



**WWF**

**REPORT**

**SCOTLAND**

**2014**



**Conservation**

**Climate Change**

**Sustainability**

# Scotland: a renewable powerhouse

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At WWF we're working to create solutions to the most serious environmental challenges facing our planet, for a future where people and nature thrive. One of the biggest challenges we're tackling is climate change.

As electricity generation accounts for one third of Scotland's greenhouse gas emissions we're committed to helping ensure Scotland reaches its target to meet 100% of gross electricity consumption from renewable sources by 2020.

Cover image: Aquamarine Power's Oyster 800 wave energy machine in operation off Orkney. © Aquamarine Power.



# FOREWORD

In 2011, WWF crunched the numbers and concluded in our ground-breaking study, *The Energy Report*, that by 2050 all of the world's energy needs could be provided cleanly, renewably — and affordably.



*“If we are to prevent the worst impacts of global climate change then we need to change where we get our energy from, and quickly.”*

Lang Banks  
director, WWF Scotland

The report also looked at the barriers to such a transition. One of the biggest barriers was that globally more money was being invested in dirty fossil fuels than in clean renewables. This is still the case today and that's why in 2013, We launched our international campaign, *Seize Your Power*.

A few months after the publication of our *Energy Report*, the Scottish Government announced it was raising its renewable electricity target to 100% of Scotland's consumption by 2020. Not only was this a welcome statement of ambition but a clear acknowledgement of just how far Scotland had come in harnessing the power of nature.

After all, it was only 10 years earlier that Scotland had set its very first renewable electricity target – a rather modest 17.5% by 2010. Yet, by 2010, Scotland was actually producing over a quarter of its needs from renewables. By 2011, it was over a third.

So, how did all this happen? How, even without possessing all the powers over energy, has Scotland been able to triple the amount of electricity generated by renewables in a decade and set itself the challenge of meeting 100% of its needs from renewables within the next 10 years?

In preparing this short report we interviewed many of the key players and stakeholders involved in Scotland's renewables revolution. Using their insights, we've attempted to draw out the key drivers that have helped get renewables in Scotland to where they are today.

As we discovered, progress has come about not just because of financial support and ambitious targets but also because of leadership, a collaborative approach between politicians, industry and civic society, and the combination of economic opportunity and the impact of enshrining the imperative of tackling climate change in law. This report isn't meant to be a toolkit for success; we simply hope it provides an insight into how a combination of factors in Scotland resulted in a boost for renewable electricity. We hope the story it tells resonates with efforts around the world for a future safe from dangerous climate change and where everyone has access to clean, renewable power.



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# EXECUTIVE SUMMARY

Scotland has an extraordinary natural resource base from which to produce renewable energy. In 2012 Scotland met almost 39% of its annual electricity demand from renewable sources, and is on course to increase this to 100% by 2020.

The story of Scotland's renewables revolution is one of shared endeavour across many parties. Consistent political leadership across successive governments, key policy decisions and support mechanisms, cross-party political support, a huge amount of engagement from industry and concerted campaigning by an active environmental NGO sector have all helped move the sector forward.

This broad engagement is set against the backdrop of a growing understanding of the threat of climate change and the need to reduce greenhouse gas emissions (and legislation to make that happen). There is a commitment to gaining the economic benefits from supporting the growth of the renewables industry and a realisation of the potential for those benefits to be felt across Scotland.

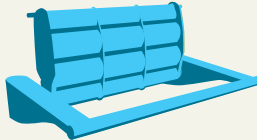
So, how has Scotland got to where it is today?

The main factors which created the right climate for rapid growth in the renewables sector are listed below. It's the combination of these factors which drove success.

**80%**  
RENEWABLE  
ELECTRICITY OUTPUT  
INCREASED BY 80%  
IN 5 YEARS

- **Ambition to create a low-carbon economy:** the renewables sector is seen as a key element of the Government's economic strategy. This ambition is shared across Government departments.
- **Tackling climate change:** promoting renewable energy growth is an essential part of meeting Scotland's commitments to reduce greenhouse gas emissions under the Climate Change (Scotland) Act 2009.
- **Political support:** there is strong cross-party support on the need for renewable energy as part of efforts to tackle climate change and the transition to a low-carbon economy. This support extends to all Government departments and a wide and diverse range of external organisations.

11,000+



jobs in renewable energy in Scotland

- **Civic support:** environmental NGOs, along with their coalition partners from wider civic society, played a powerful role in pressing for more ambitious targets, and maintaining political and media support for renewables.
- **Collaborative approach:** the Scottish Government deliberately engaged NGOs, business and academics to engage with the policy development process, making for a strong consensus across and outside government.
- **Meaningful targets:** Successive ministers used ambitious targets to set out a vision for renewables growth, giving industry something to strive towards and long-term certainty.
- **Supportive policy context:** the Scottish Government used all the policy levers at its disposal, to work proactively towards a positive vision for Scotland's energy future.
- **Significant and targeted financial support:** financial support mechanisms, prizes and investment funds all gave the industry significant financial assistance and international profile.

Looking forward, it will be important for government and industry to work with local communities to address their concerns about landscape and environmental protection, ensure they benefit from the development, and that this story is accurately reflected in the local media. Environmental NGOs have a role to play here by busting any myths, highlighting benefits, challenging inappropriate developments, and putting renewables in the broader context of climate change.

With continued leadership from government, Scotland is well-placed to deal with concerns, maintain political support, and achieve its renewables potential in the years to come. Government, industry, and environment sectors wish to see Scotland benefit from a strong and healthy renewables sector and a low-carbon economy. This desire should attract investment and drive forward growth to achieve Scotland's vision of a renewable-rich power sector.



Mass lobby of members of the Scottish Parliament on the development of the Climate Change Act, organised by Stop Climate Chaos Scotland.

## INTRODUCTION

This report charts the story of how the ‘renewables revolution’ came about in Scotland, from its beginnings at the re-establishment of the Scottish Parliament to the present day.

The report is based on interviews with representatives of government, industry, NGOs, and Parliament, all of whom have been involved one way or another in Scotland’s renewables story.

It considers the following issues:

- the resource potential for the renewables sector in Scotland and policy context which gave the Scottish Government sufficient powers to capture that potential;
- the various enabling factors which created the fertile ground for renewables expansion;
- the way in which the Scottish Government used policy levers, financial incentives, and government investment, to set the renewables sector on its upward trajectory.

