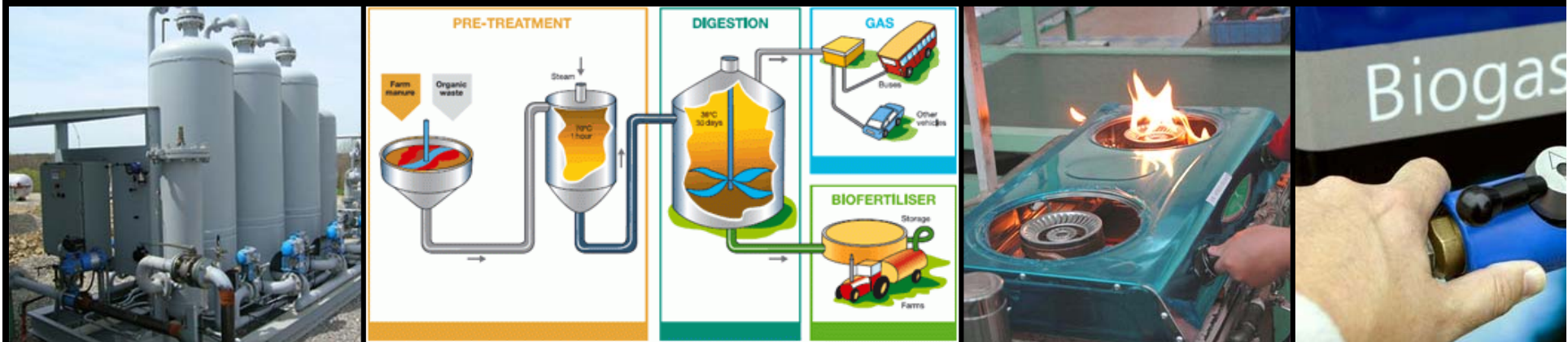




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Biogas – Burden or Business?



Birte Holst Jørgensen
Managing Director
2nd Nordic Biogas Conference
Malmö, 5 March 2008

Biogas – Bridge to Future Energy



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Change – Energy for the Future



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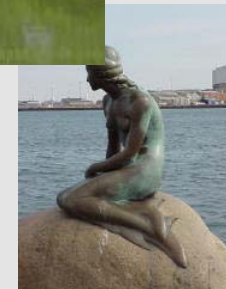
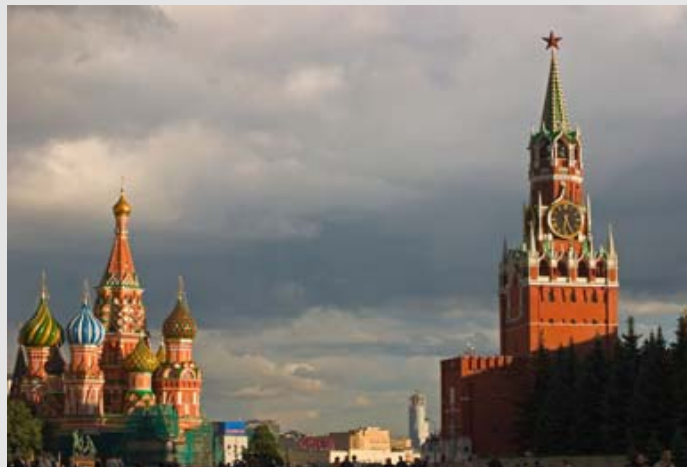
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Environmental protection and climate change

Economic growth



Energy security of supply



EU's 20-20-20 Targets in 2020



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2 Degrees C

European Council decided on its meeting 9 March 2007:

- 20% renewables of energy consumption by 2020 (6.4% in 2005), including a 10% biofuel in overall EU transport fuel consumption by 2020
- 20% GHG reduction by 2020 (compared to 1990) (and 30% if other global players come on board – USA, China etc.)
- 20% energy saving of energy consumption by 2020

Nordic Council of Ministers and Global Challenges



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Discussions started at
Nordic Session in
Copenhagen
October 2006

The premiers agreed to launch a new Nordic endeavour in globalisation...

The next actions and targets will be promoted for the benefit of a more **skilled**, more **visible** and **thriving** Nordic region.

.. The Nordic region must be a forerunner in the reduction of greenhouse gases.

