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Advantages and disadvantages of nuclear power

In this section we analyze the advantages and disadvantages of nuclear power.

Advantages of nuclear power

Expense

Less uranium is needed to produce the same amount of energy as coal or oil, which lowers the cost of producing the same amount of energy. Uranium is also less expensive to procure and transport, which further lowers the cost.

Reliability

When a nuclear power plant is functioning properly, it can run uninterrupted for up to 540 days. This results in fewer brownouts or other power interruptions. The running of the plant is also not contingent of weather or foreign suppliers, which makes it more stable than other forms of energy.

No Greenhouse Gases

While nuclear energy does have some emissions, the plant itself does not give off greenhouse gasses. Studies have shown that what life-cycle emissions that the plants do give off are on par with renewable energy sources such as wind power. This lack of greenhouse gases can be very attractive to some consumers.

The generation of electricity through nuclear energy reduces the amount of energy generated from fossil fuels (coal and oil). Less use of fossil fuelsmeans lowering greenhouse gas emissions (CO^2 and others).

Currently, fossil fuels are consumed faster than they are produced, so in the next future these resources may be reduced or the price may increase becoming inaccessible for most of the population.

Another advantage is the required amount of fuel: less fuel offers more energy. The production of electric energy is continuous. A nuclear power

plant is generating electricityfor almost 90% of annual time. It reduces the price volatility of other fuels such as petrol.

It's an alternative to fossil fuels, so the consumption of fuels such as coal or oil is reduced. This reduction of coal and oil consumption benefits the situation of global warming and global climate change. By reducing the consumption of fossil fuels we also improve the quality of the air affecting the disease and quality of life.

Disadvantages of nuclear power

One of the reasons that nuclear energy falls under fire so frequently is due to the many disadvantages it brings.

Raw Material

Uranium is used in the process of fission because it's a naturally unstable element. This means that special precautions must be taken during the mining, transporting and storing of the uranium, as well as the storing of any waste product to prevent it from giving off harmful levels of radiation.

Water Pollutant

Nuclear fission chambers are cooled by water, in both the boiling water reactors (BWRs) and pressurized water reactors (PWRs). In PWRs, cold water enters through primary pipes and the secondary pipes remove the heated water away, so the coolant is not in contact with the reactor. In BWRs, water runs through the reactor core, so if there is any leakage of fuel, the water can get contaminated and is transported to the rest of system.

We've previously discussed the advantage of using nuclear energy to reduce fossil fuel consumption. Organizations often use this argument in favor of nuclear energy but it's a partial truth. Much of the consumption of fossil fuels is due to road transport, used in heat engines(cars, trucks, etcDespite the high level of sophistication of the safety systems of nuclear power plants the human aspect has always an impact. Facing an unexpected event or managing a nuclear accident we don't have any guarantee that decisions we took are always the best. Two good examples are Chernobyl and Fukushima.

The Chernobyl nuclear accident is, by far, the worst nuclear accident in the history. Different wrong decisions during the management of the nuclear plant caused a big nuclear explosion.

One of the main disadvantages is the difficulty in the management of nuclear waste. It takes many years to eliminate its radioactivity and risks.

Nuclear plants have a limited life. The investment for the construction of a nuclear plant is very high and must be recovered as soon as possible, so it raises the cost of electricitygenerated. In other words, the energy generated is cheap compared to the cost of fuel, but the recovery of its construction is much more expensive.

Probably the most alarming disadvantage is the use of the nuclear power in the military industry. The first use of nuclear power was the creation of two nuclear bombs dropped on Japan during World War II. This was the first and the last time that nuclear power was used in a military attack

Currently the generation of electricity in nuclear reactors is done by nuclear fission reactions.

Nuclear Power Source

Nuclear energy is used to produce electricity. Heat generated from the splitting of uranium atoms in a process known as fission is used to produce steam. This steam in turn powers turbines, which are used to produce the electricity that supplies the surrounding community.

Nuclear power stations are set up in a multiple-step process that has been designed to help contain the energy and many of its negative byproducts. This process alone is the base of several advantages and disadvantages for this energy source.

Literature:

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