World Future Energy Summit

Oil-rich Abu Dhabi centre of green energy

by Alex Forbes

If the Bali climate change talks were about why humankind needs to get greenhouse gas emissions under control, January's World Future Energy Summit in the United Arab Emirates was about how to do this. What emerged is that sustainable energy is fast becoming a big – self-sustaining – business, attracting top talent and tens of billions of dollars.

While the European Commission was launching its proposals to establish political leadership of climate change mitigation in Brussels on 23 January, 5,000 kilometres away – in the desert emirate of Abu Dhabi – internationally-renowned architect Lord Norman Foster was setting out his firm's vision for the world's first 'zero-carbon, zero-waste' city.

Lord Foster's presentation was the inspiring culmination of a remarkable three-day event called the World Future Energy Summit (WFES). Coming hard on the heels of the climate change talks in Bali in December, the summit was not just a reminder of how urgent the need for action has become, it also demonstrated how fast interest in the business of sustainable energy is growing. Particularly notable was the interest of major banks, with Credit Suisse, Standard Chartered Bank and Merrill Lynch amongst the event's main sponsors.

Several of the speakers referred to a report published a couple of weeks before by London-based analysts New Energy Finance, indicating that in 2007 investment in sustainable energy solutions broke through the $100 billion barrier for the first time. The amount of new money invested in the clean energy sector grew to $117.2 billion, up 41% from 2006.

If the business of sustainable energy can sustain a rate of growth on this scale, how long before what we now call "alternative" should instead be regarded as "mainstream"?

Shane Bush, who heads the renewable energy business at Standard Chartered, was in no doubt. He told EER that after seven years of annual growth of more than 20%, the renewables industry had reached a 'tipping point' – to the extent that it had become a 'mainstream and self-sustaining industry'. Key factors, he said, were the twin drivers of climate change and energy security, emphasizing that concerns about security of energy supply were becoming as important a driver of investment in renewable energy as worries over climate change.

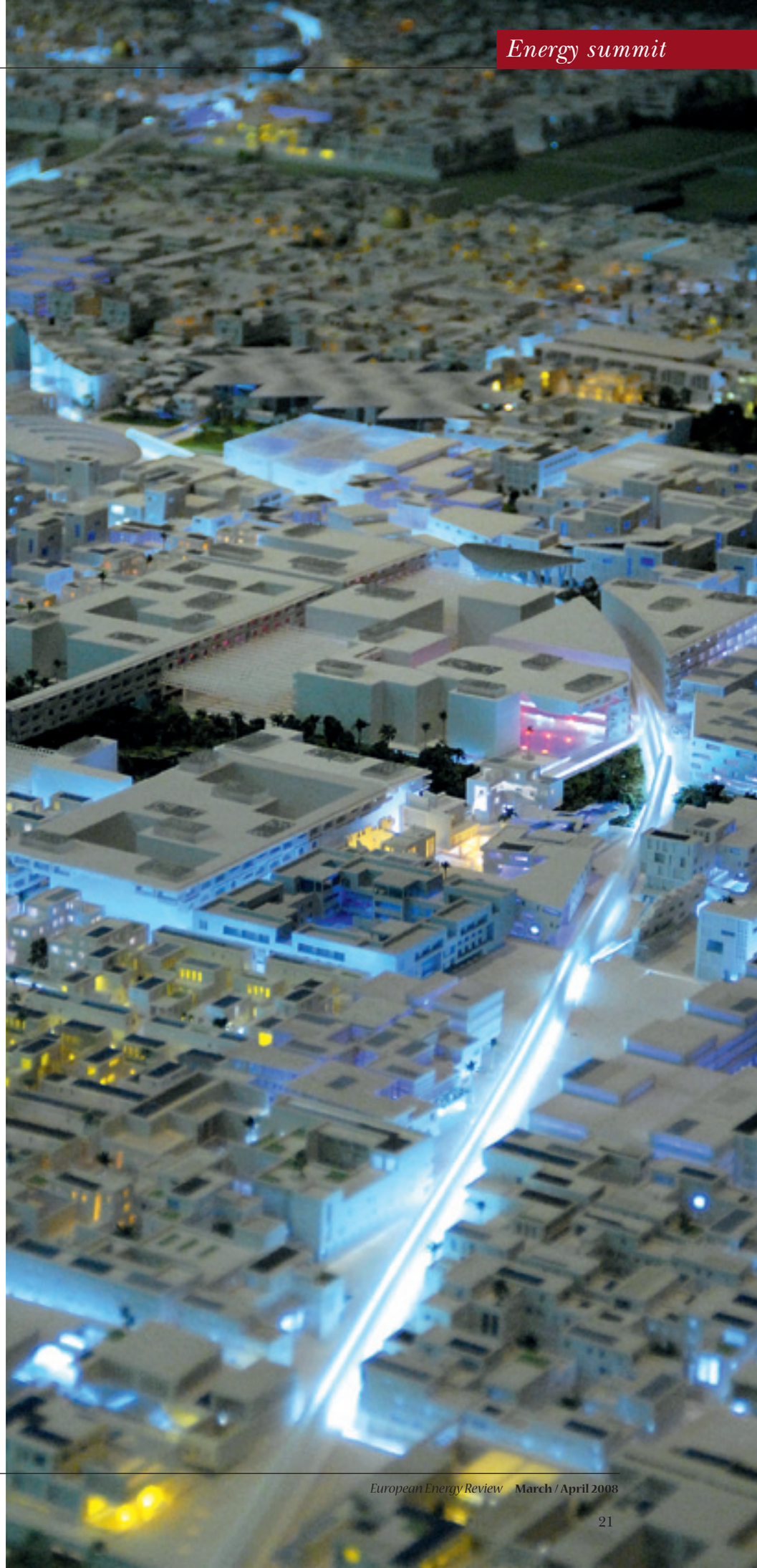
For example, said Bush, South Korea – a nation overwhelmingly dependent on imported energy – recently completed the world's largest solar photovoltaic power generation project. The 20 Megawatt utility-scale scheme is just one of four landmark renewables projects that Bush and his team have been involved in over the past 18 months.

