

The opportunity for the Gulf's financial sector

Financing the Future of Energy

2016
Update



What is the report's purpose?

The report provides an overview of trends in the global renewable energy sector between the start of 2015 and March 2016, with a particular focus on the Gulf and the wider Middle East and North Africa (MENA) region. It is intended as an update to the *Financing the Future of Energy* report, which was published in March 2015. It presents the most significant actions taken to support sustainable energy over the past 12 months, and the most recently stated targets that will shape activity over the decade to come. The report assesses which technologies show the greatest potential for future development and deployment, and what needs to happen to stimulate further action on clean energy in the region.

What is its scope?

The report sets out the global evidence on the future of clean energy within a Gulf region context. The intention is to provide the evidence base from which the financial services sector can consider their approach to providing products and services which will support the growth of the low-carbon economy. The opportunity now is for financial services organisations to understand the evidence, explore the new structures that might be required, engage the relevant governments and, ultimately, convert the trends into bankable solutions.

What geographies does it cover?

The report is primarily focused on the Gulf region, specifically, Kingdom of Bahrain, Kuwait, Sultanate of Oman, Qatar, Kingdom of Saudi Arabia and United Arab Emirates (UAE). We have tried to use this definition of 'the GCC region' throughout the report. However, there are cases where the data we use is relevant but does not divide the region in quite this way (such as data on the Middle East more broadly), and we have indicated this where it occurs. To help contextualise the challenges and opportunities in the GCC, the report also looks at the wider MENA region, the high-growth West-East Corridor stretching from West Africa to East Asia, and selected mature markets such as the USA and the EU.

Who is it for?

The report is intended principally for the finance community in the Gulf region. It provides insights into how that community might engage with public and private sector stakeholders to create a more energy efficient economy, turning the aspirations of the region for sustainability – for example the UAE's Clean Energy Strategy and the various targets announced at COP21 – into a reality that will attract the attention of the rest of the world and unlock significant financial opportunities. The report will also be of interest to the energy sector and government partners more widely in the region and in the West-East Corridor.

What methodology was used?

Two forms of evidence were used in this report. Firstly, the report draws on global analyses from energy expert bodies and academic studies to present the core trends and contexts of supply and demand behind the changing nature of global and regional energy systems. Secondly, the arguments presented in the report draw on evidence and insight collected by NBAD and collaborating partners in the course of their commercial activities in this space.

Who are the authors?

The underlying research and writing of the report was carried out by NBAD in association with the Brunswick Group. Further perspectives and evidence have been contributed by the University of Cambridge Science and Policy Consulting in the UK, and PwC's Sustainability and Renewables team based in Abu Dhabi, UAE.

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Renewable Energy Highlights of 2015

Global overview

500 asset managers responsible for \$3.4 trillion have commitments to cut carbon intensive holdings

Between 2020 and 2035 renewables predicted to grow at the same rate as oil at start of 20th century

30% more wind and solar power installed worldwide in 2015 vs. 2014

Renewables will be largest single source of electricity growth to 2020

China quadrupled renewable targets in 2015

Since February 2015 India announced renewable energy deals worth \$100 billion

Non-OECD nations overtook OECD on clean energy investment for first time in 2015

53 corporates switching to 100% renewables will create 90TWh of demand

MENA region overview

Middle East crude oil and petroleum consumption grew 4x faster than world average in 2015

Dubai commenced its tender for 800MW solar park in 2015

400MW of solar projects auctioned in Jordan in 2015

Siemens delivering 600 wind turbines to 12 wind farms in Egypt

Future opportunities

Revenues from utility-scale storage expected to grow from \$231 million in 2016 to \$3.6 billion by 2025

Market for off-grid power systems expected to grow 20x by 2024

Investment in efficient buildings expected to grow to \$125 billion by 2020

40% of emissions reduction to get to 2C could come from energy efficiency

Foreword: Financing the Future of Energy



Alex Thursby
Group Chief Executive, NBAD



The energy system of the future will not be the same as the energy system of the past. A major shift is underway, and traditional energy and renewables will work together in a much more integrated mix.

At NBAD, we wanted to better understand the role the financial services sector can play in the energy transition in our part of the world. So last year we commissioned a report on the future of energy with three world-class institutions: the University of Cambridge, PwC, and Masdar.

The report highlighted the enormous gap that is opening up between available supply and rapidly rising demand for energy globally. In the Gulf we experience that challenge acutely, with energy demand growing at three times the global average. Rapid industrialisation and urbanisation is in turn driving almost insatiable demand for energy right across the West-East Corridor – the super-region stretching from West Africa to East Asia that will drive global growth. These countries are looking for ways to break out of the pattern of traditional energy and find new, cleaner and more sustainable energy solutions.

As the West-East Corridor develops its energy infrastructure to cope with future demand, it has the opportunity to build in the role of renewables from the outset: leapfrogging richer nations in the process.

A key plank of the argument in last year's report was the scale of the funding required to feed global energy demand: \$48 trillion dollars of investment in the next 20 years. This goes far beyond the means of government spending alone. That's why we're convinced that the energy mix of the future offers excellent opportunities for the banking sector for the long term.

But today the question on everybody's mind is: will the low oil price stall the growth of renewables? We don't believe so. First and foremost, renewables are used mostly in power generation, and oil in transportation. And the underlying drivers towards renewables and low-carbon energy are long term, as Professor Douglas Crawford-Brown from the University of Cambridge outlines in his foreword to this report. The looming gap between supply and demand needs to be filled, and nations around the world are committed to decarbonising their economies and diversifying their energy supplies. These trends are here to stay.

So what are the forces that can move the renewables industry forward? Consumers' demand is shifting, with an emerging preference for clean energy. And governments are pushing harder – just look at COP21 and nations around the world raising their ambitions to decarbonise their economies. Subsidies for fossil fuels in the Middle East will go, which will level the playing field and boost the role of renewable technologies. Over the past year there

have been signs of that beginning to happen. We will see energy businesses innovate as technology advances come through, which will drive costs down further. That will support the commercial viability of renewables in the face of any immediate challenge from the new normal of low oil prices. In this context new technologies can disrupt the dynamics of the whole industry: and it can happen suddenly, as we have seen with solar. Looking ahead, advances in battery storage could prove to be a particular game-changer.

Since we published the report last year, we have seen further evidence confirming that renewables and sustainable energy are an increasingly established part of the new integrated mix. Progress is being made all the time all around the world. This update gives an overview of the most significant developments on sustainable energy in the past 12 months: it captures an encouraging picture of action being taken and ambitions being expanded.

But there's more to do in the Middle East. Its past, present and future is inextricably bound up with the global energy story. That's why, as the leading bank in this region, we want to show leadership on the future of energy. In the past year we have created a new Sustainable Business team, become the first bank in the region to sign up to the Equator Principles, and made a significant financing commitment: \$10 billion for environmentally sustainable activities over 10 years. We're delighted to lend our voice to this subject, and we hope this latest report will be a valuable contribution to the discussion on how we can work together to help this region rise to its energy challenge.

Foreword: Growing Client Demand for Sustainable Financing



Mark Yassin

Senior Managing Director – Head of Global Banking and Co-Head of Global Wholesale Banking



As the world changes, NBAD's core clients are also changing. Ten years ago – or even five years ago – I very much doubt whether we had more than a handful of clients engaged in sustainable business practices in power generation.

Today, however, we have a large universe of clients who are active in the sector and who require their financial institutions to embrace and understand the dynamics of the fast-growing renewables industry.

Many of the international oil majors, state-owned national oil companies, state utilities, and most of the big power developers now have renewable energy arms, operated directly or indirectly by them.

We also see renewable-specific developers, engineering procurement and construction contractors, technology providers, component suppliers, a whole host of private equity players, as well as institutional capital flowing into the region: all buoyed by the significant opportunities offered by the renewable sector.

The financial community has the opportunity to respond to this client demand in a coordinated manner to support the roll-out of the industry over the next decades.

At NBAD, we wanted to develop an institutional response to these forces and have taken our first definitive steps along this path. We have created a Sustainable Business team, which is dedicated to identifying and supporting these burgeoning commercial opportunities. In January 2016 we announced a commitment to provide \$10 billion over the next 10 years into lending, investing and facilitating activities which are focused on finding new and sustainable environmental solutions as a statement of strategic intent as well as a clear direction of travel for the bank. We are working now on a green bond proposition, both for our own use and to meet the needs of our corporate clients.

It may not be easy, it will involve innovation, and of course it is likely to require a change in the way we do business. We are at the beginning of our journey – and we are looking forward to finding new ways to meet our clients' emerging needs, and to working across sectors to help governments in this region achieve the scale of their ambitions to seize the renewable energy opportunity.

