


### Sustainable Energy for South and North, NGO experiences and visions including successes of Grameen Shakti

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International Network for Sustainable Energy  
CSD15, April 30, 2007



OVE - Denmark, INSEDA - India, CRT - Nepal, GS - Bangladesh

### Global Sustainable Energy Vision 2050 by INFORSE


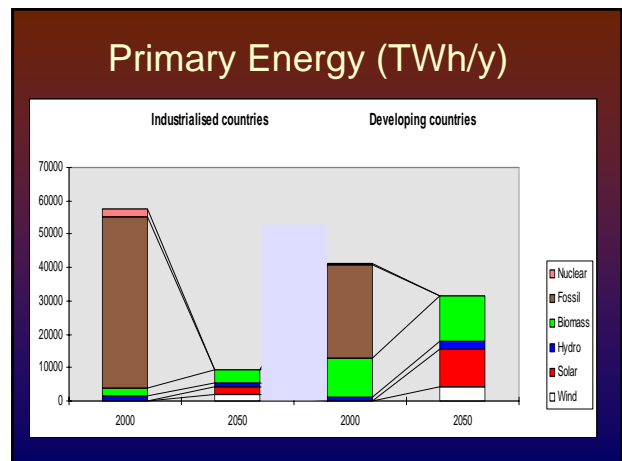
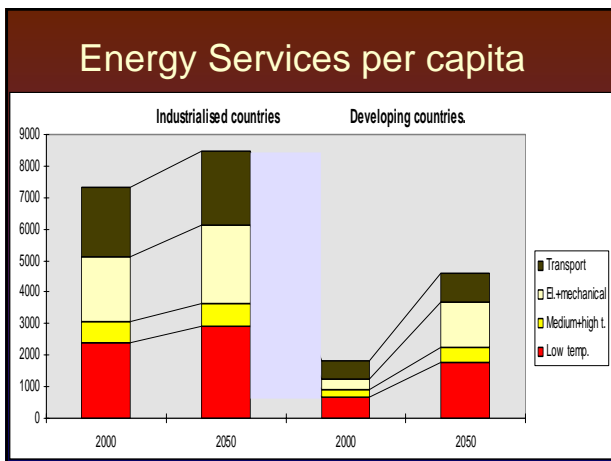
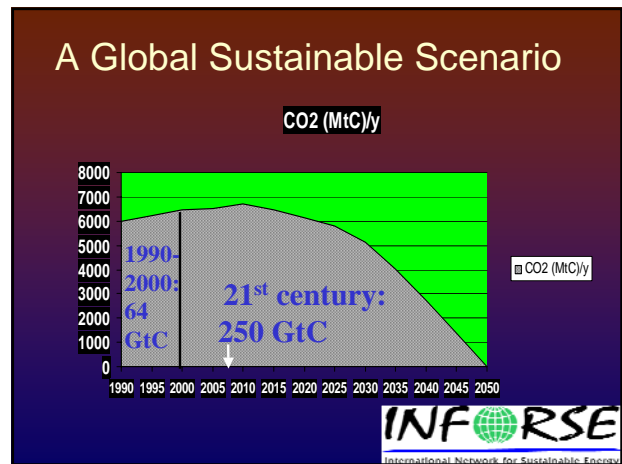
The world energy system:

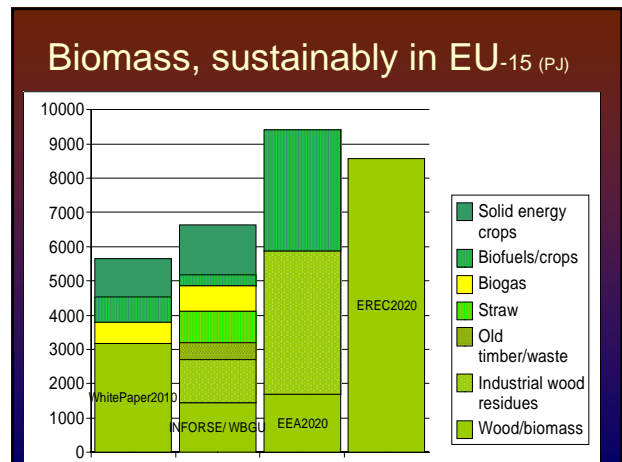
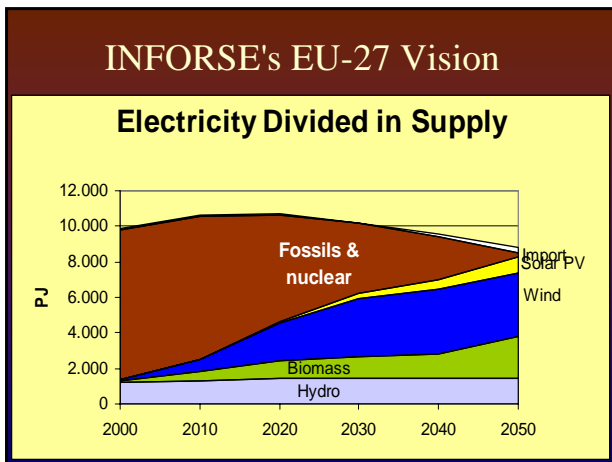
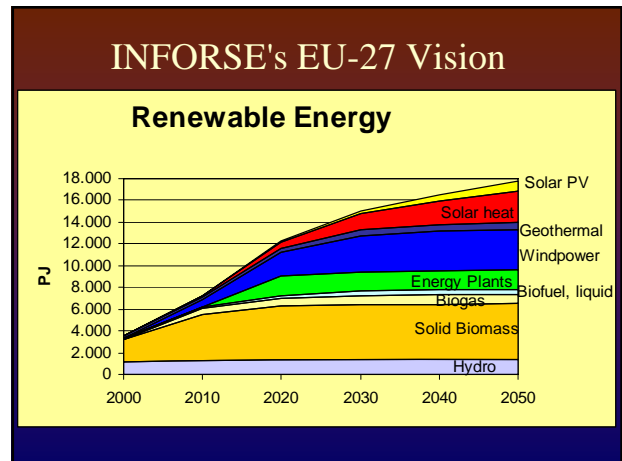
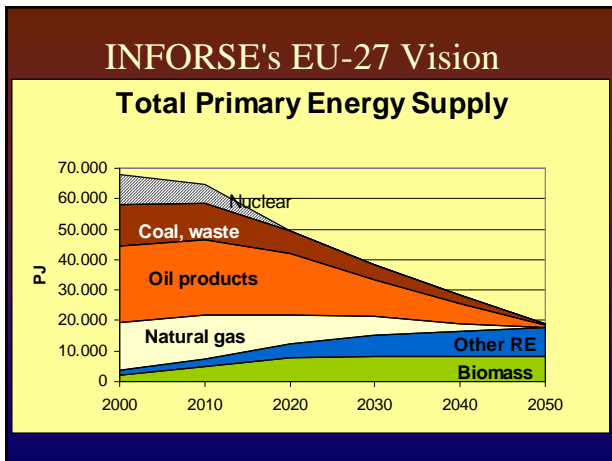
- ❖ is beyond the environmental limits
- ❖ does not provide basic energy needs as light and healthy cooking facilities to 1/4 of the world's population
- ❖ Environmental imperative: keep global warming to 1°C in 21. century (1.6°C above pre-industrial level)
- ❖ Social imperative: provide all with basic energy needs and allow developing countries to develop, including use of cheap energy supply



### Environmental Imperative

- ❖ To limit CO<sub>2</sub> in atmosphere to 450 ppm, 21<sup>st</sup> century emissions must be 490-670 GtC (56-76 years of current emissions (IPCC4))
- ❖ This might not keep global warming to 2°C
- ❖ To keep global warming to 1.6°C above pre-industrial level, we must limit 21<sup>st</sup> century CO<sub>2</sub> emissions e.g. to 250 GtC (32 years of current emissions)