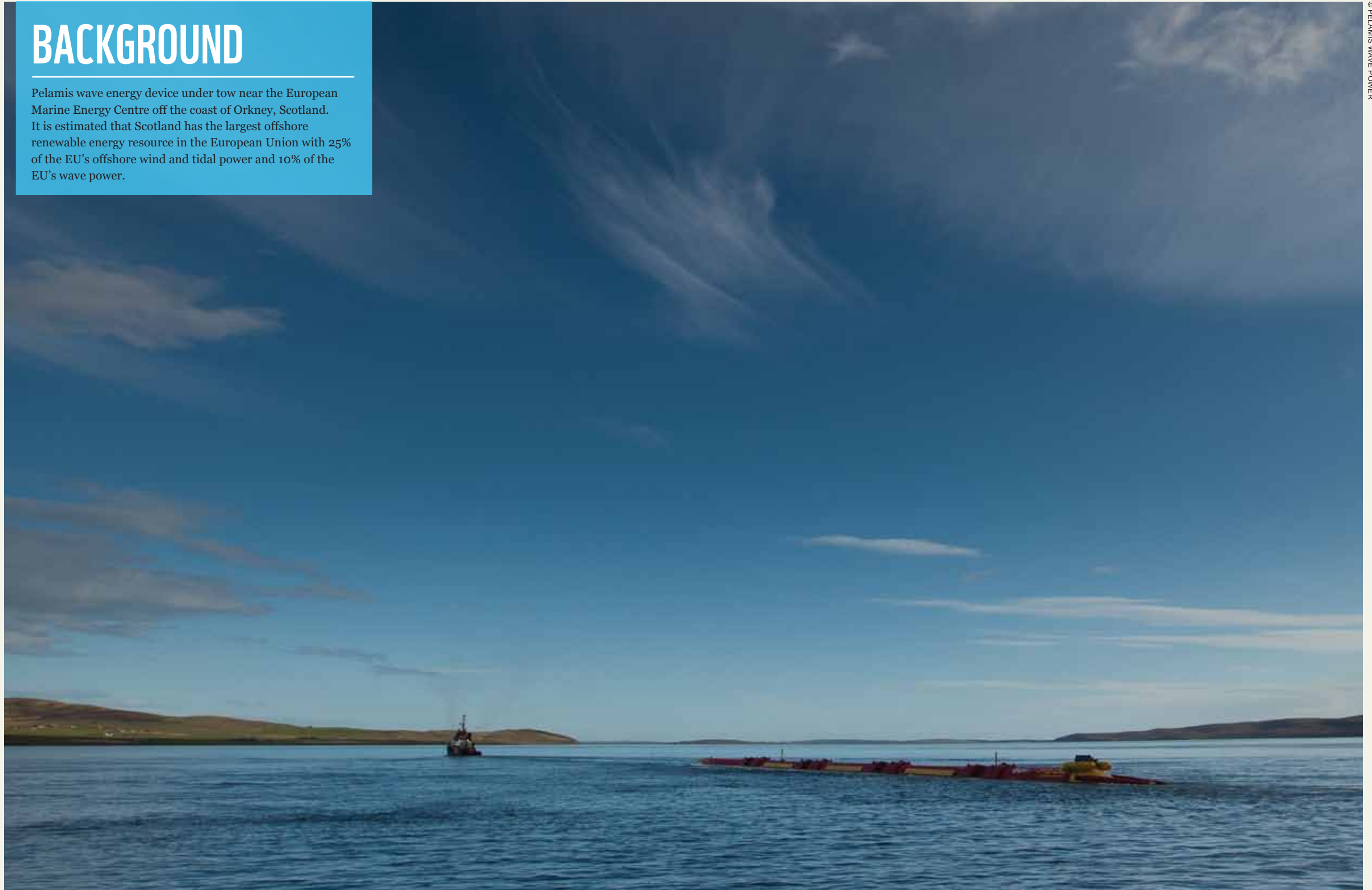
**42%**  
LEGAL TARGET  
FOR REDUCTION IN  
GREENHOUSE GAS  
EMISSIONS BY 2020

We hope that this report will serve as a useful reference to other nations and regions that could benefit from a similar level of success for renewable power as a key part of delivering a low-carbon future. Who needs to be involved, what policies work, and what financial drivers are necessary? What role can environmental NGOs play in supporting a political and civic consensus in favour of renewables growth? The report concludes with a list of success factors which can be shared with others to work together for a future powered by renewable energy.



# BACKGROUND

Pelamis wave energy device under tow near the European Marine Energy Centre off the coast of Orkney, Scotland. It is estimated that Scotland has the largest offshore renewable energy resource in the European Union with 25% of the EU's offshore wind and tidal power and 10% of the EU's wave power.



# BACKGROUND

**25%**  
SCOTLAND HAS AN ESTIMATED 25% OF THE EU'S OFFSHORE WIND AND TIDAL POWER

## Scotland's renewable resources

### Generating potential

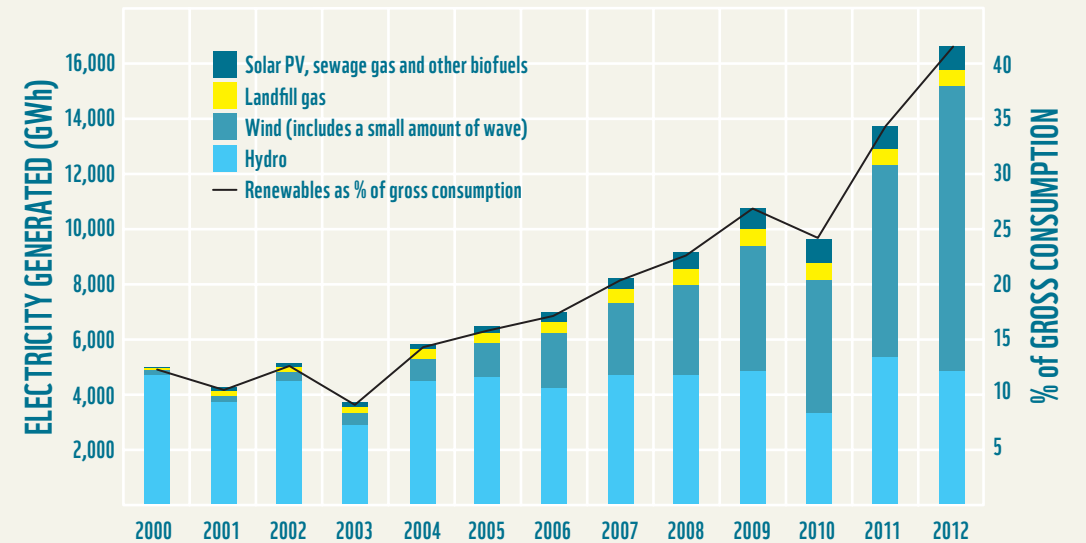
It's well known that Scotland and the seas around it contain a wealth of renewable energy sources from onshore and offshore wind, to biomass, hydro, wave and tidal power. It's estimated that Scotland has the largest offshore renewable energy resources in the European Union (25% of the EU's offshore wind and tidal power, 10% of the EU's wave power). A total renewable generating capacity of 59.1GW could be installed, and onshore wind and marine renewables could supply over 200,000GWh of electricity each year. To place these figures into context, Scotland's annual electricity demand is just under 38,000GWh. Thus, the available renewable resource could, in theory, supply Scotland's electricity needs many times over.

### The expansion of Scotland's renewable capacity and output

In 2000, just over 12% of Scotland's electricity output came from renewables, with well over 90% of this from long-established hydroelectric schemes. Wind power contributed just 4.4% with other renewable sources (mainly landfill gas and biomass) accounting for the remainder. Over the next decade, annual generation from wind power increased from just over 200GWh in 2000 to over 8,000GWh in 2012 (with hydro and other renewable sources generating 6,000GWh), helping Scotland to meet almost 39% of its gross electricity consumption from renewables that year (see Figure 1). Looking to the future, Figure 2 shows how growth is set to continue.

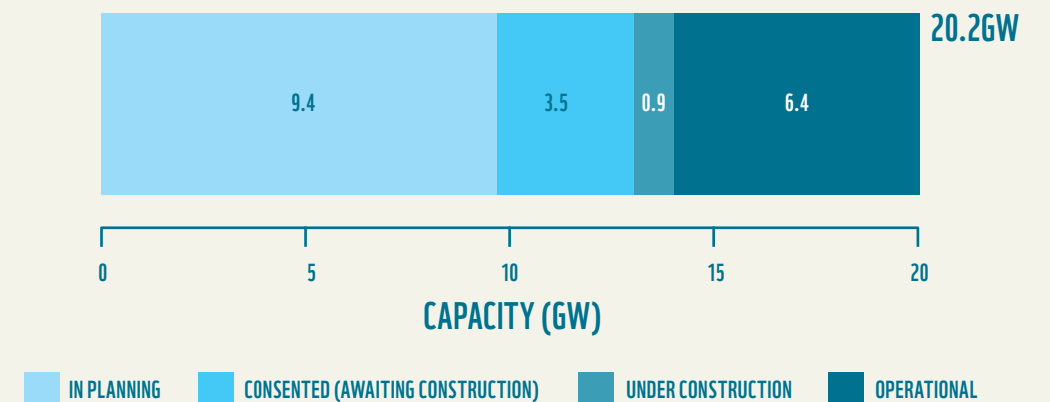
## ELECTRICITY GENERATED IN SCOTLAND FROM RENEWABLES 2000-2012

Source: DECC Energy Trends, December 2013



## FIGURE 2: RENEWABLE CAPACITY IN SCOTLAND BY PLANNING STAGE, JUNE 2013

Source: Renewable Energy Statistics for Scotland, September 2013



## Devolved and reserved powers

With the re-establishment of the Scottish Parliament in 1999, Scotland gained the powers to make decisions over many areas of Scottish life, including health, education and the environment.

Although the majority of energy policy is reserved to the UK Government, the various powers devolved to the Scottish Government provide it with very considerable influence over Scotland's energy future. In particular, the Scottish Government has the power to promote the development of renewable energy via a financial support mechanism called the Scottish Renewables Obligation, and the power to grant or withhold consent for the construction of new electricity generating stations with a capacity of over 50MW.

TABLE 1: DEVOLVED AND RESERVED ENERGY POLICY

RESERVED TO THE UK PARLIAMENT	DEVOLVED TO THE SCOTTISH PARLIAMENT
The generation, transmission, distribution and supply of electricity	Environmental protection and pollution in relation to coal, nuclear, and oil and gas
The ownership of, exploration for, and exploitation of, deposits of coal, oil and natural gas, and offshore installations and pipelines	Planning approval of the development of energy infrastructure
Nuclear energy and nuclear installations, including nuclear safety, security, safeguards, and liability for nuclear occurrences	Encouragement of energy efficiency

## Targets

Scotland's first targets for renewable electricity were set by the Scottish Government in 2000 at 17.5% by 2010.

Targets rose incrementally (see Figure 3), finally reaching 100% of projected demand by 2020 in 2011.