Perspective: Low Oil Price No Barrier to Renewables



Prof Douglas Crawford-Brown
University of Cambridge and Cambridge
Science and Policy Consulting



In early 2015, I and colleagues at the University of Cambridge, PwC and NBAD developed the *Financing the Future of Energy* report. Since then NBAD has pledged to “lend, invest and facilitate” \$10 billion of financing for sustainable energy projects, showing the power of the financial community to bring about change at real scale. They have become a living laboratory for sustainability through their Sustainable Business team, and their commitment has put Abu Dhabi and the UAE more generally ‘onto the map’ of nations showing the way forward to the world of 2050.

The challenge now is for the business community to take up the NBAD offer of financial support for sustainable projects and operations. This offer would seem at first glance to be in danger due to the rapid drop in the global price of oil over the past year.

If energy becomes cheap, what is the incentive for a business to reduce that energy use or switch to renewables? I can think of four answers to this question:

- While the price of oil in the barrel is important, much of the cost of using it as fuel is in the processing and distribution system. Those costs don’t change as the price of crude changes. Therefore, the more than twofold decline in cost of crude results in only a 10-15% drop in the overall costs of using oil. That has not been large enough to influence investment decisions away from renewables.
- The movement to renewables is not driven solely – or even largely – by comparative costs of different ways to produce energy. Economists think the issue is one solely of costs to the consumer, but they are consistently wrong in their projections of technology change. Instead, investment in renewables is driven by concerns over energy security, or looming carbon reduction targets, or the desire to provide off-grid solutions so poorer nations do not need to invest in costly transmission systems.
- Energy investment is carried out as much by transformers as optimisers. There are two broad kinds of decision-maker in the world. The first is an optimiser, who will select the technology that has the best cost. For that person, the decline in oil prices will indeed influence the relative merits of oil versus renewables. The other is a transformer, who seeks to use their investments to transform

business practices and the energy industry. For that person, the recent decline in oil price is of less interest because they are not looking solely at the market today but where they want – and expect – the market to be in the future.

- Finally, oil is not a complete substitute for renewables. Renewables tend to be for power production while oil tends to be used for transport. In fact, oil is an expensive and dirty way to produce electricity. Its days are numbered. Renewables are not yet able to be a substitute for oil in transport, at least until there is significant penetration of electric vehicles into the market. However even that market is not responding to the price decline, because much of the change to such vehicles is driven by concern over air pollution in the megacities of the world, and a decline in the price of oil does nothing but increase this pollution.

This new report from NBAD expands on the ideas and evidence of *Financing the Future of Energy*, and plots a critical path forward to turning these ideas into action. I urge you to read the report and then to join NBAD in helping to bring about the transformation to a more sustainable world. The decision to move in the same direction need not rest on a desire to ‘save the planet’: it can rest on sound business practices that ensure you remain viable as the landscape of energy, resources and environment shift over the coming decades.

Global Consensus

“COP21 is not a finish line, but a new starting point”

Xi Jinping, President of China

“This could be the framework the world needs to solve the climate crisis. It creates the mechanism for us to continually tackle the problem in an effective way”

Barack Obama, President of the USA

“The Paris Agreement confirms the irreversible transition to a lower carbon world”

Christina Figueres, Executive Secretary UNFCCC

The international community is increasingly concerned about the impacts of climate change on both the environment and the global economy, and united on the urgency of reducing emissions.

COP21 established global consensus on the long-term direction of travel towards decarbonisation, with 196 nations resolving to hold warming to a maximum of 2C. The agreement aims to guide an orderly transition to lower carbon economies in order to avoid economic turmoil. Although the pledges are not legally binding, the inclusion of a more ambitious 1.5C target and a ‘ratchet mechanism’ to increase action over time indicates the strength of intent.

The agreement has weight as the first to be jointly ratified by the USA, the EU-28, India and China, which together account for 61% of global emissions¹. Achieving the 2C target relies on nations first implementing and then extending their pledges, but influential actors across the developed and developing world have led the way by setting themselves ambitious targets as a first step.

There is also provision for richer nations to help poorer nations through finance and technology transfers. Less developed countries’ pledges are contingent upon significant support, and the agreement has established international mechanisms to ensure this happens. These include the Financing for Development framework agreed as part of the UN’s July 2015 Addis Ababa Action Agenda, which calls on signatories to align private sector investment incentives with public goals.

The other major moment of international consensus during 2015 was the Sustainable Development Goals (SDGs), which focus on development outcomes and were ratified by more than 150 world leaders. The programme replaces the original Millennium Development Goals, which lifted one billion people out of extreme poverty over the past 15 years. The SDGs identify the global energy transition as integral to achieving the next phase of poverty alleviation, and Goal 7 commits to ensuring access to ‘affordable, reliable and sustainable modern energy for all’.

China

Peak emissions by 2030; increase non-fossil fuels in primary energy consumption to 20%.

India

Reduce carbon intensity by 33-35% by 2030.

USA

Reduce emissions by 26-28% by 2025.

“Climate change and its risks are going mainstream... It has arrived as an investment issue.”

Blackrock

The global business community has also signalled a clear commitment to clean energy in the past year.

Progress has been driven from both the supply and demand sides: with a powerful combination of international commercial and institutional capital to finance new capacity, and corporate schemes to take advantage of it by powering their operations with renewables.

Asset Management Institutions

In October 2015 Blackrock – the world’s largest asset manager with \$4.5 trillion under management – published a report entitled ‘The Price of Climate Change’, which concluded that: “Climate change and its risks are going mainstream... It has arrived as an investment issue.”

100 institutions responsible for a further \$4 trillion used COP21 as a milestone to assert their commitment to energy efficiency: acknowledging that “the financial sector is uniquely placed to channel finance to promote efficiency”, and committing to “scaling up energy efficiency financing”.

Institutional investors have also begun to reduce their exposure to fossil fuels: 500 institutions managing more than \$3.4 trillion now have commitments to avoid or cut carbon intensive holdings, a significant jump from 181 institutions a year ago.² In 2015, Norway’s sovereign wealth fund – the world’s largest at \$824 billion³ – decided to ban investments in companies with a greater than 30% stake in coal-based activities.

Banking

Global banks and financial services providers have announced significant future financing commitments. In November 2015, Goldman Sachs expanded its environmental finance targets from \$40 billion to \$150 billion by 2021. Citi Group met its \$50 billion target for investments into environmental solutions earlier than anticipated, and pledged an additional \$100 billion over 10 years in February 2015. Santander joined forces with two Canadian pension funds to launch Cubico Sustainable Investments, a \$2 billion global renewable energy and water fund.

GE has also redoubled its commitment to environmental funding. The company announced plans in 2015 to dispose of 80% of its capital division. Yet it retained and expanded its Energy Finance arm, a move which EY described as a “strong signal that GE expects clean energy to become a more significant part of its portfolio”.⁴

Corporates

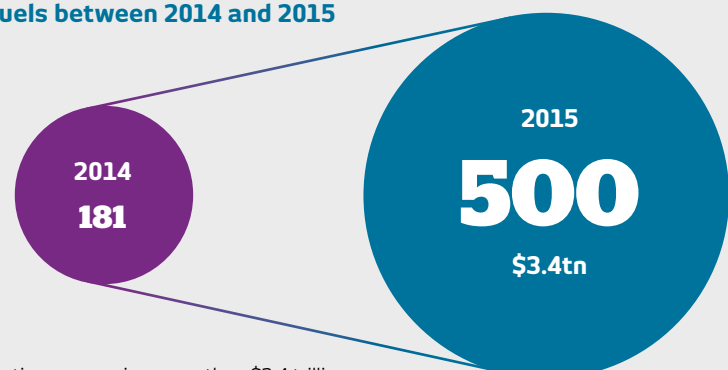
Mobilising global finance to invest in new installed capacity is one side of the equation: the other is establishing long-term market demand for low-carbon energy at scale.

The 53 multinational corporations who have committed to the Go 100% Renewable movement will create 90TWh of demand between them.⁵ During 2015, corporates signed over 2GW of power purchase agreements for large-scale renewable energy deals – the highest level to date.⁶

Consumer-facing brand names have unveiled further plans to power their operations entirely on renewables, alongside developing their own generating capacity.

- Apple signed up to Barack Obama’s \$140 billion climate pledge in July 2015, having already announced that its data centres are powered on 100% renewable energy.
- Google has invested \$2.5 billion into clean energy projects to date, and in December 2015 launched plans to double the amount of renewable energy in its data centres.

The jump in the number of institutional investors reducing their exposure to fossil fuels between 2014 and 2015



500 institutions managing more than \$3.4 trillion now have commitments to avoid or cut carbon intensive holdings, a significant jump from 181 institutions a year ago.

Source: Financial Times 2015

Global Progress on Renewables

Against the backdrop of a growing global consensus on the need for decarbonisation, actual and projected investment in renewables continues to increase.

Investment up

More money than ever before was invested in renewables in 2015: \$329 billion dollars, up 4% on 2014. 121GW of total renewable capacity was added, with 30% more wind and solar installed worldwide compared to the previous year⁷.

