

## RESEARCH ARTICLE

## EAST MED GAS EXPORT POTENTIAL

Oğuzhan AKYENER<sup>1</sup>**Abstract**

In this study, East Med gas balances were analyzed by taken into consideration of the important milestones existing in different parts of the gas flow steps (from reservoir to the market). In this regard, annual gas export potentials of the due countries up to 2050, situations of the existing and proposed export infrastructures, market balances and commercial approaches was explicated. As a result, the question of: "What to expect from the East Med gas potential up to 2050 and later?" was tried to be answered (mainly from the technical sight). In addition to these, possible results of the current political atmosphere (on the conflicts, energy prices, and diversification attempts) were also be taken into consideration.

At the initial step, by neglecting the altering political conflicts in the region, East Med gas balances and technical export potentials of three different regions (Israel, Egypt and Southern Side of Cyprus Island (SSCI) were evaluated. Undiscovered potential of the region in Lebanon, Syria and Turkey were not taken into consideration. Hence, before the discovery it is not coherent to make mathematical calculations.

While evaluating the export potentials, from reservoir to the market alternatives, all different aspects and milestones, including the official operator companies' capabilities were evaluated for each case.

Throughout the evaluations, annual gas production and demand volumes, resulting export potentials of the due countries up to 2050, situations of the existing and proposed export infrastructures, market balances and commercial approaches were explicated.

**Keywords:** East Med Energy, Gas Export Potential

**Introduction**

Gas discoveries during the last years, increased the importance of the Eastern Mediterranean (East Med) region from the sight of global policies. There are some huge discoveries in the Egyptian and Israeli maritime borders and smaller ones in the conflicted waters of Cyprus. Lebanon and Syria are (from the sight of possible reserves) other potentially important countries existing in the Levantine Basin.

Surely, there are developed and undeveloped gas reserves in the East Med. In addition, there may be additional huge potential for new possible discoveries. However, there are also big political, commercial and technical unknowns in the gas politics equation of the region and without solving and analyzing these perspectives broadly; it is not possible to make coherent analysis and advices for the future dynamics of the region.

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Leastwise, energy, new discoveries and future production profiles are important for the region. However, does having some portion of reserves mean a great opportunity for the due countries? Off course not at all. Long term development scenarios, investment environments, political conflicts, annually expected production – consumption – export volumes, surface – subsurface structures, markets' properties and the commerciality of the due projects are also important milestones to consider. Without studying these different parameters, it is not possible to make coherent analysis on the energy politics of the region. By considering this fact, it is obvious that, East Med gas equations also has to be studied from a wide range of different factors.

In addition to these, within the current altering political dynamics, highly fluctuating gas prices and Russia – Ukraine war (which makes EU deeply focus on the alternative resources), the balances have to be updated attentively. In the last quarter of 2021, due to the reverberations of the pandemic era, mostly from coal to gas, energy prices of nearly all energy types resulted in massive increases. This situation continued by worsening through the Russia – Ukraine war and the higher levels of gas prices furtherly come to stay.

Although gas prices at high levels were perceived as a periodical hope for many discoveries that did not have an economic export infrastructure in the Eastern Mediterranean, extreme investment plans had to return to their factory settings when prices returned to normal levels due to the price cap acts and climatic factors.

Undoubtedly, these extraordinary events effected the real dynamics in the East Med from the commercial and political sights.

### Egypt Gas Export Potential

Egypt is the highest volume of proved gas reserves (around 2,3 tcm) bearing country in the East Med.

Turkey Energy Strategies & Politics Research Center (TESPAM)'s 2017 long term projections (Akyener and Maraşlı, 2017) about the future of Egypt gas export potential can give a coherent approach for analysis (where the due estimations (between 2017 to 2022) are reasonable up to the current time).

Main results of the due projections are given below.

Total annual gas production projections up to 2050, including the potential volumes from new discoveries are given in the Figure 1.

