

CYPRUS: ENERGY POTENTIAL, EXPORT OPTIONS & REVENUE MANAGEMENT

As Cyprus and licensed companies prepare to resume exploratory drilling, starting with the ENI-KOGAS consortium, which is expected to start drilling in Block 9 before summer's end, Nicosia is, more than ever, determined to turn the island into an energy hub for the region. However, progress has been relatively slowed down as the country faces substantial challenges. While the appraisal drilling in Aphrodite was largely an excellent news, confirming the presence of significant gas reserves, the quantities in question were inferior to previous estimates. More gas, whether from new discoveries offshore Cyprus or from neighboring countries, is needed to justify the construction of an LNG plant in Vasilikos, the country's chosen option for gas exports. The coming year will be instrumental for the Cypriot gas sector. Beside ENI-KOGAS, Texas-based Noble Energy is expected to conduct further drilling in Block 12 by early 2015, and Total, which holds exploration rights in Blocks 10 and 11 is expected to start drilling in the second half of 2015.

Middle East Strategic Perspectives asked **Charles Ellinas, CEO and founder of ECP Cyprus Natural Hydrocarbons Company and former head of KRETYK**, the national oil and gas company, to share his views on the latest developments in Cyprus, the Island's export plans and ambitions to establish a regional energy hub.

Energy potential

Based on assessment of available data, it is estimated that all six blocks currently leased in Cyprus' EEZ may potentially hold 1000 bcm of natural gas.

Noble/Delek/Avner completed appraisal drilling of Aphrodite, with initial results confirming 100 to 170 bcm with a mean of 145 bcm of high quality gas. There are good indications of other smaller gas fields in Block 12, with at least one estimated to hold 50-60 bcm. Noble plans to start drilling early 2015.

ENI/KOGAS have Blocks 2, 3 and 9 and are planning to start exploration drilling late 2014, with completion scheduled into 2016.

Total has Blocks 10 and 11, with potential for both oil and gas, and have now completed their seismic survey programme, with exploration drilling scheduled late in 2015.

Thus, by 2016, Cyprus will know exactly how much gas it has in its six licensed blocks.

Export options

If Cyprus is to maximize its benefits from gas it should retain flexibility in its export options so that it can access both the Asian and European markets. This is the reason why its export policy is centered on LNG. Since 2012, the government's policy has been to base this on the development of an LNG plant at Vasilikos.

Depending on gas quantities and the regional political situation, Cyprus could also consider exports to regional markets, much as Israel is doing.

The main export options are:

- LNG through a land based facility at Vasilikos
- Floating LNG (FLNG)
- Floating CNG (FCNG)
- Export to Egypt and liquefaction at one of the underused LNG plants there
- Pipeline to Greece and from there to Europe – this is a long shot but Greek companies are carrying out a detailed feasibility study.

Noble and its partners are evaluating export development options from Block 12 and are considering the feasibility of the first four options. If approval is given to proceed with one of these within the next 12 months then it should be possible to start LNG exports by 2020-21.

However, proceeding with a land based LNG facility would require more gas than what the Aphrodite gas field is known to hold now. Moreover, it would also require commitment to proceed with a second liquefaction train to make the project commercially viable for exports to the Far East. If this is to happen in the near future, it would require some gas to be committed to Vasilikos from Leviathan or to wait for the results of ENI's drilling campaign. With the possibilities of Leviathan gas coming to Cyprus now been considered low, going forward would depend on ENI's drilling results and a commitment by ENI to earmark about 200 bcm to Vasilikos, ie sufficient gas to supplement Block 12 gas and to guarantee a second liquefaction train.

FCNG is still a possible option for exports to countries in the region. It could also be combined with FLNG should more gas be found in a field once it goes operational.

Export to Egypt and liquefaction at one of the underused LNG plants there would be a challenge, not the least because with current liquefaction levels, the MoU with Union Fenosa, the LoI with BG and BG's own LNG production, there will not be much capacity left for use by others.

This leaves FLNG. FLNG is a fast developing technology, with four projects already in the construction phase and ten more in the design stage. Noble and its partners are already known to be looking into implementing FLNG for Leviathan, targeting LNG exports to the Far East. Should this become a serious option then adopting FLNG for Block 12 would make sense. It is interesting to note that ENI is already well advanced in the use of FLNG as the main export option for its vast gas fields offshore Mozambique.

With the bulk of the gas in the leased Blocks expected to be in ENI's and Total's Blocks, serious gas exports from Cyprus will depend greatly on what these companies do.

