

RECAI

Issue 40

Renewable energy country attractiveness index

February 2014

Looking back to look forward

A challenging 2013 for some markets and a booming year for others suggest further volatility for the year ahead. Resilience, efficiency and innovation are likely to be key themes.

The name's bond, project bond

With bond finance increasingly mirroring project finance for large infrastructure projects, we look at what's required to leave renewable energy projects neither shaken, nor stirred.

Pulling back the curtain

The cost of energy continues to dominate the agenda, but greater transparency and informed debate are required to successfully optimize national and global energy markets.

Solar shuffle

A technology re-weighting has boosted the relative attractiveness of solar-strong markets in the index, though policy developments also continue to shuffle the top 10.



EY

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February 2014

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Chief Editor's note



Ben Warren, RECAI Chief Editor

2	Chief Editor's note
3	At a glance ...
4	Summary
6	Feature: The good, the bad and the tomorrow
12	Key developments
14	Global view
16	Our index
18	In-depth perspectives
18	Finance market – Bonds: are you ready?
20	Policy and regulation – Taking the hot air out of the energy debate
22	Country focus
22	Germany
24	Japan
26	UK
28	South Africa
30	Technology-specific indices
31	Glossary
32	EY global contacts
34	Our global cleantech services
35	Recent EY publications

The truth about renewables. The failure of November's United Nations Climate Change Conference in Warsaw to generate any significant results and the lack of binding 2030 renewable energy targets for EU Member States under the European Commission's latest proposals make one thing very clear. The future success of the renewable energy sector will not be driven by national or international decarbonization targets. It will be driven by the fact it makes sense – for the economy, for society, for investors and for businesses.

Economically, renewables continue to fall in price and increasingly displace more expensive fossil fuels. For emerging markets in particular, renewable energy potential is attracting high levels of foreign investment, generating new jobs and creating local supply chains. From a societal perspective, renewable energy is helping to boost security of supply, particularly in markets heavily reliant on energy imports. Air quality has risen to the top of the Chinese agenda, being the new protagonist of decarbonization efforts.

For investors, renewable energy assets are generating robust returns, and providing a greater range of diversified investment opportunities for retail, intermediary and institutional investors. In November, for example, the International Finance Corporation identified up to US\$1t of investment opportunities in climate change mitigation initiatives, including renewable energy, across a number of emerging markets.

We are also seeing renewable energy become a means of tackling business energy risks, with an increasing number of large corporations now procuring clean energy directly or investing in their own generating assets, signaling an energy transition driven by fundamental business need rather than subsidy.

But success will not happen by itself. The energy debate must transcend politics if it is to avoid short-termism and populist policies. Asset values must be optimized through increased efficiency. The value chain must be globalized. And new markets must be opened up to facilitate global competitiveness. Renewables can then truly compete.

Let's get busy then.

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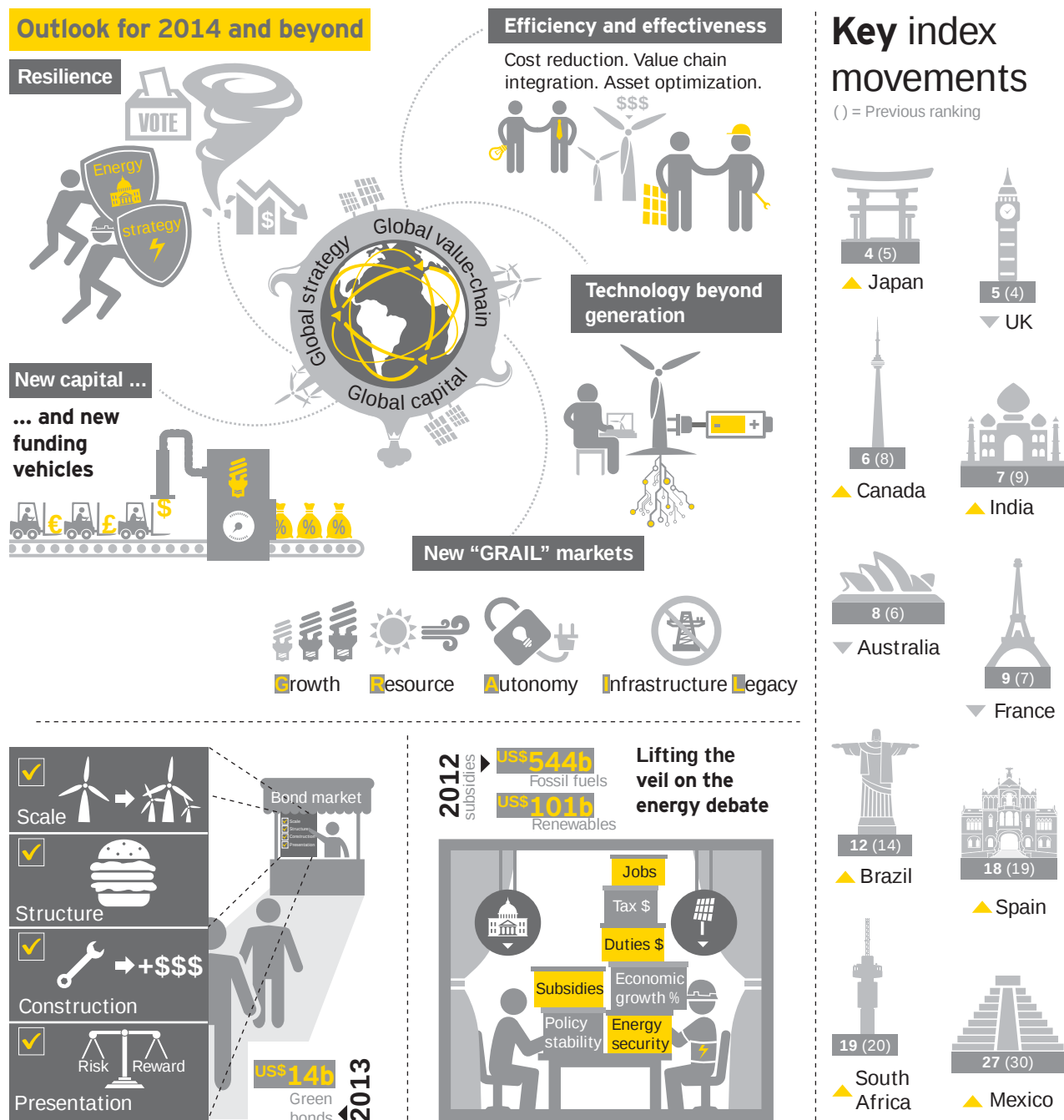
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At a glance ...

A challenging 2013 has highlighted the need for a more globally integrated sector, new sources of capital and greater transparency.



Summary

An overview of this issue

The good, the bad and the tomorrow

As we close the door on 2013 – a year that saw us celebrate the RECAI's 10th anniversary and watch the term “tariff reductions” become almost viral – we look at which countries flourished and which floundered to see whether lessons can be learned.

Such reflections have helped us identify the top 10 developments expected to shake up our index in the next 12–18 months.

Looking at the sector more broadly, we explore the five trends that will play a critical role in shaping the global renewables sector in the year ahead and beyond:

- Resilience
- Efficiency and effectiveness
- Infrastructure technology beyond generation
- New markets to watch
- Innovative financing



The era of transparency

One of the defining characteristics of 2013 was the power of policy – or often, politics – in the energy debate. But in too many cases, this debate is one-sided, uninformed and opaque.

Discussions about subsidies almost wholly focus on renewable energy support, ignoring the US\$544b of fossil fuel subsidies paid out annually. Policy-makers' rhetoric suggests they are trying to juggle different energy objectives, when in truth, it just comes down to the economics.

And it is in light of these realities that transparent and informed debate is required about the true cost of energy. This is the only way that markets will determine, and achieve, their own optimal energy mix.

The time for games and political point scoring has ended. The time for sensible, grown-up debate has begun.

Know your bonds

Green bonds issuance soared to almost US\$14b in 2013, indicating a deep pool of capital for the clean energy sector to tap. But with project bonds representing less than a quarter of this, we look at what's required to make this increasingly popular funding vehicle suitable for large-scale infrastructure.

What becomes clear is that project bonds – though not that different to project finance – are not a one-size-fits-all panacea that will meet the funding needs across the whole renewable energy sector.

Rather, the recent success of the Greater Gabbard offshore transmission project in the UK highlights that scale, structure, construction finance and presentation of the deal to the market are key steps if developers and investors are to successfully leverage the benefits the bond market has to offer.

Solar shakes up the index

An adjustment to the technology weightings, to reflect the increasing importance of solar in the global energy mix, has generated significant movement in the index this issue.

Countries across Southern Europe, Latin America, Asia and the Middle East have benefited from the adjustment, while those in wind-heavy regions such as Northern Europe, and particularly the Nordics, have slipped down the index.

Top 10 shuffle

In addition to the technology re-weighting, key market developments have also prompted movements in the rankings this issue.

Japan replaces the UK in fourth place thanks to its rapidly growing solar markets, a burgeoning offshore sector and proactivity in addressing infrastructure barriers.

The UK, meanwhile, continues to be hampered by political infighting and mixed policy measures. A series of project cancellations in the offshore wind sector also helped to take it down to fifth place.

Australia also continues its fall from grace, dropping two places to eighth position. Government measures to scrap carbon pricing and clean energy funding are derailing the country's progress to create an economically viable renewables market.

Large-scale tenders in Quebec and the removal of local content obligations from Ontario's renewable support scheme have helped Canada to move up to sixth place this issue.

Finally, in the top 10, India and France have switched places once again, with India jumping to sixth place while France slips to ninth.

Recovery and growth are expected for India after a relatively weak 2013, with ambitious targets and a series of large-scale project announcements creating a robust pipeline.

In France, a weakened macroeconomic climate and a prolonged review of the country's energy strategy continue to leave the renewables market in limbo.

Other notable rises

Outside the top 10, successful competitive bidding programs in Brazil and South Africa in 2013 have helped boost the project pipeline, taking these markets up to 12th and 19th place, respectively.

Elsewhere, Mexico has jumped three places thanks to energy market reforms that are expected to boost competition and economic growth. In Spain, the first unsubsidized solar PV plant could prompt a slow market recovery, while the offshore sector is also starting to see signs of life.

The gap narrows

While there were no ranking movements for our top three markets, the score gap has narrowed between the US and China, and Germany has lost critical points.

China has once again accelerated its deployment efforts, while congressional gridlock continues to hamper US policy. In Germany, January's reform package brings clarity but also the likelihood of a slowdown for the sector.

EU in the spotlight

The release of two major European Commission (EC) proposals in late 2013 and early 2014 are likely to have global repercussions.

The EC finally released details of the proposed post-2030 climate and energy goals, though the lack of binding renewable energy targets for individual Member States has caused outrage across the sector.

Meanwhile, the release of guidelines on permitted state aid for renewable energy projects could prompt revisions to support regimes across much of Europe, potentially affecting its relative global competitiveness.



The good, the bad and the tomorrow

With the industry at a tipping point in terms of energy policy and with new investment in clean energy in 2013 dipping 11%, a second annual fall, we've taken a look back at which markets managed to weather the storm and which were lost to the waves to understand what 2013 can tell us about the outlook ahead. RECAI Editor Klair White reports.

Good year for ...

