

North Africa - An Energy Source for Europe?

KINGSTON ENERGY CONSULTING & PROSPEX RESEARCH review the prospects for North African Gas and Power.

THE IMPORTANCE OF the North African countries to Europe's energy balance is set to increase dramatically over the next few years. Northern Africa and Southern Europe are natural energy partners, especially when it comes to natural gas. Southern Europe has a large and growing energy demand and minimal natural gas reserves. North Africa has more gas reserves than the whole of Europe, while the region's gas consumption is less than that of Italy. North Africa's own gas consumption is growing rapidly, with efficient combined cycle gas-fired power generation replacing oil-fired plants in a North African 'dash for gas'. And power demand in the region is surging on the back of rapid population growth and economic development, fuelling huge opportunities for investment in generation plant and infrastructure.

Europe's Need for Gas

Europe's main indigenous sources of natural gas are in North West Europe, onshore in the Netherlands and Germany and offshore in the UK and Norwegian continental shelf. Most of these reserves have already been heavily exploited and production is in decline in most areas. Norway is now the only significant net exporter of gas in Europe, and the UK, until now a net exporter of gas itself, will be consuming an increasing proportion of Norway's gas output from now on.

> Northern Africa & Southern Europe are natural energy partners <

Europe is turning increasingly to imported gas to meet its growing demand. In 2003, 37% of Europe's gas consumption was covered by imported gas. Europe's dependency on imported gas is expected to reach 50% by around 2012 and continue to rise, reaching 65% in 2030, by which time Europe will be importing over 400 bcm/y of gas.

Almost all of the gas currently imported into North West Europe and into the Central/Eastern European and Baltic States comes from Russia. The long distance pipelines that bring Russian gas to Europe were developed during the communist era and have provided very reliable supplies for more than four decades. The European Union's priorities for gas infrastructure development include increasing transit capacity of the existing routes to Europe, and the creation of a new northern route to bring gas from arctic Siberia to Northern Europe via the Baltic States. However, the vast distances that Russian gas must cover to reach Europe make this a relatively expensive option, especially for the Mediterranean countries.

Southern Europe (France, Italy, Portugal and Spain)

imports its gas from a more diverse set of sources. Algeria provides a little over half the non-European gas that flows into this region. Russia contributes a further third of imports and supplies of liquefied natural gas (LNG) from Nigeria make up nearly all of the remainder.

Overall, Russia (63%) and Algeria (28%) accounted for 91% of external imports of natural gas into Europe in 2003. As Europe's demand for imported gas increases, Russia, with enormous gas reserves and established pipeline links, is expected to remain Europe's largest external supplier. But Russia alone cannot meet Europe's growing demand for gas and the EU would not be happy to significantly increase its already strong dependence on Russia as a source of gas supply.

