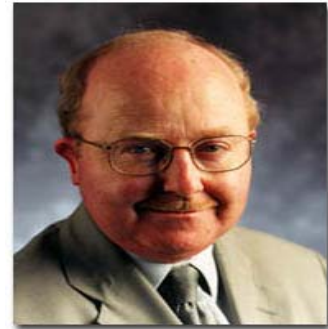




## SCOTTISH EXECUTIVE

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Minister for Environment & Rural Development  
**Ross Finnie MSP**



August 2002

Dear Sir / Madam

Scotland is blessed with a huge renewable energy resource, amounting to a staggering 75% of the entire UK installed generating capacity. The Scottish Executive is committed to developing and exploiting this resource, a commitment which sits at the heart of our Climate Change Programme. The Renewables Obligation Scotland (ROS), which we introduced earlier this year, will increase Scotland's renewable electricity generation considerably over the coming years. This will play a significant role in reducing our carbon emissions.

The ROS is producing a flood of applications for consent to build new renewables plant, and we expect many more in the coming months and years. Our largest companies have already announced investment plans exceeding £1 billion for renewable energy development over the next decade. The market is demonstrably there and set to increase. There are also marvellous economic opportunities to be grasped in the development of new sources of renewable energy such as wave and tidal power.

This consultation paper looks at the opportunities to go beyond our existing policy objectives and further increase Scotland's renewable energy in the period beyond 2010. We know that there are many challenges to be faced if we are to fully exploit the potential. **However, we firmly believe that our policies and commitment, coupled with Scotland's natural resource and expertise, mean that producing as much as 40% of Scotland's electricity from renewable sources by 2020 is a realistic aim.**

I welcome your comments on how, together, we can best realise this potential.

**ROSS FINNIE**  
**Minister for Environment and Rural Development**

## SCOTTISH EXECUTIVE

### SCOTLAND'S RENEWABLE ENERGY POTENTIAL – BEYOND 2010

#### A CONSULTATION PAPER

AUGUST 2002

#### **Introduction**

1. As part of the Scottish Climate Change Programme, the Executive is already committed to raising the overall proportion of electricity generated from renewable sources in Scotland to 18% by 2010 (including existing hydro-electric output). But Scottish Ministers have signalled their ambitions to go further. The Executive recognises that predicting the pace of technological advance and future market trends in the energy industry, over a twenty-year period, carries with it huge uncertainties. Nevertheless, Scottish Ministers are determined that Scotland should harness its huge natural resource and set challenging objectives for the further development of renewable energy in the period beyond 2010.

2. Following publication of the Report, “Scotland’s Renewable Resource 2001”, showing Scotland’s potential for renewable energy, Ministers initially indicated a target of 30% from renewables by 2020, but having reviewed the situation in preparing this paper the Executive now seeks views on the potential to generate as much as 40% of Scotland’s electricity from renewable sources by 2020.

3. The consultation document is aimed primarily at energy stakeholders, including consumer organisations, environmental groups, business, local authorities, unions, and others with a particular interest in energy issues. Respondents are invited to consider not only the issues for Government but also the actions that would be required by business and other stakeholders.

4. This consultation is taking place in parallel with a consultation on UK energy policy generally, following the UK Energy Review published in February 2002 that was carried out by the Performance and Innovation Unit (PIU) of the Cabinet Office. Both consultations assume that:

- liberalised and competitive markets will continue to be a cornerstone of future energy policy;
- it is vital to maintain security of supply;
- greenhouse gas emissions will need to be reduced significantly during the 21<sup>st</sup> century, both globally and in the UK, and the energy system is crucial to achieving this and other environmental objectives;

- competitiveness and affordability are also key drivers of energy policy;
- achieving greenhouse gas emission reductions will need major technological innovation with the potential for Scotland to take a market lead in renewable and low carbon technologies and in sharply improving energy efficiency.

