Renewables & Cleantech

It's all about the cost of electricity production

Companies impacted

SSE

Iberdrola

Centrica

We note a recent broker report highlighting that Scottish independence would pose an unacceptable risk for developers of renewable energy assets North of the border. We would highlight the fact that Scotland is the windiest part of Europe and as such has the potential to be the lowest cost supplier of renewable energy. The UK is bound by EU emission reduction targets and Scottish based renewables will play a key part in decarbonising our energy market place; regardless of the political scene. We therefore do not share the view the SSE, Iberdrola or Centrica are at risk by developing renewable energy assets in Scotland.

- The Scottish National Party (SNP) won an overall majority at the May elections and as such believes it has the mandate to seek independence from the UK. The SNP is expected to seek a referendum on independence in 2013 or 2014. Current opinion polls suggest 45% approval rating for independence. The SNP has laid down renewable energy as its cornerstone policy for job and wealth creation, targeting renewable power generation moving from around 10TWh to around 50TWh by 2020. To achieve this target, capacity would need to double from 13GW to 26GW with the bulk of this increase coming from wind energy. Wind energy would be the lowest cost and mostly readily available power source and as such would be a fundamental part of meeting the UK's carbon reduction commitments.

- We do not share recent competitor analysis that utilities developing renewable energy assets are exposed to stranded asset risk from an independent Scotland. We highlight the following key reasons why this is not the case.

- Leaving the political issues aside - the cost of electricity generation is a function of:

  - The capital cost of the generation plant
  - The operating cost of the generation plant
  - The MWhs of electricity generated per MW of generating plant installed

In terms of wind energy production costs, Scotland has the potential to be the lowest cost generator of wind energy in Europe due its unique wind characteristics.

- Higher capacity wind farms in Scotland can generate electricity more cheaply than the rest of the UK and most of Continental Europe and accommodate large electricity transmission distances. Recent competitor analysis looks at the issue of the cost of future renewable energy generated in Scotland based on today's capital and operational costs for wind farm developments and it fails to recognise that Scotland is the windiest part of Europe (see Chart 1, Table 3 later in this report). As a result of this Scotland enjoys higher capacity factors than the 26% reflected in the recently published broker report. Indeed, capacity factors of around 50% are observed in the windiest onshore locations in Scotland with obvious implications for its offshore wind industry. Generally most operating and to be constructed wind farm sites in Scotland enjoy capacity factors in excess of 30% leading to an IRR uplift of 3% versus 26% capacity sites.

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- Without Scottish based renewables the rest of the UK would be required to build far more MWs of renewable energy (most likely wind) to achieve its climate change objectives. England has a low wind speed regime combined with high urban density and as such the cost of meeting UK Government emission reduction target would be more expensive without Scottish based renewables. We therefore view Scottish independence an irrelevant factor in meeting UK wide reduction commitments as the lowest cost supplier will always be sought first.

- In order to meet the UK's target of 15% of energy from renewable sources by 2020 onshore wind will play a key element in delivering the lowest cost form of carbon free power. This view is shared by a report completed by ARUP and commissioned by the DECC (Department of Energy & Climate Change) in July this year, stating that onshore wind represents the lowest cost form of renewable energy with the potential to deploy 17.3GW by 2030 (median forecast). In addition to this, Scotland is anticipated to remain an important and increasing part of the onshore wind generation, as evidenced in Table 1 and 2. Scotland's wind energy resource is 78% of the UK average, while 62% is either operational, under construction or in planning.

Table 1: UK onshore wind accessible resources

	England and Wales	Scotland	Northern Ireland	UK
Capacity (MW)	20,291	68,824	20,564	109,679

Source: ETSE 200, New & Renewable Energy: Prospects in the UK for the 21st century

Table 2: High-level distribution of UK onshore wind prospects (MW)

	Operational	Under Construction	Consented	In Planning	Total
England and Wales	1,726 (43%)	130 (12%)	1,490 (45%)	1,775 (35%)	5,120 (38%)
Scotland	2,314 (57%)	928 (88%)	1,833 (55%)	3,229 (65%)	8,304 (62%)
GB	4,041 (100%)	1,058 (100%)	3,323 (100%)	5,004 (100%)	13,425 (100%)

Source: RenewableUK & Oxera analysis

- The proposed Electricity Market Reform (EMR) includes the introduction of a Carbon Price Support (CPS) which may lead to increased electricity pricing, particularly if we fail to meet our 2020 renewables targets. The floor price takes effect from April 2013, starting at £16/tCO_2, increases linearly to £30/tCO_2 by 2020 and is planned to increase to £70/tCO_2 by 2030. Analysis completed by HM Treasury, the Committee on Climate Change (CCC) and Oxera predict that CPS will double carbon costs for fossil fuel based industries before 2030. To illustrate the impact upon wholesale electricity pricing, a carbon price of £25/tCO_2 would increase the marginal cost of energy generation from a modern combined cycle gas turbine by around £9.0/MWh. We therefore do not share the view suggested by competitor research that natural gas could meet our overall energy needs in a cost effective manner as this does not fit in with current UK Government strategy. The CPS has the potential to lead to higher long term carbon prices than would have been delivered under the EU ETS (European Trading Scheme) alone. Based upon the UK's dependence upon Scottish wind energy it is a commercial and logical view that the lowest cost of renewable energy will be utilised first regardless of the political stewardship of Scotland.