The BP Energy Outlook 2035 published in February 2016 predicts

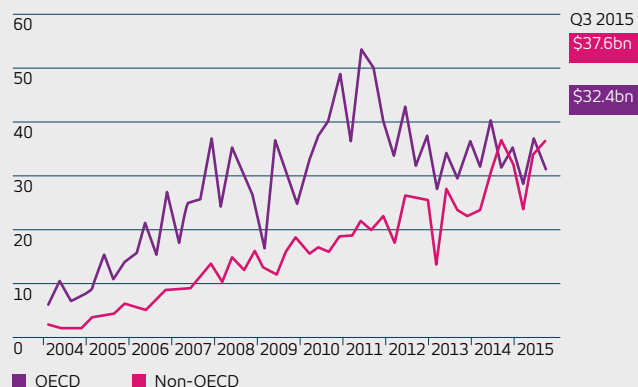
that renewables will grow at a similar rate between 2020 and 2035 as oil did at the start of the 20th century.⁸ The IEA forecasts that they will be the largest single source of electricity growth in the next five years, amounting to 700GW overall⁹; to put that in perspective, it is more than double Japan's current total installed power capacity. The IEA also predicts that renewables will overtake coal as the largest source of electricity generation worldwide by the early 2030s¹⁰.

This trend is not confined to richer nations: for the first time, more than half of the world's annual investment in clean energy came from emerging markets¹¹.

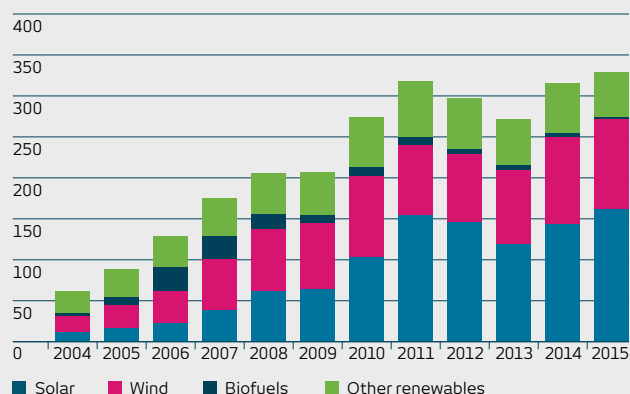
Costs down

Price is one of the major drivers of renewables uptake, and the global average levelised cost* for onshore wind and PV solar both fell in 2015¹². In Germany and the UK, onshore wind energy is the cheapest electricity to produce even without government subsidies, at 8 cents and 8.5 cents/kWh respectively versus 11.5 cents and 11.8 cents for gas and 10.6 cents and 11.5 cents for coal. Onshore wind is also cheaper than gas-fired power in China, at 7.7 cents/kWh versus 11.3 cents. However, Chinese coal remains significantly cheaper at 4.4 cents/kWh¹³.

OECD vs. non-OECD investments in clean energy (\$ billion)



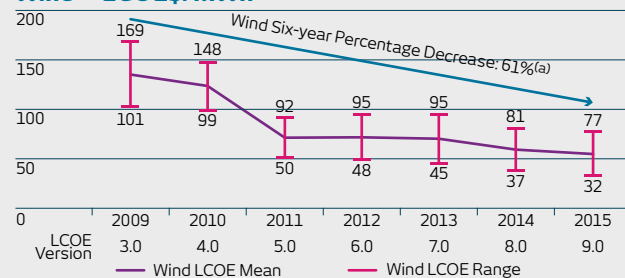
Renewable energy investment by technology



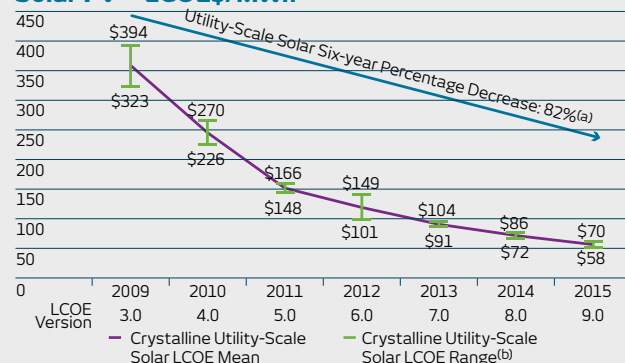
Source: Bloomberg New Energy Finance

Unsubsidised levelised cost of energy

Wind – LCOE\$/MWh



Solar PV – LCOE\$/MWh



Source: Lazard Levelised Cost of Energy Analysis 9.0

(a) Represents average percentage decrease of high end and low end of LCOE range.

(b) Low end represents crystalline utility-scale solar with single-axis tracking in high isolation jurisdictions (e.g., Southwest U.S.), while high end represents crystalline utility-scale solar with fixed-tilt design.

* Levelised cost of energy refers to the cost per kilowatt hour of building and operating a plant over an assumed financial life and duty cycle: Source: US Energy Information Administration.

“Growth in global CO₂ emissions has almost stalled... showing a partial decoupling between growth in emissions and growth in the economy”

PBL Netherland Environmental Assessment Agency

Increased ambitions

In addition to their COP21 pledges on emissions reduction, the top three national emitters China, the USA and India significantly increased existing renewable energy ambitions in 2015:

- China quadrupled its targets in 2015, and now plans to generate 150 to 200GW of electricity from solar and 250GW from wind by 2020.
- President Obama announced a new goal that 20% of US electricity generation in 2030 will come from renewables.
- India announced a plan to quadruple its renewable energy capacity to 175GW by 2022.

This intention to deploy technologies at scale is likely to stimulate further cost reductions¹⁴, and further countries can be expected to follow the example of the global and regional economic powers.

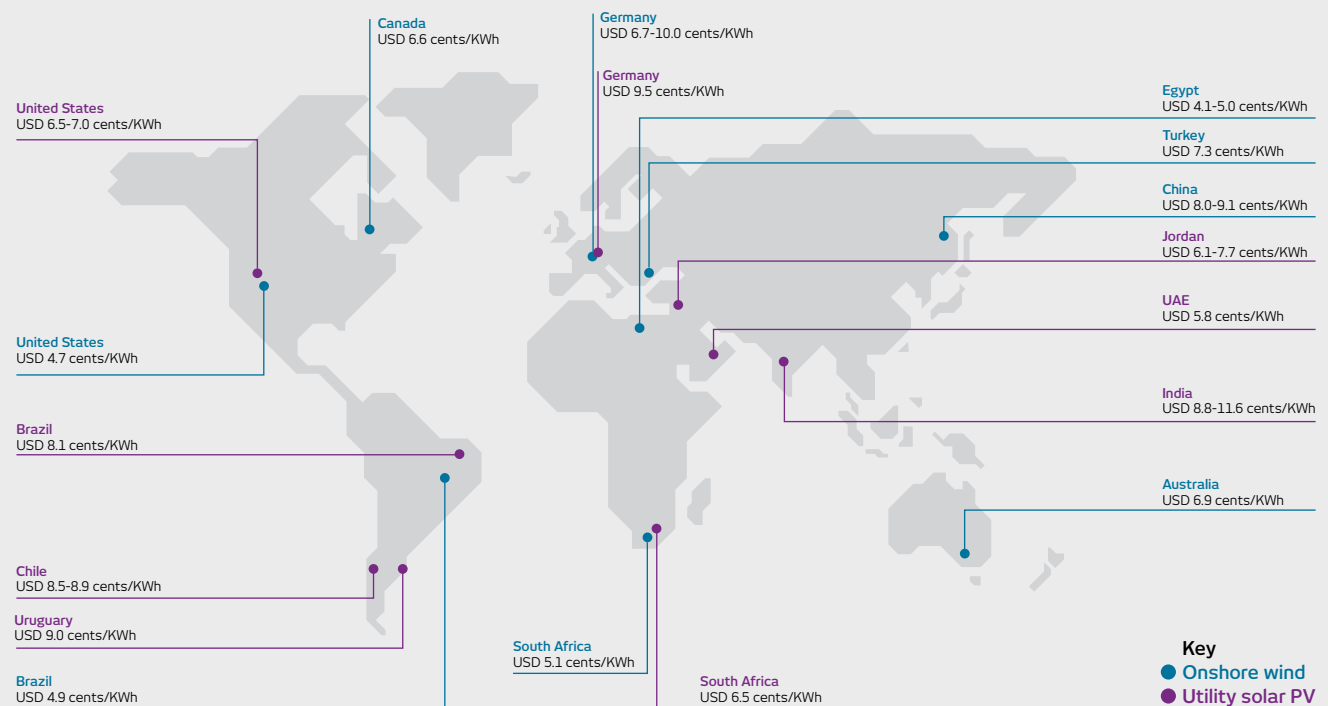
Emissions slowing

Latest available figures show that global per capita energy consumption declined in 2014: the first fall since 1998, with the exception of the 2009 recession year. Overall CO₂ emissions increased by only 0.5% in 2014, after a decade of annual average increases of 4%. These reductions both happened even though the global economy grew by 3%¹⁵. This signals

the potential for the world to decouple growth and emissions, as a result of more efficient power generation and consumption and the rise of lower carbon technologies.

