

Our Ref: CG/JCC/PS/JW/
ORG13-A1646

Dr Marc Rands
The Royal Society of Edinburgh
22-26 George Street
Edinburgh EH2 2PQ

14 July 2005

Dear Dr Rands

RSE INQUIRY INTO ENERGY ISSUES FOR SCOTLAND

Thank you for your letter of 13 May 2005.

The Scottish Environment Protection Agency (SEPA) welcomes the opportunity to contribute to the Society's enquiry on energy issues in Scotland. SEPA is the environmental regulator in Scotland responsible for radioactive substances, for emissions to land, air and water, and we also regulate the storage, transport and disposal of waste. SEPA regulates emissions from power plants, and is involved, either as a regulator or a consultee, on many aspects of energy generation. SEPA does not regulate emissions from transport nor do we have a formal role in transport or energy policy. SEPA believes that all energy uses need to be considered under this inquiry, namely those for transport, public sector, business, domestic and industrial use.

In 1998, SEPA's published Environmental Strategy identified climate change as the foremost environmental issue. Now in 2005, climate change is one of the UK's main issues for debate under its presidency of the G8. Climate change is probably the greatest threat mankind has ever faced, and poses the greatest anthropogenic stress on the environment. In response to these challenges, the UK Government is now commendably committed to a 60% cut in greenhouse gas (GHG) emissions by 2050. In Scotland, the Scottish Executive has set a target of 18% of Scotland's electricity being produced from renewable resources by 2010, and also a longer term target of 40% by 2020. The First Minister has also just announced that sector-based targets will be set for carbon dioxide reduction in Scotland.

Recent developments in climate change science now suggest that even these ambitious targets may not be enough. The inclusion of marine and biospheric feedback into climate models suggests that releases from these sources could exceed anthropogenic sources by 2050, leading to a "tipping point" where mankind is no longer the main driver of or brake on possible climate change. To avert such a scenario, reductions in GHG emissions of as much as 90% by 2030 may be required. The longer we wait, the more disruptive will be the impacts as well the remedial adaptation and mitigation measures we will have to adopt.

In light of these urgent timescales and sizeable reductions, SEPA believes that limits on fossil fuel use, so-called "de-fossilisation", has to be the key driver for any inquiry into energy. For the level of cuts discussed above to be achieved, it will be necessary for many, if not all, of the available low carbon technologies to be accelerated, used and developed further. It will require a very substantial injection of research and development funds, and a genuine culture change in our attitudes to energy use.

Cont/d.....

We believe that in facing up to the challenges of climate change, Scotland can embrace goals of sustainable development, leading to a much more sustainable and equitable society. In discussions over the forthcoming Scottish Executive strategy on sustainable development, SEPA has proposed that this needs to lead on climate change, as it is both the most pressing issue, and one that will most readily affect and engage with people and engender a more sustainable society.

We have not responded to each individual point raised in your consultation but refer you to our earlier responses to various related consultations:

Appendix A: our response to the DTI consultation of 2002 on the energy white paper.

Appendix B: our response to the Executive's 2002 consultation on Scotland's renewable energy potential.

Appendix C: our input to the RCEP study of 2003 on the use of energy crops.

Appendix D: extracts from our response to Mr Ross Finnie concerning possible issues for the forthcoming Scottish Sustainable Development Strategy to be published by the Executive later in 2005.

SEPA would welcome further discussion on these issues. Please feel free to contact me, Professor James Curran, Head of Environmental Strategy, or Peter Singleton, Emerging Issues Unit Manager, at the address on the previous page.

As a public body committed to openness and transparency, SEPA feels it is appropriate that this response be placed on the public record.

Yours sincerely

Campbell Gemmell
Chief Executive

Encs

APPENDIX A

Strategic Planning Directorate

Campbell.gemmell@sepa.org.uk

FILE REF : JCG/JCC/JW/
ORG13-A1022

12 September 2002

Angie Parkinson
Department of Trade and Industry
Room 1105
1 Victoria Street
London
SW1H 0ET

Dear Ms Parkinson

ENERGY POLICY – KEY ISSUES FOR CONSULTATION

The Scottish Environment Protection Agency (SEPA) welcomes the opportunity to contribute to the debate on energy policy within the UK. SEPA is the environmental regulator in Scotland responsible for radioactive substances, for emissions to land, air and water, and we also regulate the storage, transport and disposal of waste. SEPA does not, however, regulate emissions from transport.

SEPA recognises that energy policy is a reserved issue, whereas environmental protection and land-use planning are devolved to the Scottish Executive. SEPA also regulates emissions from power plants, and is involved either as a regulator or a consultee on many aspects of energy generation.

In 1998, SEPA's Environmental Strategy identified Climate Change as the foremost environmental issue. Many bodies, most notably the Royal Commission on Environmental Pollution (22nd Report, June 2000) and the European Commission in its 6th Environmental Action Programme argue the case for very substantial cuts in green house gas emissions. For such cuts to be achieved, it will be necessary for many, if not all, the available low carbon technologies to be used and developed further. The appendix addresses your main consultation themes in turn.

