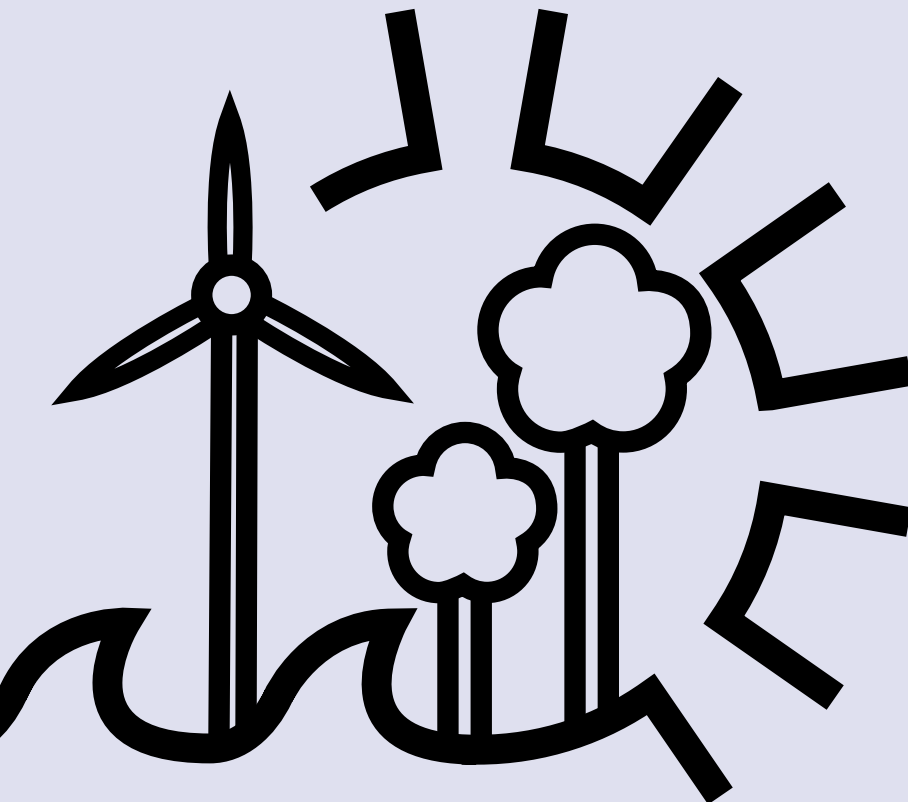


# Renewable Energy Country Attractiveness Indices

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*Quality In Everything We Do*

## Financing a sustainable future



The Ernst & Young Country Attractiveness Indices provide scores for national renewable energy markets, renewable energy infrastructures and their suitability for individual technologies. The indices are updated on a regular basis.

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# Ernst & Young Renewable Energy Group

With a dedicated 30 – strong team of international advisors, supported by a network of specialists, Ernst & Young's Renewable Energy Group helps clients to maximize value from renewable energy activity. The Group provides advice and services in the following areas:

- Financial advisory and valuation
- Financial modelling and structuring
- Taxation
- Finance raising
- Asset value optimisation
- M&A
- Market entry strategy
- Procurement strategy
- PPA tendering
- Transaction support
- PE advice
- IPO advice
- Carbon economy advice
- Strategic partnering
- Strategy review

#### Technologies

- Onshore and offshore wind
- Biomass and biofuels
- Energy from waste
- Wave and tidal
- Solar
- Fuel cells
- CHP
- Landfill gas
- Hydro
- Geothermal

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## Overview of Indices

The Ernst & Young Country Attractiveness Indices provide scores for national renewable energy markets, renewable energy infrastructures and their suitability for individual technologies. The indices provide scores out of 100 and are updated on a regular basis.

The main indices are referred to as the 'Long-Term Indices'. The Near-Term Wind Index takes a two-year view with slightly different parameters and weightings (see below).

The Country Attractiveness Indices take a generic view and different sponsor/financier requirements will clearly affect how countries are rated. Ernst & Young's Renewable Energy Group can provide tailor-made studies to meet specific corporate objectives. It is important that readers refer to the guidance notes set out on page 13 when referring to the indices.

### Long-Term Indices

The Long-Term Indices are forward-looking and take a long-term view, hence the UK's high ranking in the Wind Index is explained by the large amount of unexploited wind resource, strong offshore regime and attractive tariffs available under the ROCs system. Conversely, although Denmark has the highest proportion of installed wind capacity to population level, it scores relatively low because of its restricted grid capacity and reduced tariff incentives.

### All Renewables Index

This index provides an overall score for all renewable energy technologies. It combines individual technology indices as follows:

- Wind Index – 85% (Comprising Onshore Wind Index and Offshore Wind Index)
- Solar Index – 5%
- Biomass and Other Resource Index – 10%

### Individual Technology Indices

These indices are derived from scoring:

- General country specific parameters (the Renewables Infrastructure Index), accounting for 35%
- Technology specific parameters (the Technology Factors), accounting for 65%

### Renewables Infrastructure Index

An assessment by country of the general regulatory infrastructure for renewable energy (see page 13).

### Technology Factors

These provide resource specific assessments for each country (see page 13).

### Long-Term Wind Index

These indices are derived from scoring:

- The Onshore Wind Index – 70%
- The Offshore Wind Index – 30%

### Near-Term Wind Index

The Near-Term Wind Index takes a forward looking two-year view based on the parameters of most concern to a typical investor looking to make an investment in the near-term. The Index gives scores for onshore and offshore separately. For parameters and weightings see page 13.

