

The Energy and Climate Problems of the World - How to Solve them?

In this article you can find a survey of the modules necessary to solve the World's energy shortage and the dangers of continued use of fossil energy sources.

The world has an energy problem. The supply of the main source of energy, the oil, is gradually running out. The use of oil, coal and other fossil energy sources is polluting the planet with greenhouse gasses that are capturing heat from the sun rays in a dangerous degree.

But also most alternative energy sources give problems for the environment. Some of them take up vast areas of land, like bio-fuel production, extensive solar cell plants and wind mills. Extensive use of croplands to produce bio-diesel, methanol, ethanol or other bio-fuels can cause a chronic hunger catastrophe. Others, like nuclear power stations can accidentally destroy the environment of vast areas and potentially kill millions of people. Also leakage from deposits of nuclear waste can give the same effect. But nuclear power is very clean if everything goes well.

As it seems, there is no easy or elegant political or technical solution to the problem. The problem must be challenged with a clever combination of several means.

An important module in the solution is energy economization. Where it is possible one must use engines, technology and logistics that utilize the energy as effectively as possible. One must also stop using energy on activities that do not result in any added comfort, do not give gain of any sort, or give only marginal resulted value. By using the energy sources more effectively, the World's energy need will perhaps drop by so much as 30%.

Then the use of oil and coal must be replaced with all kinds of alternative energy sources, but no alternative must be used in such an extend or such a way that it cause new problems.

One part of the solution is using bio diesel or other bio-fuels made of waste from croplands. In the process of converting the waste to fuel, the content of minerals in the waste can probably also be extracted and sold as fertilizers. But it is unethical to grow crop just for making bio-fuel, since that can cause food shortage and rise of food prizes.

Use of solar energy to make electricity will be a great part of the solution. Theoretically every roof and outer wall in the world can be covered by solar cell panels, even though it will not be estheticly or practically possible to go so far. Wastelands that have little other value can also be used to mount large solar cell plants. There is however a limit on how much solar cell panels you can mount before the environment is disturbed.

Much more electricity can be produced by wind-mills than today, but there is a limit on the number and extent of wild-mill parks you can set up before the environment is heavily disturbed. In areas like Denmark and Northern Germany the disturbing effects can already be seen clearly.

In many areas the waves in the sea or the stream of tide water can be used to produce electricity in a

commercially economical fashion, but again there is a limit on how far you can go in building wave or tidal power plants before you destroy the environment.

The wind can also be used more directly, as it were in former periods. Sails can be mounted on large ships, especially on large cargo carriers. However, the sail rigs will probably look quite differently than those of the old vessels, and be operated automatically by computers.

Many countries have special natural energy resources that lend themselves to easy exploitation. Geothermal energy is one of these. Iceland is extensively using geothermal heat directly or to produce electricity. This technology can probably be extended for use in areas where the geothermal heat is somewhat more hidden, but still relatively close to the surface.

Heat pumps are installations using a reversed refrigerator technology to carry heat from the outside environment to the inside of a building where it is concentrated to a higher temperature. The heat can then be used for warming the building or other applications. Heat pumps need some electricity to work, but extract more energy from the outside than they consume. More extensive use of heat pumps can give a great amount of the energy needed for heating. Heat pumps can also be used to fetch geothermal energy of low temperature and concentrate it to a higher temperature without digging very deep.

Hydroelectric power plants using the natural fall of water from high to low areas have long been a major source of electric energy, and many of the existing plants can be made more efficient. To some extent new plants can also be built, but there is a limit also on this technology before the impact on the environment gets too heavy.

Unfortunately it is not possible to avoid using more nuclear power than today if the energy crisis shall be solved. There are however new developments in this area that makes nuclear power less dangerous. Scientists are right now developing a new type of reactors that will use thorium as a fuel and that will be work subcritically. The reactions in these reactors cannot go out of control. The waste also will cease to radiate after some hundred years, and not many thousand, so the storing of waste will be less problematic. But still there will be waste that must be handled safely.

Most alternative energy sources produce electricity, but it is not always practical to use the electricity directly. It is however possible to use the electricity to produce hydrogen, and the hydrogen can then be used as a clean fuel in applications where electricity does not fit.

In the long run, use of fusion power will probably be the permanent solution. But commercial fusion plant will probably still not be available in the next forty years. There is however a joker that might show up to be a salvage of the world's energy problem, namely cold fusion. This seems to be a real phenomenon, and not a misunderstanding as many thought and still think. But one does still not know if this phenomenon can be used practically to produce useful energy.

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