SEPA has not suggested any new or radical proposals, for the most part the suggestions continue and expand on existing programmes of support or research and development. However, the key to making progress in UK energy policy is for the development of a coherent long-term view on what the UK, as a whole, is going to do about energy and its impacts on climate change. This can only be achieved by an open debate that involves all sectors of society. The Cabinet Office PIU review and this subsequent consultation have started the process but there must be confidence that a consensus is reached so that the necessary long-term strategy is sufficiently robust to changing pressures in the economy, short-term

issues (such as the fuel tax crisis) and political changes.

The Royal Commission on Environmental Pollution developed 4 scenarios of the future supply and demand of energy in the UK. There needs to be more public debate on these scenarios and a decision on the route that we should follow as a nation. Once the “big picture” is in place then policy on investment, financial incentives, energy and resource taxation and research and development can be fleshed out. Many of the tools (emission trading, taxes, company travel plans and corporate reporting) are already widely in use elsewhere in the world.

It is likely that a phased approach with various technologies being promoted and supported in succession, and subject to ongoing review, will provide both a structured long-term commitment within a planned programme and the flexibility to adapt to changing technical and socio-political opportunities.

Please contact Peter Singleton at this address if you would like any further information. SEPA has no objection to this response being made publicly available.

Yours sincerely

Dr Campbell Gemmell
Director of Strategic Planning

Enc

APPENDIX

Energy Policy – Key Issues for Consultation

Scottish Environment Protection Agency Comments on Main Themes

Security of Supply

Security can be enhanced by ensuring that the electricity market remains competitive for a wide range of technologies and reducing the excessive competitive advantage that some technologies acquire because of historical Government investment. This may require renewed and repeated intervention to prevent short-term market dominance, such as by gas-fired generators. It is necessary to continue to give new entrants, particularly small and renewable generators, equal access to the transmission and distribution networks and to customers.

It is important to acknowledge that energy demand is likely to continue to rise if energy prices continue to fall. On current trends, despite improvements in energy use efficiency, a managed reduction in energy requirements is needed to prevent a gap developing between supply and demand. This can be achieved in a number of ways, for example increased choice of energy source for heating for consumers of low-grade heat. Energy policy should promote opportunities for alternatives such as heat

pumps, passive solar heating and better building design.

Climate Change

SEPA believes there is a strong likelihood that the UK will need to make very large reductions in carbon emissions over the next century as our contribution to tackling global climate change. Reductions of 70% or more seem appropriate.

We have to build a firm consensus that this is the route that the UK should follow because of the timescales involved in mitigating and adapting to climate change. If there is no clear long-term policy, then investors are subject to the whims of continual changes of direction, and history shows that they will not make the necessary commitment to a robust energy infrastructure. A settled policy does not preclude future planned reviews to account for emerging opportunities and barriers, but does send a strong message to key sectors.

The UK should invest in new technologies sooner rather than later and ensure that investment is for the longer term. The current generation of power stations will provide electricity needs only for the next 2 decades or so before they must be closed. The gap between energy demand and supply could be filled using new versions of old techniques, such as combined cycle gas turbines. But even if these are of very high efficiency and are “good quality” combined heat and power stations they will still be dependent on fossil fuels, which increasingly may have to be sourced from outside the UK.

The UK should take a lead in developing technologies and methods of climate change mitigation. Other countries, that may have a more sceptical stance on the human influence on climate, are still ahead of the UK in terms of energy technologies because the economic climate promotes viability.

SEPA believes that moving towards a low-carbon economy will enhance UK international competitiveness through leadership in new, more energy efficient, technologies.

International

Energy is already a global market, dominated by international companies. It is likely that this trend will increase. Similarly, although the UK needs to set its own energy policy, this has to be done in the context of the European and global energy markets. However, as the fourth largest economy in the world, the influence of the UK in this market is considerable.

Energy efficiency and combined heat and power

A very large increase in resource use efficiency is a key requirement to achieving a low-carbon future while avoiding adverse economic impacts. Energy efficiency gains are important in this respect but must be coupled with demand reduction if they are to be of any benefit.

We should set our sights higher than they are at the moment. Current housing stock is well insulated but it falls a long way short of the standards set in many other countries. The emphasis should be on energy demand reduction, which may require different standards in different areas of the UK.

Energy demand has increased steadily despite a continued improvement in energy efficiency. Serious consideration should be given to real energy costs more closely reflecting the cost of externalities through, for example, the imposition of an appropriate energy or carbon dioxide tax on all markets. Otherwise, any gains made by energy efficiency improvements (or even the development of renewable energy sources) are likely to be swamped by increasing demand. This may have social and political consequences but there are programmes in place to protect those suffering from fuel poverty and these should be continued and expanded. This could be funded through the recycling of revenue from an energy tax across all sectors.

Manufacturing standards must be made more stringent to ensure that energy efficient products are more readily available and less efficient products are progressively withdrawn. It is also important that information on the energy “life cycle” of a product is available to purchasers. The high cost of energy efficient products makes them less attractive than low efficiency products and this must be reversed. Possible routes would be a charge on lower energy efficiency or incentives to invest in more efficient equipment by offsetting the initial costs.

Renewables

Renewable energy represents a huge potential resource for the United Kingdom, and especially Scotland.