North Africa's Role in Gas Supply

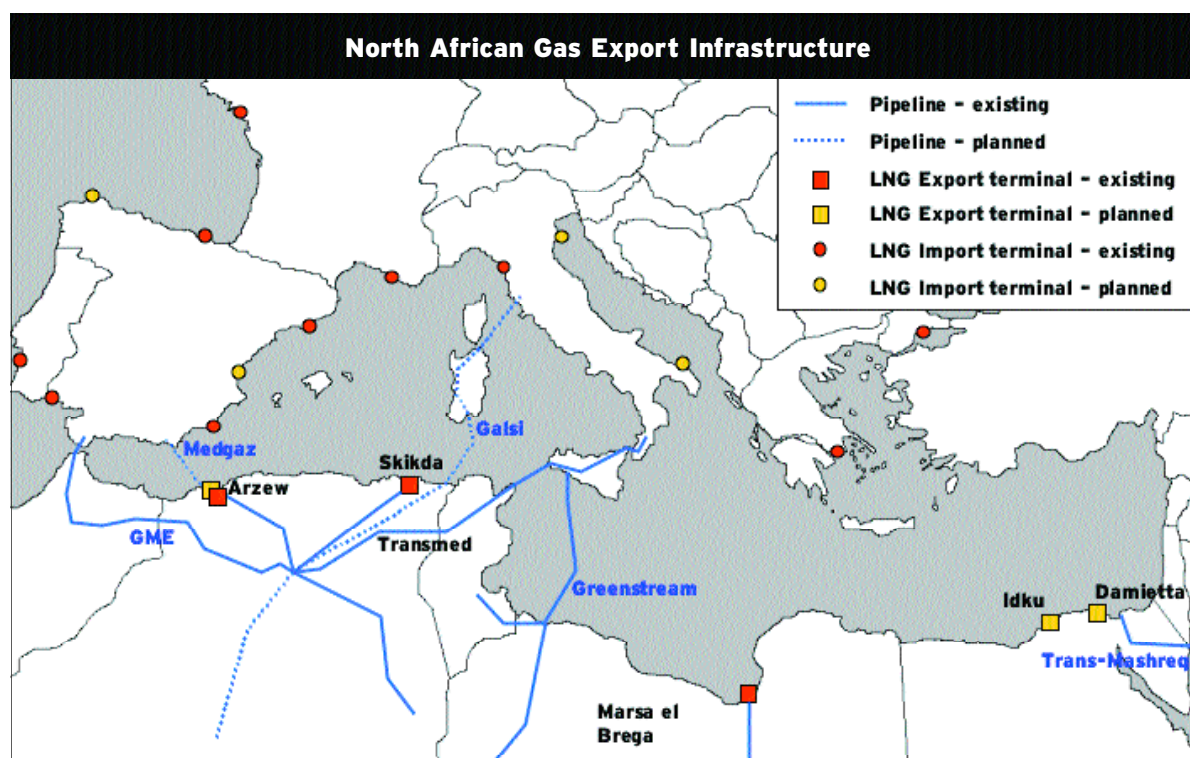
With proven natural gas reserves of 7,651 bcm, the North African countries (principally Algeria, Egypt and Libya) have 40% more gas than remains in Europe. And while European gas production is in decline, North Africa's gas exploration industry is still relatively young and the region's reserves may grow even larger as new discoveries are made.

The North African gas fields are well situated for supply to Southern Europe. The relatively short distance across the Mediterranean makes pipeline supply a cost-effective option. Two subsea pipelines have been in operation for several years, a third was recently completed, and two further projects are in progress. The presence of the Mediterranean sea with its well developed port infrastructure also allows for seaborne transport of gas as LNG, which provides far more flexibility in where the gas can be delivered, albeit at a rather higher total cost than for pipeline delivery.

North African gas is also relatively cheap to produce. The main gas fields are predominantly onshore (Algeria and Libya) or in shallow offshore waters (Egypt), in locations without the climatic challenges of arctic Siberia or the Norwegian Sea.

Algeria is already a major supplier of natural gas to Europe. Algerian gas is supplied as LNG and is also piped to Europe through the Transmed pipeline, which runs via Tunisia to Italy, and through the GME pipeline, which runs through Morocco to Spain. Algeria's main European export partners are Italy (20 bcm/y), Spain (14 bcm/y) and France (9 bcm/y). Algeria also supplies most of the gas used in Portugal and provides some LNG to Greece and Belgium.

Libya's and Egypt's potential as gas suppliers to Europe has been largely unrealised until now. In Libya's case, economic sanctions imposed by the United Nations and America brought the development of gas infrastructure to a halt and Libya's LNG exports were reduced to a paltry 0.7



bcm/y of gas to Spain. Egypt lacked the infrastructure to export gas to Europe, either by pipeline or as LNG.

The situation is changing rapidly. The sanctions against Libya have now been lifted and a boom in gas export infrastructure development is underway. The Greenstream pipeline, bringing gas from Libya to Italy, was completed in October 2004. With an initial capacity of 8 bcm/y, this pipeline has increased Libya's export capacity tenfold. Since the lifting of sanctions, several international companies have expressed interest in revitalising and expanding Libya's LNG export capability, and there is a real possibility that one or more large new LNG terminals will be constructed within the next ten years.

Egypt has never exported any gas to Europe, but will soon become the second largest North African supplier after Algeria. Two large LNG export plants are in development and expected to contribute to exports of 12 bcm/y from 2005 onwards. Planned second trains at both locations should be online by 2010, doubling Egypt's capacity to export LNG to Europe.

Meanwhile, Algeria plans to retain its leading position by nearly doubling its exports between now and 2020. Planned improvements to the existing Transmed and GME pipelines will increase their capacity by around 25% by 2015, and two new pipelines to Europe (MedGaz and Galsi) are expected to come on stream within the next 10 years, increasing Algeria's pipeline export capacity to as much as 80 bcm/y by 2020. Algeria also plans to increase its LNG export capacity, with new plant due for completion in 2008 bringing total capacity to around 35 bcm/y.

