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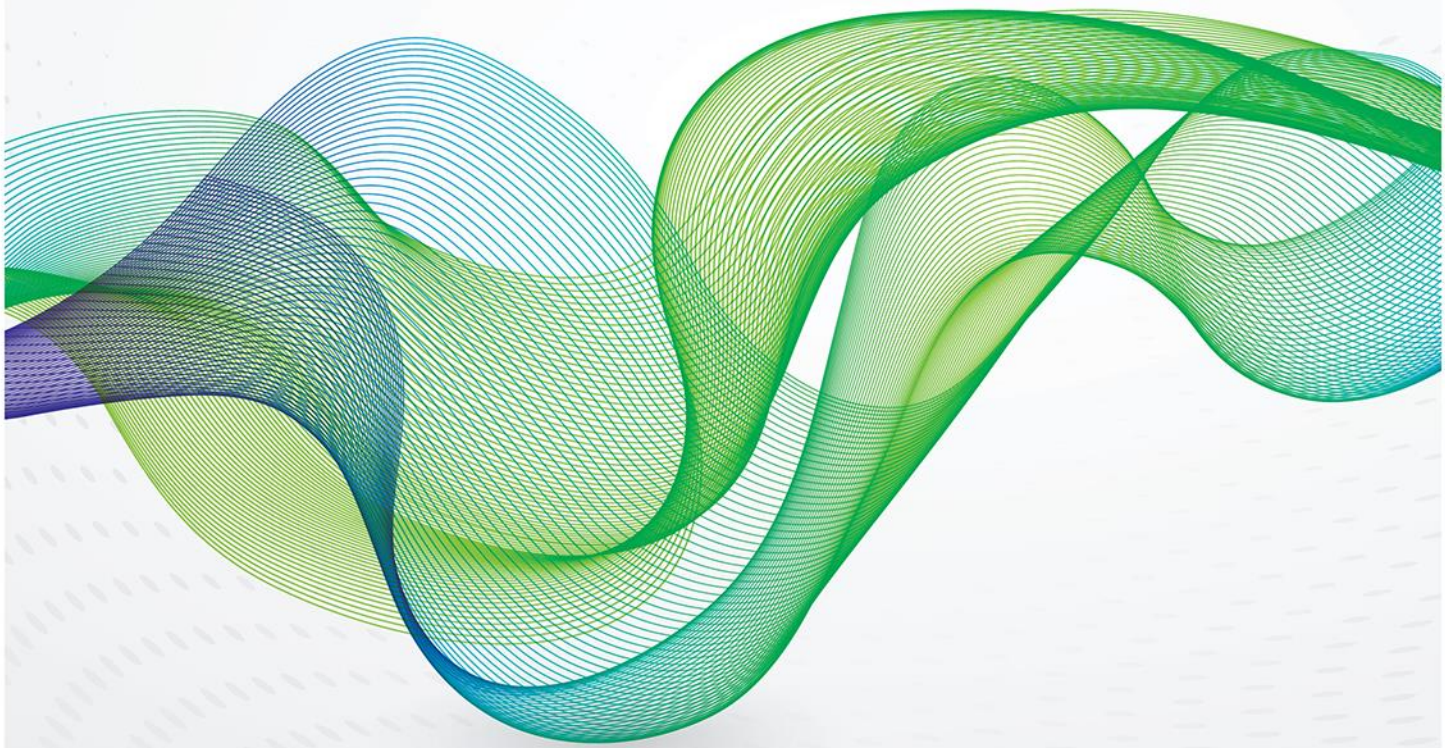
East Med

Gaza crisis tightens regional gas balances



OXFORD ENERGY COMMENT Julian Bowden, Senior Visiting Research Fellow, OIES

On 7 October 2023, Hamas attacked Israeli communities near the Gaza strip, sparking a huge Israeli military response that has now developed into an air and ground war in Gaza itself, both events bringing unprecedentedly high casualty numbers on both sides. Impacts on Israel's offshore gas sector were almost immediate. Two days after the Hamas attack, the Israeli Ministry of Energy requested that Chevron, as operator, shut down the offshore Tamar field, which produced 10.3 billion cubic metres (Bcm) in 2022, 47 per cent of Israel's output. Subsequently, export flows of gas to Egypt through the offshore EMG pipeline were suspended, although some of those exports were re-routed through Jordan.[1]

This Comment lays out Israel's gas balance, and considers potential direct and indirect impacts and wider implications of disruptions to gas production and flows from the Gaza crisis. Impacts already extend beyond the Israeli gas market itself to Egypt. More widely, it raises questions over whether the European Union (EU) will be able to rely on any gas from the East Mediterranean to help replace Russian volumes lost since Moscow's invasion of Ukraine. Finally, it also clouds the overall investment climate for gas production and infrastructure expansion in the region.

