Energy Entrepreneurs Report 2016

Overview of Independent Energy Generation across Great Britain

smartestenergy

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Foreword

Energy entrepreneurs are leading the transformation to a low-carbon future.

Energy entrepreneurs are indispensable to Britain's energy future. They are creating new jobs, improving our energy security, and helping to meet climate change targets, and there is evidence that rapid growth in renewables can bring down electricity prices.

They are leading the transformation from a centralised electricity system dominated by a few large fossil fuel power stations, to a flexible one with thousands of independent generators, where solar, wind and other renewables provide increasing amounts of clean energy, and where storage and other smart technologies save money by matching supply and demand much more closely.

Independent generators have invested nearly £2.5 billion in renewables in the four years since we started tracking the growth of the sector in our annual Energy Entrepreneurs Report. Independent capacity has more than doubled to 11GW and now supplies 7.6% of UK power.

This clean electricity is all generated in the UK, reducing the need to import oil and gas, and providing income to the businesses, farmers and communities behind these projects.

It's a remarkable achievement, the result of clear political commitment to the decarbonisation of the electricity industry and a framework which provided the right incentives for entrepreneurs to deliver rapid growth in renewable capacity. It has made the UK one of the world's leading renewables markets.

Independent generators are playing an ever more important role in building our renewable future because traditional electricity supply companies are in no shape to deliver the change that is needed. The Big Six are suffering in this low-carbon transition - share prices and dividends are falling, companies are laying off staff and some are even breaking themselves up. These incumbents are slow moving, beset by problems, and lack funds for investment.

By contrast, the energy entrepreneurs are small, nimble and innovative. They have attracted a global pool of capital to invest in Britain's renewable capacity and are taking advantage of technologies like wind and solar which are rapidly coming down the cost curve. They are starting to invest in battery storage which will play a key role in our future energy system and offers exciting new business opportunities.

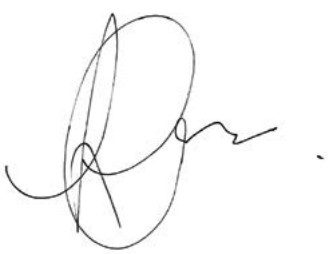
But the sector now faces a perfect storm of challenges. Wholesale electricity prices dropped 20% in 2015. The UK government has prematurely ended the Renewables Obligation for onshore wind and solar, greatly reduced the scope and scale of the Feed-in Tariff (FiT) scheme and left many unanswered questions over the future of Contracts for Difference (CfD). Piecemeal reform has created uncertainty over future energy policy and investors are demanding higher returns from renewable projects in the UK than in other European markets.

Nevertheless, the UK has a legally binding commitment to source 15% of all energy from renewables by 2020, and a target of generating 30% of electricity from renewables by that date. Further decarbonisation of our electricity industry will be essential.

Government must ensure that the right framework is in place to support continued investment in building our renewables capacity. It needs to restore confidence to the industry by providing stable policy and certainty over future support available to the industry. It should ensure that the Capacity Market allows all participants to compete on a level playing field. It should also work with the industry to develop frameworks to encourage the roll out of energy storage and maximise it's ability to accommodate the growing amount of renewables on the grid.

SmartestEnergy will continue to support independent generators, offering them guidance as they develop projects, providing a route to market, and buying their power at the best rate possible.

Robert Groves
Chief Executive Officer
SmartestEnergy



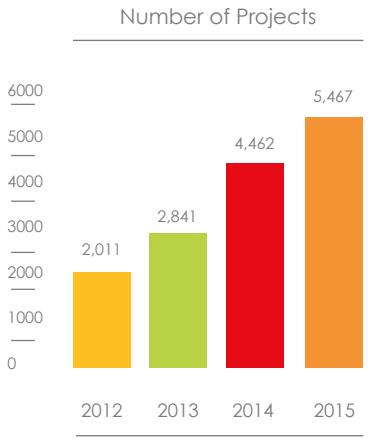
Executive Summary

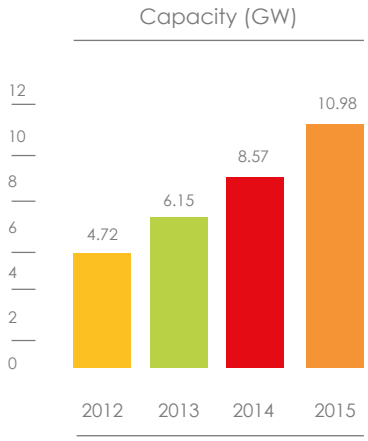
Before we begin

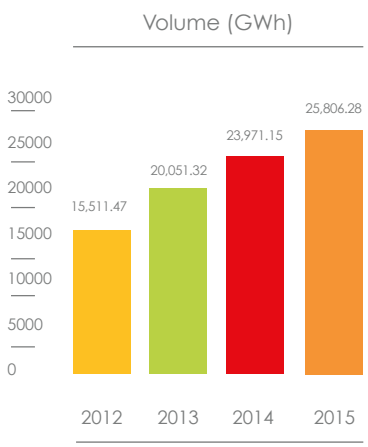
Independent generators invested over £376 million in more than 1,000 commercial-scale renewable projects in 2015, adding 2.4GW of new capacity.

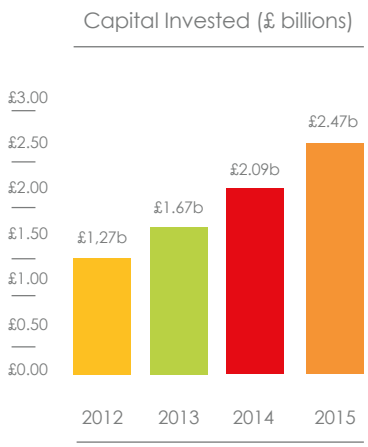
These energy entrepreneurs now supply 7.6% of UK power demand with clean electricity. Last year 5,467 projects developed outside the traditional electricity supply sector generated more than £1 billion of electricity, enough to power over 6.2 million households.

Since the Energy Entrepreneurs Report began tracking independent energy generation across the UK four years ago, almost £2.5 billion has been invested in commercial-scale projects above 50kW. Independent capacity has more than doubled from 4.7GW to nearly 11GW – nearly 40% of renewable capacity in the UK.

