

AI and energy security

What does the German population think about the use of artificial intelligence in the energy sector? Do people's attitudes change when they have a strong sense of the energy crisis?

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March 2023: Given the current challenges posed by rising energy prices and energy shortages, the political debate on pursuing an efficient and sustainable energy transition is becoming increasingly urgent. This scenario also raises the question of how artificial intelligence (AI) can be used to alleviate the energy crisis and optimize the energy supply in the long term. But what does the public actually think about AI systems in the energy industry? In a recent survey, the Opinion Monitor Artificial Intelligence [MeMo:KI] investigated the areas of application where the population would like to see AI systems, and whether this acceptance of AI is influenced by people's sense of the energy crisis. Overall, it is clear that people favor using the technology to gain an energy supply that is secure and economically stable. If they sense that there is an energy crisis, then people are more positive toward.

Background

Our energy supply is heavily influenced by various global challenges such as climate change, but also by current geopolitical events like the Russian war against Ukraine and the limited availability of fossil fuels. The desired energy transition is central to the German government's political agenda. Alongside other forms of energy, the aim is to reduce energy consumption and use resources more efficiently (Federal Ministry for Economic Affairs and Climate Protection, n.d.). Also being discussed is the role that AI systems can play here. AI is seen in the energy industry as a chance to manage the increasing complexity of the energy system and enable the efficient use of available resources, for example through improved forecasts of energy demand (German Energy Agency (dena), 2019). When it comes to how people perceive this potential, the Opinion Monitor showed that only 8% of those surveyed in June 2022 deemed aspects of sustainability, including the energy requirements of AI, to be an important issue at present.

Method:

Online survey

Executing institute:

infas quo

Base population:

German population aged 18 and older who use the Internet at least occasionally

Sample:

Weighted random sample (N=1,025)

Weighting criteria:

Age, gender and region (federal state)

Survey period:

2023, January 01. - January 29. (2023,KW 04)

Additional information:

[Detailed methodology overview](#) for the MeMo:KI project

As, for example, MeMo:KI survey results from the coronavirus crisis show, the perception of crises can change people's attitudes toward the use of artificial intelligence (Opinion Monitor Artificial Intelligence, 2020). We therefore examine in this study people's attitudes



ENERGY SECURITY

Factsheet No. 9 – July 2023

Meinungsmonitor Künstliche Intelligenz

Figure 1: Attitudes toward the use of AI in the energy sector in various applications (in %).

Question: Artificial intelligence should be used to ...

disagree neither/nor agree



... predict the energy requirements of industry and private households by using consumption and weather data so that power plants and the electricity grid can be fully utilized.



.. calculate in the energy industry the actual energy price from the current availability of energy and energy consumption, so that energy consumption can be more closely aligned with current availability.

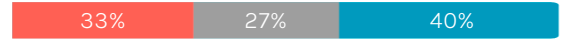


... identify possible misconduct on the part of staff in German power plants via real-time camera images so as to ensure the safety of the power plants and the unhindered generation of power.



.. make predictions from customer data provided by German energy suppliers, and thus secure their competitiveness.

N=1,025 respondents; figures in %; 2023/calendar week 4; population aged 18 and over. Rates of agreement and disagreement include the answer "agree (somewhat)" and "disagree (somewhat)".



... analyze data on staff sick leave and holidays in the energy industry so as to optimize staff planning and guarantee the supply of energy.

toward the use of AI in the energy sector with regard to security of supply and price trends, and whether these attitudes change as a result of their sense of the current crisis.

Most Germans favor using AI to ensure energy security

We first asked the German population for their opinion on the use of artificial intelligence in specific applications with a view to ensuring energy security (see Fig. 1)¹⁾. All scenarios show that people predominantly approve of the use of the technology, with those surveyed being especially in favor of using AI as a forecasting tool: over two thirds favor using it to predict the energy requirements of industry and private households in order to optimize the capacity of power plants and electricity grids. As for economic efficiency, over 60% of respondents believe that artificial intelligence should be used to calculate the actual energy price based on the current availability of energy and current energy consumption. This would allow energy consumption to be adapted to current availability.

The picture is mixed when it comes to the use of AI in the energy industry with regard to person-related data (highly problematic cases from a legal and ethical perspective). Overall, though, a positive attitude prevails here, too. Although around a third oppose the use of AI to evaluate data on staff sick leave and vaca-

tions in order to optimize staff planning and thus ensure energy supply, more people favor its use (40%). Surprisingly, just as many respondents also agree that German energy suppliers should use AI applications to make predictions about customer data – for example with the aim of avoiding losing customers or of selling more economical products and thus increasing their competitiveness. Almost half of those surveyed stated that AI in German power plants should use real-time camera images to detect possible misconduct by staff and thus guarantee the safety of power plants and their smooth running, with only around 30% being against the use of AI in this context.