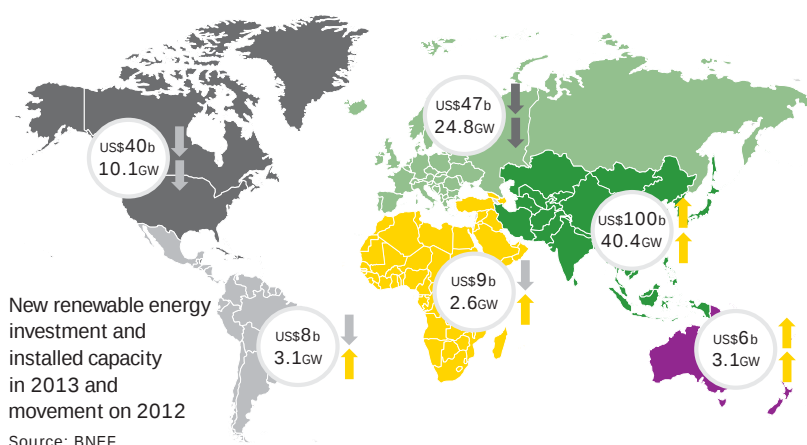
With competitive bidding programs increasingly replacing feed-in tariffs (FITs) as governments' preferred power offtake support mechanism, it was inevitable that Brazil and South Africa – the frontrunners for large-scale national capacity tenders – would continue to feature prominently on the global renewables stage.

South Africa's procurement process hit various milestones in 2013, including financial close on Round 2 projects, the awarding of preferred bidder status to Round 3 projects, and the first grid-connected project under the program.

Meanwhile, **Brazil** held five auctions last year, including its first solar-only auction, paving the way for a much-anticipated solar boom that has so far been absent due to extremely low wind prices. As expected, wind once again dominated the tender process, but all eyes are now on whether these projects can be delivered.

Latin America provided other notable rising stars last year. **Chile** has jumped from near the bottom of the index to 16th place, having approved over 9.9GW of renewables projects, many of significant scale and backed by international developers, despite no formal power offtake incentive regime.

Meanwhile, **Turkey's** solar sector seems to be withstanding political unrest in the country, with developers submitting applications totaling 9GW for the 600MW on offer in June 2013.



In **Asia**, new investment in renewable energy increased **10%** in 2013 to over **US\$100b**.

The generous FITs introduced in **Japan** in 2012, largely spurred by antinuclear sentiment, prompted elevated offshore wind ambitions and almost 7GW of solar projects installed in 2013, helping it jump from seventh to fifth place. Grid infrastructure barriers have tempered Japan's renewables boom, though the Government appears to be tackling this proactively going into 2014.

Despite its realignment to second place in May 2013 to reflect barriers to foreign investment, **China** has remained a dominant market in the index, reflecting an unprecedented pace of deployment backed by substantial targets and continued high growth in energy demand. Effective government policy has also encouraged consolidation and solar market recovery, helping China to remain in second place.

Bad year for ...

Germany's renewables market took a battering in 2013, with September's election prolonging discussions on how best to curb rising energy prices. Calls to reform the FIT program in February 2013 and ongoing rhetoric about "affordability" were not translated into policy statements, making developers and investors nervous and contributing to a staggering 46% fall in new investment. The overall robustness of Germany's market has helped keep it in third place, but 2014 will determine its long-term attractiveness as the new coalition's policy plans become clearer.

India fell from fourth to ninth place in 2013. August's reinstatement of generation-based incentives for wind came too late to reverse a dramatic fall in activity, while ongoing infrastructure barriers, a poorly enforced certificate trading mechanism and delays to the second phase of the national solar auction masked the country's true potential.

After jumping up the index to fourth place to reflect a strong decarbonization agenda and high levels of investment from Asia, **Australia** slipped down to sixth place in late 2013. September's Liberal/National Party Coalition election victory prompted a dramatic policy U-turn, with proposed legislation to abolish carbon pricing and the US\$9b Clean Energy Finance Corporation, and increasing speculation over the scaling back of the national Renewable Energy Target. Australia's attractiveness therefore remains in limbo.

Last year only got worse for many Southern and Eastern European countries, with the impact of severe subsidy reduction programs weakening project pipelines.

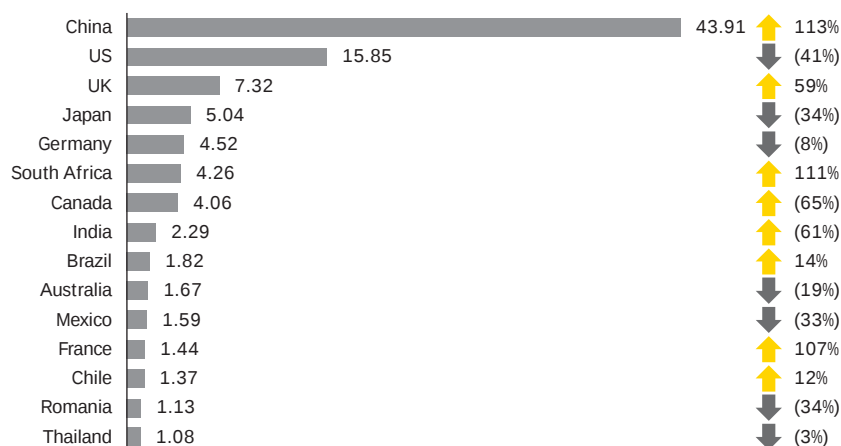
Retroactive cuts in **Bulgaria**, **Greece** and **Czech Republic** prompted a mass exodus of investors and developers. **Spain's** determination to bring down its budget deficit led to yet more dramatic measures, including profitability caps, indexation adjustments on FIT rates and flat rate taxes on electricity generation. However, 2014 may prove to be an interesting year for Spain as more subsidy-free solar projects enter the pipeline.

In **Europe**, new renewable energy investment decreased **44%** in 2013 to **US\$47b**.

The shining stars of Eastern Europe, **Poland** and **Romania**, unexpectedly lost their sparkle in 2013. With both markets poised for a solar boom on the back of generous green certificate (GC) allocations, policy U-turns saw Romania freeze and then cut its subsidies, while Poland is to abandon its revised GC scheme in favor of an auction process. Whether they are able to bounce back in 2014 remains to be seen.

In the **Middle East** and **North Africa**, a slow recovery from the Arab Spring and an absence of clear policy frameworks resulted in the loss of Egypt, Tunisia and the UAE from the index in May 2013. The region has promised a renewables boom, but it has been slow to materialize.

New-build asset finance in 2013 (US\$b) and % change on 2012



Source: BNEF

Stable year for ...

Political point scoring over rising energy bills, failure to agree on a 2030 decarbonization target and a lack of timely details on the Electricity Market Reform (EMR) kept the **UK** renewables market in a state of heightened uncertainty in 2013. However, there were still signs of buoyancy, with over 18GW of applications for the "final investment decision" program, a £800m (US\$1.3b) boost for the Green Investment Bank, financial close on the world's largest offshore wind project and a series of high-profile IPOs. This mixed bag resulted in a relatively promising year despite the ongoing EMR, which appears increasingly desperate. However, the recent mothballing of several offshore projects could signal a stormy 12 months ahead.

In the **US**, the shale gas boom and underlying partisan politics continued to put strain on the renewables sector. The wind sector experienced a dramatic slowdown following the late extension of the production tax credit (PTC) in 2012. However, amendments to the PTC criteria in early 2013, which effectively extend the eligibility period in some cases, prevented a similar boom-bust scenario for the December 2013 expiry. A modest recovery is expected in 2014 as remaining PTC projects are constructed and installed.

In each **other region** (excluding Asia and Europe), 2013 new investment varied on 2012 by less than **US\$2.5b**.

Meanwhile, President Barack Obama's Climate Change Action Plan strongly reaffirmed his green agenda, and the auctioning of over 5.5GW of offshore wind capacity signaled a new growth market. A mixed year therefore keeps the US steady at number one.

A quiet year saw **France** slip down the rankings in early 2013, with a re-examination of the country's energy strategy stalling new policy measures. However, a series of major auctions for offshore wind, solar and marine projects helped maintain a top 10 position, while recent talk of a carbon tax and nuclear levy also helped put alternative energy back on the agenda.

A World Trade Organization ruling on Ontario's local content requirements prompted an overhaul of its FIT program. However, a proactive shift to competitive tendering, also underway in Quebec, helped keep **Canada** in the top 10.

Looking ahead

Here are the top 10 developments we expect to shake up our index in the next 12–18 months.

1. New growth markets such as Ethiopia, Kenya, Indonesia, Malaysia and Uruguay will likely displace European markets with limited growth potential.
2. Troubled offshore markets in the UK, Germany and the Nordics will find their dominance challenged by China, the US, Japan, Taiwan, South Korea and even India.
3. Brazil will continue to see high levels of wind deployment, and its nascent solar market will experience rapid growth. A large supply of turbine manufacturers will also make it a supply chain hub for Latin America.
4. Electricity market reform in Mexico will open up its energy sector to foreign competition and boost economic growth.
5. Europe will experience a year of reckoning as policy reforms start to crystalize and, for good or ill, generate tangible effects. Stability created by a new coalition in Germany is also expected to calm European markets.
6. Saudi Arabia is set to run the next major procurement program but must accelerate the pace to sustain interest. Russia's second auction could put it in contention for an index position, while more tenders are expected in Europe and India.
7. The US wind sector is expected to make a modest recovery. However, it will also be the moment of truth for President Obama's Climate Change Action Plan, with opinions divided on whether the rhetoric will generate tangible results.
8. Japan is likely to put increased emphasis on wind energy as it tries to cope with excess demand for solar projects.
9. Troubled markets such as Spain and Australia could see resurgence in project activity as solar and wind applications become economically viable without subsidization.
10. It is a crunch year for Chile. Despite over 9.9GW of project approvals, little is under construction. Faster pipeline deployment is required to maintain current interest in the market.

"Four countries will lead the renewables revolution in the MENA region in 2014. Job creation and a local supply chain will drive activity in Saudi, while high energy bills are putting pressure on annual budgets in Jordan and Morocco. In the UAE, energy diversity will be key."

Nimer AbuAli, EY, UAE

Market matters

But it's not just country- or region-specific developments that will shape the market in 2014 to 2015. As globalization goes viral, the trends and imperatives driving the renewable energy sector will be market-wide, and we expect the following five trends to play a critical role in reshaping the sector in the year ahead and beyond.

1. Shock factor

"Resilience = the ability to spring back into shape or the capacity to recover quickly from difficulties"

In essence, the ability to absorb shocks. But resilience across the world's energy markets is hard to find in recent years. The inability of these energy markets to absorb shocks, whether they be economic downturns, nuclear disasters, natural disasters, falling technology costs, increasing energy demand or changes in government, has produced devastating effects in many markets. It has left nations facing major power shortages, low levels of electrification, dramatic policy U-turns, boom-bust cycles in investment and deployment, bankruptcies and unsustainably high carbon emissions.

Meanwhile, businesses are facing shocks arising from energy price volatility, energy security, exposure to regulatory measures and reputational pressures.

In the year ahead, therefore, governments and business must think about the value they put on energy sector resilience, or ignore it at their peril. Resilience is not organic, however, and proactivity is needed to both create and sustain it.

Government-backed resilience

- **Depoliticizing the energy debate.** Allowing energy to remain in the political arena, subject to political point scoring and periodic upheavals, will only ever support a short-term outlook fueled by media hits and voter preference. Stable long-term policy is required to support stable long-term investment decisions.
- **Determining the true value of energy.** To date, renewable energy has largely been assessed against the burden of subsidy. However, in determining the most resilient energy mix, a transparent and objective assessment of the value of energy is required that also factors in societal and environmental risks and rewards, as well as resilience, beyond just the price of carbon.
- **Taking control.** Markets such as China and Brazil, which have proven their ability to bounce back from global shocks, share a common theme of centralized energy planning that elevates the control a country has over its energy supply. This helps to transcend the whims of the market while still fostering private sector participation.

Corporate-backed resilience

- **Evaluation.** An objective evaluation of the existing energy profile and associated costs, factoring in externalities and opportunity costs.
- **Supply and demand.** Identification of opportunities to reduce energy consumption and the potential for self-generation.
- **Clean focus.** Increased generation or procurement of renewable energy to limit exposure to fossil fuel and transport costs or environmental regulation.
- **Obligation.** A genuine commitment to long-term energy transformation that, as with government, transcends the politics of the boardroom and focuses on the true risks and rewards.