Standard Chartered is one of the few banks to have established a dedicated renewables team. Over the past three years, Bush and his award-winning team have been involved in advizing and arranging finance for renewables projects worth more than $5 billion.

Inspired by that success, senior managers at the bank recently made a pledge to take a leading role in the financing of renewable and clean energy projects worth $8-10 billion in the bank's core areas – Asia, Africa and the Middle East – as part of the Clinton Global Initiative.

World leader

As if to underline the amount of new money pouring into the sector, the WFES summit began with an announcement by the Crown Prince of Abu Dhabi, HH Sheikh Mohammed bin Zayed Al Nahyan, that the government had pledged a further $15 billion of investment in sustainable energy development – as part of its aspiration to become a world leader in 'future energy' technologies and strategies. The new money is on top of the $250 million already invested in a clean technology fund by the government and its private-sector partners.



Model of Masdar City, a proposed zero-carbon, zero-waste car-free city of 50,000 in Abu Dhabi. Photo: Alex Forbes

In what is claimed to be the world's largest single government commitment to development of sustainable energy technology, the $15 billion will be channelled into a range of investments, projects and education initiatives through the government's Masdar initiative, a company established in April 2006 to explore, develop and commercialize future energy sources.

It is Masdar – which in Arabic means 'the source' – that hired Lord Foster to master-plan its proposed zero-carbon, zero-waste city, the centrepiece of a large and growing portfolio of clean energy projects. The city of 50,000 inhabitants, to be constructed near Abu Dhabi airport, will serve as a testing ground for new concepts in the way that people, buildings and city infrastructure interact with each other.

The WFES summit was remarkable on several levels. The opening on the first day had to be delayed by an hour while more chairs were brought into the conference hall to accommodate what the organizers described as 'overwhelming' attendance – and even then it was standing room only for some of the 3,000 delegates.
A virtual appearance by the UK's HRH Prince Charles, in the form of a holographic video, had some at the back of the hall believing he was really on stage, until he closed by paraphrasing Shakespeare's Tempest: 'I propose to wish you every success for your discussions, to vanish into thin air – and leave not a carbon footprint behind.'