In 2005, North Africa will have the capacity to provide around 38% of European gas imports, a huge step up from the 28% that it supplied in 2003. The region's share of the European gas market is set to rise strongly in the following years, with export capacity reaching 47% of anticipated European imports and 28% of demand by 2020.

Power Exchanges with Europe

North Africa's gas supplies are of vital importance for Europe's security of supply, but the same cannot be said of power. In fact, the reverse is true: North Africa needs better access to European supplies as it contends with stretched generation systems and growing demand.

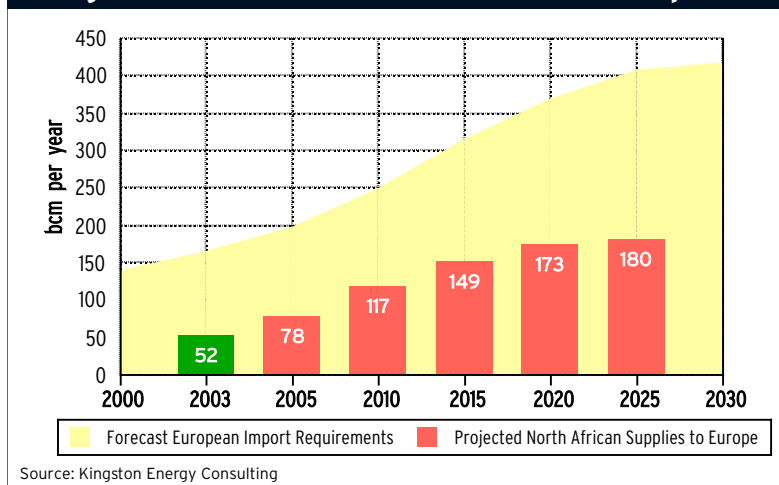
The only interconnector between the European grid and North Africa is a 1,400 MW underwater cable running between Morocco and Spain. This link is important for the Moroccan power system, but less so for Spain, and it has practically no significance to the wider European power market. Power has flowed almost exclusively from Spain to Morocco since the link was completed. There have been

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occasional exports from Morocco to Spain since December 2001, when Endesa became the first Spanish power company to import electricity from Morocco. In June 2004 industrial action at Electricité de France (EDF) disrupted Franco-Spanish trade, prompting Spain to import power from Morocco to cover French import reductions.

More capacity is on the way: a second, 700 MW line between Morocco and Spain is scheduled to come on stream in 2005. When it is completed, total link capacity of 2,100 MW will be in a position to play a major role in Moroccan power and an important role in Spanish power.

Integration with North African power grids could improve security of supply for Europe. Although Italy in particular, and to a lesser extent Spain, are relatively short of power, variations in near-term demand patterns and production costs could allow power to flow both to and from North Africa, possibly providing an additional source for both sides

Figure 1. Actual & Potential N. African Gas Exports

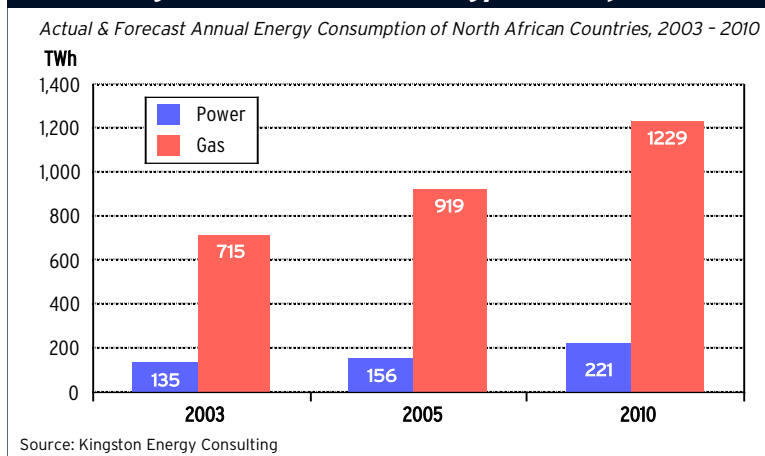
at times of peak demand in their local markets. In the longer term, demand and cost patterns could diverge widely, creating new trading opportunities.

