



REPORTAGE

Greece presses the E&P button

UPSTREAM / Plans for deep-water exploration have raised hopes of an eventual major natural gas discovery, while onshore oil development is progressing slowly / **Gerald Butt, Athens**

In a modest, modern building tucked away in a leafy residential street close to the centre of Athens a major energy transition is being managed. The building is home to Hellenic Hydrocarbons Resources Management (HHRM). Since 2011, this state-owned company has been revitalising what had become a near-moribund energy sector.

HHRM exudes vigour, taking its cue, perhaps, from president and chief executive Yannis Bassias. Not so, he insisted, in an interview with *Petroleum Economist*. He said the firm's youthful vitality stemmed not from him but from the staff themselves: "When you take me out of the

statistics, the average age here is 34, so this is great. We have a staff of just 17, we don't need any more."

This lean team has just pulled off a considerable coup, hooking super-major ExxonMobil into Greece's upstream, in partnership with Total, which already had a presence there. The latest move, many believe, will eventually see Greece emerge as a significant player on the East Mediterranean energy stage. Greek deputy energy minister Michalis Verroioopoulos told *Petroleum Economist* that "these days we're focussing on promoting hydrocarbons exploration in Greece—there's a new dynamism to it. We're very happy

having huge companies like Exxon and Total deciding to invest here."

The Zohr effect

So, what has attracted these energy super-giants to a country which, hitherto, hadn't been associated with the East Med offshore gas boom or upstream activity in general? "The big change came with the discoveries elsewhere in the region, in Israel and Cyprus, but more particularly with Zohr off Egypt," Bassias said. The Zohr field, discovered by Eni in 2015, has at least 30 trillion cubic feet (850 trillion cubic metres) of gas in place—found in a previously unknown carbonate layer. "Eni



3,200 metres

Seawater depth off Crete

a contract to an Exxon-Total-Hellenic Petroleum consortium to explore for hydrocarbons in the West of Crete and South West of Crete blocks. Repsol and Hellenic have expressed interest in a third block in the Ionian Sea to the west (known as the Ionian Block) which has similar characteristics to those off Crete.

Very deep water

While the outlook may be exciting, Bassias is quick to add that Greeks will have to wait some time to see whether reality matches expectation in terms of natural gas in place. The day when gas might come ashore is even further away. The two licences off Crete together cover a huge area (a total of 40,000 sq km/15,000 sq miles) and the water is very deep. "I want to stress," Bassias said, "that what we have here are two very big blocks where the average water depth is 3,200 metres (10,500 ft), deeper than off Brazil and the Gulf of Mexico. So, you may have some 4,000 metres of depth with interesting plays within the seabed. We have identified more than 10 structures that could be interesting."

The problem with drilling in ultra-deep waters like those off Crete isn't penetrating the rock, but rather remaining stable. "The technology for this isn't sufficiently advanced yet," the HHRM boss continued. "We don't have the drilling ships to do that. It's not just a question of refurbishing a drilling ship to enable it to drill in waters deeper than 3,000 metres."

Exxon and Total, Bassias said, are working flat out to overcome the technology issues. In the meantime, one can expect three years of seismic gathering in the offshore-Crete blocks, with more 3D seismic and other studies in the second phase—which will last a further two-to-three years. "So from now, we're five or six years away from the point when we're ready to start drilling. But by 2025 the technology that we need will be ready to allow drilling in these kinds of settings. So people need to understand that we're not going to be producing oil or gas this year or next. We're talking about six or seven years from now."

Prinos soldiers on

While the Zohr effect might well put Greece on the energy map in a dramatic way by the mid-2020s, the country hopes that there will be other reasons to be cheerful before then. At present, Greece has only one block producing hydrocarbons, Prinos, in the Gulf of Kavala off the

island of Thassos in the far north-east. Prinos was discovered in 1974 and at one point produced 30,000 barrels a day. But it then went into decline. With the licence running out, it seemed doomed to be abandoned. Then in 2007, private Greek firm Energean, which in March listed on the London Stock Exchange, acquired Prinos and set about redeveloping it. Today, production averages around 4,200 b/d and Energean hopes to gradually double this figure.

"Prinos is an old field," Energean's chief executive Mathios Rigas told *Petroleum Economist*. "It needs love and affection to handle it properly, to get the most barrels out of it." The field's reserves stand at "58m barrels of oil and contingent resources—40m is the 2P number. So there's a lot more oil to be produced from Prinos".

Energean plans to continue increasing production by drilling "a number of infill wells with our own drilling rig. We are also connecting a satellite field, Epsilon, through a small unmanned platform tied back to the main production facilities. The beauty of Prinos is that, without any extra cost, it has facilities to handle up to 30,000 b/d—the level the field once produced.