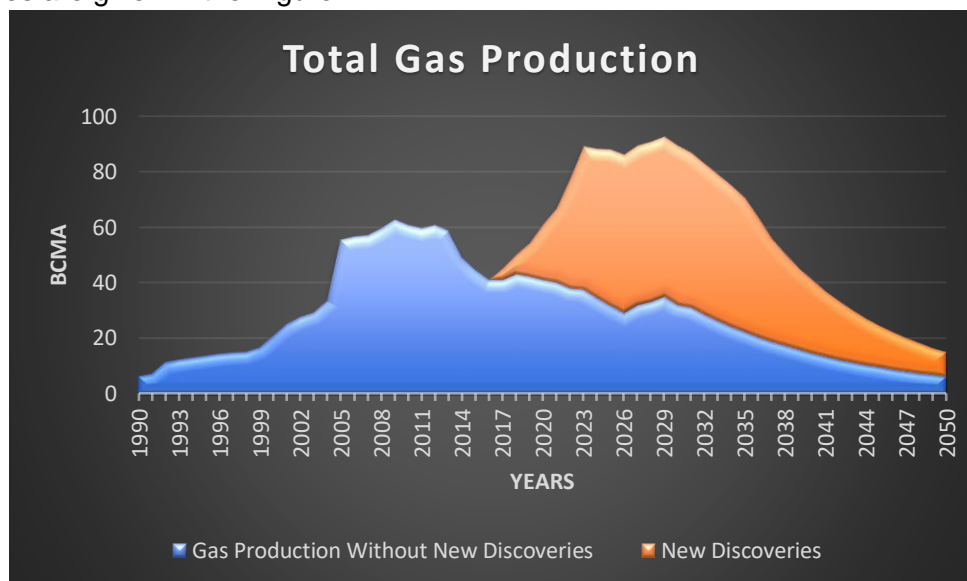


Figure 1: Egypt Total Gas Production Including New Discoveries & Current Fields [1]

*Note: These analysis and projections were done through field by field base calculations. The details can be reached from the due references.*

As can be observed, Egypt seems to have more than 80 bmca gas production rates between 2023 and 2032.

After given the production projections, in order to be able to calculate the net gas balances, we have to add the consumption profiles. In the due study (Akyener and Maraşlı, 2017), different assumptions of consumption trends were studied and the below Figure 2 compares the base case consumption estimations with the above production projections.

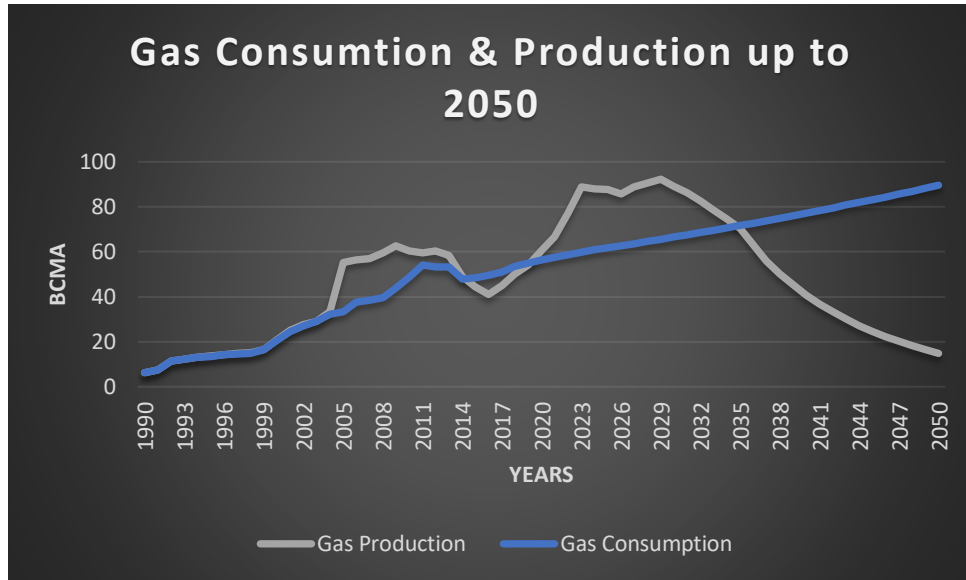


Figure 2: Egypt Total Gas Production & Consumption [1].

