

# **Energy from Waste – Why do we need it? How do we do it?**

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**With thanks to Paul James of Rumboll UK for use of some slides**

# What will we cover today?

- Context of EfW and Climate Change;
- Scottish Government Waste Policy;
- The value of EfW;
- Land Use and the Planning System;
- The use of heat;
- SEPA's Thermal Treatment Guidelines;
- Eco-Industrial Parks as a development opportunity.

# Setting the Context

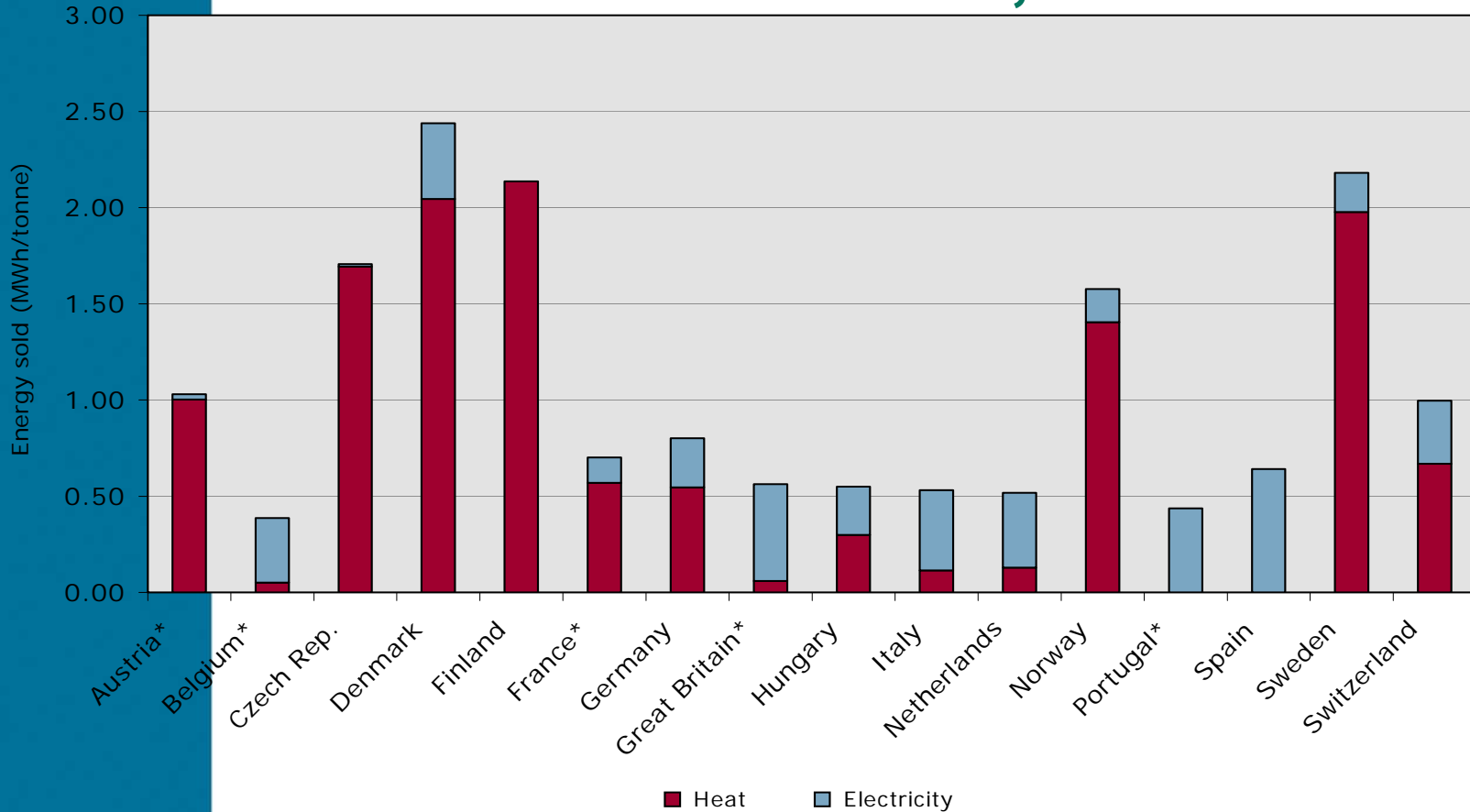
- Scottish Government Policy Announcements on 24<sup>th</sup> January 2008;
- SEPA AEA Energy Value of Scottish Waste Biomass Study;
- Scottish Biomass Action Plan;
- FREDS – Heat Group;
- Forestry Commission Wood Fuels Task Force;
- SEPA’s Thermal Treatment Guidelines.
- Energy White Paper;
- Ongoing Renewable Energy Policy Development;
- The Climate Change Bill;
- National Planning Framework;