Another advantage of oil produced from Prinos is that, under the Greek tax and royalty arrangement for the field, Energean has an average take of about 25%. So, Rigas said, "a Greek Prinos barrel is probably three times more valuable than an equivalent Egyptian barrel or another barrel where a government has taken a lot of it. The tax and royalty are so low because when we took over Prinos it was a distressed asset."

In 2015, Energean shot new 3D seismic surveys. "We understand the field very well," Rigas said. "We see additional upside, in stratigraphic traps, in deeper horizons we'll be exploring. So we think there's going to be a lot more coming out of Prinos, but we're taking our time to develop it."

"With the same geological environment off Crete as Zohr there's a good chance of having similar discoveries"

has transformed completely the image of the Eastern Mediterranean. What's exciting is that we have the same geological environment as Zohr in several areas of the East Med, not just off Cyprus, but off Greece too. So, there's a good chance of having similar discoveries."

That's what has whetted the appetite of Exxon and Total, both of which have acquired stakes in the Cypriot offshore. In early July, the Greek government awarded

Ready and waiting: offshore Greek blocks and their stakeholders
 Source: *Petroleum Economist*





Work in progress: Greece's energy sector is expanding, with a focus on E&P

Katakolon next

Another Energean block, Katakolon, situated offshore in the Western Peloponnese, is likely to be Greece's next producing asset. The government issued a 25-year exploitation licence for the West Katakolon field—a small field with 10.5m barrels of 2P reserves. Drilling is planned for 2019 using extended-reach technology to drill from onshore to offshore reservoirs, thus avoiding the construction of a rig in an area of natural beauty and cultural importance.

Costis Stambolis, head of the Athens-based Institute of Energy for South-East Europe, interviewed by *Petroleum Economist*, said that while Katakolon would be only a small producer—probably around 2,000–3,000 b/d—“it's very important from a psychological point of view because it will show that Greece can produce oil from different locations. So it will serve to boost sentiment and provide a sign that things are happening and moving here.”

For many years very little appeared to be moving in Greece's energy sector. Between 1975 and 2007, Hellenic Petroleum had exclusive rights for exploration and production in 26 blocks, and it audited and oversaw the Prinos operations. In 2011, Stambolis said, “the political masters at the time decided it was time for Greece to get involved again in energy

activities. It contracted PGS to carry out seismic work in the western part of Greece, the Ionian Sea and around Crete. It also set up HRRM.”

Third bid round?

In 2014, the country's second bid round was launched (the first one was in the 1990s) with around 20 blocks on offer. In the end, only three blocks were awarded, two to Hellenic and one (Block 2) to a joint venture between Total, Edison and Hellenic. “The bid round happened at a very bad time,” Stambolis continued, “because oil prices were going down and the Greek economy was suffering from a severe recession. To their credit, the government didn't cancel the round.” In Bassias's view “nobody was interested because at that time Greece was a frontier area and you don't invest in frontier areas when oil prices are low. You go where there's more certainty.”

Energean acquired the onshore Ioanina block in northern Epirus in 2014 and three years later farmed out 60% of the licence to Repsol, which became operator. According to Bassias, this is “an area of high pressure with geology that is very complicated because it's like millefeuille. This requires a lot of expensive seismic. From the technical performance financial points of view, Energean alone couldn't do

that.” The collection of 2D seismic is continuing, in advance of the start of exploration drilling. In 2017, Repsol also acquired 60% of Energean's onshore Aitolokarnania block in western Greece where a 2D survey is being carried out in 2018–19.

As for the future, while news is awaited from the two deep-water blocks off Crete, another bid round is planned according to Bassias, but probably not for another two-to-three years when certain blocks have been relinquished, up-to-date data prepared and thorough preparations completed. “In the second bid round, yes, Greece was going through bad times and the oil price was low. But also the strategy wasn't right. We were trying to promote through the embassies and consulates in several countries. That's not right. You have to be commercial, take your bag and go around knocking at doors for a whole year. Then it will happen, you'll have a good bid round.”

He believes that in general oil will be discovered onshore and gas offshore. But there could also be pleasant surprises. “In Africa and elsewhere they've found that when you go deep, deep, deep, with 3,000 metres depth of water and 2,000 metres of rock you may have oil. So, we may have oil offshore.” The HRRM boss—a man clearly in his element—chuckled as he considered that happy prospect. **PE**

Jumping on the gas-transit train

MIDSTREAM / Greece hopes to exploit natural gas pipelines crossing its territory to export its own volumes to Europe / **Gerald Butt**, Thessaloniki

Greece must wait several years to learn whether the Mediterranean Sea will endow the country with natural gas supplies on a par with those off Egypt. But that doesn't mean that people aren't talking about gas. Far from it.

