SCOTTISH EXECUTIVE

Global Climate Change: Scotland Taking the Lead

Sue Kearns

Head of Renewables Policy

Scottish Government

SCOTTISH EXECUTIVE

Overview

- Climate Change: Scottish policy context
- Main theme: Renewables – highlighting marine
- Not just electricity – heat too

SCOTTISH EXECUTIVE

New Scottish Government: climate change policy

- **UK Climate Change Bill**: target - 60% reduction in CO2 emissions by 2050
- **Scottish Climate Change Bill**: target – 80% reduction in GHG emissions by 2050
- We will be consulting on target, and provisions needed to meet it.
- Timescale: - consultation end of year,
  - draft Bill autumn 2008

SCOTTISH EXECUTIVE

New Scottish Government: Renewable Energy policy

- Continued commitment to renewables and clean energy
- Emphasis on diversity of supply
- Security of supply
- Community benefits
- Policy development process underway

SCOTTISH EXECUTIVE

Renewables: targets

- 18% electricity generated to be sourced from renewables by 2010 – **Achieved**

- 40% by 2020
- Expressed as % of demand
- Equates to 6GW (not a cap)

SCOTTISH EXECUTIVE

Renewables installed capacity

Technology	MW
Onshore wind	1135
Hydro	1358
Biomass electricity	38
Wave	0.5
Energy from Waste	98

- Total: (2629.5MW) exceeds nuclear
  – but not in terms of generation

SCOTTISH EXECUTIVE

Renewables: main policy areas

- Sectors:
  - **Marine**
  - **Biomass**
  - **Hydrogen/fuel cells**
  - **Off-shore wind**

- New focus on **grid**
- New focus on **heat**

SCOTTISH EXECUTIVE

Marine Renewables

- High policy priority over past few years:
  - EMEC
  - Support schemes
  - SEA

Aim to continue to build on this and maintain Scotland's world lead in marine energy.

- Plus new emphasis on grid infrastrucuture

SCOTTISH EXECUTIVE

Wave and Tidal Energy Scheme (WATES)

- £13M support scheme to develop wave and tidal energy in Scotland.
- Most projects sited at EMEC.
- Includes £2.5M to upgrade EMEC infrastructure.
- Devices expected in water over the coming years.
- Looking at potential for further funding round.

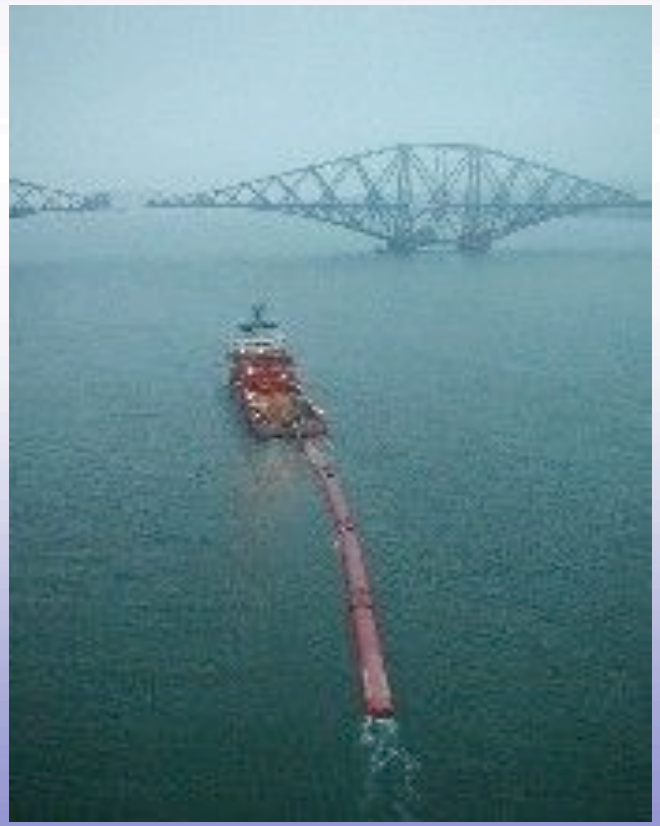
SCOTTISH EXECUTIVE

WATES – Wave projects

- **CRE Energy**

  - Installing 4 OPD Pelamis devices as a single array at EMEC.

  - Total output 3MW.



