Public attitudes to network infrastructure: an online experiment testing rationales for building new network infrastructure

Research conducted by the Behavioural Practice at Verian UK

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Any enquiries regarding this publication should be sent to us at: ESSupport@energysecurity.gov.uk.

Contents

Executive Summary 4
Introduction 7
Background 7
Research questions 7
Outline of reporting structure 8
How to read this report 9
Methods 10
Message development 10
Online experiment 12
Respondents 12
Findings 13
How to read this section 13
Attitudes towards building new network infrastructure 14
Impact of the messages on attitudes towards building new network infrastructure 20
How respondents viewed the messages 26
Communication preferences 29
Implications 31
Limitations 34
References 36

Executive Summary

Background

Great Britain's electricity transmission network needs to be upgraded and expanded to meet rising demand and support the connection of new, low carbon technologies. This will require building new overhead and underground lines and substations in communities where people live and work.

Previous research suggests relatively low levels of knowledge among the public about the need to build more transmission infrastructure across Great Britain, and that improving understanding of the potential benefits of this infrastructure could help support acceptance of it (DESNZ, 2023b, 2023c). Given this, a national information campaign could address gaps in understanding and build support for development of new transmission network infrastructure across the country. DESNZ therefore commissioned Verian to carry out the present research, so the findings can inform the delivery of any future campaign.

Aims

This research addressed two primary research questions:

- To what extent can different messages about the benefits and impacts of network infrastructure affect people's views on its acceptability?
- What types of messages are perceived as most persuasive about the benefits and impacts of network infrastructure?

Methods

This report summarises the results of an online survey experiment with 3,673 respondents recruited through the Kantar LifePoints panel.

The experiment tested the effect of five message themes on attitudes towards building new infrastructure. Each theme highlighted a different benefit of network infrastructure development. These themes were developed in collaboration with DESNZ and refined following feedback from six qualitative in-depth interviews:

- CLIMATE: Building new network infrastructure will help address climate change by integrating low carbon energy into the grid
- SECURITY: Building new network infrastructure will improve energy security
- EFFICIENCY: Building new network infrastructure will address current inefficiencies in the energy system
- JOBS: Building new network infrastructure will benefit the economy by creating new jobs

- COMMUNITY: Building new network infrastructure will bring benefits to local communities where the infrastructure is located.

The experiment used a Randomised Controlled Trial (RCT) design in which every respondent was assigned to one of six groups at random. In all groups participants saw basic information about transmission network infrastructure. In the five intervention groups respondents also saw a message highlighting a benefit of network infrastructure development. The sixth group served as a baseline (CONTROL) in which participants saw no message. No respondent saw more than one message.

The main outcome of interest was how acceptable respondents in each of the message groups thought new network infrastructure construction across Great Britain would be, and how that compared to the same measure in the CONTROL group.

Fieldwork took place between 15th March and 3rd April 2024.

Findings

Two messages (JOBS and CLIMATE) increased acceptability of building new network infrastructure across Great Britain over baseline attitudes in the control group. The increases were modest in scale, with 83% of respondents who saw the JOBS message and 82% of those who saw the CLIMATE message saying construction of new electricity infrastructure nationally would be acceptable, compared to 77% in those who saw no message (CONTROL). While the other intervention messages (SECURITY, EFFICIENCY, COMMUNITY) were not associated with a statistically significant increase in acceptability, there was no evidence that the messages harmed acceptability either (80-81% acceptable). The JOBS message was also associated with the highest acceptability for development in respondents' local areas.

When asked about the potential benefits of new infrastructure, those who saw JOBS were the most optimistic that there would be a benefit for the national economy, on local communities, and on jobs created across Great Britain and areas local to the new infrastructure. Taken with the results above, these findings suggest that messages emphasising jobs benefits are most likely to be effective at improving attitudes to building new infrastructure after a single exposure.

All messages performed similarly on most dimensions of perceived persuasiveness (e.g., being easy to understand, making a good argument, motivating to seek more information, etc.) when evaluated by respondents. The exceptions to this were EFFICIENCY and COMMUNITY, which were seen as less credible (i.e., fewer respondents thought the message was true), than the other messages.