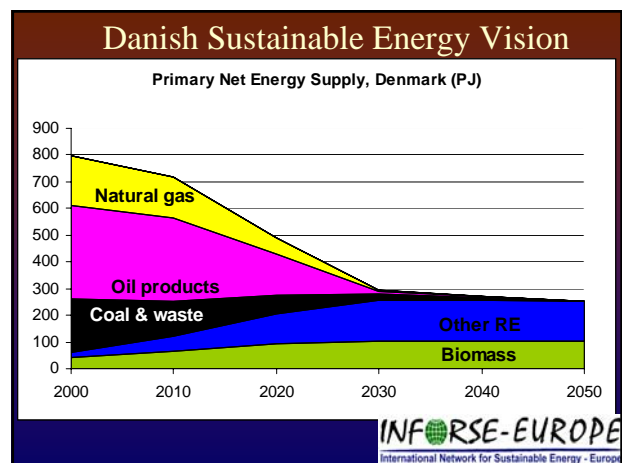





### Energy Demand

- ❖ New generations of equipment should maximize efficiency. Technology learning drives prices down. We can realize factor four within 2050
- ❖ One exception is houses. In EU houses could use only 1/7 of today's heat demand in 2050. EU Industry (Eurima/EuroACE) finds that more than 50% of energy use in buildings could be reduced. INFORSE Vision includes 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

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### A sustainable energy vision for Lithuania, proposals until 2020

- ❖ Windpower development, 1300 MW
- ❖ Better biomass use
- ❖ Straw use and energy plantations (7% agri.area)
- ❖ District heating and CHP plans, 1100 MWe CHP
- ❖ Biofuels strategy for transport
- ❖ Strategies for biogas, solar, geothermal, hydro
- ❖ Energy efficiency strategies for heating, electricity, service sector, transport

### Opportunities for Lithuania

- ❖ Phase out nuclear by 2010
- ❖ Reduce gas use with half by 2020
- ❖ Phase out fossils by 2050
- ❖ Electricity costs 3-5 €cent/kWh (below nuclear)



### Compare with Energy [R]evolution

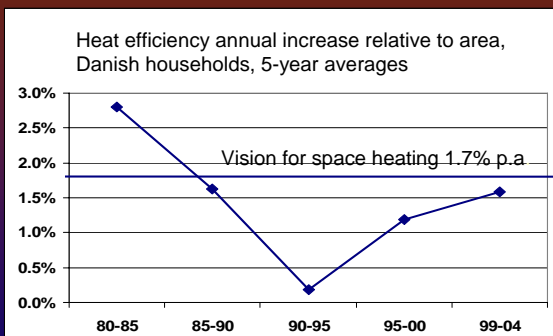
- |   |   |
|---|---|
| ❖ VISION2050  | ❖ E-REVOLUTION                                |
| ❖ Phase out of nuclear                              | ❖ Phase out of nuclear                        |
| ❖ Efficiency revolution twice energy service growth | ❖ Efficiency revolution match economic growth |
| ❖ Primary energy cut by half to 50                  | ❖ Primary energy stable globally              |
| ❖ 100% RE by 2050                                   | ❖ 50% RE by 2050                              |



### Thank you

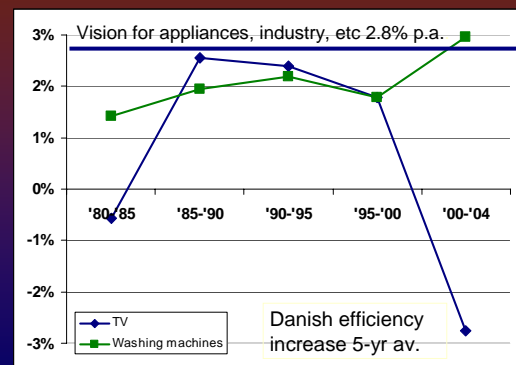


### Realise efficiency – macro scale



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### Realise efficiency – macro scale



## 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.

Large windpower development programs are cost-  
effective: extra costs today will be paid back with  
future cost reductions due to technology learning.  
Many sites cost-effective today.

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

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