# Emerging Scottish Waste Policy

- The Zero Waste challenge;
- Focus on prevention, reuse and recycling;
- EfW – only for residues after recycling;
- Avoid move to low efficiency mass burn;
- Efficient recovery of energy from waste – CHP QA;
- Climate change, energy security, public concern, integration with biomass;
- 70% Municipal Waste recycling by 2025;
- 25% cap on MW EfW (5% landfill);
- C&I recycling targets - Landfill bans?
- Shift of focus to segregated C&I waste – Landfill bans?

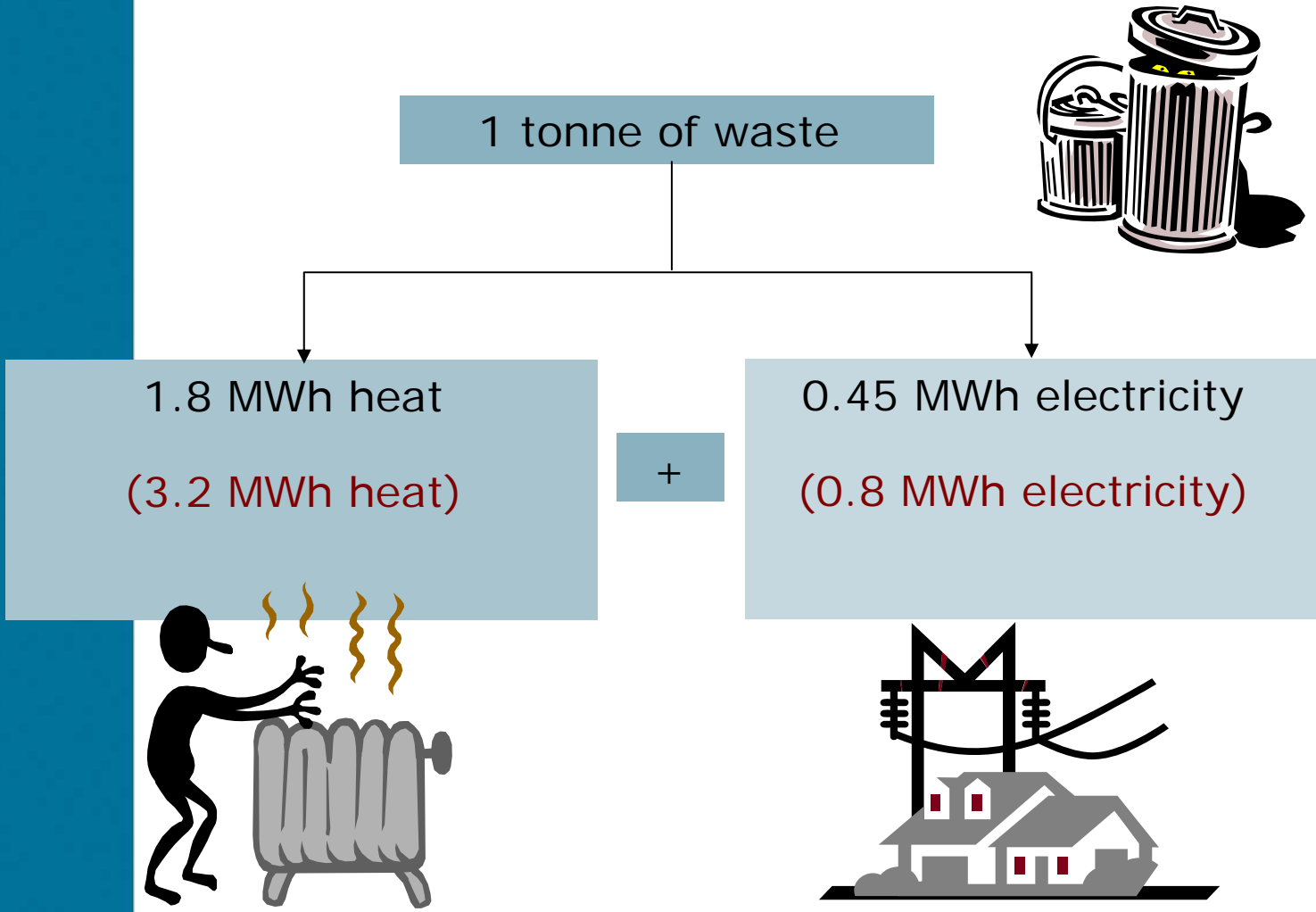


