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Oil and natural gas prospects: Middle East and North Africa

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HIGHLIGHTS

- Global oil and gas reserves and prices.
- Energy sustainability and the Middle East.
- Energy economics and investments in the Middle East.

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ABSTRACT

The MENA region is endowed with enormous resources of oil and gas, rendering it the world's richest region in this regard. Endowment differs from one country to another with few countries are almost dry; however the economic benefits proliferated to almost every country in the region. In spite of some doubts being cast about the amount of proven oil reserves, these with improved technology and new discoveries are increasing year after another. With no long term feasible alternatives to oil for transport and the increasing trade in LNG, the region's importance as a world's leading supplier of fossil fuels will continue for decades to come.

However, these favourable prospects hide many challenges facing the MENA region, among them is the difficulty in mobilizing investment funds for sustaining and increasing output to feed growing global demand. Growing local demand, due to the proliferation of subsides, is another worrying aspect that already caused few countries with modest resources to become oil importers instead of exporters, with larger exporters decreasing their surplus output. The region is also still mainly dependant on foreign technologies and skilled manpower. Regional cooperation in oil and gas networks and electricity interconnections is still modest.

The region has a long history of conflict; correspondingly it is a major importer of armaments which is increasingly eating a lot of its surplus income. With the political and social changes presently taking place in many MENA countries, due to the Arab spring and continuation of local conflicts, the sustainability of supplies from the region are increasingly a source of worry to MENA exporters and its many importers. It is also causing increasing involvement of the super powers in regional affairs.

1. Introduction

The Middle East and North Africa (MENA) region has an important role in the global oil and gas agenda. Its oil and natural gas resources are tremendous, so are its problems and challenges. The region is strategically centered between Europe, Asia and Africa. Its geological endowment differs from one country to another, however all countries in the region have benefited from the oil and gas wealth to varying degrees. The challenges are security, national and regional, sustainability and the wise utilization of the oil and gas wealth.

1.1. The oil and gas resources of the Middle East and North Africa

We start by defining the Middle East and North Africa (MENA) region as to include the Arab countries of West Asia and North Africa, as well as Iran. There are no shortage of statistics and information on MENA's oil and gas resources and confirmed reserves. Often these present varying results due to conflicting interpretations and definitions. The most widely available sources are those of the Oil and Gas Journal (O&GJ) and the BP Statistical Review of World Energy (BP, 2012). In this paper we are mostly interested in the figures of proven reserves; these are discovered volumes having a very high probability of profitable extraction. They need to be distinguished from ultimately recoverable resources which comprise cumulative production, proven reserves, possible reserve growth and undiscovered resources that are likely

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to be ultimately producible. Remaining recoverable resources are the ultimately recoverable resources less cumulative production (WEO, 2012).

The world's oil proved reserves are equal to 1653 billion barrels of oil (BP, 2012). The O&GJ figures are slightly less and amounted to only 1532 billion barrels at the end of 2011, since these did not include the extra heavy oil in Venezuela's Orinoco belt of 296.5 billion barrels which were included in BP (2012), thus making Venezuela the world's leading country for proven reserves. BP also includes Canadian tar sands at 175.2 billion barrels.

The Middle East proven reserves according to BP (2012) were 795 billion barrels, to these must be added the North Africa figure of 65 billion barrels. This makes the total figure of MENA proven reserves equal to 860 billion barrels, which are 52% of global proven oil reserves. If Venezuela's extra heavy fuel is ignored, then MENA proven oil reserves add up to 56% of the world. This signifies the very important role that MENA plays in the global oil sector and the strategic value of its reserves to the world community. However the accuracy of such oil proven reserve figures have been questioned lately (Jefferson, 2012)

It has to be stressed that the extra heavy fuels of Venezuela, Canadian tar sands and other unconventional oils, cannot be equated on the same basis with the light and medium oil reserves of MENA. The cost of production of these heavy oils is very high, they have a low extraction rate, it takes a lot of energy (natural gas and heating) to extract a barrel of heavy fuels since these heavy fuels have a low energy return on investment (EROI) compared to MENA oils of 30 or higher EROI. Extra-heavy oil needs the addition of diluents (gas condensate, NGLs and light oil) to facilitate their extraction (Salameh, 2012). Therefore in no way can the extra-heavy oils of Venezuela's Orinoco belt can be equated on the same table with MENA much more valuable reserves. The fact is that taking all factors into consideration Saudi Arabia remains the country with the world's highest oil reserves that are of value.

