formula reduces gas price for Bulgaria*, 29 January 2011, <http://paper.standartnews.com> ; Energy Press, *Σόφια : Τα βρίσκει με τον Πούτιν για τον South Stream, το αέριο, ίσως και για το Μπέλενε...*, 16 November 2010, www.energypress.gr ; ISI Emerging Markets, *Russia's Gazprom suggests 5-7% gas price cut by end-2012*, 15 November 2010, www.securities.com ; Itar-Tass, *Gazprom to reduce gas price for Bulgaria by 5-7% before late 2012*, 13 November 2010, www.itar-tass.com ; SeeNews, *Update 1 - Bulgaria, Russia set up JV on South Stream gas pipeline*, 13 November 2010, www.seenews.com ; Standart, *Moscow says no to further decrease in natural gas price for Bulgaria*, 27 October 2010, <http://paper.standartnews.com> ; Focus Information Agency, *Gas prices might drop by 15% as of 1 October*, 26 July 2010, www.focus-fen.net ; ISI Emerging Markets, *State regulator: natural gas price to fall at least 10% from October*, 20 July 2010, www.securities.com ; and also ISI Emerging Markets, *Prime Minister to provide information to Prosecutor General about gas agreement with Russia*, 1 July 2010, www.securities.com

³⁰⁸ Information from the Standart, *Gas without intermediaries as of 2013*, 27 January 2011, <http://paper.standartnews.com> ; from The Sofia Echo, *Gazprom, Bulgargaz to switch to direct gas deliveries in 2013 - report*, 26 January 2011, www.sofiaecho.com ; ISI Emerging Markets, *Bulgargaz to end 2010 with losses*, 30 December 2010, www.securities.com ; Standart, *Gazprom reluctant to eliminate intermediaries from supplies to Bulgaria*, 29 December 2010, <http://paper.standartnews.com> ; Banker Weekly, *Regulator “fines” Bulgargaz with BGN60M*, 01 October 2010, www.banker.bg ; Upstream Online, *Bulgaria ups Russian transit fee*, 16 February 2010, www.upstreamonline.com

³⁰⁹ More details on this issue are available in BBSPA, *Monthly Bulletin*, 15 January 2010, www.bbspetroleum.com; in IENE, *South – East Europe energy market watch*, Issue No. 26, July 2010, www.iene.gr; and in Standart, *Bulgaria pays twice more for Russian natural gas than Germany*, 5 July 2010, <http://paper.standartnews.com>

Figure 5: Import, transit, and upstream natural gas prices in Bulgaria

Bulgarian Gas Prices, \$/1000 cbm													
	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008	Q4 2008	Q1 2009	Q2 2009	Q3 2009	Q4 2009	Q1 2010
Average import border price	277	280	264	294	350	394	453	500	450	350	260	286	340
Transit gas	83	138	147	147	199	199	306	306	312	312	197	197	270
Melrose (indigenous production)	130	124	127	162	185	185	200	200	200	-	-	-	-
Regulator's "entrance" price	202	207	211	231	264	315	315	349	399	368	248	268	285

Transit gas - gas defined in the supply contracts between Gazprom and Bulgargaz, which refers to the transit services. The volume of the transit gas is 1,4 Bcm/y and the price of transit gas price was defined to be 83 USD/1000 cbm until the end of 2006. After the revision by Gazprom of the supply contract, the transit gas price increases gradually in a set schedule to reach average European levels by 2012.

Regulator's "entrance" price - price approved by the energy regulator for Bulgargaz. Consumers' prices are obtained by adding transmission and distribution fees to the entrance price. Entrance price is defined in Bulgarian Leva and the above quotations in USD refer to quarterly average exchange rates indicated in www.oanda.com

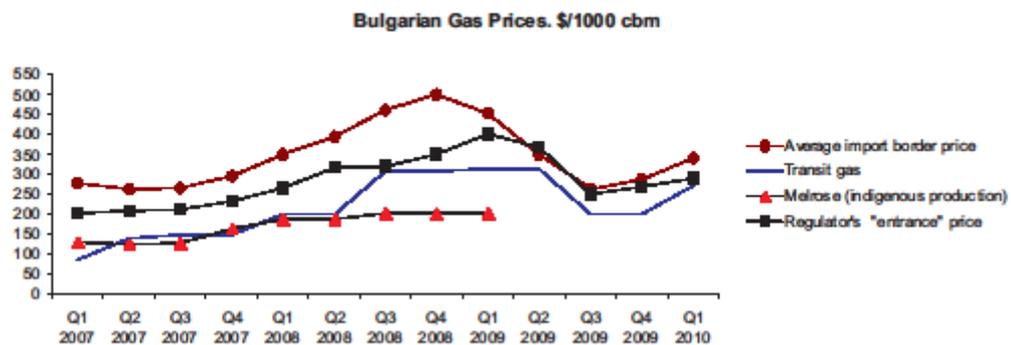


Figure 6: Breakdown of natural gas prices in Bulgaria

Bulgaria									
Gas Prices									
Bulgargaz Prices, leva (USD) per 1000 cm, VAT excluded									
<i>per resolutions of Bulgarian Energy Regulatory Commission, VAT excluded</i>									
<i>UGS storage price - leva per 1000 cbm per month</i>									
Period	1	2	3	4	5	6	7	8	9
01 January - 31 March 2003	25	8		233,38	241,38	208,38		1,82	114
01 April - 30 June 2003r.	25	8		239,33	247,33	214,33	3%	1,72	125
01 July - 30 September 2003	23,1	7,72	2,67	219,76	227,48	196,66	-8%	1,73	114
01 October - 31 December 2003	23,1	7,72	2,67	240,6	248,32	217,5	11%	1,64	133
01 January - 31 March 2004	23,1	7,72	2,67	219,27	226,99	196,17	-10%	1,56	126
01 April - 30 June 2004	23,1	7,72	2,67	213,09	220,81	189,99	-3%	1,62	117
01 July - 30 September 2004	23,1	7,72	2,67	227,5	235,22	204,4	8%	1,60	128
01 October - 31 December 2004	23,1	7,72	2,67	231,75	239,47	208,65	2%	1,51	138
01 January - 28 February 2005	23,1	7,72	2,67	231,75	239,47	208,65	0%	1,49	140
01 March 2005 - 31 March 2005	19,73	7,72	2,49	228,38	236,1	208,65	0%	1,49	140
01 April - 30 June 2005	19,73	7,72	2,49	230	237,72	210,27	1%	1,55	135
01 July - 30 September 2005	19,73	7,72	2,49	234,46	242,18	214,73	2%	1,60	134
01 October - 31 December 2005	19,73	7,72	2,49	276,91	284,63	257,18	20%	1,64	156
01 January - 31 March 2006	19,73	7,72	2,49	296,69	304,41	276,96	8%	1,63	170
01 April - 30 June 2006	19,73	7,72	2,49	302,95	310,67	283,22	2%	1,56	182
01 July - 30 September 2006	19,73	7,72	2,49	302,95	310,67	283,22	0%	1,53	185
01 October - 31 December 2006	19,73	7,72	2,49	308,58	316,3	288,85	2%	1,52	190
01 January - 31 March 2007	19,73	7,72	2,49	321,11	328,83	301,38	4%	1,49	202
01 April - 30 June 2007	19,73	7,72	2,49	319,52	327,24	299,79	-1%	1,45	207
01 July - 30 September 2007	19,73	7,72	2,49	319,52	327,24	299,79	0%	1,42	211
01 October - 31 December 2007	19,73	7,72	2,49	332,3	340,02	312,57	4%	1,35	231
01 January - 31 March 2008	19,73	7,72	2,49	365,1	372,82	345,37	10%	1,31	264
01 April - 30 June 2008	19,73	7,72	2,49	413,47	421,19	393,74	14%	1,25	315
01 July - 30 September 2008	19,73	7,72	2,49	434,8	442,52	415,07	5%	1,30	319
01 October - 31 December 2008	19,73	7,72	2,49	538,66	546,38	518,93	25%	1,49	349
01 January - 31 March 2009	19,73	7,72	2,49	614,66	622,38	594,93	15%	1,49	399
01 April - 30 June 2009	19,73	7,72	2,49	545,97	553,69	526,24	-12%	1,43	368
01 July - 30 September 2009	19,73	7,72	2,49	365,03	372,75	345,3	-34%	1,37	252
01 October - 31 December 2009	19,73	7,72	2,49	374,13	381,85	354,4	3%	1,32	268
01 January - 31 March 2010	19,73	7,72	2,49	413,24	420,96	393,51	11%	1,36	289

Source: www.bulgarqaz.com DKER

- 1 - Prices for transportation by the transmission system
- 2 - Prices for transportation by the distribution system
- 3 - Storage price
- 4 - Gas prices for consumers, connected to the transmission networks of Bulgartransgaz
- 5 - Gas prices for consumers, connected to the distribution networks of Bulgartransgaz
- 6 - Price at the entrance of the system in Leva
- 7 - Change
- 8 - Leva for 1 USD (quarterly average)
- 9 - Price at the entrance of the system in USD

Greek operator DEPA has also been pushing for a renegotiation of its long-term contracts with main suppliers Russia and Algeria, for piped gas and LNG respectively. According to CEO Harry Sachinis, DEPA will pass any savings to its client base in Greece rather than seek to boost its profit margins, as a means of ensuring sustainability for gas penetration and supporting economic recovery in Greece.³¹⁰

But despite any relative success by Bulgaria in leveraging geostrategic advantages it might have in its direct negotiations with the Russian Federation such as the South Stream gas pipeline; Belene NPP; and even the now moribund (if not already dead) crude pipeline between Bourgas - Alexandroupolis, the region as a whole remains too weak in political and economic terms to have any real influence on the wider international level. For example, despite the fact the Balkan peninsula could indeed benefit significantly from the recent supply negotiations between gas producer Azerbaijan on the one hand, and transit country Turkey on the other, there has been no involvement from any Balkan capitals.³¹¹ Likewise, there has been no reported Balkan involvement in a discussed partial decoupling of oil and natural gas prices for Russian supply to Turkey, which could arguably benefit the wider region.³¹²

In contrast to this relative weakness of Balkan players in international political / commercial terms, investments in developing multiple points of entry, as well as access to regional LNG and gas storage could have a real positive impact on their negotiating power vis-à-vis foreign natural gas suppliers. An example of this flexibility became evident in May 2011 when the Bulgarian government signalled it would be unwilling to enter into anything but a short-term supply contract with Russia upon expiration of the existing contract at the end of 2011, if pricing in the latter's proposal was not right. Indeed, Bulgaria could shortly after that date be supplied by its other SEE neighbours (*see above*).

But in the absence of any major breakthroughs in reducing import costs for countries in the region, their ability to protect profitability of the energy sector through minimum losses and cost-reflective pricing gains in importance and becomes a critical factor in their quest for natural gas supply security.

³¹⁰ Energy Press, *Να αγοράζει φθηνότερα το αέριο διεκδικεί η ΔΕΠΑ από τους Ρώσους*, 23 June 2010, www.energypress.gr

³¹¹ In June 2010, Turkey and Azerbaijan finally ironed out differences and succeeded in reaching a preliminary agreement on current and future natural gas supply from the Shah Deniz field. Specifically, Turkey agreed to raise the price it paid to the level of USD 300 / 1,000 cu.m. (from USD 120 / 1,000 cu.m.); Baku agreed to pay Ankara a transit fee of USD 45 / 1,000 cu.m. for Shah Deniz II. Turkey is to import roughly 6 bcm/y from 2019, and it was to retain a right to re-export part of this. But in April 2011, it emerged that Turkey and Azerbaijan had agreed on supply & purchase terms for Shah Deniz II supply, but other issues pertaining to this matter (including transit terms) were still pending. Azerbaijan is targeting a combined output of up to 30 bcm/y by the end of the decade, which could breathe life into a number of South Corridor gas projects, thereby contributing substantially towards SEE supply security. The offshore Shah Deniz gas field is Azerbaijan's largest, with estimated natural gas reserves between 1.2 trillion cubic metres (tcm) and 2 tcm. For more information see Cumhuriyet, *Turkey and Azerbaijan agree on purchase and sale agreement*, 30 April 2011, www.upstreamonline.com ; Upstream Online, *Turkey-Azerbaijan sign key agreements on natural gas transport*, 2 June 2010, www.upstreamonline.com ; and also Upstream Online, *Turkey-Azeri pipe deal pushed back*, 2 June 2010, www.upstreamonline.com.

