

# Anticipating and defusing the role of conspiracy beliefs in shaping opposition to wind farms

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Reaching net-zero targets requires massive increases in wind energy production, but efforts to build wind farms can meet stern local opposition. Here, inspired by related work on vaccinations, we examine whether opposition to wind farms is associated with a world view that conspiracies are common (‘conspiracy mentality’). In eight pre-registered studies (collective  $N = 4,170$ ), we found moderate-to-large relationships between various indices of conspiracy beliefs and wind farm opposition. Indeed, the relationship between wind farm opposition and conspiracy beliefs was many times greater than its relationship with age, gender, education and political orientation. Information provision increased support, even among those high in conspiracy mentality. However, information provision was less effective when it was presented as a debate (that is, including negative arguments) and among participants who endorsed specific conspiracy theories about wind farms. Thus, the data suggest preventive measures are more realistic than informational interventions to curb the potentially negative impact of conspiracy beliefs.

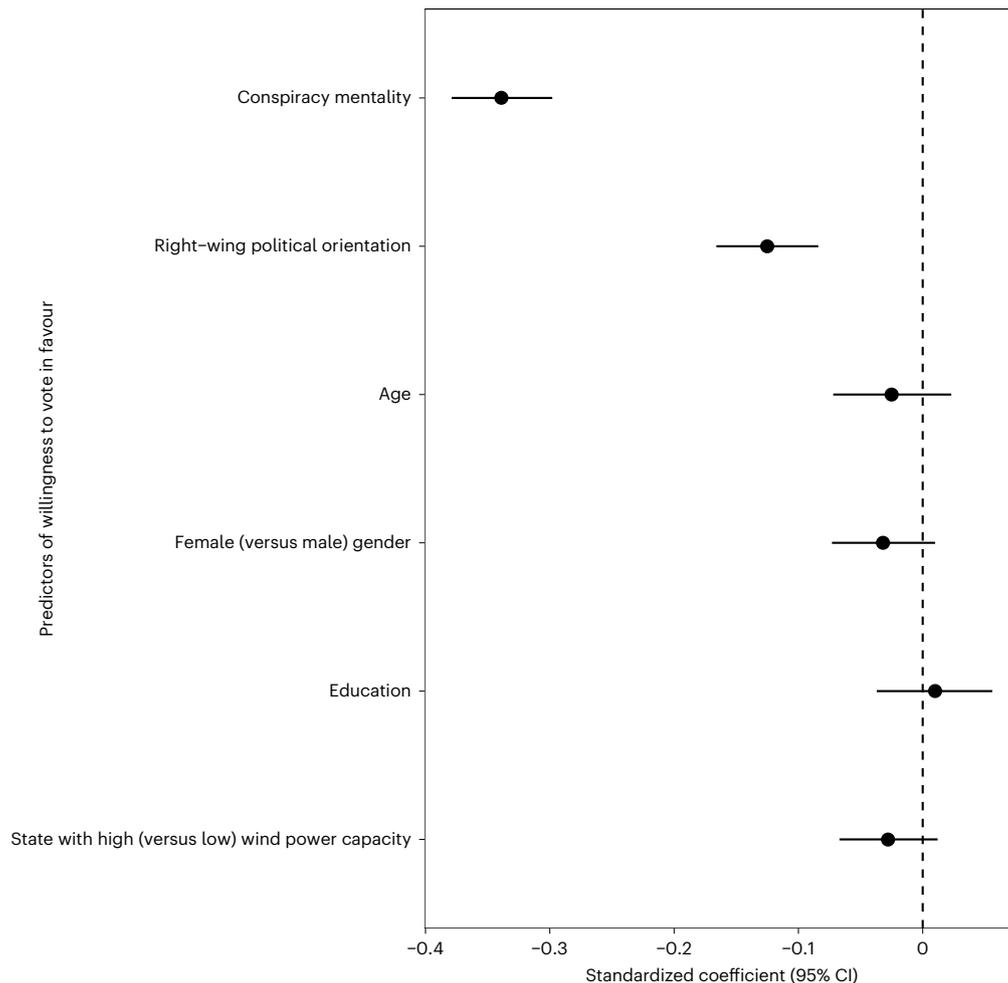
For many countries, achieving net-zero targets will require an extraordinary ramping up of energy sourced from wind. For example, when Princeton University modelled a pathway to net-zero emissions in the United States that relied entirely on renewable energy, they calculated it would require over 1 million square kilometres of land, roughly the size of Kansas, Nebraska, Iowa, Missouri, Illinois and Louisiana combined<sup>1</sup>. In Germany, the current government agreed to designate 2% of the country’s landscape for the construction of wind farms<sup>2</sup>. The scale of escalation suggests a fundamental transformation in people’s exposure to—and relationship with—wind farms in the future.

Existing research suggests that people are positive about wind energy in the abstract, but when it comes to actually establishing wind farms in local communities, there has been substantial resistance, to the point where many proposals have been killed off<sup>3</sup>. In some cases, resistance has been amplified by organized campaigns

of disinformation (for example, about negative health consequences of wind farms)<sup>4,5</sup>. These pockets of resistance might be early red flags for what other nations may soon experience once wind farms become a more visible and salient part of people’s lived experiences. Just as nations will need to massively ramp up investment in wind farms to meet renewable energy targets, so too does the scientific community need to ramp up its ability to anticipate (and defuse) factors that lead to wind farm resistance.