Effects of people’s sense of crisis on their acceptance of the use of AI

Earlier survey results from the Opinion Monitor already indicate that people accept the use of AI technologies more widely in times of social crisis when it comes to solving the emergency (Opinion Monitor Artificial Intelligence, 2020). To find out whether the current energy crisis is also tending to influence people’s opinions in favor of the use of AI, we first examined how respondents perceive the crisis. To do so, we asked people whether they would behave differently in the current situation in order to save energy (see Fig. 2).

“ People predominantly approve of the use of the technology.

¹⁾ These cases of use are based on the analysis report for the integrated energy transition and energy industry by the German Energy Agency (dena) as part of the project funded by the Federal Ministry for Economic Affairs and Climate Action, “EnerKI – The Use of Artificial Intelligence to Optimize the Energy System”.

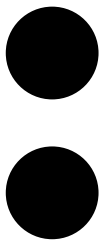


Figure 2: Independent energy measures taken by respondents (in %).

Question: What have you done so far? Due to the energy supply situation and price trends, ...

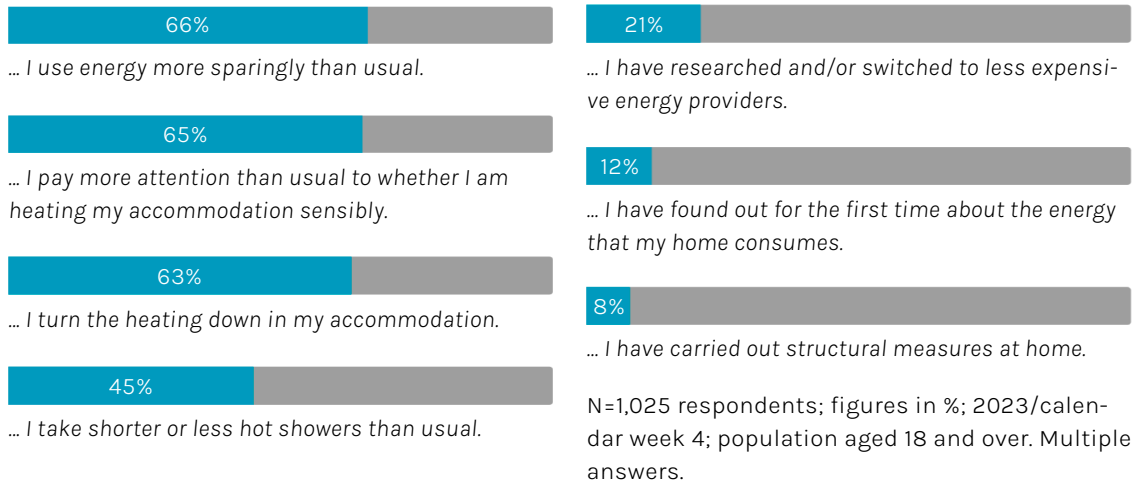
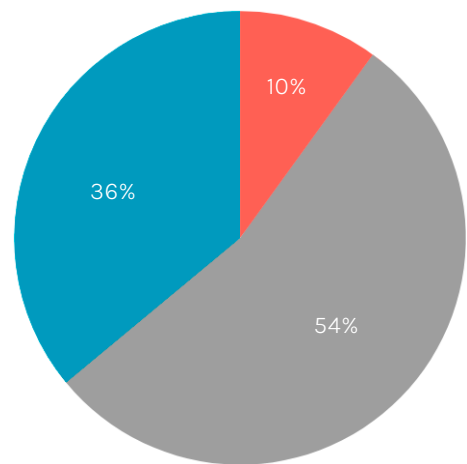


Figure 3: Groups formed according to people's sense of crisis, based on the energy measures that they take (in %).