### **Scotland's Renewable Heritage**

5. Scotland is a land rich in natural resources, including energy sources. Its waterpower has been used to generate electricity for over 100 years. More recently the oil and gas found under the waters surrounding Scotland have provided the raw material for further economic activity, which is set to continue for many years yet. There is still as much oil and gas left under the North Sea and west of Shetland as has been exploited over the last 30 years.

6. But finite resources are just that – finite. We know that the oil will run out eventually. We know also that the widespread burning of fossil fuels is having a real effect on global climate, forcing us to address climate change at the global, national and local levels. That is why the Scottish Executive is taking a broad and long term view of our energy requirements and how to meet them, while at the same time reducing carbon emissions. We need to follow the example of those who planned and built the hydro schemes in the Highlands of Scotland. They envisaged a clean and reliable source of energy and they constructed it so well that today, fifty years later, the hydro schemes are still generating enough electricity to meet around 11% of Scotland's electricity demand. With careful refurbishment, they will still be generating clean power in another 50 years time – a good example of sustainable development.

### **What has been done so far**

7. Building on the foundation provided by the hydro developments, Government support was made available in 1994, under the Scottish Renewables Obligations to help tap more of Scotland's huge renewable energy potential. This has led to over 30 projects across Scotland now generating electricity from wind, hydro, landfill gas, biomass and wave energy. Wind energy currently accounts for some 150MW of generation capacity which, depending on the fossil fuel assumed to be displaced, amounts to a reduction in carbon emissions of about 20,000 - 40,000 tonnes. This is a significant contribution to the carbon savings that we expect to be delivered over the implementation period of the Scottish Climate Change Programme. Wind generation in Scotland has continued to increase since 2000. Important progress has also been made in reducing the cost of wind energy to a level where it is now competitive with the cost of generating electricity from gas.

8. Under the Kyoto protocol, the UK's target is to reduce greenhouse gas emissions by 12.5% against 1990 levels by 2008-12; and the UK Government aims to reduce CO<sub>2</sub> emissions by 20% by 2010. In addition, the UK Government has a target of increasing the proportion of electricity supplied from renewable sources across the UK, from under 3% now, to **10% by 2010**. It is expected that the outcome of the formal review of the Kyoto Protocol targets, due to commence later this decade, will be the setting of even more challenging targets for the reduction in greenhouse gas emissions over the second compliance period, post-2012.

9. Interest in these issues was heightened by the report in 2000 of the Royal Commission on Environmental Pollution “[Energy – the Changing Climate](#)” which recommended that the UK Government take steps to cut carbon emissions by 60% by **2050**. The Executive actively participated in the PIU's [UK Energy Review](#) (see [Scottish Executive Submission](#)) which, earlier this year, recommended that the UK Government give priority to energy efficiency and renewable energy in seeking to reduce carbon emissions. The Review suggested new targets in these areas, including a UK target of increasing the proportion of electricity from renewable sources to 20% by 2020. The Executive welcomed the PIU’s recommendations, in particular the emphasis placed on energy efficiency and on renewables since this was fully consistent with our own view.

10. In 2000, the Executive decided to raise the overall proportion of electricity generated by renewable energy in Scotland to **18% by 2010** (including existing hydro output). In addition, over the past 2 years we have: -

- revised our **planning policy guidelines** for renewable energy to make it easier for developers, local authorities and others to take account of the importance we place on renewable energy, while recognising that every energy project, renewable or not, has an impact on the environment;
- **surveyed the views of the people** who live near Scotland’s wind farms and found that, in general, the nearer they live to them, the better they like them;
- published a report on Scotland’s renewable potential "[Scotland’s Renewable Resource 2001](#)", (see also paragraph 19); and
- put in place the new **Renewables Obligation (Scotland)** or ROS, which came into operation on 1 April this year.

11. The ROS is the mechanism through which we aim to reach our existing 18% objective. It is operating in parallel with the similar Renewables Obligation (RO) in England and Wales, giving renewable energy developers a GB-wide market for the “green” value of their renewable output. It puts a legal obligation on every electricity supplier in Scotland to meet a target specified by the Executive, which rises from 2003 to 2010 in line with targets in England and Wales. (Further information on how the ROS works is provided in the Annex to this document.)