Summary conclusions are:

- Israel's gas supply to the domestic market without Tamar looks secure, with some replacement volumes coming from rising output from the Karish field.
- If we assume that Israel intends to prioritize supply to the domestic market, then export volumes will necessarily be reduced. Exports to Jordan can be maintained at 2022 levels, but exports to Egypt will have to fall.
- Egyptian gas balances were already under pressure before the crisis erupted, due to falling gas production (mainly from problems at the Zohr field) and high summer demand. Liquefied natural gas (LNG) output has been either very low or zero in some months this year.
- With tight gas balances and reduced imports from Israel, the prospect of the EU receiving more LNG from Egypt in the short and medium term looks unachievable. The June 2022 Memorandum of Understanding between Egypt, Israel, and the EU, committing to higher supply, is now probably undeliverable.
- In the event that Israeli production falls further if there were to be problems at either Leviathan and/or Karish, threatening exports to Jordan, then global LNG supply potentially could be tightened by some 10 million tonnes per annum (MTPA) from a combination of lower Egyptian supply (potentially –7 MTPA) and Jordan returning as an LNG buyer (+3 MTPA).
- New investment in the Israeli gas upstream (expansion of Leviathan and Karish in particular) and in infrastructure (additional pipeline capacity to Egypt through the proposed Nitzana connection, or a commitment to Leviathan floating liquefied natural gas, FLNG) looks set to be delayed at a minimum.

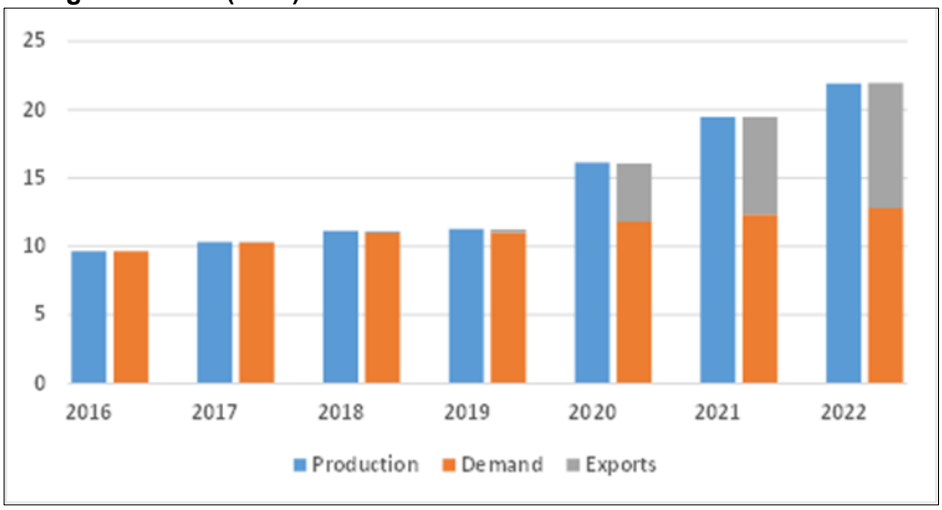
1. Israel gas supply/demand balance

1.1 Developments to 2022

Israel has quietly become a significant gas producer and exporter over the past 3–4 years, doubling the size of its gas value chain with offshore-produced gas flowing into the Israeli domestic market and exports to Jordan and Egypt. Figure 1 plots the rise in production to 21.9 Bcm in 2022, of which just over 40 per cent was exported. For comparison, this is substantially higher than any EU producer, the largest in 2022 being the Netherlands (15.1 Bcm) and Romania (8.8 Bcm).

[1] Platts European Gas Daily, reports of 9, 10, and 11 October 2023. Platts said on 30 October that Egypt reported imports from Israel had fallen to zero around the end of October.