³¹² ISI Emerging Markets, *Russia may reduce price of natural gas it sells to Turkey*, 14 May 2010, www.securities.com ; Upstream Online, *Price of Russian natural gas may be reduced 15%*, 24 February 2010, www.securities.com.

However, this remains a real problem for essentially every gas and power market in the SEE region. For example, in a public hearing in November 2010 main **Albanian** energy players tried to press Entin Rregullator te Sektorit te Energjise Elektrike (ERE), the Albanian Energy Regulatory Authority, for price increases, arguing these were necessary to allow reasonably profitable operations in Albania. In this framework, in May 2010 local power corporation Operatori i Sistemit te Shperndarjes (OSSH), a subsidiary of Czech group CEZ, announced it had equipped all its clients with electricity meters.³¹³ This investment was aimed specifically at replacing with individual monthly bills a previous scheme that focused on fixed charges, as that had proven to be both inefficient and detrimental to profitability. OSSH reportedly still purports to maintain a fixed minimum fee system though, which may be implemented from 2012 onwards, assuming it does secure the regulatory approval it has requested. Additional initiatives aimed at the modernization of the local Albanian electricity billing system, notably in terms of data processing, were similarly announced in November 2010.³¹⁴

By the same token, OSSH has now adopted a much harder line with regard to the widespread problem of electricity theft (and of course non-payment), in an effort to limit overall losses in the power grid. The level of network losses is in fact a very important issue in Albania, and a matter of bitter dispute between OSSH and ERE, as a result of ERE's use of estimates of network losses as a basis for pricing decisions, which impacts directly on OSSH's profitability and investment planning. In January 2010, OSSH decided to take the regulator to court for approving hikes of only 13%, compared to a requested 23%. ERE based its calculation for that adjustment on a network loss estimate of some 32% for 2008 (above 30% in 2010). OSSH insists losses in 2008 exceeded 35%.³¹⁵ Better calculation of network losses is hence of crucial importance to OSSH, which claims it will need real price hikes of roughly 15% per year on average, if it is to be able to realize its investment plan. The latter is worth a total EUR 180 million for the period 2009-2013 and it targets modernisation of the local electricity distribution network; refurbishment of its substations; installation of new meters; and establishment of a more efficient billing system. European interest in these planned investments was manifested

³¹³ In September 2010, OSSH was rebranded CEZ Shperndarje (CEZ Distribution) as part of an ongoing restructuring plan of the parent company; we maintain here the OSSH acronym for consistency, even with regard to events after that date (Limun.hr, *Albanian Electricity Distributor OSSH Changes Name to CEZ Shperndarje*, 27 September 2010, www.limun.hr).

³¹⁴ Balkans Business News, *CEZ has proposed, in Albania, proposed a fixed fee per month for electricity meters for all customer groups*, 23 November 2010, www.balkans.com; Balkans Business News, *Albania energy sector asks for higher prices*, 19 November 2010, www.balkans.com; Energetika.net, *CEZ Albania to overhaul its billing system*, 15 November 2010, www.energetika.net; ISI Emerging Markets, *Energy distributor OSSH equips all subscribers with electricity meters*, 6 May 2010, www.securities.com; ISI Emerging Markets, *OSSH to take customers not paying for power to court*, 19 April 2010, www.securities.com; ISI Emerging Markets, *Power distributor OSSH initiates campaign against energy fraud*, 01 February 2010, www.securities.com

³¹⁵ Balkan Insight, *Albanians pay dear for power thieves*, 4 March 2011, www.balkaninsight.com; ISI Emerging Markets, *CEZ's local energy distributor files lawsuit against state on electricity prices*, 20 January 2010, www.securities.com

through EBRD. The Bank is reportedly considering extending a senior loan of some EUR 50 million to that end to the Albanian company. A final decision was expected in March 2011.³¹⁶

In contrast, consumers, trade unions, the ombudsman, and even the Albanian government have voiced their concerns with regard to the country's ability to cope with the increases envisaged by OSSH.³¹⁷ Therefore, in October 2010 ERE turned down a request submitted by OSSH / CEZ Distribution for a unification of electricity tariffs, invoking the recession as the main reason for its opposition.³¹⁸ And in December 2010, it decided to keep electricity prices unchanged for the duration of 2011, acknowledging that both the ombudsman and the government had applied pressure in that direction. This persistent market distortion was at the time exacerbated even further by ERE's decision to force Korporata Elektroenergjitike Shqiptare (KESH), the country's state-owned power corporation, to reduce the wholesale prices at which it sells to OSSH / CEZ Distribution. On the positive side though, some price signals were put in place for discouraging heavy and inefficient electricity usage for heating and cooking.³¹⁹

In light of these developments, Tirana has announced plans to set up a USD 22 million fund to support poor households through direct monetary transfers, primarily aimed at adjusting the national context to average domestic energy budgets while alleviating the common problem of fuel poverty. But still, the abovementioned structural difficulties put in question Albania's ability to boost its security of supply through currently planned moves such as completing its electricity system overhaul; reducing dependence on hydro by means of a phased substitution with (more expensive) natural gas, as is the government's declared goal; and even offering high enough import prices to attract necessary gas volumes, if it proved successful in its current gasification plan.³²⁰

Figures 7-10 over the next two pages offer an overview of electricity pricing, bill collection rates, and electricity revenue structure in the western Balkans, including Albania. Additional details on this matter per country is provided (wherever necessary) in the section below.

³¹⁶ Balkans Business News, *Albania's CEZ Shpërndarje applies for loan to fund its turnaround and investment programme*, 16 December 2010, www.balkans.com; ISI Emerging Markets, *Power distributor OSSH to retain fixed monthly charges in 2010*, 15 December 2009, www.securities.com

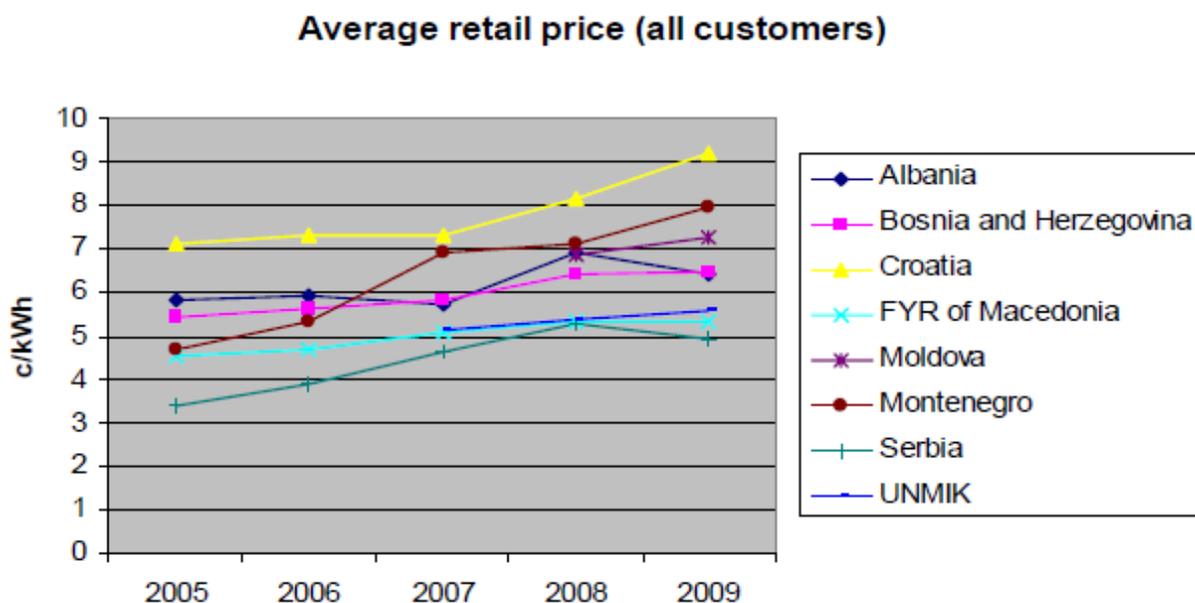
³¹⁷ According to local sources, in the summer of 2010 OSSH requested an additional 11.2% increase in electricity prices, arguing these should reach EUR 0.0774 per KWh during 2011 from current levels of only some EUR 0.0696 per KWh. For more on the multifaceted Albanian opposition to electricity price increases see for example ISI Emerging Markets, *Economy ministry opposes energy price hike in 2011*, 1 December 2010, www.securities.com; Energetika.net, *CEZ Albania demands 11.2 per cent increase in electricity prices*, 7 September 2010, www.energetika.net; and ISI Emerging Markets, *Consumers against proposed hike in electricity prices*, 26 November 2009, www.securities.com

³¹⁸ ISI Emerging Markets, *Regulator rejects request for unification of electricity tariffs*, 7 October 2010, www.securities.com

³¹⁹ Balkan Insight, *Under pressure, Albania keeps electricity price locked*, 8 December 2010, www.balkaninsight.com

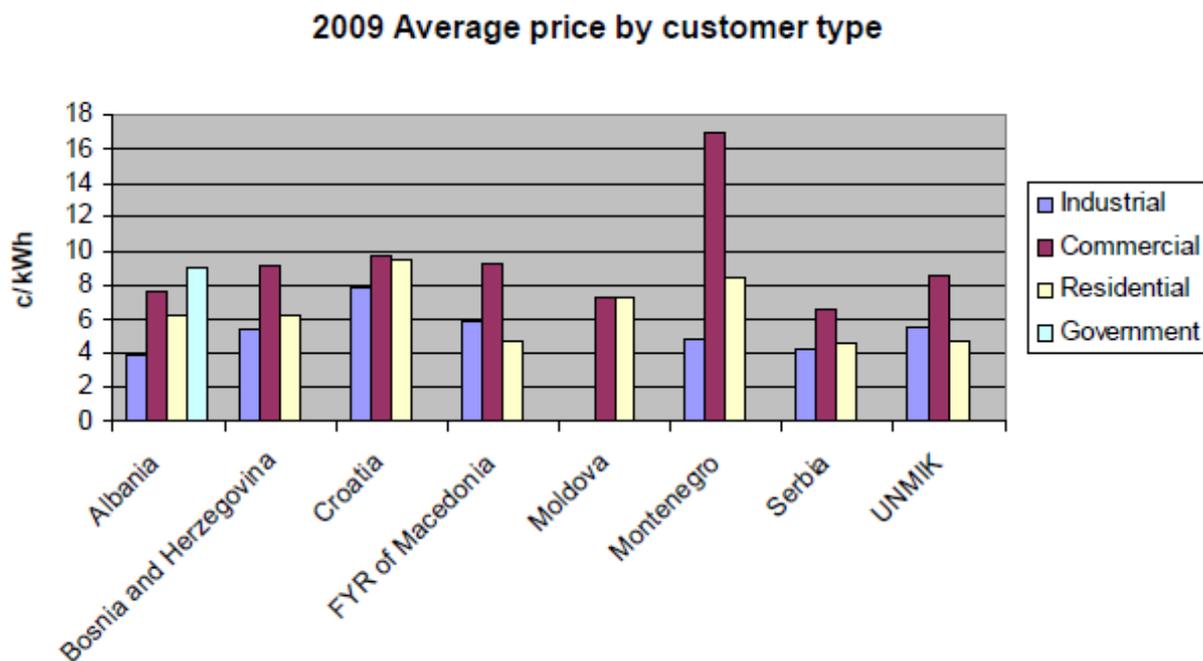
³²⁰ ISI Emerging Markets, *State to subsidise citizens for higher expenses as of Jan*, 17 December 2009, www.securities.com