As the next step, after extracting the consumption from the total production, gas balance graph of Egypt up to 2050 could be prepared as seen in the Figure 3.

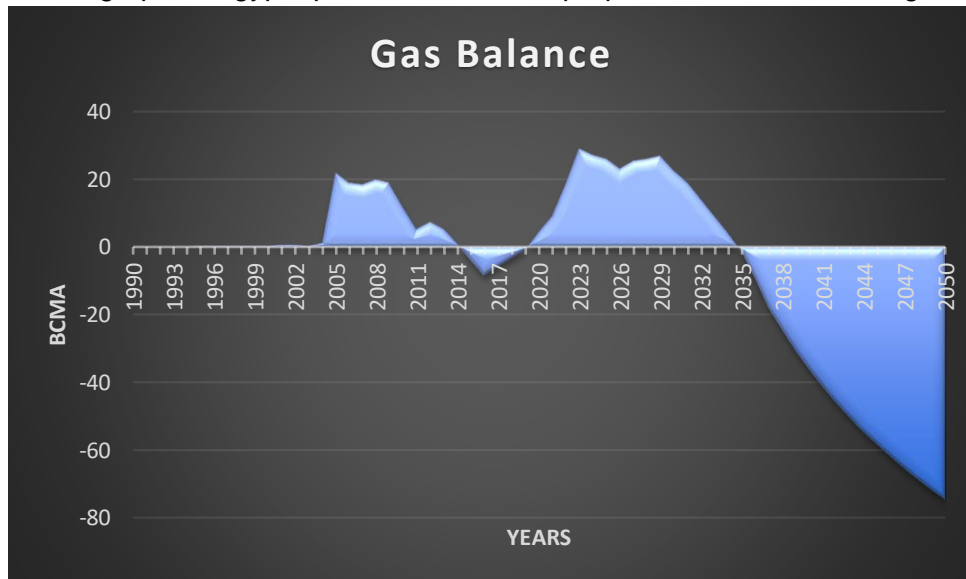


Figure 3: Egypt's Gas Balance [1].

Egypt gaz export potential is given in the Figure 4.