There was some evidence to suggest that the impact of the messages on attitudes may differ between demographic groups. For example, while men were more accepting of new network infrastructure development across Great Britain than women, it was in women where the largest impact of the messages on attitudes was observed. In particular, the effect of CLIMATE on acceptability of development across Great Britain was driven entirely by women in the sample, whereas JOBS appeared equally effective for both men and women. Also, different

messages appeared to be effective depending on whether respondents lived in rural or urban areas. The best performing message for urban respondents was JOBS, whereas COMMUNITY was most effective for rural respondents.

Overall acceptability for building new network infrastructure was high. Even in the absence of any messaging, most respondents said new network infrastructure development across Great Britain would be acceptable (77%). This was also true for development in respondents' local areas, but by a smaller majority (61%). Indeed, fewer respondents deemed local development acceptable than national development within every message group and every demographic sub-group explored. However, it is important to note that respondents were not provided with specific information about the building of new infrastructure such as its location or size. It is possible that within the context of real infrastructure projects, respondents may feel and respond differently to the messages.

We also asked respondents about their communication preferences. The results showed respondents wanted more information on how development would impact energy bills (51%), what the local benefits are (51%), and where the new infrastructure needs to be built (47%). The most trusted sources of information were those responsible for the development (e.g., National Grid Electricity Transmission (NGET) or Scottish and Southern Electricity Networks (SSEN) and Scottish Power Energy Networks (SPEN)) (39%), the UK Government (33%), and Government-appointed bodies set up to advise and respond to planning applications (e.g. Natural England and Health and Safety Executive) (33%).

Introduction

Background

Great Britain's transmission network must be upgraded and expanded to support the connection of new, low carbon technologies such as renewable energy, energy storage and nuclear power. Furthermore, government expects annual electricity demand to increase from current levels by over 35% in 2035 and by over 70% in 2050 (DESNZ & Ofgem, 2022), due to the shift towards electrification of transport, industry, and heating processes. This will require building new overhead and underground lines, offshore transmission cables and substations.

Nick Winser (electricity networks commissioner 2022-23) published a report on transmission networks in 2023. It provided a set of recommendations to address each stage of the build process to accelerate the end to end delivery timeline for transmission infrastructure from 14 years to 7 (DESNZ, 2023a; Electricity Commissioner, 2023). One challenge is that public understanding of the strategic importance of new transmission infrastructure and associated benefits is limited, and communities hosting national infrastructure do not always see a direct benefit for doing so. Therefore, an information campaign could help to increase understanding of the need for and benefits of an upgraded transmission network, including the benefits to local communities such as career opportunities this presents (DESNZ, 2023a).

The Department for Energy Security and Net Zero (DESNZ) commissioned this research to evaluate the entrenchment of views on network infrastructure, specifically the extent to which acceptability of building new network infrastructure can be improved by messaging on its benefits and why it is needed.

This work builds on existing research on public attitudes to electricity network infrastructure in the current context and addressing evidence gaps (DESNZ, 2023c, 2023b; Electricity Commissioner, 2023). Recommendations drawn from this research may inform the development of future communications to inform and build support for network infrastructure expansion.

Research questions

The research was designed to address two primary research questions:

- To what extent can different messages about the benefits and impacts of network infrastructure affect people's views on its acceptability?
- What types of messages are perceived as most persuasive about the benefits and impacts of network infrastructure?

Additionally, there are three secondary research questions:

- How does the impact of different messages on acceptability of network infrastructure vary by background/demographic factors?
- What are people's current views on network infrastructure, in the absence of any messaging interventions?
- What information do people want about plans to build more network infrastructure and who would they trust to communicate them?

Outline of reporting structure

How to read this report outlines the purpose of this report with links to other outputs from the research that can be read alongside the report.

Methods provides an overview the research methods and the messages tested.

Findings details the key results.

Implications outlines key takeaways and implications for future research and communication campaigns.