## Comments and Suggestions

We would welcome your comments or suggestions on any aspect of the Indices.

Tailor-made attractiveness surveys and market reports can be provided taking

account of specific corporate objectives. Please contact the Renewable Energy Group for further details.

### Glossary

AET	Average Energy Tariff (Spain)	MW	Mega Watt (1,000kW)
CHP	Combined Heat and Power	PPA	Power Purchase Agreement
EEG	Erneuerbare Energien Gesetz (the German feed-in tariff)	PTC	Production Tax Credit (USA)
GW	Giga Watt (1,000MW)	RO	Renewables Obligation (UK)
GC	Green Certificate	ROC	Renewables Obligation Certificate (UK)
IPO	Initial Public Offer	RPS	Renewables Portfolio Standard (USA)
LCA	Low Carbon Accelerator (UK)	RTFO	Renewables Transport Fuel Obligation (UK)
Long-Term Indices	Refers to both All Renewable Index and Long-Term Wind Index	WPPI	Wind Power Production Incentive (Canada)

## Issue Focus: The Politics of Renewable Energy



Observers of the renewable energy sector cannot help but notice the shifting balance in the global market for renewables. The sheer size and resources available to countries such as the USA, China, India and Brazil, make them formidable markets for domestic and foreign players.

We are witnessing unprecedented awareness and support for climate-friendly policies in the USA, the most energy and emissions intensive region in the world, from both politicians and the general public alike. Prominent films, such as Al Gore's "An Inconvenient Truth", are reinforced by political support. In addition, the Clinton Climate Initiative (CCI), formed in August 2006, will bring together 24 of the largest cities in the world to discuss sustainable policy making. Similarly, Republican support is evident, with challenging emissions targets set in California, and the Bush Administration's focus on diversifying fuel sources, which includes an increase in the use of biofuels. Together, these initiatives raise the prospect of renewable energy joining the mainstream alongside conventional power sources in the USA.

Political stability in emerging market economies such as China and India has particularly benefited the renewables sector. India's entrepreneurial culture and liberal business policies have helped the domestic wind market become a success story seemingly overnight. Home-grown players such as Suzlon have taken full advantage of this stability at home, such that India's domestic wind capacity is likely to outstrip all forecasts over the coming years. Further east, announcements from China indicate that in the medium term, wind projects could be built at such scale as to dwarf whole countries' entire annual installations. The Chinese State appears to be driving forward a more balanced energy policy, partly due to major environmental concerns and partly for its own energy security. Whilst coal will figure strongly in this strategy, renewables and other zero carbon technologies are seen as vital in the fight against global climate change and the abatement of domestic pollution.

Investment in renewable energy generating capacity in the USA totalled around US\$3.5bn in 2005, a figure expected to have increased in 2006 and to continue rising in the future, with energy security cited as the main policy driver. Similarly, China's renewables

installation will be in line with economic growth, but already investment in renewables (including large hydropower) is the highest in the world, with US\$17bn invested in 2005.

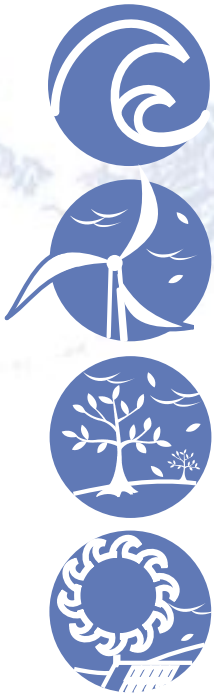
In Europe, the leading regions of Germany and Spain are seen as mature markets for wind. The skills developed have created significant opportunities in the export of goods and services relating to renewables, by German, Spanish and other European utilities, developers and manufacturers. The dominance of these markets is being challenged by the emergence of new players from young, high growth markets such as India and China.

Increased public desire for renewable energy brings with it a responsibility; to meet public demand and legislated targets for renewables capacity, whilst ensuring that such capacity is not at excessive public cost. In regions with feed-in tariff mechanisms for example, a common concern is the cost to the consumer either through levies on energy bills or additional 'green' taxes: Spain, the Netherlands, France, and Germany are all cases in point. Markets operating a green certificate (GC) system will claim that the cost is borne by the market, and that it is the fairest way of achieving renewables targets. However, where GCs are technology blind, they will, inevitably, favour the cheapest technology – namely onshore wind. We are now seeing policies amended to reduce the value of such GCs on wind, and increase them for less mature technologies.

It is possible that European policies will coalesce towards one form of support mechanism, but one thing is certain: political uncertainty without orderly transition prejudices investment. This is an issue that a surprising number of countries are currently grappling with, including Spain, Italy, the UK and the Netherlands. The good news is that all markets appear to show sensitivity towards existing investors, and regulators are becoming increasingly appreciative of the battle emerging over manufacturing capacity. There is no doubt that competition for resources will become increasingly intense as it becomes clear that there is no alternative but to have renewables as a key part of a country's energy mix.

Jonathan Johns, Partner, Ernst & Young LLP,  
Renewable Energy Centre, Exeter

# Global Highlights



## Long-Term Indices

In a surprise move this quarter, the **USA** has climbed above **Spain** in the All Renewables Index to take 1st place, reflecting the significant growth opportunities in the wind sector. Higher targets for emissions in California, and unprecedented support across an increasing number of states employing the RPS mechanism, are seen as key drivers behind the score.

**China** has risen two places to 6th, one place behind **Germany**, reflecting the level of investment flowing into the renewables market in this region.