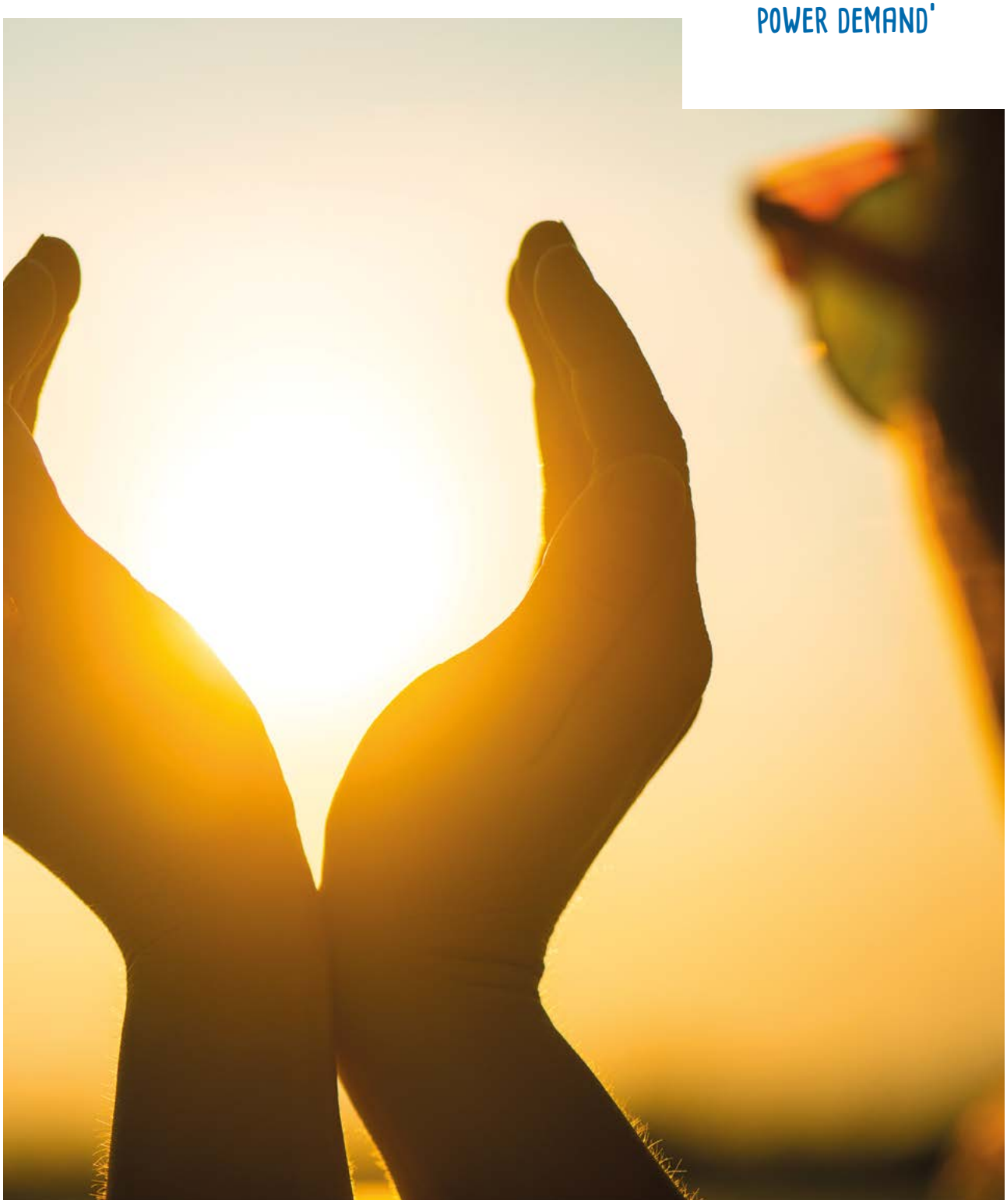








'Energy entrepreneurs now supply 7.6% of UK power demand'



Developers were responsible for 89% of the new renewable capacity last year, with 408 projects adding 2.2GW. Another significant growth area was corporates investing in on-site generation to improve energy security, cut costs and reduce carbon emissions: they built 155 projects with a combined capacity of nearly 100MW.

Farmers and landowners developed 209 new renewable projects with a capacity of 56.3MW, providing valuable revenue streams. Waste disposal operators added 77.6MW with three large projects, and eight large-scale community projects contributed 10MW, generating revenue to support local initiatives.

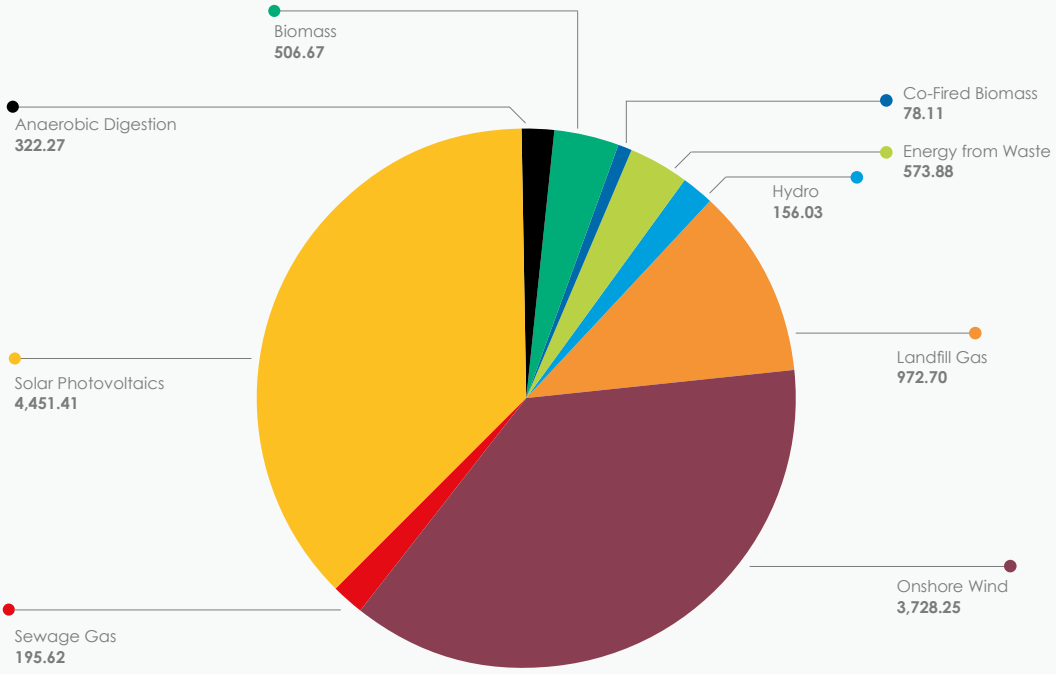
Independent solar capacity grew by 83% over the year with a rush to complete 696 new projects providing over 2GW of capacity before ROC (Renewables Obligation Certificate) subsidies ended in March 2015. It is the dominant technology in England and the second biggest in Wales.