Limitations sets out the limitations of the research, how we attempted to mitigate these, and how the results of this study should be interpreted.

How to read this report

This report provides a summary of the research methods, key findings, limitations, and implications.

A separate appendix provides additional information to the methods and findings that can be read alongside this report here.

Data tables summarising responses to all survey questions are available here.

Methods

Message development

The messages and message themes tested in the experiment were informed by previous research (Electricity Networks Commissioner, 2023) and developed in collaboration with DESNZ in an initial workshop.

Although specific messages were developed for testing, this research was concerned with testing the strengths of messaging themes broadly. We therefore collected further feedback on the messages and the themes they were designed to represent using six in-depth interviews between 31st January and 7th February 2024 (see Appendix A for more information about the qualitative sample). This feedback was used to develop the final versions of messages in collaboration with DESNZ. Each message was designed to represent a different message theme.

Table 1 shows the messages tested in the online experiment and the themes they represented.

Table 1. Messages developed for testing and the themes they represent.

Label	Theme	Message
CLIMATE	Address climate change by integrating low carbon energy into the grid	The country is facing extreme weather events like flooding, heat waves, and drought as a result of climate change. More of the energy we create must come from clean sources such as wind, solar and nuclear to reduce our contribution to climate change. Upgrading the network infrastructure that transports electricity across Britain will allow for more of this clean energy to power up our homes.
SECURITY	Improve energy security and protection from external shocks	We can become more self-sufficient and less vulnerable to unpredictable international energy sources by taking full advantage of the energy that can be generated in this country from wind, solar and nuclear. Upgrading the network infrastructure that connects home-grown energy to our homes and businesses is essential to supporting our energy security, independence and resilience.
EFFICIENCY	Address current inefficiency due to lack of system capacity	Currently, wind farms are paid to switch off when they are generating too much power, so they don't overwhelm our electricity system. This could end up costing £80 per household per year by the late 2020s if no action is taken. The capacity of our transmission network must be increased so that less of this affordable and abundant natural resource is wasted.
JOBS	Bring new jobs	Upgrading the transmission network infrastructure that transports electricity across Britain will also bring benefits to the economy. Onshore network investment could directly support 50,000–130,000 full time jobs by 2050, and there will be job opportunities in a range of professions such as engineering, environmental science, planning and construction.
COMMUNITY	Bring benefits to local communities where the infrastructure is built	Those located closest to new transmission network infrastructure will benefit from electricity bill discounts of up to £1,000 per year for 10 years. Communities will also benefit from additional funding for their area that they can have a say on how best to spend. For instance, local energy efficiency measures, educational training opportunities, or conservation projects.

Online experiment

Respondents

In total, 3,673 respondents were recruited through the Kantar LifePoints online access panel. Fieldwork was carried out between the 15th of March and 3rd of April 2024. Recruitment quotas were applied to ensure the final sample was representative of the general population in Great Britain with respect to key demographic characteristics: age by gender, region of residence, and urban vs rural area of residence. The final dataset was then weighted using population estimates from the Labour Force Survey (Jan – March 2023) (ONS, 2023). Rural/urban weighting was applied based on mid-2020 ONS population estimates for England and Wales (ONS, 2020) and mid-2021 population estimates produced by National Records of Scotland (National Records of Scotland, 2022). See Appendix B1 and B2 for the full summary of sampling and weighting methods and for a breakdown of the achieved and weighted sample. For cross breaks of respondent demographics by experimental group, see the weighted tables here.

The online experiment used a between-subject Randomised Controlled Trial (RCT) design. Respondents were randomly allocated to one of six groups: one control and five intervention groups. In the intervention groups, respondents first read general information about the electricity network (see Appendix C for full text used in the questionnaire) followed by one of five messages about the benefits of building new network infrastructure. Respondents in the control group read only the general information about the electricity network.