# Energy recovery – Electricity and heat sold per tonne of waste incinerated, 2004



Source: Energy from Waste. State-of-the-Art Report. Statistics 5th Edition August 2006. ISWA Working Group on Thermal Treatment of Waste

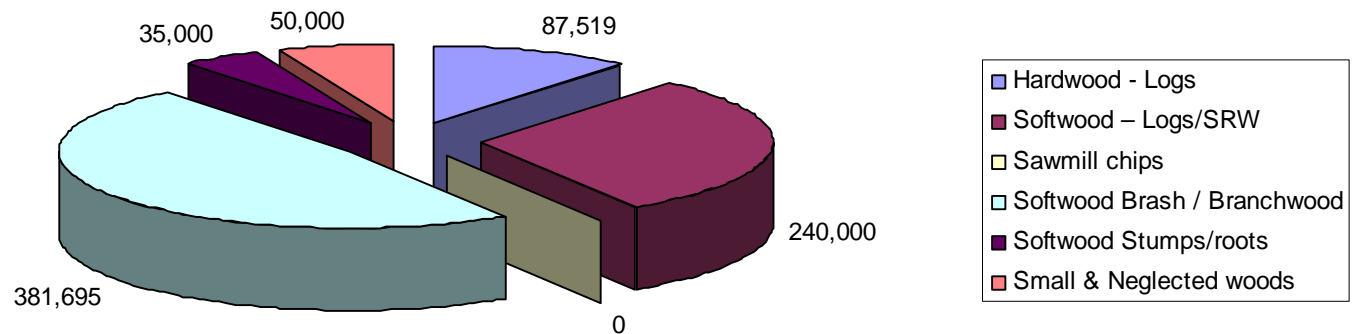
# Energy recovery from waste – UK: (approx 10MJ/kg Residual waste) and (approx 18MJ/kg Segregated waste biomass)



# Grown Biomass - What Could Be Available?

- Currently information on potential /availability is not consistent
- Differences in “Potential” and “Available”

Potential volumes available over the next five years



- Total - 0.8 million Oven Dry Tonnes
- Additional 1.1 million tonnes potential from SRC and SRF (10-15 years)