2. The two “E’s”

Despite the remarkable progress mature renewable technologies, such as wind and solar PV, have made in becoming cost competitive with conventional fuels, debates on the affordability of renewable energy and its impact on energy prices dominated the headlines in 2013. This irrepressible march toward grid parity necessitates a stronger focus on efficiency and effectiveness across the value chain, forcing stakeholders at every level to prioritize asset optimization and find new ways to extract value or reduce costs.

In short, “efficiency” and “effectiveness” need to be this year’s buzzwords, with the market setting its sights on the following goals:

- **Value chain integration.** A “networked industry” that fosters upstream-downstream integration will bring synergies into view and under control for those entities operating across the whole value chain.
- **Consolidation on a global scale.** China, Europe and the US are currently pursuing separate solar consolidation strategies. However, a global approach will promote only the most efficient and cost-effective companies, to the benefit of the sector in the long run. This will be particularly critical in the solar and offshore wind markets.
- **Repowering.** As operational assets come to the end of their useful economic life, a focus on asset optimization will create a strong market for repowering, generating demand for new technology and refinancing solutions.
- **Transaction and capital efficiencies.** Primary and secondary financing should be made more competitive and efficient at every stage of the project life cycle. Transaction synergies and innovative contracting structures should also be a focus for cost reductions.
- **Technology improvements.** From longer turbine blades to data monitoring, technological advances must increase generating efficiency and reduce costs. The recent cancellation of several UK offshore wind projects has highlighted specific technical challenges that should become the focus of innovators and project developers in the year ahead.

“The PV market in Europe has halved from 2011 to 2013, but in 2014 and onwards, we expect growth driven by the current level of cost competitiveness with self-consumption as an additional driver.”

Robert Seiter, EY EMEA Cleantech Leader

3. Beyond generation

To date, the majority of investment, transaction and project activity in the renewables sector has been centered on generation assets or the immediate value chain supporting that generation.

The last 12–18 months, however, have highlighted a critical challenge that must be addressed if the global renewables market is to increase both its resilience and its efficiency. Wind energy curtailment in China, insufficient transmission capacity in Japan, offshore grid obstacles in Germany and low levels of connectivity in Africa highlight that a robust energy future is not just about the wind turbine turning or the oil rig drilling.

- **The challenge.** Getting energy generated in the wrong location at the wrong time, to the right consumers at the right time.
- **The problem.** Inadequate transmission networks, intermittent generation, inaccurate forecasting, lack of visibility and control over supply and demand, low level of electrification in rural areas.
- **The solution.** Grid expansion and transmission efficiencies; supply management through advanced digital software; smart grids; net metering; distributed applications; and looking further ahead to the ultimate game changer, the commercialization of storage technology.
- **The 2014 message.** Robust transmission infrastructure and efficient distribution channels are critical cogs in the energy machine. Significant resource and investment are still required to develop and deploy these technologies if policy-makers and businesses are to achieve their optimal energy mix.

“The digitalization of energy will create a revolution that will have a significant social, economic and environmental impact similar to the massive changes that the mobile phone revolution created.”

Gil Forer, EY Global Cleantech Leader

4. Seeking the GRAIL

A trend that has shaped the renewables landscape over the last five years, and shows no sign of disappearing, is the critical role of emerging markets in driving renewables investment. In 2012, they contributed 46% (US\$212b) of new investment in the clean energy sector.

As grid parity gets closer and subsidies are wound down, developers and investors are no longer just chasing the best tariff regime around the world.

What makes new markets attractive for renewable energy investment – and renewable energy attractive for new markets – is increasingly down to more fundamental factors:

- **High energy demand growth.** Driven by population and economic growth – many emerging markets were shielded from the economic recession.
- **Energy autonomy.** Overcoming reliance on imports to increase energy security, or freeing up indigenous energy sources for export.
- **Lack of energy infrastructure legacy.** Developed markets with entrenched and aging transmission networks are struggling to adapt to distributed generating assets and a new energy economy. Markets without such legacy have the ability to generation-leap on the telecoms industry.
- **Low electrification.** Generates opportunities for investment in distributed applications.
- **Natural resource.** Markets in Latin America, MENA and Southeast Asia boast excellent natural resources, offer high generation efficiency and greater site selection, but remain broadly untapped.
- **Absence of local value chain.** New opportunities for international manufacturers and developers as other markets become saturated, while also generating local jobs and know-how.
- **Access to finance.** Often a critical barrier, but precedent deals and high levels of investment by multilaterals such as the World Bank and EBRD will help send signals to private investors.

We have already seen many so-called emerging economies transcend this status to become highly attractive renewable energy markets. But there are many new markets yet to be tapped, and so the quest for the “GRAIL” countries begins.

Growth, Resource, Autonomy, Infrastructure Legacy

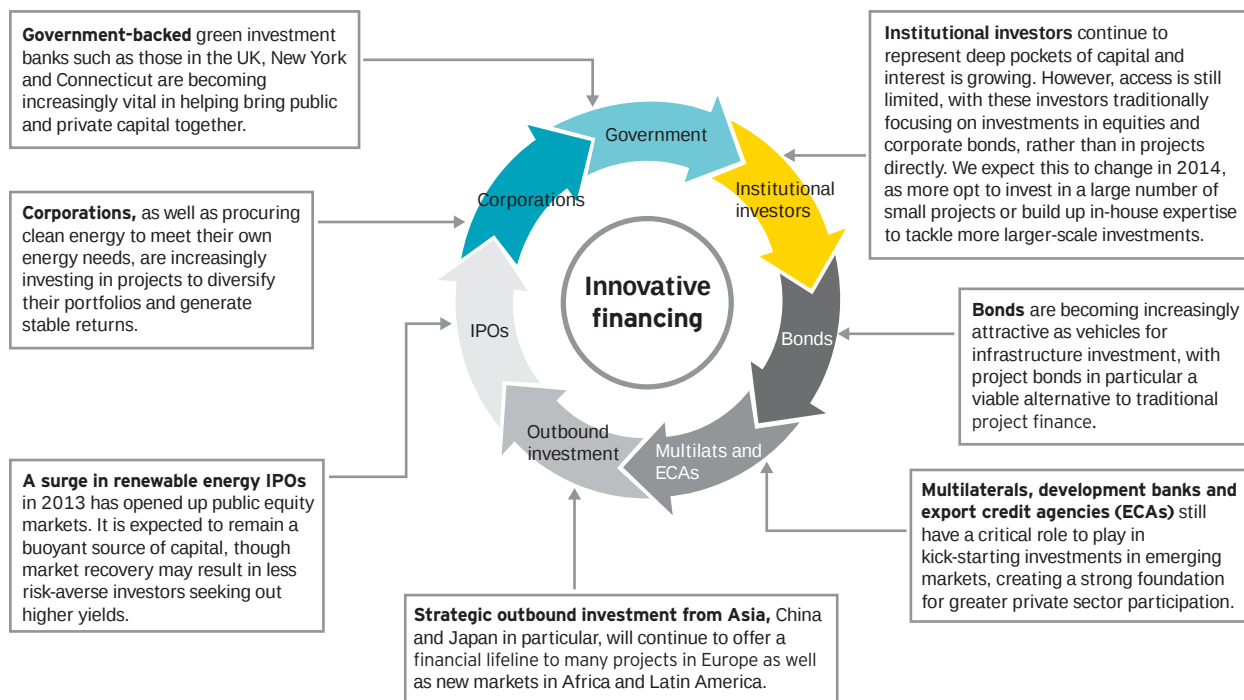
5. Show me the money

An urgent call for new sources of capital and new investment vehicles in the wake of reduced bank liquidity and constrained balance sheets dominated the investment landscape in 2013. Progress has been made, but with non-recourse debt no longer available in abundance, the theme of innovative financing will remain at the fore in the years ahead.

New conduits are still required to bridge the gap between investors and projects, supported by policies that create the right climate for investment.

“As a capital-intensive sector, accessing diverse pools of capital is critical for the future of the industry.”

Ben Warren, EY Global Cleantech Transactions Leader



Key takeaways for success in the 2014 renewables market and beyond:

1. Renewable energy is now a truly global market. Stakeholders must develop a global strategy and a global supply chain, be flexible to market changes, and be willing to go in search of new markets.
2. Continuous innovation in both generation technologies and supporting infrastructure will drive cost efficiencies and generate significant investment opportunities across both developed and emerging markets.
3. Renewable energy financing is no longer just the remit of banks and utilities. There are deep pools of capital to be tapped, but creative solutions and new conduits must be identified to open up the finance markets once again.

Key developments

Country-specific highlights

Hot



China streamlines solar. After installing a record-breaking 12GW of solar capacity in 2013, China will be targeting as much as 14GW this year and has ramped up its consolidation efforts. In early January, the Government published a list of 109 Chinese solar companies that remain eligible for domestic support measures such as favorable financing terms and participation in public tenders. Moreover, state-owned electricity grid operators must now purchase all available solar power or risk penalties. A solar sector recovery appears under way.

India scales up. After a series of delays, phase two of India's ambitious National Solar Mission attracted bids totaling 2,170MW, almost triple the 750MW on offer. This solar success will likely boost support for government plans to launch a similar program for wind; the National Wind Energy Mission, announced in January, will target 100GW of wind power by 2022, a third of India's estimated wind energy potential. Recent government plans for a 5GW solar project in the Ladakh region further emphasize the scale of India's renewable ambitions.

Mexico shake-up. A radical energy reform bill approved in late 2013 is expected to boost Mexico's economy and increase international participation across the sector. In addition to opening up the oil and gas markets to private competition, ending a 75-year monopoly, it will also help create an independent grid operator and a competitive wholesale power market. These reforms, and a new carbon tax that took effect on 1 January, are expected to boost foreign and domestic investment into an already burgeoning renewables sector.



Not

Australia risks derail. Government bills to repeal the carbon pricing legislation and the US\$9b Clean Energy Finance Corporation were approved in the Lower House in November. The Government will also undertake a review of the Renewable Energy Target. Such developments will inevitably have a downward impact on investment as projects begin to be evaluated on the basis of raw economics, although recent analysis identifying Australia as a key grid parity market for wind and solar signal an attractive market in the long run.

Germany drops the axe. The long-awaited formation of a coalition Government and the release of specific proposals on how this coalition intends to tackle rising energy costs have brought some much-needed clarity to the German renewables market. However, this clarity also paints a picture of capacity and subsidy reductions, along with the introduction of surcharge payments for self-consumption of renewable energy. The sector's reaction has been somewhat stoical, but there is little doubt the proposed reforms will reduce the relative attractiveness of the German renewables market in the short to medium term. (See our article on page 22.)

UK in a spin. Government proposals to make mature renewable technologies compete head-to-head for subsidy support from day one of the new contracts for difference (CfD) regime – on top of cuts already planned – have thrown the UK market into a spin. Mixed policy signals on the country's long-term energy strategy are also continuing to reduce investor confidence in the Government's commitment to a low-carbon energy future, while the mothballing of a number of large-scale offshore wind projects has also sparked concerns. (See our article on page 26.)

Key developments

Deal, investment and policy highlights

EU in the spotlight. The release of two major EC proposals looks set to shake up the global renewables landscape in the decade ahead. Guidelines on state aid to the energy sector, released in December, could have a significant impact on the region's competitiveness, while climate and energy proposals for the post-2020 period, published in late January, will likely form the cornerstone of any global climate change treaty in 2015. Given their significance, this issue's market roundup focuses on these latest EC proposals.