The Government should continue with the existing instruments to promote new and renewable energy but, no matter what target is set, there always remains the question of attainability. The current system of renewables obligations allows a buy-out so that the target can be missed at a financial cost to the electricity supplier. How does this compare to the external cost of not meeting this, and subsequent, targets? Is the price of non-compliance high enough to promote full development of the sector? Since the obligation has only recently started it may not be possible to answer these questions but they should be reviewed throughout the life of the measure and adjustments made if the target seems likely to be missed.

The recent EU report “Progress of Renewable Energies: Target Setting, Implementation and Realisation” suggests that the UK will fall far short of its own target.

SEPA believes that there should also be targets for future years to give the energy industries a forward view and to provide increased certainty for investment by the private sector. Targets should be set on the basis of need, not on a pragmatic Government estimate of what can be achieved. There are plenty of commercial examples of such targets being set and achieved ahead of schedule and at a profit.

The Government’s R&D programme for renewable and sustainable technologies is very welcome, but has comparatively few resources compared to the historical funding by Government on fossil and nuclear power. If newer forms of energy production are to compete then they need a level playing field for development as much as for access to transmissions systems and markets. For example, some commentators have suggested an energy tax with the revenue recycled to promote energy efficiency, waste minimisation and renewable energy sources and also to protect the most vulnerable sectors of society.

SEPA believes there should be positive planning guidelines for renewable energy, but that the needs of local communities must be considered. It is important that, for instance in considering an application for a wind farm, the planning authority understands that it can, if required, limit the extent, noise levels and height of turbine installed to limit local impact.

Transmission, distribution and trading

It is important that having made a clear decision on the direction of the UK energy policy, the distribution network is then allowed to adjust to facilitate this. If, as SEPA believes, future energy policy relies heavily on renewable technologies, the inclusion of storage in the network will also become important.

Nuclear

At present, “keeping the nuclear option open” can be achieved by continuing with the current fleet of reactors with no new build while maintaining the UK’s technical expertise through maintenance and decommissioning. Equally, it could be argued that the substantial human and infrastructure resources associated with nuclear energy in the UK would make a significant contribution if it were redirected towards renewable and sustainable energy.

Nuclear generation is a low carbon energy source and as such is considered by many to be an option for future energy supply. If new nuclear power stations are to be planned and built in the UK, SEPA believes the outstanding issues of nuclear waste disposal and public confidence must be resolved. There is already a legacy of low-level nuclear waste both sent for disposal and as the result of decommissioning. The UK already lives with the problems associated with waste storage and the marginal increase in risk due to increased amounts must be compared to the risks associated with climate change and other impacts of alternative generation.

Monitoring of radioactivity in the environment shows a distinct trend that concentrations of radionuclides are likely to either stay at current levels, which are mainly due to the presence of long-lived radionuclides from historic discharges, or be reduced due to radioactive decay and increased regulatory pressure to reduce discharges. UK Government policy to progressively reduce radioactive discharges to the marine environment over the next 20 years as part of the OSPAR strategy will assist this but may also preclude new build.

Gas & Oil

Gas and oil usage are key factors in security of supply and in their impact on climate change. Both of these issues can be addressed by a move away from traditional energy uses and a managed demand reduction. Countries with abundant fossil fuel reserves have frequently demonstrated their ability to affect UK energy policy and their influence can only increase as demand for fossil fuels from developing countries grows while the supply remains constant or reduces.

The study of carbon sequestration, perhaps in geological reservoirs, should receive more funding. This may provide a useful medium-term solution for carbon abatement, but also needs to be investigated while the North Sea infrastructure is still in place with the potential to be adapted for use in sequestration.

Bio-fuels could replace fossil fuels to a large extent, and chemical feedstocks to some extent, but any large increase in their use would require the provision of large proportions of the UK land surface and a major overhaul of agricultural policy and potentially energy supply. To be a viable alternative they must be used in conjunction with demand reduction, improved energy efficiency and minimisation of resource use.

Coal

It is important that no source of energy is excluded from consideration. If extracting energy from coal can be made efficient and low-carbon, then it has a future in a low carbon society. More immediately natural, but uncontrolled, coal derived methane emissions should be used to generate useful energy. This has a potential double win of reducing the green house potential of the emission and extracting energy.

Innovation

If the UK is to achieve ambitious reductions in emissions of green house gases, all positive methods for reduction will have to be used. Therefore, strong support for research, development and deployment is essential, as has been highlighted by many studies (e.g. PIU energy review and Report of Chief Scientific Advisor's energy research review group). In light of whatever long term goals are set for UK energy policy, a prioritised programme of introduction of technologies may be practical, e.g. in terms of potential for reduction in carbon emissions and in terms of likely technical advances, grid enhancement, closures of existing plant, etc.

Transport

Transport energy use is a major issue. There have been repeated calls for improved energy efficiency in vehicles, developments of long term low and zero carbon options and measures to address demand.

The demand for transport has to be reduced with greater encouragement for modal shift and modal integration. Innovative solutions for freight, such as urban logistics, should be explored and encouraged. The opportunity to support such systems exists within the Government's framework for Local Air Quality Management but will only succeed if it is inextricably linked to the planning system and is concomitant to inner city regeneration and to transport planning policies. This will require greater commitment to "joined up" Government and a more integrated approach generally to environmental, social and economic concerns. These are not mutually exclusive, but local and central Government still tend to treat them so.