Non-OECD nations overtook OECD on clean energy investment for first time in 2015

Recent announced long-term remuneration contract prices for renewable power (e.g. preferred bidders, PPAs or FITs) to be commissioned over 2015-19



Source: Based on IEA data from the Medium Term Renewable Energy Market Report 2015 © OECD/IEA 2015, IEA Publishing; modified by National Bank of Abu Dhabi.
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This map is without prejudice to the status of or sovereignty over any territory to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Note: values reported in nominal USD; PPAs (power purchase agreements). US values are calculated excluding tax credits; US wind value corresponds to Interior Region for commissioned projects in 2014. Other values reported correspond to projects that

are expected to be commissioned over 2015-2019. Delivered project costs may ultimately be different than those reported at the time of the auction or the signature of the PPA. For full sourcing explanation, see “Renewable Technologies: Global Technologies” chapter.

MENA: Update

Nations across MENA signed up to COP21, and there have been a number of high-profile clean energy commitments from governments in the region in the past 12 months.

75%

Energy from clean sources in Dubai by 2050

UAE Clean Energy Strategy.

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, announced a series of commitments in November 2015 aimed at making Dubai “the city with the lowest carbon footprint in the world by 2050” with 75% of energy from clean sources. The launch of the strategy coincided with the start of construction at the DEWA Energy Centre, which has received a grant of Dh500 million (\$136 million) for clean energy research.

Local corporates are also taking part: in September 2015 global marine terminal operator DP World announced plans to install 30-40MW of rooftop solar capacity on its operating sites in the Jafza free trade zone.

Abu Dhabi also plans to increase renewables to 7% of electricity generation by 2020, and in January 2016 announced that it will launch a tender for a 350MW PV solar plant in Sweihan, Al Ain.

Abu Dhabi announced its tender for a **350MW PV solar plant**

“The Paris negotiations resulted in an historic agreement, which for the first time aligns governments and sets forth a pathway toward a sustainable, low-carbon future”

**Dr. Sultan Ahmed Al Jaber,
UAE Minister of State**

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1 Saudi Arabia
Emission savings
of 130Mio Tonnes
CO₂ equivalent

2 UAE
24% clean energy
by 2030

3 Bahrain
No specific
targets: pledge
to diversify
economy

4 Oman
2% emissions
reduction by 2030

5 Yemen
14% emissions
reduction by
2030**

6 Kuwait
No specific
targets: pledge to
diversify economy

7 Qatar
Add 10GW of
solar capacity
by 2030*

8 Jordan
14% emissions
reduction by
2030**

9 Iraq
14% emissions
reduction by 2035

10 Lebanon
15% emissions
reduction by 2030

11 Iran
12% emissions
reduction by
2030***

12 Morocco
32% emissions
reduction by
2030**

13 Algeria
22% emissions
reduction by
2030**

14 Tunisia
41% reduction in
carbon intensity
by 2030**

15 Egypt
20% renewables
by 2020*

* Existing commitment, not made at COP21

** Conditional on international financial and technical support

*** Conditional on international financial and technical support and the lifting of sanctions

Source: UN INDCS, 2015

MENA: Renewables Highlights

In addition to governmental pledges for future action, the region has made tangible progress on opening up energy markets and inaugurating utility-scale renewable projects.

By 2020, MENA will see annual renewable energy investment of \$35 billion according to the International Renewable Energy Authority (IRENA).¹⁶

Liberalisation

Governments are liberalising energy markets and procurement structures across the region, attracting foreign investment and increased competition which has in turn driven down costs.



Jordan

In May 2015 Jordan switched to a competitive tender process for renewable projects, replacing the Reference Price List system which had been criticised for a lack of transparency¹⁷. The government achieved significant cost reductions with four 50MW solar projects closing at bids of between 6 and 8 cents/kWh – down from previous levels of 16.9 cents/kWh¹⁸. By the end of 2015, Jordan had allocated 400MW of solar power projects through auctions. Earlier that year, Chinese renewable company Hanergy announced a grant of \$310 million to set up a power transmission network dedicated to renewable energy projects in the country, while the French development agency agreed a loan of \$44 million to the National Electric Power Company (NEPCO) to upgrade transmission lines.



Egypt

Egyptian parliament passed a bill in February 2015 to support the privatisation of the energy sector, opening up transmission and sales to private entities. GE is now delivering a contract for 46 wind turbines, and Siemens has agreed a deal to install a further 2GW of wind capacity. EFG Hermes predicts a debt and equity investment opportunity of approximately \$6 billion to \$7 billion for Egypt's feed-in-tariff renewable energy programme to 2018.



Algeria

Algeria has increased its clean energy finance capabilities by merging its national funds for renewable energy and energy savings, and passed a comprehensive IPP and Feed-in Tariff package into law. The first solar project to be privately procured on this basis was announced in October 2015 with UK-based developer Renewable Energy Partner.

Wind

“Wind is a very, very cheap source of energy, particularly in Egypt and also in Saudi Arabia and desert countries”

Joe Kaeser, President and CEO of Siemens AG



Jordan

After more than a year of construction, the Masdar-developed Tafila wind farm commenced commercial operations in September 2015 at full capacity of 117MW. The facility will account for almost 10% of Jordan's renewable energy target and increases the nation's total power by 3%.¹⁹ Dr. Sultan Ahmed Al Jaber, UAE Minister of State and Chairman of Masdar, described it as the “foundation for future energy partnerships in Jordan”.



Egypt

In 2015 Egypt inaugurated a 200MW wind farm in Gabal el Zeit²⁰, bringing total wind capacity to 800MW in the country.²¹ The government also signed a Memorandum of Understanding with Lekela Power – a joint venture between Actis and Mainstream Renewable Power – for a 250MW wind farm in the Gulf of Suez, and awarded Siemens a contract to develop 12 wind farms with a total capacity of 2GW.



Oman

The contract for Oman's first commercial scale wind farm at Dhofar is planned to be awarded in early 2016. The 50MW facility will come into operation in 2017.

Solar

“The Middle East and North Africa's solar energy potential could amount to 100 times the electricity demand of MENA and Europe combined”

World Bank



UAE: Dubai

The Mohammed Bin Rashid Al Maktoum solar park commenced its tender for its 800MW phase three in 2015. Having achieved the lowest global production cost for PV energy globally on phase two at 5.84 cents/kWh, the Dubai Electricity and Water Authority (DEWA) aims to achieve an even lower price in this latest round. Dubai is promoting solar not just at grid scale, but also at a residential level. By 2030 the emirate will require all rooftops to have solar panels as part of a strategy to generate 75% of its electricity from clean energy by 2050.



UAE: Abu Dhabi

Abu Dhabi Water and Electricity Authority (ADWEA) also announced plans for a new 350MW PV plant: commenting on the move, Bloomberg New Energy Finance said that “at the prices [seen in Dubai], building solar seems like a sensible diversification strategy and not a financial sacrifice”.



Morocco

In October 2015 the Noor I phase of the Ouarzazate solar project in Morocco began supplying 160MW of energy to the grid. When the entire CSP plant completes in 2017 it will power one million homes.



Jordan

Construction began on the 52MW Shams Ma'an PV solar plant in Jordan, which will become the biggest in the nation and will be built, operated and maintained by First Solar.

MENA: Challenges and Opportunities

The energy gap in the Middle East continues to widen, and energy intensity remains a real challenge.

Middle East oil consumption grew almost four times faster than the world average in 2015, according to the BP Statistical Review of Energy. The six GCC nations remain in the top 14 per capita emitters of carbon dioxide globally.²³

Developments in North Africa

North Africa has made global headlines in the past year with the ambition of its renewable energy targets and the scale of its new installations. The inauguration of the first phase of the Ouarzazate facility in Morocco's Sahara region attracted particular attention as the world's largest concentrated solar power plant, as did the country's eye-catching pledge for 42% renewable energy consumption by 2020. Neighbouring Algeria topped the league tables on total new solar capacity in 2015, adding 268MW²⁴ according to the nation's Renewable Energy Development Centre CDER.