Once ENI and Total complete their drilling programmes in 2016, it may take three more years before they assess the results and complete their development programmes. Given that whatever export options they choose it would take about four years to complete construction, the earliest they would be able to export gas from these Blocks is 2024, assuming no delays.

Potential markets

The key markets for the bulk of Cyprus gas are Europe and Asia, and more specifically Far East Asia. But costs and timing are critical factors.

Prices make the Far East a primary target, but with competition, increasing costs and timing are critical factors. An ever-increasing number of projects is targeting the Asian markets, seeking long-term sales contracts post-2020. With Australian LNG well ahead, East Africa and Russia planning to start exports by 2018 and North America soon after, East Med LNG may lose out on the Far East if it is not in a position to start exports by early 2020s.

China is actively securing long-term gas supplies, both by pipeline from central Asia, eg Turkmenistan, and as LNG imports. However, shale gas is expected to change China's energy landscape significantly after 2020. After Ukraine, Russia is also looking more proactively to increase gas sales to Asia and the Far East.

But even in Asia the gas price scene is changing.

- The gas price of the 38 bcm China-Russia deal is estimated to be \$10 per mmbtu, about the same as the Russian gas supplied to Germany and much less than the current price in Japan of over \$15 per mmbtu.
- India is now in discussions with Russia for a similar deal and with the US for import of LNG.
- Japan has decided to go back to nuclear power, thus reducing its future LNG needs.
- Shale gas production in the US and elsewhere is increasing rapidly.
- Driven by the Ukraine crisis North America is granting many more licenses for LNG export, but much of it will be destined for the Far East.

All of the above are expected to have a strong influence in reducing gas prices in Asia in the longer term below current expectations, some believe to as low as \$10-12 per mmbtu. As a result, in Canada some of the LNG projects still at the planning stage are being reconsidered.

Timing for the construction of LNG export facilities, and costs, are becoming critical issues. It will become increasingly difficult to secure attractive Far East LNG sales contracts from 2020 onwards. Those LNG projects that are delayed, or are unable to find Far East buyers soon,

because of costs, may face increasing pricing and finance risks with time. This would leave Europe, but the low gas prices make this market a challenge for LNG exports.

Gas prices in Europe are low and are expected to remain low, ie \$8-10 per mmBTU. According to a study by MIT, a land based LNG facility at Vasilikos will mean a combined production and liquefaction cost of about \$7.5-8 per mmBTU. With an additional \$1.5-2 per mmBTU for transportation to Europe and regas the total cost would be \$9-10 per mmBTU.

Thus, if Cyprus gas is to be competitive in Europe the export options are limited. In fact FLNG may be the main option. As Leviathan may also be going for FLNG this may be the way forward for East Med. As FLNG combines production and liquefaction in one facility, unit LNG costs may come down by 30-40% in comparison to a land based facility.

The Ukraine crisis is again altering the balance in Europe, with the EU inevitably declaring its intention to embark on a new drive to become less dependent on Russian gas. East Med gas could now be seen as one such source. Cyprus being an EU member should help.

Given that Leviathan is now progressing fast into the production and export stage, most Israeli gas exports may be destined for the Far East. Lebanon is way behind and given current problems, it will take a long time before it is in a position to consider exports. This leaves Cyprus. Given the pace of developments most of its gas will be ready for exports at about 2024, thus risking missing the Far East markets and relying on Europe. Not a bad thing but prices will dictate development options. The main export option is likely to be FNLG.

Development of hydrocarbon resources in the East Med should be a catalyst to encourage countries in the region to resolve their differences and share the benefits – and thus achieve win-win solutions. Even though these resources promise to be substantial, they are small in global terms and if not developed carefully and timely the opportunity to realize substantial benefits may be missed. Whichever way these resources are developed, significant financial benefits for Cyprus will not materialize earlier than ten years from now.

Revenue management

At various stages the government of Cyprus has declared that profits will go into a national hydrocarbons fund with similarities to the Norwegian sovereign wealth fund. This will be used to

stabilize the economy and benefit future generations. IMF is already involved in this process and it is one of the commitments undertaken by Cyprus in its bailout agreement with its international lenders. This will ensure transparency and its success.

Cyprus, an attractive destination for investments

Given its location, its EU membership, its excellent relationship with the other East Med countries and security, Cyprus is an ideal location for companies to use as a base to service the East Med offshore hydrocarbons industry and installations. Lebanon and Lebanese companies can benefit from this and the lessons learnt in developing this industry and pick and choose the best practices developed in this process.