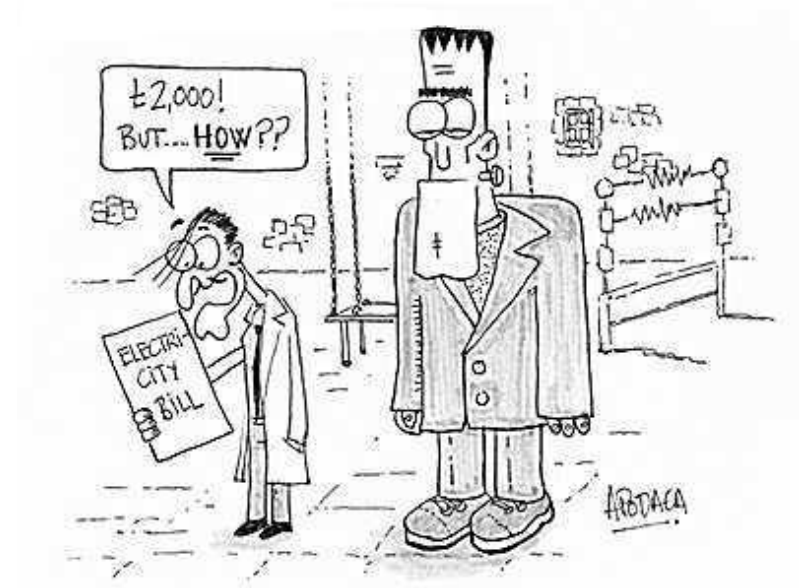
# Tonnages of Waste and process residue **Biomass Materials – All Sources including wood.**

- SEPA waste biomass study identified approx = 10 million tonnes of waste biomass. Wood Fuel Task Force = 7.3 million tonnes.
- Commercial and Industrial 5,400,000 tonnes
- Similar to agricultural 531,000 tonnes
- Wood processing 244,000 tonnes
- Landscaping 98,000 tonnes
- Arboriculture 268,000
- Forestry related wastes 844,000.
- SEPA Data: If used with CHP = **12,501,800 MWh** of energy (via CHP) = Approx **1.4 GigaWatt** equivalent;
- **7,200 jobs**
- Carbon savings = **2,463,171t CO<sub>2</sub>eq**, which is approximately **4.5%** of Scotland's total emissions [\[1\]](#) – this figure increases if you count avoided landfill methane;