Growth in onshore wind slowed with only 233 new projects across the UK, adding 263.2MW, a 7% increase in capacity. This is ahead of planned subsidy cuts in 2016, and may have been due to factors such as increased difficulty in securing planning consent or grid access in different parts of the country.

The slow growth is in contrast to the 690MW added in 2014. Nevertheless, the technology took the lion's share of investment in Scotland and was also top in Wales.

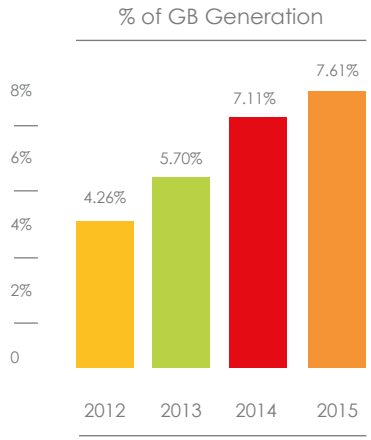
Scotland's Highlands & Islands is the most active region, supplying 5.2% of all independent renewable generation in the UK, closely followed by Yorkshire (4.6%). Cornwall, Devon and Somerset between them supply a further 10%.

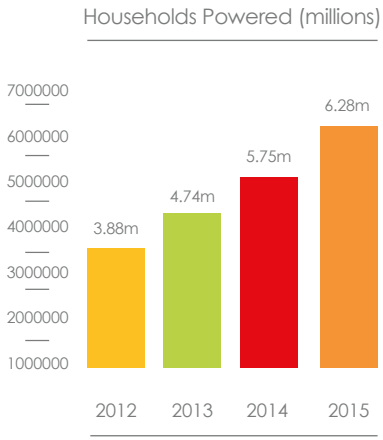
Total market breakdown by renewable technology (MW)



This continued growth demonstrates the vital role that independent generators can play in helping policymakers solve the "energy trilemma" – decarbonising energy generation and helping to meet climate change targets while ensuring security of supply and minimising costs to consumers and businesses.

The clean power independent generators now produce is equivalent to taking more than 8.9 million cars off the road[1]. This energy is all generated in the UK, reducing the need to import oil and gas, and providing vital income to the businesses, farmers and communities behind these projects.





'THE CLEAN POWER INDEPENDENT GENERATORS NOW PRODUCE IS EQUIVALENT TO TAKING MORE THAN 8.9 MILLION CARS OFF THE ROAD'

Government subsidies and rapid falls in the costs of solar and wind technology have helped to drive growth of the market. Renewable power is becoming increasingly competitive: in 2014 three solar projects successfully bid to supply electricity at £79.23 per MWh in the UK's first Contract for Difference auction. Costs of solar are expected to fall by another 33% to 2020, according to the Solar Trade Association[2].

However, wholesale electricity prices fell more than 20% in 2015, largely as a result of cheap oil and gas. Although renewables capacity grew 28% over the year, the wholesale value of the electricity generated by independents dropped by more than 4% - the first fall since the Energy Entrepreneurs Report began.

The UK government has now axed most of the subsidies that were originally designed to support the renewables industry and uncertainty over future energy policy is hitting investor confidence[3]. Strong investment is likely to continue as long as there are projects in the pipeline with guaranteed support. However, spending on renewables is set to peak in 2017 and then nearly halve to £238 million in 2020 according to analysis of the government's national infrastructure pipeline[4].

1 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/438187/CRC_-_Conversion_factors.pdf
https://www.gov.uk/government/collections/vehicles-statistics
2 http://www.solar-trade.org.uk/wp-content/uploads/2015/03/LCOE-report.pdf
3 http://www.ey.com/GL/en/Industries/Power---Utilities/EY-renewable-energy-country-attractiveness-index-latest-issue
4 http://www.businessgreen.com/bg/analysis/2452477/low-carbon-infrastructure-investment-set-to-fall-off-a-cliff-after-2017

This is a crisis for independent generators. The pressure is on to innovate and find entrepreneurial ways to extract more value from renewable energy projects to maintain returns and make future projects viable.

The biggest prize potentially lies in energy storage. The first independent generators are already installing commercial scale solutions, allowing them to store intermittent solar and wind energy to sell when it is most profitable. Storage also provides opportunities to earn money by providing Demand Response and a range of other grid services. Battery costs are forecast to fall 20%-30% a year making storage an increasingly attractive solution to independent generators.

'THE BIGGEST PRIZE LIES IN BATTERY STORAGE. TECHNOLOGY COSTS ARE FALLING RAPIDLY'

Independent generators will also be looking at how to make existing capacity work harder. One option is to add complementary technology to existing sites – for example building a solar project next to a wind farm to maximise the return on their grid connection. Another is to change their Power Purchase Agreement to more actively manage when they sell their power to the market and what price they are able to achieve.

Ironically, this crisis in investment is happening at a time when demand for renewable electricity is growing. Around the world businesses face increasing pressure from governments, investors and customers to play their part in tackling climate change, and buying clean power is one of the quickest, most cost-effective ways of cutting their carbon footprint.

Britain has a legally binding commitment to source 15% of all energy, including heat and transport, from renewables by 2020. We cannot be confident of meeting this obligation without a policy framework which provides support for independent generators and investors.

Government and independent generators must work together if we are to create a clean, cost-effective energy system which meets the UK's future energy needs.

Government can boost investor confidence by providing clarity on future renewable energy policy, especially the support that will be available under the Levy Control Framework beyond 2020.

It can ensure best value for consumers by reforming the Capacity Market, to ensure that renewables, energy storage and Demand Side Response are able to compete on a level playing field.

It can also maximise the potential of energy storage to create an efficient, cost-effective and smart electricity system, by developing frameworks that encourage its roll-out and its ability to accommodate higher levels of renewables on the grid.

Independent generators

play growing role in new energy system

Independent generators are at the forefront of a shift in the way electricity is generated and transmitted. Generation is moving away from a small number of very large power stations to a system where it is more widely distributed across the country with a much greater variety of generation technologies.

Independent generators are playing an increasingly important role and are now responsible for 5,467 renewable projects with a capacity of 11GW. Last year they added 1,007 new sites with 2.4GW of capacity – a 28% rise.