The policy revision in **Greece** has given hope to developers invested in the significant pipeline of wind projects awaiting consent, justifying Greece's move from 13th to 7th place. Meanwhile, **Norway's** improved score has raised it one place to 14th reflecting a modest new subsidy regime announced in October 2006. **Italy**, on the other hand, drops one place in the indices reflecting some uncertainty over the future of the green certificate mechanism.

## Near-Term Wind Index

The **USA** reached a 10GW milestone in August 2006 and is expected to have 12GW installed by the end of the year. **Spain** retains 2nd place in the Near-Term Wind Index as the uncertainty doesn't affect immediate momentum.

**India**, **Germany** and the **UK** remain in 3rd, 4th and 5th respectively; a reflection of continued project activity in these markets.

**Italian** green certificates and high power prices combine to make it an attractive market in the next two years, hence its position in this quarter's indices.

## Market Activity, Q3 2006

Market activity this quarter began in the Italian wind market, when Endesa acquired a 14MW wind farm, in July, and EnerTAD purchased the rights to two wind farms with a total capacity of 103MW.

In neighbouring France, Theolia acquired a 60% stake in a 30MW wind power development.

In the far east, China's Longyuan Electric Power Group undertook a restructuring, through the merger of three wind power companies within the group to focus on accelerating wind power development. Also in the region, Science Development City, a

Chinese investment company, has formed an alliance with Japanese J-Power, and Chinese developer Shanaxi Wind International Electricity, to develop four wind farms with a total capacity of 174MW in China. International interest in China continues unabated, with Iberdrola acquiring 25.1% of Guangxi Guidong Electric, and Roaring 40s and Datang Jilin Power Generation opening their jointly developed wind farm in northern China in October 2006.

American power company, AES, has expanded its European wind generation business through the acquisition of a minority interest in InnoVent SAS in France, and a majority stake in Bulgarian Kavarna. The two acquisitions give AES access to a pipeline of around 720MW in the two countries.

In solar, China-based ReneSola has achieved a US\$50m IPO on AIM. Suntech Power, another Chinese based firm, has reached an agreement to purchase 66% of Japanese solar PV module manufacturer, MSK Corp., for US\$107m; the remaining 34% is expected to be acquired at the end of 2007 for a price between US\$53m and US\$193m.

Spanish corporates flexed their muscle this quarter when Acciona entered the race to purchase Endesa, acquiring a 10% share in the company for €3.4bn. Meanwhile Spanish utility and wind giant, Iberdrola, entered the Estonian market by purchasing 80% of Estonian wind farm developer Raisner for an undisclosed amount.

In the UK, wind developer Hainsford Energy was acquired by Netherlands based Triodos Bank for an undisclosed amount. In September, USA wind developer Clipper Windpower raised US\$85.1m on AIM, reflecting the exchange's strong renewable energy credentials. The funds raised are expected to be used to fund the Endeavor wind project in Iowa.

Across the channel in Denmark, DONG Energy A/S acquired Swedish based Storrund Vindkraft AB for an undisclosed sum. The deal allows former owners, Borevind AB, to re-purchase 20% of Storrund Vindkraft AB at a future date.

Interest in the sector among the oil and gas giants remains strong with BP Alternative Energy set to expand its presence in the USA through its acquisition of Greenlight Energy for US\$98m. Early positioning in the marine renewables sector, taking advantage of offshore engineering expertise, has enticed Total to acquire 10% of the UK marine turbine developer, Scotrenewables Marine Power.

## All Renewables Index at Q3 2006

Ranking**	Country	All Renewables Index	Wind Index	Solar Index	Biomass & Other Index	Renewables Infrastructure Index***
1 (2)	USA*	71	72	75	64	76
2 (1)	Spain	68	69	72	58	78
3 (3)	India	63	64	61	50	65
4 (4)	UK	62	64	48	57	66
5 (5)	Germany	61	61	71	60	55
6 (8)	China	57	60	42	36	59
7 (7)	France	56	56	58	53	55
7 (6)	Italy	56	57	62	52	63
7 (8)	Portugal	56	57	62	49	63
7 (13)	Greece	56	58	53	43	59
11 (10)	Canada	55	58	41	41	63
11 (10)	Ireland	55	57	36	44	61
13 (12)	Netherlands	54	55	47	42	56
14 (14)	Sweden	52	52	44	53	53
14 (15)	Norway	52	53	33	49	56
16 (16)	Australia	49	50	56	44	51
16 (16)	Denmark	49	50	43	45	58
18 (18)	Belgium	48	50	36	36	53
19 (19)	Finland	38	37	27	50	39
20 (20)	Austria	34	31	48	47	49

\* Indicates states with Renewable Portfolio Standards and favourable wind regimes

\*\* Ranking in the Summer 2006 All Renewables Index in brackets

\*\*\* Combines with each set of Technology Factors to generate the Individual Technology Indices

The **USA** took pole position in the All Renewables Index reflecting a strong long-term outlook for the wind, solar and biofuels sectors, and stretching new targets for emissions reductions set in California. The move also highlights a degree of uncertainty in Spain over the drafting of a new renewable energy law, due out in 2007, about which rumours over a new tariff regime have stirred concerns by wind farm developers.

In Europe, the new **Italian** government announced in July that it is making plans to encourage the use of renewables through splitting out national objectives and making regions accountable for targets. Next door in **France**, changes to the tariff regime have now been confirmed and as a result, rates will no longer fall by 10% once 1.5GW installed wind capacity has been reached. The offshore wind market will replace competitive tenders with a fixed purchase price of €130/MWh, and solar and biogas feed-in tariffs will double to €30/MWh / €103/MWh respectively. The announcement reaffirms France's position in the indices as a stable long-term investment market.