2030 climate and energy goals

- Binding target on each Member State to reduce greenhouse gas emissions 40% below the 1990 level – double the 2020 target of 20%
- EU-wide binding target for renewable energy of at least 27% in 2030 (up from 20% by 2020), though no specific binding targets on individual Member States (unlike the 2020 target)
- An indicative target of increased energy savings of 25% by 2030, though the role of energy efficiency will be subject to further debate
- Reform of the EU Emissions Trading Scheme to establish a flexible supply reserve to prevent oversupply and ineffectively low prices
- New governance framework to simplify and streamline processes for reporting on Member States' national plans and EU-wide targets

The European Council will review these proposals in March, though formal legislation is unlikely before 2015.

The reaction

It seems the European Photovoltaic Industry Association said what everyone else was thinking when it labeled the 2030 package a "lame duck."

Criticism of the proposals generally falls into two categories: those claiming that a 40% emissions reduction target does not go far enough and those attacking the lack of binding renewables targets for Member States.

Admittedly, the proposals were always going to be a compromise given the furious political bargaining in Brussels over recent months. But with the proposals allowing technologies such as nuclear, carbon capture and storage and energy efficiency to be used in meeting the overall goal on carbon, the imperative behind renewable energy deployment has taken a bit of a beating.

State aid for renewables projects

The EC has invited comments on proposed revisions to state aid guidelines for assessing public support for energy projects that will likely require most EU-28 countries to adapt their renewable support schemes in some way. The consultation period ended on 14 February, with the EC aiming to put new rules into force by 1 July.

The proposals cover various aspects of the energy market, but the summary below focuses on the key points that could significantly affect renewables projects across the EU.

- The EC is prepared to authorize aid schemes for renewable energy for a maximum of 10 years, recognizing that EU legislation does not yet fully internalize the costs of environmental pollution.
- State aid should move away from FITs and toward more market-friendly regimes, such as electricity price premiums or tradable certificates. FITs should only be granted for <1MW projects (<5MW for wind).
- Investment aid should cover a maximum of 45% of eligible costs for new installations (slightly higher for midsize and small enterprises, plus 5–15 percentage points in underdeveloped regions). Investment aid previously received must also be deducted from any operating aid.
- Permissible operating aid amounts:
 - "Deployed" technologies (>1%–3% electricity production at EU level)
 - Premiums: limited by competitive bidding
 - GCs: no overcompensation in the aggregate
 - Aid is technology neutral: may define minimum number of different sources but not pre-define the technologies
 - "Less deployed" technologies
 - Premiums: should not exceed the difference between levelized cost and market price for specific technology
 - GCs: no overcompensation in the aggregate for each differentiated level of support
- Feed-in premiums are only applicable until the plant has been fully depreciated, and GCs must not dissuade increased competitiveness.

Global view

Competitive bidding programs, subsidy reductions and unsubsidized projects continue to signal a shift away from fixed tariff support, while energy policy reviews have started to move beyond Europe.

North America

- In the **US**, the PTC for wind projects was allowed to expire once again on 31 December. Amendments to the eligibility criteria in 2013 will likely prevent a dramatic slowdown, but delaying an extension package too long could start to affect developer and investor appetite.
- Also in **US** policy, the White House has ordered all federal Government entities to triple the amount of electricity generated by renewables to 20% by 2020.
- The **US** Government will auction 80,000 acres off the coast of Maryland this year for the development of over 850MW of wind capacity. Currently, there are 11 projects totaling 3,800MW already under "advanced development."
- The **Ontario** Government has introduced a bill dropping the domestic content requirements attached to its FIT scheme.
- **Québec** government-backed utility Hydro-Québec has issued a call for tenders for 450MW of wind farms across the region, all of which must be connected by December 2017.
- For **Mexico** see our "Key developments" on page 12.

South America

- In **Brazil**, wind took all the capacity in November's multi-technology A3 tender (39 projects totaling 830MW) and secured a further 2.3GW in December's A5 auction at an average price of just US\$51/MWh. December also saw 1GW of hydro and 160MW biomass awarded. The A5 auction had attracted a staggering 35GW of bids.
- December also saw **Brazil's** first solar-only auction, attracting high levels of interest by foreign companies. Six projects were awarded 123MW at an average price of US\$96/MWh.
- Spain's Abengoa has won a contract to build a 110MW solar thermal plant in **Chile's** Atacama Desert. The US\$1b project would be the largest solar thermal plant in South America.
- Outside the RECAL, **El Salvador** will hold an international tender for 100MW of renewable energy capacity, requiring US\$250m in investment.

Europe

- **France** launched a consultation on renewable energy support schemes in December, examining both classic models and welcoming new suggestions. It will also consider priority grid access. Also in France, bids have been submitted by at least two consortia for construction rights for two major offshore wind projects.
- Bord na Mona is seeking approval to construct Europe's largest onshore wind farm in **Ireland**. The 1GW project would cost US\$1.38b and is part of the utility's broader plan for a 2GW "Clean Energy Hub" in the Irish Midlands. This hub, valued at US\$7b, would export power to the UK from 2020 and is anticipated to generate US\$1.4b of export revenue annually.
- Grupo Enerpro has completed **Spain's** first unsubsidized, utility-scale 1MW solar plant, and it plans a further 10 projects this year that will also forgo any public subsidies. In another first, October saw the inauguration of Spain's first offshore wind installation, a 5MW prototype installed by Spanish developer and manufacturer Gamesa off the island of Gran Canaria.
- **Romania** has approved cuts to its support scheme for renewables projects completed after 1 January 2014. Wind energy will get 1.5GCs/MW until 2017 and 0.75GCs thereafter (down from 2 and 1, respectively), support for solar was halved to 3GCs/MW, and small hydro will get 2.7 GCs/MWh down from 3.

Europe (continued)

- A proposal to restrict new wind farms to just 2% of **Austria's** biggest state – also the area with the greatest wind energy potential – has cast doubt on whether Lower Austria will be able to meet its energy goals.
- **Norway's** US\$820b sovereign wealth fund, the world's largest, has sought government permission to expand its portfolio to cover direct investment in infrastructure such as renewables, potentially prompting significant capital flows into the sector.
- **Bulgaria** is experiencing another shock as its Parliament approves a new 20% levy on the revenue of existing renewable energy facilities as part of the country's 2014 budget plans.
- For **UK** and **Germany** see our "Key Developments" section on page 12.

Middle East and Africa

- In an unexpected turn of events, **Kenya** has suspended issuing new licenses for wind farms and solar plants until 2017, in efforts to deal with rising electricity costs. In more positive news, three geothermal projects totaling 2GW have been approved for development in the country's central Rift Valley under public-private partnerships.
- Indications by some major lenders, including the World Bank and the EIB, that they will not finance **Morocco's** planned solar projects in the disputed Western Sahara region, could put 1.1GW of its 2GW 2020 target at risk. A tender for three projects in the region was due to be launched in late 2013, but no announcement has been made. Wind has fared better, with the African Development Bank offering a US\$950m grant to advance a 102MW wind farm near Tangiers.

- **South Africa** has awarded preferred bidder status to 17 projects under Round 3 of its renewable energy procurement program, characterized by high demand, low prices and strong foreign interest. (See our article on page 28.)

Other key developments in non-RECAI markets include:

- In **Algeria**, a Chinese consortium has won a tender to construct 233MW of PV projects, with completion expected this year.
- **Ethiopia** has signed a landmark deal with Reykjavik Geothermal that will see US\$4b invested in a 1GW geothermal project, one of the world's largest. A US-based JV has also received approval to construct three 100MW solar projects.
- The World Bank's International Finance Corporation has helped secure US\$221m for a 117MW wind farm in **Jordan** from lenders including the EIB and EKF (Denmark's ECA).

Asia-Pacific

- In a final ruling, **China** will uphold import duties imposed on US and South Korean polysilicon companies last year. Anti-dumping duties remain as high as 57%, while anti-subsidy rates of 2.1% for the US and 2.3%–12.3% for South Korea have been confirmed. For policy, also see our "Key developments" on page 12.
- Recent policy speculation signals a possible return to nuclear as **Japan** battles rising costs and carbon emissions. Meanwhile, an increased FIT for offshore wind looks likely. (See our article on page 24.)
- **Taiwan's** Government has signed two agreements with local companies to build 300MW of offshore wind capacity by 2020 as part of a program to install 3GW by 2030. In December, Siemens announced plans to collaborate with local developers on these first offshore wind projects.
- Looking to new markets, **Pakistan's** Alternative Energy Development Board expects 5GW of renewables to be added in the next three years, while a 500MW solar project is being developed with Canadian support. In the **Philippines**, the Government announced in December the approval of 633.5MW of renewables projects, expected to come online in 2014.
- For **Australia** and **India** see our "Key developments" section on page 12.

Our index

RECAI scores and rankings at February 2014

(See page 30 for individual technology indices.)

Rank	Previous ranking	Market	Market RECAI score	Macro drivers			Energy market drivers			Technology-specific drivers		
				Macro stability	Ease of doing business	Total	Prioritization of renewables	Bankability of renewables	Total	Wind	Solar	Other technologies
1	(1)	US	74.4	65.1	70.8	68.5	51.6	78.7	67.8	70.6	75.6	54.3
2	(2)	China	73.1	66.9	45.9	54.3	60.8	64.9	63.3	77.0	82.6	53.5
3	(3)	Germany	66.8	75.5	61.4	67.0	61.6	74.1	69.1	57.2	59.4	43.9
4	(5)	Japan	64.1	72.6	60.7	65.5	66.2	70.8	69.0	42.7	61.6	52.8
5	(4)	UK	62.8	79.9	76.0	77.6	57.9	70.0	65.2	58.8	44.7	40.2
6	(8)	Canada	58.9	80.3	73.2	76.1	50.5	62.8	57.9	51.7	46.0	43.7
7	(9)	India	58.4	52.1	35.8	42.3	65.5	51.0	56.8	49.6	65.8	43.7
8	(6)	Australia	58.2	81.3	71.5	75.4	43.4	62.5	54.9	44.5	54.9	34.6
9	(7)	France	57.9	69.7	60.4	64.1	57.0	61.6	59.8	48.4	48.8	40.1
10	(10)	South Korea	54.9	67.7	61.4	63.9	62.7	55.8	58.6	40.6	46.6	41.1
11	(12)	Italy	53.7	48.1	44.0	45.6	68.5	64.2	65.9	35.9	48.3	40.5
12	(14)	Brazil	53.4	52.9	37.7	43.8	56.9	53.8	55.0	46.9	48.2	54.7
13	(11)	Belgium	53.3	69.5	77.4	74.2	58.4	55.0	56.4	42.7	39.7	31.0
14	(15)	Chile	52.5	77.2	72.6	74.4	69.1	50.6	58.0	32.1	44.4	33.5
15	(13)	Denmark	52.1	80.1	72.5	75.6	62.8	56.5	59.0	46.8	30.4	28.7
16	(16)	Netherlands	52.0	73.3	60.9	65.8	62.6	61.2	61.8	43.6	33.4	29.4
17	(17)	Portugal	50.7	46.9	65.1	57.8	70.5	51.1	58.9	37.0	39.5	34.8
18	(19)	Spain	50.6	52.7	56.0	54.7	53.6	65.7	60.9	33.1	43.7	22.8
19	(20)	South Africa	50.6	60.7	61.2	61.0	42.4	47.9	45.7	36.1	55.1	21.5
20	(18)	Sweden	50.3	83.7	73.9	77.8	65.5	63.5	64.3	44.5	21.3	37.0
21	(22)	Taiwan	49.4	70.8	63.5	66.4	45.8	52.6	49.9	33.5	44.7	30.6
22	(23)	Thailand	49.2	57.3	69.4	64.5	45.5	52.4	49.7	25.7	51.8	27.8
23	(24)	Turkey	48.3	53.0	51.5	52.1	56.9	49.4	52.4	41.7	36.3	37.5
24	(21)	Austria	48.2	72.3	63.9	67.2	60.1	58.5	59.1	31.6	33.6	33.5
25	(26)	Peru	46.8	61.7	66.2	64.4	35.1	56.1	47.7	24.1	45.7	41.0
26	(25)	Poland	46.1	66.7	53.6	58.8	66.0	52.7	58.0	38.8	25.5	30.6
27	(30)	Mexico	46.0	57.5	57.6	57.6	42.9	52.6	48.7	35.5	36.9	29.0
28	(27)	Ireland	45.2	67.6	72.2	70.4	77.3	59.4	66.6	41.4	13.2	26.7
29	(31)	Israel	45.1	70.1	67.2	68.4	48.6	51.7	50.5	19.0	45.0	13.8
30	(28)	Norway	44.9	78.5	75.1	76.5	50.1	64.7	58.9	42.6	13.5	34.4
31	(32)	Morocco	44.8	49.6	44.8	46.7	57.6	37.6	45.6	34.8	44.8	8.5
32	(33)	Romania	44.6	50.8	47.9	49.1	52.2	51.0	51.5	33.4	35.8	22.9
33	(34)	Greece	44.0	37.5	41.4	39.9	59.5	39.6	47.6	30.1	44.6	25.0
34	(29)	Finland	43.6	80.2	70.2	74.2	60.5	60.7	60.6	42.7	10.6	28.8
35	(38)	Saudi Arabia	42.3	65.0	70.0	68.0	35.5	41.3	39.0	18.1	50.6	3.8
36	(35)	Bulgaria	42.1	56.5	56.4	56.4	54.5	40.6	46.2	27.7	35.5	21.0
37	(36)	Ukraine	41.1	35.4	33.0	34.0	45.3	33.4	38.2	35.3	44.8	26.0
38	(37)	Czech Republic	40.8	61.8	54.9	57.6	58.0	47.0	51.4	24.0	29.8	23.8
39	(40)	Kenya	40.4	44.7	40.4	42.1	52.9	29.0	38.6	31.2	38.8	34.6
40	(39)	Slovenia	40.0	55.5	51.9	53.4	56.8	46.5	50.6	20.5	31.5	29.2