Renewable developers were responsible for building 408 independent projects last year representing 89% of the new capacity, a total of 2.2GW. They have built more than a third of all independent renewable projects (37%), and 77% of the market by capacity. Many are sold on to fund managers after completion as they offer a steady long-term return.

Farmers and landowners built 209 new projects in 2015 with combined capacity of 56.3MW, providing valuable new revenue streams, often on low-quality land. Together they account for 28% of all projects and 5% of the market by capacity.

Businesses invested in 155 new on-site generation projects with a capacity of 98.6MW, saving on power bills, boosting their energy security and cutting their carbon footprint. On-site generation accounts for 13% of all projects and 6% of capacity.

The waste disposal sector also plays a significant role. Last year two big energy from waste projects contributed 76.8MW and a sewage gas scheme added a further 0.8MW. Overall the sector provides 6% of independent renewable capacity from 224 projects.

Eight new large-scale community projects added 10.2MW of capacity last year taking their share of the market to 1.65%. Although most community renewables schemes fall below the 50kW threshold covered by this report, the 83 large-scale projects now in operation are generating nearly £16.5 million worth of energy a year, providing valuable revenue to support local amenities in often fragile and rural communities.

Growth in capacity by ownership type

Ownership type	Total Capacity (MW)	New Capacity in 2015 (MW)	% Growth
Charity	0.24	-	0.0%
Community	181.75	10.2	5.9%
Developer	8,470.34	2,149.4	34.0%
Farmer	405.37	31.8	8.5%
Landowner	172.80	24.4	16.5%
Business	667.01	98.6	17.3%
Public Sector	74.17	0.7	1.0%
Waste Disposal	646.02	77.6	13.6%
Water Company	299.60	2.2	0.7%
Unidentifiable	67.63	18.1	36.4%
Grand Total	**10,984.9**	**2,412.94**	**28.1%**

Growth in project numbers by ownership type

Ownership type	Total Projects	New Projects in 2015	% Growth
Charity	2	-	0.0%
Community	83	8	10.7%
Developer	2,015	408	25.4%
Farmer	1,212	167	16.0%
Landowner	306	42	15.9%
Business	728	155	27.1%
Public Sector	113	7	6.6%
Waste Disposal	224	3	1.4%
Water Company	269	5	1.9%
Unidentifiable	515	212	70.0%
Grand Total	**5,467**	**1,007**	**22.6%**

'Renewable developers were responsible for building 408 independent projects last year - more than a third of all new projects'

Customer Story:
Barra Community Wind Turbine

Clean power dividends will benefit residents for a generation

Barra Community Wind Turbine

When the island of Barra's wind turbine started operation in 2014 the community celebrated the completion of a massive project which will benefit residents for a generation.

The 900kW Enercon E-44 wind turbine has been installed at the most north-westerly point of the island where it is expected to become one of the most productive turbines of its size in Western Europe.

It is forecast to generate a community dividend of £50,000 to £100,000 each year of its 20-25 year lifespan in addition to covering the core costs of the local community company and financing a strategic fund for capital projects.

"It was a long journey to get the turbine up and running but worthwhile as the local community will benefit from the income stream generated over the years to come," said Project Leader Euan Scott.

"I think the turbine has helped give the islanders here a sense of self belief and a confidence that there is a future not just for ourselves but for our children."

The project is thought to be the first community wind turbine project to have been successfully undertaken entirely in-house. Residents had to overcome many challenges – not least the fact the island in the Outer Hebrides is some 75 miles from the Scottish mainland.

The £2.45 million project, which sells its electricity to SmartestEnergy under a Power Purchase Agreement, was financed with backing including a loan of £1.85 million from Triodos Bank and £550,000 from the Scottish Government's Renewable Energy Investment Fund.

'The 900kW wind turbine is expected to become one of the most productive turbines of its size in Western Europe'

Growth in renewables

varies by region across the UK

'Solar is the dominant technology in England making up 52% of renewable capacity'

England, Scotland and Wales all saw double digit growth in renewable projects in 2015, but differences in geography, climate and planning consents are reflected in the pattern of renewable growth.

England added more than 2GW of new capacity across 791 projects at a cost of £315.7 million. It saw the greatest growth in capacity, 36%, while project numbers were up 24%. Solar is the dominant technology making up 52% of total renewable capacity, followed by onshore wind 17% and energy from waste 7%.

Wales added 195.4MW of capacity in 108 projects at a cost of £30.8 million – a growth of 27%. It saw the greatest growth in projects, up 30%, albeit from a low base, while capacity grew by 27%. Onshore wind is the dominant technology (47% of renewable capacity) closely followed by solar (38%) and biomass (5%).

Scotland added 135MW of capacity with 108 projects at a cost of £30 million. Projects were up 14% but capacity only grew 6%. Onshore wind accounts for the lion's share of renewable capacity in Scotland (86%) with much smaller contributions from hydro (5%) and landfill gas (4%).

The trend has continued for solar developers to expand their horizons away from the traditional core investment areas where high land prices and a scarcity of sites have reduced options. The number of commercial-scale solar projects in Wales for example jumped by over 62% to 125 during the year and in Scotland by 46% to 41.

The Highlands & Islands region of Scotland supplies 5.2% of all renewable generation in the UK, the most active region. Its 571MW of mainly wind projects, include a significant number of community-owned turbines in remote and rural locations. 15 new sites take its total to 158.

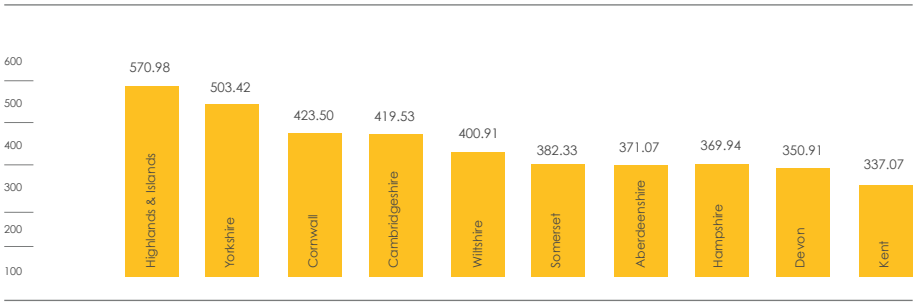
Yorkshire follows closely behind with 503.4MW of capacity supplying another 5%. It added 74 sites during the year to take total numbers to 469.