Figure 1: Israel gas balance (Bcm)

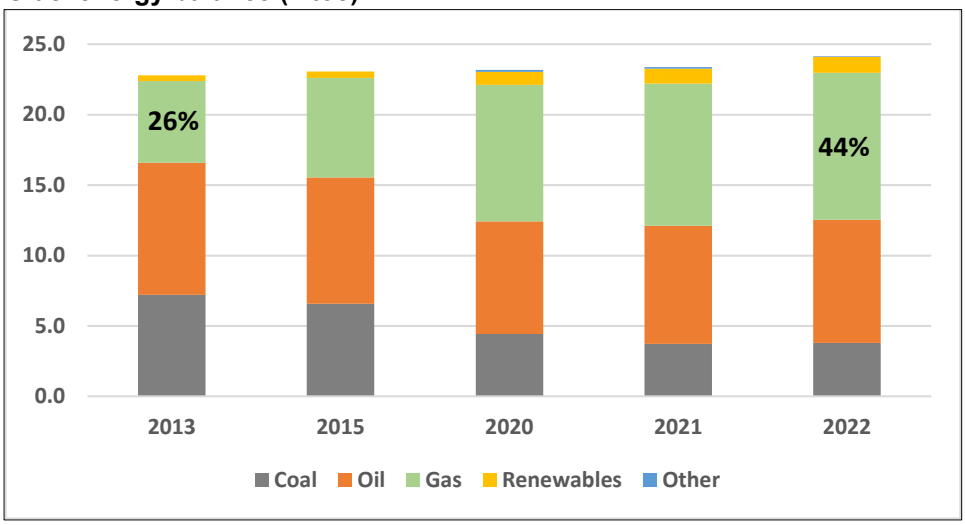


Sources: NewMed Energy Periodic Report 2022 para 6.8, and Israel Ministry of Energy & Infrastructure annual gas report 2022 page 7

The emergence of Israel as a major gas player has been relatively quiet because the value chain is strictly regional: it has no direct links to international gas markets, and an indirect link only insofar as Israel's gas exports to Egypt are part of Egypt's supply mix and therefore support Egyptian LNG exports.

Gas has become very important in the Israeli domestic energy mix. In past years, Israel was completely dependent on imported fuels, but with the development of its own gas, and to a much lesser extent renewables, security of supply has been transformed as it is now almost 50 per cent supplied by domestic resources. The share of gas in the domestic mix is now a relatively high 44 per cent (Figure 2), versus the EU average of 24 per cent). Israel had a longstanding policy of allocating 60 per cent of production to the domestic market with the remainder allocated to exports, but rising renewables has encouraged a debate in recent years around relaxing that ratio in favour of exports, in order to avoid the risk of stranded assets after gas demand peaks. With a relatively stable total energy requirement over the past 10 years, the availability of gas has enabled Israel's power generators to reduce coal- and oil-fired power.

Figure 2: Israel energy balance (Mtoe)



Source: Israel Central Bureau of Statistics[2]

[2] https://www.cbs.gov.il/he/publications/doclib/2022/24.shnatonenergy/st24_01x.pdf

Disaggregated flows are shown in Table 1 in a snapshot of the balance in 2022. Production comes from three fields: Tamar, Leviathan, and now Karish, which came on-stream in late 2022. The Israeli domestic market consumed 12.7 Bcm in 2022, with exports of 9.2 Bcm. Gas exports to Jordan met virtually all of the kingdom's gas demand. Egypt is the largest market in the region by far, with demand in 2021 of 61 Bcm, meaning that supply from Israel covered 8–10 per cent of demand.

Table 1: Israel gas flows snapshot 2022 (in bcm)

Supply		**Demand**		
Leviathan	11.4	Domestic market		12.7
Tamar	10.2	Exports		
Karish	0.3	Jordan	2.9	
		Egypt	6.3	9.2
	21.9			**21.9**
		Routes to export markets		
EMG offshore pipeline Israel-Egypt			4.6	
Jordan north (Jordan and into Arab Gas P'line)			4.4	
Jordan south			0.2	
Total exports			**9.2**	

Source: Israel Ministry of Energy & Infrastructure Annual Report 2022, page 7

1.2 2023 production and Tamar shut-in

Karish is ramping-up towards an expected plateau of around 6 Bcm per annum (Bcma). Operator Energean has stated that it expects output of around 4.5 Bcm for 2023, since it is now producing at an annualized target rate of 6 Bcma.[3]

Leviathan output in the first half of 2023 was almost flat at 5.3 Bcm versus 5.5 Bcm in 2022.[4] But with less volume going into the domestic market to accommodate Karish, Leviathan's exports to Egypt were up 25 per cent from 2.5 Bcm to 3.1 Bcm over the first half of 2023.