News from **Belgium** in the offshore wind market was the announcement that Thornton Bank is on schedule to be operational in 2011. Further out to sea, Evelop,

a subsidiary of Econcern, announced plans to build a 330MW wind farm, which is due to be operational in 2010, and a consortium of Belgian developers received a concession for a 150-216MW offshore wind farm some 40km from the coast.

Scandinavian markets have stirred once more with **Norway** rising one place to 14th in the Index. This follows an announcement from the government that it plans to subsidize renewable energy sources from 2008. Wind power producers would receive US\$12.08/MWh and biomass producers US\$16/MWh. The subsidies will be paid over 15 years. Also in October, Statkraft announced plans to develop Norway's largest onshore wind farm at 750MW, following their recent completion of the 39.1MW Kjollefjord wind farm.

A major aspect of **China's** growth strategy, targeting 30GW wind by 2020, appears to be driven by joint ventures with regional authorities as well as the government's centralized tendering process. Project size is on the increase, and soon may be a rival to the USA, with projects such as China Longyuan Electric Power Group and Weichang county's impressive 1,600MW onshore wind farm. Foreign developers are also taking on major developments including Gamesa Energy China,

## Long-Term Wind Index at Q3 2006

Ranking**	Country	Wind Index	Onshore Wind Index	Offshore Wind Index
1 (2)	USA*	72	78	58
2 (1)	Spain	69	78	49
3 (3)	India	64	74	41
3 (3)	UK	64	63	66
5 (5)	Germany	61	61	62
6 (6)	China	60	63	53
7 (8)	Canada	58	63	47
7 (13)	Greece	58	62	49
9 (10)	Portugal	57	62	45
9 (10)	Ireland	57	58	55
9 (6)	Italy	57	62	43
12 (8)	France	56	58	52
13 (12)	Netherlands	55	54	57
14 (15)	Norway	53	55	51
15 (14)	Sweden	52	53	52
16 (16)	Denmark	50	46	58
16 (16)	Belgium	50	48	55
16 (18)	Australia	50	53	42
19 (19)	Finland	37	37	36
20 (20)	Austria	31	45	n/a

\* Indicates states with Renewable Portfolio Standards and favourable wind regimes

\*\* Ranking in the Summer 2006 Long-Term Wind Index in brackets

who signed agreements with the Shandong government to build a 250MW wind farm portfolio. Investment in production remains strong, with REpower entering a tri-partite joint venture with domestic Inner Mongolia North Heavy Industries Group (NORHEINCO) and Honiton Energy to establish a new wind-turbine manufacturing plant. Regional strategies are unfolding such as in the Ningxia region, western China, where there are plans to invest US\$2.23bn in building nine wind farms over the next 15 years. The installed capacity of the region is expected to reach an impressive 2,150MW by 2020. China's steady climb in the All Renewables and Long-Term Wind Indices is a reflection of what many forecasters see as the biggest potential market for onshore and offshore wind.

Limiting this growth, and hence China's position in the Indices, will be the practical limitations of building a series of wind farms of over 250MW capacity, both in terms of supply of turbines and components, but also a lack of expertise with which to develop projects. China's strength in manufacturing and political momentum may prove onlookers wrong, in which case it could become the focus of the wind industry for many years to come.

Canada's long-term renewables policy may have been doubted in the past, but provincial support has helped it become the 12th country in the world to surpass

1GW of installed wind capacity. Wind installation is well supported at the provincial level with Quebec growing at a rapid pace aiming at 4GW by 2015 and Manitoba launching a 1GW plan in September 2006. There is, however, concern within the industry regarding the continued provision of incentives at federal level, following the incoming Conservative Government's announcement that the funding planned for WPPI (Wind Power Production Incentive) expansion will be frozen.

The Spanish renewables industry was shocked at an announcement this quarter of an emergency decree (RD 7/2006) removing the 2004 regulation (RD 436/2004) support for the market. The proposed changes involved removing the guaranteed minimum payment for renewables and no longer indexing to the average electricity market tariff (AET). Spain's score in the All Renewables Index drops only point, and remains the same in both Long-Term and Near-Term Wind Indices since the uncertainty does not appear to have affected momentum in the wind industry, but does represent a slightly increased political risk as reflected in a drop in the Renewables Infrastructure Index. Furthermore, IDEA the Spanish Energy Agency has indicated that no firm decisions have been made regarding the draft decree, and nothing has actually passed in law to indicate such a dramatic withdrawal of subsidy.

## Near-Term Wind Index at Q3 2006

Ranking**	Country	Wind Index	Onshore Wind Index	Offshore Wind Index+
1 (1)	USA*	89	89	n/a
2 (2)	Spain	83	83	n/a
3 (3)	India	74	74	n/a
4 (4)	Germany	55	55	53
5 (5)	UK	54	52	82
6 (7)	Italy	53	53	n/a
6 (8)	Canada	53	53	n/a
8 (5)	France	52	52	41
8 (8)	China	52	52	n/a
10 (10)	Portugal	49	49	n/a
11 (11)	Ireland	43	43	n/a
11 (11)	Greece	43	43	n/a
13 (13)	Australia	42	42	n/a
14 (14)	Netherlands	39	37	56
15 (16)	Norway	38	38	n/a
16 (15)	Sweden	35	35	54
17 (16)	Belgium	34	33	40
18 (18)	Denmark	31	28	44
19 (19)	Austria	30	30	n/a
20 (20)	Finland	27	27	n/a

\* Indicates states with Renewable Portfolio Standards and favourable wind regimes

+ Countries with no offshore development expected to reach construction in the next two years have been excluded from the Near-Term Offshore Wind Index

\*\* Ranking in the Summer 2006 Near-Term Wind Index in brackets

The Near-Term Wind Index takes the perspective of an investor looking to make a commitment within the next two years. The methodology and weightings used to produce the Near-Term scores are slightly different from that of the Long-Term scores so the two are not directly comparable. The Near-Term Wind Index places a greater emphasis on market growth and takes into account a narrower range of parameters than the Long-Term Index.