12. Our policy is that the ROS and RO targets north and south of the border should be the same; this is to ensure that Scottish electricity consumers will not pay more than their share of the additional costs of the new sources of renewable energy that are needed. These additional costs are estimated at around 4-5% extra on electricity prices by 2010. There is however an expectation that in Scotland, new electricity trading arrangements (the British Electricity Transmission and Trading Arrangements or BETTA) currently being planned by the energy regulator Ofgem, will lead to a reduction in electricity prices generally when they are introduced in 2004-05, which would offset at least some of the increase due to the cost of the ROS. There is also some confidence that the unit cost reductions of renewable energy technologies seen over the last decade have further to go over the next 10-20 years.

## **The Challenges**

13. If Scotland is to realise its full potential renewable generation capacity, then it will be necessary to significantly **strengthen the grid**. The GB grid companies, working in conjunction with the Department of Trade and Industry (DTI) and with Scottish Executive input have examined this in a major transmission issues study. We need to ensure not only that the new renewable generating capacity can be connected to the grid but also that the electricity can reach the customers who need it. In most locations, the considerable investment required would be used to strengthen existing overhead electricity lines rather than build new ones, although some new build would be needed. The main concentration of electricity demand in Britain is in the south east of England, a very considerable distance from the best sources of renewable energy across Scotland. Hence the GB-wide nature of the transmission issues study, the results of which are due to be published later this year. The Executive remains committed to working with the electricity industry, the Department of Trade and Industry and the regulator, Ofgem, to ensure that the grid is developed and operated to its optimal efficiency.

14. A key issue in all of this is of course **cost**. The cost of strengthening the grid would be considerable. However, as previously stated, our policy is that Scottish electricity consumers should not pay more than their share of the additional costs of the new sources of renewable energy. We believe therefore that we should maintain parity between the renewables obligations in Scotland and in England and Wales, thus ensuring that any additional costs related to upgrading the grid are met by electricity consumers across Great Britain.

15. Although we are strongly committed to further renewable energy development, we recognise that particular types of development can give rise to public concerns. Wind farms do have a visual impact on the environment of Scotland, and we acknowledge that there are extremely important **natural heritage issues** to be taken into account. We have to meet our international and national statutory obligations to protect designated areas, species and habitats of natural heritage interest, and the historic environment, from inappropriate forms of development. Even outside the various areas across Scotland designated on environmental or scientific grounds, and away from the many parts of the country of outstanding scenic value, there are other areas where development might be constrained, e.g. near urban areas or airports, or because of military low flying. Our **National Planning Policy Guideline [NPPG6](#)**; Renewable Energy Development, takes these issues fully into account, while stressing the importance of vigorously addressing climate change by reducing carbon emissions. At the present time, NPPG6 is felt to be sufficient to achieve a balance consistent with achieving our 18% target for renewables, but additional measures may be needed to support a higher target.

16. By 2010, it is expected that Cogenzie coal fired power station will have been closed. Beyond 2010, Scotland's nuclear stations, which at present meet 55% of Scotland's electricity needs, will be coming near the end of their lives - Hunterston B some time after 2011, followed by Torness perhaps around 2020. Their output is carbon free, and unless they are replaced their closure will leave a large energy gap to be filled. A reduction in energy demand as a result of better energy efficiency measures, and an increase in the amount of renewables capacity available in Scotland, will help fill that gap, although on the basis of current energy technology, these will not be sufficient in themselves to fully make up the shortfall. So, if Scotland is to avoid a significant increase in carbon emissions, it will be

imperative to maximise the contribution from renewables and improved energy efficiency – always taking account of the intermittent nature of many renewable electricity sources.

