

All – Energy Conference

Aberdeen 21-22 May 2008

**Waste Biomass – The hidden answer to a larger
problem?**

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

Setting the Context

- Scottish Biomass Action Plan (<http://www.scotland.gov.uk/Publications/2007/03/12095912/0>);
- The Scottish Heat Plan;
- The Forestry Commission Scotland Wood Fuel Task Force report (<http://www.forestry.gov.uk/forestry/INFD-7APFXA>) recognises that waste biomass including waste wood and woody material is the most important early source of biomass energy;
- The Sustainable Development Commission report – A Burning Issue (<http://www.sd-commission.org.uk/publications.php?id=651>).

Setting the Context

- The Climate Change Bill;
- National Planning Framework;
- AEA Energy Value of Scottish Waste Biomass;
- Scottish Government Policy Announcements on 24th January;
- SEPA's Thermal Treatment Guidelines;

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 - 60%;
- Climate, 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?



Making the Case: Energy from Waste Biomass in Scotland – SEPA study

- Waste sources reviewed:
 - Agricultural
 - Commercial & Industrial
 - Forestry and
 - Slaughterhouse wastes
 - Municipal waste

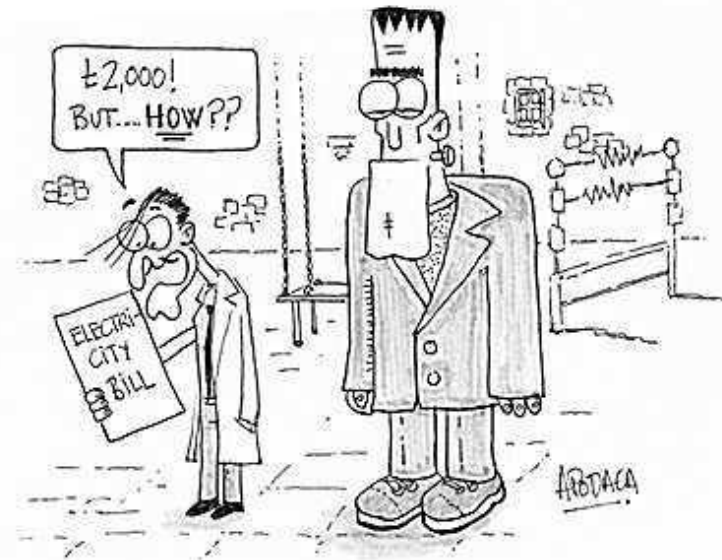
SEPA Energy from Biomass Study (AEA)

- Around 9,650,000 tonnes of waste biomass available for use;
- Significant quantities going to landfill – CH₄;
- If used with CHP = **12,501,800 MWh** of energy (via CHP) = Approx **1.4 GigaWatt** equivalent;
- **7,200 jobs**
- Carbon savings = **2,463,171 t CO₂eq**, which is approximately **4.5%** of Scotland's total emissions [\[1\]](#);

[\[1\]](#) National Air Emissions Inventory 2005

What does it all mean?

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



Compare this to energy crops!

- In order for energy crops to meet the energy potential from waste biomass over 200% of current arable land would be required!

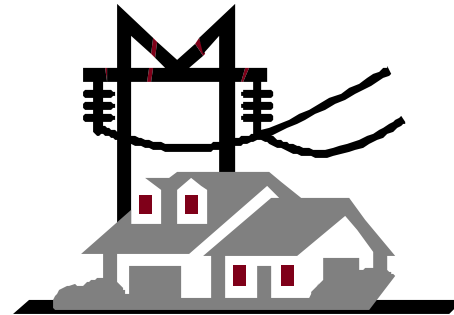
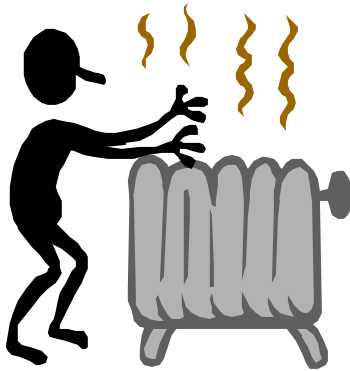
Energy recovery from waste