....**Therefore**, they want to carry out co-operation in increasing investment, in the evaluation of technological possibilities and the identification of more significant technologies with respect to closer Nordic co-operation.

Joint global marketing of the above strengths will be given special emphasis.

(The Nordic premiers in Punkaharju 18-19 June 2007)

Biogas – what about it?



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1. Can biogas break the dependence on fossil energy?

2. Will it make sense to harmonise support schemes for biogas and other RES

3. Are our R&D investments in biogas sufficient to make them competitive?

4. Top of Europe – test market for biogas?

5. How can we bring biogas to global markets?



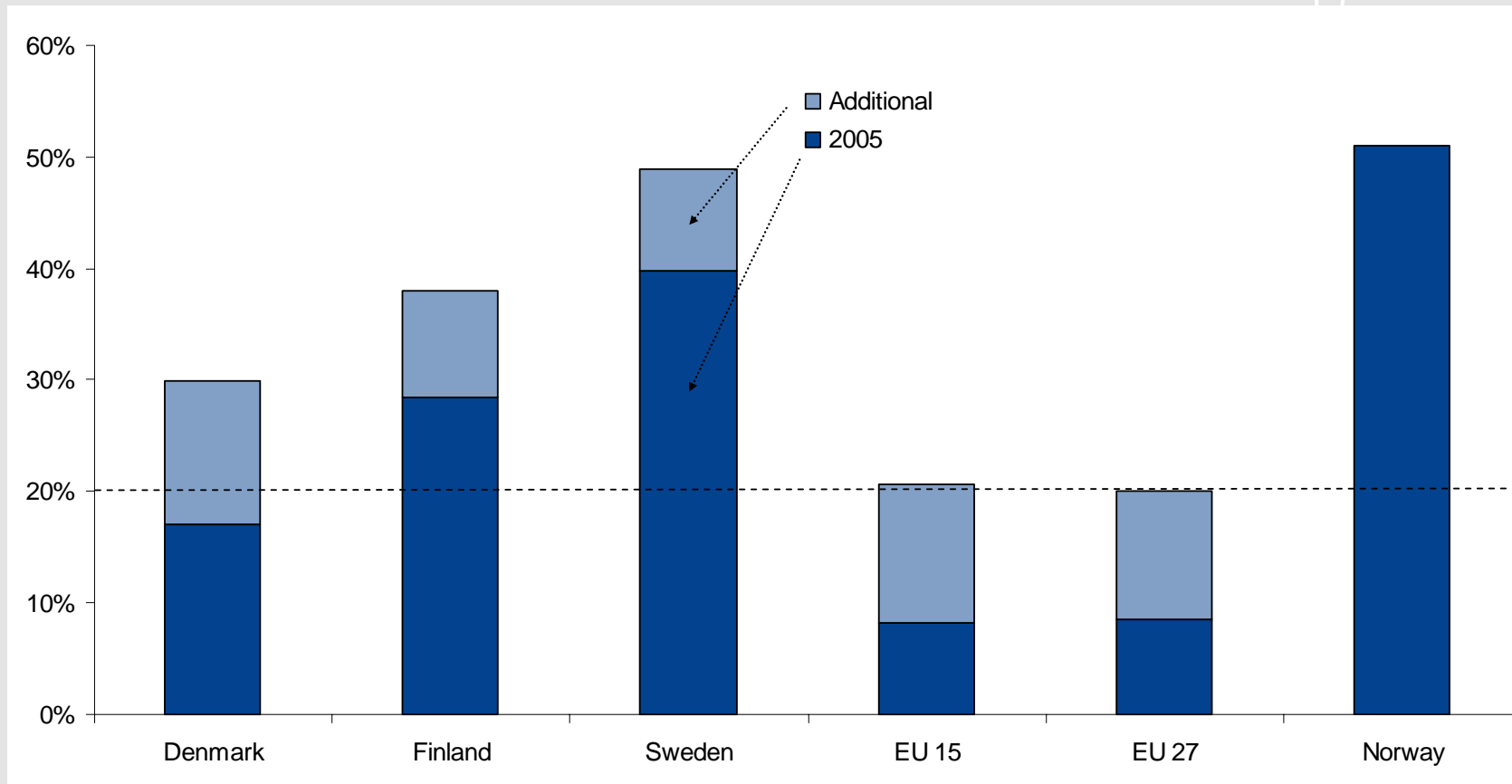
1a. Breaking the Dependence on Fossil Energy



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Share of Renewable Energy of Final Energy Consumption – 2005 level and additional efforts needed to reach 2020 target



Source: EU Commission, COM(2008) yyy final, January 23 2008; Eurostat.



