



A photograph of a person in a light-colored shirt and dark suit jacket running. They are carrying a black briefcase. A white envelope is on the ground in the foreground. The background shows a building with windows.

# Renewable energies: a reality, not just an idea

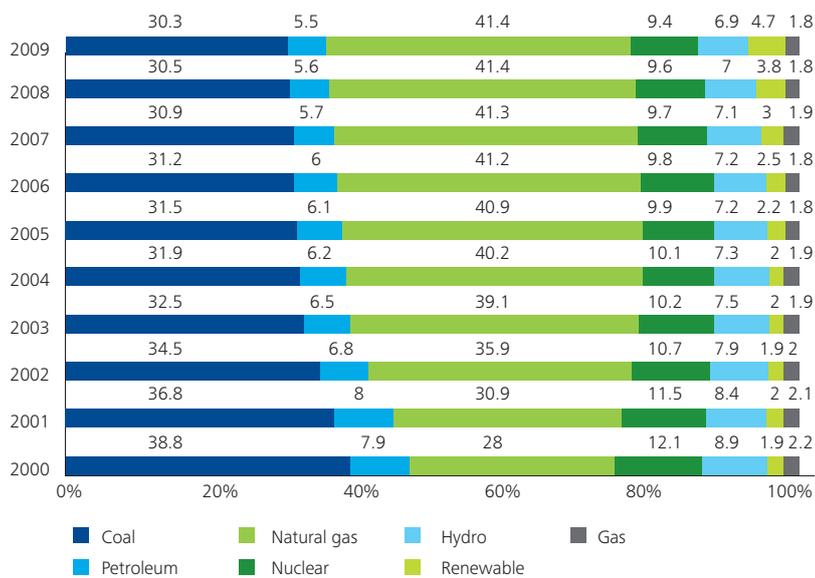
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Recent discoveries of oil and gas fields in areas deemed as unconventional - such as the Mediterranean coast for example - have added impetus to the energy sector. However, traditional energy resources remain both, depleting and polluting and new sources of power generation that already exist, must be further developed. Alternative energy sources such as nuclear and renewable energies are the two probable solutions to our increasing energy needs.

### Evolution of renewable energy

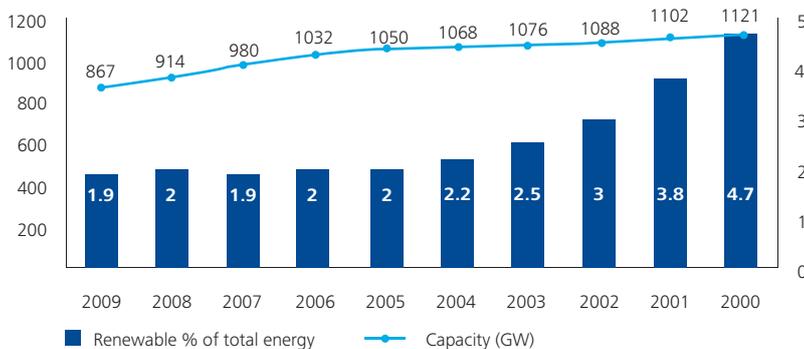
Despite considerable investment cost, renewable energy is safe – production wise – and environmentally friendly – excepting the issue of nuclear wastes and the unusual occurrence of disasters such as Chernobyl and Fukushima – and requires no fuel. Numerous techniques of production have been developed, that are more or less lucrative depending on location, weather and other factors.

**Table 1: U.S. Electric net generation (2000-2009)**



Source: EIA, AWEA, SEIA, GEA

**Table 2: Renewable energy as a function of capacity**



Source: EIA, AWEA, SEIA, GEA

Capacity is also growing. Despite its relatively small contribution to overall electricity production (see Table 1), renewable energy usage is increasing considerably year on year in terms of total capacity (see Table 2): "Although renewable energy (excluding hydropower) is a relatively small portion of total energy supply both globally and in the United States, the installed renewable energy capacity in both the world and in the United States has more than tripled between 2000 and 2009," according to the U.S. Department of Energy.