17. Scotland's renewables potential is of course **not** limited to onshore wind farms. As a proven and commercially viable technology, onshore wind will clearly make a major contribution, but we firmly believe that Scotland must also invest **in the development of alternative renewable sources** such as offshore wind, wave and tidal power, biomass and photovoltaics (PV). Through driving these technologies towards commercial viability we can not only increase the potential sources of renewables, but also reap the benefits of greater integration between intermittent sources of energy, such as wind, and predictable sources, like tidal and biomass.

### **The Longer Term Potential**

18. In December 2001, the Minister for Environment and Rural Development, Ross Finnie, published a report entitled “Scotland’s Renewable Resource”, which revealed the sheer scale of the potential renewable energy resource in Scotland. This was estimated at 60 GW capacity. In comparison, this amounts to around three quarters of the installed electricity generating capacity across the entire UK. It would be enough to meet Scotland’s current peak winter demand 10 times over. By harnessing this potential it is clear that **Scotland can become a world leader in the field of renewable energy.**

19. On the basis of proposals already submitted, or in prospect, the Executive believes that a significant amount of new renewable energy generation will be built in Scotland, attracted by the huge natural resource and the positive planning environment. To achieve our target of 18% by 2010 will require around 1,000MW of new capacity, largely wind, although some other technologies may also be deployed, such as hydro. This level of capacity is equivalent to around 10 large wind farms, each with 70-80 turbines, and would, if sited on-shore, use around 0.2% of Scotland’s land area in total. We believe this will be achieved. However, our policy of strong support for renewable energy will not prevent us from ensuring that each individual project is rigorously scrutinised for its environmental impact.

20. Considerable progress is already being made. The impact of the ROS, taken with Scotland’s massive renewables potential, and the Executive’s strong policy commitment, is resulting in a large number of wind energy developers approaching the grid owners in Scotland (ScottishPower, and Scottish and Southern Energy) to discuss connection. In addition, several developers have applied to the Executive for the consent of Scottish Ministers, under the Electricity Act, to build large wind farms and hydro schemes, and many more are scoping their proposals under environmental regulations, prior to making formal applications. The total amount of additional capacity represented by these proposals is in excess of 2,500MW.

21. It would be unrealistic to expect that all of these proposed developments will reach fruition. But, on the basis of current proposals, we believe that the total amount of new renewable energy capacity built in Scotland will significantly exceed that needed to meet our target of 18% by 2010. And of course, we expect that further proposals will be brought forward in the next few years.

22. A sizeable reduction in carbon emissions does not represent the only benefit from pursuing the development of renewable energy. There would also be **economic activity** arising in Scotland, albeit renewable developments do not tend to create large numbers of

jobs. But, in creating strong demand for renewable energy, the ROS is starting to distribute jobs to more remote areas and present new business opportunities for Scottish manufacturing companies. The new Vestas wind turbine factory at Campbeltown in Argyll is a good example of this, creating over 100 high quality jobs. There are other examples in manufacturing also. We estimate that there are currently perhaps around 1,000 people in Scotland who owe their jobs to renewable energy, and we expect that number to increase in the years ahead.

23. Over the longer period, we see huge opportunities for Scotland to become a major player in the development and application of wave and tidal power in particular. The Executive has already provided support for the world's first commercial wave energy scheme, which is now in operation on Islay. We have recently announced that we will work with Highlands and Islands Enterprise and contribute to the funding of a Marine Energy Test Centre in Orkney. The provision of a dedicated facility for testing and proving wave and tidal technology could lead to significant export and manufacturing opportunities for Scotland, and the synergies and potential rewards for our fabrication sector could be substantial. Scotland is already an important player in the energy industry, relative to its scale, and the Executive is determined to maintain and enhance our influence on the development of new renewable technologies in the longer term.