There are plans for new high capacity subsea links running directly to Southern Europe from Algeria, Tunisia and Libya. Algeria and Libya in particular are well placed to produce cheap gas-fired power and sell it to import-hungry Europe. However, the cost of these long lines is substantial, and in practice, most North African power companies are in no position to export power to Europe while they race to meet rising demand at home. For now, these long link projects remain on hold.

North African Energy Markets

North Africa's own energy needs are small compared with Europe's but are growing fast. At 135.1 TWh in 2003, North Africa's electricity consumption is slightly smaller than that of Sweden (Europe's sixth largest market), while the region's 2003 gas consumption figure of 61.8 bcm falls between that of Italy and France, Europe's third and fourth largest markets. But the region has one of the highest population growth rates in the world, the population having tripled since 1950. This is driving growth in electricity consumption of around 7% per annum, and gas consumption is rising even faster.

Most of the region has been electrified, but the existing networks are inadequate to cope with burgeoning demand,

Figure 2. N. African Energy Consumption

and need substantial investment. New generation capacity of around 20,000 MW will also be required by 2010. Most of this new plant is likely to be gas-fired, with large new combined cycle plants already under construction from Morocco to Egypt and more on the drawing board. The drivers behind North Africa's 'dash for gas' are persuasive:

- Replacing oil-fired generation with plants burning plentiful, locally produced gas frees up valuable oil for export.

- Combined cycle gas-fired plants offer higher efficiency and better environmental performance.

- Gas-fired plants can be built quickly, with a smaller investment of capital per MW of capacity than other plant types.

Gas consumption is soaring primarily as a result of increased use in power generation, but the use of gas as a fuel for industry and for domestic and commercial consumers is also growing as the local gas transmission and distribution infrastructure is expanded.

North Africa: European Energy Partner?

Europe is North Africa's main source of foreign investment in the energy industry. Relations between the EU and North Africa are governed by the Euro-Mediterranean Partnership (EMP), known as the Barcelona Process. Launched in 1995, the EMP aims to assist the liberalisation of the region's economies and promote the opening of national markets to foreign investors. The ultimate goal is the creation of a Euro-Mediterranean Free Trade Area by 2010, which would create a zone of some 40 States and 600-800 million consumers. The programme includes energy policy goals of increasing the interconnections between Europe and Mediterranean countries, promoting efficient, clean and safe energy production and use, and adopting common rules and standards across the region. And this is not just a talking shop: European money is supporting economic and trade reform within the region through the Mediterranean Development and Aid programme, and European companies are at the forefront of commercial investment into the energy industry.

On the other hand, engagement with the North African energy industry is not without risks. Governments have typically been tightly controlled by leaders with military backing. Change of leadership is rare, with Colonel Gaddafi of Libya in power since 1969 and President Hosni Mubarak of Egypt since 1981. This makes the potential consequences much greater

if change does come - the inevitable changes of guard, when they come, may be the occasion for deep political changes, either positive or negative.

The US government has formally identified seven terrorist groups in North Africa, which share a fundamental Islamist agenda. Energy installations have been among their targets, but with little real impact, as attacks on high-profile energy targets such as production installations have largely been deterred or blunted by extensive security measures. Nevertheless, there are both risks and costs involved in operating in the region as a result.

The optimist's view would be that extremism in the region is largely under control, that Libya's return to the international system is a positive sign, that with increased foreign investment, the substantial economic potential of the region is set to be realised over the next decade and that, above all, the obvious potential of energy trading between North Africa and Europe will trump any policy differences in other areas. The pessimist would counter that internal conflict has been contained but not defused, that government regimes - especially Libya's - remain dictatorial and unpre-

dictable, that true economic reform is not part of the region's agenda and that investment in the North African energy business is nothing more than gambling.

Both Europe and North Africa stand to benefit if international energy companies assess that the potential rewards

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of involvement in North Africa outweigh the risks. The several dozen major international energy companies that are already operating in the region clearly think they do ■

KINGSTON ENERGY CONSULTING, PROSPEX RESEARCH & EUROPEAN RESEARCH & ANALYSIS

have written a new 170 page report: *North Africa Gas and Power*, providing comprehensive analysis of industry trends and the vital commercial and regulatory issues. The report is published by Prospex

Research and is available electronically for £795/€1,150

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