

## Why is Europe repeating the energy crises of the past?

Fuel reserves in power stations are being phased out

The present energy crisis is the logical result of European energy policies. Neither Russia nor changing wind conditions are to blame. The new crisis was programmed in Europe. Russia does what a monopolist must do.

In the 1960s, electricity consumption increased rapidly. New power plants were needed. They had to be simple, cheap and clean. Oil seemed to be the perfect fuel. The new power stations were built rapidly for only one type of fuel. The global dependence on imported oil gave the countries in the Middle East the idea to maximize their income by reducing supply of oil to the world market. The result was a dramatically increased price level of oil. This recipe is now being reused by a monopolist for natural gas.

Coal seemed to be the best alternative to oil, but the new power plants were not equipped for coal. It took large investments over a couple of decades to add special equipment for handling of coal, ashes and slag and, in some cases, to replace entire boilers.

The advantages of coal were low price, suppliers in all parts of the world and cheap storage facilities. The exhaust gas could be cleaned for all essential types of pollution except one: carbon dioxide. With storages of fuel for several months of normal operation, it was possible keep out of fuel markets during price peaks. This policy stabilized the fuel markets.

A different policy was proposed after the oil crises. The electricity production should be decentralized. Local wind turbines, solar panels, solar cells and gas-fired combined heat and power plants (CHP) should replace the large power plants and reduce the need for electricity transport and for overhead lines. "Small is beautiful".

"Coal" became a derogatory term, and it was gradually accepted by decision-makers that coal-fired power stations should be rapidly replaced by wind power, which is non-dispatchable and without storage. Wind turbines became larger and had to be organized in parks, both onshore and offshore. The wind parks became larger than most power stations. Solar cells were also arranged in large parks. That was the end of the decentralized structure.

There is no concern in Denmark about the loss of useful properties by decommissioning the traditional power plants and their fuel storages. In Sweden and Germany, operational problems have become obvious. Several nuclear units were closed down. Large rotating units stabilize the transmission systems. Therefore, disconnection of rotating machines reduced the transport capacity of the grids. The lost production was replaced by wind power in the opposite end of the both Sweden and Germany. Increased transport in a weaker grid caused bottlenecks and increasing curtailment of renewable power, particularly in Germany and Denmark.

During 2021, the volume of stored gas in Europe fell significantly below the average level, mainly due to higher demand and lower production. Besides, the inflow of wind and water was below normal. There was only additional import of natural gas to fill the gap. Russia is the new monopolist. The increased prices of gas and electricity demonstrate Europe's vulnerability, which cannot be relieved at short notice.

A couple of essential conditions have changed and may help explaining, why the fuel storages are disappearing.

- In the past, Danish electricity companies were required to have fuel for a certain time at the beginning of the winter season due to the risk of freezing waters, but freezing waters have not been a problem since the 1990s, and the rules have been lifted.
- The introduction of competition and the development of electricity markets did not give power producers incentives to maintain stocks of fuel. Eventually, there will be only minor fuel reserves left at the power stations.



However, fuel storages and long-term stocks of fuel are still important measures if a certain stability of energy prices is desirable.

The point is that all types of electricity production have advantages and disadvantages. The disadvantages of dominant use of wind and solar power have been ignored. Targets were set in a green competition between political parties. The result is an ambitious transition, which has not been properly planned.