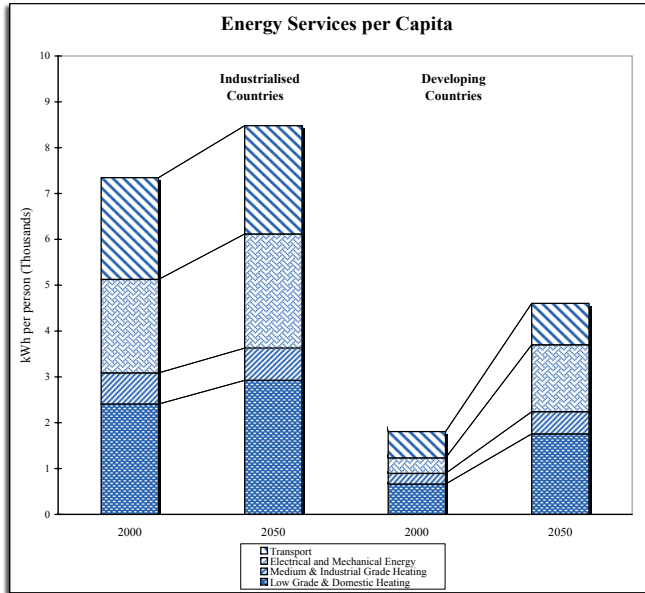
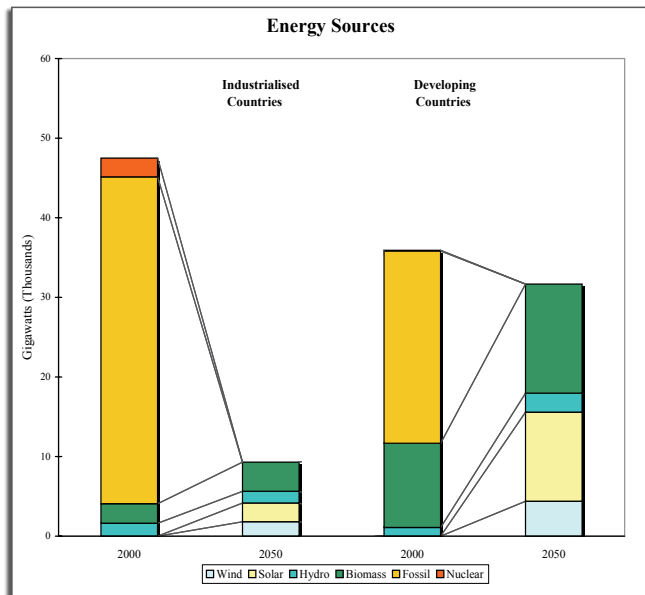


## Global Vision for Sustainable Energy



Development of energy services (heat, light, transportation, etc.) per capita in 2050 compared with those in 2000.



Combining the development of the energy service level with best available technologies in energy efficiency, it will be possible to cut demand to sustainable levels to be covered by local renewable energy sources. Quantities are shown in TWh/year.

## Sources for the Visions and Further Info

The global scenario for 2050 is based on the Low Energy Consumption Scenarios, Bent Sørensen et.al., Roskilde University, Denmark.

The European and national visions and their documentation are available at <http://www.inforse.org/europe/Vision2050.htm>

## International Network for Sustainable Energy - Europe

### INFORSE-Europe

Contact on Visions:

Gunnar Boye Olesen

Klosterport 4E, 1. floor, DK-8000 Aarhus C

Ph: +45-86227000

Fax: +45-86227096

E-mail: [ove@inforse.org](mailto:ove@inforse.org)

[www.inforse.org/europe](http://www.inforse.org/europe)



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November 2012

# SUSTAINABLE ENERGY VISIONS

## 100 % RENEWABLES



Global, regional, national visions and scenarios

Proposals to achieve sustainable energy systems, following environmental & social imperatives



**INFORSE**

## Sustainable Energy Visions 2030-40: 100 % Renewables

In the coming decades, it will be crucial that the world's energy systems be made environmentally benign and adequate to meet everybody's energy needs. We have better technologies than ever before to use energy efficiently and to use the world's renewable energy resources without harming the environment.

INFORSE's vision explores ways in which we can use these technologies to change the world's obsolete, dangerously polluting energy patchwork to a sustainable system that will satisfy the global imperatives of achieving environmental/ climate stability and of ensuring basic energy security for all. The visions include the phase-out of nuclear power. Carbon Capture and Storage (CCS) is not part of the visions.

