

# Quit Nuclear Power – invest in the Energy [R]evolution!



## Energy [R]evolution

Together with the European Renewable Energy Council (EREC), Greenpeace has published a global energy scenario as a practical blueprint for how CO<sub>2</sub> reduction targets can be urgently met, and how an affordable energy supply on the basis of steady worldwide economic development can be secured. These goals are both possible to achieve at the same time. The urgent need for change in the energy sector means that this scenario is based only on proven and sustainable technologies, such as renewable energy sources and efficient decentralised cogeneration.

Commissioned from the Department of Systems Analysis and Technology Assessment (Institute of Technical Thermodynamics) at the German Aerospace Centre (DLR), the report develops a global sustainable energy pathway up to 2050. The future potential for renewable energy sources has been assessed with input from all sectors of the renewables industry around the world.

The good news is that the global market for renewables is booming. Decades of technical progress have seen renewable energy technologies such as wind turbines, solar photovoltaic panels, biomass power plants, solar thermal collectors and many others move steadily into the mainstream. The global market for renewable energy is growing dramatically; in 2008 its turnover was over \$ 120 billion (US dollars), almost twice as high as the previous year.

The power industry and utilities need to take more responsibility, because today's investment decisions will define the energy supply of the next generation. We strongly believe that this should be the 'solar generation'. Politicians from the industrialised world urgently need to rethink their energy strategy, while developing countries should learn from the world's past mistakes and build their own economies on the strong foundations of a sustainable energy supply.

Renewable energy could more than double its share of the world's energy supply - reaching up to 30% by 2030. All that is lacking is the political will to promote its large scale deployment in all sectors at a global level, coupled with far reaching energy efficiency measures. By 2030 about half of global electricity could come from renewable energies.

The Energy [R]evolution Scenario concludes that the restructuring of the global electricity sector requires an investment of \$ 14.7 trillion (US dollars) until 2030. This compares with \$ 11.3 trillion under the Reference Scenario based on International Energy Agency projections.

In fact, the additional costs for coal power generation alone from today up to 2030 under the Reference Scenario could be as high as \$ 15.9 billion (US dollars): this would cover the entire investment needed in renewable and cogeneration capacity to implement the Energy [R]evolution Scenario. These renewable sources will produce energy without any further fuel costs beyond 2030, while the costs for coal and gas will continue to be a burden on national and global economies.

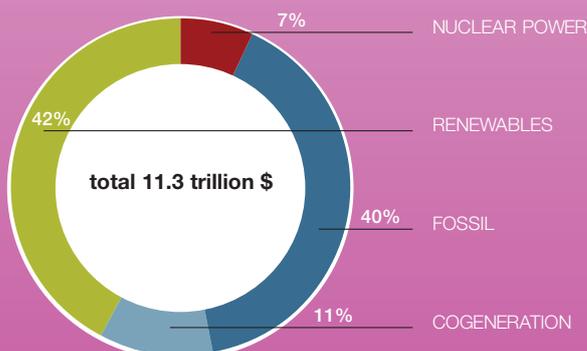
In fact, given the significant risks associated with nuclear power, the investments required to implement the Energy [R]evolution scenario gain more appeal. Economically compelling returns resulting from lower installed cost of renewable energy generation, like wind farms (€1,200/kW in 2005) and concentrated solar power plants (€2,700/kW in 2020)<sup>1</sup>, with measurable risk and associated quantifiable contingencies do appeal. These renewable energy sources will produce energy without any further fuel costs beyond 2030.

Investments required in energy infrastructures as well as emerging opportunities in the clean tech industry offer much more attractive opportunities for compelling investment returns from proven technologies and future developments.

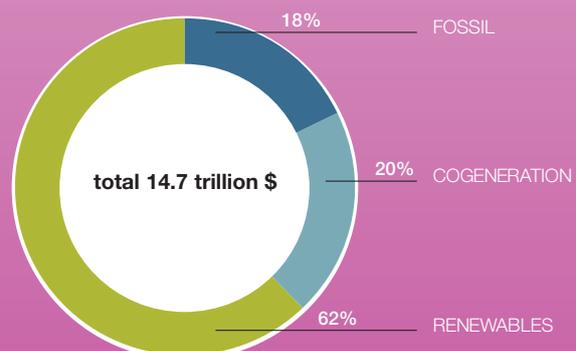
<sup>1</sup> Concentrating Solar Power - Global Outlook 09, SolarPACES/ESTELA/Greenpeace, May 2009. Available from [www.greenpeace.org/international/press/reports/concentrating-solar-power-2009](http://www.greenpeace.org/international/press/reports/concentrating-solar-power-2009)

## investment shares - reference versus energy [r]evolution

reference scenario 2005 - 2030



energy [r]evolution scenario 2005 - 2030



**“ While the average annual investment required to implement the Energy [R]evolution Scenario would need just under 1% of global GDP, it would lower fuel costs by 25% - saving an annual amount in the range of \$ 750 billion.”**

**image** Renewable energy: the PS10 Concentrating Solar Tower plant. Below the tower, movable mirrors called heliostats concentrate the sun's rays to the top of the tower, where a solar receiver and a steam turbine are located. The turbine drives a generator, producing electricity.



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## Facts

- Renewable electricity generation capacity reached an estimated 240 Gigawatts (GW) worldwide in 2007, an increase of 50% over 2004. Renewables represent 5% of global power capacity and 3.4% of global power generation. These figures exclude large hydropower, which accounted for 15% of global power generation alone.
- Renewable energy (excluding large hydropower) generated as much electric power worldwide in 2006 as one-quarter of the world's nuclear power plants.
- The largest component of renewable generation capacity is wind power, which grew by 28% worldwide in 2007, to reach 95 GW. The annual capacity growth rate is even higher: 40% more in 2007 than in the year before.
- The fastest growing energy technology in the world is grid-connected solar photovoltaics (PV), with a 50% annual increase in cumulative installed capacity in both 2006 and 2007 to reach 7.7 GW. This translates into 1.5 million homes with rooftop solar PV feeding into the grid.
- Rooftop solar heat collectors provide hot water to nearly 50 million households worldwide, and space heating to a growing number of homes. Existing solar hot water/heating capacity increased by 19% in 2006 to reach 105 Gigawatts thermal (GWth) globally.
- The use of biomass and geothermal energy for both power and heating has been increasing in a number of countries, including for district heating networks. More than 2 million ground source heat pumps are now used in 30 countries to heat (and cool) buildings.
- Renewable energy, in particular small hydropower, biomass and solar PV, is providing electricity, heat, motive power and water pumping for tens of millions of people in the rural areas of developing countries, serving agriculture, small industry, homes and schools. 25 million households cook and light their homes with biogas and 2.5 million households use solar lighting systems.
- Developing countries account for more than 40% of existing renewable power capacity, more than 70% of solar hot water capacity and 45% of biofuels production.
- In terms of investment, an estimated \$ 71 billion US dollars was invested in new renewable power and heating capacity worldwide in 2007 (excluding large hydropower). Of this, 47% was for wind power and 30% for solar PV. Investment in large hydropower, the most established renewable energy source, added a further \$ 15–20 billion. The total amount invested in new renewable energy capacity, manufacturing plants and research and development during 2007 is estimated to have reached a record \$ 100 billion.