- Energy security is also a major part of future planning. For the UK to expose itself to greater energy dependence from the Middle East and Russia would be too great a risk for the energy mix. As a consequence we believe that locally supplied clean energy would almost certainly be treated as a priority, not as a stranded asset as depicted in the recently published competitor broker report. We do not see Shale Gas or Nuclear energy providing viable alternatives in terms of cost, risk and return, or meeting our carbon reduction commitments.

- Based upon Scotland's rich wind resource the cost of the UK Government's climate change policies are reduced, not increased. If an independent Scotland were held to ransom with their stranded renewable energy assets this would only lead the rest of the UK paying a higher electricity price (due to carbon costs and the potential for fossil fuel price inflation). Additionally, mainland Europe (in particular Germany) would be a ready buyer of zero emission energy if the rest of the UK was unwilling to accept their neighbours' energy exports. There are already plans to link Scotland's energy exports into the Nord Pool in addition to increasing the availability of pumped storage thereby reducing intermittency from wind and decreasing costs further.

- Another factor omitted from the recent competitor research is the current system charges for accessing the UK grid. Transmissions costs for Scottish based wind farms are substantially higher in order to provide a levelised return for investors based upon increased capacity and to a lesser extent grid transmission distances. See Table 3, which summarises evidence of transmission costs for Scottish based wind farms

Table 3: UK regional load factors and costs (pre-tax)

TNUoS generation zone	TNUos (£/kW)	Capex Index	Fixed O&M	Load Factor (%)
Western Highland & Skye	22.8	1.0	1.3	26-36
North Scotland	20.1	1.0	1.1	24-36
Central Highlands	17.6	1.0	1.3	22-32
Argyll	13.3	1.0	1.3	24-34
South Scotland	12.5	0.9	1.1	22-32
North east England	8.8	1.0	1.0	22-34
Humber & Lancashire	5.4	1.1	0.9	19-29
South Yorks & North Wales	3.6	1.1	1.0	19-29
Midlands	1.6	1.0	0.9	18-28

Source: Mott MacDonald, Scottish Powr & Oxera analysis

- The current UK Renewables Obligation Scheme (ROC) is the main subsidy for stimulating wind energy production. Wind farms attract one ROC per MWh (expected to fall to 0.9ROC/MW after consultation). If Scottish operational wind farms where grandfathered in (although perhaps not) we would still expect the price of ROC's to increase as the rest of the UK utility sector would seek alternative sources of reducing their carbon exposure. Ultimately the rest of the UK would procure the lowest cost of carbon free power and this would almost certainly be found in the Scottish market place. We therefore see minimal risk to developing Scottish based renewable assets regardless of the prevailing political scene. The recently published competitor research suggests that the rest of the UK would be subsidising Scotland's wind energy production, which is true; however without this source of energy the costs of meeting the UK's EU emissions targets would be substantially higher. Utilities operating in an independent Scotland would not require access to ROC as the prevailing wholesale price for clean energy would be sufficiently high enough via power purchase agreements to mitigate the independent risk in our view.

- The future capital cost of wind turbines will be driven down by competition (in particular from the Chinese), innovative design and increasing the rated capacity of wind turbines. This is precisely what DECC's Offshore Wind Cost Reduction Task Force has been assembled to do. Wind turbine costs have fallen by around 18% in the last two years and are expected to fall further as the rated capacity and efficiency of turbines increases. To this end companies like Gamesa, Doosan and Mitsubishi have all committed to set up operations in Scotland to exploit its rich wind resource. There are also operational cost reductions in the pipeline in condition monitoring and asset management techniques designed to reduce the cost of operating onshore and offshore wind farms.