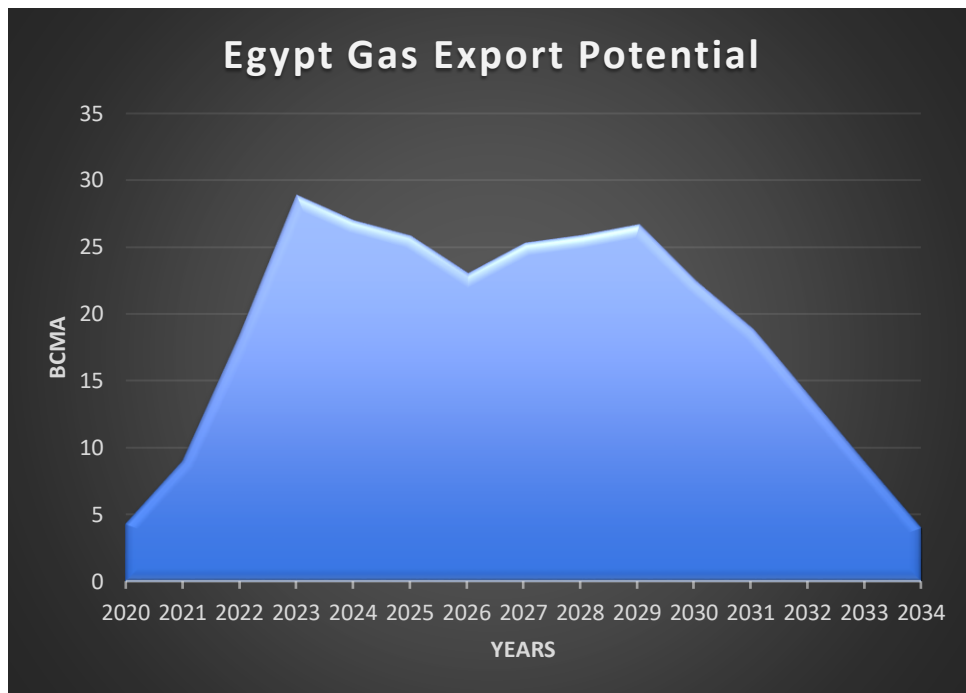


Figure 4: Egypt Gas Export Potential (for annual consumption incremental rate is 1.5%) [1]

At this situation, next step must be the analysis of possible export routes. Hence, for a gas field to be invested and developed, a commercial market reach has to be accomplished.

Now, Israel is a net gas exporter and is feeding (meeting the due demand in) the Jordan market. Which takes the pipeline routes out of the game. In addition to this, Israel signed an agreement (in 2022) to utilize Egypt's existing LNG terminals' free capacity to export Leviathan gas. In this concept, instead of using Ashkelon pipeline for the Israel direction, a reverse flow may start in the coming years.

On the other hand, the current infrastructures seem as nearly enough within the current conditions. In other words, Egypt will be a self-sufficient country regarding with the gas export volumes and existing domestic gas export infrastructures comparison. Egypt will not look for new investments and use its unused volumes of existing LNG facilities for gas exports. This strategy will be also the cheapest one by considering the cost profiles [1].

### Israel Gas Export Potential

Israel is the second important proved gas reserves (with around 1 tcm) bearing country in the region.

Again, as in the Egypt side, TESPAM's 2016 long term projections (Akyener, 2016) about the future of Israel gas export potential gives a coherent approach for analysis (where the due estimations (between 2016 to 2022) are reasonable up to the current time).

Main results of the due projections are given below.

After evaluating the production projections of the important fields in Israel, by considering the demand profile, export potential has to be analyzed.

For future gas demand profile of Israel, a study of Israel's Ministry of Energy and Water Resources, named "Israel's Natural Gas Demand Forecast 2011-2040" is used. Between the years 2041 to 2050, average incremental rate of the existing forecast (0,6 bcma) is added to the previous year's value.

As shown in the graph below, production values in Figure 5 and the 2050 demand profiles are combined.