As other energy resources decrease, it seems renewable energy will be the ultimate long-term power generation resource. Governments are increasingly getting engaged in projects by investing capital and labor to help promote and advance clean power generation more efficiently.

### Types of renewable energies

One of the most commercially used sources of energy is biomass, produced from organic material such as plants and animals. In the U.S. alone, the use of biodiesel has multiplied by a factor of 100 during the period 2000-2009, according to the U.S. Department of Energy. The advantage of biomass energy relative to its peers is that it does not depend on variables (i.e. radiant light and heat of the sun, flow of water) consequently, it guarantees, to a certain extent, continuous power generation. Wood is considered to be the most widely used electric resource generation among all solid biomass since it has the highest calorific value (a thermal unit representing the amount of heat produced by complete combustion of a given mass). Additionally, wood is abundant so it can be used to a large extent.

Other energy sources have witnessed large growth such as wind, solar and geothermal energies, with wind turbines scoring the highest growth among all renewable energies (a factor of 9 between 2000-2009). Wind power creates energy by transforming kinetic energy into mechanical energy. Geothermal energy originates from the Earth, it is considered among the few resources that can continuously supply power. Nevertheless, the full potential of geothermal energy is yet to be reached.

Hydraulic energy has had a commercial presence since a long time with dams producing electricity for decades. It was first used for irrigation and the operation of several mechanical devices and has ultimately developed into a more effective and efficient source of power generation.

### Green taxes

Governmental fiscal policies such as tax reductions on green products also contribute to the expansion of these alternate sources of energy. Adversely, green tax programs have been established to minimize the usage of harmful resources: tax levies, also referred to as “green taxes” or “environmental taxes” are high on products with considerable density of detrimental materials (such as Polyvinyl Chloride or PVC).

### Future opportunities and new solutions

Unlike what is commonly thought, renewable energy does not actually work well alone: the sun is not always shining, wind speed fluctuates, even lakes behind dams get larger or smaller depending on the time of year. These factors make renewable energy an unreliable source at times, but when functioning properly, they can reduce the dependence on carbon or uranium and supply part of our needs with clean energy.

Consequently, many studies have elaborated methods and techniques to reduce air-polluting emissions resulting from transportation. Among the most recent discoveries are the Electric and the plug-in hybrid electric vehicles (EV and PHEV). The latter consume both gasoline and electricity (greenhouse gas GHG), which ultimately reduces emission of pollutants (i.e. CO<sub>2</sub>).

Other scientists have discovered ways to significantly increase storage capacity by keeping hydrogen, which is then used in fuel cells or internal combustion engines, to produce electricity.

When encouraged and used effectively, clean sources of energy can contribute to a better preservation of our environment and even be cost effective at times (especially the running cost since no fuel is required).

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## Unlike what is commonly thought, renewable energy does not actually work well alone

In the Middle East region in particular, wind speeds are more consistent, particularly on the Saudi side of the Suez Canal and the in the Empty Quarter (Rub Al Khali). In addition, there is guaranteed high intensity sunlight for far longer, especially in the Sahara Desert, where covering a minimal percentage of the land with solar panels is thought to provide enough power to cover the planet (a plan that is not without its own set of inherent problems.) Nevertheless, from a regional perspective, this natural resource should be invested in rather than ignored.

### Success stories

The most high-profile renewable energies projects have been undertaken in Egypt: from developing selective wind turbine by manufacturing turbine towers and blade facilities for the local market to supplying products to emerging North African and Middle Eastern markets.

Another project is the Global El Zeit Project Wind Park. Worth USD 880 million, it is to be developed on the Red Sea coast. When fully operational, the plant will generate an output of 350 GWh per year and will cut carbon dioxide emissions by 500,000 tons per year. The plant is expected to employ up to 40 workers for plant maintenance, in addition to more than 100 workers in the construction of the wind farm.

One more project is the Zaafarana Wind Park Project which is a German, Danish, Spanish and Egyptian joint venture. This wind park will be delivering a total output of 160 MW after its completion.

Relying totally on renewable energy is still a bit controversial for the time being, yet with better techniques to store energy, we may be able one day to see these sources as our main supply of energy.

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