The **USA** continues to lead the Near-Term Wind Index, re-enforcing its position this quarter by achieving an impressive 10GW installed capacity in August 2006, and forecasting to reach 12GW by the end of this year. The USA market continues to be boosted by large scale projects such as the 735MW Horse Hollow project.

**Italy's** position in 6th, behind the UK, reflects some of the highest prices for renewable energy generation in Europe. With green certificate prices (set by the former grid operator, GRTN), of €109/MWh, and brown power prices at c.€70/MWh, this market is particularly attractive to investors in the near-term.

**France** has dropped back to 8th place in the near-term, a reflection that the revised tariff and renewable energy

law will not have an immediate effect on the market, and stronger potential from Italy and Canada (given strong provincial support for renewable energy).

The **UK** holds on to its place in the Long-Term and Near-Term Indices, its score unchanged since the Energy Review published in July, which boosted its score in the last issue. In the near-term, the outcome of the Energy Review has raised concerns from the wind industry that it could cause current development to stall given the uncertainty over the revenues under the RO. Nevertheless, the UK position in the Near-Term Wind Index remains at 5th place to reflect continued interest in UK onshore wind and reassurances from government that existing investors should be protected from any adverse effects of the proposals.

## Commentary – High Scoring Countries

### USA (RPS)

Income stream based on RPS Specific Obligation Mechanism and the Production Tax Credit (“PTC”)

Ranking	Q3 06	Smr 06
All Renewables Index	1	2
Long-Term Wind Index	1	2
Near-Term Wind Index	1	1

California introduced its toughest renewables legislation to date in August, setting a target of reducing emissions by 25% by 2020, which provides a long-term incentive to investors and shows a deep level of commitment from one of the largest economies in the world.

Rapid growth in the USA wind market is forecast to continue this year taking total installed capacity to over 12GW by the end of the year. The scale of wind farm projects continues to increase with the completion of the world's largest wind farm 735MW Horse Hollow project owned by FPL Energy in Texas, making Texas the largest wind state ahead of California.

Investors continue to take a positive outlook for the future of the PTC and are investing in the

long-term with the assumption that the PTC will continue. For example, Airtricity announced that it has signed a deal to purchase 500MW of turbines from GE. The turbines will be used in four projects one of which is not due to come on-line until after the PTC expires.

The solar photovoltaic industry has received a modest incentive from the USA Department of Energy which plans to provide US\$170m over three years, aimed at public-private partnerships to research and develop solar photovoltaic technologies. The aim of the subsidy regime is to help make solar PV cost competitive by 2015.

Investors continue their strong support for early-stage solar technology firms with SolFocus securing US\$25m in financing, SolarCity securing US\$10m, Solaria Corp. securing US\$22m equity and thin-film technology company Ascent Solar Technologies completing a US\$16.5m IPO.

Finally, a boost to biofuels with the USA Department of Agriculture (USDA) supporting the industry with 41 energy-related grants being awarded. One such project grant was awarded this summer to Midwest Biodiesel Producers who will receive US\$0.3m to invest in a start-up biodiesel plant. New York State is also supporting biofuels by banning exclusive fuel contracts which have limited the availability of renewable fuels.

### Spain

Option of a fixed price or market based tariff under the Regimen Especial

Ranking	Q3 06	Smr 06
All Renewables Index	2	1
Long-Term Wind Index	2	1
Near-Term Wind Index	2	2

Concern has been growing for some time, particularly in government, over excess profits earned by renewable generators, with average wind earnings 30% above the government target price, reaching €86.61/MWh.

On the other hand, Spain's target under Kyoto, a permitted 15% rise in emissions by 2010, looks to be ever more challenging with an increasing population and one of the highest GDP growth rates in Europe. The country is currently 50% above 1990 emissions levels, and this is likely to influence any final decisions on the new renewable energy law and incentives, mentioned earlier in the Country Attractiveness Indices, as part of an overall emissions reduction strategy. The major Spanish operators are cautiously optimistic that the new laws will not be too radical to endanger the reputation of the country in the renewables

market. There have been oral assurances from government that it is more concerned with capping excess earnings than altering the whole structure.

Wind development continues and soaring steel prices have encouraged some manufacturers to consider using concrete wind-turbine towers. Acciona Windpower for example, have confirmed their interest in returning to this material and others are likely to follow suit. Concrete is returning to favour due to its durability, cost and strength, and with rotor diameters reaching lengths of 128m there is a requirement for towers to be in excess of 100m tall. It is particularly suited to offshore wind parks as it is more resistant to the effects of the sea and corrosion.

According to the Spanish renewables association, APPA, the biomass sector requires urgent attention from the government if it is to reach its 1,695MW 2010 target. Projects are currently reportedly being delayed by insufficient returns on investment provided by the current tariff structure.

The solar market is watching with interest as scaleability of solar PV is tested on a 20MW park in Alicante, to be developed by CitySolar, built and operated for a pool of domestic investors. The park will consist of 200 individual power plant systems on 50 hectares and is estimated to have an electricity yield of 300 million kWh annually.