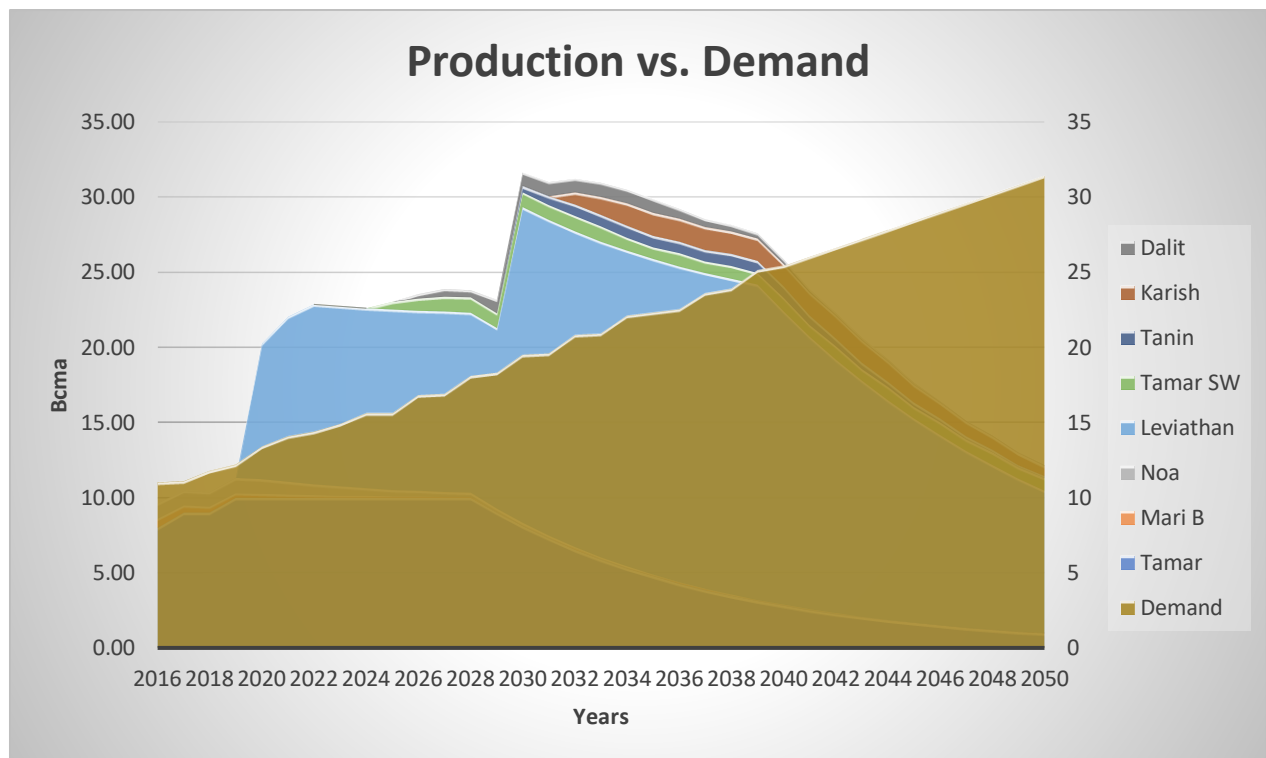


Figure 5: Israel's Production & Demand Profiles [2].

As a result, the gas balance graph (Figure 7) was prepared.



Figure 6: Israel Gas Balance and Export Potential up to 2050 [2].

If a more sustainable export route (such as Türkiye option) can be accomplished, then new investors can be easily found for the pending exploration blocks and all the current projections may change. In addition to these, Israel's Supreme Court may intervene in all export targets by citing national interests as reasons. In fact, this situation may put the production and export targets of existing foreign companies in the country into difficulties. In fact, there is a struggle

in this context in the background of the demonstrations that have been going on for weeks in Israel today. The Netanyahu government wants to reduce the intervention abilities of this Supreme Court in order to pave the way for international investors. Because of this attempt, a serious resistance is being put up in the country. The conflicts between the upper lobby, which considers initially the Israel's national interests (somehow we can say nationalists), and the views of international investors (under the leadership of Chevron), made the process like this. Of course, many internal dynamics have also been effective in this context. However, it should not be forgotten that all these developments and changes started with the purchase of the relevant assets in Israel by the famous oil company Chevron. Chevron's diplomatic capabilities and centuries-old experience of influencing the internal dynamics of countries have shown itself not only in Israel's internal balances, but also in Israel-Egypt relations and the resolution of the Israel-Lebanon EEZ border disputes. An oil company that thinks pragmatically and has much greater economic (and intelligence) capabilities than almost many other states has been able to play with all the dynamics of the region.

These balances will undoubtedly affect the energy production processes and export targets in Israel.

On the other hand, today Chevron has plans to export the remaining gas from Leviathan-Phase2 from LNG facilities in Egypt or to build a floating LNG facility. However, all of these plans were claimed again during the periods when natural gas prices were high. Comparing the prices at that time with today's figures, it can be predicted that only the floating LNG option will be on the shelf, at least for now. Egypt option, on the other hand, will continue as long as there is empty LNG capacity (for only spot smaller volumes). Since Egypt's increasing the capacity of its existing facilities or establishing a new facility will not be a sustainable and economical choice according to the current scenarios, this option does not seem to pave the way for major transformations for the Israeli hydrocarbon sector. While the Egypt option may be considered a partial solution for part of the second phase of Leviathan, it will not be sufficient for the development of new possible Israeli blocks.