- No measures, weak sense of crisis
- One to three measures, moderate sense of crisis
- Four or more measures, strong sense of crisis

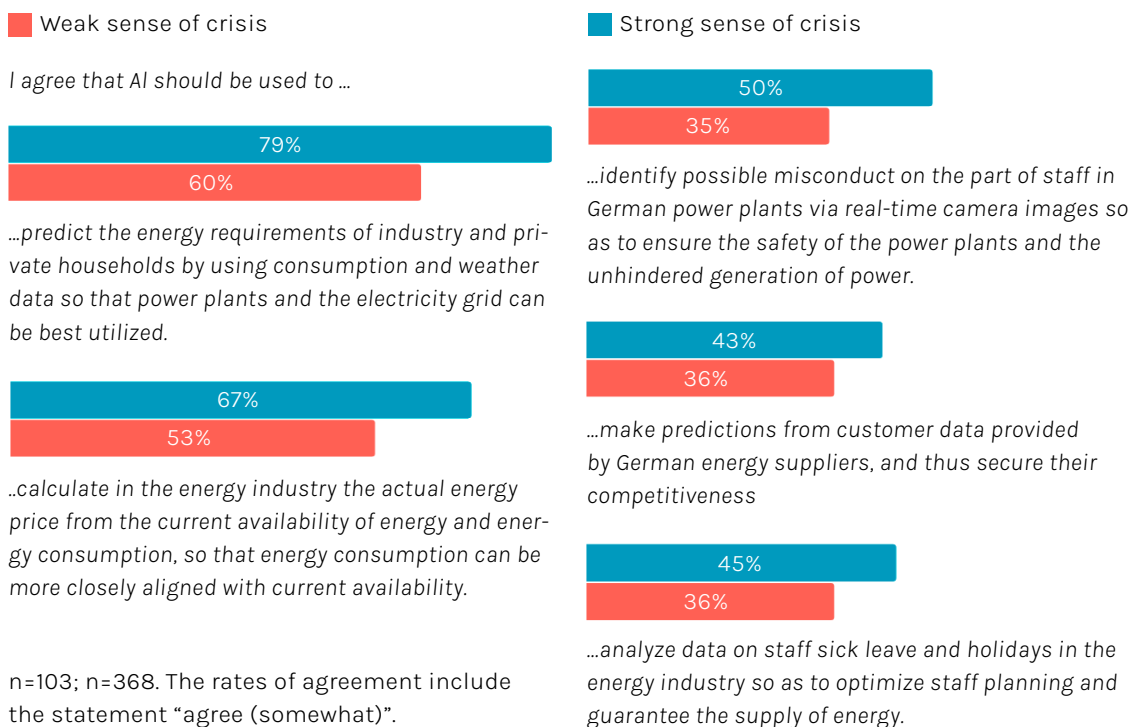


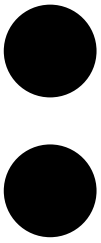
N=1,025 respondents; figures in %; 2023/calendar week 4; population aged 18 and over.



Those with a keener sense of the energy crisis are more in favor of AI to regulate energy than those who are less sensitive to the crisis.

Figure 4: Attitudes toward the use of AI in the various applications according to sense of crisis (in %).





ENERGY SECURITY

Factsheet No. 9 –
July 2023

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We then divided the respondents into groups. We assigned people who do not take any independent action to regulate their energy consumption in the face of the current situation (10%) to the group comprising those with a less keen sense of the crisis (see Fig. 3). A second group comprises those who take one to three measures (54%). Those saying that they take four or more steps of their own are people who take the crisis more seriously, and we have assigned them to the group with a strong sense of the crisis (36%).

We then compared the two extreme groups, i.e. those with a weak and a strong sense of crisis. It emerges that the latter are definitely more in favor of using AI technologies to ensure energy efficiency: while around 80% of those with a strong sense of crisis favor using AI to predict energy demand in industry and private households as a means to optimize grid utilization, that figure is 60% among those with a weak sense (see Fig. 4, next page).

Two thirds of respondents with a strong sense of crisis also believe that AI should be used in the energy industry to calculate the actual energy price from the current availability of energy and energy consumption, while almost half of this group agree with the controversial use of AI to monitor staff sickness and vacations. This also applies to the use of AI to monitor staff misconduct using real-time camera images.

Summary

Our results show that, faced with the energy crisis, most of the German population are more in favor than against the use of artificial intelligence to make the supply of energy efficient and secure. This applies in particular to when the technology is used for forecasting. A mixed picture emerges, though, when it comes to the use of person-related data, such as the monitoring of people's sick days and vacations. But approval for the use of AI systems to ensure energy security prevails even in this problematic context, too.

This positive attitude toward the use of technology is reinforced when we look at the respondents' sense of crisis. It is clear that those with a keener sense of the energy crisis are more in favor of AI to regulate energy than those who are less sensitive to the crisis, which suggests that in times of crisis people see AI as a tool that can help solve the social emergency.

Suggested citation

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