In other domains, it has long been understood that people’s attitudes towards science and emerging technologies are shaped by their cultural and ideological world views<sup>6–9</sup>. One world view that has become a particular focus of attention is what we refer to here as ‘conspiracy mentality’, the notion that it is commonplace for groups of elites with bad intentions to conduct elaborate hoaxes on the public and to do so in near-perfect secrecy<sup>10–12</sup>. People who subscribe to this world view are more likely to be sceptical about climate science and

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**Fig. 1 | Predictors of willingness to vote in favour of wind turbines.** Standardized regression coefficients  $\beta$  (centre) with error bars indicating the 95% CI for each predictor from a multiple linear regression with willingness to vote in favour of constructing wind turbines close to one's hometown as criterion ( $N = 2,113$ ).

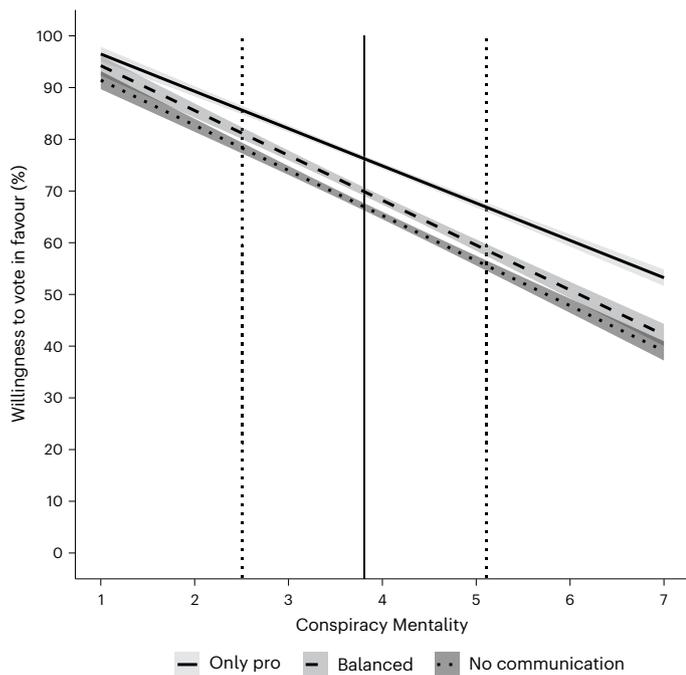
(in particular) about vaccines<sup>9,13,14</sup>. This general, relatively stable world view manifests in beliefs in specific conspiracy theories regarding concrete situations or topics<sup>15</sup>. In many Western countries, for example, up to a quarter of variance in people's attitudes towards vaccines can be explained merely by knowing whether they believe Princess Diana was murdered or the 9/11 attacks were an inside job<sup>13</sup>. Knowing the powerful role of conspiracy mentality and specific conspiracy beliefs in understanding attitudes towards other large-scale social initiatives, it seems overdue to examine its role in people's attitudes towards wind farms.

In this Article, we report research in which we examine the relationship between several indicators of conspiracy beliefs and opposition to wind farms. In addition, we test experimentally the effects of different types of information provision on participants' attitudes. We find that conspiracy mentality explains a large portion of people's resistance to vote in favour of a potential wind farm in their community. Believing in a specific conspiracy theory around the construction of the wind farm does so to an even larger degree. Informing people about the benefits of the wind farm has a considerable positive effect on their intentions to vote for the wind farms, particularly among those with a strong conspiracy mentality. These effects are smaller when people are also provided with counterarguments or when they believe in a specific conspiracy theory about the wind farm. Overall, our research suggests that conspiracy beliefs play a major role in understanding resistance to wind farms and sheds light on how to counteract this opposition.

## Conspiracy mentality and resistance to wind farms

There are at least two reasons to assume that wind farms are vulnerable to being caught in the net of suspicion implied by a conspiracy mentality. First, conspiracy theories have long circulated about wind turbines, even if this phenomenon has largely evaded academic attention. For example, despite dozens of academic studies indicating that wind farms pose no threat to human health<sup>16,17</sup>, conspiracy theories persist that they contribute to congenital abnormalities, fatigue and/or cancer, claims that have been propagated by anti-wind farm lobby groups and echoed by senior politicians including former US President Donald Trump<sup>5,18</sup>. More mainstream conspiracy theories assert that politicians are pushing ineffective technologies for cynical financial reasons. High conspiracy mentality predisposes people to believe such misinformation<sup>15</sup>.