Cornwall, Devon and Somerset are hotspots for investment in solar in particular with 738 sites across the region. They added 108 sites last year and now account for 10% - or 1.1GW - of the total independent capacity across the UK.

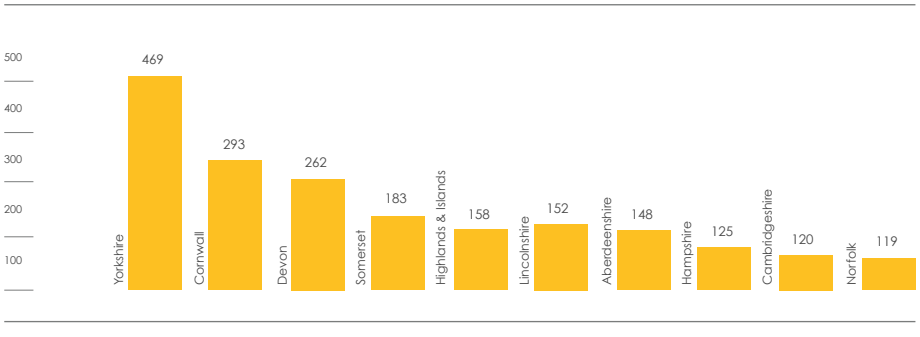
Growth in capacity and projects by region

	Region	Total capacity (MW)	New capacity 2015 (MW)	Total number of projects	New projects 2015
1.	Highlands & Islands	570.98	66.77	158	15
2.	Yorkshire	503.42	88.94	469	74
3.	Cornwall	423.50	100.97	293	41
4.	Cambridgeshire	419.53	111.37	120	19
5.	Wiltshire	400.91	202.32	93	20
6.	Aberdeenshire	382.33	4.45	148	13
7.	Hampshire	371.07	70.21	125	14
8.	Devon	369.94	74.14	262	42
9.	Kent	350.91	88	108	20
10.	Somerset	337.07	66.42	183	25

Top regions by capacity (MW)



Top regions by number of projects



Business on-site generation

produces £100 million of electricity

Businesses are among the most active investors in renewables. The case for on-site generation remains strong as a means of protecting against rising electricity prices and boosting energy security.

Across the country the number of sites generating their own power has more than doubled in four years to 728, and last year they produced electricity worth £99.6 million on the wholesale market but worth more to those consumers by avoiding costly system and network charges on a typical business electricity bill. There were 155 new on-site generation projects last year – an average of three a week– although we expect this number to rise as technology costs fall and more businesses realise the significant energy cost savings of generating power on-site.

Solar accounts for 25.7% of all on-site generation. Retailers and wholesalers with supermarket and warehouse roofs ideally suited to solar panels were by far the most active investors, developing 88 new projects taking the total across the sector to 281. Manufacturers added 14 new sites and the service sector added 12.

A growing focus on sustainability and cutting carbon is a key factor in this trend, with businesses under increasing pressure to play their part in tackling climate change.

Businesses were among the strongest voices calling for action to limit dangerous global warming at the Paris Climate Summit, and some of the world's biggest brands have now pledged to switch to 100% renewable power, including Google, Unilever, Nike and BMW. A £352 billion coalition of investors, including Aviva, one of the UK's largest insurers, is specifically calling on businesses to commit to 100% renewables.

Reputation and consumer attitudes are also driving demand for renewables. A survey of 1,000 UK consumers[5] found that almost four out of five people (77%) were more likely to buy from a consumer brand with a positive approach to sustainability and two thirds would recommend a brand because it either invested in its own renewable energy projects or bought most of its energy from renewable sources.

On-site generation is not an option for every business, but there is growing interest in buying renewable electricity. Companies can now count the renewable electricity they purchase against their carbon targets and make major reductions in the emissions they report, providing it is rigorously sourced and certified.

SmartestEnergy has developed a portfolio of 100% renewable products with the UK's first energy labels clearly stating the source and carbon content of electricity, to provide this assurance.

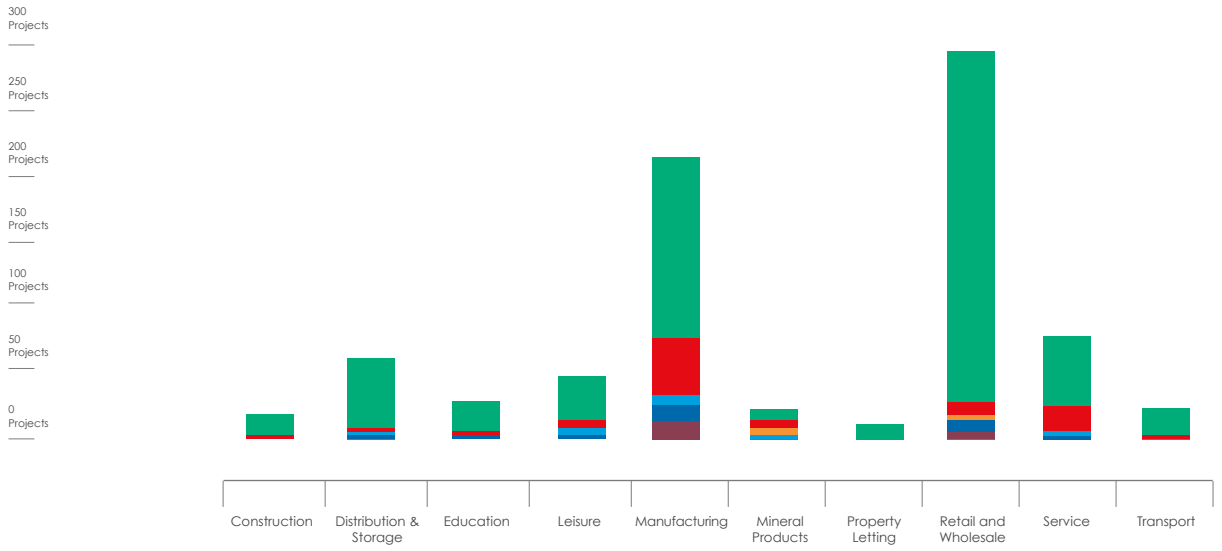
Business and the Renewables Revolution[6], launched by SmartestEnergy in 2016, revealed that switching to renewable power is the quickest and most cost-effective way for most organisations to cut their carbon footprint, adding less than 1% to electricity bills. The report highlights a range of business benefits, setting out how using renewable power can build investor confidence, help win customers and encourage employees to engage in money-saving energy efficiency programmes.