Figure 7: Average retail electricity prices 2005 - 2009 in the Western Balkans



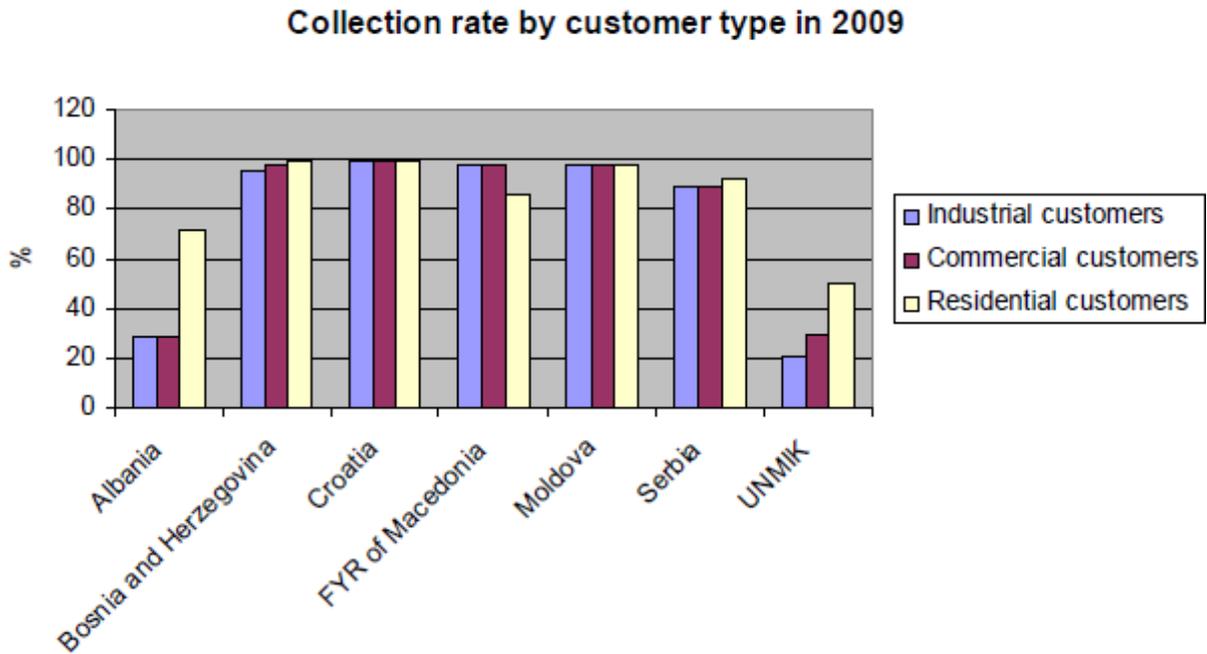
Source: Energy Community Regulatory Board, *Electricity prices and tariffs in the Energy Community*, p.4, Paper presented at the 16th Electricity Forum of the Energy Community by Edin Zametica, Athens, 12 October 2010, www.energy-community.org

Figure 8: Average electricity prices by customer type for 2009 in the Western Balkans



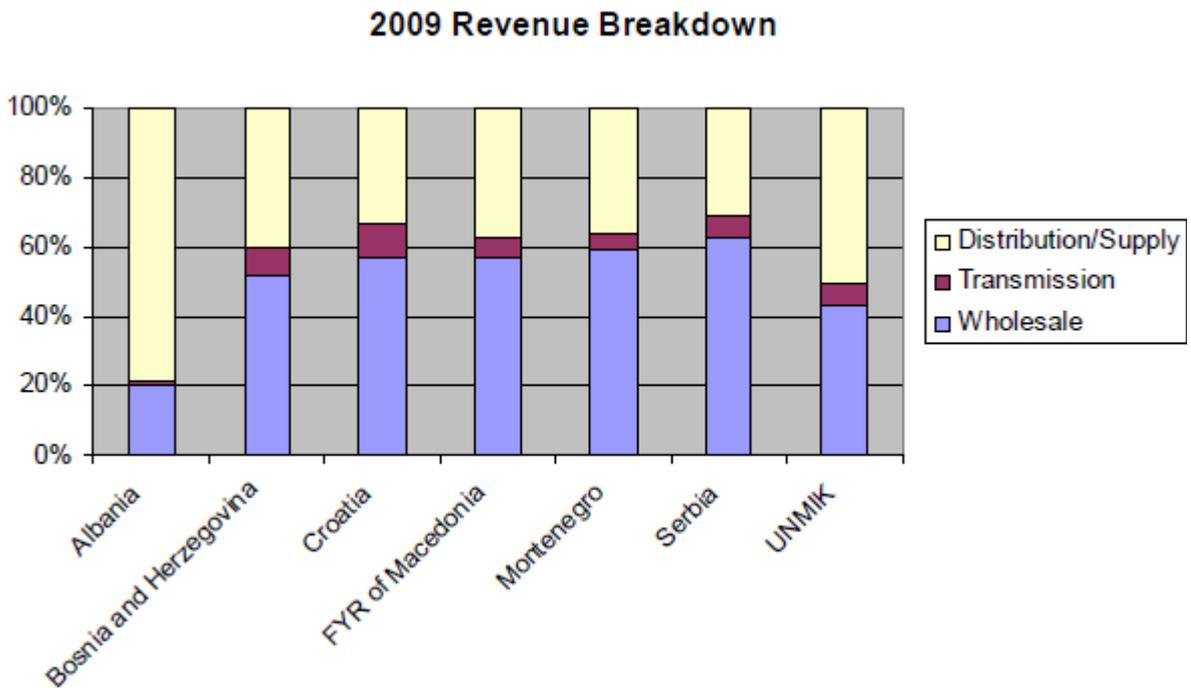
Source: *ibid.*, p.6,

Figure 9: Electricity collection rates by customer for 2009 in the Western Balkans



Source: *ibid.*, p.14,

Figure 10: Electricity revenue breakdown for 2009 in the Western Balkans



Source: *ibid.*, p.5,

Following the example of OSSH in Albania, in September 2010 public utility Elektroprivreda of **Bosnia & Herzegovina** (FBiH) announced plans to install remote electricity meters in users connected to its local network, in an attempt to expand its revenue stream and protect profitability. Bosnia & Herzegovina has already received financial support from the EBRD on similar projects.³²¹ Analogous concerns about profitability have prompted power producers in Republika Srpska to push authorities towards price hikes, arguing that a planned modernization of energy assets will otherwise be impossible to carry out. In this context, the Regulatory Commission of Republika Srpska (RERS) approved an average 6.2% hike as of January 1st 2010, specifically 7.7% residential; 6.6% industrial; and 2.3% in the commercial sectors. Local producers were arguably hoping for better rates at the time. Moreover, it was not immediately clear whether these prices were to remain unchanged in 2011, especially in light of the 96% drop in Elektroprivreda BiH 2010 profits, largely due to low prices.³²²

In December 2010, local operator BH-Gas said it did not anticipate any gas price increases for 2011, with the possible exception of adjustments in line with related oil prices as per contractual obligations. By the same token, in January 2011 both BH-Gas and Elektroprivreda confirmed that no price hikes would be taking effect in Bosnia & Herzegovina within their respective domains until the summer. Elektroprivreda went as far as denying it had even requested such a surge in local electricity prices. However, in March 2011 it emerged that Elektroprivreda FBiH was seeking such price increases invoking production costs due to increases in feedstock prices for its power plants (notably coal).³²³

Furthermore, in April 2011 BH-Gas increased local ex-tax natural gas prices by almost 10.8% to Bosnian Mark (BAM) 720 / USD 530 per 1,000 cu.m., levels potentially unsustainable for consumers. What is more, the company added that another gas price hike was in fact to be expected by year-end. Additionally, earlier in December 2009 BH-Gas had announced it would cease deliveries to distribution and heating utility Zvornik Stan; the latter had reportedly incurred a total EUR 1.1 million debt due to the recession, coupled with relatively low end-user prices and misaligned feedstock costs. Likewise, in January 2011 BH-Gas warned that security of gas supply to Bosnia & Herzegovina was

³²¹ Balkan Insight, *EBRD grants €35 million for Montenegro power grid*, 26 November 2010, www.balkaninsight.com ; Energetika.net, *Elektroprivreda BiH is introducing remote reading of electricity meters*, 6 September 2010, www.energetika.net

³²² Information from Balkans Business News, *Top Bosnian utility Elektroprivreda BiH 2010 profit slumps on falling prices*, 31 December 2010, www.balkans.com ; ISI Emerging Markets, *RS electricity prices likely to remain unchanged in 2011*, 1 November 2010, www.securities.com ; and Energetika.net, *Higher electricity prices in Republika Srpska from January 1*, 5 January 2010, www.energetika.net

³²³ ISI Emerging Markets, *Elektroprivreda BiH proposes power price hike* , 22 March 2011, www.securities.com ; ISI Emerging Markets, *Elektroprivreda BiH applies for 10% electricity price hike*, 8 March 2011, www.securities.com ; ISI Emerging Markets, *Electricity, gas prices to stay throughout winter*, 25 January 2011, www.securities.com ; ISI Emerging Markets, *Electricity, gas prices to stay by April 1*, 25 January 2011, www.securities.com ; ISI Emerging Markets, *One price of gas throughout winter*, 24 December 2010, www.securities.com

threatened by increasing difficulty in the last quarter of 2010 to collect debt from its customers, notably from main natural gas user and BH-Gas customer Sarajevo Gas.³²⁴

The above suggest that the gas & power market in Bosnia & Herzegovina is still largely problematic; and, as such, not supportive in real terms of further gasification of Bosnia & Herzegovina.

EU member state (and also main Balkan player) **Bulgaria** has been experiencing difficulties of its own with regard to energy pricing.³²⁵ Bulgargaz was seeking a 6.91% hike in local natural gas prices as of July 2011, to ex-tax levels of roughly BGN 569 / USD 415 (May 2011 average exchange rate) per 1,000 cubic metres, due to increases in the company's oil-linked natural gas supply contracts. However, the Bulgarian regulatory commission SEWRC / DKER was resisting such gas price levels. Indeed, Bulgarian natural gas prices had risen again by 4.47% in April 2011 to BGN 532 / USD 391 per 1,000 cubic metres, with low-pressure users paying BGN 540 / USD 397 (April 2011 average). Importantly, in February 2011 there were reports that Bulgargaz was seeking as much as a 6.3% increase in local natural gas prices in order to reflect its rising supply costs; and that the Bulgarian regulatory commission SEWRC / DKER was calculating a 5% gas price rise for the same period.³²⁶ Earlier in December 2010, SEWRC / DKER had forced gas price reductions of some 5.7% for the first quarter of 2011, resulting to BGN 509 / USD 357 per 1,000 cubic metres (November 2010).³²⁷ The Bulgarian company has been contesting the relevance of assumptions implied in the gas price put forward by SEWRC / DKER, especially the projected 300 mcm gas withdrawal from UGS Chiren,

³²⁴ Info from ISI Emerging Markets, *Federation BiH ups natural gas price by 10.8%*, 15 April 2011, www.securities.com ; ISI Emerging Markets, *FBiH: price of gas up by 10.7 per cent, government will remove mark-up cap*, 15 April 2011, www.securities.com ; ISI Emerging Markets, *Bosnia: BH Gas says gas shortages threaten market*, 17 January 2011, www.securities.com ; Limun.hr, *BH Gas warns about debts which jeopardize supply*, 13 January 2011, www.limun.hr ; and Energetika.net, *Due to the debt BH Gas is going to turn off the gas supply to the company Zvornik Stan*, 8 December 2009, www.energetika.net

³²⁵ Effective 2009 average domestic natural gas prices, including taxes and VAT, stood at EUR 0.028 per Kilowatt – hour (KWh) for consumption levels of 15,000 KWh per year; and at EUR 0.034 per KWh for levels of 30,000 KWh per year. Average industrial gas prices were predictably much lower, at EUR 0.016 per KWh (including excise but excluding VAT). At the same time, average domestic electricity prices with taxes and VAT were EUR 0.093 per KWh for consumption levels of 3,500 KWh per year, and EUR 0.077 per KWh for consumption of 7,500 KWh per year (and 30% during night-time). Finally, average industrial electricity prices stood at a reduced EUR 0.070 per KWh. For more see European Commission, *Europe's energy portal*, accessed 6 September 2010, www.energy.eu.