Masdar hired Lord Norman Foster to masterplan its proposed clean city. Photo: Alex Forbes

Sultan Al Jaber, ceo of Masdar. Photo: Alex Forbes

This he then did, but not before delivering a serious message: 'Scientists are now saying that the problem of climate change is so grave and so urgent that we have less than 10 years to slow, stop and, indeed, reverse greenhouse gas emissions. That is why common actions in each and every country are urgently required to protect the common inheritance that has been given to us by our creator.'

Prince Charles was followed by his brother the Duke of York, who, attending the event in person, did not mince his words: 'It is quite clear from all the evidence that we as a species are having an effect on our planetary system. We did not intend for this to happen, that is absolutely certain, but we have had and are having the effect of changing vital systems that have regulated our planet's health for millions of years which has enabled our species to become the dominant one. We are at a crossroads of evolution; we fail to confront these issues, and – as a plain, simple fact – our species will become extinct.'

These were strong words from someone who was attending the summit in his role as the UK's Special Representative for International Trade and Investment.

> *What we are really talking about is reducing the world's energy insecurity*

What was most remarkable about the summit, however, was the diversity of speakers that it attracted. It is not so long ago that speakers from the international oil and gas companies at major energy conferences were at times interrupted by NGO protestors who would suddenly appear dangling from the ceiling, shouting slogans and unfurling banners. In stark contrast, at the WFES event, leading executives from international oil and gas companies, such as BP's Vivienne Cox, Shell's Graeme Sweeney and Total's Philippe Boisseau, appeared on the same stage as leading figures from environmental NGOs, such as Jonathon Porritt of Forum for the Future and the International Executive Director of Greenpeace, Dr Gerd Leipold.

Up on the stage with Porritt, Cox and Sweeney was the US Energy Secretary Samuel Bodman. He had earlier reminded delegates that, according to the latest World Energy Outlook from the International Agency, more than $22 trillion of new investment would be needed to meet extra global demand for energy between now and 2030. He continued: 'If we are to encourage economic growth around the world, if we are to raise living standards for all people and all nations, if we are to improve our environmental health, the world needs clean, affordable, diverse energy supplies, as well as new suppliers and supply routes. This set of global challenges demands responsible action, both from consuming nations and producing nations. I don't want to sound too alarmist but what we are really talking about is reducing the world's energy insecurity. That, in my judgement, is the crux of the issue.'

He added: 'I challenge governments around the world to make a public commitment to increase investment in the research and development necessary to achieve the technical breakthroughs that we need, as well as the right balance between energy security and environmental stewardship. The Masdar initiative provides a ready example of just what I mean.' He also stressed that: 'The growing use of alternative energy should not be viewed as a threat to any oil-producing nation.'

Bullish

Another highlight of the summit was the announcement by Vivienne Cox, who heads BP Alternative Energy, that Hydrogen Energy, BP's joint venture with Rio Tinto, had begun work on a $45 million front-end engineering and design (FEED) for a low-carbon, industrial-scale, hydrogen-based electricity generation project to be located in Abu Dhabi. A decision is expected early next year, which, if positive, would lead to the 420 MW plant coming on stream in 2012.

Cox said the $2 billion plant – yet another project in which Masdar is involved – would use natural gas as a feedstock and that the carbon dioxide produced would be made available for re-injection for enhanced oil recovery (EOR). A significant benefit would be that the captured CO_2 could replace some of the natural gas currently used for EOR, freeing it up for the local market.

'The project would avoid around 1.7 million tonnes of emissions a year,' she said. 'That is equivalent to eliminating the carbon dioxide emissions from all of Abu Dhabi's cars.'

Looking ahead, Cox was particularly bullish about the prospects for the growth of renewable/alternative energies: 'At BP alternative energy we're trying to develop a suite of new energies inside a traditional international oil company. We brought BP's renewables businesses together two years ago because it has become clear that now is the time to build a sustainable energy industry alongside our traditional oil and gas businesses.'

Cox stressed that the hydrogen power project showed that a sustainable world did not have to be a world without hydrocarbons. 'In fact,' she said, 'any scenario for future energy use shows that

we need a blend of renewable energy and hydrocarbons. The crucial question is what the mix will be. Already wind-power is growing at around 30%/year. Solar photovoltaics at up to 50%/year. Biofuels at up to 20%/year. Around $100 billion was invested in sustainable energy last year. And over 50 countries have adopted targets for future shares of renewable energy.'