Second, attitudes towards wind farms appear to be trust sensitive; analyses of surveys, experiments and interview data converge to argue that support for wind farms is primarily shaped by people's sense of equity, integrity-based trust, justice and fairness<sup>19–21</sup>. Given that conspiracy mentality is characterized by distrust of elites<sup>12,22</sup>—and given that trust in the involved parties (for example, local governments) is a key driver of the acceptance of wind farms<sup>19,20</sup>—it seems reasonable to expect that people with a stronger conspiracy mentality might be more opposed to the construction of wind farms in their community. Similarly, wind farms could be rejected because wind energy is largely accepted by societies, and holding views in counterpoint to the mainstream is related to conspiracy mentality<sup>23,24</sup>.



**Fig. 2 | Voting intentions by conspiracy mentality and information provision.** Willingness to vote in favour of constructing the wind turbines as a function of conspiracy mentality (7-point rating scale from 1 ‘do not agree at all’ to 7 = ‘fully agree’ with higher scores indicating stronger conspiracy mentality) and communication (only pro versus balanced versus no communication) from an aggregated analysis across all studies ( $n_{\text{only pro}} = 1,578$ ,  $n_{\text{balanced}} = 1,044$ ,  $n_{\text{no communication}} = 1,548$ ). Lines represent estimates per condition, shaded areas the  $\pm 1$  standard error margin. The solid vertical line represents the sample mean of conspiracy mentality; the dotted vertical lines mark one standard deviation below and above the mean, respectively.

We tested this prediction in eight pre-registered studies in Germany (collective  $N = 4,170$ ). The German context is ideally suited to examine this question because of Germany’s leading role in wind farm technology; in 2020, it produced 131 TWh (103.7 TWh onshore), which amounts to 23.7% of the country’s gross energy consumption<sup>25</sup>. Germany ranks third in terms of installed wind power capacities<sup>26</sup>, and the current government has envisaged to nearly double the capacity until 2030<sup>27</sup>. However, there have been examples of citizen resistance towards wind farms in Germany<sup>28,29</sup>, and occasionally, such protests have been seized upon by far-right populist parties as part of a broader sentiment of alienation and resentment in coal mining communities<sup>30</sup>. In short, policy around wind energy is a major topic in Germany, one that is discussed both at the grassroots level and in official political debates. Understanding the psychology of wind farm resistance in an early adopter such as Germany will provide important clues to what might occur in other countries seeking rapid decarbonization.

We asked participants to imagine a scenario in which the construction of five wind turbines was planned close to their community and to indicate the likelihood (0–100%) with which they would vote in favour of the wind turbines in a local referendum. In addition, we measured participants’ conspiracy mentality (for example, ‘Politicians and other leaders are nothing but the string puppets of powers operating in the background’; ‘Most people do not recognize to what extent our life is determined by conspiracies that are concocted in secret’)<sup>12</sup>. None of the items used in this measure referred to wind farms or energy policies.

Studies 1–7 were conducted with convenience samples of German adults. When aggregated, they revealed a strong negative correlation,  $r(2,055) = -0.34$ ,  $p < 0.001$ , such that acceptance of wind turbines was lower among those with a stronger conspiracy mentality. To obtain a more accurate estimation of this relationship in the German

population, Study 8 ( $N = 2,115$ ) used a nationally quota-balanced sample regarding gender, age, education and state. We also controlled for political orientation, given that conspiracy mentality is particularly strong among conservatives in Germany<sup>31</sup>. On average, participants in this sample indicated modestly high support for the building of wind turbines (mean ( $M$ ) = 64.95, standard deviation ( $SD$ ) = 31.30). However, supporting our prediction, a higher conspiracy mentality strongly predicted lower support for the building of wind turbines, unstandardized regression coefficient ( $b$ ) =  $-7.94$ , 95% confidence interval ( $CI$ ) [ $-8.90$ ;  $-6.98$ ], Student’s  $t(2,106) = -16.23$ ,  $p < 0.001$ , Pearson correlation coefficient ( $r$ ) =  $-0.33$ , over and above age, gender, education, and political orientation (Fig. 1). This means that conspiracy mentality ( $M = 4.01$ ,  $SD = 1.34$ ) was associated with lower support for wind turbines by 11 percentage points per standard deviation (for example, from 65% to 54% from people with average conspiracy mentality to people with 1 SD above average).

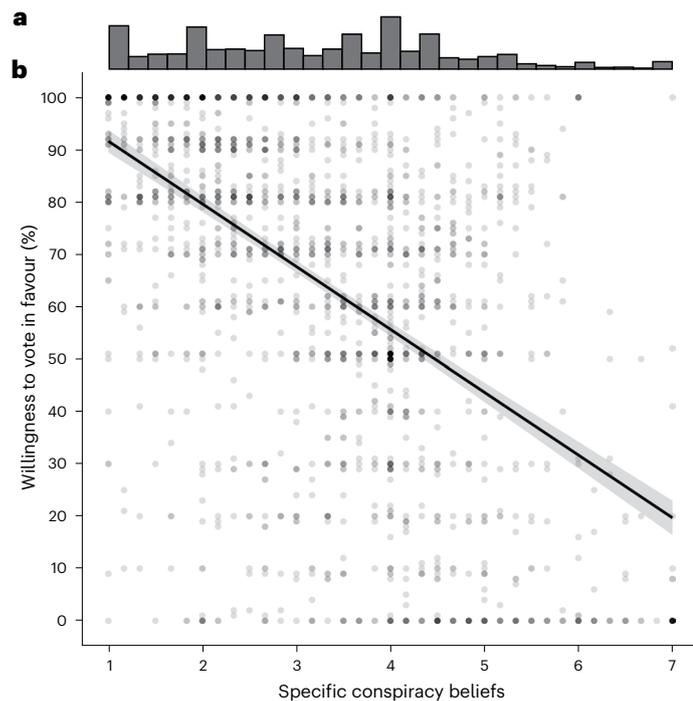
### Effects of providing arguments in favour of wind farms