³²⁶ ISI Emerging Markets, *Regulator: natural gas price up by less than 7%, heating utilities with higher prices*, 10 June 2011, www.securities.com ; SeeNews, *Bulgargaz seeks 6.91% rise in Q3 natgas prices*, 10 June 2011, www.seenews.com ; SeeNews, *Bulgargaz plans to seek 7.12% hike in natgas prices in Q3*, 12 May 2011, www.seenews.com ; Dnevnik News, *Bulgargaz hikes natural gas price by 4.47%*, 1 April 2011, <http://news.dnevnik.bg> ; ISI Emerging Markets, *Energy regulator raises natural gas prices by 4.47% as of April 1 2011*, 1 April 2011, www.securities.com ; Sofia Echo, *Bulgargaz hikes natural gas price by 4.47%*, 31 March 2011, www.sofiaecho.com ; ISI Emerging Markets, *Energy regulator expects natural gas price hike of up to 5% as of April 1*, 23 February 2011, www.securities.com ; Sofia Echo, *Energy regulator projects 5% increase in gas prices in April*, 22 February 2011, www.sofiaecho.com ; SeeNews, *Bulgargaz plans to seek 6.3% hike in natgas prices in Q2*, 22 February 2011, www.seenews.com ; Sofia Echo, *Bulgargaz projects 6.3% increase in gas prices in April*, 21 February 2011, www.sofiaecho.com.

³²⁷ Cited prices in USD in this section are based on the average interbank 0% exchange rate (ask) for BGN / USD conversion in the indicated period (as presented in www.oanda.com).

which could reportedly lead to TOP violations for the Bulgarian gas company against its suppliers; and also the specific BGN / USD exchange rate on which these calculations were premised.³²⁸

Bulgarian heating prices were similarly expected to fall at the time as a result of the abovementioned decreases in natural gas prices, as a substantial part of heating generation in Bulgaria is gas-based. Indeed, feedstock gas reportedly accounts for ~75% of costs in such gas-based heat production.³²⁹ Hence, the Bulgarian capital Sofia was at the moment anticipating a 5.1% drop in its heating prices; Pleven was expecting some 5.7%; Vratsa ~5.4%; Bourgas ~5.2%; Pernik ~0.67%; and Sliven ~0.46%. But exactly due to this linkage between natural gas and heating prices in the country, the winter of recessionary 2010 saw Bulgarian consumers pay an extra 12% on average for their central heating. The steepest increases were seen in Sofia (18.6%); in Gabrovo, in central-north Bulgaria (16%); in Vratsa, north-western Bulgaria (15.92%); and in Rousse on the border with Romania (15.89%).³³⁰

Earlier in September 2010, SEWRC / DKER had approved an ex-tax 0.94% decrease for the fourth quarter of 2010, which resulted in an end-user price of BGN 537.4 / USD 358 per 1,000 cubic metres (September 2010 average). However, Bulgargaz had at the time proposed an even lower ex-tax gas price of BGN 535.1 / USD 357 per 1,000 cubic metres (September 2010 average). Besides taking into account as usual the price levels of competing fuels, as well as the related currency fluctuations, Bulgargaz had factored into its offer also the prospect of a purchase of 100 mcm of domestic gas from Kaliakra and Kavarna, at -30% compared to the Romanian border price. These upstream fields have been awarded under a 7- and a 10-year concession respectively to UK producer Melrose Resources. Bureaucratic shortcomings and delays initially put in question whether this prospect could be realized as early as the fourth quarter of 2010, but these seemed to have been overcome in time.³³¹

³²⁸ SeeNews, *Bulgaria's energy regulator endorses 5.17% cut in Q1 gas prices*, 27 December 2010, www.seenews.com ; ISI Emerging Markets, *Regulator wants 6% gas price cut, distributor proposes 2*, 22 December 2010, www.securities.com; ISI Emerging Markets, *Energy watchdog proposes 5.21% reduction of natural gas prices*, 20 December 2010, www.securities.com ; ISI Emerging Markets, *Regulator sees chance for 2% + price cut for natural gas*, 14 December 2010, www.securities.com

³²⁹ ISI Emerging Markets, *Sofia heating utility expects EUR 30.2 mn loss this year*, 23 December 2009, www.securities.com

³³⁰ ISI Emerging Markets, *Gas, heating prices down by about 5% as of Jan. 1*, 3 January 2011, www.securities.com ; SeeNews, *Bulgaria's energy regulator endorses 5.17% cut in Q1 gas prices*, 27 December 2010, www.seenews.com ; Focus Information Agency, *Gas price and thermal energy cheaper as of January 1*, 22 December 2010, www.focus-fen.net ; ISI Emerging Markets, *Energy watchdog proposes 5.21% reduction of natural gas prices*, 20 December 2010, www.securities.com ; ISI Emerging Markets, *Regulator sees chance for 2% + price cut for natural gas*, 14 December 2010, www.securities.com ; The Sofia Echo, *Energy watchdog: price of heating could fall*, 14 December 2010, www.sofiaecho.com ; and also The Sofia Echo, *Price of central heating in Bulgaria to increase on average by 12%*, 28 September 2010, www.sofiaecho.com

³³¹ ISI Emerging Markets, *Bulgargaz suggests gas price to go down 1.78% from January*, 10 December 2010, www.securities.com ; ISI Emerging Markets, *Natural gas prices decrease by 0.94% as of Oct. 1*, 01 October 2010, www.securities.com ; ISI Emerging Markets, *Cabinet grants 7-year gas extraction concession to Melrose Resources*, 30

But even though favourable at first glance for the Bulgarian operator, the regulator's decision to support a higher price for natural gas was meant also as a means of compensating it for revenue effectively foregone and losses thus incurred by Bulgargaz during the period January - August 2010. This was estimated at BGN 76 million / USD 51 million (January - August 2010 average) and was the result of a mismatch between supply costs and end-user prices approved by SEWRC / DKER. But according to Bulgargaz, if these losses were indeed to be factored into Bulgarian end-user prices, rather than returning their full value to the company as a separate instalment (or similar), then this would in reality require substantially higher prices for natural gas, even if only to allow break-even. Bulgargaz has still to acknowledge the legality of this move by SEWRC / DKER and has accordingly referred the case to the Bulgarian Supreme Court.³³²

In August 2010, Bulgargaz had asked for a 2.96% hike in the price of gas for the fourth quarter 2010. But this move was contrary to public opinion, which was instead expecting to see gas price decreases. The apprehension of the Bulgarian operator (and government) on that matter was evident at the time, in the pains they took to stress how, rather than a liability, this price hike should be seen as a success. This was premised on the idea that, thanks to a relevant agreement with Moscow, the proposed rate of increase had actually been contained from an otherwise unavoidable 6.9% hike. Still, this line of argument only helped draw further attention to the obvious inconsistency with earlier announcements that referred to the possibility of decreases in the gas import price of 4% - 7%, which were to bring savings of up to 15% in retail gas and 7% in Sofia heating as of October 2010 (*see above*).³³³

The above had been preceded by a number of even more considerable natural gas price increases, always to the dismay of recession-struck consumers in the country. For example, in June 2010 SEWRC / DKER approved a 24.6% hike; this in turn resulted in an average 1.8% rise in electricity, and an 11.7% rise in heating prices.³³⁴ Bulgargaz had at the time asked for even higher gas prices, arguing it would otherwise be forced to operate at a loss, to the detriment of its operations and plans.

September 2010, www.securities.com ; Bloomberg, *Bulgaria to cut natural gas prices 1% on Black Sea production*, 30 September 2010, www.bloomberg.com.

³³² ISI Emerging Markets, *Bulgargaz to end 2010 with losses*, 30 December 2010, www.securities.com ; ISI Emerging Markets, *Natural gas prices decrease by 0.94% as of Oct. 1*, 01 October 2010, www.securities.com ; Banker Weekly, *Regulator "fines" Bulgargaz with BGN60M*, 01 October 2010, www.banker.bg

³³³ Dnevnik News, *Hopes for cheaper gas in Bulgaria peter out*, 18 August 2010, <http://news.dnevnik.bg> ; SeeNews, *Bulgargaz seeks 2.96% rise in gas prices in gas prices in Q4*, 17 August 2010, www.seenews.com

³³⁴ As mentioned above, gas prices impact directly on heating utilities in Bulgaria, which represent an important component of the country's energy system. In late 2009, Sofia's state-run heating utility, one of the largest suppliers in the country with heat production capacity of more than 3,000 MW and cogeneration units with total output capacity of some 280 MW, warned of heavy losses due to a mismatch between its feedstock costs and client rates. This structurally imbalanced market context for Bulgarian heating utilities puts at risk their financial health, and potentially also undermines investment planning. Furthermore, it may also undermine their ability to compete in the international market for attracting necessary gas volumes. (ISI Emerging Markets, *Sofia heating utility expects EUR 30.2 mn loss this year*, 23 December 2009, www.securities.com).

However, strong opposition from local business and unions succeeded in averting this move.^{335 336} By the same token, in January 2010 an envisaged 17% hike ultimately shrunk to much lower 10.5%. At any rate, Sofia has now decided to move forward with a revision of its pricing mechanism, so it can better reflect gas inventories and be more in line with EU practices.

In this framework, the Bulgarian natural gas operator reported losses in the order of approximately BGN 30 million / USD 20 million (2010 average) for 2010.³³⁷ Moreover, these significant difficulties for Bulgargaz have been exacerbated by its inability to collect outstanding debt from heating utilities, as themselves continue to be very much hard-pressed financially. For example, in September 2010, the municipality-owned heating utility of Sofia, one of the largest energy providers in the county, suffered from continuing liabilities to Bulgargaz in the order of BGN 30 million / USD 20 million, and of up to BGN 80 million / USD 53 million including delays.³³⁸ Meanwhile, the privately-owned heating utilities of Bourgas, Pleven, and Vratsa owed an additional BGN 6 million / USD 4 million; and the heating utility of Shumen, north-eastern Bulgaria, which has now been taken over by the municipality, owes Bulgargaz a further BGN 12 million / USD 8 million.³³⁹

Against this backdrop, in January 2011 it emerged that, in an effort to avoid supply disruptions, the Sofia heating utility would repay by mid-February 2011 up to 90% of its pending debt to Bulgargaz, and ultimately also an additional BGN 500 million / USD 340 million (2010 average) of older debt. It was also planning to revert to better collection of outstanding debt from household and commercial clients to itself (which amounts to almost half its older debt to Bulgargaz) to support its cash flow. According to company sources, the utility suffered losses of some BGN 17 million / USD 11.5

³³⁵ ISI Emerging Markets, *Bulgaria gas price soars by 25%*, 29 June 2010, www.securities.com ; Dnevnik News, *Businesses keep fingers crossed for slimmer gas spike*, 28 June 2010, <http://news.dnevnik.bg>

³³⁶ ISI Emerging Markets, *Energy regulator approves 10.5% hike in natural gas price as of January 1*, 4 January 2010, www.securities.com

³³⁷ Information from ISI Emerging Markets, *Bulgargaz to end 2010 with losses*, 30 December 2010, www.securities.com ; and ISI Emerging Markets, *Gas supplier Bulgargaz to end year with accounting loss of 30 million leva*, 29 December 2010, www.securities.com

³³⁸ Unless otherwise stated, cited prices in USD in this section are based on the average interbank 0% exchange rate (ask) for BGN / USD conversion in August 2010 as presented in www.oanda.com.