## India

### Regional feed-in tariffs and tax based incentives

Ranking	Q3 06	Smr 06
All Renewables Index	3	3
Long-Term Wind Index	3	3
Near-Term Wind Index	3	3

India's high position has been brought about by attractive incentives, excellent resources and a stable barrier-free environment for business.

The state of Maharashtra is helping to fuel the growth by setting up a US\$92.9m fund to develop 1,000MW of renewable energy projects over the next three years.

Strength in the market at home has given Indian firms the ability to make international acquisitions. Sterling Infotech Group (SIG), for example, is buying a 40% stake in Finnish wind-turbine company, Winwind, for US\$25.6m.

Leading integrated wind company Suzlon, announced plans for a 100MW wind farm in the

Idukki and Palakad district. Meanwhile, Mineral Sales Private Ltd are investing in a further 40MW at two sites at Harihar and Dhule, and state-owned Oil and Natural Gas (ONGC) are developing two 25MW wind farms in Karnataka and Gujarat.

Danish-Indian partnership Vestas RRB India have announced plans to invest US\$301m to develop wind farms in western India including a 160MW plant in Gujarat State and a 100MW plant in Maharashtra State.

Vestas are encouraging growth in manufacturing, by investing US\$21.4m in a blade manufacturing facility which will become operational in 2007.

Suzlon meanwhile are investing US\$320m in an integrated manufacturing facility, encouraged partly by the fiscal incentives available in India's Special Economic Zones (SEZ).

International interest also comes from German wind-turbine manufacturer, REpower, who have signed a lease agreement with Essar Group for the design and manufacture of 1.5MW wind-turbines in India. The companies have also agreed to set up a joint venture to produce 2MW turbines in 2007.



## UK

### Green Certificate based ROC system

Ranking	Q3 06	Smr 06
All Renewables Index	4	4
Long-Term Wind Index	3	3
Near-Term Wind Index	5	5

The reaction by the renewable industry in the 3rd quarter to the UK government's Energy Review has been largely positive. In particular the strengthened commitment of the Renewables Obligation out to 20% by 2020, with guaranteed headroom of 1% and the possibility of a tapering mechanism in order to protect ROC prices in the event of over-supply, was welcomed as it provides the stability the industry was looking for. There were also encouraging measures to speed up consenting and grid connection. However, the future banding of the RO mechanism proposed by the Department of Trade and Industry (DTI), aimed at the development of less successful technologies is causing concern. The changes would commence around April 2009 and, until decisions are made as to its composition, there will inevitably be greater uncertainty in the near-to medium-term. Consultation is ongoing and a White Paper is expected in April 2007.

The wind industry in the UK continues to grow at an ever-increasing rate year on year. Onshore wind farms to receive permission in Scotland this year include the 45MW Longpark wind farm, the 32MW Drumderg wind farm. In addition, Airtricity have successfully negotiated a 6MW extension to their Ardrossan wind farm. Elsewhere, one of the

first privately owned wind farms in Wales received consent and Michelin opened the largest corporate project in the UK at 4MW.

At a corporate level Spanish utility Iberdrola made its first foray into the UK market with the purchase of approximately 20MW of wind capacity, 18MW from Amec Wind Energy and 2.5MW from West Coast Energy. It has a stated aim of 200MW in the UK by 2011.

Wave and tidal power shows great potential for the UK as an island nation. Financial assistance received by the Cornwall's Wave Hub project included a £4.5m grant from the UK government. The Scottish Executive is calling on industry to provide 160MW of marine power by 2010.

The biofuels industry remains in its youth in the UK, but showed encouraging signs this quarter with D1 Oils announcing a new plant in Merseyside, and AIM listed Renova Energy securing the funding for a second USA plant. Unfortunately, due to a failed planning application, the £11.5m of government funding for a planned biomass plant in Devon was withdrawn.

Finally, in line with the growing renewables market the number of ethical funds in the UK is booming as institutional investors continue to show an appetite to enter the market. The Low Carbon Accelerator (LCA) became the first listed private-equity fund investing solely in renewables when it floated on AIM, and Climate Change Capital (CCC) raised a further £22m through their Ventus 2 & 3 fund raisings and set up the largest private sector carbon fund in the world, which they hope will top US\$1bn.



## Germany

20-year Government guaranteed feed-in tariff under the Erneuerbare Energien Gesetz (EEG)

Ranking	Q3 06	Smr 06
All Renewables Index	5	5
Long-Term Wind Index	5	5
Near-Term Wind Index	4	4

German wind power is going against the predicted decline and has grown by 883MW during the first half of this year, a 73% increase on last year. This surge has been attributed to the realisation of delayed projects from 2005.

The offshore wind market continues to grow with Plambeck Neue Energien receiving approval for a 400MW wind farm, with construction due to start in 2008/09, Offshore Ostsee Wind a joint venture between WPD and Wind-projekt GmbH has also received approval for a 60MW offshore with completion anticipated in 2007/08.

Germany has had a successful history in innovative renewables, and the state-wide grant fuel-cell system operated by Energie Baden-Württemberg has progressed technology into the commercial mainstream. Siemens and Energie Baden-Württemberg have announced plans for the first ever 1MW fuel-cell power plant capable of producing electricity at 70% efficiency. The groundwork for the planned fuel cell hybrid plant is scheduled for completion in 2008, with the plant running at full capacity by 2012.