The substantial and robust relationship between conspiracy mentality and rejection of wind farms raises the question of how this resistance might be reduced. Usually, there are campaigns preceding local referenda in which stakeholders provide information supporting their position to the local population. Indeed, there is initial evidence that such communication can help increase wind farm acceptance<sup>3,32</sup>. One important factor that was identified in these studies was the local authority’s support for the wind project. It is, however, questionable whether such support would be beneficial to persuading people with a conspiracy mentality, as there is some evidence that they react defensively towards communication provided by sources of power<sup>33</sup>.

In Studies 1–8, we also tested whether communication that provides arguments in favour of wind turbines would increase likelihood of voting for wind turbines and whether this depended on participants’ conspiracy mentality. We provided participants in one experimental condition with a leaflet (written by the authors but inspired by real information campaigns; Supplementary Methods) about hypothetical planned wind turbines said to be issued by the local municipality. The leaflet featured arguments about, for instance, potential for reducing carbon emissions, security of energy supply and opportunities for financial profit of citizens and municipality. In a merged analysis across all studies ( $N = 4,170$ ), moderated multiple regressions showed that providing pro arguments about wind turbines significantly increased participants’ willingness to vote in favour of constructing them, compared with a no-information control,  $b = 4.66$ , 95%  $CI$  [ $3.74$ ;  $5.57$ ],  $t(4,164) = 9.98$ ,  $p < 0.001$ . Interestingly, an interaction with conspiracy mentality emerged,  $b = 0.76$ , 95%  $CI$  [ $0.05$ ;  $1.46$ ],  $t(4,164) = 2.11$ ,  $p = 0.035$ , such that the effect of communication was *greatest* among those with a stronger conspiracy mentality (Fig. 2). In other words, a communication that took participants roughly 2 minutes (median 112 seconds) to read was highly effective in reducing the negative relationship between conspiracy mentality and wind farm acceptance.

To probe the robustness of these effects, Study 2 examined what would happen if the information was provided by industry (as opposed to government); the effects reported above remained unchanged (Supplementary Table 7). In Study 3, we examined what happens if the referendum was initiated by local opponents of the project (as opposed to supporters). Again, the main effects of conspiracy mentality and information provision were not moderated by this manipulation (Supplementary Table 7). Thus, our data provide stable evidence that communication in favour of building wind turbines increases likelihood of voting for it—especially among those with strong conspiracy mentality.

A subset of studies (Studies 4–6, 8) included an additional experimental condition in which participants received arguments in favour of the wind turbines but also the same number of contra arguments. Here we sought to increase ecological validity because in real-world



**Fig. 3 | Belief in a specific conspiracy theory and voting intentions.**

**a,b.** Distribution of specific conspiracy beliefs (7-point rating scale from 1 'do not agree at all' to 7 'fully agree' with higher scores indicating stronger specific conspiracy beliefs)(a) and correlation between specific conspiracy beliefs and willingness to vote in favour of the wind turbines (b) ( $N = 2,115$ ). The line represents estimates of voting intention; the shaded area represents the 95% confidence interval.

contexts, people are exposed to pro and contra arguments as part of debate. These studies also spoke to a theoretical controversy. On the basis of the classical Yale model of persuasion, this kind of two-sided communication could be considered particularly trustworthy and effective<sup>34</sup>, although subsequent research has shown inconsistent results<sup>35</sup>.

Results revealed that the effectiveness of pro arguments was significantly reduced when counterarguments were also included,  $b = -3.19$ , 95% CI [-4.21; -2.17],  $t(4,164) = -6.13$ ,  $p < 0.001$ . Still, receiving both pro and contra arguments slightly increased willingness to vote in favour of wind turbines compared with receiving no communication,  $b = 1.47$ , 95% CI [0.45; 2.49],  $t(4,164) = 2.81$ ,  $p = 0.005$  (Fig. 2). It is reassuring to know that providing pro and contra arguments simultaneously does not make things worse—especially in light of previous research showing that denialists' rhetoric reduces beliefs in anthropogenic climate change<sup>36</sup>. Still, these studies demonstrate that stakeholders who want to convince the local population of wind turbines' merits might have a harder time when facing other stakeholders with competing interests.