An Aldersgate Group report in 2014[7] found that many companies wanted to support renewable power but were held back by confusion over a variety of costs and schemes. It called for clear labelling of the carbon content of electricity and calculated that the measure could see low-carbon power supply nearly half of all industrial and commercial demand by 2020, up from 14.4% to 48.3%.

'THE NUMBER OF SITES GENERATING THEIR OWN POWER HAS MORE THAN DOUBLED IN FOUR YEARS'

5 http://www.smartestenergy.com/info-hub/sustainability-matters-report/
6 http://www.smartestenergy.com/info-hub/business-and-the-renewables-revolution-report-2016/
7 http://www.aldersgategroup.org.uk/latest/2014/06

Leading technologies by business sector



	Construction	Distribution & Storage	Education	Leisure	Manufacturing	Mineral Products	Property Letting	Retail and Wholesale	Service	Transport
Solar Photovoltaics	6	27	8	17	137	3	7	248	54	14
Onshore Wind	1	4	4	9	37	5		12	12	3
Landfill Gas						1		2		
Hydro		1		9	8	3			6	
Co-Fired Biomass					1					
Biomass		2	1	2	14			12	2	1
Anaerobic Digestion	1	1	1		17			7	1	

Customer Story:
Aberdeen & Northern Eggs
Processing four million eggs a week by wind

Aberdeen & Northern Eggs

In 2010 Aberdeen and Northern Eggs invested around £1.2 million in a wind turbine to power farm buildings and packing lines at its business, which handles up to 4 million eggs a week.

On a windy day the 800kW turbine is able to power its entire production facility with renewable electricity, and it earns money by supplying spare output to the grid via a Power Purchase Agreement with SmartestEnergy.

The company, which is behind the Farmlay brand, has since commissioned 200kW of solar PV and replaced its gas heaters with a woodchip-fuelled biomass plant which heats water before it is pumped to rearing units to keep chicks warm.

Robert Chapman, who runs the family-owned enterprise at Strichen in Aberdeenshire with his wife Ethel and son Iain, says financial benefits are not the only consideration.

"We are retailers as well as farmers, and consumers are increasingly looking to the businesses they buy from to demonstrate sustainability," he said.

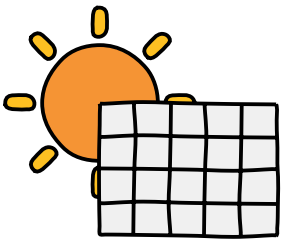
"Investing in renewable energy is a win-win for the business as it reduces our costs as well as helping our operations be more environmentally-friendly."

The business aims to minimise environmental impact across its operations, and runs its own fleet of vehicles so it can plan collections and deliveries more efficiently and reduce food miles.

'INVESTING IN RENEWABLE ENERGY IS A WIN-WIN FOR THE BUSINESS AS IT REDUCES OUR COSTS AS WELL AS HELPING OUR OPERATIONS BE MORE ENVIRONMENTALLY-FRIENDLY'

'On a windy day the 800kW turbine is able to power its entire production facility'

Changing approach
to projects has driven growth



'FOR THE THIRD YEAR RUNNING SOLAR HAS SEEN THE GREATEST GROWTH IN CAPACITY'

Independent generation is becoming an option for growing numbers of businesses and other organisations. The trend is for an increasing number of smaller projects to come onto the grid and average project size has fallen by 15% since the first Energy Entrepreneurs Report, as rapid deployment of renewables has brought economies of scale.

For the third year running solar has seen the greatest growth in capacity, although the 83% increase is half that of the previous two years. Some 696 projects were developed – 69.1% of all new independent projects. Future growth is expected to slow because new solar projects are no longer eligible for ROCs, since April 2015.

There is much debate about falling costs of solar, but we can see the average project size has more than trebled from 0.61MW to 1.95MW in four years, it is a fair assumption that investment in each project has also risen but exact numbers are difficult to obtain.

Onshore wind is still the second biggest technology by far, but growth in both capacity and projects has continued to slow. Although 233 new projects were built – a rise of 12.9% – this represented just a 7% increase in capacity. Onshore wind capacity grew 24.8% in 2014 and 44.4% in 2013.

In contrast to solar, the average size of onshore wind projects has fallen by over half from 4.2MW four years ago to 2.1MW last year.

Landfill gas remains the third biggest technology across the UK contributing nearly 1GW of capacity from 458 sites.

The hydro sector saw almost an 18% growth in projects, the second highest after solar, with 56 new schemes totalling 16.8MW. Average project size has decreased from 0.8MW in 2012 to 0.4MW in 2015.

'Onshore wind is the second biggest technology by far, but growth has slowed'

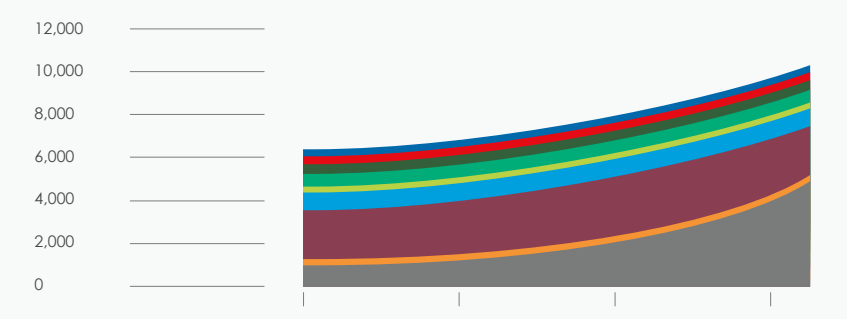
The rapid deployment of solar and onshore wind in recent years has seen costs fall dramatically. More mature technologies also tend to benefit from more favourable financing terms as they are regarded as lower risk.

Every time solar power doubles, costs fall by 24%, and every time wind power doubles costs fall by 19%, according to Bloomberg New Energy Finance. Since 2000 the solar industry has doubled in size seven times and the wind industry four times[8].

Analysis by the Solar Trade Association[9] suggests further economies are in the pipeline. It estimates that the cost of large-scale solar projects will fall by 33% to 2020, with a further 11% reduction in the period 2020–2030.

Rapid increases in renewables capacity can lead to significant downward pressure on wholesale electricity prices, according to a paper comparing the UK with Germany, where growth in wind and solar have been matched by a seven-year decline in prices including a 37% drop in the most recent two years[10].