Index highlights

Solar savvy. An adjustment to the technology weightings to reflect the increasing importance of solar in the global energy mix has generated significant movement in the index this issue. While new investment in renewable energy fell last year, solar continued to represent over half the total spend, a trend that is expected to continue across our 4–5 year outlook period.

This recalculation of the technology weightings has contributed to a boost in the rankings for countries across Southern Europe, Latin America, Asia and the Middle East, while those in regions such as Northern Europe, and particularly the Nordics, have slipped down

Given the widespread impact of the re-weighting, this commentary will focus on other key developments that have affected the index, though a roundup of other notable re-weighting movements is provided below.

The **US** and **China** retain their positions at the top of the index, though the score gap has narrowed significantly. China has once again accelerated its deployment efforts, with its program of consolidation already prompting signs of recovery in the solar sector. In the US, congressional gridlock, cheap shale gas and lapsed clean-energy credits have cast doubt on whether President Obama's renewed green agenda will see the light of day.

Germany also retains third place but has lost critical points. Recently announced revisions to renewables subsidies, though providing much-awaited clarity, signal tougher times ahead as the cuts threaten the country's shift away from nuclear.

After a booming 2013, which saw 7GW of new renewable capacity deployed, **Japan** has replaced the UK in fourth place. While the return of the nuclear debate and grid constraints signal challenges ahead, increased investment in storage and transmission and signs of a burgeoning offshore sector have boosted the medium-term outlook.

The **UK** falls to fifth place, as prolonged policy uncertainty is replaced with the less-than-welcome news that mature technologies must compete for CfDs from day one, while a series of project cancellations spell trouble for the offshore wind sector.

India has jumped up to sixth place, with recovery and growth expected after a weak 2013. Ambitious targets, large-scale project announcements, and a series of national and state auctions are creating a robust pipeline, while resolve to maintain local content obligations should boost the supply chain.

Australia drops down to eighth place, with the Government's move to repeal carbon pricing and review the Renewable Energy Target creating a cloud of uncertainty over the sector.

France has also fallen two places, with a weakened macroeconomic climate – reflected by a downgraded sovereign credit rating – and yet more energy market consultations, decreasing the likelihood of a comprehensive renewable energy policy reform any time soon. A ruling by the European Court of Justice in December also makes it likely France's wind FIT will be categorized as state aid by the Conseil d'Etat.

Neighboring movements have boosted **Canada** up to sixth place, although a bill to drop domestic content requirements and plans to prevent the construction of new coal plants in Ontario, together with a call for tenders for 450MW of wind farms in Quebec, have helped boost the market's attractiveness.

Large-scale capacity tenders in late 2013 have helped push **Brazil** and **South Africa** up to 12th and 19th place, respectively, reflecting an increased project pipeline. The third round of South Africa's procurement program was almost 2.5 times oversubscribed, while December saw Brazil's first solar-only auction, opening up this previously untapped market.

Severe policy measures in **Spain** continue to deter investors, but news that the country's first unsubsidized utility-scale solar plant has been completed could spark a revival in the sector. This, combined with some traction in the offshore wind sector, has boosted Spain up one place in the index.

Mexico has jumped three places, with extensive power reforms in late December expected to increase foreign investment and competition in the sector. An improved sovereign credit rating also indicates a more buoyant macroeconomic outlook.

Other markets notably impacted by the technology re-weighting:

Moving up – Greece, Italy, Israel, Peru, Saudi Arabia, Taiwan, Thailand, Turkey

Moving down – Austria, Belgium, Denmark, Finland Ireland, Norway, Sweden

For information on the RECAI methodology, please visit www.ey.com/recal.

1

Finance market



Bonds: are you ready?

If you are eyeing finance sources for renewable energy, then you can hardly have failed to spot the rise of bond funding in the sector over the last year. BNEF calculates that green bond issuance soared to almost \$14b, double the market's previous high in 2010. This has been put down to a surge in supranational bank bonds and the appearance of a new variant, the "self-labeled corporation."

In some respects, this boom in green bonds is to be expected. Bond funding, where an issuer traditionally gives away value in the form of repayable debt plus interest, is a common financing mechanism for infrastructure assets with an established rate of return. And the maturing renewable energy industry, with proven technology; well understood resource risk; and, in some jurisdictions at least, good sovereign credit standing behind revenues, is now much more suited to access these capital sources.

Change in the wind

However, there is a perception that bond markets are costly to access, and a limited track record of renewable energy project bond deals to date has pushed most leverage investors in the direction of traditional project finance. In 2013, project bonds represented just US\$3.2b of the total green bonds issuance according to BNEF.

However, the global financial crisis and new regulation (such as the EU's Basel III) continue to challenge debt tenors and liquidity, encouraging sponsors to shop around for other capital sources and governments to look to stimulate the market. The Greater Gabbard offshore transmission owner (OFTO) project, on which EY acted as lead financial advisor, is an example.

While not a standard renewable energy funding opportunity (being a 20-year availability-based revenue stream, indexed to inflation and unrelated to generating asset performance), the deal was structured in a way that

would be familiar to anyone more used to looking at bank-funded project finance. It was clearly linked to a specific infrastructure asset and, with around 85% debt to equity, it was much more highly geared than many vanilla project financings currently seen in the market.

Indeed, the UK energy regulator, Ofgem, appeared to endorse the use of bonds as an alternative to project finance while referring to the deal. It signaled that the European Investment Bank Project Bonds Credit Enhancement, which was used to guarantee 15% of the transaction, "is designed to enable infrastructure projects such as the Greater Gabbard OFTO."

Look before you leap

However, project developers looking for finance need to be aware of some important considerations before jumping on the bond bandwagon:

- **Size matters.** The upfront structuring and diligence results in significant transaction costs being incurred; therefore, bigger deals (over US\$200m) tend to be required. Developers and sponsors might need to aggregate assets into a portfolio to realize the benefits of the lower margins and longer tenors.
- **You need structure.** Depending on the asset or portfolio of assets, credit enhancement or guarantees and tranching of the capital structure might be needed to realize the right credit profile for financing.
- **Construction adds expense.** The cost of interest in construction can be far higher than for typical bank deals, where commitment fees are paid rather than a full coupon. This additional up-front cost can make construction projects better off with the banks.
- **Presentation is important.** The placement of project bonds in the debt capital markets is key, matching the risk and reward profile and ticket size of the issuance to the right segment of the debt market.

Project bonds are not a panacea for all renewable energy financings, but are worth more than a peek.



An alternative debt source

With these caveats out of the way, what is clear from the Greater Gabbard OFTO is that there is little reason not to at least consider project bonds as an alternative to funding a project. Bonds are a good way of funding large projects that would need very large bank clubs and, post-construction, can provide an excellent refinancing opportunity for short-term debt- and equity-funded projects.

Public versus private

The liquidity and tenor benefits can be maximized in the public market, which gives access to a very wide pool of investors. However, rating requirements and regulation mean that the costs of a publicly traded issuance may be significant. The overall debt cost is also only known at the point of the raise, giving less certainty to equity holders of their returns.

A private placement offers a halfway house providing access to the same investors but on a more negotiated basis. There are opportunities for more custom financings matching up investors and project developers with specific liability positions and funding needs. This can create a simpler route to financing, especially for those developers used to the (apparent) pricing certainty historically provided by the banking market, needing lower up-front costs and with smaller capital raises.

One size doesn't fit all

Project bonds are not a panacea for all renewable energy financings, particularly in instances where projects are smaller and sub-investment grade. However, where mid-to long-term tenors are being sought, the project has opportunities for export credit or other credit enhancement, or if a refinancing strategy is being pursued, bonds should be considered in the potential funding mix.

For higher-risk projects, the bond markets are unlikely to be cost effective and bank funding will continue to have a role. However, the Gabbard example shows the direction of travel for the lower risk end of the project finance market, which is likely to drive those banks that are lending into new areas and structures.

Worth more than a peek

So don't throw away your address book of project financiers from the banks quite yet. However, consider the commercial and financial structuring with half an eye on the project bond market. It may just help you out when it comes to that difficult margin discussion.

Know your bonds

Corporate: issued by a company, normally with multiple operations such as major utility companies, and can be either secured or unsecured

vs.

Government/multilateral: similar to a corporate bond, secured on the balance sheet (e.g., the World Bank's US\$1b climate bonds)

vs.

Project: secured on an individual project such as the Greater Gabbard OFTO

Public: issued into the public markets and freely tradable, making them relatively liquid

vs.

Private: issued to individual investors or group of investors, allowing more tailoring and flexibility

Rated: assigned a rating by a credit rating agency, representing independent external due diligence; a rating can help reduce the cost of finance

vs.

Unrated: not formally rated by an agency and more typically seen in private bespoke issuances where due diligence is usually undertaken by the investors

2

Policy and regulation



Taking the hot air out of the energy debate

Today, if the word “subsidy” is used in an article or speech about energy policy, chances are that the word “renewable” will be right next to it. One of the biggest problems facing the development of renewable technologies today is the growing public perception that they are only ever viable with state or consumer financial support.

That view need not be correct, as is being proved by unsubsidized onshore wind and PV projects that are beginning to appear in places such as Latin America, Spain and Australia. Also, it's a one-sided view. Other energy sources have, and continue, to get subsidies too, but you don't get to hear about them.

The International Energy Agency calculates that global fossil fuel subsidies totaled US\$544b in 2012, more than five times the subsidies for renewable energy.¹ This lack of clarity about state support is not just a problem for renewable energy developers, but for energy policy as a whole.

Biased information

With infrastructure investments already focused on a 20- to 30-year horizon, it is vital to make sure policy decisions are not based on biased or partial information.

At the moment, though, renewable power sources and fossil fuels are not being compared on a like-for-like basis. In Spain, for example, renewable energy is blamed for rising electricity bills even as the subsidy regimes supposedly causing the problem are being axed.