24. We are also encouraged by the growing interest among local communities in pursuing their own environmentally friendly ways of generating the energy they need. The Executive recently announced that it would fund the **Scottish Community Renewables Initiative (SCRI)**. Run through a partnership with the Energy Saving Trust and Highlands and Islands Enterprise, the SCRI will provide a front door for communities to access relevant expertise and finance. Expert teams will advise local groups on how to access the range of funding initiatives available for renewable energy projects. Help will be on hand to assess how new technologies can help local groups, in preparing feasibility studies, and in bidding for grants. Ultimately, the SCRI could lead to schools, hospitals, farms and community centres being powered by energy crops, biomass-heating schemes or by solar photovoltaic panels. Such schemes could be enormously productive in terms of promoting awareness of the issues surrounding renewable energy and its role in a sustainable society. The SCRI will sit alongside schemes already in place, which provide advice to households on matters such as energy conservation and micro combined heat and power systems. In addition, the Executive sponsors the Energy Saving Trust which is administering a £20 million Major Photovoltaic Demonstration Programme. Through this programme community groups and individual households will be able to apply for funding to demonstrate the benefits and applications of PV, ultimately reducing the costs of installation and increasing take-up of this technology.

## **Conclusions**

25. The Executive is committed to creating a policy, economic and planning environment which places this country in the vanguard of a new energy industry that is sustainable and could bring with it considerable economic benefits for Scotland. Our policy will result in a significant reduction in carbon emissions and lead to additional economic activity, particularly in the remoter areas. It offers the opportunity for Scotland to become a world leader in renewables technology.

26. Currently, 11-12% of our electricity generation comes from renewable sources. We believe that our objective of raising this figure to 18% by 2010 will be achieved. The Executive is determined to build on the powerful incentive provided by the ROS to provide

meaningful and practical support for new technologies like wave and tidal power and, to continue to raise public awareness and acceptance of the benefits of renewable energy. We recognise that there are significant technical, environmental and financial challenges to be overcome and we are committed to tackling these in partnership with the industry and other key stakeholders.

**27. In setting out a longer term vision for the future we believe the potential exists for as much as 40% of Scotland's electricity to be generated by renewable means by 2020.**

#### **Invitation to comment**

28. This paper raises many issues, on which the Executive would welcome your views. We look for the responses to this consultation to help us develop a balanced and sustainable renewables policy that will take full advantage of Scotland's massive renewables potential – with the carbon reductions and economic benefits this will bring – while at the same time striving to minimise the economic and environmental costs. You are invited to comment on any issue, but in particular we would ask that you consider the following questions: -

- Do you share our view that Scotland can comfortably expect to meet and exceed our existing target of 18% renewables by 2010?
- Is it reasonable to suggest that by 2020, we can achieve a position whereby Scotland could generate as much as 40% of its energy from renewable sources by 2020? What measures would be required to realise this potential?
- How can the Executive best support and encourage further investment in renewables? What actions might be needed and by whom to promote the rapid development and commercialisation of new forms of renewable technology such as wave and tidal power, biomass and photovoltaic panels?
- How can significant growth in renewable energy (particularly wind farms) in Scotland be reconciled with other policy interests, such as environmental and aviation interests?
- What impact will an increased reliance on renewables have on Scotland's electricity network?

29. If you have views on the issues raised in this paper, please let us have them. They should be sent **by 30 November 2002** (and preferably by email) to: -

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**Please note that, unless respondents request otherwise, all comments received may be made available for public view.**

## **THE RENEWABLES OBLIGATION (SCOTLAND) (ROS)**

The ROS works in the following way:-

- Ofgem accredits each qualifying renewable energy generator;
- the generators sell their output in the market in the usual way;
- Ofgem electronically issues renewables obligation certificates (ROCs) to accredited generators in accordance with their metered output to the grid;
- electricity suppliers throughout Britain obtain the ROCs they need as evidence that they have met their statutory targets (either by purchasing them in the ROC market from generators or by constructing renewable energy projects themselves). Some or all of the cost of this will be passed on to consumers; and
- suppliers then redeem their ROCs, or alternatively pay a buy out price to Ofgem, to discharge their obligation.

ROCs can be traded separately from the electricity generated by renewable energy sources, and this happens in a GB-wide market, which we believe will mean that the degree of achievement of the ROS target in Scotland is likely to find the same level as that in England and Wales under the Renewables Obligation.