

**With its abundant oil reserves, the Middle East is the last place you would expect to be interested in clean energy. However, governments and investors awash with oil revenues and an eye on the future are waking up to the opportunities and benefits.**

THE Middle East might not seem a natural base for clean energy technologies given its vast reserves of fossil fuels and their importance to the region's economies. However, a number of recent developments suggest that clean energy is becoming a major focus for Middle Eastern governments and investors and that this interest will continue to grow. Paradoxically, one of the main reasons for this is strong oil prices, according to Samer Salty, CEO of Zouk Ventures, a venture capital firm that manages a clean technology fund.

The revenue inflows from high oil prices mean that Middle Eastern investors have a lot of money that they are looking to place. "These are quite sophisticated investors," says Salty, "and they understand that clean technology provides some great investment opportunities." Indeed, the returns from clean energy investments in recent years have been quite spectacular. In 2006, the NEX index of clean energy stocks rose 33%, while the amount of money invested on public markets increased by 141%, with the solar, wind and biofuels sectors performing most strongly.

The influx of oil revenues has led to rapid economic growth in a number of Gulf Cooperation Countries, with many governments looking to diversify their economies into areas such as tourism, financial services and manufacturing. As a result, the Middle East has become the largest project finance market in the world, according to HSBC, with USD 33bn of finance raised for projects in the region in the first half of 2006, a third of the global total.

The rapid pace of growth has put pressure on existing infrastructure, strained electricity capacity and led to increased air pollution. Reports suggest that electricity generation in the UAE will rise by 60% by 2010. This has led to

a need for clean energy and more general clean technologies within Middle Eastern countries. Even Iran is planning for 1% of its power generation to be from renewable resources over the next four years.

Given energy constraints, not just domestically but among the oil exporters' customers, an increase in demand for clean energy makes sense to Mr Salty. "If you do not use the energy resources you have, you can sell them. This means that as demand for energy grows, particularly in Asia, it is in the Middle East's interests to ensure that market development is stable. Investing in clean technology, both domestically and abroad, is one way of doing that."

The quest for economic diversification has led to a thirst for foreign investment from Middle Eastern countries, and one avenue for this that governments have identified is the Clean Development Mechanism of the Kyoto Protocol. Last September, Saudi Arabia held the world's first CDM conference, signalling the kingdom's interest in attracting CDM investment. The conference heard that only Morocco, Tunisia and Egypt in the Arab world have CDM-registered projects but that the region's characteristics mean there are many opportunities to be exploited. Another bonus of the CDM regime is that, with its inherent public benefit, it appears to be compliant with Islamic finance laws. This will make it easier to raise funds regionally.

Sultan Ahmed Al Jaber, CEO of Abu Dhabi Future Energy Company (ADFEC), says, "We are very well-placed to lead in clean tech. We have abundant sunshine, making solar power an obvious investment, we are at the forefront of water technologies because 99% of our water supply is desalinated and we have a large-scale resource for CO2 sequestration in the form of empty

and partially empty oil wells."

In April last year, ADFEC set up the Masdar initiative, which aims to develop Abu Dhabi's role and market share in future international renewable energy projects and position it as a developer of new energy technologies. The initiative includes an innovation centre to support the demonstration, commercialisation and adoption of sustainable energy technologies, a university offering specialist graduate programmes in renewable energy and sustainability, a development company focused on emissions reduction and CDM solutions and a Special Economic Zone for companies that will invest in development of renewable energy technologies and manufacture of products. It also established a USD 100m clean technology fund to co-invest with private sector partners in domestic and foreign companies focused on emerging technologies.

Abu Dhabi is not alone in attempting to attract technology research to the region – Bahrain is to launch a USD 1bn science and technology park that will target the clean energy industry among others. Bahrain is also focusing on district cooling using seawater and other non-drinking water sources, which could reduce Bahrain's peak power demand by 400MW by 2020. Property investors in the region are also starting to focus on energy efficiency measures, in the light of the combination of the property boom and high energy prices.

There is a growing concern for the environment among business and government leaders in the Middle East, says Mr Salty. "It is a fairly recent development – it is partly about measuring up to international benchmarks and partly as a result of population growth in the region – people see the impact of development immediately."

CO2 sequestration represents

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another opportunity. It has the dual benefit of reducing carbon emissions and improving the capacity of oil wells being used for enhanced oil recovery (EOR). Currently, natural gas is used for EOR, but if the CO<sub>2</sub> is stripped out of natural gas and sequestered, the remaining hydrogen can be used as a fuel.

In addition, Mr Salty believes that proprietary technologies for controlling

leaks and reducing flaring developed by the region's oil companies could be transferable to carbon capture. "Companies such as Saudi Aramco are pretty sophisticated in terms of carbon capture and flare-up technology. The national oil companies will no doubt be looking for commercial outlets for their technologies."

Recent returns on clean energy investments, the advent of CDM and the

pressure for increased infrastructure investments owing to rapid population growth and the quickening pace of economic development, have created a favourable climate for clean energy investment. "Some savvy investors from the region have already invested in clean energy," says Mr Salty. "Middle Eastern investors will likely be some of the biggest players in the clean technology sector globally."

TABLE 1: SELECTED RENEWABLE ENERGY PROJECTS IN THE MIDDLE EAST

PROJECT NAME	COUNTRY	SECTOR	CAPACITY (MW)	TOTAL VALUE (USD M)	DEVELOPERS	STATUS	DESCRIPTION
Solar Power Plant 1	Algeria	Solar	25	N.D	Abner Energia, New Energy Algeria	Financing secured	A 25.0MW solar thermal plant combined with a 130MW combined cycle gas power plant
Kureimat Solar Plant	Egypt	Solar	30	N.D	Egypt's Ministry of Electricity and Energy	Permitted	Total capacity, including a CCGT element, will be 151MW
Zafarana Wind Power Project	Egypt	Wind	120	N.D	Egypt New and Renewable Energy Agency	Financing secured	Is expected to be commissioned in 2007
Yazd Solar Plant	Iran	Solar	N.D	N.D	Government of Iran	Announced	Initial reports surfaced in early 2005. Subsequent lack of information suggests the project has not progressed
Ain Beni Mathar Gas/Solar Plant	Morocco	Solar	30	N.D	Moroccan National Electricity Office	Financing secured	Solar plant will form part of a larger gas-fuelled power station
Essaouira Wind Farm	Morocco	Wind	60	82.5	Moroccan National Electricity Office	Financing secured	Will be grid-connected and has applied for CDM status
Lafarge Tetuoan Wind Farm	Morocco	Wind	10.2	N.D	Lafarge Ciments	Partially commissioned	Located at the Lafarge cement factory. Has requested registration as a CDM project
Parc Eoilen de Tangiers	Morocco	Wind	140	97.4	Moroccan National Electricity Office	Financing secured	Is expected to be commissioned in 2007
Touahar Wind Farm	Morocco	Wind	70	N.D	Iberdrola and Moroccan National Electricity Office	Announced/ planning begun	Part a larger collaborative effort by the two companies
D1 Oils Arabia Biofuel Refinery	Saudi Arabia	Biofuels	N.D	N.D	D1 Oils	Announced/ planning begun	Plant will produce biodiesel from jatropha
Sidi Daoud Wind Farm	Tunisia	Wind	19.3	15.6	Tunisia Electricity and Gas Company	Commissioned	Began operations in 2002
Tunisia STEG Wind Farm	Tunisia	Wind	100	105	Tunisia Electricity and Gas Company	Announced/ planning begun	Global Environment Facility has offered a USD 10.5m funding initiative

ANALYSIS

Source: New Energy Finance