### Specific conspiracy beliefs

Results reported so far are based on a measure of *conspiracy mentality*; that is, the general propensity to believe in conspiracy theories. As outlined above, this needs to be distinguished from believing a *specific* conspiracy theory within a given context<sup>15</sup>; in this case, conspiracies surrounding the referendum that participants were evaluating. To examine specific conspiracy beliefs, we included six items (for example, 'The municipality withholds important information that would speak against the construction of the wind turbines'; 'The municipality has made secret arrangements with the executing energy company so that both would profit financially from the construction of the wind turbines'). These beliefs were relatively widespread in the nationally quota-balanced sample; 26% of participants scored above the scale midpoint ( $M = 3.23$ ,  $SD = 1.39$ ; Fig. 3).

These conspiracy beliefs were even more strongly associated with lower support for wind turbines than conspiracy mentality (again controlling for demographic variables and political orientation),  $b = -11.51$ , 95% CI [-12.33; -10.69],  $t(2,106) = -27.45$ ,  $p < 0.001$ ,  $r = -0.51$  (Supplementary Fig. 1). Support for wind turbines was by approximately 16 percentage points lower with each 1 SD increase in specific conspiracy beliefs. When adding specific conspiracy beliefs and conspiracy mentality simultaneously to the regression, conspiracy mentality predicted substantially less variance,  $b = -1.25$ , 95% CI [-2.32; -0.17],  $t(2,105) = -2.28$ ,  $p = 0.023$ , than the specific belief,  $b = -10.83$ , 95% CI [-11.84; -9.82],  $t(2,105) = -21.01$ ,  $p < 0.001$ . This supports the idea that specific conspiracy beliefs are manifestations of conspiracy mentality in concrete contexts<sup>15</sup>.

Providing arguments in favour of building the wind turbines still enhanced support among those strongly endorsing specific conspiracy beliefs,  $b = 2.86$ , 95% CI [1.95; 3.76],  $t(3,747) = p < 0.001$ , but only about half of the extent to which it did for those with a strong conspiracy mentality. However, in the studies for which positive information was balanced with negative information, there was no reliable improvement in voting intentions among those with strong specific conspiracy beliefs,  $b = 0.54$ , 95% CI [-0.42; 1.50],  $t(3,747) = 1.10$ ,  $p = 0.270$ . Although there was no evidence that information provision caused backfire effects among those high in conspiracy beliefs, it is sobering that the positive effects of supportive evidence could be neutralized by counterarguments.

### Discussion

A rapid increase in the number of wind farms is needed to reduce carbon emissions worldwide and to slow climate change. The current research revealed a factor that could be a major barrier to achieving this goal: conspiracy beliefs. We showed that the stronger people's conspiracy mentality, the less likely they were to vote for the construction of wind turbines close to their community in a potential referendum. It is revealing to examine the relative strength in predictive value of conspiracy mentality compared with other variables (percentage of variance explained in voting intentions can be calculated by squaring the correlations). Conspiracy mentality explained five times more variance compared with political orientation and around 20 times more variance than age, gender, education and state in the nationally quota-balanced sample.

Notably, over a quarter of this sample scored high on endorsement of *specific* conspiracy theories about the wind farm construction. When considering participants' beliefs in these specific conspiracy theories, the relationship was even stronger, explaining at least 25 times more variance in voting intentions compared with the other variables. These findings suggest that a predisposition to believe conspiracy theories is a barrier to wind farm acceptance and even more so when this general predisposition crystallizes into believing specific conspiracy theories about the authorities' motives.

Longitudinal research provided evidence for the causal effects of conspiracy beliefs on vaccination and countermeasures during the COVID-19 pandemic<sup>37–39</sup>. It therefore also seems reasonable to assume a similar causal pathway here: that participants start with a general conspiracy mentality, which takes shape in the form of specific conspiracy beliefs, which then directly affect voting intentions<sup>15</sup> (but see ref. 40). However, our studies are not designed to test this causal claim. Longitudinal studies may be useful going forward in terms of shoring up the case for a causal relationship between conspiracy beliefs and wind farm resistance.

Our studies also investigated potential methods of intervention and offered good news: people can be reached via public communication that stresses the benefits of wind farms. Overall, and particularly among those holding a strong conspiracy mentality, willingness to vote for the construction of wind turbines could be enhanced by providing pro arguments (for example, potential to reduce emissions).

This communication was still effective (but to a lesser degree) among people who strongly believed in specific conspiracy theories around the wind turbines. This adds substance to the limited body of research investigating public communication about wind energy projects<sup>3,32</sup>. It shows that providing arguments early on (ideally before specific conspiracy beliefs evolve) is important to increase wind farm acceptance and to counter the negative phenomena associated with conspiracy mentality. Drawing on research on conspiracy mentality and vaccination, such communication might be even more effective when it comes from people's close social environment (compared with authorities)<sup>41</sup> as peer influence also shapes energy-related behaviours<sup>42</sup>. The positive effect of information provision is reassuring given discussion in other literature that in polarized environments, information about science can cause backfire effects<sup>43,44</sup> and in the context of a general scepticism in the scholarly community that conspiracy theorists can be 'reached' through information provision alone<sup>45,46</sup>.

However, some of the reported studies examined effects of information provision under more realistic conditions, that is, when people had access to both arguments in favour of and against building the wind turbines. These results gave less reason for optimism. On one hand, balanced communication was still somewhat effective among those with a strong conspiracy mentality. On the other hand, it remained ineffective among those who strongly believed in a specific conspiracy theory around the referendum. One way of reaching these people might be prevention rather than intervention.