Looking ahead into 2024 and assuming Tamar remains shut-in, or that the EMG offshore pipeline remains closed, then with Leviathan producing 11.5 Bcm and Karish at 6 Bcm, that total of 17.5 Bcm would cover domestic demand and allow around 4.5 Bcm of exports. In turn, that would mean Jordan's 3.0–3.5 Bcm demand could be met, but would only leave some 1 Bcm for exports to Egypt.

2. Export markets

2.1 Jordan

Jordan (2021 population 11.1 million) is heavily dependent on fuel imports. The country has some domestic gas production, but has mostly relied on oil and gas imports.[5] Jordan's energy demand currently (2021 data) is 8.7 million tonnes of oil equivalent, of which gas accounts for a relatively high 37 per cent. The renewables contribution is slowly growing and accounts for 14 per cent of energy demand.

[3] Energean (2023).
[4] NewMed Energy (2023), p. 4.
[5] Domestic gas production was 0.16 Mtoe in 2021, covering just 5 per cent of total gas demand. For the Jordan energy balance, see https://www.memr.gov.jo/ebv4.0/root_storage/ar/eb_list_page/memr_facts_&_numbers_2021-28.08.2022.pdf

Most of Jordan's gas demand is for power, with 80 per cent of Jordanian electricity now generated from gas. As to future demand, in 2022 NewMed saw demand rising to 3.8 Bcm in 2023 and then settling at around 3.8–4.2 Bcma for the rest of the decade (Figure 3).

Figure 3: Jordan gas imports and gas demand (Mtoe)

Source: NewMed Energy Periodic Report 2022 para 7.11.2(c)

A major problem has been securing a constant flow of gas. Initially, supply was through the Arab Gas Pipeline (AGP) from Egypt, which started flowing gas to Jordan in 2003. But tightening Egyptian gas balances caused exports to fall, then cease, then resume at a lower level. Jordan then constructed an LNG terminal at Aqaba: in mid-2015 the *Golar Eskimo* floating storage regasification unit (FSRU) arrived and import operations started. For the period 2016–2018, small LNG flows through Aqaba were even exported back to Egypt down the AGP.

Table 3: Jordan gas imports

	2019	2020	2021	2022	2023 (9 months)
LNG	2.1	1.3	0.0	0.1	0.13
Israel	0.2	2.1	2.9	2.9	
Total imports	**2.3**	**3.4**	**2.9**	**3.0**	

Sources: Kpler[6]; NewMed Energy Periodic Report 2022, para 7.11.2(c)

With Israeli gas production rising fast, imports from Israel have become the primary source of gas and have backed out virtually all LNG. In the event of a collapse of imports from Israel, then clearly with such a high share of gas in the energy mix, and Egypt almost certainly being unable to replace supply, Jordan would need to resume LNG imports.

2.2 Egypt

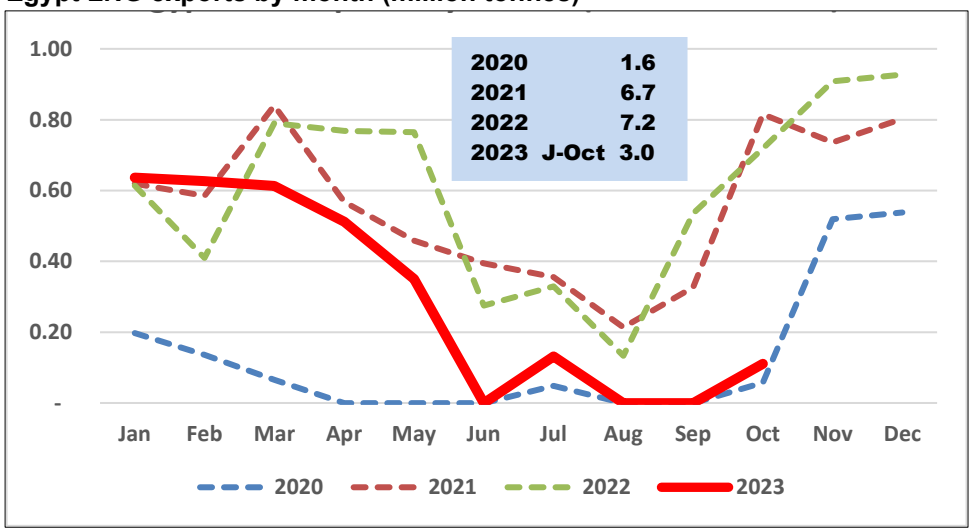
Egypt is the largest gas market in the region by far, with gas demand at around 61 Bcma, and gas accounting for a huge 60 per cent of domestic energy demand.[7] With gas balances often tight, Egypt has frequently flipped between surplus and deficit. Egypt's gas trade with its neighbours and the global LNG market have been far from constant. In 2023, Egypt moved into gas deficit.