**100%**  
OF SCOTLAND'S  
GROSS ELECTRICITY  
CONSUMPTION  
FROM RENEWABLES  
BY 2020

In 2009, with the passing of the Climate Change (Scotland) Act, the Scottish Government added targets for renewable heat and reduction in energy demand. The Government's 2013 plan for meeting its climate change commitments includes a target to cut emissions from the power sector by more than four-fifths by 2030 to 50gCO<sub>2</sub>/kWh. These targets (see Table 2) form the backbone of the Scottish Government's climate change policy.

FIGURE 3: RENEWABLE ELECTRICITY TARGETS OVER TIME

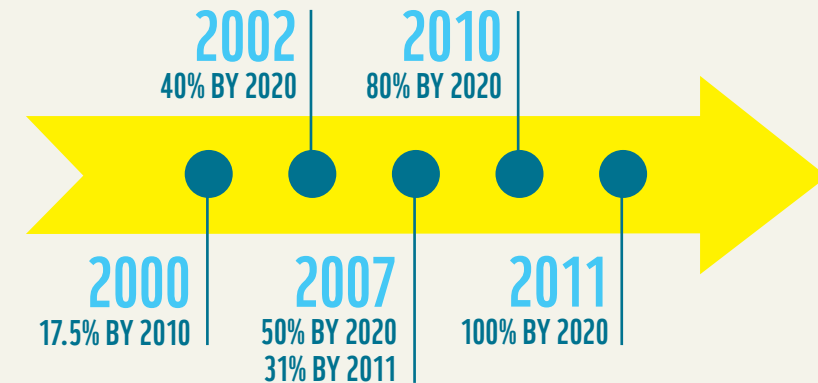


TABLE 2: RENEWABLE ENERGY AND ENERGY DEMAND REDUCTION TARGETS AS OF 2013

ELECTRICITY GENERATION	RENEWABLE HEAT	ENERGY EFFICIENCY
Equivalent to 100% of gross consumption by 2020 Interim target of 50% by 2015 [Power sector emissions target of 50gCO <sub>2</sub> /kWh by 2030]	11% of heat demand provided by renewable sources by 2020	Total energy demand reduced by 12% by 2020 from a 2005-2007 three year average baseline



# CREATING THE RIGHT CLIMATE FOR CHANGE

In 2009 the Scottish Parliament passed the Climate Change (Scotland) Act that included emission reduction targets of 42% below 1990 levels by 2020 and 80% by 2050. Alongside a low carbon economic policy this legislation has helped create the environment for growth in renewable generation.



# CREATING THE RIGHT CLIMATE FOR CHANGE

In addition to the rich renewable resources, Scotland needed the right combination of factors to provide the fertile ground for rapid growth in its renewables sector.

In the words of Stephen Gethins, former special adviser to the first minister:

*“The three most important factors in making Scotland an attractive place to invest in renewables? Resource, expertise and political certainty.”*

**£1.5BN**  
OF RENEWABLE  
PROJECTS WERE  
COMMISSIONED  
IN 2012

Politicians, business leaders, environmental NGOs and communities embraced the renewables revolution, creating the certainty that industry needed to invest over the long term. According to Jenny Hogan, director of policy at Scottish Renewables, the renewables sector could deliver an extraordinary win-win solution:

*“Renewable energy means secure energy, cutting carbon to meet our climate change obligations, creating jobs and, ultimately, keeping costs down.”*

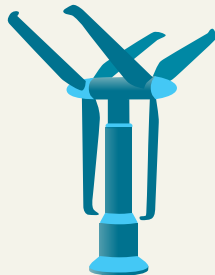
The opinions of these different sectors of society reinforced each other, strengthening the determination of political leaders in a relentless pursuit of ambitious targets. The key enabling factors for growth in Scotland’s renewable power sector are detailed below.

## A low-carbon economy

*“Any government is looking for opportunities where they can marry two policies in one ... renewables provides the opportunity to be greener with significant economic growth.”*

Jason Ormiston, head of media relations and public and regulatory affairs, Vattenfall

The Scottish renewable energy sector has enjoyed unambiguous support from successive Scottish ministers over the years. This is because it allows Scotland to gain large economic benefits by tapping into a massive home-grown resource while also making steep reductions to Scotland’s greenhouse gas emissions. It ticks both the



economic and environmental boxes at once, while also promising the social benefits of increased employment in some of the most deprived areas of Scotland.

Since devolution, programmes for government and national economic strategies have given increasing priority to the renewables sector, culminating in the *Low-carbon Economic Strategy* in 2010. This strategy is a fundamental part of the overall national economic strategy, and is explicitly linked to meeting commitments under the Climate Change Act. The current Scottish Government also expects the renewables sector to help achieve future security of supply and underpin Scotland’s economic recovery over the next decade and beyond.



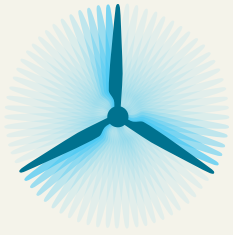
## Tackling climate change – the environmental context

*“Scotland’s climate change obligation is one of the drivers ... that have pushed our [renewable energy] targets in the right direction.”*

Jenny Hogan, director of policy, Scottish Renewables

The first Scottish target for renewable electricity generation was included in the Scottish Government’s first climate change programme, published in November 2000. This was an explicit recognition that exploiting Scotland’s renewable energy resource would be as much to do with tackling the huge challenge of climate change as it was to do with boosting Scotland’s economy. The second climate change programme saw one of the first mentions of setting a renewable heat target, also seen as crucial to achieving Scotland’s climate change commitments.

The Climate Change (Scotland) Act of 2009 was passed unanimously by the Scottish Parliament and commits Scotland to making reductions in its greenhouse gas emissions of at least 42% by 2020 and at least 80% by 2050, both relative to a 1990 baseline. Greenhouse gas inventory figures for 2011 (the most recent year for which accurate data are available) show that the energy supply sector accounts for 33% of Scotland’s total greenhouse gas emissions, down 24% since 1990. Even with these reductions, it is still the largest source of greenhouse gas emissions in Scotland, and it is clear that developing Scotland’s renewable energy resource will be crucial to securing a largely decarbonised electricity supply by 2030.



## Community development

*“For me it was an exciting win-win: renewable resources in areas where we desperately needed new employment ... this was a big economic opportunity.”*

Sarah Boyack, MSP, minister for transport, environment and planning (1999-2000)

Scotland’s renewable resources are typically in fairly remote areas in the north and west of the country, where development can bring jobs to areas of relatively high unemployment, boosting the local economy and helping to stem the exodus of young people. The Scottish Government has a target for local and community ownership of renewable generating capacity of 500MW by 2020. By 2012, there were already some 5,000 energy projects in community or local ownership. The Scottish Government estimates achieving the target could be worth up to £2.4 billion for Scottish communities and rural businesses.

In some areas there has been significant opposition to renewable energy. Local residents concerned about the effect of wind farm developments on landscapes, and those who feel they have not gained materially from the increased economic activity, can sometimes form well-organised and highly visible protest groups. Other communities have positively engaged with the renewables industry by negotiating agreements that a portion of the revenue would be paid to the community for a range of projects, including energy efficiency.

## Leadership

Unambiguous political support from across the Scottish Government over three consecutive governments is frequently cited as one of the most significant factors that has made Scotland such an attractive place for the renewables industry to do business. Alex Salmond, the First Minister since 2007, a former energy economist, understands the value of political certainty to this industry and frequently takes the opportunity to communicate his personal support for the renewables sector. Scottish Government civil servants state that he is “categorically pro-renewable energy” and investors know that “within the Scottish administration there is 100% support for the industry”. This is in stark contrast to the UK

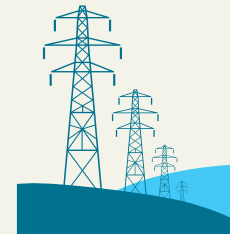
Government, whose support for a renewed gas and nuclear agenda and conflicting messages of support for renewables has only served to damage the investment environment.

## Cross-party support

There is little dissent from the view that developing a strong renewable energy sector is an effective way to deliver tangible economic, environmental and social benefits to the whole country. Some parties differ over the most appropriate technologies to be used, but on the broader question of support for the renewable sector, there is overwhelming consensus that this is an industry that is worthy of political backing that crosses party lines.