The planning system should be used more effectively to limit the need for journeys with integrated developments and fewer housing estates planted in the middle of the country with little or no local infrastructure.

Regarding the use of fuel cells, electric vehicles and other alternative fuels for transport, the infrastructure necessary for our current transport system, with its emphasis on the private car, has been built up over a century with very large Government investment. At the same time investment in public transport has declined. Making changes to the system will require long-term commitment and high levels of investment to introduce other energy sources into the market. However, there have been many well-documented examples of new public transport initiatives that have dramatically reduced the growth of private car use.

It is important when considering transitional solutions such as LPG and fuel cells powered using fossil fuels to plan their introduction, and transfer to final solution, in case they end up as an additional problem rather than a solution. With current technologies, hydrogen fuel vehicles are likely to require very significant and increased amounts of electricity generation to synthesise the fuel and these additional demands must be planned for and capacity created.

New working practices could have a significant effect on emissions by reducing transport demand but are reliant on infrastructure (broad band communication networks for instance) that can only be provided by Government directly or by it providing a firm lead. Similarly the Government needs to lead by example in encouraging these practices. Also reconsideration of freight miles may be able to yield reduction in emissions, as has been recently highlighted by the concept of food miles.

Summary

SEPA believes climate change to be such a potentially severe and damaging environmental problem that there is an urgency to address the causes robustly. SEPA would urge the UK Government to set demanding multi-decadal targets for greenhouse gas reduction. A supporting policy commitment would then be necessary to deliver a long-term programme of investment in low-carbon energy alternatives. The programme should be multi-sectoral, covering electricity generation and energy consumption by the domestic, commercial and transport sectors. The programme must include best estimates of energy demands in various forms over the future decades, taking account of possibly significantly increased call on electricity supplies to substitute for other emission generating sources, such as domestic boilers and traditional internal combustion engines. The programme should then prioritise and phase the remedial measures: demand control must be the first priority through energy efficiency programmes, wind power would appear to be the next priority, followed by a programme which would probably involve elements of all known low-carbon energy supply sources in order to meet demand over future years. More controversial or prototype energy sources should be phased at later stages to allow for technical advances or the possibility of substitution. The task is extremely demanding and there is no prospect of

getting forecasts right first time, but identified review stages with continued commitment to previous investments should provide sufficient confidence to attract commercial interest.

SEPA
12/09/02

APPENDIX B

FILE REF : JCG/JCC/JW/
ORG13-A1077
YOUR REF: -

25 November 2002

Ms Hazel Gibson
Scottish Executive
Energy Division
Meridian Court
5 Cadogan St
Glasgow G2 6AT

Dear Ms Gibson

SCOTLAND'S RENEWABLE ENERGY POTENTIAL – BEYOND 2010

The Scottish Environment Protection Agency (SEPA) welcomes the opportunity to contribute to the debate on renewable energy generation in Scotland.

In 1998, SEPA published its Environmental Strategy which identified climate change as the foremost environmental issue. Many bodies, most notably the Royal Commission on Environmental Pollution (22nd Report, June 2000) and the European Commission in its 6th Environmental Action Programme argue the case for very substantial cuts in green house gas emissions. For such cuts to be achieved, it will be necessary for many, if not all, the available low carbon technologies to be used and developed further. With this in mind, the suggested 40% target for the percentage of Scotland's electricity generated from renewable means is welcomed by SEPA. A few detailed comments on the proposal are discussed in the annex attached.

However, it has to be accepted that virtually all forms of energy generation have an environmental impact, and most cause at least some emissions of greenhouse gases under full life-cycle analysis. Affordable energy is vital to a modern vibrant economy, and to social well-being. Therefore, in setting and adopting a target for renewable generation, it is important not to lose sight of the Scottish Ministers' goal of promoting sustainable development in Scotland. This requires that every scheme proposed for development be measured against a set of "sustainable development" criteria to ensure that the balance of these underlying needs is properly met.

SEPA strongly supports the concept of setting long term visionary targets for renewables in Scotland and believes this must be set against a coherent long-term view on energy policy for both Scotland and the UK. The Cabinet Office PIU review and the subsequent Department for Trade and Industry consultation have started the process but there must be confidence that a consensus will be reached so that the necessary long-term strategy is sufficiently robust so that it can withstand, but also marginally adjust to, changing pressures in the economy, short-term issues (such as the fuel tax crisis), technical advances, and inevitable political changes. This can only be achieved by an open debate that involves all sectors of society.

It is likely that to meet a 40% renewables target, a phased approach with various technologies being promoted and supported in succession will be required. The energy policy, renewables target and accompanying incentives must be subject to ongoing review, which will provide both a structured long-term commitment within a planned programme and the flexibility to adapt to changing technical and socio-political opportunities.

Please contact Peter Singleton at this address if you would like any further information. SEPA has no objection to this response being made publicly available.

Yours sincerely

Dr Campbell Gemmell
Director of Strategic Planning

Enc

ANNEX

Questions raised in the consultation are shown in bold

1. Do you share our (Scottish Executive) view that Scotland can comfortably expect to meet and exceed our existing target of 18% renewables by 2010? And,
2. 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?