Moreover, the demonstrations in Israel show that the probability of Netanyahu's failure to intervene in the legal system is strong. Therefore, Chevron and other foreign investors will have to struggle not only with economic-diplomatic problems but also with domestic legal directives while making export targets [5].

This shows once again that Turkey is the most reasonable and economical choice (even if there are political difficulties) so that Israel can easily make export plans and find investors in its new fields.

### **Gas Export Potential In The Southern Side Of Cyprus Island**

In the southern side of Cyprus Island, there exist some new discoveries that could not be taken into development phase. According to TESPAM's calculations, these discoveries approximately bears around: [4].

- 118 bcm reserves in Aphrodite, ,
- 116 bcm reserves in Calypso,
- 89 bcm reserves in Glaucus.

At the current situation, due to the conflicts on the Cyprus Island, none of these structures can find chance to be invested and taken into production. On the other hand, hence, all these reserves are dry gas, which makes LNG costs too high to handle. Due to these facts, the only way is to reach a possible market through a new pipeline project. However, it was globally accepted that doability of the popular proposed East Med Pipeline Project is impossible (from

the economic, commercial, technical, legislative and political aspects). This results in Turkey to be the unique market and the possible transit route for the Cyprus Island (including the Northern Side) possible gas sales.

After noting this fact, by assuming the conflicts in Cyprus solved and Turkey agreed on to transport and buy the Israeli plus Cyprus Island gas, then the due reserves can be developed and taken into production in such a projection below.