Following this, respondents completed a questionnaire that assessed the effect of messages on acceptability of new network infrastructure development (see Appendix C for the full questionnaire). The questions were drawn and adapted from the Public Attitudes Tracker (DESNZ, 2023c) and Community Benefits social research (DESNZ, 2023b). We ran a further six in-depth interviews between 12th and the 19th of February 2024 during questionnaire development to cognitively test our primary and secondary outcome measures (see Appendix A for more information about the qualitative sample).

The primary outcome measure was how acceptable respondents would find the building of new network infrastructure nationally (as measured on a 7-point scale ranging from ‘completely acceptable’ to ‘completely unacceptable’). Secondary outcomes included mean acceptability for building new network infrastructure locally, and the proportion who would find this acceptable on a national and local level. Follow up questions included asking those who would not find building new network infrastructure “acceptable” the reasons why, perceived benefits of building new network infrastructure, and perceptions of the intervention messages.

We also collected demographic information, attitudes towards climate action and energy security, what respondents wanted to know more about with regards to building new network infrastructure and who they would trust to communicate this.

Findings

How to read this section

In this report, the term “development” is used to refer to “plans to build new network infrastructure”.

The study’s two primary research questions concern the effectiveness and perceptions of the different message themes being tested. To give context for those comparisons, we begin by exploring attitudes across the full study sample, and within the CONTROL arm, which provides a measure of ‘baseline’ attitudes in the absence of any messaging. We then investigate the impact of each of the intervention messages by comparing them to that baseline. Finally, we explore what respondents perceived to be the benefits of network infrastructure development, their views on how persuasive the different intervention messages were, and their preferences for receiving communications around network infrastructure development.

Running many tests for ‘statistical significance’ makes it likely that some will be spurious false positive results arising by chance. To avoid this issue, we have followed best practice for trials and have designated one question as the ‘primary outcome’: “how acceptable or unacceptable would you find the construction of new electricity infrastructure across Great Britain?”. In this section, we only report whether a finding is statistically significant at the 95% confidence level for this question. All other results are reported descriptively (e.g., “X% of respondents said Y”) or should be considered as ‘exploratory’ findings in need of follow-up research to confirm.

Full weighted tables with exploratory significance tests for all questions are available here.

Unless stated otherwise, all results presented here are drawn from the weighted survey data.

Attitudes towards building new network infrastructure

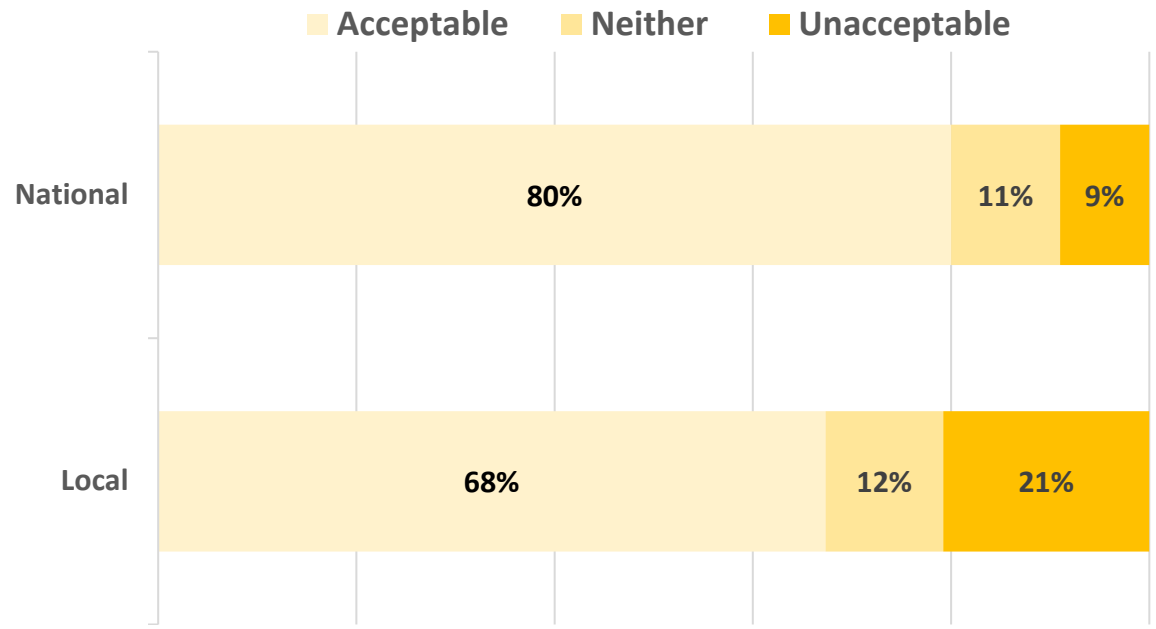
Respondents were broadly accepting of network infrastructure development. Across the full sample, most respondents said they would find building new network infrastructure across Great Britain acceptable (80%). Only 9% of respondents said national development would be unacceptable, and 11% answered neither acceptable nor unacceptable.