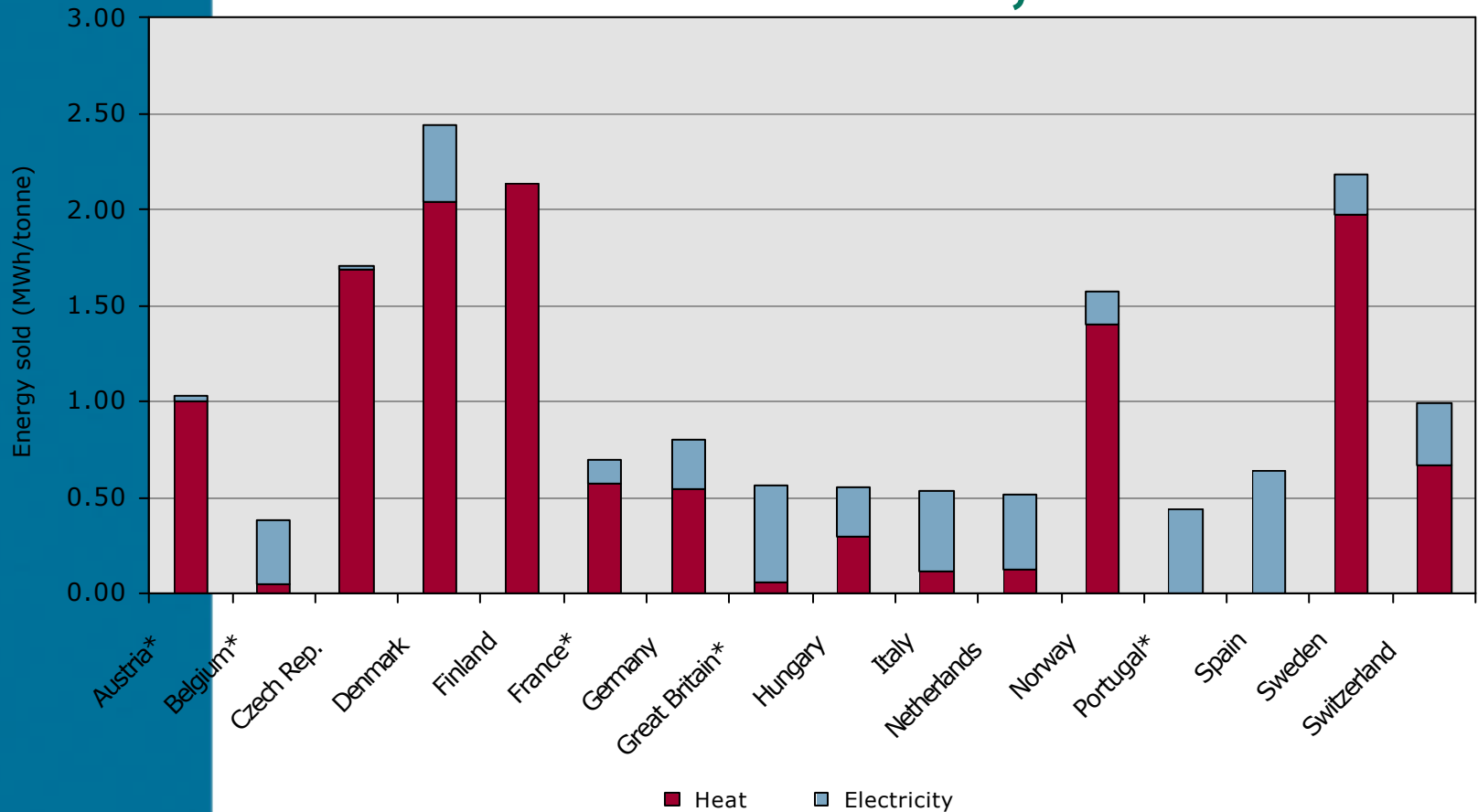
1 tonne of waste

2 MWh heat

0.65 MWh electricity

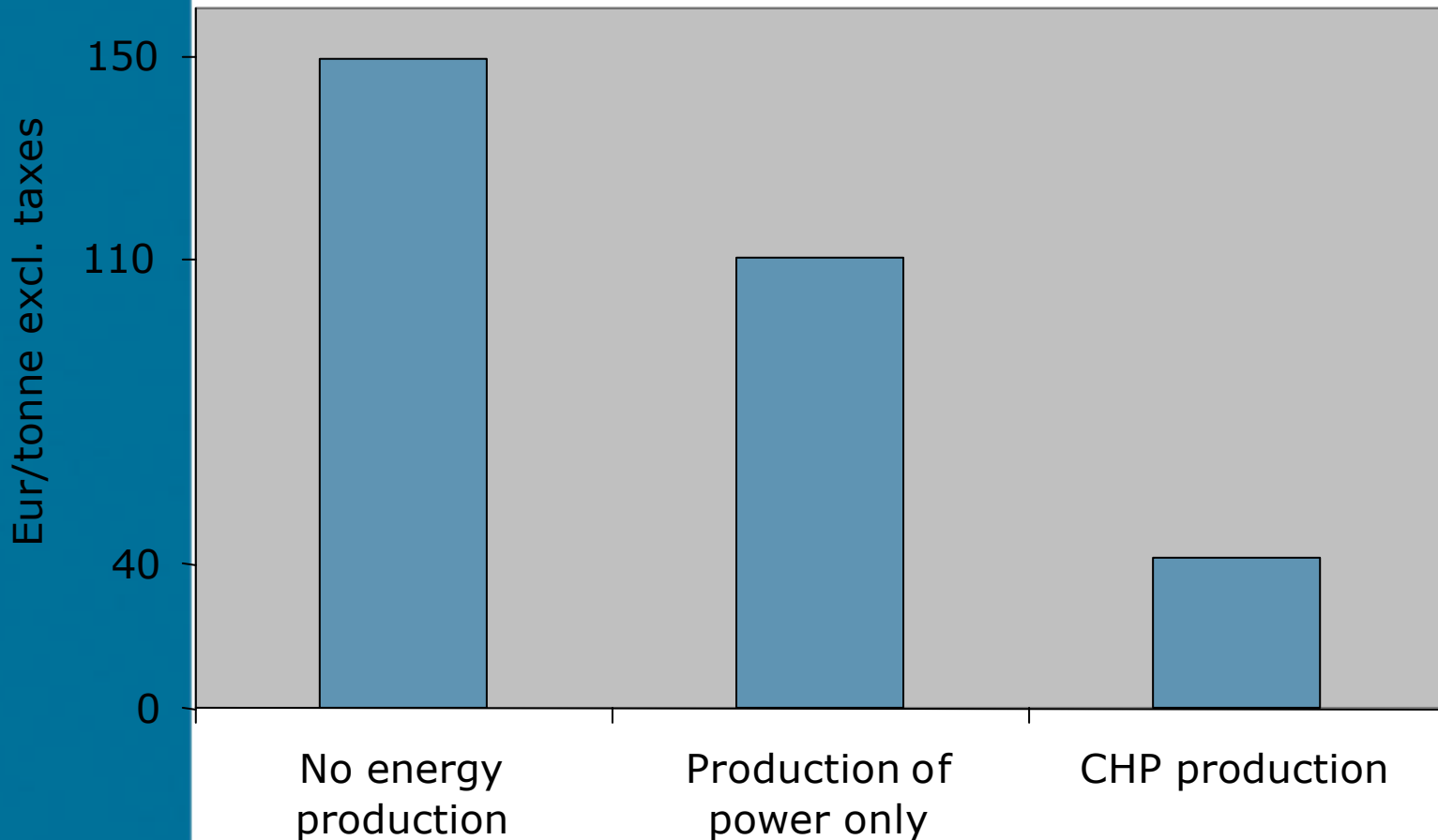


Energy recovery – Electricity and heat sold per tonne of waste incinerated, 2004



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

The impact of energy production on gate fees



Wood Fuel Task Force Report – The Government Response

- Demonstration trial sites – technology /biodiversity /amenity /shooting
- Develop single Scottish wood fuel web site;
- Improve data;
- R&D on SRF and SRC, use of set aside and development of LCA technology for land use policy;
- Trading floor?
- Use of Rural Development Contracts to incentivise growers;
- Standards – market confidence;
- Brash and wood recovery grants – timber transport grants – SBSS under review;
- Energy Saving Trust, Scottish Community and Householder Renewables Initiative;
- Improved planning.

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

Purpose:

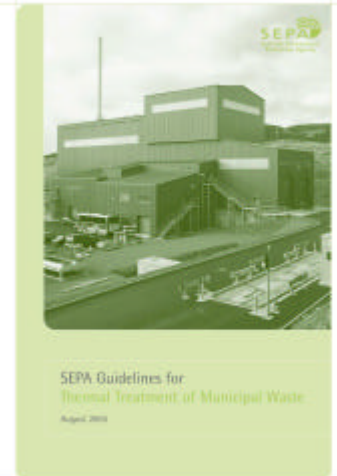
To update SEPA's Thermal Treatment Guidelines (2004) and guide applicants, developers and the planning system in developing new energy from waste facilities that form part of an integrated and efficient system for energy from waste in Scotland