The German solar sector is securing its silicon supply through long-term fixed price deals. For example, ErSol Solar Energy have signed a contract with Wacker to supply polysilicon for 6 years from 2009. The solar market is also attracting foreign interest with Arise Technologies, a Canadian solar technology firm, signing an agreement with German advisors to explore manufacturing opportunities. Long-term national silicon production has received a boost, with SolarWorld and Degussa jointly constructing a solar silicon plant capable of producing 850 tonnes annually. Production is due to commence in 2008. Silicon shortages have driven SolarWorld to increase the level of waste silicon recycling with the aim of obtaining 40% of its silicon through recycling.

Market activity in the solar sector, rounds off another busy quarter in Germany, and includes Aleo Solar completing their US\$120m IPO and the announcement that Solarvalue will stage a US\$63m IPO in early 2007.

## Offshore Issues

German developer Plambeck Neue Energien has won permission from Germany's federal agency for marine shipping and hydrography for its Gode offshore wind farm in the North Sea. Initially the wind farm, 33km off the Island of Nordeny, will consist of 80 5MW turbines with plans to expand to more than 220 turbines. Costs for the first 400MW phase, to begin construction in 2008/09, are estimated at €750m.

Danish authorities have received applications for a tri-national wind farm in Danish waters. Kriegers

Flak III would be adjacent to KF I and KF II currently under development in German and Swedish waters in the Baltic. If completed, the Danish scheme will make Kriegers Flak the world's largest offshore wind farm, comprising 299 turbines with total capacity of 1,500MW.

Offshore wind farms in the Baltic are reaching a pivotal point with German partners, Wind-Project and WPD ready to move ahead with financing on Baltic 1 wind farm.

## Biofuels Update

The global biofuels market has been enjoying increasing investor attention with impressive market growth rates predicted. Commentators predict a doubling of global bioethanol and biodiesel production capacity over the next two years, albeit from a low base. Whilst the industry, particularly bioethanol, has an established history based on proven technology, the biofuels sector has typically been fragmented, delivered low returns and been dominated by small scale producers. Higher growth rates are being driven by a combination of key drivers, including high oil prices, fuel supply concerns, the search for new markets to support domestic agriculture and the desire to reduce CO<sub>2</sub> emissions (especially within the transport sector).

There has been a clear public policy response to these drivers as governments promote biofuels through a raft of new policies and regulations, unlocking long-term investment. Within Europe for instance an EU Directive in 2003 set clear targets for increased biofuels uptake (2.75% in 2006, rising to 5.75% in 2010). The UK has since translated this into domestic policy through the Renewable Transport Fuel Obligation (RTFO) which has helped drive investment in some of the largest plants in Europe. The RTFO (to be introduced in 2008) requires fuel suppliers to source 5% of their fuel from renewable sources by 2010 and will be a tradeable certificate similar to the ROC. With such a regulatory structure in place, the UK could become one of the largest biodiesel markets in Europe over the next 5-10 years.

A separate EU directive allows member states to exempt biofuels from normal excise duties on transport fuels. Germany for instance, allows a total tax exemption on biodiesel, which has attracted investors into the market, making Germany one of the world's largest producers and consumers of biodiesel in Europe. Across the Atlantic, 2005 and 2006 have been witness to a buoyant USA biofuels market, driven by strong political and regulatory support and an abundance of fuel supply, in the form of corn feedstock. Consumer-led policy, in the form of the 2005 Energy Policy Act, now allows allocation of credits to vehicle fleets using biodiesel, which can be used to fulfil their biofuels requirements, and may promote biodiesels in lieu of the current race to produce bioethanol.

Growth to date has centred on small independents, but the next phase of growth may require larger-scale financial backing. For instance, established fuel distributors are becoming more vertically integrated by acquiring blending/refining capabilities. The response from oil majors to this

growth is particularly interesting. In the most part they have been reluctant to blend and distribute biofuels. However, the position is changing rapidly as various majors announce significant research and development initiatives and take the lead in exploring the next generation of biofuels eg. BP and DuPont announced a partnership in June 2006, to develop, produce and market biobutanol and other biofuels products, starting in the UK. Oil majors' continued participation in the development of a viable consumer market for biofuels is seen as key to overcoming technical and supply chain barriers, which currently hold the industry back. Meanwhile, project financiers are being attracted to the market, providing a valuable source of capital for independents.

Market volatility is prevalent however, and to some investors, the sector is not yet attractive enough. Some IPOs have highlighted that biofuels could quickly fall out of favour, for example failed listings from Jupiter Biofuels in Australia and Hawkeye Renewables in the USA, and Aventine Renewable Energy, who raised US\$390m from their IPO in June 2006, saw their shares decline by 11% during the first day of trading. This trend has been attributed to concerns of over-supply and declining crude oil prices. Investment continues to ply the sector with finance, and this quarter, the biofuels market has again seen a flurry of activity. The German bourse in Frankfurt raised US\$236m for biofuels producer Verbio in October 2006, US\$285m for CropEnergies, and US\$59m for BioDiesel International in September. The Australian markets raised US\$28m for Axiom Energy and US\$27m for Sterling Biofuels in successive IPOs in September 2006.

The rapid growth of the biofuels market has presented investment opportunities across the globe, and looks to continue to do so as companies seek funding to develop second generation technologies. The future for the biofuels market therefore looks bright, but it may be a bumpy ride.

## Euromoney and Ernst & Young Awards

The 3rd Euromoney and Ernst & Young Global Renewable Energy Awards were held at the Marriott Grosvenor Hotel, London, on the evening of 25th September 2006. Over 230 industry professionals attended the event which formed part of the 8th annual Renewable Energy Finance Forum.