The earliest targets were set by a coalition of Labour and Liberal Democrat politicians. These were increased by a Scottish National Party government. The Scottish Green Party has been a constant voice in support of a more sustainable energy policy. Throughout successive governments, the Conservative Party has consistently supported the renewables sector, though more recently expressing some caution due to concerns about the impact of onshore wind farms. Irrespective of which party or parties are likely to be in power following future elections, it is unlikely that the present strong political support for the renewables industry will waiver. This political certainty translates into economic confidence for the industry and its investors. This is a point made by representatives of a renewable energy company based in Wales, during a recent inquiry by a Scottish Parliamentary Committee:

*“The Scottish Government is strongly committed to renewable energy and its leadership in that regard is why we invest in Scotland. We are a Wales-based company, so you might have thought that we make all our investment decisions and invest most of our risk money in Wales, but that is not the case. We have chosen to develop and invest in Scotland and to open offices in Scotland because of that strong leadership ... The targets are extremely important. There are targets in Wales, but we find that they are not often applied or given sufficient weight in the planning balance. The Scottish Government’s targets are important to us as a company when we are looking at where we want to invest.”*



## The Scottish Government's collaborative approach

*“The Scottish Government has very little constitutional power over energy policy and far less resources than the UK Government. But it benefits from tight policy networks, with a lot of engagement with the energy industry, the academic community and engineering experts, whose reach stretches right into the heart of government, through forums like the Energy Advisory Board.”*

Nicola McEwen, senior lecturer, University of Edinburgh

In addition to the use of its devolved powers, and working with the UK Government on energy policy, the Scottish Government style and approach has been a significant factor in encouraging the growth of the renewables industry. This has been a deliberate attempt to maximise its effectiveness through engaging with the renewables industry, academia, environmental NGOs and other stakeholders with an interest in Scotland's sustainable energy future.

Scottish ministers and civil servants have become very adept at working closely with organisations outside government and have developed very strong and mutually supportive relationships both within government and across civic society. The Scottish Government has set up partnership working groups on sustainable economic development, marine energy and renewable energy development, focused on achieving government targets.

Communication between the NGOs, government and the renewables industry is also effective. These close working relationships helped develop a coherent energy policy to which a wide range of interest groups can subscribe. This in turn provides potential investors with the confidence that only solid political support can provide.

*“The pragmatism that has been shown by green NGOs, businesses, trade unions and others has helped [the Scottish Government] get to where we are today, and we'll need to continue that as we head towards 2020.”*

Stephen Gethins, Special Advisor to the First Minister (2009-2012)



## Environmental NGO role

*“The Scottish Government is very keen to interact with Scottish environmental NGOs ... Ministers speak and interact with them regularly, and it's a good and positive relationship.”*

Stephen Gethins, special advisor to the first minister (2009-2012)

The very strong links between energy and environment mean that Scotland's environmental NGOs have played a key role in pushing for more ambitious environmental legislation, tighter controls on unsustainable energy sources and more challenging renewable energy targets. A variety of tactics by environmental campaigners and the renewables industry, including political engagement and media comments at key moments, contributed hugely to the setting of Scotland's first renewable electricity target in 2000.

From 2006 onwards, the environmental NGOs have allied themselves with faith groups, trade unions, international development charities and others to form Stop Climate Chaos Scotland. This coalition of more than 60 civil society organisations was instrumental in pushing for the 42% emissions reduction target by 2020 to be included in the Climate Change (Scotland) Act of 2009, and also in encouraging all of Scotland's political parties to increase the targets for renewable energy production. This message of support was then echoed by the business sector and shortly after the Climate Change Act was passed, the 2020 Climate Group was established, bringing together business leaders, local authorities and government figures.

WWF Scotland and our NGO partners played a prominent and sustained role in securing Scotland's climate change and renewable energy targets using a variety of tactics including:

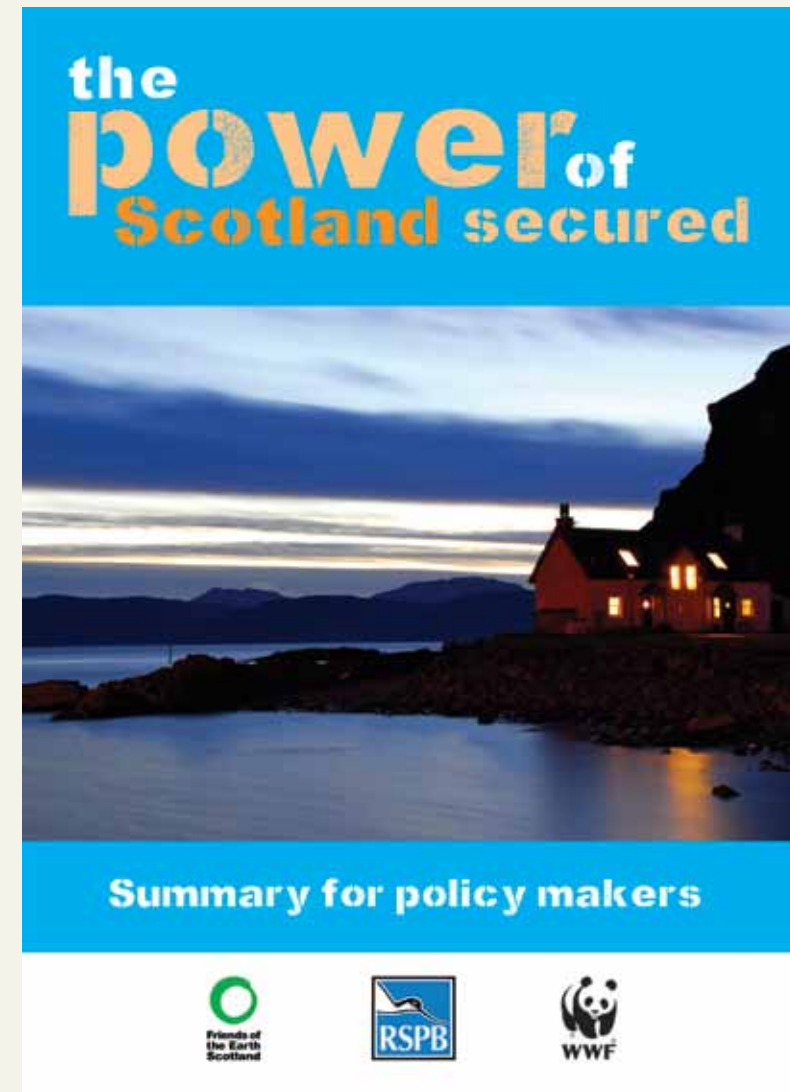
- developing strong relationships with politicians and getting strong commitments in party manifestos;
- commissioning authoritative and independent analysis of the renewable potential in Scotland;
- submitting evidence to relevant parliamentary inquiries and government consultations;
- encouraging supporters to lobby their local politicians and respond to parliamentary inquiries and government consultations;
- engaging and, where appropriate, collaborating with civil servants;

- developing strong working relationships with the renewables industry and working together to strengthen the case for renewables targets;
- media comments, opinion pieces and letters.

### Role of the media

Media coverage of the expansion of the renewables industry has played a notable role in how the issue is perceived within Scotland, across the UK and overseas. At a national level, there is support within the media for the economic benefits that continue to flow from the expansion of the renewable energy sector. At a local and regional level, media interests can often align themselves with those opposing specific renewable energy developments. In doing so, the local media often fails to represent the wider public opinion that has consistently shown itself to be in favour of the expansion of the renewables industry.

WWF Scotland and other NGOs played an important role in busting some of the myths, particularly around wind power, and made efforts to ensure that there is balanced media analysis of all of the issues relating renewable energy production, not just the local campaigns over the sites of particular wind farms. This has given considerable support to political leaders backing ambitious targets.



*The Power of Scotland Secured* is the third in a series of influential reports from environmental NGOs in Scotland on the potential growth in renewable electricity generation.

# DRIVERS FOR CHANGE

Fabricating Aquamarine Power Ltd's Oyster wave energy device in Scotland. A combination of government policies, including the use of ambitious targets for renewables have helped increase renewable generation in the last ten years.

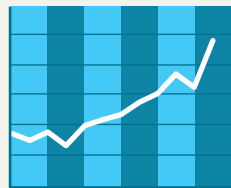


# DRIVERS FOR CHANGE

*“There are three things needed for successful investment in new [renewables]: you need a route to market whether it is through a financial support mechanism or electricity networks, you need a planning system with the political support to deliver growth, and you need general public acceptance of what you’re trying to do. And all those three things were generally coming together in Scotland [during the early 2000s] albeit electricity network availability was slow to catch up...”*

Jason Ormiston, head of media relations and public and regulatory affairs, Vattenfall

The Scottish Government used the supportive climate for renewables growth described above to put in place the policy and financial drivers which made Scotland an attractive place to do business. These drivers can be divided into: targets, policies, and financial support. The timeline in Figure 4 shows the progression of policy and targets over the last decade.