³³⁹ ISI Emerging Markets, *Sofia heating utility to rewrite rescue plan*, 7 October 2010, www.securities.com ; ISI Emerging Markets, *Sofia heating utility expects EUR 14.8 mn loss in 2010*, 7 October 2010, www.securities.com ; Banker Weekly, *Regulator "fines" Bulgargaz with BGN60M*, 01 October 2010, www.banker.bg ; The Sofia Echo, *Price of central heating in Bulgaria to increase on average by 12%*, 28 September 2010, www.sofiaecho.com; ISI Emerging Markets, *Heating prices to remain unchanged, certain companies threatened with termination of supplies*, 21 September 2010, www.securities.com

million (2010 average) in 2010, and was expecting losses of some BGN 20 million / USD 13.5 million (2010 average) in 2011, if heating prices were to remain depressed throughout the year.³⁴⁰

In December 2010, Bulgargaz also threatened the heating utility of Shumen with supply cut-offs. According to local media reports, Shumen owes the Bulgarian gas company a total BGN 15.5 million and had pledged to repay it some BGN 2.3 million by December 2010, to which it failed to adhere. Local authorities refused to allow the cut-off to proceed and unsuccessfully examined the possibility of alternate supply options, which could obviously not be successful due to its last-minute nature. Furthermore, the dispute with Bulgargaz caused a stand-off between the local authorities at Shumen and the country's central administration in Sofia, which openly called for the mayor's resignation. Following an intervention of PM Boyko Borisov, in January 2011 it emerged that Bulgargaz would allow minimum gas supply to the Shumen heating utility to continue despite the still unresolved issue, due to the extreme weather conditions prevalent at the time.³⁴¹

Finally, in January 2011 it emerged that the Bulgarian electricity transmission operator NEC was planning to request a BGN 0.01 price increase from current levels of BGN 0.18 (including VAT), aimed at protecting the company's investment programme worth some BGN 219 million in 2011. Meanwhile, the Bulgarian regulator was expecting electricity price increases which would not exceed the 5% threshold as of July 2011 (and possibly be only up to + 1.7% for residential users). These increases in Bulgarian electricity prices are reportedly aimed at reflecting higher production costs due to streaming of a number of new renewable projects in the country. In any event though, local distribution companies have in contrast asked for average electricity price hikes of up to 13.2%. These are opposed by Bulgarian authorities on economic (inflationary pressures) grounds.³⁴²

³⁴⁰ The Sofia Echo, *Toplofikatsiya Sofia to pay 90M leva of its debt to Bulgargaz by mid-February*, 3 January 2011, www.sofiaecho.com; ISI Emerging Markets, *Sofia heating utility to pay 90 million leva of overdues for gas supplies to Bulgargaz in early February*, 3 January 2011, www.securities.com; The Sofia Echo, *Heating in Sofia will not be cut-off, mayor says*, 30 December 2010, www.sofiaecho.com; ISI Emerging Markets, *Heating utility Toplofikatsiya Sofia has EUR 255 mn in debts to suppliers*, 23 December 2010, www.securities.com

³⁴¹ The Sofia Echo, *Gas crisis: Bulgargaz will maintain limited deliveries to Shoumen*, 4 January 2011, www.sofiaecho.com; also The Sofia Echo, *Bulgargaz halts gas deliveries to Shoumen heating utility*, 30 December 2010, www.sofiaecho.com; ISI Emerging Markets, *Bulgargaz halts gas deliveries to Shoumen heating utility*, 30 December 2010, www.securities.com; ISI Emerging Markets, *Shoumen heating utility fails to change gas supplier*, 29 December 2010, www.securities.com; and ISI Emerging Markets, *Gas supplier Bulgargaz worried with heavy indebtedness of central heating utilities*, 29 December 2010, www.securities.com

³⁴² ISI Emerging Markets, *Regulator: natural gas price up by less than 7%, heating utilities with higher prices*, 10 June 2011, www.securities.com; ISI Emerging Markets, *CEZ, E.ON propose power price hike of at least 10% as of July 1*, 1 March 2011, www.securities.com; ISI Emerging Markets, *EVN proposes 5.1% electricity price hike as of July 1*, 28 February 2011, www.securities.com; ISI Emerging Markets, *Energy regulator expects 1.5% power price hike as of July 1 on green energy cost*, 9 February 2011, www.securities.com; ISI Emerging Markets, *Electricity price will go up to factor in*

Hence, evidence on all the gas, heating, and electricity levels presented above suggests the persistence of serious pricing tensions across Bulgaria's energy sector, including between natural gas import costs and what the local market can in fact bear, eventually also leading to an undermining of efforts aimed at boosting security of supply in the country and wider.

Such difficulties and disagreements with regard to natural gas pricing have emerged also in **Croatia**, a minor oil & gas producer. In December 2009, Zagreb agreed to buy back from strategic investor MOL by end-2010 the natural gas segment of INA (*Prirodni plin*), which had proven unprofitable due to burdensome and restrictive pricing regulation. It also pledged to put in place a more favourable regulatory framework that would limit MOL / INA losses until the above transaction had taken place. In return, MOL agreed to help the Croatian company settle an outstanding dispute with the tax office. In view of that agreement, in the same month the Croatian government allowed MOL/ INA to raise its local gas prices by an average 19%. This price hike was premised on the need to reflect better related upstream production and storage costs, both vital components of a successful supply security policy. At the same time, reinforced government support to the country's generally vulnerable residential sector succeeded in keeping increases in that context at bay and less than 15%.³⁴³

Losses from the gas segment were consequently reduced by EUR 27 million in the first half of 2010. However, they were still substantial and hovered in the area of EUR 46 million – and as much as EUR 62 million in the first nine months of 2010 - with MOL / INA once more pointing the finger at their (unavoidably) below-cost sales. In this sour environment, in July 2010 industrial prices increased by up to 16% in response to rising gas import prices and currency fluctuations. But as in December 2009, a request for comparable price increases in the country's residential sector was rejected by Zagreb. Furthermore, in October 2010, Agencija za Zaštitu Tržišnog Natjecanja (AZTN), the Croatian competition agency, launched an investigation into whether the range of gas price hikes seen in the country from late 2009 and until that point were in fact in line with national rules and regulations.³⁴⁴

RES power costs, 8 February 2011, www.securities.com ; ISI Emerging Markets, *Grid operator NEC to request electricity price rise*, 20 January 2011, www.securities.com.

³⁴³ See ISI Emerging Markets, *Natural gas prices increase by 15% as of Jan 1*, 4 January 2010, www.securities.com ; Croatian News Agency, *Price of natural gas for households to go up 15% as of Jan 1*, 30 December 2009, www.hina.hr ; and ISI Emerging Markets, *Cabinet agrees with Hungary's MOL to buy INA's gas unit by end-2010*, 17 December 2009, www.securities.com

³⁴⁴ ISI Emerging Markets, *Ina group earns net profit of Hrk 559 million*, 29 October 2010, www.securities.com; ISI Emerging Markets, *Croatia: Gov't not to acquire Prirodni Plin gas company*, 19 October 2010, www.securities.com; ISI Emerging Markets, *AZTN investigating why price of gas went up by 70%*, 7 October 2010, www.securities.com; Limun.hr, *Ina blames prices of gas for loss*, 2 August 2010, www.limun.hr ; Limun.hr, *INA: Gas price for industry up 16%*, 5 July 2010, www.limun.hr; and ISI Emerging Markets, *Fresh shock: price of gas for industry up by more than 15%*, 2 July 2010, www.securities.com

Dealing a further blow to MOL, in the same month the Croatian government decided not to buy back INA's loss-making natural gas segment, despite an earlier agreement between the two sides to do so. As a result, INA / MOL reportedly asked for increases in residential pricing of the order of 40% to 100%. There was also relatively wide speculation at the time on the possibility of INA / MOL extending its stake in (partially state-owned) Croatian oil logistics operator JANAF, by some EUR 130 million. Furthermore, irking the Croatian government, in December 2010 MOL sought to acquire an additional 8% stake from small stakeholders in INA itself, but without first having notified Zagreb as expected. Crucially, the Hungarian bid would, if successful, bring MOL's ownership rights in the integrated (upstream to downstream oil & gas) Croatian player to levels above the absolute majority threshold. At any rate, in response to the pricing requests of INA / MOL, Croatian officials have drawn attention to the fact the company already enjoys access to domestic production with low royalties and cannot credibly be considered to be in need of international pricing in support for its product marketing. Subsequently, in January 2011 it was formally announced that Croatian gas prices were to go up by only some 10%, thereby confirming earlier published reports and estimates. Importantly, this decision may have also been influenced by the upcoming national elections.³⁴⁵

Local utility HEP has also been quick to point out the negative impact of the abovementioned price hikes on its own operations. HEP operates a total 1,601 MW thermal generation capacity in Croatia, of which some 331 MW is natural gas-fired and another 699 MW can operate on both fuel oil and gas. Hence price increases in natural gas - which at ~700 mcm consumption levels per year represents one of the key feedstock sources for HEP - can have a direct and deep impact on both overall power generation costs on a national level, as well as on the size of the total natural gas market in Croatia.³⁴⁶ Indeed, in view of these rising feedstock costs, Zagreb has decided to pass responsibility for heating prices from the national regulator to local authorities, in an effort to facilitate transition to more sustainable levels, thus revealing similar tensions to the ones presented in the case of Bulgaria above. The market is now waiting to see how this shift in pricing responsibilities translates in practice.³⁴⁷

³⁴⁵ See ISI Emerging Markets, *Electricity, gas price hikes avoided due to election*, 22 February 2011, www.securities.com ; ISI Emerging Markets, *Gas prices up*, 2 January 2011, www.securities.com ; ISI Emerging Markets, *Hungarian MOL to acquire 8.0 pct of Croatia's INA*, 3 December 2010, www.securities.com ; ISI Emerging Markets, *Ina will keep gas, raise its price by 13%*, 2 December 2010, www.securities.com ; ISI Emerging Markets, *Ina will keep gas distribution, raise price for households*, 2 December 2010, www.securities.com ; ISI Emerging Markets, *MOL asking for share in Janaf*, 22 November 2010, www.securities.com ; ISI Emerging Markets, *State will not take over Prirodni pin*, 17 November 2010, www.securities.com ; ISI Emerging Markets, *Gas prices up*, 31 October 2010, www.securities.com ; Government of the Republic of Croatia, *Prime Minister says government will do everything to prevent drastic gas price hikes*, 31 October 2010, www.vlada.hr

³⁴⁶ Gas demand in Croatia contracted by more than 9% in 2009; for more on HEP's reaction to the price increases of INA see Energetika.net, *Ina increases gas prices, Hep announces increased electricity bills*, 22 December 2009, www.energetika.net

³⁴⁷ ISI Emerging Markets, *Hike in heating prices expected*, 7 September 2010, www.securities.com

Finally, in January 2011 it emerged that the Croatian government would retain at least until June 2011 protective measures against gas and power price increases for local vulnerable residential consumers, the effect of which was mandated to last until end-2010 at the time of their introduction by Zagreb. Indicatively, at the beginning of 2010, the Croatian government decided to curb the anticipated gas price increases to 15% for the country's residential sector, from an expected increase of about 19%. The differential between these two rates was to be paid out directly by the country's state budget. Importantly, vulnerable consumer group protection has reportedly been extended until end-2011.³⁴⁸ As above, the decision of Croatian authorities not to allow any substantial electricity price hikes could be related to the upcoming parliamentary election in this SEE country (*see above*).

In 2010, Independent Power Producers (IPPs) in **Greece** accused the country's state-owned Public Power Corporation (PPC) of manipulating to its advantage the System Marginal Price (SMP). According to the IPPs, this was done through an irregular usage of PPCs (cheap) hydro- and lignite-based power generation capacity, which brought the Greek SMP down to non-cost-reflective levels. This was further exacerbated by the fact that CO₂ emissions costs were at the time not taken at all into consideration in the calculation of the Greek SMP, hence favouring lignite-based power generation. IPPs, which rely on cleaner but more expensive gas, were thus in effect shut out of the Greek market. If the SMP context in Greece indeed operates as it has been described by local independent producers, then this represents a serious issue which can undermine IPP profitability and discourage investment, with negative repercussions also on ongoing efforts at Greek gasification and supply security.³⁴⁹

In this framework, in July 2010 Greek media reported the EU and the IMF would take an active interest in these issues, including compliance with their continuing EAP financial assistance scheme. In September 2010, the government announced a long-due change in the country's SMP system, mostly as a result of the pressure from frustrated IPPs at home and also indispensable creditors abroad. The proposed restructuring sought to address all the main points of friction mentioned above. Accordingly, it comprised more explicit criteria and limitations on the usage of hydro-based units; heavy penalties for false reporting of unit availability; and partial incorporation into the final price of relevant emissions costs. Consequently, Greek SMP rose by some EUR 4 per MWh, leaving room for gas-based IPPs to compete (and, crucially, continue to invest) in the national electricity market.