1b. The Role of Biogas?

	2004				2005			
	Décharges Landfill Gas	Station d'épuration Sewage sludge gas	Autres biogaz Other biogas	Total	Décharges Landfill gas	Station d'épuration Sewage sludge gas	Autres biogaz Other biogas	Total
United Kingdom	1 327,0	177,0		1 504,0	1 421,0	179,0		1 600,0
Germany	573,2	369,8	351,7	1 294,7	573,2	369,8	651,4	1 594,4
Italy	297,7	0,3	37,5	335,5	334,1	0,4	42,0	376,5
Spain	219,1	52,4	23,6	295,1	236,5	56,8	23,6	316,9
France	127,0	77,0	3,0	207,0	129,0	77,0	3,0	209,0
Netherlands	67,1	53,8	28,9	149,8	59,8	50,7	29,6	140,1
Denmark	13,8	19,8	55,6	89,3	14,3	20,5	57,5	92,3
Belgium	56,3	9,7	7,8	73,8	56,3	9,7	7,8	73,8
Czech Republic	18,6	28,7	2,9	50,2	21,5	31,4	2,8	55,8
Poland	21,5	23,9		45,4	25,1	25,3	0,3	50,7
Austria	11,8	19,1	14,5	45,4	11,8	19,1	14,5	45,4
Greece	20,5	15,5		36,0	20,5	15,5		36,0
Ireland	19,9	4,8	5,1	29,9	24,9	4,8	5,1	34,8
Sweden	12,0	22,1	1,2	35,3	10,1	18,7	0,9	29,8
Finland	16,6	9,9		26,5	16,6	9,9		26,5
Portugal			4,5	4,5			10,0	10,0
Slovenia	5,8	0,9		6,6	6,0	0,7		6,8
Luxembourg			5,00	5,0			6,7	6,7
Slovakia		5,7	0,2	5,9		5,7	0,2	5,9
Hungary	0,7	2,6	0,2	3,5	0,8	2,9	0,2	3,8
Total EU	2 808,6	893,1	541,7	4 243,3	2 961,4	898,0	855,6	4 715,0

Source: EurObserv'ER 2006



2. Prospects for Harmonised Support Schemes



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Instrument	Implementation	Planned
Fuel switch obligation	Biomass Agreement (DK); biofuel supply obligation (S)	Biofuel supply obligation (Fin in force 1/1 2008) (DK law proposal start of 2008)
Market instruments	Green Certificates (S); EU ETS (DK, Fin, S)	
Tax exemptions	Biomass (DK); Biofuels (S, N); green car bonus, particle filter rebate (S); E85 car import duty rebate (N); peat to heat, biomass in heat & CHP (S, Fin)	CO2 neutral biofuels general tax exemption; amendment of tax relief system
Subsidies/Feed in tariffs	Biogas fixed tariff of 74.5 øre/kWh (DK); CHP based on natural gas and waste (DK);	Biogas plants for electricity (Fin); fuel switch away from oil boilers, prohibition of oil boilers in new buildings (N)
Research grants & Programmes	Energy crop investment support (SE); ForskNG (DK); EUDP (DK); RENERGI (NO); DH infrastructure & heat plants (N); SGC (SE)	
Investment subsidies	New investment in RE up to 30% (Fin)	