Growth in capacity (MW)



Technology	2012	2013	2014	2015
Anaerobic Digestion	164.13	242.58	313.05	322.27
Biomass	389.90	488.19	496.83	506.67
Co-Fired Biomass	91.82	60.30	61.28	78.11
Energy from Waste	463.87	445.78	497.08	573.88
Hydro	164.64	122.25	139.22	156.03
Landfill Gas	1,023.12	965.15	972.70	972.70
Onshore Wind	1,930.76	2,787.69	3,477.91	3,728.25
Sewage Gas	168.67	191.01	194.81	195.62
Solar Photovoltaics	322.28	847.04	2,432.01	4,451.41

8 http://www.bloomberg.com/news/articles/2016-04-06/wind-and-solar-are-crushing-fossil-fuels
9 http://www.solar-trade.org.uk/wp-content/uploads/2015/03/LCOE-report.pdf
10 http://www.businessgreen.com/bg/feature/2433980/will-renewables-subsidy-cuts-mean-uk-misses-out-on-cheaper-electricity

Innovation can fuel new growth

in the smart power revolution

This is a critical point for the UK's independent generation market. It has delivered remarkable growth, more than doubling capacity to nearly 11GW in just four years. However, generators will now need to seize emerging opportunities to overcome significant challenges.

Falling wholesale prices have hit generators' bottom line. The average wholesale price of renewable electricity fell more than 20% in 2015. Although renewable capacity grew 28% over the year the value of the electricity generated by independents dropped by more than 4% - the first fall since the Energy Entrepreneurs Report began.

Cuts to renewables subsidies, government opposition to onshore wind and uncertainty over future energy policy are also hitting profit margins and investor confidence.

Strong investment is only likely to continue for projects in the pipeline with guaranteed support, and falling technology costs will also continue to benefit the sector. However, spending on renewables is set to peak in 2017 and then nearly halve to £238 million in 2020 according to analysis of the government's national infrastructure pipeline.

This is a crisis for independent generators. Against this backdrop, developers have to innovate and find entrepreneurial ways to extract more value from renewable energy projects and make future projects viable.

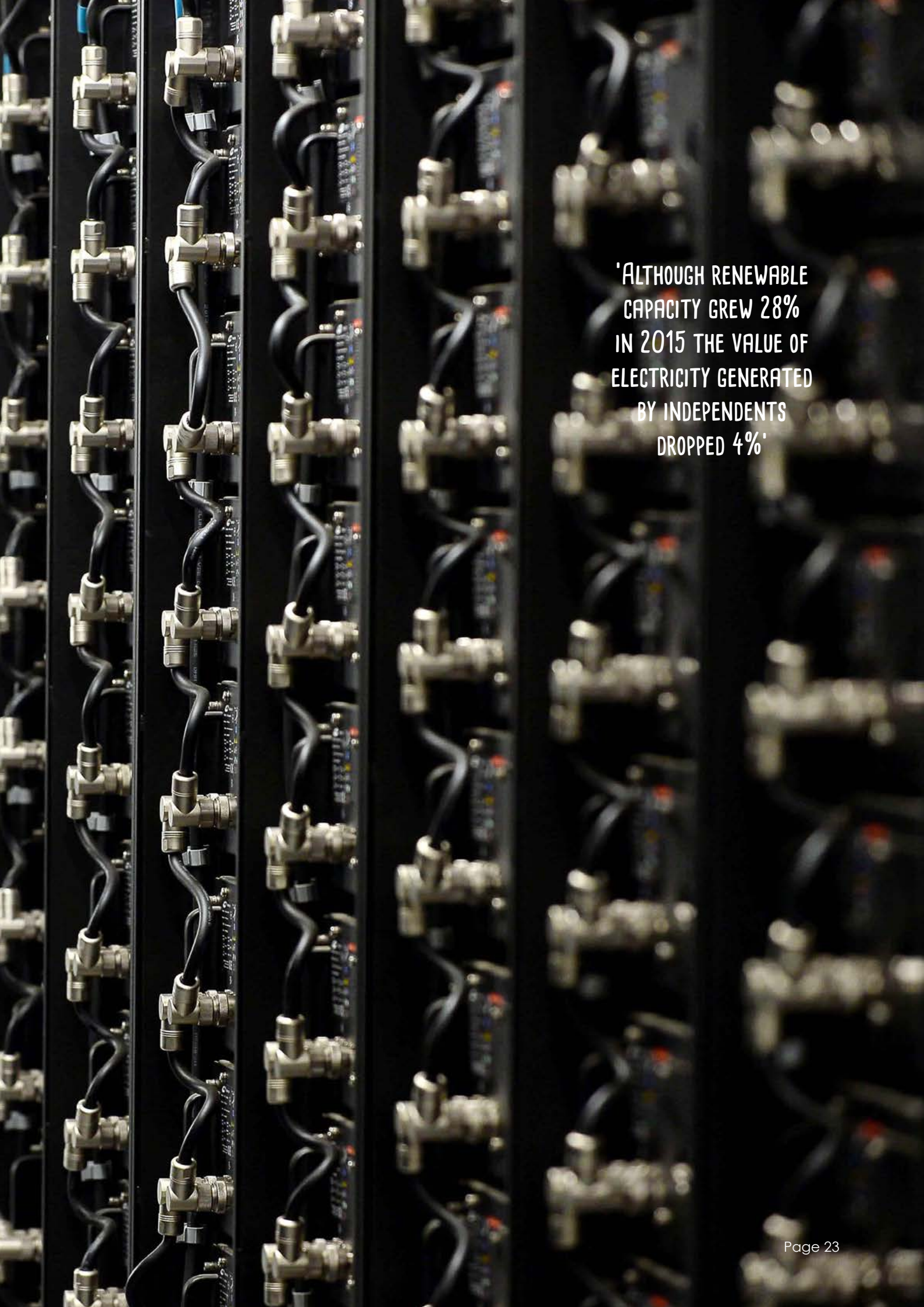
The National Infrastructure Commission has identified electricity storage, demand side response, and interconnection to other countries, as three key innovations in a "smart power revolution" which could save UK consumers £8 billion a year by 2030. [12] Its report was endorsed by Chancellor George Osborne in his 2016 Budget.

Battery prices are falling rapidly and will make electricity storage an increasingly attractive option for independent generators, opening up significant new revenue streams. Lithium-Ion batteries halved in cost to $500/KWh in 2014 and are likely to fall by 20%-30% each year, according to Deutsche Bank[13].

Solar developer Anesco installed its first 250kWh storage unit at a solar farm in Dorset in 2014 and has since put 10 more into operation. The company recently topped a list of private companies in Britain with the fastest-growing profits after three years[14].