³⁴⁸ ISI Emerging Markets, *Measures curbing growth of electricity, gas prices for households extended*, 3 January 2011, www.securities.com

³⁴⁹ See Energy Press, *Ασκήσεις ισορροπίας από ΠΑΕ για το «άνοιγμα» της χονδρικής στο ρεύμα*, 17 July 2010, www.energypress.gr; and also Energy Press, *Χάρης Φλουδόπουλος: "Παιδικές ασθένειες" στην αγορά ηλεκτρισμού*, 17 July 2010, www.energypress.gr

However, even this was in the end finally diluted due to a number of temporary derogations granted, which contributed towards a new drop of Greek SMP to historically low levels.³⁵⁰

The EU and IMF also applied pressure on the Greek government towards reform of electricity prices. The latter have traditionally been characterized by cross-subsidisation which in turn allowed access for parts of the residential and agricultural sectors to non-cost-reflective tariffs, notably at the expense of local commercial consumers, who bore the brunt of this financial burden.³⁵¹ In this framework, in October 2010 Athens announced average price hikes of 13.7% in residential consumption levels of up to 800 KWh / year; of 2.7% in residential consumption between 800 KWh and 1,600 KWh / year; and 1.6% between 1,600 KWh and 2,000 KWh per year. In contrast, higher consumption levels saw average decreases: of 4.4% for residential consumption between 2,000 KWh and 3,000 KWh per year; and of 13.8% for 3,000 KWh per year and above. There were also provisions for a reduced social tariff of up to 20% for vulnerable groups including the unemployed, low-income workers, disabled people, and legal guardians with 3+ underage dependents. In a similar vein, the heavily subsidised Greek agricultural sector saw average price increases of 5% in low voltage and 7% in medium voltage; while industrial users received a relatively mixed bag, which included reductions of up to 13.5% in low and increases of up to 8.7% in medium voltage. Finally, recession-hit commercial consumers received a welcome boost in their efforts at survival, with envisaged reductions of between 4.3% and 18.4% in their electricity bills.^{352 353}

Other charges such as excise tax, social support, and transmission costs are to be redistributed on a progressive basis, to alleviate the worst social and economic effects of the new pricing structure. Changes were to take effect as of (recessionary) January 2011, with additional increases expected for 2012 and 2013, during which the Greek government expects to see gradual recovery of the economy.

³⁵⁰ Energy Press, *Κατακόρυφη μείωση στην οριακή τιμή ρεύματος έφερε η 5^η ημέρα αναφοράς*, 20 December 2010, www.energypress.gr; Energia.gr, *Αυξάνεται κατά 3 έως 4 Ευρώ η Ο.Τ.Σ.*, 30 September 2010, www.energia.gr

³⁵¹ Effective November 2009, domestic Greek electricity prices including taxes and VAT, stood at an average of EUR 0.089 per KWh (30% during night-time); while industrial electricity prices, including taxes but not VAT, were at an average level of EUR 0.091 per KWh for consumption of 2,000 Megawatt – hour (MWh) per year, and at EUR 0.073 per KWh for 24,000 MWh; see European Commission, *Europe's energy portal*, accessed 6 September 2010, www.energy.eu

³⁵² Energy Press, *Κάθε έξι μήνες αυξομειώσεις στα τιμολόγια, ώστε να αντανakλούν το κόστος*, 8 October 2010, www.energypress.gr.

³⁵³ Revenues in the context of the Greek power system are under pressure also from collateral recession-inflicted damage, namely reduced rates of electricity bill collection, combined with increasing incidents of electricity and infrastructure theft. For year 2010, incremental low- and medium-voltage overdue payments to PPC stood at approximately EUR 139 million, of which EUR 101 coming from the company's low voltage clients, namely the residential and small commercial sectors. Local reports mention total overdue for 2010 at roughly EUR 570 / 400 million for total and low-voltage respectively. Additionally, there has been a number of reports of electricity and infrastructure theft in various locations across the country. See Kathimerini, *Στα 400 εκατ. ευρώ έφτασαν οι απλήρωτοι λογαριασμοί ρεύματος*, 11 February 2011, www.kathimerini.gr; Energia.gr, *Διευκρινίσεις της ΔΕΗ για τους ανεξόφλητους λογαριασμούς*, 11 February 2011, www.energia.gr.

Moreover, these price hikes are in fact seen as necessary in Brussels and Athens, in preparation of a planned full reflection of real production costs in 2012, and incorporation of emissions costs in 2013. The Greek energy regulator has also proposed that electricity tariffs are now revised every six months, as a means of keeping more readily in line with relevant fluctuations in international feedstock costs. Athens has yet to decide on this issue but, as with reform of the local SMP system mentioned above, Greek gasification and (ultimately also) security of natural gas supply is on the whole expected to be strengthened from this restructuring, especially upon its completion in 2013.³⁵⁴

Furthermore, in December 2010 media reported that retail gas prices in the capital region (Attica) would increase as of January 1st, due to a combination of EPA Attica price increases on fixed charges of approximately 1.2%; combined with a recent hike in pertinent VAT from 11% to 13%; and also increases as a direct corollary of its oil-indexation marketing policy. Indeed, the latter was to stand at 18% off concurrent heating gasoil prices as of January 2011, from its previous constant of -20%. However, by March 2011 there were thoughts at EPA Attica to take advantage of the new excise tax on heating gasoil which is to be imposed as of November (i.e. near parity with motor diesel excise). The aim is to increase the differential between local gas and gasoil prices at substantially above 20%, thereby supporting its commercial strategy concerning penetration of natural gas in the Attica region. In any event, Attica ex-tax prices for residential heating stood at EUR 51 per MWh in January 2011. In the second city of Thessaloniki, where the local EPA follows a different gas pricing methodology, ex-tax prices T3 (commercial / residential central heating) were in fact very similar to those at Attica, standing at only slightly above EUR 50 per MWh. There are no other fixed charges in the T3 context. Even these prices compared favourably to the fuel's main competitor in Greece, i.e. heating gasoil. However, the aforementioned price hikes have drawn opposition from media and consumers.³⁵⁵

Electricity prices in **Montenegro**, which is not currently gasified, remain below cost recovery and are characterized by cross-subsidies from commercial consumers to residential and large industrial ones. The country's *Energy Development Strategy to 2025* envisages a tariff / pricing policy that will take into account market-based costs (including environmental costs) and profit margins, thus encouraging energy efficiency and ultimately also improving the country's reliability / security of energy supply.

³⁵⁴ Ibid.

³⁵⁵ Energy Press, *Αυξάνει πάνω από 20% η ΕΠΑ Αττικής τη διαφορά αερίου με το πετρέλαιο θέρμανσης...*, 4 March 2011, www.energypress.gr ; Energy Press, *Η ΕΠΑ Αττικής δίνει διευκρινίσεις για τις αυξήσεις τιμών*, 3 February 2011, www.energypress.gr ; in EPA of Attica, *Τιμολόγια φ.α. οικιακής χρήσης*, accessed 23 January 2011, www.aerioattikis.gr ; EPA of Thessaloniki, *Τιμές φυσικού αερίου*, accessed 23 January 2011, www.epathessaloniki.gr ; Energia.gr, *Θεσσαλονίκη: δωρεάν σύνδεση στο δίκτυο φυσικού αερίου από την ΕΠΑ*, 11 January 2011, www.energia.gr ; Energia.gr, *Αυξήσεις και στις τιμές του φυσικού αερίου από την αρχή του νέου έτους*, 29 December 2010, www.energia.gr ; Energy Press, *Αυξήσεις και στο φυσικό αέριο από 1^{ης} Ιανουαρίου*, 29 December 2010, www.energypress.gr. For more information on gas pricing methodologies in Greece see Anastasios Giamouridis, *Natural gas in Greece and Albania: supply and demand prospects to 2015*, December 2009, Oxford Institute for Energy Studies, www.oxfordenergy.org

Against this background, local power utility Elektroprivreda Crne Gore (EPCG) and transmission operator Crnogorski Elektroprenosni Sistem (CGES) have asked for increases in the order of 79%, and a decision by the Regulatory Authority for Energy (RAE) was expected by end-February 2011. However, earlier in January 2010, RAE had decided to reduce Montenegrin electricity prices by an average of 15.7%, as a means of alleviating related recessionary pressures on the national economy. The move had naturally stirred up opposition from EPCG, which was quick to point out that RAE's decision put its profitability and investment program at risk. Such moves anyway undermine ongoing efforts at putting in place an attractive regulatory framework which in the future could support gasification of the local power sector, including secure supply with gas from the international market. Montenegro has also been working towards improving the competitiveness of its electricity sector, principally by limiting loss levels currently incurred by it, and also improving its bill collection rates. The EBRD has already granted EPCG a EUR 35 million loan for upgrades in its distribution system, including installation of approximately 175,000 new smart meters.³⁵⁶

Energy product pricing is fast becoming a priority issue also in **Serbia**, where signs of tensions such as the ones described above are increasingly evident between main players, including government, power producers, industry, and individual consumers. For example, in January 2010, dominant integrated company NIS threatened to cut off oil supply to a number of heating utilities due to outstanding debt; similar debt problems have been reported also with regard to the local natural gas operator Srbijagas (as heating in Serbia is usually gas-fired, with oil used mainly as a back-up fuel). The latter is now threatening to take over more than 10 companies, including local gas distributors, which in October 2010 reportedly owed it more than EUR 400 million in combined debt. The inability of these utilities to settle old liabilities and thus also procure new volumes has largely been the result of a growing mismatch between local end-prices and international feedstock costs.³⁵⁷

Indeed, heating prices in Serbia remain regulated and low; in contrast, feedstock costs, which can reach up to 75% of operating expenditures, follow international prices. The latter have in recent months followed an upward trajectory despite the crisis, applying pressure on the Serbian energy

³⁵⁶ See ISI Emerging Markets, *Energy regulator to decide on electricity price hike by end-February*, 20 January 2011, www.securities.com; also ISI Emerging Markets, *Electricity prices in Montenegro might increase considerably in 2011*, 7 December 2010, www.securities.com; likewise, Balkan Insight, *EBRD grants €35 million for Montenegro power grid*, 26 November 2010, www.balkaninsight.com; Energetika.net, *Regulatory authority reduces the price of electricity in Montenegro*, 4 January 2010, www.energetika.net; and International Energy Agency (2008), *Energy in the western Balkans: the path to reform and reconstruction*, OECD / IEA, www.iea.org

³⁵⁷ According to Srbijagas, the company is owed a total EUR 430 million, of which approximately EUR 220 million has been accumulated in 2009 alone. More info in Bloomberg, *Serbia's gas company to convert claims into equity*, *Novosti says*, 23 November 2010, www.bloomberg.com; ISI Emerging Markets, *Serbia: Srbijagas owed EUR 430mn*, 20 October 2010, www.securities.com; and Energetika.net, *Nis cutting off crude oil supply due to debts of thermal power plants, 15 towns in Serbia at risk of being left with no heating*, 18 January 2010, www.energetika.net

system. Existing distortions in the local downstream oil sector which stem from the overall market dominance of NIS have similarly taken their toll on these pricing structures. As a result, in January 2010 a total 15 Serbian cities were threatened with cuts in the midst of the harsh Serbian winter, undermining security of supply in this central Balkan country.³⁵⁸

Uncomfortably, according to Srbijagas management, heating prices in the country would have to see increases in the order of 50% if all pending debt were finally to be repaid to the Serbian company.³⁵⁹ As of May 2011, heating plants reportedly owed some EUR 150 million from previous gas supply.³⁶⁰ In this context, Srbijagas has openly laid blame for its 2009 losses on the government's unfavourable pricing policy which, according to the company, has magnified the negative impact of an already bad economic climate and of a consequently reduced (by 33% Y/Y) gas market. This predicament has been further aggravated for Srbijagas by a debt which reaches some EUR 175 million in total, accumulated from non-payment by both residential and commercial clients who continue to face financial and economic problems.³⁶¹

Against this backdrop, Srbijagas has invoked difficulties in proceeding with its investment plan, a development which is of direct relevance to the security of supply in both Serbia and the wider region, by virtue of being able to discourage investment in projects of regional importance such as gas interconnectors and underground storage. Srbijagas difficulties are corroborated by reported results for January – September (inclusive) 2010 during which the company suffered EUR 30 million losses, bringing it a step closer to bankruptcy. Moreover, in September 2010 Srbijagas CEO Dušan Bajatović warned of potential losses of up to EUR 100 million by April 2011 for his company and asserted that a price hike of more than 25% would be necessary if Srbijagas's profitability and ability to pay for new deliveries were not to be undermined, which obviously is a precondition of supply security.³⁶² However, as the Serbian government remained very careful with regard to the possible impact of price

³⁵⁸ Energetika.net, *Nis cutting off crude oil supply due to debts of thermal power plants, 15 towns in Serbia at risk of being left with no heating*, 18 January 2010, www.energetika.net

³⁵⁹ As of November 2010, Belgrade local authorities raised heating prices by 30% in order to cover increased feedstock costs as well as protect their ability to repay related debt and ensure supply. They also laid blame on Srbijagas for not providing them with feedstock natural gas at cost prices. For more information on this matter see for example ISI Emerging Markets, *Price of heating in Belgrade up 30 percent*, 2 November 2010, www.securities.com.

