Sustainable Energy Vision for EU - 27

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International Network for Sustainable Energy

European Sustainable Energy Seminar, Organised by INFORSE, EUFORES, EREF

March 20, 2007

http://www.inforse.org/europe/seminar07_BXL.htm
The EU leaders has recognized:

- The world is beyond the environmental limits
- does not provide basic energy needs as light and healthy cooking facilities to 1/4 of the world’s population
- We must limit global warming to 2°C above pre-industrial level
- EU must take the lead
A Global Sustainable Scenario

CO2 (MtC)/y

1990-2000: 64 GtC

After 2000: 240 GtC
EU Policies for Energy

- Limit global warming to 2°C above pre-industrial
- Reduce CO\textsubscript{2} 8% by 2010 (Kyoto) and 30% by 2020
- Increase energy efficiency 20% 2005-2020 with equipment standards, national plans, improvements of buildings, etc.
- 12% Renewables by 2010 (White Paper) and 20-25% by 2020 (EU Parliament, Dec. 06)
INFORSE's EU-27 Vision

Total Primary Energy Supply

Preliminary version – March 2007
INFORSE's EU-27 Vision

Renewable Energy Supply

- Hydro
- Geothermal
- Biomass
- Energy Forest
- Bio-fuel, liquid
- Biogas
- Windpower
- Solar heat
- Solar PV

Preliminary version – March 2007
Electricity Divided in Supply

- Fossils & nuclear
- Solar PV
- Wind
- Biomass
- Hydro

INFORSE's EU-27 Vision

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CO\textsubscript{2} Emmissions

Preliminary version – March 2007
How do we reach it?
Developments to reach it
Efficiency trends
National examples
EU Energy Supply

**Wind:** Growth to 70,000 MW in 2010 (current trend), 220,000 MW in 2020 and 375,000 MW in 2040 (up to 15,000 MW/year), now 6000 MW/year),

¼ expected offshore. This is 20-30% higher than EWEA/EREC forecasts for 2020.

**Solar:** PV market has reached the critical 500 MWp/year globally, and grows > 25% pr. year
Energy Demand

- Most energy consuming equipment will be replaced many times before 2050: new generations of equipment should maximize efficiency. Technology learning drives prices down.

- One exception is houses. In EU houses could use only 1/7 of today’s heat demand in 2050. For the vision is proposed 1.7%p.a. specific reduction leading to 57% reduction 2000 – 2050.

- For transport is expected increase in conversion efficiency from today’s 15-20% to 50%, and re-gain of “break energy”: factor 4 efficiency increase

- Energy service demand will increase, 0-100%

- -33% in car use in EU-15, but + 100% in Lithuania
Realise efficiency – macro scale

Heat efficiency annual increase relative to area, Danish households, 5-year averages

Vision for space heating 1.7% p.a.
Realise efficiency – macro scale

Vision for appliances, industry, etc 2.8% p.a.

Danish efficiency increase 5-yr av.
Vision for Denmark (OVE’05)

- Strong growth in windpower until 2030
- Half specific building consumption 2005-2025
- Flexible electricity use: heat pumps and hydrogen
- Sustainable transport system by 2030 (33% reduction in car use)
- el-storages from 2030
Primary Net Energy Supply, Denmark (PJ)

- Biomass
- Other RE
- Coal & waste
- Oil products
- Natural gas

Chart showing the trend from 2000 to 2050 for each category of energy supply.
A Sustainable Energy Vision for Lithuania

- Potentials for renewable energy divided in windpower, solar, wood, straw, energy plantations, biogas, geothermal
- Assuming high growth of windpower, straw, wood, energy plantations until 2020, then growth in solar
- Growth trends in transport, construction etc. will continue till 2015, and then level off gradually
- Energy efficiency potentials to be realised
- Biomas CHP important part of new structure
Develop energy balances for 2010, 2020, 2030, 2040 and 2050.
Evaluate hourly energy balance
Proposals for Actions until 2020

- Windpower development
- Better biomass use
- Straw use and energy plantations
- District heating and CHP plans
- Biofuels strategy for transport
- Strategies for biogas, solar, geothermal, hydro
- Energy efficiency strategies for heating, electricity, service sector, transport
Coming visions

- Vision for Latvia (next week)
- Vision for Poland, depending on funding
- Vision for Romania, update, fall’07 (dep. on funding)
- Consolidate vision for EU-27, comments welcome
- If possible: vision for India
Thank you
Biomass, sustainably in EU (PJ)

Categories of Biomass:
- Solid energy crops
- Biofuels/crops
- Straw
- Old timber/waste
- Industrial wood residues
- Wood/biomass

Comparative analysis of biomass sources for different studies and projections:
- White Paper 2010
- INFORSE/WBGU
- EEA 2020
- EREC 2020

Graph showing the contribution of each category to the total biomass, with projected values for 2020.