SCOTTISH EXECUTIVE

WATES – Wave Projects

- **Ocean Power Technology**
- Installing Powerbuoy device.
- Output 250kW
- Trialling new mooring system

SCOTTISH EXECUTIVE

WATES – Wave Projects

- **AWS Ocean Energy**
  - Archimedes Swing device

- **Aquamarine**
  - Power take-off unit for Oyster device
  - near shore device

- **Wavegen**
  - advanced Wells turbine system
  - sited at Isle of Islay

SCOTTISH EXECUTIVE

WATES – Tidal generation projects

- **Open Hydro**
  - Installing open centre turbine and trial of gravity base installation.

SCOTTISH EXECUTIVE

WATES – tidal generation projects

- **Scotrenewables**
- Installing tidal turbine device
- Output 1.2MW

- **Tidal Generation**
- Extracting core sample from berth area at EMEC

SCOTTISH EXECUTIVE

Longer term revenue support: Marine Supply Obligation

- Introduced under Renewables Obligation (Scotland)
- Provides secure long term support to marine energy developers
- Places obligation on suppliers to source % power from marine. Increased support via ROS to those who comply.
- MSO levels set annually in consultation with industry

SCOTTISH EXECUTIVE

MSO and banding

- Scottish Government welcomes principle of banding
- Not yet enough info to decide if will apply in Scotland on marine – but will be working with BERR
- Changes to ROS will require consent of Scottish Parliament

SCOTTISH EXECUTIVE

Wave and tidal SEA

- SEA undertaken to assess how much capacity could be developed, taking environmental constraints into account.
- Work based on FREDS Marine Group estimate that 2GW could be developed by 2020
- Thorough process led by independent steering group.
- Consultation on environmental report completed this summer.
- **Key finding**: **between 1GW and 2.5GW could be developed by 2020 within "acceptable" environmental constraints.**

SCOTTISH EXECUTIVE

Wave and Tidal SEA

- Number of issues raised:
  - need for further in-depth survey work
  - more analysis of environmental impacts
  - ensure mitigation measures understood and applied.
- Currently considering how to address SEA conclusions
- Formal response by end of year.
- Outputs of SEA will help inform wider marine strategy development.

SCOTTISH EXECUTIVE

Grid infrastructure for marine generation

- Short term capital support and longer term revenue support only solve two thirds of barriers facing marine energy sector
- Remaining barrier is issue of grid availability and access.

SCOTTISH EXECUTIVE

Scottish International Grid connections and Renewables transmission

- Issue wider than marine energy
- Huge renewables resource in north of Scotland.
- Need for grid transmission to centres of demand at mimimum cost to environment.
- Also wider need for security of supply.

SCOTTISH EXECUTIVE

Current framework

- Current UK regulatory framework disadvantaging Scottish renewables: e.g. high access charges.
- But some scope for regulatory flexibility (RPZ)
- And Ofgem considering island connections issue.

SCOTTISH EXECUTIVE

Scottish Government Grid studies

- Technical study on grid stability under different generation scenarios.
- Irish Scottish Links Energy Study (**ISLES**).
- Under development: North Sea Energy Grid (**NSEG**).

SCOTTISH EXECUTIVE

Next steps

- ISLES complete – will be seeking industry views and buy-in to full scoping.
- Looking for international partners for North Sea Energy Grid work.
- Scottish Govt helping to make business case for commercial investment.

SCOTTISH EXECUTIVE

Other sectors being supported

- Hydrogen/Fuel Cells
  - £1.5M support scheme
  - 7 projects from housing association scheme in Shetland to R&D in St Andrews University
- Off-shore wind
  - £3M grant to Talisman/Beatrice project
  - Demonstration deep-water
  - SEA being planned

SCOTTISH EXECUTIVE

Scottish Biomass Support Scheme

- £10.5M scheme (+ leverage of private sector funds)
- About 80 projects being funded across Scotland, with grants up to £400k
- Plus demos under SCHRI in Highlands and Islands
- 2:1 ratio – boiler installation:supply chain
- Nearly all heat-only
- Scheme met most of demand 2007/08
- 150 expressions of interest in any future round
- Scottish Govt will continue to support biomass

SCOTTISH EXECUTIVE

Renewable Heat Policy

- European renewable energy target: 20% by 2020
- Electricity, heat and transport
- Renewable Heat policy being developed for Scotland

SCOTTISH EXECUTIVE

FREDS Renewable Heat sub-group: work programme

- consider a range of technologies
- look at policy & legislation to maximise opportunities and overcome barriers
- clarify size of baseline heat market
- consider targets and mechanisms
- make recommendations to the Scottish Government