Some of the most inspirational aspects of the event were the contributions from internationally renowned architects and design 'visionaries', such as Lord Norman Foster and William McDonough. The latter presented a vision of a building that 'can do everything a tree can do except replicate – a building that receives its energy from the sun, that grows food, that builds soil, that provides a habitat for hundreds of species, that changes colours with the seasons, that creates micro-climates, that would purify water.'

Rivalry

There were some who were sceptical about Abu Dhabi's motives for wanting to establish leadership in sustainable energy technologies.

In the aftermath of the event, one Canadian journalist wrote: 'Should the country that currently has one of the largest carbon footprints on a per capita basis of any nation on the planet now be recognized as an environmental leader?'

Other commentators have suggested that Abu Dhabi's Masdar initiative was partly prompted by rivalry with nearby Qatar, which has an immensely successful programme of natural gas development. Or, indeed, rivalry with neighbouring emirate Dubai, whose construction boom has to be seen to be believed.

During the summit, Masdar's ceo, Dr Sultan Al Jaber, said: 'Masdar signals Abu Dhabi's intention to build upon its energy expertise and become the leading source of the world's future energy solutions. It is also an important example of Abu Dhabi's long-term strategy to secure its future by investing resources domestically.'

There were many people who commented on the strangeness of a World Future Energy Summit being held in an emirate that is one of the world's biggest producers of oil and gas. But that is no stranger than an international oil company like BP deciding to develop an alternative energy business.

As one participant commented to EER: 'What better place to hold such an event? And what better way to spend the proceeds of oil and gas windfalls?' ■

Abu Dhabi highlight: Lord Browne on renewables

'Navigating a world of shifting sands'

If you had to pick a person that exemplifies the fundamental changes under way in the energy industry, a good choice would be Lord John Browne.

Formerly the group chief executive of BP, then the second-largest oil and gas company in the world, he is now managing director for alternative and renewable energy at Riverstone Holdings, a private equity company that specializes in what it describes as the 'energy and power industry'.

Admittedly, the timing of Browne's departure from BP was not entirely of his own choosing, but even while he was its chief executive he had begun to steer the company in new directions that included renewable and other sustainable energy technologies. It was because of Browne that BP became the first major oil and gas company to acknowledge the likelihood that global warming was being caused by the burning of fossil fuels. The famous 'Beyond Petroleum' campaign of 2000 may have seemed a little over-the-top at the time, but his vision that "big oil" needed to start investing in alternative energies was not obvious to all back then.

Little wonder, then, that delegates at the recent World Future Energy Summit in Abu Dhabi listened avidly to his keynote presentation. On the opening morning of the conference, Browne set out what, in his view, energy companies needed to do to navigate their way through the uncertainties currently swirling around the industry.

'During the 40 years that I've spent in the energy business,' he said, 'I have lived through at least four periods of change and uncertainty, when the rules of the game shifted. The first was the rise of Opec in the 1970s. Those of us in the 'seven sisters' had no choice but to pack our bags and to go home. The second was the surge of oil from Alaska and the North Sea in the 1980s – an era of abundant supplies from multiple sources. The third was the fall of the Berlin Wall and the widespread use of high-speed computing – geopolitics and technology opening up new areas to explore. And the fourth is the current period – another period of dramatic change, probably the most significant I've seen in my career so far.'

Trends

'I'm struck by the degree of uncertainty and complexity surrounding us at present. I'm also struck by the number of new actors now appearing on the energy stage', Browne went on. 'We are in a world of shifting sands. And in such a world,

energy businesses need principles – fixed points which will help us to navigate.'

Browne outlined four trends that have come together to define the current era:

- High fossil-fuel prices have been caused by the coincidence of strong demand and supply-side factors that include the 'dramatic increase' in oil and gas production costs.
- Concern over security of supply has been growing. 'Fears about short-term supply disruptions and so-called Peak Oil are exaggerated,' he said, 'but oil and gas resource concentration is real and is leading many countries to diversify energy supplies and promote domestic energy sources.'
- 'Scientific evidence that climate change is occurring and that it will have dramatic impacts if nothing is done to mitigate greenhouse gas emissions has become increasingly convincing.'
- Because of high prices, energy insecurity and environmental concerns, society is increasingly demanding energy that is sourced and delivered differently, leading to technology innovation. 'The brightest and the best – from biology, physics and engineering – are turning their attention to doing just that,' said Browne. 'As a result, global investment in renewable and alternative energy now stands at more than $100 billion per year.'