## Targets

### The emergence and development of renewable energy targets

*“The renewable electricity targets have acted as a positive feedback loop – they’ve raised aspirations, got investors to focus on reality and make things happen ... this in turn leads to yet more success.”*

Jim Mather, minister for enterprise, energy and tourism (2007-2011)

The Scottish Government’s renewable energy targets set out an ambitious but realistic vision for growth. While not statutory, they have been significant factors in determining planning policy, funding support, economic strategies and the skills agenda – giving all a sharp focus on realising the ambitions. This approach has given the targets substance and credibility to investors, the industry and political leaders.

**FIGURE 4: DEVELOPMENT OF POLICIES AND TARGETS 2000-2013**

2000	<ul style="list-style-type: none"> <li>National planning guidelines on renewable development</li> <li>Scottish Government climate change programme sets 17.5% target by 2010</li> </ul>
2001	<ul style="list-style-type: none"> <li>Independent analysis of potential renewable energy generating capacity and output published</li> </ul>
2002	<ul style="list-style-type: none"> <li>Renewables obligation Scotland comes into force</li> </ul>
2003	<ul style="list-style-type: none"> <li>40% by 2020 target set</li> </ul>
2004	<ul style="list-style-type: none"> <li>National planning framework published – specifies grid improvements required for expansion of renewables sector</li> </ul>
2007	<ul style="list-style-type: none"> <li>Scottish planning policy 6 – renewable energy</li> <li>Marine supply obligation comes into force</li> <li>Economic Strategy contains new target of 50% by 2020 with interim target of 31% by 2011</li> </ul>
2008	<ul style="list-style-type: none"> <li>Saltire prize announced for marine renewables</li> </ul>
2009	<ul style="list-style-type: none"> <li>Climate change (Scotland) act passed</li> </ul>
2010	<ul style="list-style-type: none"> <li>Low-carbon economic strategy</li> <li>80% by 2020 target set</li> <li>Scottish planning policy supports all forms of renewable energy to achieve targets</li> </ul>
2011	<ul style="list-style-type: none"> <li>2020 Routemap for renewable energy Scotland</li> <li>100% by target set</li> <li>Energy consents unit streamlines planning applications for 50MW and over</li> </ul>
2012	<ul style="list-style-type: none"> <li>Guidance on spatial frameworks for windfarms</li> <li>Electricity generation policy statement</li> </ul>
2013	<ul style="list-style-type: none"> <li>Planning guidance review proposes significant protection for areas identified as ‘wild lands’</li> <li>District heating plan published</li> </ul>

The first targets for new renewable electricity generating capacity in Scotland were set in 2000 — at 17.5% by 2010. This level was actually achieved in 2007, three years earlier than anticipated. In late 2001, the Scottish Government published an analysis of the potential of Scotland’s renewable resource to supply electricity at an affordable rate. This quantitative study raised awareness of the potential of this sector and allowed the Government to plan for expansion.

In 2003, following a consultation on the development of the industry, the Government announced a target to generate 40% of Scotland’s electricity demand from renewable sources by 2020.

The next opportunity to increase targets came with the 2007 election. Environmental NGOs and others had pressed for ambitious renewables targets in political party manifestos with good success. Following the election of the Scottish National Party as the biggest party in the Scottish Parliament, the target for 2020 was increased from 40% to 50%, with an interim target of 31% by 2011 – requiring a doubling of Scotland’s renewable capacity in just four years. Two years later, the 2020 target was raised once again, from 50% to 80% of Scotland’s annual electricity demand. Then in May 2011, after the SNP administration was re-elected with an overall majority in the Scottish Parliament, the 2020 target was set at 100%.

Scotland’s targets play a significant part in meeting the UK’s contribution to the EU’s renewable energy road map that sets out a requirement to supply 20% of Europe’s total energy demand from renewable sources by 2020. Scotland’s own target is for 20% renewable energy, matching the EU vision and going beyond the UK allocated share of 15%.

While much of the attention has focused on the electricity generation targets, the Scottish Government also set targets for renewable heat and energy efficiency in 2009. Both will make a significant contribution to reducing emissions, and energy efficiency is seen as a cost-effective way to help meet renewable electricity targets.

## Policies

### Supporting policy context

Despite the Scottish Government not having full executive powers over energy policy, over the years it has used the powers that it does have to full advantage, kick-starting Scotland’s renewables revolution. The renewables industry and civil servants attribute early successes in increasing renewable energy capacity to the development of a sound policy framework. They especially cite a well thought-out planning system for renewables and effective financial support mechanisms as the two most important policy levers that have facilitated the successful expansion of the renewables industry.

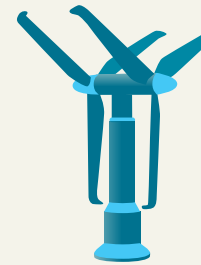
### Use of planning policy to encourage the renewables industry

*“The first planning guidelines sent an important message that there was political support for renewables. At the time, onshore wind was the only game in town, but we were building on the back of well-established hydro schemes with the knowledge that wave and tidal would be longer-term aspirations.”*

Sarah Boyack, MSP, Minister for Transport, Environment and Planning (1999-2000)

Planning approval for onshore and offshore energy infrastructure is devolved to the Scottish Government, and has been one of the key mechanisms used to determine the direction of energy policy. The publication of national planning policy guidelines on renewable energy developments in June 2000 was an early policy intervention with the aim of getting the industry moving quickly, and ensuring that the momentum that was beginning to build up was not lost. These planning guidelines required applications for wind farm developments to be assessed by local planning authorities and weighted against a range of different criteria, such as environmental, economic, development and landscape.

The first National Planning Framework was published in 2004 (followed by revisions in 2009 and 2013), setting out the Government’s guide to spatial development to 2025. The framework provides the national context for planning decisions and is a significant factor in deciding spending and policy priorities. One of the key objectives of the framework is to realise Scotland’s





renewable energy targets. The framework specifies a number of grid infrastructure improvements necessary to facilitate the planned expansion of the renewables sector, and notes the potential to adapt coastal oil and gas facilities for renewables development.

*“The National Planning Framework has moved renewables and the low-carbon economy high up the agenda ... this filters down into Scottish planning policy.”*

Jenny Hogan, director of policy, Scottish Renewables

The alignment of national and local planning policy is seen as critical to producing local spatial plans highlighting appropriate sites for renewables developments, and forecasting the local contribution towards national targets. New planning guidelines were produced in 2007 on renewable energy which advised local authorities to use the planning system to ‘manage the process of encouraging, approving and implementing renewable energy proposals’. The policy is designed to help deliver the renewable energy targets and support the economic and environmental benefits renewables can deliver. In 2013, planning guidance proposals responded to emerging opposition to some onshore wind farms by increasing protection for environmentally sensitive areas. In addition to guidance, there are a series of online toolkits and documents aimed at specific renewable technologies that are regularly updated in line with this fast-moving industry.



While local planning authorities deal with applications for new electricity generation developments of under 50MW, larger schemes are considered by Scottish ministers via the Government’s Energy Consents Unit. The unit also considers applications for transmission lines and offshore power stations. Concerns that the consents unit was taking too long to deal with applications led to a review which concluded that the unit should issue decisions no more than nine months after the initial application.

This streamlining of the planning consent process sits alongside the project Good Practice Wind, which is designed to address the barriers to the deployment of onshore and offshore wind generation by ensuring wider environmental objectives are fully taken into account and actively involving communities in the planning and implementation process.

### **Use of consenting powers to block new nuclear generating capacity**

The Scottish Government’s clear anti-nuclear policy helps support its pro-renewables agenda. The Scottish Government has the power to withhold consent for new large-scale electricity generating capacity, giving it an effective veto over the construction of new nuclear power stations. This power has been used by the current Scottish Government to rule out the development of new nuclear build in Scotland.

The UK Government’s increasing support for nuclear power stands in direct contrast to the situation in Scotland, where the Government position on nuclear power, lukewarm at best during the first two terms of the Scottish Parliament, has hardened into unambiguous opposition under the Scottish Government (led by the Scottish National Party) that has been in power since 2007. Many believe that the Scottish Government’s stance has been absolutely crucial in allowing the renewables sector to brand itself as the only plausible zero-carbon electricity generation option on the table, a position that the renewables industry in England and Wales is forced to share with the nuclear industry.

### **Grid and infrastructure development**

A number of key issues that are crucial to the expansion of Scotland’s renewables sector are reserved to the UK Government. These include the grid and infrastructure improvements which are critical to delivering renewable electricity targets in Scotland. Infrastructure improvements receive high priority in national planning guidance, and renewables growth has accelerated improvements to enhance capacity and security of supply. Examples include the upgrade of the East Coast transmission line and the replacement of the main north-south power line with a higher capacity route. This latter upgrade was approved despite local opposition to the large pylons because it was seen as vital for accessing renewable energy in the north. It is the most significant electricity infrastructure reinforcement in decades.