Preventive approaches against conspiracy beliefs and their negative correlates have already been tested in the literature. Most prominently, inoculation or pre-bunking strategies are effective in reducing people's susceptibility to misinformation and conspiracy theories<sup>46–48</sup>. That is, providing people with a weak dose of false information up front, or making them aware of the strategies that are used by conspiracy theorists, can prepare them to resist misinformation. Likewise, providing detailed explanations about an issue before conspiracy theories spread can increase people's resistance against these narratives<sup>49,50</sup>. Such strategies could be applied in the domain of wind farm acceptance as well.

Embedded in the German context, the current research focused on a single country in which wind energy already plays a major role. But given their pledge to reach net-zero emissions, other countries will probably be in a similar position of increasing wind energy in the future. Investigating the role of conspiracy mentality in shaping citizens' support for wind farms in a country on the forefront of implementing this technology provides valuable insights for other countries on steep decarbonization trajectories.

## Methods

### Participants and study design

We pre-registered all studies on [aspredicted.org](https://aspredicted.org) (Study 1: <https://aspredicted.org/46at3.pdf>; Study 2: <https://aspredicted.org/rn59j.pdf>; Study 3: <https://aspredicted.org/z3by8.pdf>; Study 4: <https://aspredicted.org/pg5st.pdf>; Study 5: <https://aspredicted.org/gt893.pdf>; Study 6: <https://aspredicted.org/vv9wi.pdf>; Study 7: <https://aspredicted.org/mq4ut.pdf>; Study 8: <https://aspredicted.org/m295a.pdf>).

In total,  $N = 4,170$  participants took part in our studies (Study 1:  $n = 142$ ; Study 2:  $n = 275$ ; Study 3:  $n = 361$ ; Study 4:  $n = 416$ ; Study 5:  $n = 419$ ; Study 6:  $n = 249$ ; Study 7:  $n = 193$ ; Study 8:  $n = 2,115$ ). Three hundred and one additional participants were excluded based on pre-registered criteria (below). The sample sizes of all single studies were determined to be able to detect at least a small effect ( $f^2 = 0.05$ ) in a multiple regression analysis with a statistical power of 80% at a significance level of 5%. Demographic data of the participants are presented in the Supplementary Table 1. All studies were conducted online with German adults who were recruited via participant platforms (Clickworker: Studies 1, 2, 3 and 7; Prolific: Studies 5 and 6). Study 8 was run by a recruiting agency (Respondi) to collect a nationally

quota-balanced sample (in terms of age, gender, education and state). Payment of participants differed between studies due to different survey lengths but was generally above the statutory minimum wage in the country (except Study 8 for which the recruiting agency determined the payment).

As noted in our pre-registrations, we included participants in our analyses if they fulfilled the following criteria: were at least 18 years old, spoke German fluently (because study materials were largely text based), did not fail the attention check items included in the survey, did not take the survey multiple times, were not psychology students (because they are familiar with psychological study procedures and might be suspicious about our hypotheses) and were not identified as statistical outliers in the main analysis (based on studentized deleted residuals, see pre-registrations). In Study 8, however, we did not apply the language and psychology criteria (as pre-registered) to not compromise the representativeness of the sample. For the same reason, we did not analyse the data of 75 participants in Study 8 who were additionally recruited due to a sampling error of the recruiting agency. On the basis of these criteria  $N = 301$  participants from the original samples were excluded (Study 1:  $n = 10$ ; Study 2:  $n = 24$ ; Study 3:  $n = 36$ ; Study 4:  $n = 34$ ; Study 5:  $n = 28$ ; Study 6:  $n = 22$ ; Study 7:  $n = 4$ ; Study 8:  $n = 143$ ). The applied exclusions did not change the results in a way that would lead to different conclusions than the ones we presented in the main text.

### Procedure and measures

The experiments were implemented via the Qualtrics survey software. The procedure and measures were nearly identical across all studies. Slight differences across studies were due to the specific research questions addressed in each study. After giving informed consent at the outset of the studies, participants were asked to imagine that there were plans to build five wind turbines close to their communities and that there was a referendum to decide on these plans. Participants were aware that the referendum and the wind farms were fictitious.

Then, participants were randomly assigned to different experimental conditions. Two of these conditions were identical in all studies: the *only pro* condition and the *no communication* condition. In the *only pro* condition, participants were told that the municipality published a leaflet to inform citizens about the planned wind turbines and that the information was based on independent experts' reviews. The leaflet contained seven arguments in favour of building the wind turbines (Supplementary Methods for details). Participants in the *no communication* condition did not receive such a leaflet but directly proceeded with the survey. Besides these two basic experimental conditions, several studies contained additional experimental conditions (Supplementary Table 2 for an overview). In Study 2, we added a condition in which the leaflet (containing only pro arguments) ostensibly stemmed from the operating energy company (instead of the municipality) to manipulate vested interests (Supplementary Table 8 for manipulation check results). Studies 4 and 5 contained an additional experimental condition in which participants received an equal number of arguments opposed to building the wind turbines in alternation with the pro arguments. These counterarguments were said to be raised by a local initiative opposing the wind turbines. In Studies 6 and 8, we presented the same balanced arguments, but here they were presented by the same source (that is, the municipality bringing up both sides but eventually refuting the counterarguments). We refer to these latter two conditions as *balanced* conditions.