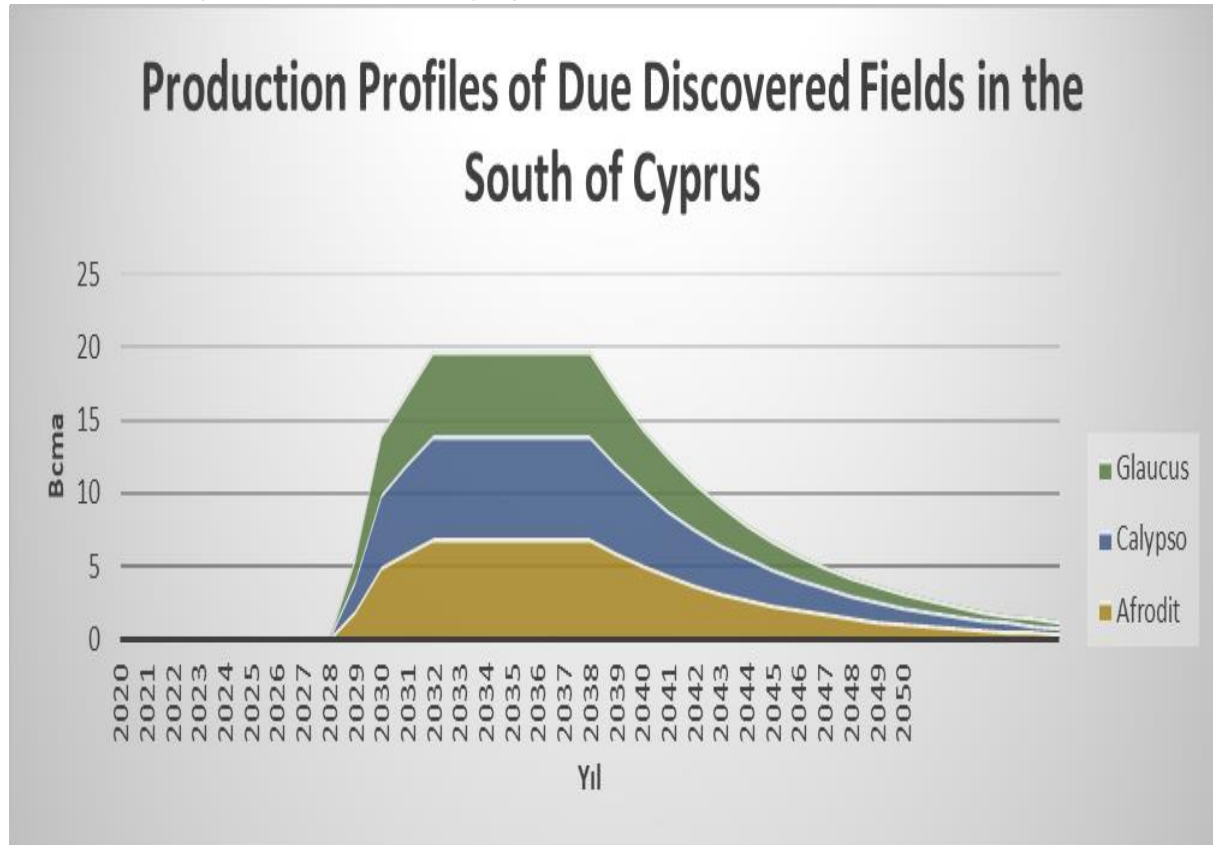


Figure 7: SSCI Gas Export Potential up to 2050 [2].

*Note: First production for all these three fields are assumed to be started in 2028.*

As can be shown from the Figure 8 above, the total supply volume from the SSCI may reach in a tantalizing level for EU markets. However, without reaching an acceptable solution with Turkey and Northern Cyprus, all these discoveries will have to be locked in the underground.

### TOTAL GAS EXPORT POTENTIAL IN THE REGION

As mentioned above, technically by analyzing the possible gas export projections in the East Med we encounter with the reality of:

- Hence being in a position to have the ability to export its gas from the existing LNG infrastructures, Egypt is out of the equation.
- Israel has additional around 5 bcma export potential. However, to make such exports, needs to find a reliable and economic market reach. (There are some question marks in Egypt free LNG capacity utilization options.)
- In addition to this, Israel also have possible new structures (interpreted in the seismic studies) waiting to be invested and tested, which can be accepted as new reserves. That is why again for Israel to find investors for these new projects; the country needs a possible export route.



- There is an important volume of export potential in SSCI. However, due to the existing conflicts, there will not be any real investments for the further development projects.
- By understanding, Israel additional export potential and the SSCI discoveries can be exported together, then the total volume to discuss in the view will be around a peak of 25 bcma.