SEPA believes that it is both practical and desirable to meet the existing renewable electricity generation target by 2010, and to set a bolder target of 40% by 2020. However, this can only be done in the light of continued policy commitment to the support of renewable energy development. This will require the necessary fiscal incentives (including viable access to the grid), long-term commitment to research and development in this field and support for emerging technologies

As the timescale for the target lengthens, and the proportion of renewable electricity energy increases, then significant other factors have to be considered to ensure uptake and supply. By 2020, Scotland will have lost several of its major power stations, possibly contributing more than 40% of current electricity demand. How will this demand be replaced, solely by “renewables”, or also by “traditional generation methods”? As the percentage of reliance on renewables grows, concerns over downtime, and in particular energy storage become more significant. Finally, if the UK sets ambitious greenhouse gas reduction targets as suggested by both the Royal Commission on Environmental Pollution (22nd Report, June 2000) and the European Commission in its 6th Environmental Action Programme, then the proportion of Scotland’s total energy used as electricity is likely to increase, making a percentage based target for renewables increasingly more difficult to attain.

3. 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?

As stated above it is essential that significant research and development funds are made available to support the development of viable forms of renewable technology. This programme has to have long-term commitment to ensure that solutions are developed in the short, medium and long-term. Secondly it is necessary that long-term fiscal schemes are developed for assisting the commercialisation of these developments.

4. How can significant growth in renewable energy (particularly wind farms) in Scotland be reconciled with other policy interests, such as environmental and aviation interests?

SEPA recognises that National Planning Policy Guideline No. 6 and Planning Advice Note No. 45 provide guidance on wind farm development to planners and that these documents do make mention of the environmental considerations to be taken into account. The statutory requirement to consult SEPA and Scottish Natural Heritage for wind farm proposals provides further environmental protection from inappropriate development, and SEPA is largely content with the level of environmental protection provided by the present regulatory system. It is important, however, that the comments provided by statutory consultees such as SEPA are taken into account in the decision making process, in order to ensure that the potential level of environmental protection provided through the planning process is actually put into effect. If this is the case then many of the environmental threats posed by wind farms can be eliminated, and so also are any potential conflicts between renewable development and environmental protection.

As the prime driver for renewable energy development is greenhouse gas reduction, it is important that each application is accompanied by sound and verifiable life cycle analysis that demonstrates that the scheme does reduce overall emissions.

SEPA is aware that aviation interests conflict with some of the potentially most viable areas for wind farm development, it is important that these issues are addressed and a suitable compromise reached that allows Scotland to make the most of its potential for renewable energy generation.

SEPA does have concern that some developers believe that environmental considerations can be largely ignored in the aim of meeting the Scottish Ministers' renewable generation target.

SEPA believes that most hydropower developments will affect the local aquatic environment to such an extent that they will need instead to satisfy the derogation tests set out in the Water Framework Directive, as enacted by the Water Environment & Water Services Bill currently before parliament (e.g. for heavily modified status) in order to be allowed to proceed. SEPA would therefore wish Ministers and the Executive to be aware of the requirements of these tests, as set out in Articles 4(5) and 4(7), when considering proposals for schemes above 1MW.

SEPA believes that it is incumbent on developers to understand the forthcoming legislation and expects them to bring forward sensitively sited and well-designed schemes that avoid the most significant potential environmental impacts. SEPA would welcome any guidance the Executive may wish to give on how both these aspects of policy should be balanced and on what status, if any, the renewable energy targets should play in the licencing process.

5. What impact will an increased reliance on renewables have on Scotland's electricity network?

SEPA is aware of concerns over the impact of the New Electricity Trading Arrangements (NETA) and

the proposed British Electricity Trading and Transmission Arrangements (BETTA) on the market for electricity generated by renewable means. The market has been designed to meet energy demand at the lowest cost to the consumer and gives no consideration to the environmental consequences.

Under NETA, generating plant is run on the basis of operating cost alone, which usually results in fossil-fuelled generation taking precedence over renewable sources. There is little consideration of the environmental costs of electricity generation. The Renewables Obligation Scotland (ROS) and Climate Change Levy (CCL) go some way to reflecting these external costs but fall far short of all but the most modest estimates of the cost to the environment. For instance, 1 tonne of coal burnt would attract a levy charge of £11.70 but lead to the emission of over 2 tonnes of carbon dioxide with a damage cost of £40, using the mid-range cost recommended by DEFRA.

The structure of the current and proposed trading arrangements also works against wind generation because it penalises intermittent producers. Their potential market share is reduced and it discourages investment in new plant. This effect is offset to a large extent by the ROS and clearly there are a great many proposals for new wind farms but will this continue when the target underlying the ROS is met? If the obligation is met mainly by wind generation then how can we engender an incentive for investment in wave and tidal generation, which will be needed at an early stage if a new higher target is to be achieved?

New financial mechanisms may be needed to further support renewables, for instance consideration should be given to the extension of some form of CCL to the domestic sector to promote energy efficiency and demand reduction. This would require appropriate safeguards for those in fuel poverty but energy demand is likely to continue rising in the face of ever decreasing energy costs. As with the non-domestic sector it should be revenue neutral and the income could be used to fund domestic energy efficiency programmes. However, once business has adjusted to it, the CCL and similar instruments will only promote further renewable capacity if it increases year on year.