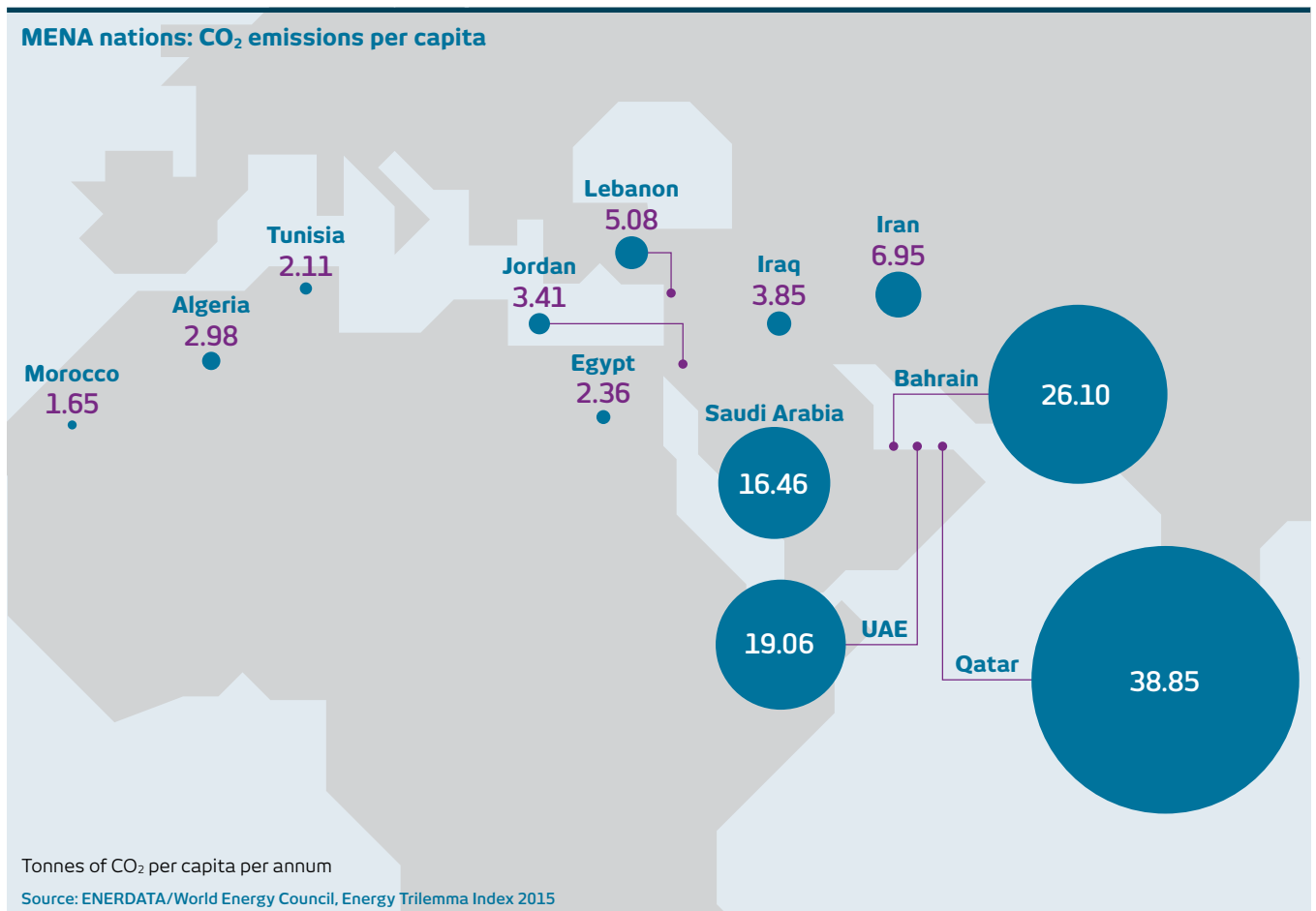
Long-term potential in the Gulf

Compared to North Africa, progress on renewables in the GCC appears slow at first glance. Although the first utility-scale CSP project was developed by Masdar in Abu Dhabi in 2012, Saudi Arabia has pushed back its 2030 clean energy targets to 2040, while Bahrain and Kuwait did not submit specific emissions reductions goals at COP 21.

The UAE stands out as an exception – and highlights the longer-term potential of the Gulf market. At the start of 2015 the Mohammed bin Rashid Al Maktoum solar park created a new global benchmark for solar prices, attracting a world-record low tariff of 5.84 cents/kWh for its 200MW second phase. At the start of 2016 the Dubai Electricity and Water Authority (DEWA) announced its aim to go further still, setting a target price of less than 5 cents/kWh for the 800MW third phase.²⁵

The investment grade credit ratings of many GCC nations will help them to access wider pools of international capital that may not be so readily available to some North African jurisdictions.

Middle East crude oil and petroleum consumption grew **4x faster** than world average in 2015



West-East Corridor Update

The great growth region of the world stretches from West Africa to East Asia. At NBAD, we call this the West-East Corridor. It is characterised by an expansion of private enterprise and increased capital flows, which coupled with a rising population will drive ever increasing demand for energy and other resources.

Some West-East Corridor nations have abundant coal within their borders, and where this is so, are likely to use it to fuel industrialisation while reducing their dependence on energy imports. However, high-tech renewables are also forecast to expand rapidly in the super-region. Meeting rising demand while achieving emissions reduction targets will therefore institute a new trend across the West-East Corridor: increasing coal consumption at the same time as the rapid growth of renewable capacity.²⁶

1 China's renewables

The world's largest polluter is leading the way on renewables investment. In 2015 it spent \$110 billion – more than the United States, India, Sub-Saharan Africa, and Latin America combined.²⁷ Wind capacity has increased more than 70-fold in a decade, while solar capacity has multiplied more than 300 times over the past five years.²⁸

2 India's renewables

Since February 2015 India has announced renewable energy deals worth more than \$100 billion²⁹. The nation's solar project pipeline stands at over 8GW, compared to an average installation rate of 1GW per year in the past three years. The latest studies conclude that Indian solar power has now achieved price parity with coal: and a new national low was achieved in 2015 with a fixed 25-year solar PPA at 7 cents/kWh.³⁰

3 Japan and Korea's renewables

Japan and Korea remain heavily reliant on fossil fuels, at 94% and 84% respectively.³¹ Both have now emerged as the most promising renewables markets in Asia-Pacific outside of India and China³², and are in the top eight countries with the fastest-growing solar capacity: Japan second only to China³³, adding 10GW of solar in 2015.

4 Thailand's solar

Thailand has more solar capacity than the rest of the South-East Asia region combined at 1.2GW, with investment exceeding \$2 billion in 2015.³⁸

5 Indonesia's renewable energy

In June 2015 Indonesia announced a target of 19% renewable energy by 2019. Construction has begun on the nation's first utility-scale wind project, a 50MW facility in Bantul.

6 Malaysia's twin-track strategy

Energy demand in Malaysia will double by 2040³⁹. In that timeframe, coal is predicted to overtake oil and gas to become the nation's primary energy source, and renewables will increase to 16% of energy generation.⁴⁰

7 Nigeria's renewables potential

The Nigerian government mandated in November 2015 that all electricity distribution companies must source a minimum of 50% of their total energy from renewable sources, and pledged at COP21 to reduce carbon emissions 45% by 2030. In a country where wood fuel currently makes up 80% of the energy mix⁴¹, a commitment to renewables could see Nigeria jump straight to clean grids.