Based on ECON Poyri, Bioenergy Market PPP, Workshop I, 2007

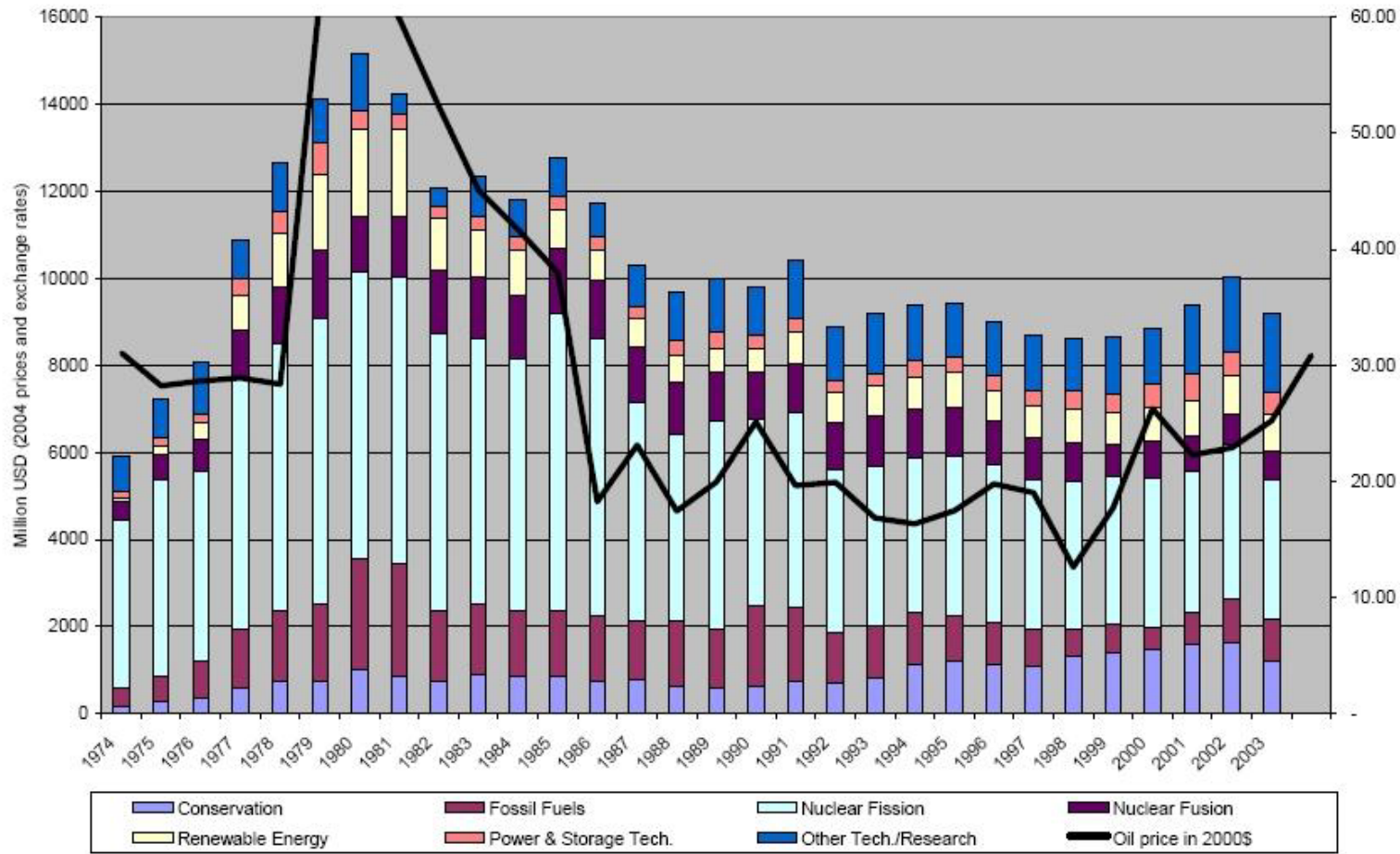
3a. Do we invest sufficiently in Energy R&D



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Figure B: R&D expenditure in IEA countries and oil price 1974 - 2004



OECD report, June 2006

3b. Nordic Countries no Exception



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Total public energy R&D expenditure in Finland, Denmark, Norway and Sweden, 1975 – 2005, Million € (2005 prices)