The picture changes when we estimate the ultimately technically recoverable resources. In the following Fig. 1, MENA amount to approximately 1200 billion barrels of the global figure of 5800 billion, i.e. only 21%. This may not be the true picture because the unconventional oil resources of MENA have not been fully explored since the attention has till now centered on its easily extractable and cheap to produce conventional oil.

The MENA region is equally endowed with rich proven reserves of natural gas. These, at the end of 2011, amounted to 88 trillion cubic meters (tcm) of total world reserves of 208 trillion, i.e. 42%, mostly concentrated in Iran and Qatar at 16% and 12% of the world's, respectively. Saudi Arabia's share of total world's proven gas reserves is only 4%. The same applies to remaining technically recoverable natural gas resources. The world figure amount to 790 tcm, of which 42% are unconventional. Most MENA's resources are conventional, see Table 1. The same as in the case of oil, MENA's unconventional gas recorded resources are limited because interest has been concentrated till now on the abundant easy to produce conventional gas.

It is of great interest to notice the increasing, over time, amount of Middle East proven reserves of oil and gas. Proven oil reserves in 1991 were only around 700 billion barrels, in 2011 these increased by 14% to 795 billion in spite of cumulative production during that period that was 25–30 million barrels per day. The same applies to natural gas. MENA's proved gas reserves increased from 48 tcm in 1991 to over 88 tcm at end of 2011, i.e. a growth of 83% during these last twenty years pointing out to the increasingly future potential of the region to meet the world's growing demand for oil and gas. Some of the proven gas reserves are the off-shore recently discovered resources east of the Mediterranean, which are most suited to satisfy the growing gas demand in Europe.

We estimate MENA's proven oil reserves to amount to 860 billion barrels of oil and another equivalent 581 billion barrels of natural gas. Although the natural gas reserves are still marginally less than that of oil however these are significantly increasing year after another and are expected to equal proven oil reserve in the

Table 1
Remaining technically recoverable natural gas resources, end 2011 (in trillion cubic meters).

	Conventional	Unconventional				Total
		Tight gas	Shale gas	Coalbed methane	Sub total	
E. Surope/ Eurasia	144	11	12	20	44	187
Middle East	125	9	4	–	12	137
Asia-pacitic	43	9	4	–	94	137
OECD Americas	47	11	47	9	67	114
Africa	49	10	30	0	40	88
Latin America	32	15	33	–	48	80
OECD Eurpoe	24	4	16	2	22	46
World	462	81	200	47	328	790

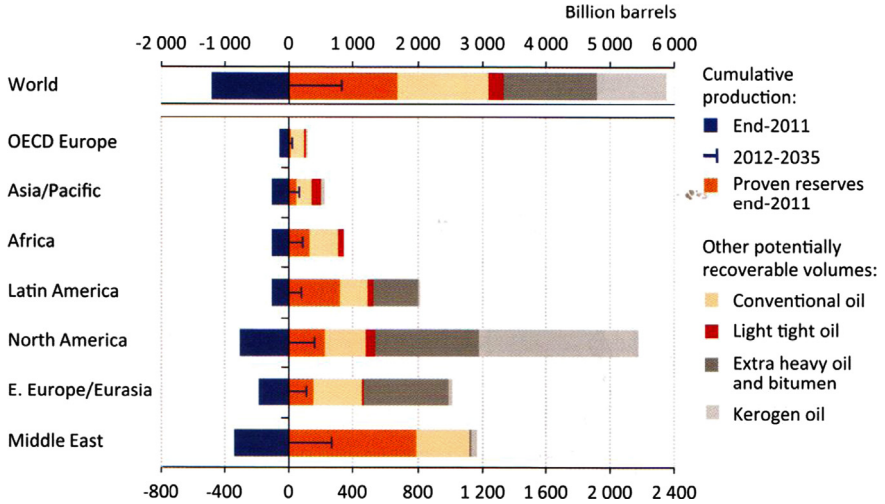

Fig. 1. Ultimately technically recoverable resources and cumulative production by region.
Source: WEO, 2012