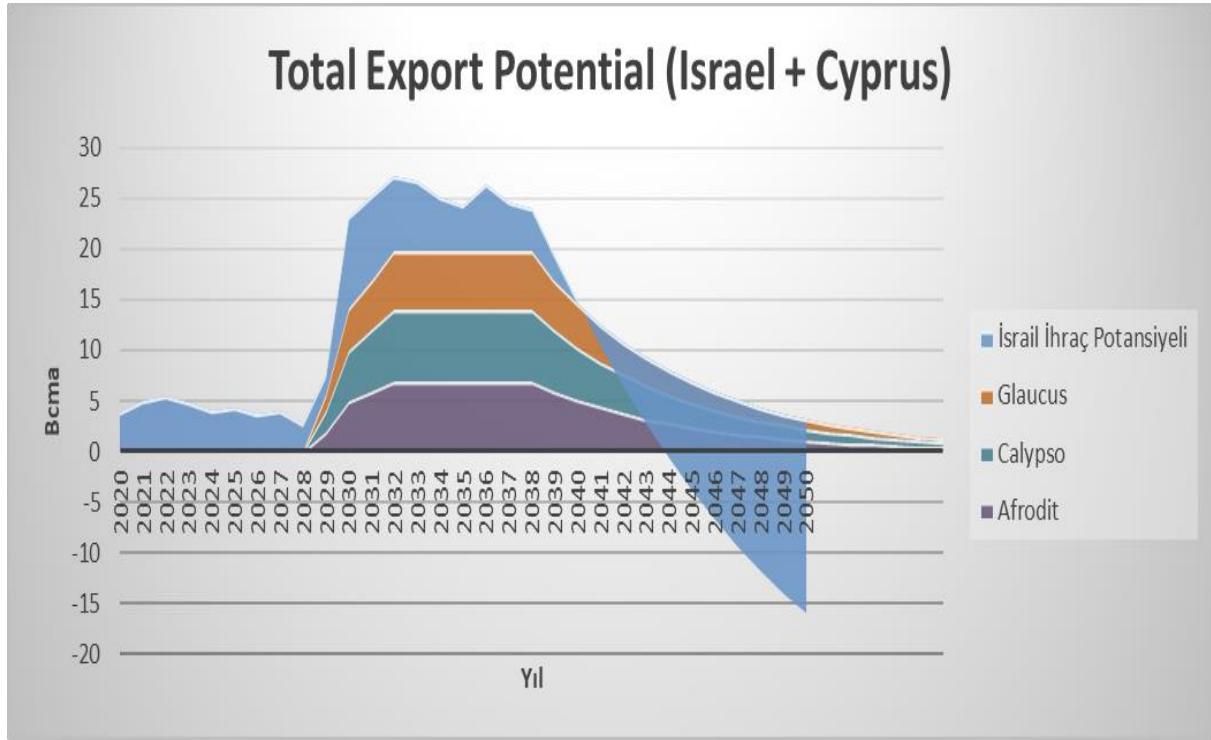


Figure 8: Israel + SSCI Gas Export Potential up to 2050 [2].

This is the technical reality, for the future analysis. However, the policy side directly affects the decisions in the region.

### Conclusion

As a result, studies show that the hydrocarbon resources and possible resource potential in the Eastern Mediterranean cannot be evaluated efficiently and brought into the economy. In fact, the Lebanese and Syrian maritime areas, where we expect new investments and new possible discoveries, should be added into this table.

Egypt is excluded from the integrated natural gas export model. Because its own technical export capacity is sufficient for itself. However, it is very important to implement a model in which cooperation with Turkey and the TRNC is provided in order to bring the additional resource potential in Israel and the south of the Cyprus Island into the economy. There are many plans and studies put forward by TESPAM in this context [3].

If the current situation is analyzed from this framework;

- Egypt, hence being in a position to have the ability to export its gas from the existing LNG infrastructures, is out of the equation of all political discourses.
- Israel has additional around 5 bcma export potential by analyzing the long-term sales possibilities. However, again to make such exports, needs to find a reliable and economic market reach.
- In addition to this, Israel also has possible new structures (interpreted in the seismic studies) waiting to be invested and tested, which can be accepted as new reserves.



This means; again, for Israel to find investors for these new projects, the country needs a possible export route.

- There is an important volume of export potential in SSCI (around 18 bcma plateau rate). However, due to the existing conflicts, there will not be any real investments for the further development of the due projects.
- Israel's additional export potential and the SSCI discoveries can be exported together, which means the total volume to discuss will be around a peak of 25 bcma.
- This is a good volume by comparing the gas supply security concerns of EU.
- This volume politically and economically can be transported to EU only through a route on Turkey.
- Turkey is also the biggest, reliable, sustainable and commercial gas market in the region (which is a more profitable option for the gas suppliers in the East Med).
- Balkan countries do not have such a rigid approach as other EU countries in terms of Demand volumes. Regarding their closer borders to Turkey, a possible pipeline through Turkey to EU will also benefit both from Turkey and Balkan Markets (and also may be for the inner locations of EU, where the demand is higher)
- Energy and water problem of the whole Cyprus Island may be resolved by the help of Turkey.
- Current political climate can be used as an advantage to solve all these blocked issues in the region.
- In this concept, gas trade opportunities can be used as a lever point.
- By analyzing from the technical perspective, for long term gas sales considerations,
  - there is around 20 bcma plateau export level for Egypt,
  - there is around 20 bcma plateau export level for SSCI,
  - there is around 5 bcma plateau export level for Israel.

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### Ethics Committee Permission

Ethics committee permission is not required for this study. No research has been conducted on any living creature (human and animal). The article belongs to the field of literature.

**Deconfliction Statement**

The author of the article declares that there is no conflict of financial interest between him and any institution, organization, person related to this study.

**Support and Thanks**

Support was not received from any institution or organization in the study.