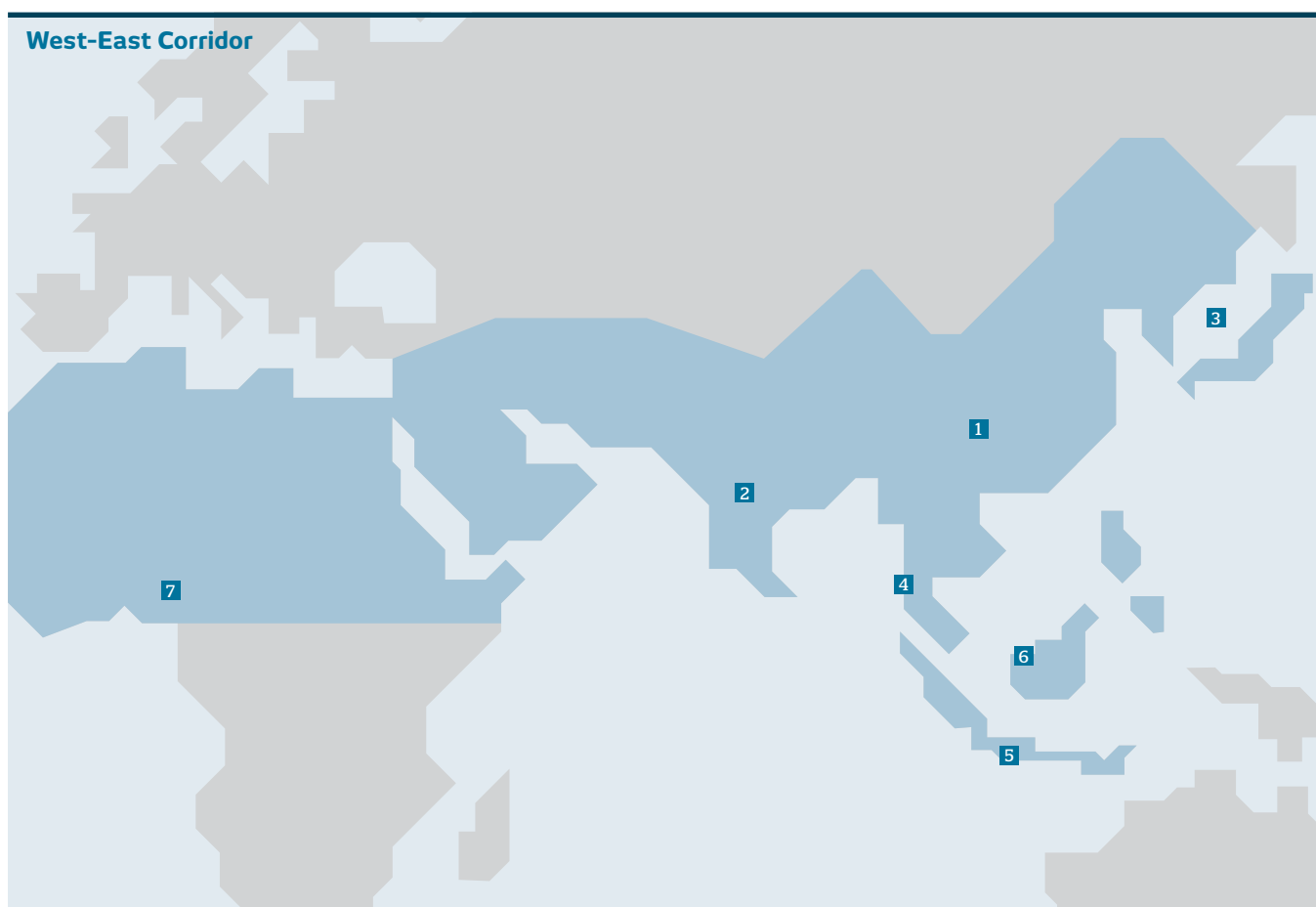
As its most populous and largest economy, Nigeria is key to unlocking Sub-Saharan Africa's renewables potential: a 2015 McKinsey study predicts that the region could achieve a 27% reduction in CO₂ emissions,⁴² while the IEA forecasts that renewables should meet almost two-thirds of power demand growth in sub-Saharan Africa through to 2020.⁴³

“Conventional energy prices present significant volatility for national budgets across the West-East corridor. Policymakers are therefore increasingly looking at renewables to reduce risk exposure”

PwC

Since February 2015 India announced renewable energy deals worth \$100 billion

ASEAN aiming for 23% renewables in regional energy mix by 2020



Collective action in South-East Asia

The South-East Asian region (ASEAN) is set to become the fourth-largest economic bloc in the world by 2050.³⁴ Rapid industrialisation coupled with booming population has resulted in a 50% increase in energy demand since

2000³⁵, which is expected to rise a further 70% by 2040.³⁶

In 2015 ASEAN made a bold move by acting collectively on the energy challenge as a bloc: committing to increase the share of renewable

energy in the regional fuel mix to 23% by 2020, up from 12% today. In line with the trend towards coal plus renewables, the share of coal power in ASEAN's mix will also increase from 32% today to 50% in 2040.³⁷

New Frontiers

Smart and renewable grids, and energy efficiency opportunities will together drive the sector forward by enabling less carbon intensive forms of both generation and consumption.

In 2015 these areas raised combined funding of \$1.7 billion⁴⁴. Each displays strong potential, and rapid technology advances and new deployments over the past year could stimulate significant capital flows in the near future.

Energy Storage

During 2015 a range of global banks identified batteries as the next clean energy breakthrough^{45, 46}. Battery storage can drive the energy transition in three main ways: grids, homes and vehicles. In each area research and development is converting rapidly into commercial technologies.

The scale of the opportunity

Global revenue for advanced batteries for utility-scale storage is expected to grow from \$231.9 million in 2016 to \$3.6 billion by 2025⁴⁸, and the market for Lithium-ion batteries for vehicles is forecast to reach \$30.6 billion by 2024⁴⁹. Goldman Sachs sees batteries as a “massive untapped opportunity for investors”, and in November 2015 announced an initial target of \$500 million to finance ‘advanced grid technologies’.

Renewables plus batteries at grid-scale in Italy

In September 2015, Enel Green Power and GE inaugurated a sodium-nickel chloride battery storage system at the Catania 10MW photovoltaic plant, connecting it successfully to the high-voltage grid.

A similar partnership with Siemens has installed a lithium-ion battery at the 18MW Potenza Pietragalla wind farm.

Goldman Sachs described lithium batteries for vehicles as “the new gasoline”

“Storage will hasten the demise of fossil fuels... and battery storage is starting to become a reality”

Citi Group

Revenues from utility-scale storage expected to grow from \$231 million in 2016 to \$3.6 billion by 2025

“Grid-scale solar storage will be the missing link of solar adoption”
Deutsche Bank

Energy storage



Grids

A March 2015 report from Deutsche Bank called grid-scale storage the “missing link of solar adoption”, the ‘holy grail’, and the ‘killer app’ for renewables thanks to its ability to cope with intermittency⁴⁷.

In addition to battery solutions, Audi’s ‘Power to Gas’ approach converts surplus wind power into natural gas which can then be used when required to balance loads. A 6MW unit began selling excess capacity to the grid in Werlte, Germany in July 2015.



Homes

Domestic energy storage will enable homeowners to benefit fully from off-grid energy, helping small-scale renewable systems pay back more quickly. In May 2015, Tesla unveiled its Powerwall lithium-ion home battery range, which captured worldwide media attention upon launch and went on to attract orders worth \$1 billion by the end of the year.

In September 2015, Harvard University reported that they have developed a cheap, durable and safe chemical battery for off-grid solar homes.



Vehicles

Goldman Sachs has called Lithium “the New Gasoline”, concluding that “its unique properties make it a key enabler of the electric vehicle revolution”, helping to decarbonise the transport sector.

In October 2015, Cambridge University scientists announced a breakthrough on a super-battery that could drive over 600km on a single charge.

New Frontiers

Off-Grid

A 2014 Morgan Stanley report⁵⁰ predicted a 'tipping point' was approaching in the developed world, as the falling costs of batteries and solar PV would see huge numbers of homeowners going off-grid.

As batteries develop further, this may start to happen, but the market to date remains niche: in Europe, solar PV installed in off-grid systems account for less than 1% of the installed PV capacity; in the US it is in decline⁵¹.

In that context, the immediate opportunity for off-grid systems is in the developing world. There are 400GW of costly and carbon intensive diesel generators around the globe⁵², primarily in emerging economies. Off-grid renewables are seen as an opportunity to replace increasing amounts of that energy supply over time.

The scale of the opportunity

The value of developing remote power systems is expected to grow from \$10.9 billion in 2015 to \$196.5 billion in 2024⁵⁴, representing an almost 20-fold increase.

"Developing countries that seek substantial electricity system improvements can now leap-frog traditional approaches"

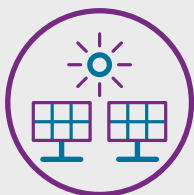
ANZ Bank

Off-Grid



Pathways to clean grids

An estimated 100 million people are already served by off-grid renewables, with the majority in the West-East Corridor region: Bangladesh, Cambodia, China, India, Morocco and Mali all have more than 10,000 solar PV village mini-grids. This could help the region move directly to clean technologies, leapfrogging more developed countries in the process.



Access to electricity

Off-grid renewables are crucial to achieving the international community's aim of connecting the 'bottom billion' that currently has no access to electricity: announced in the 2015 SDGs as a route to improving development outcomes and enabling economic growth. In October 2015 the South Africa International Renewable Energy Conference declared that decentralised power solutions are now a financially viable alternative for isolated regions, which currently spend an estimated \$30 billion a year on kerosene⁵³.

Private sector pioneering off-grid renewables

Off-grid projects have tended to be small-scale to date, but are growing in number and attracting ever higher profile corporate involvement. In October 2015 Schneider Electric commissioned off-grid solar energy systems for six Nigerian states, bringing power to 7,000 people. Similarly Off Grid Electric won the UAE's Zayed Future Energy Prize for its work bringing clean electricity to rural Africa. In the Middle East, Italian and Emirati companies are collaborating to install Saudi Arabia's first temporary, off-grid, solar-hybrid plant.

“The cleanest energy choice of all is not to waste it. And the ‘fifth fuel’, as energy efficiency is sometimes called, is the cheapest of all”

The Economist

Energy Efficiency

Around 40% of the emissions reductions required to limit global temperature increase to less than 2C could come from energy efficiency, according to the most recent and comprehensive analysis of the sector prepared by the IEA⁵⁵.