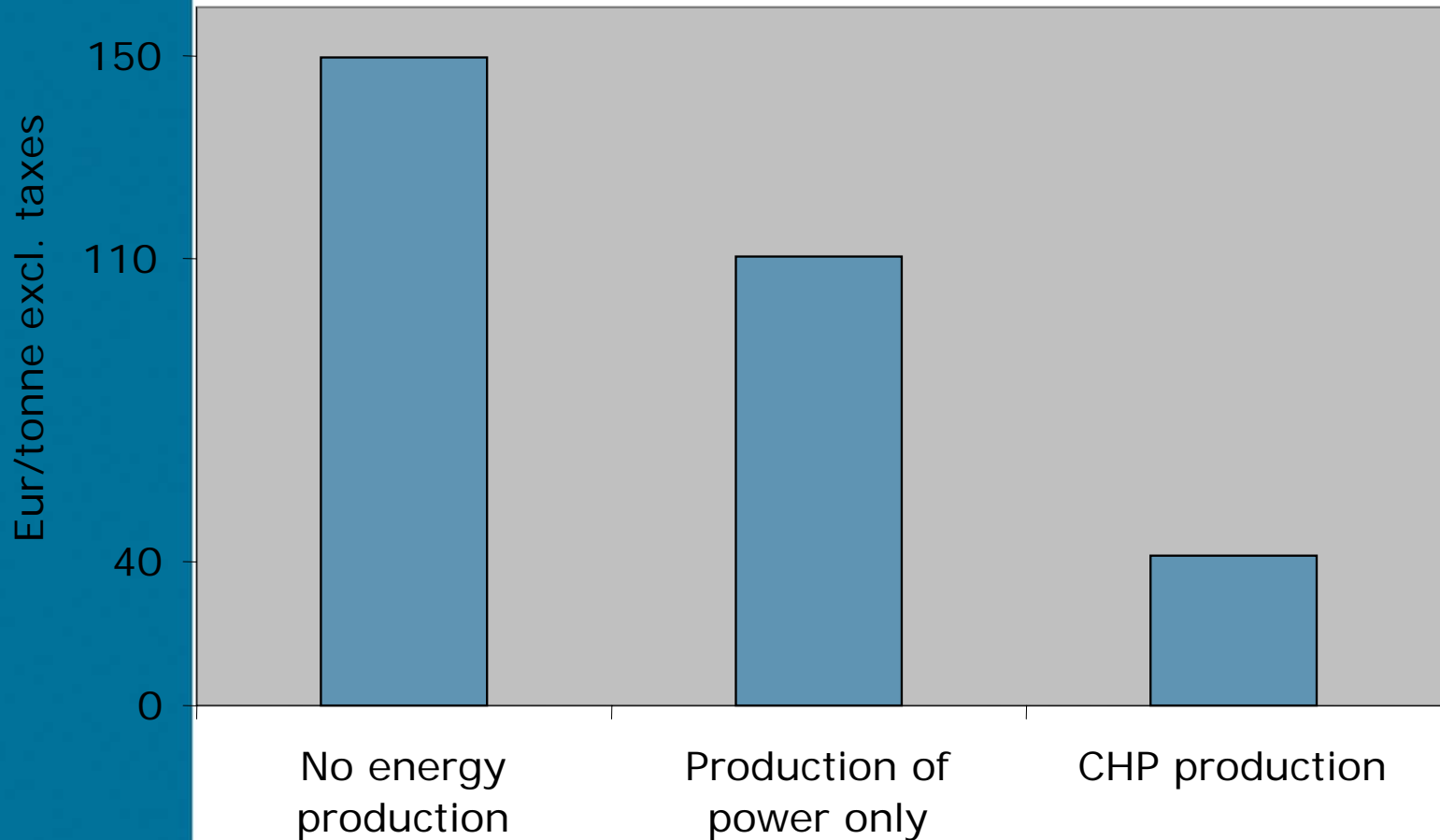
**\*\*\* Some major DATA Issues that we still need to resolve –  
We are working on this \*\*\***

# What does it all mean?

- **634MW** is sufficient to supply the energy needs for around one million of Scotland's 2.4 million households!



# The impact of energy production on gate fees



# The Emerging Thermal Treatment Guidelines 2008 (Municipal and Commercial & Industrial waste)

## Purpose:

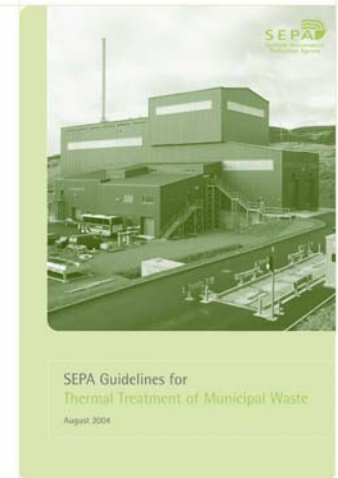
To update SEPA's Thermal Treatment Guidelines (2004) and guide applicants, developers and the planning system in developing new energy from waste facilities that form part of an integrated and efficient system for energy from waste in Scotland

## General Guidance on:

- Context – climate, energy security et al
- SEPA role in Planning
- BPEO – Life Cycle Assessment
- Proximity, partnerships

## Specific Permitting Policy:

- Best Available Techniques (BAT) to drive efficiency
- **Heat Plan** requirements and use of **Combined Heat and Power Quality Assurance** scheme
- **SEPA is also pushing for a landfill ban on all waste biomass from commercial and industrial sources in the revised National Waste Management Plan.**



**2003 Guidelines  
under revision**

# Forum for Renewable Energy Development - Scottish Heat Plan

Context: Infancy, challenges, opportunities, intervention, potential.....

