Deadlines cannot help with the introduction of the heat pump - emissions trading does

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The required heat pumps are just as unavailable as the necessary tradesmen

With great difficulty, the three governing parties have now reached a compromise on the heat pump. It will only be prescribed for new buildings or for the complete replacement of an old heating system, if a repair is no longer possible. Exceptions are to be made for heating systems that run on biogas or hydrogen - this should not affect the majority of citizens. These alternatives were presumably included primarily so that legislators can claim to have acted in a technology-open manner.

In Germany, about five million households heat with oil and about 14 million with gas. Roughly speaking, assuming a service life of 20 years, one million heating systems need to be replaced by a heat pump every year. On top of that, there are about 100,000 new buildings per year. We wonder who is going to produce all these heat pumps by 2024 and who is going to install them. To put this into perspective: that is more than the total number of heat pumps in Germany at present and about 4 times the sales volume in 2022. It is often forgotten that heat pumps are really not a new invention. The technical foundations were laid more than 100 years ago, and it is a little surprising when heat pumps are now conjured out of the hat as the energy "saviour". As early as 1978, a law was passed in Germany to promote the modernisation of dwellings and to save heating energy. Even then, this law was intended to promote the installation of heat pumps. After about 45 years, there are now about one million installed heat pumps - a figure that must now be reached every year for new installations. This month, the Bundesverband Wärmepumpe (German Heat Pump Association) unsurprisingly gave the average waiting time for a heat pump as 18 months, given the large difference between supply and demand.

And if the heat pumps existed, we would hardly have the electricity to run them

The 1.1 million new heat pumps would also need electricity: at about 5,000 kWh per system, this amounts to a total of 5.5 billion kWh per year, which corresponds to an increase in the electricity demand of private households (about 130 billion kWh) of about four percent per year. For comparison: a nuclear power plant supplies about ten billion kWh of electricity per year. Mathematically, after 20 years (to stay with the theoretical example of nuclear power plants and to show the dimension of the electricity demand), about ten additional nuclear power plants would be needed to produce the electricity required for heat pumps.

For Germany, however, the example with nuclear power plants is purely theoretical; the federal government is relying here primarily on the expansion of renewable energies. And here comes the next problem: the heat pumps will almost simultaneously call up the largest part of their annual electricity demand in the cold weeks of the year. If one assumes for a rough calculation that 80 percent of the annual electricity consumption occurs in three winter months, the additional electricity demand of private households increases by almost 14 percent during this time. Unfortunately, this additional demand is offset by an equally seasonally lower electricity production based on renewable energies, since on the shorter winter days with flatter solar radiation, photovoltaics can produce significantly less and wind speeds are significantly lower than the annual average. A good example of this is November 2022; for several weeks, electricity was produced almost exclusively with gas, coal and nuclear power, as wind and sun had more or less failed. If nuclear power is also eliminated soon, the electricity for heat pumps will physically almost necessarily be produced to a very large extent with coal and gas. The required 65% share of renewable energy for heat pumps therefore seems almost (or even completely) impossible.

Now, the problem of the dark period cannot be solved, and larger storage facilities for electricity that function over a period of two or three weeks do not exist in Germany. Even in 20 years, this will not have fundamentally changed. However, as coal-fired power plants are shut down in addition to nuclear power plants, Germany will accordingly need a very large amount of (new) gas-fired power plants as a backup for such times as electricity demand rises at the same time. Many people are not even aware of this. Because of the danger of dark doldrums, wind- and sun-independent power generators without huge electricity storage facilities that have not yet been invented must always grow along with the supply of green electricity providers.

At the same time, we are not fundamentally against the use of heat pump technology: there are very good (again physical) reasons for relying on this technology in the long term, because one unit of energy can provide

more than one unit of energy for heating - a fundamentally grandiose approach. We therefore also think it is absolutely right that the changeover to heat pumps should be pushed forward with vigour, as was obviously attempted as early as 1978. But dear Federal Government, the sledgehammer method will not work this time either. Above all, the deadline of 1.1.2024 will not work. And to put it bluntly: even postponing the cut-off date will not help. New buildings are built every year and old heating systems break down every year. So a later deadline will not reduce the installation burden. As a negative side effect, there would only be more undesirable panic buying by households who would quickly have a new and cheaper oil or gas heating system installed before their heating system breaks down.

The expansion of emissions trading offers one solution

How can we get out of this dilemma if postponing the deadline doesn't help either? It is actually quite simple: one would have to bring forward a small part of the expansion of emissions trading decided for 2028 at the European level. If the emissions from the combustion of gas or oil are given a price because emission rights have to be presented for heating with them, permanent financial incentives to switch will be created. This would be all the more true if the revenue from the auctioning of the rights were distributed evenly to the citizens. The Fuel Emissions Trading Act already introduced in Germany would be a good basis for this, even if it is currently still a tax. This tax would have to develop into an effective trade in emission rights for the private combustion of gas and oil, where the rights are actually

scarce and their number is reduced from year to year. The rest would take care of itself, and without problematic economic distortions. In any case, there would not be an unrealistic deadline where legal requirements collide with industrial limits - but the project would certainly be ambitious.

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