³⁶⁰ ISI Emerging Markets, *Gas prices to go up by around 20%*, 12 May 2011, www.securities.com

³⁶¹ Energetika.net, *Serbia is facing great problems due to the non-payment of gas bills*, 23 September 2010, www.energetika.net ; Balkans Business News, *Serbia households, companies owe Srbijagas 17.5 billion dinars*, 12 March 2010, www.balkans.com ; Energetika.net, *Srbijagas ends 2009 in the red, incurring a loss of 97 million euros*, 4 January 2010, www.energetika.net

³⁶² According to Srbijagas, as of May 2011 the company owed USD 19 million to Russia supplier for gas purchased from it, as well as an additional EUR 20 million to NIS for purchases of locally-procured natural gas. More information is available in ISI Emerging Markets, *Gas prices to go up by around 20%*, 12 May 2011, www.securities.com

increases on the country's vulnerable residential and commercial consumers, it refused to allow any increase in local gas prices for the remainder of 2010.³⁶³ Srbijagas was at the time expected to pay Gazprom USD 360 / 1,000 cu.m until 2011, according to information by Srbijagas and Yugorosgaz, a Gazprom subsidiary. However, that was later revised to as much as USD 377 per 1,000 cu.m.³⁶⁴

In January 2011, local media reported that the Serbian government was working with Srbijagas towards maintaining gas prices at their present levels, despite continuing currency appreciation risks. However, Serbian import prices had by then reportedly gone up to some USD 383 per 1,000 cu.m. Thus as a result of these persistent discrepancies between natural gas supply costs and end-prices, losses were expected to reach up to EUR 300 million for the Serbian gas operator by the end of 2011. In March 2011 it emerged that a decision about a possible hike in natural gas prices would be taken in April, and that this would be implemented by the Serbian authorities as of May or June 2011. Srbijagas has unofficially asked for a 20% gas price hike, including 15% in the residential sector. However, a price increase closer to 10% was in fact more likely for the abovementioned period. Furthermore, the company has reportedly been unsatisfied with the current gas pricing methodology, and accordingly requested a revision that would take more firmly into account currency fluctuations. The local body competent for such requests, i.e. the Agencije za energetiku Republike Srbije (AERS), seems to be in agreement with this restructuring and claims a relevant process has already been put in motion and should be completed soon. Nevertheless, this issue seems to be still pending.³⁶⁵

Electricity price hikes in Serbia are approved by the government, following a proposal to that end from utility EPS and the AERS; however, the latter is to assume full responsibility for that as of 2012. In this framework, EPS was reportedly envisaging a 15% rise in electricity prices as of January 2011. Nonetheless, it failed to gain all the necessary approvals from the government of Serbia at that stage,

³⁶³ See ISI Emerging Markets, *Srbija: Srbijagas posts total losses of EUR 330 mn*, 22 December 2010, www.securities.com; also ISI Emerging Markets, *No price increase of gas till the end of the year*, 14 October 2010, www.securities.com; Tanjug, *Possible gas supply problems if price of gas does not rise*, 24 September 2010, www.tanjug.rs; Tanjug, *Bajatović: We expect reply on who will pay price difference*, 22 September 2010, www.tanjug.rs; B92, *Natural gas price hike "realistic"*, 22 September 2010, www.b92.net; and ISI Emerging Markets, *Gas price to increase*, 13 September 2010, www.securities.com

³⁶⁴ More details are available in ISI Emerging Markets, *The price of Russian gas for Serbia the same till the end of the year*, 5 October 2010, www.securities.com; also in ISI Emerging Markets, *Koldin: price of Russian gas will remain unchanged*, 4 October 2010, www.securities.com; and in B92, *Natural gas price hike "realistic"*, 22 September 2010, www.b92.net; B92, *Political will creates gas prices*, 5 September 2010, www.b92.net

³⁶⁵ See ISI Emerging Markets, *Srbija gas price to increase by 10% from June 2011*, 26 April 2011, www.securities.com; also ISI Emerging Markets, *Gas more expensive by 15% at the end of the season*, 4 March 2011, www.securities.com; ISI Emerging Markets, *Srbijagas says prices to increase from May or June 2011*, 3 March 2011, www.securities.com; ISI Emerging Markets, *Decision on price increase of gas in April*, 2 March 2011, www.securities.com; ISI Emerging Markets, *Srbijagas and govt aim to prevent gas price increases*, 25 January 2011, www.securities.com; ISI Emerging Markets, *Srbijagas and government seek way to keep current price*, 21 January 2011, www.securities.com; ISI Emerging Markets, *Energy prices in Serbia won't increase before end of year*, 12 October 2010, www.securities.com; ISI Emerging Markets, *Srbijagas: natural gas prices to rise by 15%*, 2 July 2010, www.securities.com

and was in effect postponed to April (originally March) 2011, when prices rose by an average 15.1%. Earlier in March 2010, Serbian authorities had approved an EPS request for a combined ~10% hike, including 11% in residential and 9% commercial, in an effort to balance between inflation and shifts in exchange rates of the Serbian currency. This had been preceded by an extra 9% in August 2008. But according to EPS, electricity prices in Serbia were (at least until the previous price hike) by some 18% less than would in reality be needed for the operator to be able to carry out its infrastructure development program in a timely manner. Moreover, a combined 60% increase in local electricity prices by the end of 2013 is in fact perceived by the company as *sine qua non* if it is to complete successfully its ongoing restructuring programme. In this context, in January 2011 EPS took out a EUR 57 million loan in support of its operations, reportedly in light of insufficient revenues stemming from persistently below-cost energy prices. However, there is growing opposition to EPS price increases from both the public and local media, which claim that losses are in fact a result of the company's own failure to rein in expenses.³⁶⁶

But due to mounting public pressure and aiming at boosting profitability and power supply security, EPS has also been working towards limiting losses while also trying to improve bill collection rates. The country has already received financial support to that end from international donor bodies, including the EBRD. In the absence of other available options, EPS has sought to protect profitability and investment by following the earlier examples of OSSH (Albania) and Elektroprivreda (FBiH). Specifically, it is pushing forward with a EUR 80 million tender for the purchase and installation of approximately 25,000 remote electricity meters, aimed at improving collection accuracy by 2015. According to the Serbian operator, unauthorized electricity consumption in the country accounts for an estimated 4% of its total sales, therefore costing it an average of almost EUR 60 million per year. Against this backdrop, in September 2010 EBRD agreed to a EUR 40 million loan for that purpose. Relevant provisions of the said deal include a pay-back period of 12 years and grace period of 3 years, and also an annual interest rate of 6-month Euro Interbank Offered Rate (EURIBOR) plus 1%. Signing of a similar agreement with EIB on the remainder sum was expected within October 2010. According to the Serbian government, the above EPS policies are applicable to Srbijagas as well. Hence in January 2011 it was announced that EBRD was considering contributing up to EUR 18.5

³⁶⁶ ISI Emerging Markets, *Electricity prices go up 15.1% as of Apr. 1*, 1 April 2011, www.securities.com ; Balkan Insight, *Electricity prices in Serbia go up by 15 percent*, 1 April 2011, www.balkaninsight.com ; Tanjug, *Electricity prices to rise as of April 1, EPS grants discounts*, 28 February 2011, www.tanjug.rs ; ISI Emerging Markets, *EPS amends 2011 business plan to include electricity price hike as of March 1*, 22 February 2011, www.securities.com ; ISI Emerging Markets, *Cvetkovic: Electricity prices could go up in March*, 19 January 2011, www.securities.com ; Energetika.net, *EPS took a loan, because the company couldn't pay for the repair and maintenance work of its power plants due to illiquidity*, 18 January 2011, www.energetika.net ; ISI Emerging Markets, *Power utility EPS takes EUR 57 mn loan*, 17 January 2011, www.securities.com ; ISI Emerging Markets, *Electricity prices to rise by 10% as of Mar 1*, 29 January 2010, www.securities.com ; ISI Emerging Markets, *Electricity prices to be raised by 10% as of April*, 26 January 2010, www.securities.com

million towards completion of a total EUR 20.5 million project aimed at improving energy efficiency and achieving tariff reform in Novi Sad, northern Serbia through modernisation of its heating system, including substation modernisation; a biomass pilot project; and installation of heat cost allocators and thermostatic radiator valves in pilot buildings for more accurate measurements of consumption levels. A final decision on the matter was expected by March 2011.³⁶⁷

In any event, Belgrade has so far legitimized higher energy prices as part of a greater effort to promote efficiency and allow the creation of exportable power surpluses for more profitable markets, thus ultimately improving the financial situation of both EPS and the Serbian economy as a whole.³⁶⁸ In addition, there have been government efforts towards identifying sensitive consumers in the residential sector and alleviating fuel poverty through introduction of direct and / or other subsidies. However, a possible failure to align local electricity costs and prices will likely undermine investment and possibly also not allow the country to improve its supply security by breaking free from its current need to import electricity by 2014, as is its declared goal.³⁶⁹

UNMIK / Kosovo has similarly been facing serious cash-flow issues in its energy (heating) sector which have *de facto* undermined security of supply even to users not responsible for these problems. Specifically, Pristina's sole heating supplier TERMOKOS proceeded to cut-offs in response to persistent unpaid bills, including to apartment blocks, to government buildings, and even to hospitals. TERMOKOS claims it is owed EUR 15 million since 1999, including EUR 4.8 million since 2009, and has expressed fears concerning its ability to purchase feedstock (fuel oil) for heating generation. Disconnected UNMIK / Kosovo users have thus turned to electricity for meeting their heating needs, which in turn lead to a 25% increase in the consumption of (anyway problematically supplied) electricity and to a consequent severe threat of possible system overload.³⁷⁰

The Energy Regulatory Commission (ERC) of **the former Yugoslav Republic of Macedonia** proposed increases in local electricity prices at end-2010, which would be in the order of about 6.4%.