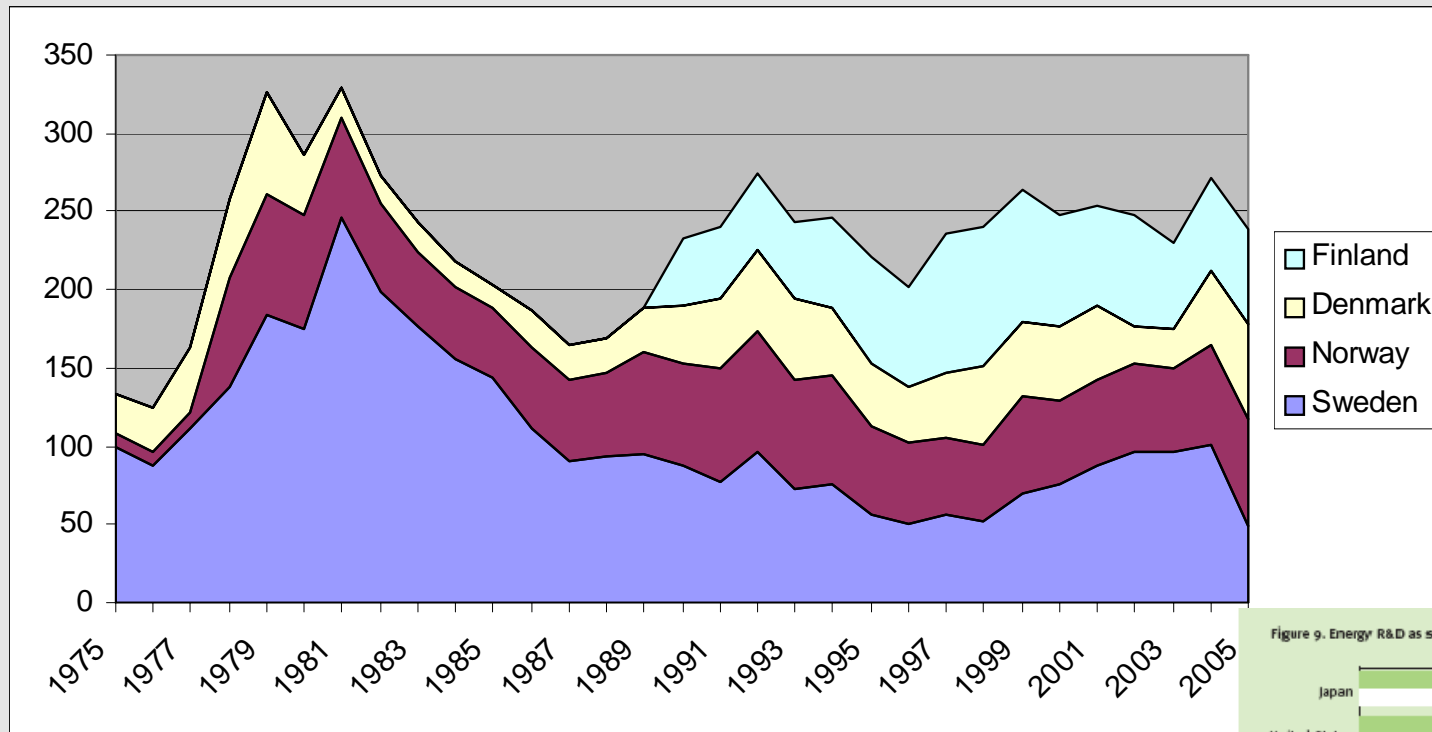
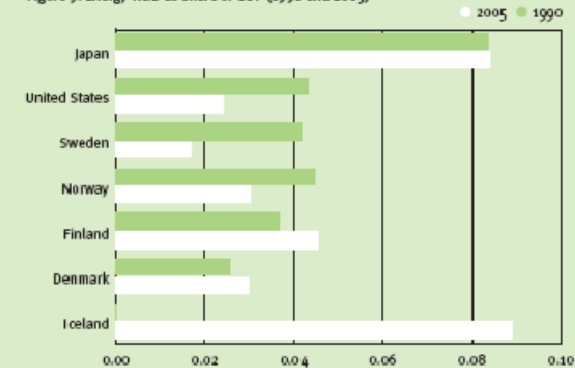


Figure 9. Energy R&D as share of GDP (1990 and 2005)*



Source: IEA (2005), Rannis (2004)

Source: Nordic Energy Research R&D Activities 2003-2006 Report

3c. Time for Nordic Research Effort in Bio-gas?