Attitudes were more mixed on building new network infrastructure in respondents' local areas (defined to the respondents as within 15 minutes' walking distance from their home), although again most said it would be acceptable (68%). 21% of respondents would find local development unacceptable and 12% would find this neither acceptable nor unacceptable.

Figure 1 shows attitudes towards building new network infrastructure nationally and in local areas.

Figure 1 Acceptability of building new network infrastructure nationally and locally.

Q: How acceptable or unacceptable would you find the construction of new electricity infrastructure in areas across Great Britain in general/in your local area?



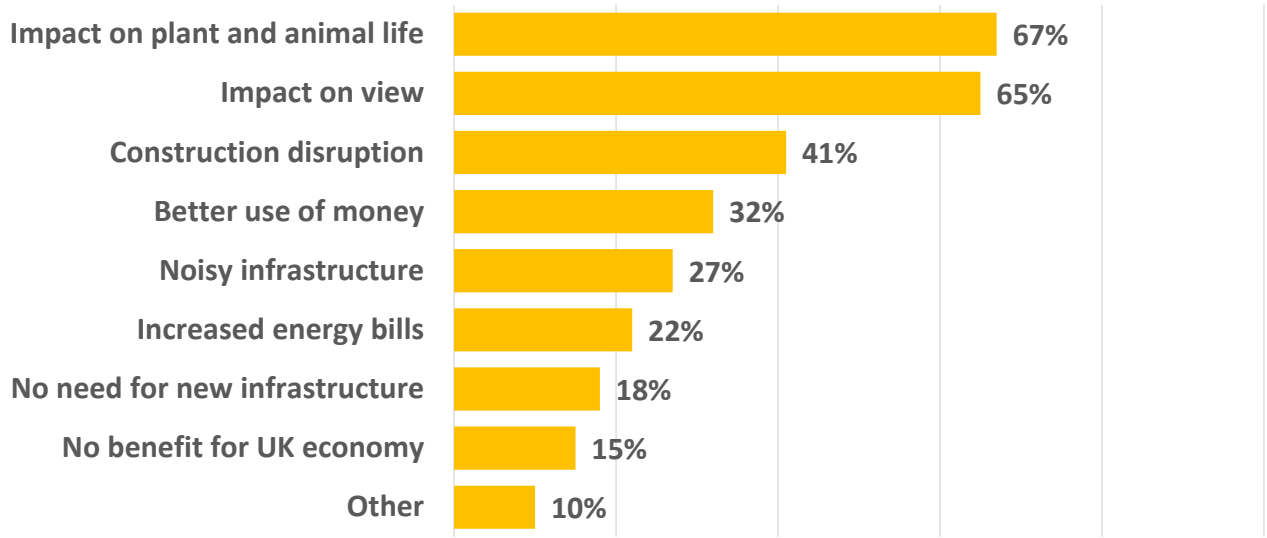
Note: Total 'acceptable' is the sum of 'completely acceptable', 'mostly acceptable' and 'somewhat acceptable.' Weighted base NATIONAL: All respondents N = 3,673, LOCAL: All respondents excluding those who did not think building new infrastructure in their local area was possible N = 3,544.