SCOTTISH EXECUTIVE

Technologies

- Biomass (CHP and heat-only)
- Ground source heat pumps
- Solar heating
- Geothermal aquifers
- Energy from waste (EfW)
- Anaerobic digestion (AD)
- Landfill gas
- Air source heat pumps
- Water source heat pumps
- Wind-to-heat

SCOTTISH EXECUTIVE

Technology applications

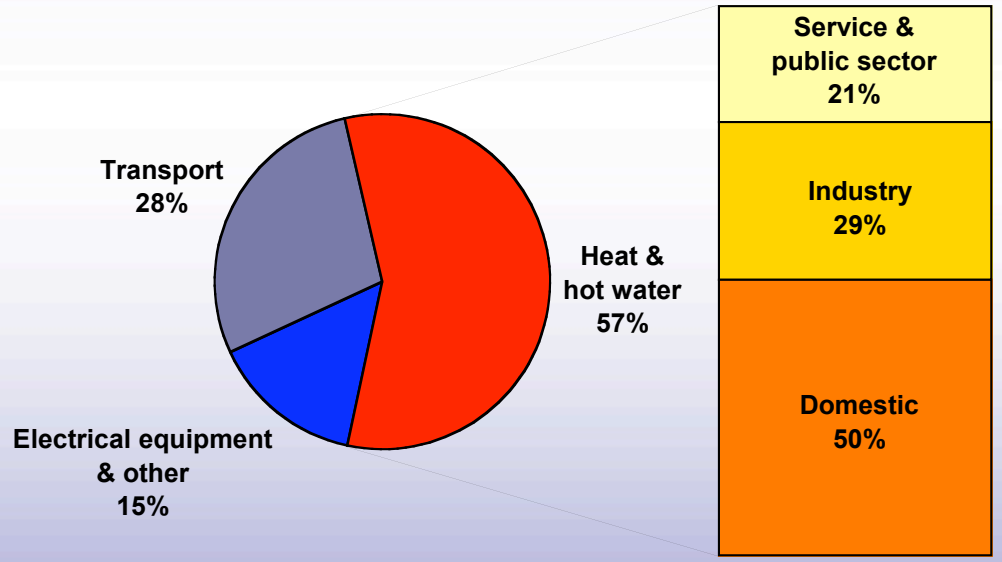
SCOTTISH EXECUTIVE

Policy overlaps

- **Building Standards**
- **Fuel Poverty**
- **Planning**
- **Public Procurement**
- **Air Quality**

SCOTTISH EXECUTIVE

Size of heat market



SCOTTISH EXECUTIVE

Heat Market

Domestic

- Over 80% of energy used for heat and hot water
- largest sector is high density urban housing

➔by 2020 slight increase in heat demand counterbalanced by improved energy efficiency of buildings

SCOTTISH EXECUTIVE

Heat Market

Industrial

- signficant sectors for Scotland are the chemical, food & drink, and paper industries
- low-medium temperature process heat - variety of renewable heat technologies
- high temperature process heat (e.g. furnaces, kilns) - existing hydro & gas-fired CHP in use
- decline in consumption 1990-2002 of 31%

➔ by 2020 ongoing decline and increased energy efficiency of industrial processes

SCOTTISH EXECUTIVE

Heat Market

Public & Service Sector

- leisure facilities, schools, hotels & catering, commercial offices

➔by 2020 decline in heat demand due to increased energy efficiency of public buildings

SCOTTISH EXECUTIVE

Targets for Renewable Heat: scale of challenge

Targets for 2020?

- 10% target = 4.7 TWh per annum
- 20% target = 9.5 TWh per annum

20% heat target

- domestic: 3600 MWth installed capacity (assumes 30% heat load)
- industrial: 770 MWth installed capacity (assumes 80% heat load)
- service & public: 1520 MWth installed capacity (assumes 30% heat load)

SCOTTISH EXECUTIVE

Emerging Vision

- A smart sustainable warm Scotland
- Developing a commercially viable diverse renewable heat industry for communities throughout Scotland
- Cheap, convenient & clean

SCOTTISH EXECUTIVE

Possible incentives

- Training
- Awareness-raising
- District heating networks
- Long term support mechanism and/or capital grant or soft loans
- Fuel supply development

SCOTTISH EXECUTIVE

Next Steps

- Report to be agreed by FREDS Renewable Heat Sub-group by end of year
- Renewable Heat Strategy to be published
- Will form part of Scottish Government's Energy Strategy

SCOTTISH EXECUTIVE

Conclusion

- Scottish Government committed to renewables as part of drive to address climate change
- Already supporting key sectors
- Turning to look at heat and grid infrastructure
- …and community benefits.