The developed world has led the way on this agenda, and further legislation can be expected to create additional gains. Subsidy reduction and efficient buildings will be the primary drivers in the developing world.

Legislation as a driver of efficiency

In the developed world, energy efficiency has helped to create the first signs of the decoupling of economic growth and carbon emissions, and new legislation will bring further investment opportunities:

- EU policymakers will treat efficiency as an ‘energy source in its own right’, giving it the same priority as installing new generation capacity to ensure that it can compete for investment on equal terms.
- In the USA, the Clean Power Plan requires states to submit plans by September 2016 to reduce the carbon intensity of their power sectors, highlighting energy efficiency as a main route to doing so.

In the developing world, reductions in fossil fuel subsidies can be expected to boost energy efficiency as the cost of wastefulness increases. Egypt, India, Indonesia, Malaysia, Mexico, Thailand and the UAE have recently either cut or abolished fuel consumption subsidies, which could suggest that these emerging economies will follow the same path as the developed world.

Focus on buildings to reduce energy intensity

Efficient buildings are set to be a global focus, though they will be given particular emphasis in the developing world, where new stock is being constructed in the context of targets to lower energy intensity. Overall global investment in efficient buildings is projected to increase to over \$125 billion (excluding appliances) by 2020.

- In China, spending on efficient buildings exceeded \$18 billion in the past year.
- In October 2015, Dubai announced plans to introduce a ranking system for building’s energy efficiency, and to set minimum standards for retrofits and new builds. This builds on the success of Abu Dhabi’s Estimada Scheme, launched in 2008 to embed sustainable construction principles.
- Air conditioners are responsible for 56% of all electricity consumption in Saudi Arabia. Now new legislation is targeting efficiency improvements of 35% in air conditioning by 2020. Recently enacted policy also aims to improve the energy efficiency of new passenger vehicles in the country by 20% by 2020.

Annual investment in efficient buildings expected to grow to \$125 billion by 2020

40% of emissions reduction to get to 2C could come from energy efficiency

Perspective: 2015 Exceeded Expectations



Hannes Reinisch, Sustainable Energy Leader, PwC Middle East

2015 exceeded expectations for renewables – 2016 and beyond will continue this trend

Developments throughout 2015 have validated expectations set in the first edition of this report last year – opportunities in the renewable energy sector were large in scale, cost-effective, and policymakers and financial institutions played a pivotal role in fostering the growth of the industry.

NBAD's newly launched 10-year strategy to provide \$10 billion sustainable energy finance is ground-breaking, and seems perfectly timed in accelerating the pace of our energy transformation in the MENA region and across the globe.

We have seen significant evidence of this transformation, as further cost reductions and policy innovation sustain the clear business case for renewable energy. As our colleagues at the International Renewable Energy Agency (IRENA) demonstrated in 2014, global net capacity additions of renewables now exceed all other sources combined – coal, oil, gas and nuclear.

The impact of oil price

This is not a trend we see diminished by lower global oil prices, and lower gas prices in some markets – especially not in the Middle East and North Africa where local gas costs are on the rise.

Even though energy prices have dropped, they would have to drop further to unsettle the business cases for renewables – which themselves are not standing still. The cost of

renewables has continued its downward trajectory, and is still competitive with conventional energy prices at current levels in many cases.

Stability versus volatility

A perspective we do see gaining importance – which this report will also help shed light on – is 'stability versus volatility' – and the associated risks. The rollercoaster rides of conventional energy prices present significant volatility for electricity markets and for many national budgets across the West-East Corridor – in particular the MENA region.

Policymakers are therefore increasingly looking at renewables to stabilise long-term projections and reduce risk exposure through a diversified energy mix and a diversified economy, to decouple economic growth from dependence on fossil-fuel prices and, over time, carbon intensity.

The importance of COP21

The ground-breaking Paris agreement signals the further strength of low-carbon technologies in the period beyond 2020, and hence the investments to be made today.

We have seen an impressive commitment to renewables deployment across the West-East Corridor since last year. In 2014, Egypt set its renewable target to 20% by 2020; in March 2015, India announced a renewables target of 175GW by 2022 (recently brought forward to 2020) and Indonesia announced a target of 19% renewables by 2021 in June 2015. In the UAE, the clean energy target was set at 24% by 2021 and Dubai has now set its sight on no less than 75% clean energy by 2050. The establishment of a federal ministry for climate change in the UAE demonstrates the level of commitment to the issue at government level.

The role of policy

Besides targets, other policy enablers are evolving as well. In particular, the announcement of the Dubai's \$27 billion Green Fund is among the most vital current developments for local renewable energy and energy efficiency projects – a potential game-changer to the scale and scope of the market for the Emirate's green strategies.

Across the region, we have also observed governments strengthening institutional capacity through the development of new authorities, policy mandates and regulation – vital to the renewable energy transition and more commercial, private sector participation. These include tariff reforms which reduce long established fossil-fuel subsidies for gas, water, electricity and transport fuels. Examples range from the introduction of a solar rooftop scheme in Dubai, to significant subsidy reforms and introduction of feed-in tariffs in Egypt.

Overall, these changes can pose a challenge and an opportunity to the utility sector across the MENA region. We see many have already started to transform their organisations, to adapt to, or even shape the transforming landscape of new generation technologies, procurement approaches and business models.

So we expect 2016 to continue to be another exciting year for sustainable energy and I am confident this report will be of great value to keep us up to date on how we finance the future of energy.

Perspective: Finance can Catalyse MENA Clean Energy Growth



**Nathan Weatherstone, Head
of Sustainable Business, NBAD**

Mobilising the financial community to catalyse MENA's clean energy growth

As set out elsewhere in this report, MENA's power sector has seen something of a step change in policy and practice since March 2015 and the publication of the *Financing the Future of Energy* report: a shift in favour of clean energy generation with a clear expectation that renewables will become an increasingly important part of the energy mix.

Two things have driven this shift: the demonstration beyond all reasonable doubt that the most efficient renewable technologies can be highly competitive with traditional power sources, coupled with governments' renewed strategic commitments to lower carbon economies, as exemplified in the national responses to COP21 but also based on the desire for greater energy independence and the decoupling of energy prices from damaging volatility in commodities.

On the face of it, the energy mix of the region appears to be at something of an inflection point with the promise of an orderly transition from a centralised, mainly fossil fuel-based system to a more intelligent, potentially distributed system driven by cleaner energy derived from the region's abundant natural solar and wind resources.

But is it? And if it is, what will it take to truly create the oft-quoted 'paradigm shift'?

Enabling policy, efficient regulation and more streamlined procurement will undoubtedly play its part, but we believe that a very large part of the answer rests with the financial community. To achieve the scale of ambition flagged at COP21, private and institutional capital will be required to catalyse the clean energy sector in a way not previously seen.

An international perspective

For the first time, 2015 saw the developing world attract greater capital flows into clean energy than the 30 OECD member countries; the more mature markets may well offer lessons to some of the more nascent renewables markets.

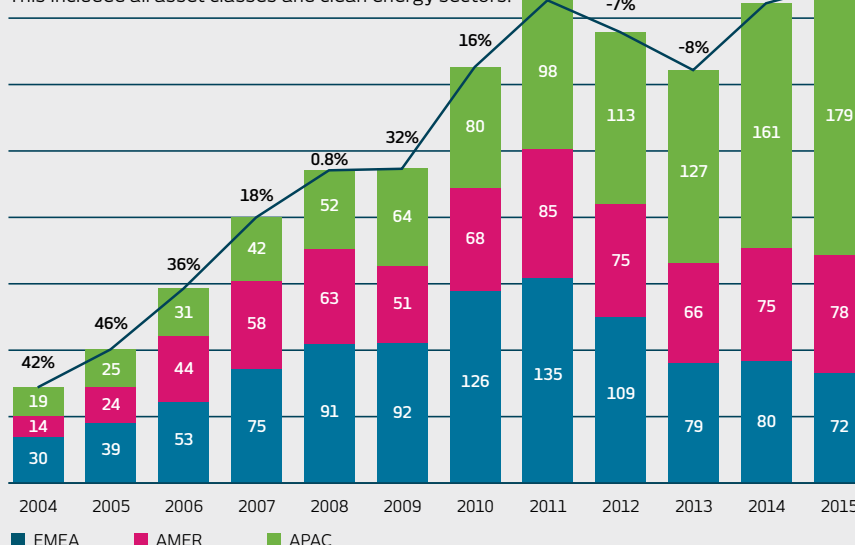
Investment flows into the industry are historically not linear. If we look at the data from both Europe and the US

over the past decade, both markets present similar characteristics: broadly increasing investment trends which peak in 2011, then fall back for the next few years.

Why is this the case? In the US, the mid-2000s saw an acceleration in the shift to clean energy-based on positive sentiment and plentiful funding from deep and sophisticated capital markets. However, in times of economic stress such as post-global financial crisis America, attitudes hardened and support for the sector dropped away as quickly as it mobilised. The impact of tax policy was also key: on-off flows of investment were promoted by the availability, then non-availability of tax breaks and tax credits – a kind of politically-driven funding cycle.