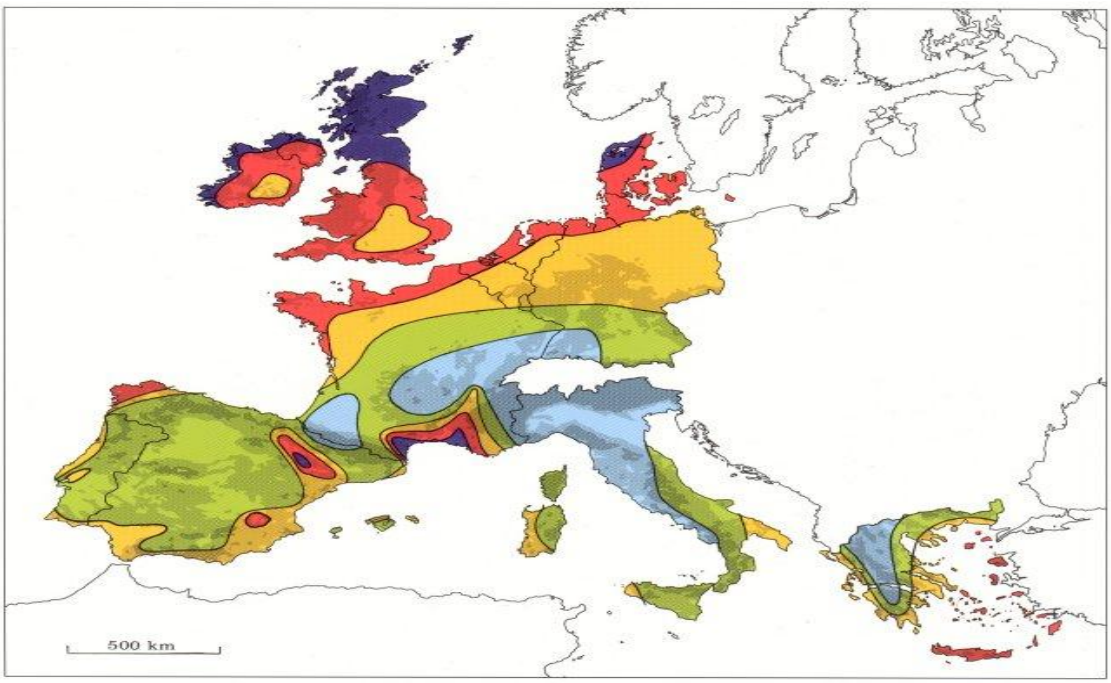
- The renewable industry has seen substantial cost reduction programmes in the last few years and this is set to continue (unlike other forms of fossil fuel based energy). This will reduce the subsidy burden moving forward as well as mitigating the risk of carbon price exposure via the ETS and CPS.

- The practical benefits of pumped storage appear to have been overlooked in the recently published competitor analysis. Without pumped storage the UK's electricity system would not be able to operate at the levels of availability we all enjoy, in addition to reducing the cost of energy production. Pumped storage in Scotland will facilitate better management of intermittent sources of electricity and will enable better prices to be commanded by on-demand renewables.

- Utilities remain focussed on key issues facing the sector, namely; EMR, grid connection availability / charges and planning decisions that impact upon their key investment decisions. The issue of an independent Scotland does not take a prominent role in the investment decision making process. This view has already been supported by bodies such as SSE. In the last 12 months the Scottish renewable industry has invested more than £750m, with the industry planning further investment of £46bln to 2020.

- We take the view that the recently published competitor research presents a rather alarmist perspective of the renewables investment scene in Scotland. Committed and planned expenditure will prevail in order to meet our emissions reductions and to neutralise exposure to fossil fuel price inflation in the future and to this end low cost renewable energy from Scotland will play a key role.

Chart 1: European wind resources



Wind resources[1] at 50 metres above ground level for five different topographic conditions

	Sheltered terrain[2]		Open plain[3]		At a sea coast[4]		Open sea[5]		Hills and ridges[6]	
	$m\,s^{-1}$	Wm^{-2}	$m\,s^{-1}$	Wm^{-2}	$m\,s^{-1}$	Wm^{-2}	$m\,s^{-1}$	Wm^{-2}	$m\,s^{-1}$	Wm^{-2}
	> 6.0	> 250	> 7.5	> 500	> 8.5	> 700	> 9.0	> 800	> 11.5	> 1800
	5.0-6.0	150-250	6.5-7.5	300-500	7.0-8.5	400-700	8.0-9.0	600-800	10.0-11.5	1200-1800
	4.5-5.0	100-150	5.5-6.5	200-300	6.0-7.0	250-400	7.0-8.0	400-600	8.5-10.0	700-1200
	3.5-4.5	50-100	4.5-5.5	100-200	5.0-6.0	150-250	5.5-7.0	200-400	7.0- 8.5	400- 700
	< 3.5	< 50	< 4.5	< 100	< 5.0	< 150	< 5.5	< 200	< 7.0	< 400

Source: RISO National Laboratory

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Recommendation (12 months)	
Buy	10% or greater upside
Hold	+10%/-10% variation
Sell	10% or greater downside