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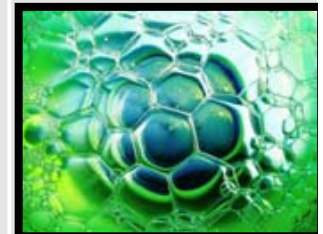
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RESEARCH TOPICS

- Feedstock for biogas
 - Manure and organic waste
 - Energy crops
- Pretreatment
- Digesters
- After storage
- Post treatment
- Gas storage
- Gas treatment
- Gas utilisation
 - Boilers
 - ICE
 - Gas turbines
 - CHP
 - Fuel cells
- Advanced LCA and system analysis

RATIONALE

- Create synergy and critical mass, overcome fragmentation and thereby use available resources more efficiently
- To bring together complementary competences
- Position research communities in a competitive research arena
- To make attractive exchange programmes with top research countries and emerging economies

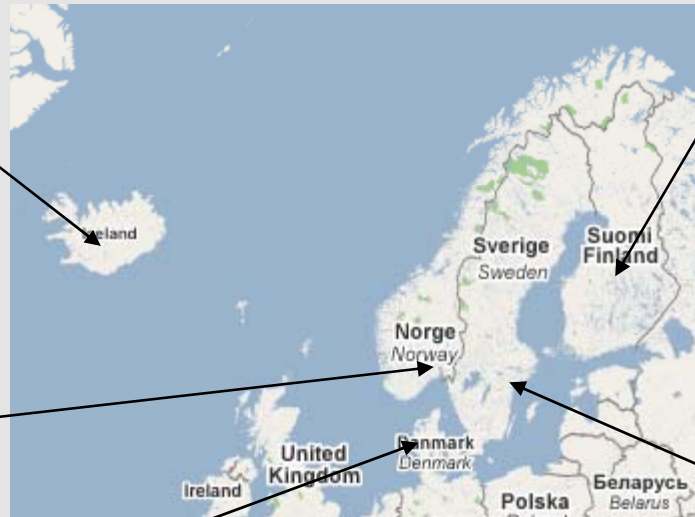


4. Top of Europe Demonstrating Bio-gas Technologies



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**COP15 – Copenhagen 2009
Showcase
Energy Expo**

5a. Business Opportunities in China



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- 15% renewables of total energy consumption by 2020.
- Renewable energy usage ~ total 600 million tons of coal equivalent in 2020 (compared with 166 million tons or 7.5% of total energy consumption in 2005).
- Expected investments: two trillion yuan (266.7 billion U.S. dollars) during the 2006-2020 period.
- By 2020, installed hydropower capacity expected to reach 300 million kilowatts, wind power capacity 30 million kw, biomass power 30 million kw, and solar power 1.8 million kw.
- By 2020, about 300 million rural people will use biogas as their main fuel, when China will use 10 million tons bio-ethanol and two million tons of bio-diesel to replace 10 million tons of oil annually.

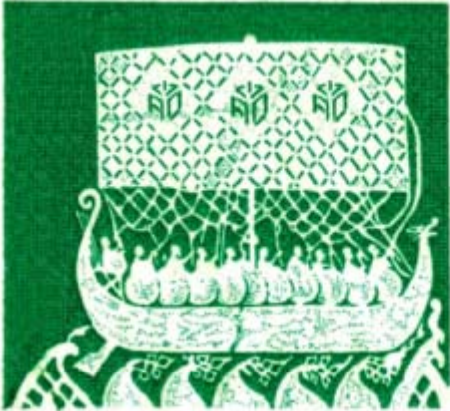
National plan published September 2007.


5b. Bringing Biogas to California





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Presented by:
 AlwaysOn

Hosted by:
 SRI
International



AlwaysOn
Nordic Green '08

Organising partners:
EAS Enterprise Estonia
Innovation Center Denmark
Innovation Norway
FINNODE
VINNOVA
Nordic Innovation Center
Nordic Energy Research

21 – 22 April 2008
Palo Alto, California

"Nordic Green will be a groundbreaking conference for the cleantech industry. It's a unique opportunity for the best minds from Silicon Valley and the Nordic countries to meet up and forge the next generation of environmental solutions. This is a must-attend event for anyone in green technology." – Tim Draper

We are the Champions?



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“Just like when the footballer Zlatan enters the field, his opponents know his skills, and are extra aware and watch him extra close, other countries are aware of the Nordic achievements in bio-energy [biogas], and are watching us extra close.

If the first part of cutting fossil fuel use and introducing green alternatives was the easy part, the next step we face to increase to yet another level will be difficult and much more complicated.

When Zlatan faced one defender in his first games, he now faces two defenders when he plays. Introducing bio-energy [biogas] in niches faced small barriers, bio-energy [bio-gas] in the next step will challenge our conventional energy system”.

Daniel Molin, Project Assistent
Master Student at UoO





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Thank you for your attention!

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