The current system of charging for maintenance and upgrades of the grid is a barrier to renewables development in remote and rural areas. Since the heaviest use of electricity in the UK is in the south-east of England, generators pay higher costs the further away they are from this region to reflect the cost of constructing

and maintaining the system. This inevitably means that renewable energy generators located in remote areas of Scotland face very high charges for connection to and use of the transmission network. This policy has deterred investment in these areas, and some have questioned Scotland's ability to meet its climate change and renewables targets if the problems are not addressed.

The Scottish Government has worked closely with the UK Government and the energy regulator to put in place a new charging structure which will better reflect the costs of renewables, and assist the transition to a low-carbon energy sector at lowest cost to the consumer. This lengthy process is nearing conclusion and is likely to provide a level playing field for mainland renewable generation in comparison with the rest of the UK. In terms of island generation where charges can be as much as seven times that for mainland generators, it is hoped there will be an additional level of support provided for these schemes.

## Financial support and picking winners

### Renewables Obligation Scotland

*“The Renewables Obligation was absolutely crucial in encouraging new development.”*

Sarah Boyack, MSP, minister for transport, environment and planning (1999-2000)

At least as important as the use of planning policy has been the use of financial support mechanisms to encourage the take-up of renewables. Most significant of these was the Renewables Obligation Scotland which imposed an obligation on licensed electricity providers to source an increasing proportion of electricity from renewable sources. Renewables Obligation Certificates, or ROCs, are issued to eligible generators for each megawatt hour (MWh) of electricity they produce, and either sold along with aMWh of renewable electricity or traded separately. Should a supplier not have enough ROCs to meet their obligation, they must pay the current buy-out price for the balance.

The obligations were originally designed to be technology neutral and they didn't discriminate between different sources of qualifying renewable energy. Since onshore wind was the cheapest

and most mature of all the renewable technologies available at that time, the ROS inevitably favoured the rapid expansion of this technology, arguably at the expense of emerging forms of renewable energy such as offshore wind, wave and tidal power.

The Scottish Government decided to address this potential imbalance with the Marine Supply Obligation (MSO). This was introduced in 2007, requiring suppliers to source a specified proportion of their ROCs from eligible marine renewable sources. The MSO was later replaced by a system of banding that awarded different numbers of ROCs to different forms of renewable technology. Onshore wind currently receives one ROC perMWh, tidal stream power receives three ROCs perMWh and wave power five ROCs perMWh. Under this approach, the Government is able to differentiate support according to the maturity of the sector. This has allowed the Government to target new 'winners' and position itself as the place to develop wave and tidal energy.

*“RO banding in Scotland led to higher levels of support for wave and tidal than the rest of the UK ... several foreign companies moved into Scotland ... they wanted to be close to the resource and close to the market, which looked like being the fastest growing market for wave and tidal in the world ... and you can't get better incentives for that kind of investment.”*

Jason Ormiston, head of media relations and public and regulatory affairs, Vattenfal

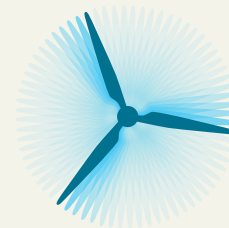
The UK Government is currently considering a new form of financial support mechanism and it remains to be seen how this change will impact on the Scottish renewables sector.

### Scotland's development agencies

*“[Scottish Enterprise] sees renewable energy as hugely important, both in terms of the transition to a low-carbon economy, but also in terms of the direct economic benefit that we see coming from renewables.”*

Seonaid Vass, energy strategy manager, Scottish Enterprise

The Scottish Government has used its considerable powers over economic development to provide maximum financial and practical support to the growing renewables sector. The development agencies, Scottish Enterprise and Highlands and Islands Enterprise, place a great deal of importance on the value to the Scottish economy and society of a healthy renewable



energy industry, and a number of initiatives (see Table 3) have been developed to assist the sector to grow and flourish. Their programmes are driven by the Low-carbon Economic Strategy, and specifically on achieving the renewables targets.

**TABLE 3: ECONOMIC DEVELOPMENT PROJECTS AND FUNDS**

INITIATIVE	DESCRIPTION
<b>International Technology and Renewable Energy Zone (ITREZ)</b>	A partnership between academia and industry to support the development of the offshore renewables sector
<b>National Renewables Infrastructure Plan</b>	Helps plan and fund the development of the port and harbour facilities that will be used to support the expansion of offshore wind and related technologies, including testing and demonstration
<b>Prototyping for Offshore Wind Energy Renewables Scotland (POWERS)</b>	A fund open to offshore wind turbine manufacturers to support the capital costs associated with the full scale production of next generation wind turbine prototypes in Scotland
<b>Wave and Tidal Energy: Research, Development and Demonstration Support (WATERS)</b>	A fund to help developers of low cost-of-energy wave and tidal devices move from technical prototypes to full commercialisation
<b>Scottish Innovative Foundation Technologies Fund</b>	Funds to support costs of deep water turbine foundations with the aim of reducing costs of mass manufacture
<b>Marine Renewables Commercialisation Fund</b>	Provides capital support for projects that will accelerate the commercial deployment of wave and tidal energy
<b>Renewable Energy Investment Fund (REIF)</b>	Loans, equity investments and guarantees to promote the use of energy from renewable sources, community ownership of renewable energy assets, and provide for district heating networks

The agencies help ensure that Scottish businesses gain as much benefit as possible from the renewables supply chain. They identify gaps in the existing supply chain and help suitable companies (which may already be active in the oil and gas market) to fill them. Scottish Development International, a joint venture between the Scottish Government and development agencies, helps attract foreign investment and develop export markets. The renewables sector has achieved recent success with investments by big players such as Gamesa, Mitsubishi, Samsung and Mitsui.

It's difficult to measure the impact of specific interventions. However, total investment in the renewables sector doubled in 2012 to reach £1.5 billion and jobs in the renewables sector numbered over 11,000 in 2012. Looking forward, the offshore renewables industry is predicted to deliver 28,000 jobs by 2020, contributing £7.1 billion to the Scottish economy.

**28,000**  
JOBS IN OFFSHORE  
RENEWABLES  
BY 2020

**Supporting the skills agenda**

The Scottish Government has been clear that the existing expertise of the Scottish workforce must be a key part of the renewable industry's success story. Overseas companies need to be confident that any locally-recruited workforce has the education and training necessary to support their operations before locating in Scotland.

The Government is working through Skills Development Scotland to address the challenges of educating and training for the next generation of renewable energy specialists. Scotland's heavy engineering heritage stood Scotland in good stead when it came to supporting the development of the offshore oil and gas industry during the 1970s and 80s, and it is hoped the experience of fabricating oil and gas platforms will be of great value when the expected expansion of offshore renewables (wind, wave and tidal) takes off during the coming years.

The Skills Investment Plan for the energy sector was published in February 2011, and recognises the energy sector as one of Scotland's key economic drivers. However, there are those within the renewables industry who remain concerned about the lack of suitably trained personnel coming out of Scotland's colleges and universities. One project to help address the skills gap is the Transition Training Network (TTN), a collaboration between the National Skills Academy for Power and Scottish Renewables to help the transition of skilled employees to the renewables sector from other industries.

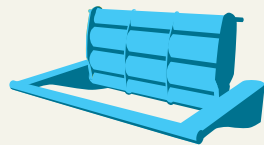
### Supporting emerging technologies

*“There is a focus on helping Scottish companies get involved in the renewable energy supply chain ... we want to anchor the renewables supply chain here in Scotland.”*

Seonaid Vass, energy strategy manager, Scottish Enterprise

The UK failed to reap the full economic benefits from onshore wind or from the first generation of wave devices that were being developed in Scotland during the 1970s and 80s. Having learned from these missed opportunities, the Scottish Government is keen to see that the next generation of wave and tidal devices are developed, tested and manufactured in Scotland, and then installed on a commercial basis in Scottish waters. This way, Scottish companies will benefit from the new supply chains that will emerge, and from the export markets as these new devices, having proved themselves in Scotland’s challenging marine environment, are sold around the world.

The consistent support for marine renewables over the years has produced some ‘firsts’ such as the first deep water offshore wind farm, and the world’s first grid-connected, accredited test facility for wave and tidal devices and technologies. Evidence of the Government-wide effort to support emerging technologies in addition to the financial support noted above are shown in Table 4.