Subsidy benefits

Subsidies themselves are not the problem. Most renewable and non-renewable energy subsidies are there for a reason. Witness Nigeria, whose gasoline subsidies are needed to make energy affordable for ordinary people. When they were axed in January 2012, prices doubled overnight and sparked a nationwide strike, forcing the Government to backtrack.

Elsewhere, energy subsidies can help combat fuel poverty, safeguard jobs, foster innovation or simply ensure that the lights stay on. These are all valid policy drivers – as is the principle of supporting the building of a renewable energy sector so that climate change can be mitigated and the lights kept on for future generations. But measuring the relative merits of such policy drivers, especially in times of austerity when public or consumer funds are scarce, depends entirely on transparency, with governments making the arguments clearly and openly. In most markets, however, this is not happening.

Not all subsidies are the same

This lack of transparency is evident not only in the levels of subsidy but also their nature.

For example, while existing subsidies for traditional fuels tend to be long-standing and systemic, those for renewable energy by and large are intended just to support the earlier adopters of generation technologies and help them achieve scale to bring down prices.

Renewable energy support regimes are falling fast while fossil fuel subsidies are not. Policy-makers should acknowledge this and either publicly justify or rectify it, recognizing that some long-standing subsidies may have become part of a “business-as-usual” scenario that mainly favors vested interests.

Opening up the debate

Even in renewable-friendly Germany, far more public debate has been devoted to green power subsidies than to existing support for fossil fuels. Cuts to support for renewables announced in January led to a quote by newly appointed Energy and Environment Minister Sigmar Gabriel, saying, “For a secure transition to renewable energy ... we need the support of the population. With rising energy prices, we will lose that.”²

1. *World Energy Outlook 2013*, International Energy Agency, 12 November 2013.

2. <http://www.ft.com/cms/s/0/8c207bec-82a1-11e3-8119-00144feab7de.html?siteedition=uk#axzz2rll2NxlJ>

Government and industry need clear terms of trade if private sector capital is going to fund a sustainable energy future.



What this ignores, however, is that surveys, including a January poll by the Allensbach polling company, indicate that the German public by majority is continuing to support renewable energy as a means of transitioning away from nuclear, even at a higher cost, raising concerns that politics appears to remain at the heart of the debate. Industry claims that new renewable energy projects only account for a small proportion of the increase in the surcharge that is being blamed for rising energy prices further suggest that renewables are being unfairly targeted in a one-sided debate.

In the US, transparent and informed debate is difficult with energy policies and priorities differing between states, and partisan politics often turning efforts to discuss the rationalization of financial support for energy into a catalog of defeated bills. Understanding the scale of the issue is also problematic, with credible estimates of fossil fuel subsidies ranging wildly from US\$14b to US\$52b.

More heat than light

Renewables have also become a political football in the UK. Energy retailers publicly blame rising energy prices on green levies, despite the fact that most of the country's estimated £12b (US\$19.7b) energy subsidy supports traditional fuels.³ Stung by his political opponents' populist campaigning, Prime Minister David Cameron reportedly told his aides to "get rid of all this green crap" from consumers' energy bills – a damaging allegation (yet to be formally denied) for a politician who once promised "the greenest government ever."

Renewable energy bodies in most developed markets are aware of the danger that an imbalanced debate may lead to reactive, short-term policy shifts that end up creating long-term difficulties for the renewables sector. In November 2013, for example, the turbine maker Vestas launched a campaign called "Act on Facts" in the UK and Ireland. Morten Albæk, Vestas Group Senior Vice President, explained: "The public debate about wind energy and green levies in the UK is too often being distorted by factually flawed arguments and misleading information."

Follow the money

Nevertheless, the UK is one place where the quest for greater energy cost transparency may have encountered an unlikely ally: the nuclear power industry. A high-profile debate over the price the Government would pay for new nuclear generation (the so-called "strike price") brought energy costs to the fore in 2013. In principle this is nothing more than a standard independent power producer negotiation, but it was significant in helping focus attention on possible political and economic motivations behind pricing, particularly the potential for job creation.

And in agreeing a price of £92.50 (US\$152) per megawatt-hour for the electricity that will be produced by EDF's Hinkley Point C plant when it comes online in 2023, the UK Government set a benchmark against which other new generation sources could be measured. Onshore wind, by comparison, will get £90 (US\$148) per megawatt-hour from 2017, making it look like good value for money. Less mature technologies, such as offshore wind, look more costly, but it shouldn't be forgotten that the main reason for subsidy is to prove immature technologies.

The bottom line

Government and industry need clear terms of trade if private sector capital is going to fund a sustainable energy future. Where financial or regulatory support is required, affordable secure energy, the creation of new industry and tax receipts are expected in return.

What is needed is a single view of the truth about energy costs – present and future. Too often, regulators, industry and government can't agree on the facts: transparent and honest debate will build confidence among investors and the public, enabling informed choices. Transparency is therefore the key to a secure energy future.

3. House of Commons Environmental Audit Committee, Energy Subsidies, Ninth Report of Session 2013–14, Volume 1.



Germany



Highlights

- The new coalition Government has released its proposals for amendments to the support regime for renewable energy, including subsidy reductions and competitive bidding.
- The accelerated FIT for offshore wind has been extended, but national targets have dropped from 10GW to 6.5GW by 2020.
- The revisions have left some market participants even more hesitant to invest and prompted calls for further clarity.
- A proposal to make self-consumption of renewable energy liable for 70% of a consumer surcharge has attracted significant criticism.
- The EU is investigating surcharge exemptions worth an estimated €5.0b.

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The waiting ends. Late 2013 brought Germany a much-awaited coalition Government. Early 2014 brought it a much-feared renewables reform package.

The coalition agreement between Angela Merkel's Christian Democrat Party and Sigmar Gabriel's Social Democrat Party was swiftly followed by a decision to bring energy policy under the remit of the economy ministry, itself signaling the priorities of the new Government. In December, Gabriel took up the post as Germany's new Minister of Economics and Energy, and in January, he rewrote Germany's energy future.

Scaling down. The Government's proposals include the following technology-specific reforms:

- Fall in the average FIT across new renewable energy plants to €0.12/kWh (US\$0.16) from €0.17/kWh (US\$0.23) from 2015
- Reduction in support for onshore wind projects of 10%-20% on 2013 levels from 2015; the current onshore wind FIT average is €0.09/kWh (US\$0.12)
- An annual flexible cap of 2.4GW-2.6GW for new onshore wind installations, beyond which subsidies will fall 0.1% per 200MW
- The reference level for annual installations of new solar PV plants reduced to 2.5GW from 3.5GW currently
- From 2017, tenders of up to 400MW of ground-based PV arrays annually (to be extended to other technologies if successful)
- Annual cap of 100MW for new biomass plants
- "Compression tariff" for offshore wind extended to 2019, but initial tariff reduced by €0.01/kWh (US\$0.01) in both 2018 and 2019. The current initial FIT is €0.19/kWh (US\$0.26)
- Reduced national target for offshore wind from 10GW to 6.5GW by 2020 and from 25GW to 15GW by 2030. Post-2020, tenders may be used to allocate the buildup of offshore wind capacity

Rankings snapshot	Issue 40	Issue 39
Total RECAI	3	3
Onshore wind	3	3
Offshore wind	2	2
Solar PV	4	3
Solar CSP	29	29
Biomass	3	1
Geothermal	5	5
Hydro and marine	11	7

The call for firms producing their own energy to pay a significant portion of the renewables subsidy surcharge has attracted major criticism.

Non-technology-specific measures include:

- A cap on overall renewable electricity generation of 45% by 2025 and 60% by 2035
- Self-consumption of power by operators of both renewable and conventional energy plants will pay 70% and 90%, respectively, of the surcharge paid by consumers for grid-based power, from which they are currently exempt
- “Direct marketing” (the sale of power on the energy exchange) will become mandatory for all new renewable energy plants from 2017, with a phased reduction in the threshold from 5MW to 100kW in the interim period. Under direct marketing, generators receive a premium on top of the power revenue (instead of a fixed tariff), which currently includes a “management” payment to cover transactional costs associated with selling to the exchange. This additional payment will be scrapped under the reforms.

Just the start. The Cabinet has approved the proposed reforms to the Renewable Energies Act (EEG) but must now present these to both houses of Parliament in April. If approved, the amended legislation would come into force on 1 August 2014, though actual cuts to subsidies would only be applied from 2015.

Fighting talk. In a series of powerful speeches, Minister Gabriel proclaimed that Germany has “reached the limit of what we can ask of our economy,” referring to the €24b (US\$32b) annual cost of renewable subsidies, though arguably the cost of fossil fuel subsidies was conveniently ignored. Gabriel also made the somewhat thought-provoking comment that Germany had been “financing the learning curve” on renewable energy for other European countries.

Puzzled reaction. The initial reaction to the Government’s paper on potential amendments was somewhat muted, with market participants now even more puzzled and awaiting further clarification before making investment decisions. However, industry groups and many “Länder” (German federal states) are now starting to openly oppose the changes.

Homemade energy. The measure that seems to have attracted the most criticism is the call for firms that produce their own energy to start paying a significant portion of the surcharge that funds renewable energy subsidies. For self-consuming renewables plants, this would translate to an extra €0.044/kWh (US\$0.06). Exemption from this surcharge to date has prompted industry to generate 25% of its own power and hundreds of thousands of companies and homeowners to install solar panels to reduce their own energy bills. Critics claim it will alienate ordinary citizens from the energy transition.

Going round. But looking at the numbers can also send you round in circles. True, self-consumption has helped to lower the cost of the Government’s energy program as it reduces the volume of power being sold into the grid at above-market rates. But do such exemptions, which also cover energy-intensive industries, also inflate the fee for other consumers and businesses, leading to soaring energy prices? The bottom line does not yet seem clear.

Never a good time. The introduction of mandatory direct marketing for all plants has also promoted a backlash, with claims that it will further limit the participation of citizens and medium-sized companies in the energy transition. Meanwhile, many in the solar sector have lamented the decision to restrict deployment when the technology is becoming increasingly cheaper.

The €5b question. The release of the Government’s EEG reform proposals came just a month after the EC announced its intention to investigate exemptions from the renewable subsidy surcharge granted to some 2,300 energy-intensive companies, estimated to be worth around €5.0b (US\$6.9b) per annum. The review will assess whether the waivers represent unlawful state aid and could force companies to repay the surcharge. The Government rejects the claims, with Chancellor Merkel saying “as long as there are countries in Europe where electricity is cheaper for industry than it is in Germany, I cannot see how we are distorting competition.”

Japan

Highlights

- The nuclear debate looks to be back on the agenda, as rising energy costs and pollution prompt the Government to re-examine its energy strategy.
- A revised 2020 carbon reduction target would allow a 3.1% increase in emissions.
- An 11% solar FIT reduction is forecast following over 26GW of project approvals.
- A government review is likely to increase the FIT for offshore wind, as greater emphasis is put on Japan's wind market.
- Inadequate infrastructure is continuing to create grid connection bottlenecks, but government grants and energy market reform indicate improvements ahead.

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New year, old debate. After a colossal 18 months for Japan's renewable energy sector, signs that nuclear is back on the agenda and a downgrading of the country's carbon emissions reduction ambitions might leave the sector wondering what 2014 has in store. Admittedly, the nuclear debate never really went away, but the increasing trade-off between pollution, cost and public opinion has reignited government focus on the future of Japan's energy mix. The question is, will this throw renewables off track or reinforce support?

Back in the mix. Draft proposals released by the Ministry of Economy, Trade and Industry (METI) in early December stated that, although dependency on nuclear should be reduced as much as possible, it will continue to be used as an important base-load power source, subject to a series of safety measures. Still, it's a far cry from the previous administration's call to phase out nuclear completely by 2030, something that secured significant public support.