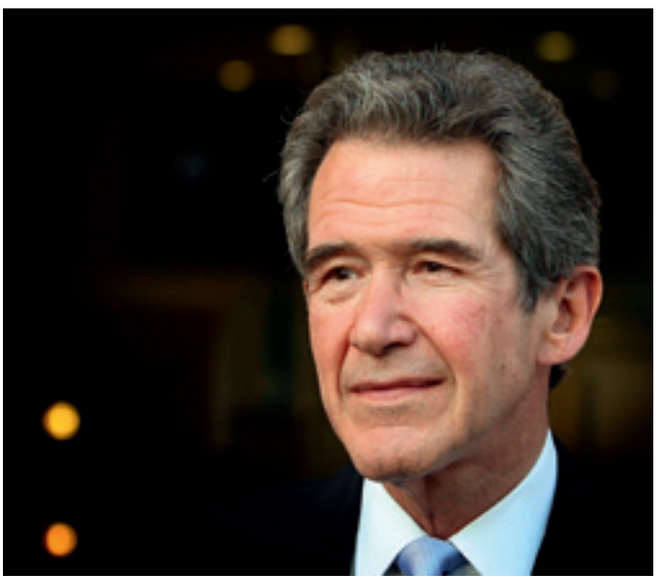
Given this backdrop, he asked, how should energy businesses plan for the future?

'At this stage in the development of the energy sector,' he continued, 'it is not possible to predict with confidence the specific outcomes that will prevail. But even if the destination is uncertain, I believe we can make progress by following certain principles.'

His first principle was to maintain flexibility – the ability to adapt and respond quickly to change. 'Flexibility is about maintaining a portfolio of options and knowing which to scale up and which to shut down – and when,' he said. 'The need for flexibility is particularly apparent in the market for renewable and alternative energy, where a broad suite of options exists.'

> *'In ten years time we will see several carbon billionaires'*

His second principle was that energy companies, governments, scientists and NGOs needed to work in 'collaborative networks'. 'Energy businesses,' he said, 'are increasingly coming into contact with some of the world's most challenging issues: climate change, poverty, human rights, and the depletion of natural resources. Progressive companies have realized two things: first, they cannot ignore such issues: and second, they cannot respond alone. They do not have the expertise, the contacts or the credentials. And so over the last two decades we have seen a remarkable growth in cooperation between energy companies, governments, scientists and NGOs to confront some of these issues.'



Former BP ceo Lord Browne. Photo: Peter Macdiarmid/Getty Images

Browne's third principle was energy efficiency. 'Efficiency's central role in our energy future is the only really certain bet we can make. It sits at the intersection of all the trends I've talked about. It reduces costs. It allays insecurity. It addresses climate change. And it flows from technology innovation. Changing consumer behaviour will be critical – and I believe governments need to do much more in this regard.'

Browne's fourth and final principle he described as 'making carbon mainstream'. 'It is now virtually certain that carbon will become a core economic concern for all businesses in the coming years,' he said, 'and, increasingly, a basis on which management performance – across all sectors – will be judged. There is now the prospect of a global agreement to succeed the Kyoto Treaty by 2009, with strengthened carbon measures likely to take centre stage. The journey will not be linear. Equity considerations mean the emergence of a global carbon price will be a highly political process – leading to uncertainty that must be managed.'

Browne noted that the emergence of a carbon price represents as much of a business opportunity as it does a threat. 'I predict that in ten years time we will see several carbon billionaires. And we will see renewable and alternative energy "majors" in the Fortune 500. As always,' he said, 'the biggest opportunities will be in those sectors and sub-sectors that experience the greatest rate of growth. And where these lie will depend on the dynamics of the trends I have spoken about. The challenge is that how the trends will develop, and how they will inter-relate to one another, remains uncertain.' ■