Afterwards, participants were asked to indicate their voting intentions as our main dependent variable. The concrete wording of the referendum was 'Are you in favour of the municipality leasing land for the purpose of constructing and operating five wind turbines?'. Participants' response options ranged from 'I would definitely vote no' (0%) to 'I would definitely vote yes' (100%). In Study 3, we added two experimental conditions (one presenting only pro and one presenting no communication) in which the framing of the referendum was

reversed; that is, asking whether participants were against (instead of in favour of) constructing the wind turbines. In all studies, we included further measures for exploratory reasons (Supplementary Table 3 for a complete list of measures). In Studies 3–8, we measured belief in specific conspiracy theories about the referendum with a six-item scale. Conspiracy mentality was always assessed at the end of the survey with a 12-item scale<sup>42</sup>. Both measures were not substantially affected by the preceding experimental manipulation (conspiracy mentality: effect size eta-squared ( $\eta^2$ ) = 0.002; specific conspiracy beliefs:  $\eta^2$  = 0.01). Thus, we were successful in our aim to not activate conspiracy theories with our manipulation. Demographic information including age, gender and education was then retrieved before debriefing participants about the purpose of the study.

### Analysis strategy

To analyse the relationship between conspiracy mentality (or specific conspiracy beliefs) and the acceptance of wind turbines in the nationally quota-balanced sample (that is, Study 8), we conducted linear multiple regression analysis. Conspiracy mentality was included as predictor and age, gender (+1 female, -1 male), education (1 = low, 2 = medium, 3 = high), political orientation (from 1 'left' to 7 'right') and state. We sorted the 16 German federal states according to their installed onshore wind power capacity divided by the size of the state. Then, we split the states into two groups representing the lower (-1) and the upper half (+1) in terms of installed capacity per km<sup>2</sup> resulting in comparable numbers of participants (Supplementary Table 4 for the rank order of the states). To be able to include gender as a covariate in these analyses, we removed the two participants who reported their gender as 'other'.

To examine the impact of the pro arguments versus balanced arguments, we report merged analyses across all studies in the main text (that is, we combined the data of all studies into one large dataset). This was possible because all studies shared the crucial properties of the experimental design and used the same procedure and measures. Such an aggregated way of analysing the data has the advantage of maximizing statistical power to detect the true effect of interest with smaller confidence intervals<sup>51</sup>. It also allows for presenting all the data we collected in an efficient and transparent manner (that is, we report all studies that we conducted to test the research questions). The reason for conducting several smaller studies partly lies in the fact that the first results were counter to our theory-driven expectations (pre-registrations), which led us to replicate them in subsequent studies and to test several plausible moderators (as outlined in the main text). The final study served to confirm these results with a large and nationally quota-balanced sample.

The merged analyses followed the pre-registration of Study 8 and contained three experimental conditions (communication: only pro versus balanced versus no communication). In a first linear multiple regression analysis, we tested the impact of the only pro (versus no communication) condition on willingness to vote for the construction of the wind turbines. To this end, and following the recommendations of Aiken and West<sup>52</sup>, we used orthogonal contrasts to code the experimental conditions (focal contrast: +1 only pro, 0 balanced, -1 no communication; residual contrast: -1 only pro, +2 balanced, -1 no communication) and mean-centred the continuous predictor conspiracy mentality. In addition, the interaction terms of both contrasts and mean-centred conspiracy mentality were included as predictors. Following the same principal procedure, we conducted two more linear multiple regression analyses to examine the effectiveness of the balanced communication. These two regression analyses used different contrasts to compare the balanced with the only pro condition (focal contrast: -1 only pro, +1 balanced, 0 no communication; residual contrast: +1 only pro, +1 balanced, -2 no communication) and the balanced with the no communication condition (focal contrast: 0 only pro, +1 balanced, -1 no communication; residual contrast: +2

only pro, -1 balanced, -1 no communication). All statistical tests were two sided. Analyses with specific conspiracy beliefs as predictor were carried out analogously. Complete results of these regression analyses and the pre-registered analyses for all individual studies can be found in the Supplementary Notes. All analyses were carried out with IBM SPSS v25. The research data are publicly available via PsychArchives<sup>53</sup>.

### Ethics

All studies were conducted in line with the ethical guidelines for psychological research of the American Psychological Association and the German Research Foundation and received ethical approval by the institutional ethics board of the Leibniz-Institut für Wissensmedien (Tübingen, Germany; LEK 2019/001).

### Reporting summary

Further information on research design is available in the Nature Portfolio Reporting Summary linked to this article.

### Data availability

The data supporting the findings reported in the manuscript and the source data of Figs. 1–3 are publicly available via PsychArchives (<https://doi.org/10.23668/psycharchives.8253>).