[6] https://www.kpler.com
[7] African energy balances, African Energy Commission (AFREC), 2023; NewMed Energy (2022), para 7.13.6.

Imports from Israel have nearly tripled in recent years, from 2.2 Bcm in 2020 to 6.3 Bcm in 2022. Imports have been mainly transported through the EMG offshore pipeline. This pipeline was originally built to export Egyptian gas to Israel (from Al Arish to Ashkelon) and operated as such from 2008–2012. It has now been reversed, and in 2022 flowed 4.6 Bcm to Egypt. The balance of Israel's exports to Egypt were routed via Jordan. Although it is offshore, EMG runs mostly parallel to Gaza and was closed down in October.

Egypt has two LNG plants: Idku's ELNG project with a capacity of 7.2 MTPA (Shell operated); and Damietta with 5.0 MTPA (ENI operated). In 2022, combined output was 7.2 million tonnes.[8] Some 70 per cent of these exports went to Europe and Turkey. At the beginning of 2023, Energy Minister Tarek el-Molla was reported as saying he expected LNG exports to be at around the same level at about 7.5 Mtes.[9] In the event, he could not have been more wrong: export levels plummeted. Over the summer months there was virtually no LNG production, so that for the year overall, exports could come in under half the 2022 volume.

Figure 4: Egypt LNG exports by month (million tonnes)



Source: Kpler

With exports at such low levels, Egypt will have become a net importer of gas over 2023 in the form of pipeline imports from Israel. Egypt has been caught by an unfortunate perfect storm, with production down and demand up. Gas production has fallen sharply, down 9 per cent in the first half of 2023, mainly due to problems at Zohr from water penetration in the reservoir.[10] Domestic demand has been very high due to a hot summer, which has triggered major power blackouts. With the priority being supply to the domestic market, cutting LNG exports has been the policy lever pulled (Figure 4).

3. EU – the search for alternative supply

European Union policy is to remove Russian gas completely from its supply portfolio before 2030. With Russian gas reduced sharply in 2022, together with a push to raise storage levels for winter 2022/23, balance was achieved through demand cuts and increased LNG supply. The contribution from attempts to procure more from other pipeline suppliers achieved little. Table 3 describes how the EU (including UK but excluding Turkey) rebalanced in 2022.

[8] NewMed Energy (2022), para 7.13.6.
[9] Platts European Gas Daily, 13 February 2023.
[10] El Safty (2023); MEES 22 September 2023.

Table 3: European gas balance – 2022 changes (in bcm) how Europe rebalanced in 2022

Supply reduction		Demand reduction & supply increases	
Russia supply	79	Demand reduction	69
Underground storage build	54	LNG supply increase	59
		Pipeline supply increase (from Norway, N Africa, Azerbaijan)	5
	133		**133**

Source: OIES analysis
Note: Europe defined as EU and UK; numbers exclude Turkey

To try to pull in more gas immediately and into the medium-term, European Commission officials visited many suppliers and concluded Memoranda of Understanding on additional supply. The MOU between the EU, Israel, and Egypt was signed in Cairo in June 2022 by Energy Commissioner Kadri Simson and the Energy Ministers of Egypt and Israel, Tarek El-Molla and Karine Elharrar, respectively.[11] In terms of substance, this MOU was vague, stating that the "sides will endeavour to work collectively towards enabling a stable delivery of natural gas to the EU". But the intent was clearly to draw additional LNG from Egypt's two plants, with gas supply coming from Egypt and/or Israel. It did not specify potential volumes, or about developing any pipeline links into southern EU countries such as Greece or Italy.