## Heat Plan – Key recommendations:

- Heat Mapping;
- Detailed analysis of potential, barriers, costs, targets;
- Development of a Heat Strategy;
- Focus on off grid and fuel poverty;
- Public procurement – LA's / Public Estate / Housing Associations;
- Waste biomass landfill bans – waste fuel standard – energy recovery only at high efficiencies;
- Building regulations!!!;
- Air quality – (issues!!);
- Best practice benchmarking - EU;
- **Government response to be consulted on in September.**

# Implement heat planning on the ground

- Use of CHP QA scheme to establish efficiency - Linked to Renewable Obligation Certificates (ROCs), Enhanced Capital Allowances (ETAs) and Climate Change Levy;
- Get a Heat Plan with the Application;
- Heat Plan moves facility to CHP EfW; Standard (circa 35% efficiency – 3-5 years);
- CHP QA aspirational goal objective via supportive national Heat Policy framework and fiscal incentives – circa 60%.

# How do we do it?

- Crucial role for the Land Use Planning System;
- Waste is a controversial subject with the public and the planning system is key interface point with public;
- The public will object so need for good quality engagement by all parties;
- Planning can help delivery in two key areas;
  - Development plan policies can promote/direct – where it goes;
  - Development management decisions on applications – how well it works;

# Land Use Planning Context

- National Planning Framework
- Scottish Planning Policy 10 – Planning for Waste Management
- Scottish Planning Policy 6 – Renewable Energy
- Planning Advice Note 63- Waste Management Planning
- Material planning considerations supporting move to sustainable waste management - National Waste Strategy :National and Area Waste Plans and importantly...
- SEPA's Thermal Treatment Guidelines

# What this means for Planning System

Helping to ensure new thermal treatment plants are in the right place and designed to:

- Maximise recovery of heat and power
- Be part of an integrated network of waste management facilities
- Take residual waste only after all efforts made to extract recyclable and compostable material

How do we do that .....

# Getting the Size right!

- SEPA undertaking a series of regional waste management baseline assessments to identify existing and required capacity:
- National Planning Framework is the vehicle for clear capacity signals especially on landfill and EfW – role Action Plan .
- Issues:
  - Landfill cost pressures and impacts;
  - Reducing landfill needs over time;
  - EfW Networks – segregated biomass?
  - Scale of EfW facilities – heat use;
  - Public perception.

# Conclusion - How do we get there?

- Ban the landfill of waste biomass from commercial and industrial sources – (leave MSW to Local Authorities).
- Require its segregation by producers = clean, efficient waste stream for fuel or composting (or both if AD).
- Develop appropriate scale technology solutions for maximum energy recovery – Electricity and/or Heat;
- Innovate in heat use – space heating, Eco-Industrial Parks, food production; heat storage technologies (>50% Scottish energy demand ).
- Encourage co-firing with grown biomass sources – (fuel standards?).
- Explain this to the public - How clean is your bonfire or barbecue!?
- **Planning – Location, Location, Location**

# What is an EIP?

- *"The goal of an EIP is to improve the economic performance of the participating companies while minimizing their environmental impacts. Components of this approach include green design of park infrastructure and plants (new or retrofitted); cleaner production, pollution prevention; energy efficiency; and inter-company partnering. An EIP also seeks benefits for neighboring communities to assure that the net impact of its development is positive."*

**Definition by Indigo Developments to US-EPA in 1993!**

## Good...but 15 years later we could take it further in Scotland and say...

EIPs are one or more regional facilities designed to:

- Capitalise on synergistic development opportunities such as available low grade heat;
- Support regional self sufficiency in critical goods, services and resources;
- Enhance the national transition to sustainable economic growth;
- Provide a transitional driver for an economic renaissance of the Scottish economy.

# Useful tools to help

- SEPA checklists on what we are looking for in our role as consultee on planning applications;
- DVDs of Waste management in Europe and Shetland Plant to help;
- SEPA report on the improvements in the legislation controlling such facilities;
- SEPA is here to help on this subject;
- Sources of information – leaflets available at the SEPA stand for information!!



Scottish Environment  
Protection Agency