### Code availability

The code used to analyse the datasets is publicly available via PsychArchives (<https://doi.org/10.23668/psycharchives.8252>).

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## Author contributions

K.S. and M.J.H. acquired funding for the studies. K.W. and K.S. conceptualized the study with feedback from L.P. and M.J.H. K.W. collected and analysed the data. K.W., L.P., K.S. and M.J.H. interpreted the data. K.W. drafted the article. All authors provided critical revision and approved the final version of the article.

## Competing interests

The authors declare no competing interests.

## Additional information

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Study description	We conducted eight studies with quantitative experimental designs. As part of an online questionnaire, participants were randomly assigned to one of several conditions (an overview of conditions per study is given in Supplementary Table 2). Participants either received no information about the wind farms, received only information in favour of building the wind farms or received information both in favour of and against building the wind farms. We measured participants' intention to vote in favour of building the wind farms in a (fictitious) local referendum as well as their conspiracy beliefs (i.e., conspiracy mentality and specific conspiracy beliefs).
Research sample	Study 1: German citizens recruited via Clickworker (mean age = 36.21, 69 female, 70 male, 3 other); sample chosen for convenience Study 2: German citizens recruited via Clickworker (mean age = 37.13, 137 female, 136 male, 2 other); sample chosen for convenience Study 3: German citizens recruited via Clickworker (mean age = 34.21, 186 female, 172 male, 3 other); sample chosen for convenience Study 4: German citizens recruited via Clickworker (mean age = 29.90, 198 female, 206 male, 12 other); sample chosen for convenience Study 5: German citizens recruited via Prolific (mean age = 28.12, 209 female, 202 male, 8 other); sample chosen for convenience Study 6: German citizens recruited via Prolific (mean age = 28.51, 129 female, 112 male, 8 other); sample chosen for convenience Study 7: German citizens recruited via Clickworker (mean age = 40.42, 70 female, 119 male, 4 other); sample chosen for convenience Study 8: German citizens recruited via Respondi (mean age = 44.87, 1067 female, 1046 male, 2 other); representative sample (i.e., nationally quota-balanced for age, gender, education, and region) More details on sample characteristics are given in Supplementary Table 1. Informed consent was obtained from all participants and they were paid for participation. Payment differed between studies but was generally above the minimum wage in Germany.
Sampling strategy	Studies 1 to 7: convenience; Study 8: national quota-balanced sample. No a priori power analyses were conducted for the studies. Instead, we aimed at a minimum sample size of $n = 75$ to 150 participants per condition (depending on the study) and preregistered rules for sequential testing (according to Lakens, 2014) in order to guarantee a sufficient statistical power to detect a minimum effect size of interest ( $d > 0.2$ ). The planned number of participants was preregistered for every study and we stucked to these plans.
Data collection	All data was collected in online studies with participants using their personal computer. No researcher or assistant was present at the data collection.
Timing	Data was collected at the following dates. Study 1: 4th of October 2021 Study 2: 29th of October 2021 Study 3: 25th to 27th November 2021 Study 4: 13th December 2021 Study 5: 17th to 18th January 2022 Study 6: 8th to 11th March 2022 Study 7: 15th of March 2022 Study 8: 18th to 28th March 2022.
Data exclusions	As preregistered, we included participants in our analyses if they fulfilled the following criteria: being at least 18 years old, speaking German fluently (because study materials were largely text-based), not failing the attention check items included in the survey, not taking the survey multiple times, not being psychology students (because they are familiar with psychological study procedures and might be suspicious about our hypotheses), and not being identified as statistical outliers in the main analysis (based on studentised deleted residuals, see preregistrations). In Study 8, however, we did not apply the language and psychology criteria in order to not compromise the representativeness of the sample. For the same reason, we did not analyse the data of 75 participants in Study 8 who were additionally recruited due to a sampling error of the recruiting agency. Based on these criteria $N = 301$ participants from the original samples were excluded (Study 1: $n = 10$ ; Study 2: $n = 24$ ; Study 3: $n = 36$ ; Study 4: $n = 34$ ; Study 5: $n = 28$ ; Study 6: $n = 22$ ; Study 7: $n = 4$ ; Study 8: $n = 143$ ).
Non-participation	Information unavailable. Data of participants who declined their participation were not written by the survey software but deleted immediately.
Randomization	In all studies participants were randomly assigned to the experimental conditions (information on participants per condition can be assessed in Supplementary Table 2).

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Recruitment

Participants (Studies 1 to 7) were recruited via the participant platforms Clickworker and Prolific. Participants sign up voluntarily on these platforms and usually have a higher education level, are younger, and are more politically left-leaning compared to the general population. To ensure representativity of our results, we conducted a large final study (Study 8) via the recruiting agency Respondi who guaranteed quota that matched age, gender, education, and region of the German population.

Ethics oversight

All studies were conducted in line with the ethical guidelines for psychological research of the American Psychological Association and the German Research Foundation and received ethical approval by the institutional ethics board of the Leibniz-Institut für Wissensmedien (Tübingen, Germany; LEK 2019/001)

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