With the current supply/demand problems in Egypt and the turn down in LNG output this year, and with limited prospects of higher Egyptian production or imports from Israel, achieving the stated ambitions of this MOU looks unlikely.

4. Investment

Across the Israeli gas industry, confidence built over the past 3 years has led to several expansion projects across the upstream and midstream. Leviathan partners have plans to take production from 12 to 21 Bcma, with gas potentially flowing directly to the existing Egyptian LNG plants, or investment in an FLNG scheme.[12] Tamar partners are looking at a 6 Bcma expansion plan.[13] On infrastructure, an expansion of pipeline export capacity to Egypt, via the proposed 65 km onshore Nitzana pipeline from Ravat Hovav near Beersheva to Nitzana on the Egypt border, with 6 Bcma capacity, was approved in May 2023.[14]

There are also companies seeking to enter the Israeli offshore. Notable here is the BP–ADNOC offer to buy a 50 per cent stake in NewMed Energy for around $2 billion, announced in March 2023 but still not closed.

So far, there have been no announcements of any investment cancellations. Chevron was reported on 1 November 2023 as saying it will continue with Leviathan expansion, for example.[15] But it will be extremely surprising if current events do not lead to delays to schedules and commitments.

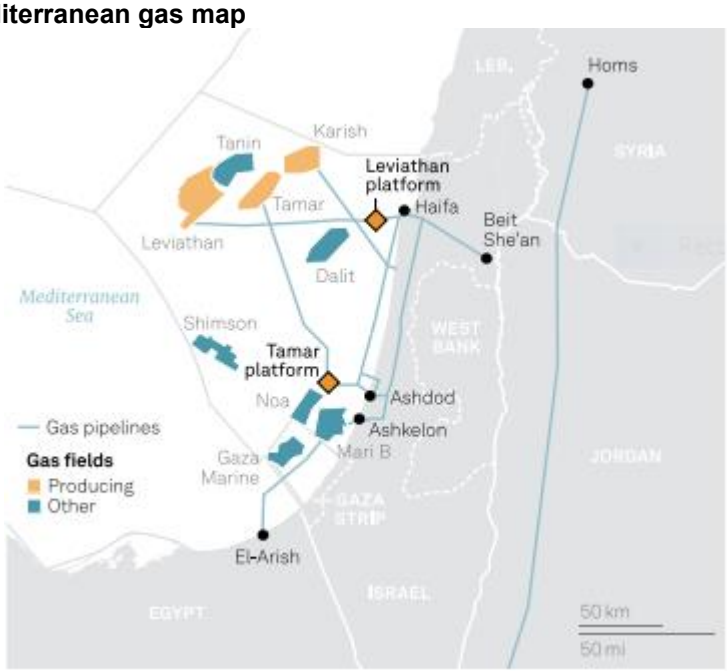
5. Conclusions

Israel has built scale over the past 3–4 years as a major regional gas player. Expansion plans would take it to the next level, and move it from leading a regional value chain to something more integrated with the global gas market. The Tamar shut-in will not jeopardize supply into the domestic Israeli market, mainly because of the Karish field ramp-up, but export volumes will be affected. It is expected that supply to Jordan will not be affected, but exports to Egypt will be cut at a time when Egypt is already struggling to allocate gas to its LNG plants. The near-term and even medium-term prospects of more

[11] EU-Egypt-Israel (2022).
[12] NewMed Energy (n.d.).
[13] MEI (2023a).
[14] MEI (2023b).
[15] Shiryaevskaya and Mazneva (2023).

LNG volumes to the EU look remote. Apart from the Tamar and EMG pipeline shut-in, so far there have been no other gas impacts and no announcements of investment cancellations. But expansion plans will be re-examined, and delays look probable. Cyprus has not been discussed here, and these events could work either way: if the Egyptian balance remains critically tight into 2024, then market conditions around Egypt could lead to acceleration of Aphrodite and other fields being developed; on the other hand, any Cyprus plans involving Israel could be parked for the moment.

Figure 5: East Mediterranean gas map



Source: S&P Global Commodity Insights[16]

[16] https://www.spglobal.com/commodityinsights/en

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