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) – efficiency deminimis circa 60%.
- **Heat Plan** requirements



**2003 Guidelines
under revision**

Forum for Renewable Energy Development - Scottish Heat Plan

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

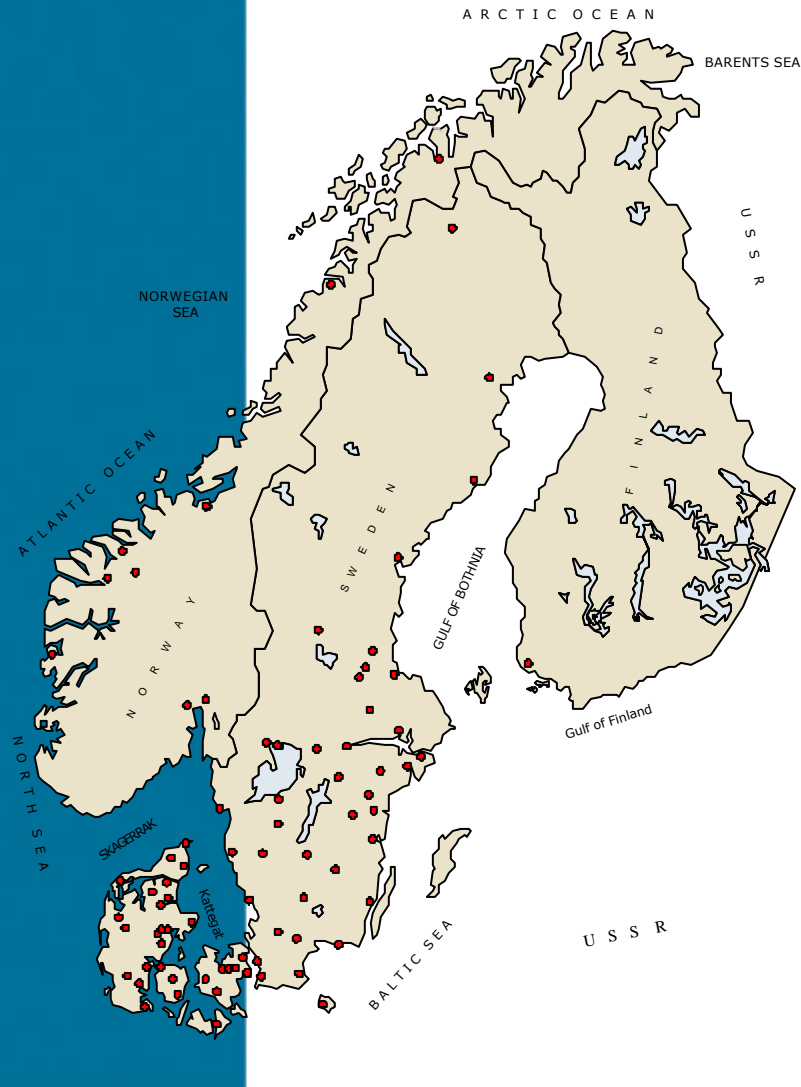
Heat Plan:

- Heat Mapping;
- Detailed analysis of potential, barriers, costs, targets;
- Develop 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!!);
- ROC support – banging for CHP and ACT for waste only with CHP;
- Best practice benchmarking - EU;
- Training.

Getting the Capacity needs right!

- SEPA undertaking a series of regional waste management baseline assessments to identify existing and required capacity:
 - EfW and Landfill
- National Planning Framework is the vehicle for clear capacity signals.
- Issues:
 - Landfill cost pressures and impacts;
 - Reducing landfill needs over time;
 - EfW Networks – segregated biomass;
 - Scale of EfW facilities;
 - Public perception – emissions, particulate matter (PMs), carbon and climate.

EfW plants in Scandinavia



Similarities with Scotland ?

- climate = variant N European
- 8+ month heating demand
- population size and distribution
- low landfill required
- desire for energy diversity
- desire for energy security
- desire for low CO2 energy

Energy from grown biomass

- **The OECD and the United Nations' Food and Agriculture Organisation, reports that the increased demand for bio-fuels is causing fundamental changes to agricultural markets which may in turn drive up world prices for many farm products.**



How do we get there?

- Ban the landfill of waste biomass from commercial and industrial sources.
- 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 – Heat Plan;
- 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.
- Explain this to the public - How clean is your bonfire or barbecue!?



Scottish Environment Protection Agency