Filling the gap. The renewables boom of 2012 to 2013 was largely driven by the energy gap created by this anticipated shift away from nuclear, supported by generous tariffs introduced in July 2012. It was never expected that renewables would fill the gap immediately, necessitating an increase in fossil fuel imports (such as LNG from Australia) to meet demand in the short term. But the nuclear gap undeniably established a long-term goal for domestic, and clean, energy supplies.

Causing conflicts. Unfortunately, the nuclear gap has also pushed up energy prices and increased carbon emissions, sparking a debate on whether the short-term pain is worth the long-term gain once renewable energy deployment is sufficient to displace the majority of fossil fuel imports. The average electricity costs in Japan for industrial users of US\$179/MWh is more than double that in the US and a third higher than the UK. The instant boost to energy security and reduced carbon emissions from a return to nuclear would also potentially weaken the imperative for large-scale renewables deployment.

Ranking snapshot	Issue 40	Issue 39
Total RECAI	4	5
Onshore wind	12	12
Offshore wind	11	11
Solar PV	3	4
Solar CSP	31	31
Biomass	1	2
Geothermal	2	2
Hydro and marine	3	3

The Government is considering increasing the FIT awarded to offshore projects to recognize the higher capital costs.

Carbon comedown. Concern was also prompted after a revised carbon emissions reduction target was announced in mid-November. It calls for Japan to cut emissions by 3.8% by 2020 compared with 2005 levels, while the country's 2009 commitment sought to reduce emissions 25% by 2020 from 1990 levels. Calculations by BNEF, taking into account a rise in actual emissions, indicate this is in fact equivalent to a 3.1% increase in emissions on the original 1990 baseline.

Solar bubble. While such decisions muddy the water on Japan's long-term energy strategy, there is also no escaping the country's strong push on renewables deployment, with solar in particular experiencing tremendous growth. Figures at the end of October 2013 show that, since implementing its FIT program in July 2012, Japan has approved over 26.2GW of clean energy programs and added close to 7GW of capacity, with solar representing over 90% of the pipeline. In November, a consortium of seven Japanese companies opened the 70MW Kagoshima Nanatsujima solar plant, by far the country's largest.

FIT on the block. However, this significant level of activity, combined with falling technology costs, makes it highly likely that METI will cut solar tariffs this year. BNEF has forecast an 11% reduction that would take the tariff down to JPY32/kWh (US\$0.32) for fiscal 2014, though still over a 20-year period. Japan's *Nikkei* newspaper has reported cuts closer to 20%–30%, though it does not provide a source. Cuts to the solar FIT are not expected to have a dramatic impact on growth in the sector, though they may slow activity slightly in the 12–18 months ahead.

Struggling to cope. The more worrying and imminent factor curbing growth in the solar sector is the inability of Japan's transmission infrastructure to cope with the high levels of solar deployment. As early as March last year, just nine months after the FIT was introduced, Hokkaido Electric had received grid connection applications for 1.6GW of PV projects yet estimated it could only connect 400MW of utility-scale solar in total.

Making progress. But 2014 should start to see the results of government proactivity in this area. Last year, it launched a JPY29.6b (US\$300m) grant program to support utilities' installation of large-scale battery systems for increased integration of renewables, while an increasing number of specific flow battery storage projects have recently been approved in various regions, including Hokkaido.

Monopoly reform. Renewables integration is also expected to be boosted by the much-awaited reform of Japan's electricity market, which is currently dominated by 10 regional utilities. In November, legislators approved the first step in reforms to introduce greater competition and scope for more distributed energy. The new legislation will create an independent body to coordinate supply and demand across the nation's electricity grids, with further legislation to liberalize the electricity market by 2016 expected soon.

Change of wind direction. There are signs that the overwhelming focus on Japan's solar sector over the last 12–18 months, though welcome, may be about to rebalance itself with an increased focus on wind.

Finding the right FIT. As well as pursuing an ambitious goal of 1GW by 2020, the Government is also considering increasing the FIT awarded to offshore projects to recognize the higher capital costs. Currently, both onshore and offshore projects enjoy the same FIT of JPY23.1/kWh (US\$0.232) over 20 years, but in late 2013, the Government asked a panel of experts to model a range of scenarios to determine what an appropriate tariff could look like. A higher FIT in 2014 would significantly spur development in an already expanding sector.

Getting a head start. And it seems wind is already learning lessons from its solar cousins. In a bid to avoid infrastructure bottlenecks, a JV contract has been awarded to Mitsui & Co., Marubeni and Softbank to build a series of transmission lines on the west coast of Hokkaido island. The pilot project will service and identify technical issues in areas that are suitable for wind power generation but with weak transmission networks.



UK



Highlights

- The latest EMR proposals would see mature technologies such as onshore wind and solar compete for FITs as early as 2014.
- Final strike price details revealed a £5/MWh reduction across most technologies, while offshore wind got a £5 boost in 2018-19.
- The Government is continuing to send mixed signals over its commitment to a low carbon energy mix, potentially putting £330b of investment at risk.
- The cancellation and downsizing of five major offshore wind projects has reinforced economic, technical and political challenges.

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Never rains but pours. Once again, a plethora of major announcements for the UK's renewable energy sector has brought both joy and tears. Late December saw the EMR receive royal assent, bringing the CfD regime into law and confirming the final strike prices that had been announced earlier in December. The end of 2013 also saw an update to the Final Investment Decision (FID) Enabling process, identifying those projects ranked as provisionally affordable ahead of contract award in early 2014. Finally, some signs of certainty for the sector.

Head to head. But the smiles disappeared as quickly as they arrived following the launch in January of a consultation on government plans to make more mature renewable technologies compete directly for CfD subsidies from day one of the new support regime. This will see onshore wind and solar PV compete head-to-head for the first time as early as 2014. Energy from waste, hydropower, landfill gas and sewage gas will also be included in these "constrained auctions," while less mature technologies, such as offshore wind, wave and tidal, anaerobic digestion, and dedicated biomass plants, will not have to bid competitively for capacity.

Competitive tension. The Government hopes these auctions will return bids that fall below the guaranteed strike prices, with the Department for Energy and Climate Change (DECC) claiming project pipelines indicate a high enough level of demand to create competitive tension. Critics of the proposal say it risks destabilizing investment, for onshore wind in particular, given the regime changes and subsidy cuts already planned. DECC's proposals appear to be in part motivated by the EU's latest state aid guidelines, which require a move away from technology-specific forms of subsidy (see our "Key developments" section on page 13).

Rankings snapshot	Issue 40	Issue 39
Total RECAI	5	4
Onshore wind	4	4
Offshore wind	1	1
Solar PV	7	7
Solar CSP	39	39
Biomass	2	6
Geothermal	15	15
Hydro and marine	20	20

The lack of clarity on the Government's long-term energy strategy comes at a time when energy security is a concern and investors are looking for commitment.

Final strike. The announcement of final strike prices in early December has helped to create some sense of stability, even if the rates for the most mature technologies are now around £5 (US\$8) below those suggested in the original consultation. Offshore wind, meanwhile, received a £5 (US\$8) boost to £140/MWh (US\$229) in 2018 to 2019, but still as part of a phased reduction from £155/MWh (US\$254) in 2015 to 2016.

Mixing it up. However, this glimmer of certainty has done little to dispel accusations that the Government is continuing to send mixed signals. In January, the Prime Minister proclaimed, "We're going all out for shale," as he announced plans to allow local authorities to keep 100% of business rates raised from fracking sites. In early November, Ed Davey – the UK Energy Minister increasingly in charge of damage control – was quick to reassure investors that renewables subsidies will remain intact after Prime Minister David Cameron ordered a review of green levies in consumer energy bills.

Supply security. The worrying lack of clarity on the Government's long-term energy strategy comes at a time when energy security is a real concern and investors are looking for commitment. In December, the EC launched an investigation into the Hinkley Point C nuclear subsidy deal, expressing doubts that the 3.2GW facility "suffers from a genuine market failure." A prolonged investigation could prevent the EDF-led consortium from taking a final investment decision in July 2014 as planned and thereby potentially jeopardize future energy supplies.

Investors want signs. According to Stephanie Pfiefer, CEO of the Institutional Investors Group on Climate Change, independent estimates put the infrastructure investment required to secure UK future energy supply at around £330b (US\$541b) by 2030, but investors need to be confident in the Government's commitment to a low-carbon future.

Not on display. Arguably, however, lobbying the EC to reject calls for a binding 2030 renewable energy target, and yet another close defeat for a proposal to set a 2030 decarbonization target for the UK in 2014 rather than 2016, does not exactly showcase this commitment.

Offshore hit. The UK offshore sector has also taken a battering, with a number of high-profile projects being mothballed in recent months:

- SSE Plc will review its development plans after two offshore ventures missed out on FID funding.
- Scottish Power has canceled plans to develop its 1.8GW Argyll Array project, citing a number of construction and technical issues.
- RWE has scrapped its 1.2GW Atlantic Array project, claiming it was no longer economically viable, and slashed the capacity of its Triton Knoll wind farm down from 1.2GW to 600MW-900MW.
- Dong has acquired the 580MW Race Bank project after Centrica planned to scrap the £2.0b (US\$3.3b) venture amid policy uncertainty.

Rationalization expected. These announcements highlight the technical, economic and policy challenges that lie ahead for the sector. However, with more than 40GW of offshore capacity allocated in site licensing rounds to date – well above the Government's 2020 target of 10GW and exceeding the money set aside to fund offshore projects in this period – further cancellations and mothballing might be expected.

Not written off. There is still much to shout about for the offshore sector. It has emerged relatively unscathed, and indeed boosted, by the finalization of CfD strike prices. The awarding of a site lease to Statoil in November to install the UK's first floating offshore wind farm should boost efforts to open up deepwater sites. In December, final approval was granted to Able UK's £450m (US\$736m) project to construct offshore wind manufacturing and port facilities in northeast England. And in January, the UK's GIB joined forces with Japan's Marubeni on its proposed acquisition of a 50% stake in DONG's 210MW Westernmost Rough offshore wind project.

Doing more. However, the UK Government and the renewables sector itself still have much work to do to regain full confidence. The risks and rewards of the CfD scheme need to be fully understood, and greater certainty is required over budget availability for projects under the Levy Control Framework.



South Africa



Highlights

- Round 3 of the national renewable energy procurement program generated over 6GW of applications for the 1.5GW on offer.
- International developers represented over 75% of the bids.
- Bidding prices fell 46% and 27% on Round 2 for solar and wind prices respectively, indicating increased levels of competition.
- The grid connection of Scatec Solar's 75MW solar PV plant signals a key milestone for the national procurement program.
- Bidding rounds to date have contributed almost US1b to socioeconomic development in South Africa.

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REIPPP does it again. After a series of delays, November finally saw South Africa's Department of Energy award preferred bidder status to 17 projects under Round 3 of its Renewable Energy Independent Power Procurement Programme (REIPPP). The auction was characterized by high levels of competition – generating the lowest bid prices to date – and received significant interest from international developers, representing over 75% of the bids for wind and solar according to BNEF.

Worth the wait. The Round 3 delays – largely to allow lenders to reach financial close on Round 2 projects before processing new applications – clearly did not dampen enthusiasm. The growing maturity of the South African market and the success of the first two REIPPP rounds resulted in significant over-subscription; for the 1.5GW on offer, the Government received 93 bids totaling over 6GW of capacity.

Mixing it up. The successful projects, totaling 1,456MW, comprised seven wind projects (787MW); six solar PV projects (450MW); two solar thermal (200MW); and for the first time, one landfill gas and one biomass project (18MW and 16.5MW, respectively). The successful projects will enter into PPAs with state-owned utility Eskom and receive guaranteed payments for 20 years.