*“Scotland has positioned itself over the past four or five years as the place to do wave and tidal.”*

Jason Ormiston, head of media relations and public and regulatory affairs, Vattenfall

### Community development

Community Energy Scotland delivers the Scottish Government’s Community and Renewable Energy Scheme (CARES). This initiative provides loan funding to communities, rural businesses and clusters wishing to develop local renewable energy schemes. This affordable financial assistance is designed to provide support during the pre-planning stage of project development, and should help towards the Scottish Government’s target of 500MW of community-owned renewables by 2020. CARES can also provide support for urban community renewables, such as photovoltaics or wood-fired boilers for community buildings located in areas of multiple deprivation. Another initiative is the Warm Homes Fund, which provides loan funding to support renewables projects in communities suffering from fuel poverty.

**TABLE 4: INTERVENTIONS TO SUPPORT EMERGING TECHNOLOGIES**

INTERVENTION	DESCRIPTION
<b>European Marine Energy Centre – Orkney (2003)</b>	World’s first and only test centre for wave and tidal devices. Funded largely by the Scottish Government and Highlands and Islands Enterprise, this centre is now independent and self-financing.
<b>Saltire Prize (2008)</b>	The prize is worth £10m to the first company installing a wave or tidal device in Scottish waters that produces 100GWh over a continuous two-year period. This is the largest innovation prize in history and represents a very conscious effort to showcase Scotland’s renewables opportunities on the world stage.
<b>Scottish European Green Energy Centre in Aberdeen (2009)</b>	Funded by Scottish Government and European Regional Development Funding. The First Minister launched this centre calling attention to Scotland’s leadership in demonstrating and deploying of marine renewable devices, grid and infrastructure developments.
<b>Scottish Low-carbon Investment Conference (2010)</b>	Annual conference since 2010 funded by the Scottish Government. Al Gore was the keynote speaker at the 2011 conference, where he praised Scotland both for its world-leading carbon emission reduction targets and its ambitious targets on renewable energy generation.
<b>European Offshore Deployment Centre – Aberdeen (2013)</b>	The Deployment Centre allows offshore wind developers and supply chain companies to test cutting edge wind technology in an offshore environment before commercial deployment. The centre aims to reinforce Aberdeen’s place as the energy capital of Europe.
<b>Memorandum of Understanding (MoU) between Scottish Development International and South Korea (2013)</b>	MoU to increase trade links and promote export potential in marine renewables. One of several examples of trade agreements, delegations and trade fairs to promote the Scottish renewables industry.



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Jamie Ardagh, an Eigg crofter and Eigg Electric employee, beneath some of the island's wind turbines.

## CHALLENGES FOR THE FUTURE

The renewables sector has benefited from widespread political and civic support for the industry in the last decade, but as the industry matures

and developments appear in more communities, maintaining this support will have its challenges. Some groups opposed to wind farms have emerged, pressing their political representatives to stop developments.

In the face of this shifting context, the Scottish Government remains constant in its support for the sector and has responded to these concerns in the three ways noted below.

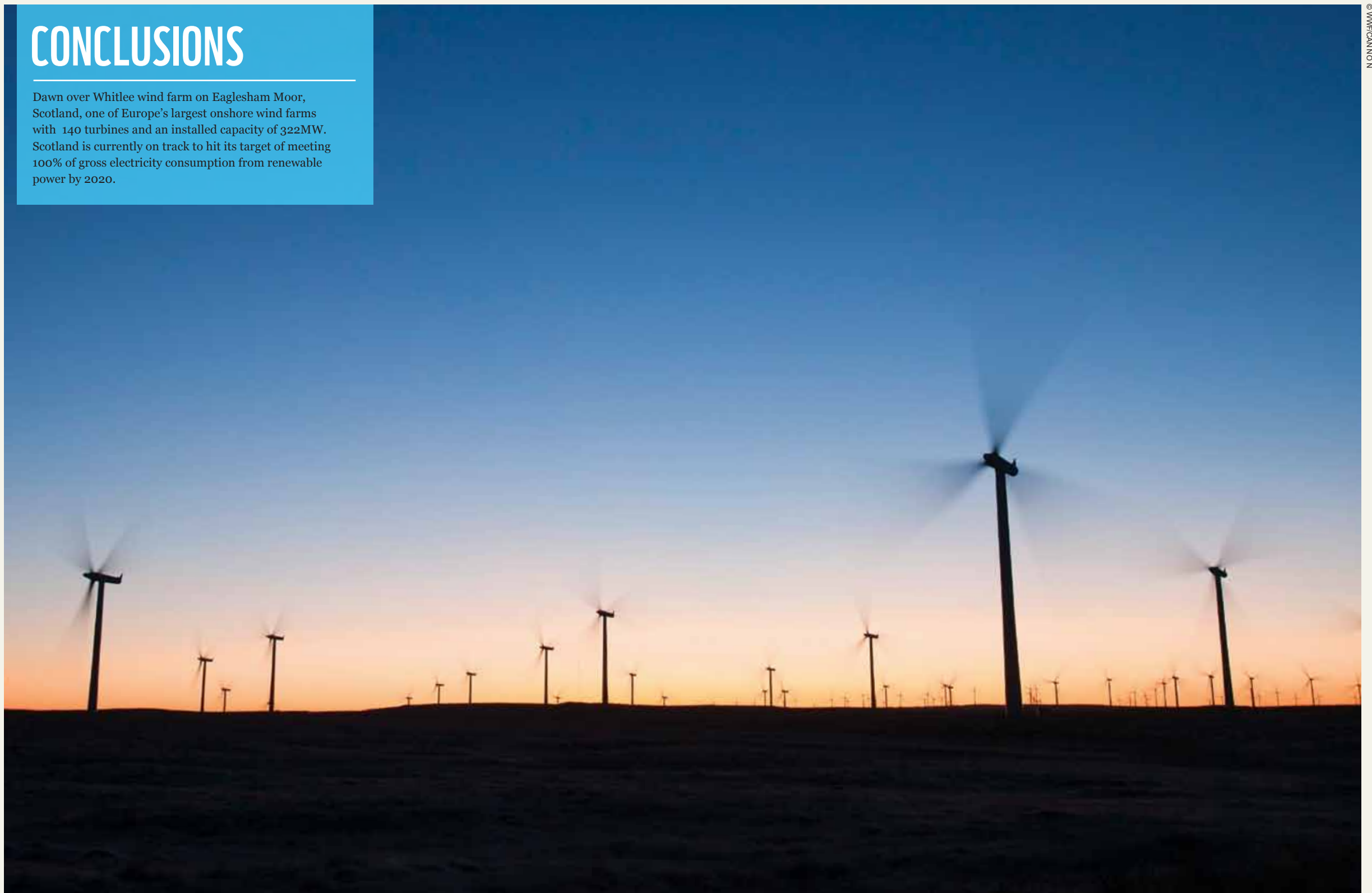


- **Acknowledged the need for some restrictions on development:** the latest national planning framework and planning guidance proposes significant protection should be given to some 20% of Scotland identified as 'wild land', covering about 20% of the land area of Scotland. The guidelines also propose extending the separation distance between wind farms and cities, towns and villages.
- **Sharing the benefits of renewables:** the Government wants more communities to reap great benefits from renewable developments. Loans and advice are provided to encourage community and local ownership of renewables; as well as guidance on accessing community benefits from commercial developments. Some of this assistance is directed at impoverished communities that struggle to pay heating bills.
- **Scrutiny:** the Scottish Parliament held a lengthy inquiry into the achievability of Scotland's renewable energy targets. It concluded that the 100% target is achievable and gave its full support to Government efforts to achieve that aim.

For the most part, Scotland continues to have a very positive association with renewables. This support for the renewables sector cannot be taken for granted, and there is a continuing need for government, industry, academia and NGOs to work together to communicate success and ensure the benefits for jobs, skills and local regeneration are realised on the ground.

# CONCLUSIONS

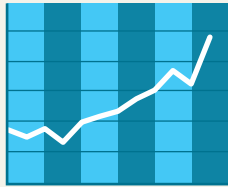
Dawn over Whitlee wind farm on Eaglesham Moor, Scotland, one of Europe's largest onshore wind farms with 140 turbines and an installed capacity of 322MW. Scotland is currently on track to hit its target of meeting 100% of gross electricity consumption from renewable power by 2020.



# CONCLUSIONS

Over the last decade Scotland's renewable energy sector has enjoyed spectacular growth

with impressive increases in installed renewable capacity and energy output. At the same time, ambitions for the sector rose sharply with targets rising over time, ultimately reaching a target to generate the equivalent of 100% of Scotland's annual electricity demand from renewable sources.



This rapid growth was reliant not only on the vast resource potential, but a combination of factors which created the right conditions to attract investment. The Scottish Government was able to make use of this positive climate for renewables and managed to articulate and develop an ambitious vision of its renewable energy future.