APPENDIX C

Our Ref: JCC/SC/PS/IM
ORG13-A1268
Your Ref:
Directorate of Strategic Planning

If telephoning ask for:
Professor James Curran

Rhian Enright
RCEP Secretariat
Royal Commission on Environmental Pollution
5-8, The Sanctuary
Westminster
London
SW1P 3JS

03 October 2003

Dear Ms Enright

ROYAL COMMISSION STUDY ON THE USE OF ENERGY CROPS FOR HEAT AND POWER PRODUCTION – INVITATION TO SUBMIT INFORMATION

I thank you for your consultation letter of the 27TH August 2003, addressed to Sir Ken Collins, SEPA's Chairman. SEPA is grateful for the opportunity to comment. Detailed comments on the questions you raised in your consultation are attached in an annex.

SEPA strongly supports the Scottish Executive's target of 18% of Scotland's electricity being produced from renewable resources by 2010, and also the setting of a longer term target of 40% by 2020. SEPA also supports the UK Government's commitment to the Royal Commission's recommendation that the UK should reduce carbon dioxide emissions by 60% from current levels by about 2050. For such cuts to be achieved, it will be necessary for many, if not all, the available low carbon technologies to be used and developed further. SEPA strongly supports further studies into such technologies.

The UK should invest in new technologies sooner rather than later and ensure that investment is for the longer term. SEPA believes that moving towards a low-carbon economy will enhance UK international competitiveness through leadership in new, more energy efficient, technologies.

The Government's R&D programme for renewable and sustainable technologies is very welcome, but has comparatively few resources compared to the historical funding by Government on fossil and nuclear power. If newer forms of energy production are to compete then they need a level playing field for development, including equitable access to transmission systems and markets. For example, some commentators have argued for an energy tax with the revenue recycled to promote energy efficiency,

waste minimisation and renewable energy sources and also to protect the most vulnerable sectors of society.

SEPA believes that energy crops are likely to play a significant role in our shift away from fossil fuels. However, it is important the overall aim of reducing greenhouse gas emissions is prominent as the main driver, to ensure that the most effective means of achieving this is promoted at all times.

SEPA would welcome further dialogue on any of the points raised in this response. If you have any questions or wish to pursue any of the points we have raised please contact either Peter Singleton (peter.singleton@sepa.org.uk) or myself at the address below.

Yours Sincerely

Professor J Curran
Environmental Futures

Annex

What are the principle environmental benefits of biomass as a source of heat and power energy? What are the disbenefits? How do they compare to the benefits/ disbenefits of other forms of renewable energy?

The principle benefits of biomass as a source of heat and power energy are its sustainability and its positive impact on the environment. The green plants from which biomass fuels are derived fix carbon dioxide as they grow, so their use does not add to the levels of atmospheric carbon, therefore they are carbon neutral. Using residues will improve the local environment, while at the same time planting energy crops on land not required for food production can generate jobs, improve rural economies and help maintain agriculture and forestry.

SEPA strongly supports further research into crops for energy. Energy crops require reduced chemical input when compared to conventional arable crops and can provide an alternative use of agricultural land. Scientists at Forest Research, as part of a national research programme, have been examining how the yield from over 30 varieties of energy crops varies in different climates and sites. This type of research, together with the RCEP's study will further inform policies, technologies, financial and demand communities.

One of the main restrictions of biomass technology is the level of financial risk hindering large scale development of pre-commercial technologies. Some policies address these in part, however rewards may not yet be strong enough to overcome the risk. A second disbenefit is that the greenhouse gas emission reduction of these technologies is variable and can be quite poor. For instance, it has been suggested that the saving from biomass for CHP schemes is far greater than that for bio-fuels. It is very important in promoting these "new technologies", that the overriding goal of reducing greenhouse gas emissions is the primary driver. SEPA agrees with the EU comments that if biomass is to play a strong role in the energy market an adequate infrastructure is required in order to ensure a steady supply.

Such studies as mentioned above should further inform these communities.

Finally, there maybe public concern about visual and habitat issues. In extreme circumstances there may also be water quantity issues if the particular bio-fuel has a higher water requirement than previous vegetation.

What are the public concerns regarding biomass energy generation? Why do these concerns arise and how can they be taken account of in the future development of biomass energy generation?

There are two distinct scenarios in relation to biomass energy generation. These are the burning of virgin crops grown specifically as an energy supply and the burning of waste biomass e.g. wood, that could be utilised as an energy supply.

In relation to these scenarios our experience is that the main public concerns are likely to centre on issues such as: Transport implications. (e.g. number of loads can increase due to low calorific value of some of energy crops in comparison to other materials) Odour Atmospheric emissions

To an extent these issues can be mitigated by:

Planning of transport routes and methods of transport Location of production, processing and selection of the energy crop

In relation to scenario two the use of waste wood would generate the same issues of public concern as that of burning any waste material. People have concerns for the health impacts of waste incineration, especially in relation to dioxins, and do not want such sites built near to them.

People consider burning of waste materials as a waste of resource, and have a preference to see wastes recycled or composted.

Increased understanding and education can mitigate these issues. SEPA believes it is important to have an integrated waste management system where only the appropriate wastes are burnt after maximising composting and recycling.

