

Wind power and its industry in different countries

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Wind power is the conversion of wind energy into a useful form of energy, such as using: wind turbines to make electricity, windmills for mechanical power, wind pumps for water pumping or drainage, or sails to propel ships. A large wind farm may consist of several hundred individual wind turbines which are connected to the electric power transmission network. Offshore wind farms can harness more frequent and powerful winds than are available to land-based installations and have less visual impact on the landscape but construction costs are considerably higher.

Small onshore wind facilities are used to provide electricity to isolated locations and utility companies increasingly buy back surplus electricity produced by small domestic wind turbines. Although very consistent from year to year, wind power has significant variation over shorter timescales. The intermittency of wind seldom creates problems when used to supply up to 20% of total electricity demand, but as the proportion increases, a need to upgrade the grid, and a lowered ability to supplant conventional production can occur.

Power management techniques such as having excess capacity storage, dispatch able backing supplies (usually natural gas), storage such as pumped-storage hydroelectricity, exporting and importing power to neighboring areas or reducing demand when wind production is low, can greatly mitigate these problems. Wind power, as an alternative to fossil fuels, is plentiful, renewable, widely distributed, clean, produces no greenhouse gas emissions during operation and uses little land Any effects on the environment are generally less problematic than those from other power sources.

As of 2010 wind energy production was over 2.5% of worldwide power, growing at more than 25% per annum. The overall cost per unit of energy produced is similar to the cost for new coal and natural gas installations. Although wind power is a popular form of energy generation, the construction of wind farms is not universally welcomed. Fossil fuels are subsidized by many governments, and wind power and other forms of renewable energy are also often subsidized. For example a 2009 study by the Environmental Law Institute assessed the size and structure of U. S. energy subsidies over the 2002-2008 periods.

The study estimated that subsidies to fossil-fuel based sources amounted to approximately \$72 billion over this period and subsidies to renewable fuel sources totaled \$29 billion. In the United States, the federal government has paid US\$74 billion for energy subsidies to support R&D for nuclear power (\$50 billion) and fossil fuels (\$24 billion) from 1973 to 2003. (Energy subsidies are measures that keep prices for consumers below market levels or for producers above market levels, or reduce costs) During this same timeframe, renewable energy technologies and energy efficiency received a total of US\$26 billion.

It has been suggested that a subsidy shift would help to level the playing field and support growing energy sectors, namely solar power, wind power, and biofuels. History shows that no energy sector was developed without subsidies. According to the International Energy Agency (IEA) (2011) energy subsidies artificially lower the price of energy paid by consumers, raise the price received by producers or lower the cost of production. " Fossil fuels subsidies costs generally outweigh the benefits.

Subsidies to renewables and low-carbon energy technologies can bring long-term economic and environmental benefits". In November 2011, an IEA report entitled *Deploying Renewables 2011* said "subsidies in green energy technologies that were not yet competitive are justified in order to give an incentive to investing into technologies with clear environmental and energy security benefits". The IEA's report disagreed with claims that renewable energy technologies are only viable through costly subsidies and not able to produce energy reliably to meet demand.

In the US, the wind power industry has recently increased its lobbying efforts considerably, spending about \$5 million in 2009 after years of relative obscurity in Washington. By comparison, the US nuclear industry alone spent over \$650 million on its lobbying efforts and campaign contributions during a single ten year period ending in 2008. Following the 2011 Japanese nuclear accidents, Germany's federal government is working on a new plan for increasing energy efficiency and renewable energy commercialization, with a particular focus on offshore wind farms.

Under the plan large wind turbines will be erected far away from the coastlines, where the wind blows more consistently than it does on land, and where the enormous turbines won't bother the inhabitants. The plan aims to decrease Germany's dependence on energy derived from coal and nuclear power plants. Commenting on the EU's 2020 renewable energy target, Economist, Professor Dieter Helm, is critical of how the costs of wind power are cited by lobbyists. Helm also says that the problem of intermittent supply will probably lead to another dash-for-gas or dash-for-coal in

Europe, possibly with a negative impact on energy security. A House of Lords Select Committee report (2008) on renewable energy in the UK reported a "concern over the prospective role of wind generated and other intermittent sources of electricity in the UK, in the absence of a break-through in electricity storage technology or the integration of the UK grid with that of continental Europe. Many wind power companies work with local communities to reduce environmental and other concerns associated with particular wind farms. In other cases there is direct community ownership of wind farm projects.

Appropriate government consultation, planning and approval procedures also help to minimize environmental risks. Some may still object to wind farms but, according to The Australia Institute, their concerns should be weighed against the need to address the threats posed by climate change and the opinions of the broader community. In America, wind projects are reported to boost local tax bases, helping to pay for schools, roads and hospitals. Wind projects also revitalize the economy of rural communities by providing steady income to farmers and other landowners.

In the UK, both the National Trust and the Campaign to Protect Rural England have expressed concerns about the effects on the rural landscape caused by inappropriately sited wind turbines and wind farms. Some wind farms have become tourist attractions. The White Lee Wind Farm Visitor Centre has an exhibition room, a learning hub, a cafe with a viewing deck and also a shop. It is run by the Glasgow Science Centre. In Denmark, a loss-of-value scheme gives people the right to claim compensation for loss of value of their property if it is caused by proximity to a wind turbine.

The loss must be at least 1% of the property's value. There have been numerous reports of those living close to wind turbines suffering adverse health effects from noise, vibration and shadow flicker, and in 2009 New York Pediatrician, Dr. Nina Pierpont, claimed to have identified an effect for which she coined the term "Wind Turbine Syndrome". An industry commissioned review of the current research on the possible health effects of wind turbine noise and vibration reported in 2010 that, "the sound (including sub audible sound) is not unique, and does not pose a risk to human health.

Although the sound may cause 'annoyance' for some people, this in itself is not an adverse health effect. "The findings of the report have, however, been questioned on a number of grounds including; that the reviewing group did not include an epidemiologist, usually a given for assessing potential environmental health hazards, and that there was no clear description of the methods the researchers used to search for available research, nor how they rated the quality of the research. In October 2010 The Society for Wind Vigilance held an international symposium concerning the subject.

A study on wind farm noise published in 2012 by The US state of Massachusetts reported that people are annoyed by sound from wind turbines at far lower sound levels than they are by noises from railroads, aircraft, or road traffic. The study found the percentage of respondents who found noise levels highly annoying rose quickly as sound levels increased above about 37dbA (about the level of a conversation). Wind Power Is A very good resource for energy I think that everybody should use win power in the future