New investment in clean energy by region – 2004-15 (\$ billion)

Total annual new investment in clean energy by region. This included all asset classes and clean energy sectors.



Note: Total values include estimates for undisclosed deals. Included corporate and government R&D, and spending for digital energy and energy storage projects (not reported in quarterly statistics).

Source: Bloomberg New Energy Finance

If the pattern of capital flows is largely similar in Europe, some of the underlying causes are perhaps very different. The global financial crisis undoubtedly had an impact, but one of the major drivers for a reduction in clean energy investment was the uncertainty generated by direct government action. Tariff reductions imposed unilaterally by some of the European sun-belt countries served to undermine the attractiveness of the sector and was responsible for diverting investment elsewhere.

What we saw in both markets following these dips was a wave of retrenchments, corporate consolidations and a renewed focus on cost cutting and technology improvements that, although painful at the time, led to the emergence of a stronger industry with much more resilience to adverse business conditions. This silver lining has benefited those who delayed entry into the renewables sector – most notably in the Middle East.

The Middle East countries have timed their entry into renewables well

The Power Purchase Agreement signed between DEWA and Acwa Power in 2015 signalled a new global low in the cost of solar, with a levelised tariff of less than 6 cents/kWh. This was based on a competitive tender with normal commercial terms, double-digit rates of equity return and a debt financing package sourced from regional commercial banks. What hasn't been so widely reported is that the tariff proposals of the second ranked bidder (again, a Saudi developer) would also have set a new world low had it been taken forward. We think this demonstrates three important trends for the region:

Firstly, it is now unarguable that lower cost renewable technologies such as utility scale photovoltaic solar parks are commercially competitive. Importantly, these are no longer reliant on subsidy or state support: the on-off capital flows driven by tax breaks should now be a thing of the past in many parts of the world. Even in the context of a low trading range for hydrocarbon-based commodities, it has become increasingly obvious that renewable technologies should be part of the future energy mix where good natural resources exist. Based on tariff proposals in MENA, the same can also be said for onshore wind.

Secondly, it challenges the old world corporate order. Just a few years ago, who would have thought that developers from the centre of the world's hydrocarbon economy would be beating more established players from the mature markets? As has happened before, a response from the global utility scale developers will come and when it does, it will serve to make clean energy even more competitive.

Thirdly, the funding for the DEWA project was based on private sector capital. With technical capability and commercial viability now proven, financing has become the critical consideration in the advancement of the regions' renewables sector both from a competitiveness perspective as well as meeting the sheer scale of funding requirements for renewable projects.

With a more consolidated industry, and with the lowest global tariff for solar established in the region, there is every incentive for the Middle East to press that advantage and progress towards becoming a world centre for renewable energy.

Diversified funding: a prerequisite for growth in clean energy

Total global investment in clean energy reached \$329 billion in 2015. The Middle East Solar Industry Association estimates that investments in utility-scale solar parks across MENA totalled just over 1% of this in 2015, but is set to increase its share of the global market. Given the scale of the gap between energy demand and production across MENA, the funding requirements for renewable projects will grow rapidly in the coming years. The renewables industry will need to tap a diverse range of liquidity pools in order to meet this demand.

The MENA region is fortunate to have a long-established model for mobilising private sector expertise and investment; the independent power production structure (IPP). Typical capital structures are based on long tenor funding which seek to match the economic life of the underlying asset. Traditionally, this has been sourced from banks, as was the case in Dubai. However, with the majority of utility-scale renewable projects wedded to this or similar structures, we foresee the potential for capacity constraints and the need for heightened financial innovation.

Commercial and investment banks are usually experienced at evaluating and quantifying the riskiest periods in projects – in the construction stage. However, they are increasingly being regulated away from extending the type of long debt tenors that facilitate competitive tariffs.

Conversely, international capital markets are much larger than the funding available from the banking sectors and there are categories of investors who seek out long-term, lower risk cash flows; the sort which renewable energy projects produce.

In our view, these two markets need to come together if the financial community is to come close to bridging the funding gap, supplemented by the region's rich Islamic financing expertise, export credit agency support and the continuation of development bank backing in parts of North Africa.

This will take a degree of innovation and flexibility from all concerned parties:

1. Government procurers

will need to modify current procurement models which are based on competitive tariffs underpinned by long-term committed financing and switch to structures which allow for refinancing points and diversification of liquidity pools throughout long-term contracts.

2. Equity sponsors

will need to become more accepting of refinancing risk in the context of the limited upsides afforded by a fixed tariff structure.

3. Debt capital markets and institutional investors

will need to develop a deeper understanding of the opportunities offered by the sector in developing as well as developed markets.

4. Banks

will need to become more flexible in their suites of financing products.

Whilst banks will remain the primary funding mechanism for the foreseeable future in MENA, over-reliance on one source of risk capital won't create a genuine paradigm shift in delivering clean energy. In the near to medium term, accessing institutional finance through the refinancing of large-scale bank-financed projects and portfolios of bundled generating assets will allow banks to recycle liquidity and support projects of strategic importance. However, when the industry finds a way to attract institutional finance and the capital markets from the get-go is when promise will turn into reality and we will see a genuine transformation in the pace of the region's clean energy delivery programmes.

NBAD and The Future of Energy

2015 was the year in which NBAD established sustainability as a core part of its business focus. We did this through developing the corporate architecture that addressed all stakeholders: our banking colleagues, our client network, our shareholders and the wider international community.



At NBAD, we believe that financing the future of sustainable energy offers excellent opportunities for the banking sector – and is essential for the development of the MENA region.

Published the Future of Energy report

NBAD worked with the University of Cambridge and PwC to explore how the financial sector can help shape a more sustainable future in the context of new energy solutions. We published the findings in the *Financing the Future of Energy Report: The Opportunity for the Gulf's Financial Services Sector* in March 2015.

The report was launched at the Global Financial Markets Forum in March 2015, NBAD's flagship annual conference for the financial services industry, in a panel consisting of representatives from both the traditional energy markets and the renewables sector: Masdar, Acwa Power, Shell and Kuwait Petroleum Corporation. The panel members confirmed that the region and the world should expect a more integrated energy mix in the future.

Set up a dedicated Sustainable Business team

As the world changes, so our core clients are also changing. We now have a large universe of clients who want and need a specialist capability in sustainable financing. That's why we created a sustainable business team which will explore and promote environmentally sound banking opportunities, in clean energy generation as well as other sectors such as transportation schemes that effect modal transfer from road to rail, sustainable water and waste management and energy efficient real estate.

Signed up to the Equator Principles

We became the first bank in the UAE to sign-up to the Equator Principles, the global benchmark for assessing environmental and social risk in project finance. They are a voluntary set of guidelines based on International Finance Corporation (IFC) standards on social and environmental sustainability, and on the World Bank Group's Environmental, Health and Safety general guidelines.

It provides the basis for us to further define our institutional ESG ('environmental social and corporate governance') frameworks when we engage with clients, and to adopt international best practice in social and environmental risk evaluation. In addition, it will support our commitment as a bank to track and report our own ESG performance, aligning with Global Reporting Initiative's G4 guidelines and through the Carbon Disclosure Project.

Announced a \$10 billion target for environmentally sustainable activities

The bank has signalled its intent to be a leader of growth in environmentally sustainable activity through our target to finance, invest and facilitate \$10 billion of sustainable business within the next 10 years: the first such target from a bank in the Middle East. We have taken this step because we are committed to helping this region meet its energy challenge.

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Acknowledgements

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About the Authors and Contributors

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NBAD is the leading bank in the Middle East and one of the safest banks in the world. Our roots in Abu Dhabi give us a deep understanding of the dynamics of the Arab region and its connection to the world's markets. And we aim to become the number one bank for anyone who wants to do business along the West-East Corridor.

NBAD established a dedicated Sustainable Business team in August 2015, under the leadership of Nathan Weatherstone, to evaluate and create new financing products that will support the development of renewable energy and sustainable businesses. The team will embark on an engagement programme with key regulators, policymakers and industry players to capture up-to-date market trends and promote continued partnership between the financial sector and environmentally sustainable businesses.

Cambridge Centre for Climate Change Mitigation Research

The Cambridge Centre for Climate Change Mitigation Research (4CMR) produces interdisciplinary scholarly research to identify and assess policies that reduce the risks of climate change while allowing for global economic development. We do this through the study of both mitigation (reducing climate change) and adaptation (reducing the risks when climate change does occur). At the heart of our research is the development of integrated models that allow for the complexity of social and physical processes to emerge through linking knowledge of economic, environmental, energy, land and public health. We also work with public and private sector organisations to apply our research in facilitating design and adoption of effective policies and practices.

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