## Success factors

- **Ambition to create a low-carbon economy:** the renewables sector is seen as a key element of the Government economic strategy, while at the same time meeting its commitments to reduce carbon emissions under the Climate Change (Scotland) Act. This ambition is shared across Government departments.
- **Political support:** there is strong cross-party support on the need for renewable energy as part of efforts to tackle climate change and transition to a low-carbon economy. This support extends to all government departments and a wide and diverse range of external organisations.
- **Civic support:** environmental NGOs, along with their coalition partners from wider civic society, played a powerful role in pressing for more ambitious targets, and maintaining political and media support for renewables.
- **Collaborative approach:** the Scottish Government deliberately sought the participation of NGOs, business and academics with the policy development process, making for a strong consensus across and outside government.

- **Meaningful targets:** Ministers used ambitious targets to set out a vision for renewables growth, giving industry something to strive towards and long-term certainty.
- **Supportive policy context:** the Scottish Government used all the policy levers at its disposal, to work proactively towards a positive vision for Scotland's energy future.
- **Significant and targeted financial support:** financial support mechanisms, prizes and investment funds all gave the industry significant financial assistance and international profile.

## Next steps

Going forward, it's vital that the Scottish Government continues to work with partners to maintain the strong consensus in favour of renewables growth in Scotland. This will become increasingly challenging as renewables projects get built and become more apparent to people who live or travel nearby. The Scottish Government and the renewables industry need to spend more time and resources engaging with local communities, discussing and responding to their legitimate concerns. They also need to communicate more effectively the benefits – economic, social as well as environmental – of renewable energy. They then need to ensure proposals and benefits are actually delivered, and accurately portrayed in the local media.

In sum, successive Scottish governments have demonstrated strong leadership in promoting the renewables sector in Scotland. It has deliberately and consistently communicated a positive story about renewables potential and growth in Scotland which then feeds on its own success. Jobs, economic growth, carbon reduction targets, and local community development are frequently cited as benefits. Every opportunity is taken to give the industry a boost – through a regular flow of positive press stories, creating supportive planning policies, and working with all stakeholders on developing and achieving ambitious targets for the future. As a result, investors in Scotland's renewables sector infrastructure know they can engage with the industry safe in the knowledge that there is long-term political support, backed up by active and engaged environmental, industry and community sectors.

# ACKNOWLEDGEMENTS

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# REFERENCES

- Cabinet Office and Scottish Office, Devolution Settlement: Scotland. Online. Available at: <https://www.gov.uk/devolution-settlement-scotland>
- Community Energy Scotland (2012). CARES loan scheme. Online. Available at: [http://www.communityenergyscotland.org.uk/support/cares/cares\\_loan](http://www.communityenergyscotland.org.uk/support/cares/cares_loan)
- European Commission (2007). Renewable Energies in the 21st century: building a more sustainable future. Online. Available at: [http://ec.europa.eu/energy/energy\\_policy/doc/03\\_renewable\\_energy\\_roadmap\\_en.pdf](http://ec.europa.eu/energy/energy_policy/doc/03_renewable_energy_roadmap_en.pdf)
- Garrad Hassan (2001). Scotland's renewable resource 2001 – Executive summary. Online. Available at: <http://www.scotland.gov.uk/Resource/Doc/47176/0014633.pdf>
- Intelligent Energy Europe, Good Practice Wind Project (website). <http://www.project-gpwind.eu/>
- National Grid (no date). Explanation of draft TNUoS tariffs for 2012/13. Online. Available at: <http://www.nationalgrid.com/NR/rdonlyres/95B3202A-4966-464E-A5F5-EAD5A3197FBC/50867/DraftTNUoSstariffsfor201213.pdf>
- Office of Public Sector Information, no date. Electricity Act 1989, Section 32. Online. Available at: <http://www.legislation.gov.uk/ukpga/1989/29/section/32>
- Office of Public Sector Information, no date. Electricity Act 1989, Section 36. Online. Available at: <http://www.legislation.gov.uk/ukpga/1989/29/section/36>
- Ofgem – Project TransmiT (website): <http://www.ofgem.gov.uk/Networks/Trans/PT/Pages/ProjectTransmiT.aspx>
- Scottish Development International (2012). 800 renewables jobs for Scotland. Online. Available at: <http://www.sdi.co.uk/news/2012/03/800-renewables-jobs-for-scotland.aspx>
- Scottish Development International (website). Energy Key Facts. <http://www.sdi.co.uk/sectors/energy/energy-key-facts.aspx>



Scottish Enterprise (no date). National Renewables Infrastructure Fund. Online. Available at: <http://www.scottish-enterprise.com/your-sector/energy/energy-how-we-can-help/energy-funding/renewables-fund.aspx>

Scottish Enterprise (no date). POWERS. Online. Available at: <http://www.scottish-enterprise.com/your-sector/energy/energy-how-we-can-help/energy-funding/powers.aspx>

Scottish Enterprise (no date). WATERS. Online. Available at: <http://www.scottish-enterprise.com/your-sector/energy/energy-how-we-can-help/energy-funding/wave-and-tidal-energy-fund.aspx>

Scottish Executive (1999). Making it work together. Online. Available at: <http://www.scotland.gov.uk/Resource/Doc/158140/0042788.pdf>

Scottish Executive (2003). Securing a renewable future – Scotland's renewable energy. Online. Available at: <http://www.scotland.gov.uk/Resource/Doc/47034/0014765.pdf>

Scottish Executive (2004). Marine energy testing centre opens. Online. Available at: <http://www.scotland.gov.uk/News/Releases/2004/08/10103847>

Scottish Government (2007). Renewable energy potential. Online. Available at: <http://www.scotland.gov.uk/News/Releases/2007/11/27095600>

Scottish Government (2010). A Low-carbon Economic Strategy for Scotland. Online. Available at: <http://www.scotland.gov.uk/Publications/2010/11/15085756/2>

Scottish Government (2010). Target for renewable energy now 80% - news release. Online. Available at: <http://www.scotland.gov.uk/News/Releases/2010/09/23134359>

Scottish Government (2011). Renewables revolution aims for 100% - news release. Online. Available at: <http://www.scotland.gov.uk/News/Releases/2011/05/18093247>

Scottish Government (2012). Scotland's renewables routemap short life task force on streamlining energy development licensing and consents – final report. Online. Available at: <http://www.scotland.gov.uk/Resource/0038/00387242.pdf>

Scottish Government (2013). Renewable electricity statistics for Scotland March 2013. Online. Available at: <http://www.scotland.gov.uk/Resource/0041/00417390.pdf>

Scottish Government (2013). Energy in Scotland: a compendium of Scottish energy statistics and information, January 2013. Online. Available at: <http://www.scotland.gov.uk/Resource/0041/00415880.pdf>

Scottish Government (2013). Scottish Greenhouse Gas Emissions 2011. Online. Available at: <http://www.scotland.gov.uk/Publications/2013/06/1558/2>

Scottish Government (2013). Proposed planning revamp. <http://www.scotland.gov.uk/News/Releases/2013/04/Planning-systems-30042013>

Skills Development Scotland (2011). Skills investment plan for the energy sector. Online. Available at: [http://www.sfc.ac.uk/web/FILES/Skills/Skills\\_Investment\\_Plan\\_for\\_the\\_Energy\\_Sector.pdf](http://www.sfc.ac.uk/web/FILES/Skills/Skills_Investment_Plan_for_the_Energy_Sector.pdf)

Scottish Government (2012). Offshore renewables investment map. Online. Available at: <http://www.scotland.gov.uk/News/Releases/2012/04/Renewables-jobs23042012>

Scottish Government (2013). Ministerial statement on greenhouse gas emission reduction targets. Online. Available at: <http://www.scotland.gov.uk/News/Speeches/RPP2speech>

Scottish Low-carbon Investment Conference (website: <http://www.slconference.com/>)

Scottish Parliament (2012). Official Report of the Economy, Energy and Tourism Committee, 6th June 2012. Online. Available at: <http://www.scottish.parliament.uk/parliamentarybusiness/28862.aspx?r=7065&mode=pdf>

Scottish Renewables (website). Scotland's Renewable Energy Sector in Numbers 2012. <http://www.scottishrenewables.com/scottish-renewable-energy-statistics-glance/>

UK Government (2013). Progress on Scottish islands renewables project. Online. Available at: <https://www.gov.uk/government/news/progress-on-scottish-islands-renewables-project>

# Scotland: a renewable powerhouse in numbers

100%  
RECYCLED



SCOTLAND: A RENEWABLE POWERHOUSE

42%

reduction in greenhouse gas emissions by 2020 required by Scottish Climate Change Act

£1.5BN

worth of renewable power projects were commissioned in Scotland in 2012



100%

By 2020, Scotland aims to generate 100% of its gross electricity consumption from renewables

80%

increase in renewable output between 2007 and 2012



## Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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