More please. The large number of competitive bids, for wind and solar projects in particular, has prompted the Government to consider awarding additional capacity, although no further details on volume or bidders had been disclosed at the time of writing. Meanwhile, the disclosure of successful projects for the capacity that has been awarded was quickly followed by a raft of announcements by the developers behind the bidding entities, highlighting the significant level of participation by foreign companies.

Rankings snapshot	Issue 40	Issue 39
Total RECAI	19	20
Onshore wind	27	26
Offshore wind	28	28
Solar PV	13	14
Solar CSP	6	7
Biomass	37	37
Geothermal	39	39
Hydro and marine	23	22

The ongoing success of the renewables procurement program and the growing interest of international developers and funders is helping South Africa to blaze a trail.

International success. A consortium led by Irish developer Mainstream Renewable Power confirmed it has secured three wind projects requiring an estimated ZAR9b (US\$912m) and totaling 360MW of capacity. Meanwhile, China's biggest wind farm operator, China Longyuan Power Group, has announced that it has awarded two phases of a wind project totaling 244MW, and Spain's Abengoa confirmed it has secured half of the solar thermal capacity on offer. The 100MW CSP plant will be built next to its existing 100MW KaXu plant, making the company's South African CSP portfolio the largest in the Southern Hemisphere.

Center stage. The announcement of successful bidders, however, has put Enel Green Power SpA firmly in the spotlight. Italy's largest utility was awarded almost two-thirds of the solar PV capacity on offer, securing four projects totaling 314MW, while its two successful wind projects with capacity of 199MW represent around a quarter of the total. The six projects will cost around €630m (US\$866m).

A fighting chance. Enel's success in securing over a third of the projects awarded highlights the higher concentration of sponsors compared to previous rounds. While the impact of this is not yet clear, market commentators have speculated that this could reduce appetite for unsuccessful bidders to take their projects through to future rounds, if the significant work required to submit competitive bids is perceived to be undermined by the success of only a few bidders.

Bidding low. Round 3 was certainly competitive. The average price for solar bids was ZAR993/MWh (US\$97) while wind projects averaged just ZAR736/MWh (US\$72). These prices represent a 46% and 27% fall on Round 2 solar and wind prices, respectively, and are significantly lower than many other markets. BNEF estimates the global average levelized cost of electricity to be US\$128/MWh and US\$83/MWh for solar and wind respectively. While the robust evaluation process should ensure these projects remain bankable, very low bidding prices – as seen in Brazil – can generate concerns over the deliverability of projects further down the line.

The first but not the last. The connection of Scatec Solar's 75MW solar PV plant in September 2013 may help allay these fears. Three months ahead of schedule, it became the first renewable energy project awarded under the REIPPP to become operational, a significant milestone in South Africa's energy transformation.

Finance flowing. Funding appetite for these projects also seems to have remained high. Barclays Africa Group Limited, for example, is to fund almost one-third of the US\$3.3b of projects awarded under Round 3, while Rand Merchant Bank has signed up to underwrite senior and mezzanine financing for 17 bids participating in the latest auction. In October, the Development Bank of South Africa announced it would offer as much as ZAR4b (US\$401m) in additional funding for the REIPPP.

Broader benefits. And it's not only direct investment that is being generated. According to the country's Energy Minister Ben Martins, bidding rounds to date will contribute around ZAR9b (US\$877m) to socioeconomic development. The program is also creating significant job opportunities and higher wages, helping to bring down unemployment levels that have averaged 25% over the past four years. The influx of foreign workers to support construction and operation programs has also helped boost local economies.

More to do. However, more is still required if South Africa is to remain on track to install its target 3.7GW by 2016 and 6.9GW by 2020. Electricity demand growth is putting strain on the grid, necessitating significant levels of investment in infrastructure, while the third quarter of 2013 saw South Africa's economy expand at the slowest pace since the 2009 recession.

On fire. Notwithstanding the challenges ahead, however, the ongoing success of the country's flagship renewables procurement program and the growing interest of international developers and funders is a strong sign that South Africa is blazing a trail across the global renewables sector.

Technology-specific indices

The technology indices reflect a weighted average across macro, energy market and technology-specific parameters.

Rank	Onshore wind		Offshore wind		Solar PV		Solar CSP		Biomass	
	Country	Weighted score	Country	Weighted score	Country	Weighted score	Country	Weighted score	Country	Weighted score
1	US	73.5	UK	74.5	China	74.6	US	72.6	Japan	65.7
2	China	71.7	Germany	70.0	US	74.3	Chile	63.3	UK	64.8
3	Germany	65.9	China	69.0	Japan	70.2	Australia	61.8	Germany	64.6
4	UK	65.7	US	65.4	Germany	69.2	India	60.7	China	62.6
5	Canada	64.2	Belgium	60.4	India	62.6	China	59.5	Brazil	62.5
6	Ireland	61.4	Denmark	60.1	Australia	61.5	South Africa	58.9	US	61.5
7	Sweden	60.9	Sweden	58.7	UK	61.2	Morocco	58.0	Finland	59.4
8	India	60.7	Netherlands	57.8	France	59.6	Israel	57.1	Sweden	58.5
9	Australia	60.5	France	57.6	Canada	59.4	Spain	56.2	South Korea	58.1
10	France	60.5	Finland	57.3	South Korea	58.7	Brazil	54.2	Denmark	57.5
11	Denmark	60.1	Japan	57.2	Italy	58.1	Italy	53.6	Netherlands	56.8
12	Japan	60.1	South Korea	54.7	Thailand	57.9	Turkey	52.5	France	56.2
13	Norway	60.1	Canada	51.9	South Africa	56.6	Peru	50.8	Belgium	56.0
14	Brazil	59.7	Norway	48.3	Chile	56.4	Greece	50.7	Canada	54.9
15	Finland	58.6	Ireland	45.8	Belgium	55.3	Saudi Arabia	50.3	Italy	53.8
16	Netherlands	58.4	Australia	44.4	Spain	55.2	France	48.7	Austria	53.5
17	Poland	57.3	Taiwan	44.1	Taiwan	54.9	Kenya	47.9	India	52.1
18	Turkey	57.2	Poland	37.8	Brazil	54.4	Portugal	47.9	Ireland	51.4
19	Portugal	56.5	Portugal	36.6	Israel	54.2	Mexico	46.5	Poland	51.3
20	Belgium	56.5	Italy	36.4	Peru	53.7	Thailand	45.9	Australia	51.0
21	Austria	56.3	India	36.2	Saudi Arabia	53.2	Taiwan	37.2	Thailand	50.8
22	Italy	56.0	Chile	34.1	Portugal	53.2	Canada	32.0	Portugal	50.0
23	South Korea	56.0	Turkey	32.3	Netherlands	51.8	South Korea	25.9	Norway	49.9
24	Chile	55.1	Spain	31.5	Austria	51.4	Belgium	-	Taiwan	49.3
25	Spain	54.9	Brazil	30.7	Denmark	49.9	Bulgaria	-	Chile	49.3
26	Mexico	53.9	Ukraine	29.6	Greece	49.7	Czech Republic	-	Peru	48.7
27	South Africa	53.5	Peru	29.5	Morocco	49.5	Denmark	-	Spain	47.1
28	Romania	52.5	South Africa	27.8	Romania	48.6	Finland	-	Czech	46.8
29	Morocco	51.7	Mexico	26.1	Mexico	48.6	Germany	-	Slovenia	44.9
30	Taiwan	51.3	Romania	25.5	Turkey	48.2	Ireland	-	Turkey	43.8
31	Thailand	49.7	Bulgaria	25.0	Bulgaria	47.7	Japan	-	Greece	42.9
32	Greece	48.6	Kenya	21.8	Ukraine	46.6	Netherlands	-	Mexico	42.8
33	Czech	48.3	Morocco	21.2	Slovenia	46.2	New Zealand	-	Ukraine	41.7
34	Bulgaria	48.2	Greece	21.0	Czech	45.8	Norway	-	Kenya	40.5
35	Kenya	46.8	Israel	16.5	Poland	44.5	Poland	-	Bulgaria	40.0
36	Ukraine	46.8	Slovenia	13.4	Kenya	44.1	Romania	-	Romania	39.7
37	Peru	46.2	Saudi Arabia	13.1	Sweden	44.0	Slovenia	-	South Africa	37.9
38	Slovenia	44.7	Austria	-	Ireland	35.6	Sweden	-	Israel	35.4
39	Israel	44.5	Czech Republic	-	Norway	35.0	UK	-	Morocco	21.0
40	Saudi Arabia	40.9	Thailand	-	Finland	31.6	Ukraine	-	Saudi Arabia	18.0

Glossary

Rank	Geothermal		Hydro and marine	
	Country	Weighted score	Country	Weighted score
1	US	68.7	China	54.8
2	Japan	57.3	US	54.3
3	Turkey	51.6	Japan	53.2
4	Italy	50.8	Canada	53.0
5	Germany	48.2	Brazil	52.6
6	Kenya	47.4	Peru	51.6
7	Mexico	46.8	Norway	50.5
8	China	46.1	India	49.9
9	France	45.7	Sweden	49.8
10	Portugal	45.1	Turkey	49.6
11	Chile	44.7	Germany	49.5
12	Australia	43.7	Italy	48.7
13	Peru	42.8	Chile	48.5
14	Poland	40.4	Austria	47.9
15	UK	40.0	France	46.9
16	Canada	39.2	Australia	46.8
17	Belgium	38.4	South Korea	46.6
18	India	38.2	Portugal	46.2
19	Austria	37.1	Slovenia	45.2
20	Slovenia	36.7	UK	44.8
21	Taiwan	34.6	Taiwan	44.2
22	Greece	34.1	Poland	44.0
23	Sweden	32.7	South Africa	43.8
24	Romania	32.0	Romania	43.1
25	Netherlands	31.8	Mexico	43.1
26	Norway	31.6	Kenya	42.4
27	South Korea	30.7	Belgium	41.6
28	Thailand	29.1	Netherlands	41.1
29	Bulgaria	27.4	Finland	40.7
30	Saudi Arabia	26.9	Bulgaria	40.5
31	Czech	26.5	Ireland	40.2
32	Ireland	23.5	Denmark	40.0
33	Brazil	22.9	Spain	39.8
34	Spain	22.1	Israel	39.8
35	Denmark	-	Czech	39.8
36	Finland	-	Thailand	39.7
37	Israel	-	Ukraine	39.3
38	Morocco	-	Greece	38.4
39	South Africa	-	Morocco	37.6
40	Ukraine	-	Saudi Arabia	-

Abbreviation	Definition
b	Billion
BNEF	Bloomberg New Energy Finance
CfD	Contracts for difference
DECC	Department of Energy and Climate Change (UK)
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECA	Export credit agency
EIB	European Investment Bank
EMR	Electricity Market Reform (UK)
EU	European Union
FID	Final Investment Decision
FIT	Feed-in tariff
GC	Green certificate
GW	Gigawatt
IPO	Initial public offering
kWh	Kilowatt hours
m	Million
MENA	Middle East and North Africa
METI	Ministry of Economy, Trade and Industry (Japan)
MW	Megawatt
MWh	Megawatt hour
OFTO	Offshore Transmission Owner
PPA	Power purchase agreement
PTC	Production tax credit
PV	Photovoltaic
REIPP	Renewable Energy Independent Power Procurement Programme
t	Trillion
JV	Joint venture

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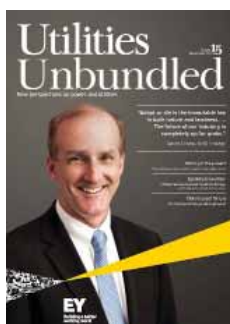
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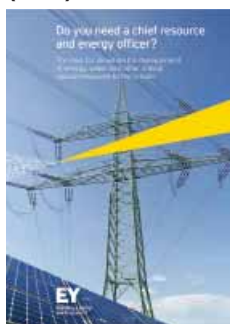
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