What level of investment would be needed in order to introduce effective co-firing of biomass and fossil fuels? Would this be justified by the environmental gain to be expected? To what extent could fossil fuels be replaced by biomass? What growth in other non-fossil fuel sources would be necessary in order to achieve radical carbon reduction targets?

A number of new government programmes are providing a push for innovation in the biomass energy sector, however the programmes are relatively new and it is too early to judge their potential impacts. There is still a lack of market pull to generate projects that would stimulate innovation and improve commercial viability.

The technology for co-firing with fossil fuels can be regarded in the Development and Demonstration phase for existing coal fired installations at present. Reducing the costs and optimizing the performance will obviously improve the attractiveness and cost effectiveness of this technology.

What timescale is necessary to develop a large scale switch from fossil to bioenergy and what medium term measures are necessary to bring this about?

Currently our economic and social system is dependent on the development of conventional sources of energy and particularly on the generation of electricity. One of the main problems is financial,

renewables need significant initial investment. One possible way of financing renewables would be to subject the more mature sources of energy – gas, oil and nuclear – to a contribution towards the development of renewable energy sources.

In the UK the DTI has made £30m available to stimulate the use of biomass especially energy crops, by encouraging the early deployment of biomass fuelled heat and electricity generation projects. The New Opportunities Fund will also provide £33m for energy crops power generation and £3m for small scale biomass/ CHP projects. The Renewables Obligation was introduced and renewable energy is exempt from the Climate Change Levy. This together with a solid research and development base, should encourage the growth of renewables.

There is also a need for regulations to be adapted for land planning and use so as to give priority to the installation of renewable energy generation plants.

Demand for renewable energy sources could be improved by high oil prices. However it is more likely that fiscal or financial incentives are needed.

What would the impacts on agriculture be and what support, both nationally and internationally, is there for moving away from food crops on agricultural land towards crops for energy?

It is unlikely that the UK will abandon home production of agricultural produce. Even if agricultural subsidies were reduced, the economic benefits of non-agricultural alternative land uses may be greater than those for energy crops in many areas.

Internationally, the area of high quality land available for energy crops will be constrained by the need for increased food production as world population increases. The notion that half the available crop land could be devoted to energy crops is highly questionable, given the needs for energy, food and water security. However, significant opportunities exist to develop poor quality or even blighted land for energy cropping as many of the health issues associated with growing crops on these sites do not apply to energy crops.

Energy crops can have environmental disbenefits, involve the transport of a bulky product, may involve multiple stakeholders and may be economically advantageous only in certain localities.

What proportion of biomass could be provided by forestry and agricultural wastes in addition to coppicing?

Consideration should be given to using some of the existing infrastructure to support use of forestry by-products. For instance could small scale bio-fuel generators be sited near existing hydro schemes, thus using the existing grid infrastructure, and allowing forest waste to be transported smaller and economically viable distances before incineration?

To what extent can bioenergy offer a practical integrated energy production and waste management scheme?

SEPA believes that provided energy from waste is part of a network of waste management facilities and integrated with other waste management methods, then it can contribute to dealing with waste that has been produced in a more sustainable way.

Is biofuel for transport a realistic and attainable goal for transport policy in the UK? What measures would need to be introduced to develop this sector?

The infrastructure necessary for our current transport system, with its emphasis on the private car, has been built up over a century with very large Government investment. It is therefore eminently pragmatic to start the “next generation” of transport debate by simply changing the fuels and drive mechanisms of the existing modes of transport. In the UK there is some R&D activity however there is little commercialisation with regards to biofuel for transport. There has been little technology push or market pull although EU legislation on biofuels, pressure for agricultural diversification and interest in the UK market from overseas technology developers could change this. The UK now has Europe’s largest network of Liquid Petroleum Gas filling stations, as a result of fuel tax advantages, the same story could be repeated using biofuels. However, it is important that the any such scheme is developed to minimise greenhouse gas emissions.

Also, there have been many well-documented examples of new public transport initiatives that have dramatically reduced the growth of private car use.

Globally the market for renewable transport fuels is showing strong signs of growth mainly due to energy security issues, global warming and air quality concerns. It is estimated that 25bn litres of bioethanol for fuel and 3bn for biodiesel were consumed globally in 2002. In particular mitigating global warming may require a significant contribution from renewable transport fuels.

It is important that greenhouse gas emissions associated with transporting fuels must be taken into account in assessing the benefits of biomass schemes.

To what extent would fiscal measures such as duty reduction on biofuels be cost effective in terms of carbon reduction?

See above

APPENDIX D

What are the critical things that need to happen in Scotland to deliver a sustainable future?