"We are in the middle of huge investment in gas," Greek deputy energy minister Michalis Verroioopoulos told *Petroleum Economist*. "This is in both international projects and the domestic market. There's a big space for natural gas in Greece."

Greece's interest is both in securing diverse and dependable sources of gas supply and finding ways of transporting any future gas reserves to market.

Greece imports all the gas it consumes. Around 70% comes via pipeline from Russia, 15% from Turkey via the Greece-Turkey interconnector and the rest from liquefied natural gas. The country's sole LNG terminal is at Revithoussa, a small island west of Athens, which began operations in 2000. An expansion project is set for completion this year. When finished it will raise regasification capacity by 40% to 4.7m tonnes a year and involves the construction of a third 95,000-cubic-metre-capacity (3.3m-cubic-foot) storage tank.

Plans are advanced for a floating storage and regasification unit at Alexandroupolis, close to the Turkish border. The facility's four regasification units will have capacity to produce a total of 6.1bn cubic metres a year of gas and initially store up to 170,000 cm. A final investment decision is awaited and could be determined by the planned Greece-Bulgaria interconnector pipeline project receiving permission to proceed.

Tanap to Tap

Alexandroupolis lies close to where the Trans Adriatic Pipeline (Tap) connects to the Transanatolian Pipeline (Tanap), which

brings natural gas across Turkey from Azerbaijan. Tap, running from east to west across northern Greece, is close to completion. The pipeline will carry on through Albania, with the aim of then routing under the sea to Italy and from there into other European markets. The initial capacity of the pipeline, which has European Union backing, will be 10bn cm/y. The aim is that Azeri gas will reach EU markets in 2020. Under Greece's deal with Tap, the country will receive 1bn cm/y from the pipeline. The shareholders in Tap are BP (20%), Socar (20%), Snam (20%), Fluxys (19%), Enagás (16%) and Axpor (5%).

"Building a pipeline from western Greece, offshore or onshore, directly to Italy is technically feasible"

In the second phase, Tap's capacity could be doubled. At this point Greece will be hoping that it has gas that could be transported to Europe through the pipeline. Greece is also a partner (along with Italy, Cyprus and Israel) in a plan to transport East Mediterranean gas to European markets. The Eastern Mediterranean gas project (EastMed) envisages the construction of 1,300km (807-mile) offshore pipeline and a 600km onshore pipeline.

It would initially bring Israeli and Cypriot gas to Cyprus. From there the pipeline would pass under the sea to Crete, before connecting to mainland Greece in the Peloponnese and continuing to western Greece and Italy. The project is owned by IGI Poseidon, with Greece's state gas firm Depa and Edison owning 50% each.

Energy hub?

In the view of Yannis Bassias, head of state-owned Hellenic Hydrocarbons Resources Management (HRRM), the possibility of two gas pipelines crossing into Europe is hugely advantageous for Greece, opening up the prospect of it becoming an energy hub. "Greece is the western-most part of

the Eastern Mediterranean," he told *Petroleum Economist*, "and the eastern-most part of the West Med. This is an excellent position geographically because from western Greece you go straight to Italy and other European markets." Tap, in its first phase, may not have capacity to take on gas from Greece. But the second phase would be different.

According to Costis Stambolis, head of the Institute of Energy for South-East Europe in Athens, "building a pipeline from western Greece, offshore or onshore, to Italy is not difficult because Tap is already making plans to lay a pipe from Albania to Italy. The problem is that the communities in southern Italy where the pipeline would go are objecting very strongly to this. I'm sure in the end they will find a solution. But technically it's feasible because we're not talking about deep water."

As for the planned EastMed, passing through Crete, it would be ideally placed to take on export volumes from any discoveries in the two ultra-deep-water blocks off the island that are to be explored by the ExxonMobil-Total-Hellenic Petroleum consortium.

Voices can be heard expressing doubts about the economic viability of EastMed, given the transportation costs involved. But Bassias believes these worries are unfounded. More and more gas is being discovered in the East Med, in Egypt and elsewhere. Egypt's LNG facilities won't be able to handle all the gas in excess of what's consumed domestically. And Europe is anxious to diversify sources of supply as much as possible.

"There's a lot of gas that has to be transported and it's probably not so expensive when you look at it over a time window of several years," HRRM's boss continued. Even if the final cost is, say, \$10bn, there are 500m people in the EU, it's not such a big deal for each pocket." A final investment decision on EastMed is likely in 2019.

The hope in Greece is that the financial and other issues associated with pipeline projects to Europe will be resolved in the next few years. By then the Greek upstream should be well placed to contribute to these new export facilities. **PE**

70%

Russia's share of Greek gas imports