Independent generators have a track record of innovation so we expect to see them focussing on how to make existing capacity work harder.

11 http://www.businessgreen.com/bg/analysis/2452477/low-carbon-infrastructure-investment-set-to-fall-off-a-cliff-after-2017
12 https://www.gov.uk/government/news/a-smart-power-revolution-could-save-consumers-8-billion-a-year-adonis
13 http://cleantechnica.com/2015/03/04/energy-storage-could-reach-cost-holy-grail-within-5-years/
14 http://www.solarpowerportal.co.uk/news/solar_developers_named_among_britains_fastest_growing_firms_4563



'Although renewable capacity grew 28% in 2015 the value of electricity generated by independents dropped 4%'

Customer Story:
UK Power Networks
Giant battery pioneers energy system of the future

UK Power Networks

A 6MW battery - one of Europe's largest electricity storage facilities - is helping pioneer the smart energy system of the future.

The giant battery at Leighton Buzzard is the size of three tennis courts and can store enough energy to power 6,000 homes at peak times. It is trialling the role that storage can play in enabling a low-carbon, decentralised power system and in reducing costs by matching supply more closely with demand.

The battery is the heart of the £18.7 million Smarter Network Storage (SNS) project developed by UK Power Networks and supported by Ofgem's Low Carbon Networks Fund. It is the UK's first multi-purpose grid scale electricity storage system, and evidence from the project is informing industry and government plans.

Electricity storage will play a key role in the shift to a low-carbon economy with renewables playing a much greater part in meeting the country's energy needs.

It can provide back-up power to overcome the intermittency of wind and solar generation, reduce peak demands on the network, and avoid the need for costly new infrastructure at a time when electricity consumption is predicted to rise in the years ahead.

The SNS project, which SmartestEnergy is a partner in, aims to provide the industry with a greater understanding of the business case for storage, and examine options for regulation and pricing. That in turn should help to reduce system investment costs, accommodate increasing levels of intermittent low-carbon generation and ultimately lead to lower bills for consumers.

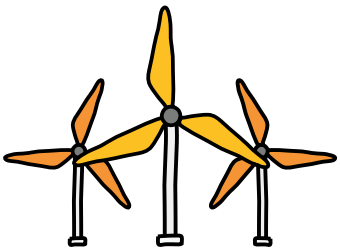
James Graham of SmartestEnergy's Business Electricity Team, said: "Storage will be an increasingly important development in the market and will be key to managing intermittency as renewable generation takes on a greater role in meeting UK energy demand. It is already something many of our independent generation customers, particularly solar developers, are starting to ask us about so we are excited about being actively involved in helping storage technology develop".

'A 6MW BATTERY - ONE OF EUROPE'S LARGEST ELECTRICITY STORAGE FACILITIES'

'THE GIANT BATTERY IS THE SIZE OF THREE TENNIS COURTS AND CAN STORE ENOUGH ENERGY TO POWER 6,000 HOMES AT PEAK TIMES'

Independents face opportunities

and challenges in the future energy market



The renewable sector is now a thriving part of our economy. It employs 112,000 people and jobs have grown seven times faster than the UK average, according to the most recent figures from the Renewable Energy Association[15].

The industry is helping meet UK climate change commitments, increasing our energy security and contributing to air quality improvements by replacing power from polluting coal plants.

However, there is a real risk the growth of this dynamic sector could stall in the face of low wholesale energy prices, premature subsidy cuts, and uncertainty over future energy policy which is denting investor confidence and pushing up the cost of capital.

Britain has a legally binding commitment to source 15% of all energy from renewables by 2020. This includes heat and transport, so to achieve this commitment the government has set a target of generating 30% of all electricity from renewables. In 2015 renewables generated 24.7% of UK electricity[16] but we cannot be confident of meeting our legal obligations without a policy framework which provides support for energy entrepreneurs and investors.

The government should act to reassure investors in order to continue investment:

- Provide clarity on the Levy Control Frame budget beyond 2020 and detail on the future of Feed-in-Tariffs for small-scale and community projects.

- Reform the Capacity Market to allow renewables, storage and demand side response to compete with conventional sources.

Independent generators need this clarity from the government in order to create a clean, cost-effective energy system which meets the UK's future energy needs. With it, there is precedence to suggest they have the resourcefulness and entrepreneurial skills to find opportunities in this challenging market.

The renewable sector will undoubtedly continue to grow next year. How strongly it grows will depend on how government and energy entrepreneurs respond to these issues.

15 http://www.r-e-a.net/news/uk-renewable-energy-jobs-grow-over-7-times-faster-than-national-average-employment-growth
16 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/511955/Energy_Trends_March_2016.pdf

Methodology and sources

Figures have been compiled from publicly available project data from the Ofgem FiT Register and the Ofgem Renewables Register as at 31st December 2015. Projects commissioned before this date but not yet accredited are therefore not included and will be captured in future reports.

For the purposes of the Energy Entrepreneurs Report, commercial-scale schemes are classed as those with a capacity of 50kW or more. Independent projects are defined as those not owned by an electricity supply company.

Value of generation is based on a wholesale energy price of £39.93 per MWh (average APX Reference Price Data for 2015) and household usage of 4.11MWh a year.

Load factors for different renewable technologies are estimated as: Anaerobic Digestion 60.50%; Biomass 63.40%; Co-Fired Biomass 62.3%; Energy from Waste 35.80%; Hydro 39.20%; Landfill Gas 55%; Ocean Energy 3.2%; Onshore Wind 26.50%; Sewage Gas 47.50%; Solar PV 11.20%. (Source: Ofgem, 31st July 2014.)

Investment data is based on capital investment costs from Electricity Generation Costs published by DECC, 17th July 2013.

About us

SmartestEnergy is Britain's leading purchaser of electricity from independent renewable generators with over 600 projects in its portfolio, including 13% of Great Britain's independent renewable capacity.

The company is a UK licensed business electricity supplier to large industrial and commercial organisations and supplies some of the biggest brands on the high street. It has offices in London, Ipswich and Glasgow.

If you have any questions about the report or would like to use any of the data, please contact the Marketing team on **020 7448 0900** or **marketing@smartestenergy.com**

We would like to thank our customers for their valuable contribution to this report

Our environmental commitment
We take our environmental responsibility seriously and have therefore only printed a small quantity of this report. We would encourage readers to download the report at:

SmartestEnergy.com/ EnergyEntrepreneurs2016

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