The proposed changes will increase energy security and are compatible with global equity. The additional costs to society will be small, or even negative, if the changes are planned well and if they are phased in as part of the natural transitions of power plants and equipment. They will require initial investments and long-term strategies, nationally and internationally. They will also require major shifts in the energy-supply system as well as in energy-consuming equipment and structures.

## Global Scenario

According to studies done by independent researchers, it is feasible to supply the world with 100% renewable energy and, thus, to achieve a 100% reduction of energy-related CO<sub>2</sub> emissions. This assertion assumes:

- That the world population will not exceed 9.4 billion;
- That all basic energy and food needs are met;
- That the best available energy-efficiency technology today becomes the average technology. This yields efficiency increases of a factor between 4 and 8, with efficiency measured as the ratio between used energy and resulting energy services in the form of heating, cooling, light, transport, etc.

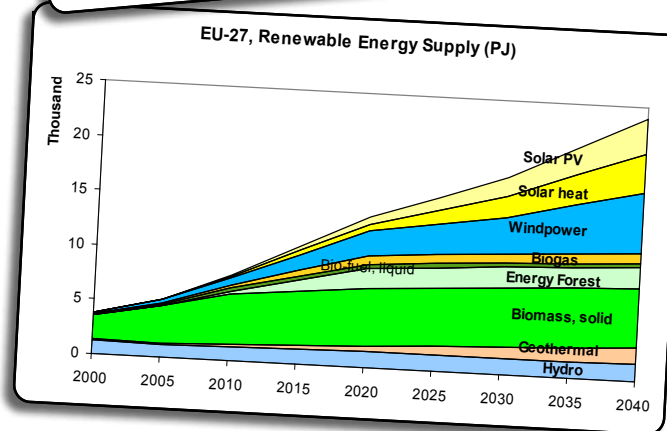
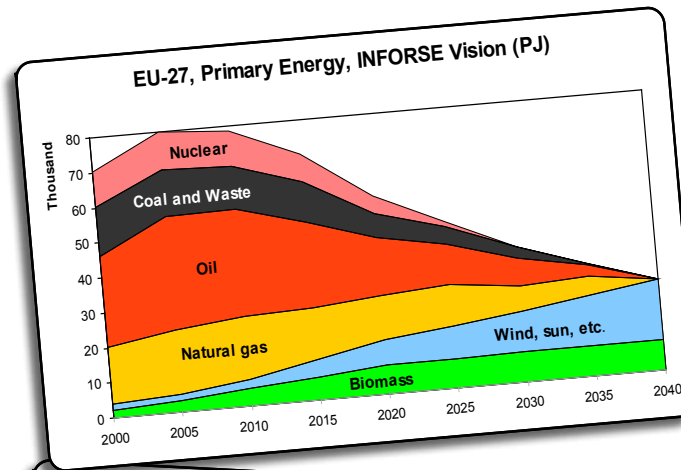
Several researchers found that this can be realised globally by 2050. INFORSE's global vision is based on one of these studies.



## Vision for the EU Countries

INFORSE-Europe and its member organisations are working on a European vision with a scenario for phase-out of fossil and nuclear energy in the EU-27 by 2040. It builds on existing work on renewable energy and energy-efficiency potentials. The scenario is made with a spreadsheet tool developed by INFORSE.

The vision brings us to 25% renewable energy in 2020, which is possible with identified renewable-energy proposal in the EU countries. It also achieves a reduction by 40% of greenhouse-gas emissions from energy in the period from 1990 to 2020, which is possible with 25% renewable energy combined with 20% energy-efficiency increase over 2005 levels and with increased cogeneration of heat and electricity (CHP). In the first decades, windpower and biomass are most important, whereas later, solar technologies are expected to capture most of the growth. End-use efficiency is estimated to increase by a factor of 2.5 by 2040 for industry and electricity use, but for houses only by 45%, as it will require energy renovation of existing houses.



## National Sustainable Energy Visions

In cooperation with national members, INFORSE has developed a number of national visions of feasible sustainable energy development for the respective countries. These vary according to national renewable energy resources, energy consumption patterns, and priorities of the national NGOs involved. For each country, detailed assumptions are made, and the documentation is made available online. For some countries, action plans and cost calculations are included.

Visions have been developed for Belarus, Bulgaria, Denmark, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia, Ukraine, and, in a similar process, for the UK with ZeroCarbonBritain. The Danish vision and ZeroCarbonBritain include transitions of energy systems to 100% renewable energy supplies by 2030, while the other includes a transition by 2040 or eventually 2050.