³⁶⁷ See Balkans Business News, *Serbia's Novi Sad province looks to finance upgrade of heating system*, 11 January 2011, www.balkans.com ; also SeeNews, *EBRD mulls loan of up to 18.5 mln Euro for Novi Sad district heating project*, 10 January 2011, www.seenews.com ; and Balkans Business News, *Serbia: tender for purchase of remote electric metres with EBRD funding*, 3 September 2010, www.balkans.com

³⁶⁸ Energetika.net, *More expensive electricity in Serbia after March 1st*, 2 February 2010, www.energetika.net

³⁶⁹ More in ISI Emerging Markets, *EPS CEO advocates another electricity price hike*, 22 July 2010, www.securities.com ; also in ISI Emerging Markets, *Electricity prices to rise by 10% as of Mar 1*, 29 January 2010, www.securities.com ; ISI Emerging Markets, *Electricity prices to be raised by 10% as of April*, 26 January 2010, www.securities.com ; and in Energetika.net, *Preferential price of electricity for vulnerable energy consumers in Serbia*, 9 February 2009, www.energetika.net

³⁷⁰ Balkan Insight, *Unpaid bills leave thousands cold in Kosovo*, 7 January 2011, www.balkaninsight.com

Electricity pricing in the local residential sector was therefore expected to rise to the level of some MKD 4,028 / USD 87.6 per MW in 2011, from a previous MKD 3,787 / USD 82.3 per MW in 2010. According to local sources, the ERC based its pricing analysis on comments received by Strezevo, Negotino TPP, ELEM, MEPSO, and EVN. However, ELEM immediately voiced its opposition to the proposed price hike, disputing among other things the share of the increment allocated to its operations.³⁷¹

ERC allowed power prices to increase about 10% since January 2010, in support of system viability. Transmission operator Makedonski Elektro Prenosen Sistem Operator (MEPSO) got a ~13% increase; a distribution subsidiary of Austrian EVN got roughly 10.5%; and the utility ELEM approximately 7%. On the losing side, the residential sector was burdened with an additional ~1.5% when connected to any one of heating plants at Istok, Zapad and Centar, and with almost 7.9% when connected to Sever. The commercial and public sectors suffered a more substantial ~20% in Istok, Zapad and Centar, and as much as ~38% for Sever, which obviously impacted their operations and increased overall costs. Electricity prices in the former Yugoslav Republic of Macedonia had risen again by 13% in 2008.³⁷²

Concerning central heating, prices went up by 17% in August 2009 after a 13% rise in early 2009. Furthermore, in July 2010 it emerged that, due to increases in the price of feedstock natural gas, heating prices in the capital city of Skopje would increase by a hefty 10%. Nevertheless, this was still lower than the levels requested by involved players. Finally, as in the cases of Bosnia & Herzegovina, Serbia, and Montenegro mentioned above, the former Yugoslav Republic of Macedonia has received financial support from the EBRD for the installation of smart meters and other projects relating to the modernization of its electricity grid.³⁷³

The above suggest that the country has some way to go before becoming an attractive market for energy investors, which could affect negatively its ability to support necessary infrastructure development (including gas-fired power and heating generation) and hence to boost its problematic security of supply. However, there seems to be at least some willingness on behalf of local authorities

³⁷¹ Among players lobbying local authorities for this price hike was former state-owned utility ELEM and heating company Toplifkacija AD-Skopje, which plans to construct a CCGT in collaboration with Russian Energy Group Sintez. Information from ISI Emerging Markets, *Electricity price to be raised by 6.36%*, 21 December 2010, www.securities.com; and ISI Emerging Markets, *Electricity prices to grow 10.07% as of 2010*, 17 December 2009, www.securities.com

³⁷² For more on electricity pricing regimes in the former Yugoslav Republic of Macedonia see also ISI Emerging Markets, *Power distributors seek price hike*, 14 December 2010, www.securities.com; and Balkan Insight, *EBRD grants €35 million for Montenegro power grid*, 26 November 2010, www.balkaninsight.com

³⁷³ Ibid.

in the country to listen to the business community and try to find realistic solutions to its problems. Moreover, the government's long-term energy strategy envisages liberalization of energy prices to cost-reflective levels by 2015, which if implemented will be a major contributor to supply security. Finally, in order to pre-empt any negative pressures from such moves, the government is already working towards alleviation of fuel poverty, including through the use of direct subsidies.³⁷⁴

In conclusion then, pricing of energy products - notably gas, power, and heating - on both the import as well as the local distribution level is a real concern in essentially all SEE countries, and can have a direct impact on the region's gas supply security. This is a result of the relevance of (relatively high) pricing in helping markets attract the natural gas volumes they need from their foreign suppliers. However, large sections of the population in this region are unable to bear the burden of high prices. The contradiction for SEE players thus lies there. If they do not increase energy prices, they could experience difficulties in securing adequate gas supply from producers increasingly global in outlook, especially at times of emergency when supply of this needed gas may come at a significant premium. Or they could decide to pay this premium at the expense of their own profitability and investment plans, hence again undermining (even if indirectly) security of supply in the markets where they operate.

If, on the other hand, these players decide / succeed in pushing forward with gas, electricity, and heating price increases to cost-reflective levels, they might find themselves against the prospect of less promising demand growth. This is particularly true in a region such as SEE, where substitution with oil products and also with locally-procured alternatives such as biomass continues to be relevant. Policy-makers in the SEE should be aware of this predicament and seek to optimise their energy mix. Natural gas needs to be phased at cost-reflective price levels as soon as possible where most efficient, notably in the context of CHPs and CCGTs, and even before the mandatory 2015 deadline. Furthermore, parallel measures such as improving bill collection (with or without donor support) can also play a very useful role, as a means of increasing necessary revenue streams and discouraging inefficient energy uses. Finally, direct monetary transfers to selected vulnerable consumers can put in place a necessary aegis over the heads of those who would otherwise unfairly lose from this transition.

³⁷⁴ ISI Emerging Markets, *Macedonia: regulator says Skopje heating prices will rise*, 28 July 2010, www.securities.com; ISI Emerging Markets, *Macedonian energy needs EUR 4-5 bn investments by 2030*, 22 April 2010, www.securities.com; Energetika.net, *With the new year Macedonia sees price increases for electricity and central heating*, 30 December 2009, www.energetika.net

Glossary

AERS	Agencije za energetiku Republike Srbije (Serbia)
AES	Applied Energy Services Corporation (USA)
AGRI	Azerbaijan – Georgia – Romania Interconnector
AGSC	Azerbaijan Gas Supply Company
ANG	Adsorbed Natural Gas
AZTN	Agencija za Zaštitu Tržišnog Natjecanja (Croatia)
BAM	Bosnian Mark
BASF	Badische Anilin- und Soda-Fabrik (Germany)
BBSPA	Balkan and Black Sea Petroleum Association (Bulgaria)
BCM	Billion Cubic Metres
BCM/Y	Billion Cubic Metres per Year
BEH	Bulgarian Energy Holding
BOTAS	Boru Hatları ile Petrol Taşıma (Turkey)
BP	British Petroleum
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CEE	Central and Eastern Europe
CGES	Crnogorski Elektroprenosni Sistem (Montenegro)
CHP	Combined Heat and Power
CMEC	China (National) Machinery & Equipment (Import & Export) Corporation

CNEEC	China National Electric Equipment Corporation
CNG	Compressed Natural Gas
CCC	Consolidated Contractors Company (Greece)
CU.M.	Cubic Metres
DCC	Dispatching and Control Centre
DEPA	Dimosia Epicheirisi Aeriou (Greece)
DESFA	Diacheiristis Ethnikou Systimatos Fysikou Aeriou (Greece)
EAP	The Economic Adjustment Programme for Greece
EBRD	European Bank for Reconstruction and Development
ECA	Economic Consulting Associates (UK)
ECB	European Central Bank
ECRB	Energy Community Regulatory Board
EDF	Électricité de France
EEPR	European Energy Programme for Recovery
EERP	European Economic Recovery Plan
EGL	Elektrizitaets - Gesellschaft Laufenburg (Switzerland)
EIA	Energy Information Administration (USA)
EIB	European Investment Bank
ELEM	Elektrani na Makedonija (The former Yugoslav Republic of Macedonia)
ENEL	Ente Nazionale per l'Energia eLettrica (Italy)
ENI	Ente Nazionale Idrocarburi (Italy)

ENP	European Neighbourhood Policy
ENPI	European Neighbourhood and Partnership Instrument
E&P	Exploration & Production
EPA	Etaireia Parochis Aeriou (Greece)
EPC	Engineering, Procurement, and Construction
EPCG	Elektroprivreda Crne Gore (Montenegro)
EPS	Elektroprivreda Srbije (Serbia)
ERC	Energy Regulatory Commission (The former Yugoslav Republic of Macedonia)
ERDF	European Regional Development Fund
ERE	Regullator te Sektorit te Energjise Elektrike (Albania)
ESIA	Environmental and Social Impact Assessment
ESII	Energy Security and Infrastructure Instrument
EU	European Union
EUR	Euro (currency)
EURIBOR	Euro Interbank Offered Rate
EVN	Energieversorgung Niederösterreich (Austria)
FBiH	Federation of Bosnia & Herzegovina
FEED	Front End Engineering and Design
FSRU	Floating Storage and Regasification Unit
FYROM	The former Yugoslav Republic of Macedonia

GDF	Gaz de France
GDP	Gross Domestic Product
GE	General Electric (USA)
GERB	Citizens for the European Development of Bulgaria
GWh	Gigawatt - hour
HEP	Hrvatska Elektroprivreda (Croatia)
IAP	Ionian – Adriatic Pipeline
IEA	International Energy Agency
IENE	Instituto Energeias Notioanatolikis Europis (Greece)
IFI	International Financial Institution
IGB	Interconnector Greece – Bulgaria
IMF	International Monetary Fund
INA	Industrija Nafta (Croatia)
INGS	Independent Natural Gas System (Greece)
IPP	Independent Power Producer
ITGI	Interconnector Turkey – Greece – Italy
JANAF	Jadranski Naftovod (Croatia)
JV	Joint Venture
KfW	Kreditanstalt für Wiederaufbau (Germany)
KV	Kilovolt
KWh	Kilowatt - hour

LNG	Liquefied Natural Gas
MCM	Million Cubic Metres
MCM/D	Million Cubic Metres per Day
MENA	Middle East and North Africa
MEPSO	Makedonski Elektro Prenosen Sistem Operator (The former Yugoslav Republic of Macedonia)
MENA	Middle East and North Africa
mmbtu	million British thermal units
MOH	Motor Oil Hellas (Greece)
MOL	Magyar Olaj és Gázipari Részvénytársaság (Hungary)
MoU	Memorandum of Understanding
MW	Megawatt
MWh	Megawatt - hour
NATO	North Atlantic Treaty Organisation
NBP	National Balancing Point (UK)
NEC	National Electricity Company (Bulgaria)
NGO	Non – Governmental Organization
NIF	Neighbourhood Investment Facility
NIGEC	National Iranian Gas Export Company
NIS	Naftna Industrija Srbije (Serbia)
NNGS	National Natural Gas System (Greece)

NPP	Nuclear Power Plant
NSRF	National Strategic Reference Framework (Greece)
OSSH	Operatori i Sistemit te Shperndarjes (Albania)
PIP	Public Investment Programme (Greece)
PM	Prime Minister
PPC	Public Power Corporation (Greece)
PPD	Prvo Plinarsko Društvo (Croatia)
PPP	Public - Private Partnership
PSP	Podzemno Skladiste Plina (Croatia)
QEWC	Qatar Electricity & Water Company
QPI	Qatar Petroleum International
RAE	Regulatory Authority for Energy (Greece)
RERS	Regulatory Commission of Republika Srpska (Bosnia & Herzegovina)
RES	Renewable Energy Sources
RWE	Rheinisch-Westfälisches Elektrizitätswerk (Germany)
SA	Société Anonyme
SEE	South Eastern Europe
SEWRC / DKER	State Energy and Water Regulatory Commission (Bulgaria)
SME	Small and Medium Enterprises
SMP	System Marginal Price
SOCAR	State Oil Company of Azerbaijan Republic

TAP	Trans – Adriatic Pipeline
TCM	Trillion Cubic Metres
TEG	Tri-Ethylene Glycol
TEN – E	Trans-European Networks for Energy infrastructure
TGI	Turkey – Greece Interconnector
TOP	Take – Or - Pay
TPA	Third – Party Access
TPP	Thermal Power Plant
UGS	Underground Gas Storage
UNMIK	United Nations (Interim Administration) Mission in Kosovo
USD	United States Dollar
VAT	Value Added Tax
WBIF	Western Balkans Investment Framework
YPEKA	Ypourgeio Perivallontos, Energeias, kai Climatikis Allagis (Greece)
Y/Y	Year on Year

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