The Awards emphasize the growing importance of the private sector in delivering clean and secure indigenous energy supplies for our and future generations, particularly at a time when technologies mature and carbon constraints begin to bite.

The Awards were established in 2004 to recognize projects, companies and individuals who contribute the most to taking the renewable industry forward and demonstrate best practice in renewable energy finance and development.

Nominations for 2006/07 open early next year, therefore now is the time to start considering those most active companies deserving recognition at next year's Awards.

For further information on previous Awards, please visit [euromoneyenergy.com](http://euromoneyenergy.com).

The Euromoney and Ernst & Young Global Renewable Energy Awards 2006 Winners were:

- IPO of the Year  
Suzlon Energy
- M&A of the Year  
Acciona
- Private Equity Deal of the Year  
Babcock & Brown
- Senior Debt Deal of the Year  
HVB
- Entrepreneurial Developer of the Year  
WPD AG
- Corporate Developer of the Year  
CLP Group
- Emerging Technology of the Year  
Shell/Choren
- Most Enterprising New Market of the Year  
BP Alternative Energy
- Renewable Region/City of the Year  
Tamil Nadu, India



Photo: Winner of the Corporate Developer of the Year Award - CLP Group

# Commentary – Guidance Notes

## Long-Term Index

As stated on page 2, the Individual Technology Indices, which combine to generate the All Renewables Index, are made up as follows:

- Renewables Infrastructure Index – 35%
- Technology Factors – 65%

These Guidance Notes provide further details on the Renewables Infrastructure Index and the Technology Factors.

## Renewables Infrastructure Index

The Renewables Infrastructure Index is an assessment by country of the general regulatory infrastructure for renewable energy. On a weighted basis, the index considers:

- Planning and grid connection issues – 42%; Favourable planning environments (low failure rates and strong adherence to national targets) score highly. Grid connection scoring is based on the ease of obtaining a grid connection in a cost effective manner. The score also takes account of the degree of grid saturation for intermittent technologies.
- Electricity market regulatory risk – 29%; Markets that are fully deregulated score higher, as they have experienced the market shock on underlying wholesale prices that this transition may exert. Whilst this may not affect current projects, these effects are particularly important when considering long-term investment prospects.
- Access to finance – 29%; A market with a mature renewable energy financing environment, characterized by cheap access to equity and good lending terms will score higher.

This generic Renewables Infrastructure Index is combined with each set of technology factors to provide the Individual Technology Indices.

## Technology Factors

These comprise four indices providing resource-specific assessments for each country, namely:

- Onshore Wind
- Offshore Wind
- Solar
- Biomass and Other Resources

'Other' renewable energy resources include small hydro, landfill gas, wave, tidal and geothermal technologies. Energy from waste is not considered. Each of the indices considers, on a weighted basis, the following:

- Power offtake attractiveness – 19%; This includes the price received, the potential price variation and length of PPAs granted. Higher scores are also achievable if the Government guarantees the power offtake rather than merchant offtakers.
- Resource quality – 19%; For example wind speeds and the sun index.
- Market growth potential – 18.5%; This considers current capacity compared to published targets. Higher scores are given if ambitious targets have been made and policy frameworks are in place to accelerate development. The realism of targets are also taken into account as well as the

seriousness with which they are being pursued (eg: penalties in place for non-compliance).

- Project Size – 15.5%; Large projects provide economies of scale and a generally favourable planning environment, which facilitates project development financing.
- Tax climate – 11%; Favourable, high scoring tax climates that incentivize Renewable Energy generation can exist in a variety of forms and/or structures. The most successful incentives and structures have been direct renewable energy tax breaks or brown energy penalties, accelerated tax depreciation on renewable energy assets and tax efficient equity investment vehicles for individuals.
- Grant/soft loan availability – 9%; Grants can be available at local, regional, national and international levels; and may depend on the maturity of a technology as well as the geographical location of the generating capacity. Soft loans have historically been used in pioneering countries to kick start the renewable energy industry. High scoring is achieved through an array of grants and soft loans.
- Current installed base – 8%; High installed bases demonstrate that the country has an established infrastructure and supply chain in place, which will facilitate continued growth and, in particular, encourage the re-powering of older projects.

## Near-Term Wind Index

As stated on page 2, the Near-Term Wind Index focuses on factors of most immediate concern to near-term investment in wind energy. The scoring follows the same methodology as for the Long-Term Index but with a more focused set of parameters and a tailored weighting. Therefore the indices consider on a weighted basis the following for onshore and offshore wind separately:

- Power offtake attractiveness – 27%
- Tax Climate – 8%
- Resource Quality – 14%
- Market Growth Potential (mid 2006 to mid 2008) – 40%
- Project Size – 11%

In the Offshore Wind Near-Term Index, countries with no projects estimated to reach construction in the next two years (to mid 2008) are excluded.

It should be noted that the Market Growth Potential score is based on a view taken on the basis of a range of business analysts' forecasts and Ernst & Young's own market knowledge. There is significant variation between analysts' views on each market and within some markets the variation is greater than in others. The forecasts used are a market view only and the scores in no way guarantee that the forecast capacity will be built.

Whilst comparisons have been made between scores in the Long-Term and Near-Term Wind Indices, it should be emphasized that, due to the different weightings and parameters used, these cross-comparisons are of a narrative nature only and in no means indicate any quantitative valuation.

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- Taxation
- Finance raising
- Asset value optimisation
- M&A
- Market entry strategy
- Procurement strategy
- PPA tendering
- Transaction support
- PE advice
- IPO advice
- Carbon economy advice
- Strategic partnering
- Strategy review

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