We have five suggestions:

(1) *Environmental Assessments within Companies*

In our submission to the public consultation of the Scottish Executive's Green Jobs Strategy in 2004, SEPA proposed that the Executive should introduce legislation to ensure that all Scottish businesses undertake internal environmental assessments. We have considerable evidence, from many voluntary exercises, that companies will usually improve their profitability by more than 5% if a degree of attention is paid to reducing their total resource use (water, energy, raw materials) and to minimising their waste streams (solid waste, effluents, air emissions). We suggested that such an assessment should be required at some point during rolling five-year periods, so that businesses can build them into their normal planning and investment cycles. Importantly, the assessments should be done in consultation with the staff of each company, in a similar way to the delivery of health & safety legislation. Not only will this improve innovation, internal commitment and delivery, but will, in the process, educate around 2.5 million people throughout Scotland in a basic understanding of the environmental impacts of their everyday actions. Hopefully this awareness will be carried across into personal lives and lifestyles with the potential for amplified environmental benefits. We suggested that the regulatory procedure could be very light since companies will be motivated to keep up with their competitors in terms of productivity and profitability and could, therefore, be captured through normal and established financial reporting and auditing procedures. We believe that this proposal for smart regulation would deliver improved productivity in the Scottish business sector, a resultant growth in employment potential, an educated workforce more aware of their daily environmental impacts and, of course, significant environmental benefits. This is regulation that delivers on all three factors of sustainable development.

(2) *Carbon budget and Executive spending review financial allocations*

We suggest that an effective carbon trading scheme, internal to the public sector within Scotland, could be introduced by providing a carbon budget in parallel to the financial allocations to public sector organisations under each cycle of the Scottish spending review. The Executive would expect each financial unit to report on carbon emissions, using standard and relatively simple conversion factors for example for fuel use, transport and heating, and to meet their specified carbon allocation within each spending review cycle. In your recent letter of 26 August 2004 you have already asked public sector organisations to monitor and improve on their environmental performance. If a unit performs beyond its carbon expectation then it could be rewarded by an increased financial allocation to be spent on further improved environmental performance in the succeeding spending review round. Units which fail to meet carbon targets could be financially penalised, and the unmet allocations rolled forward in addition to the new carbon targets. This proposal would deliver a reducing carbon emission from the Scottish public sector, year on year, and would confirm the intention of government to lead in delivering climate change mitigation.

It is possible that such a scheme could be used particularly imaginatively in the school situation – both as an education tool but also to provide additional high profile funding for schemes of special relevance or interest to the students themselves.

(3) *Procurement and score cards*

The Scottish public sector annual financial turnover is estimated to be 48% of Scotland's GDP (2002/3 figure). Within that amount, there is considerable potential for direct purchasing of goods and services to encourage improved sustainability within supply chains. The European Directive EC2004/18 effective from January 2006 will introduce a further degree of liberalisation in setting environmental and other criteria in larger public procurement procedures. We would like to propose that a score card scheme developed by the Executive to guide public sector purchasing into more sustainable performance. It would be sensible for the score cards to be relatively simple and to target an expanding and prioritised list of major purchasing sectors (for example, stationery, vehicles, office furniture, cleaning contracts, IT systems and maintenance). The score card would be issued to intending suppliers, for both large and small contracts, and would ask relevant questions on the sustainability of their service provision or goods (for example, local sourcing of materials or maintenance, energy efficiency of equipment, recyclability of components). The scores achieved against these questions would be considered as an integral part of the subsequent award of contracts. Executive guidance would necessarily be required on the decision-making process in order to ensure consistency and legality across the public sector.

This approach will necessarily drive improved performance right across the private commercial sector as it responds to the public sector's tendering requirements.

(4) *Three-year programmes and Audit Scotland role.*

To ensure that sufficient seriousness and attention is devoted by the public sector in Scotland to the issues in paragraphs (2) and (3) above, we would suggest that the Executive publishes a 3-year programme of sustainable development actions for the public sector in parallel with the rolling spending review allocations. If necessary these actions could be backed by the issuing of Ministerial directions but, importantly, there must be some independent monitoring and audit of achievement. It would seem appropriate for Audit Scotland to take on the role, in its normal duties, of ensuring that sustainable development actions and targets are achieved within the public sector.

(5) *Council Tax review*

At the 4th session of the Environment & Rural Development Committee's climate change inquiry on 2 February 2005, SEPA made a proposal that the ongoing Burt review of Scottish local government finance could perhaps consider a realignment of Council Tax to address domestic carbon emissions. The existing Council Tax is often criticised for being linked to property value and for not being either progressive, or reflective of the occupancy of domestic premises. A Council Tax scheme linked to the release of carbon dioxide from a property, which is fairly readily derived from oil, gas or electricity usage, would potentially address these criticisms as well as tackle climate change in a very public and demonstrable way. Total energy usage in a household is linked clearly to the size of the property and also to the number of occupants and, to some extent, to the occupants' ability to pay for the consumed energy. A Council Tax banding scheme, based on a standardised conversion of energy use to equivalent carbon dioxide release, would penalise those who are profligate with energy, through poor insulation, inappropriate fuel source, or poor management, and would conversely reward those who insulate well, use green energy sources, and are careful in their fuel management. Such a tax would incentivise reduction in emissions, particularly through energy efficiency and uptake of renewables, and be a very public demonstration of government concern about the importance of climate change. Such a tax would very effectively focus the public on ways to reduce their own tax demands. We are aware, of course, as with most taxes, that certain community sectors will be disproportionately disadvantaged and some financial support may be necessary but there are opportunities to address these cases in an innovative way – for example the fuel poor could be given preferential access to green (carbon free) electricity tariffs thereby significantly reducing their exposure to the proposed Council Tax liability.

END