Respondents in the CONTROL arm did not see any of the intervention messages, so their attitudes can represent a baseline for the public, in the absence of any communications. As in the full sample, most respondents in CONTROL said building more network infrastructure across Great Britain would be acceptable (77%; 10% unacceptable), and this proportion was lower when it came to development within respondents' local areas (61%; 24% unacceptable).

The top three reasons respondents would find building new infrastructure unacceptable were the same at the national and local level (see Figures 2 and 3). Of the 9% (N = 333) of the full sample who said building new infrastructure nationally would be unacceptable, 67% (N = 224) were concerned about the impact on plant and animal life, 65% (N = 215) the impact on the view, and 41% (N = 135) disruption from construction.

Figure 2 Reasons for finding national development unacceptable.

Q: You said you would find it unacceptable for new electricity network infrastructure to be built in areas across Great Britain in general. Why is this?

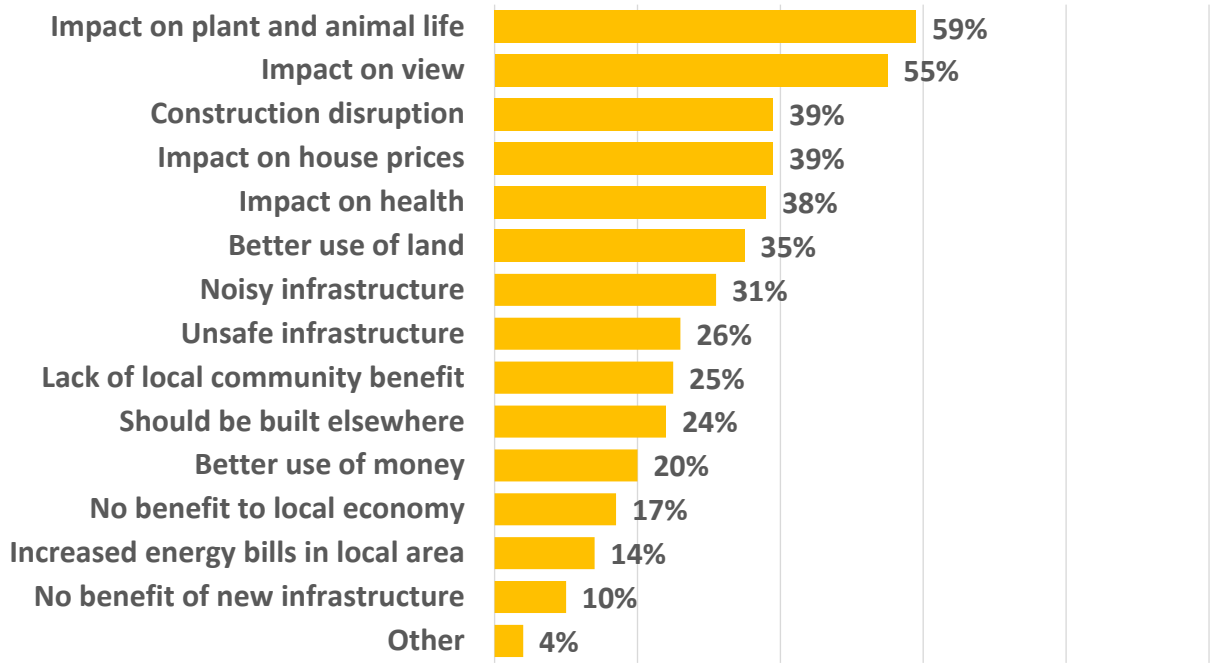


Note: Weighted base: Those who would find it unacceptable to build new electricity infrastructure in areas across Great Britain in general N = 333.

Out of the 21% (N = 741) of the full sample who said building new infrastructure locally would be unacceptable 59% (N = 437) were concerned about the impact on local plant and animal life, 55% (N = 411) were concerned about the impact on the view, and 39% (N = 293) were concerned about disruption from construction.

Figure 3 Reasons for finding local development unacceptable.

Q: You said you would find it unacceptable for new electricity network infrastructure to be built in your local area, within 15 minutes' walking distance from your home. Why is this?



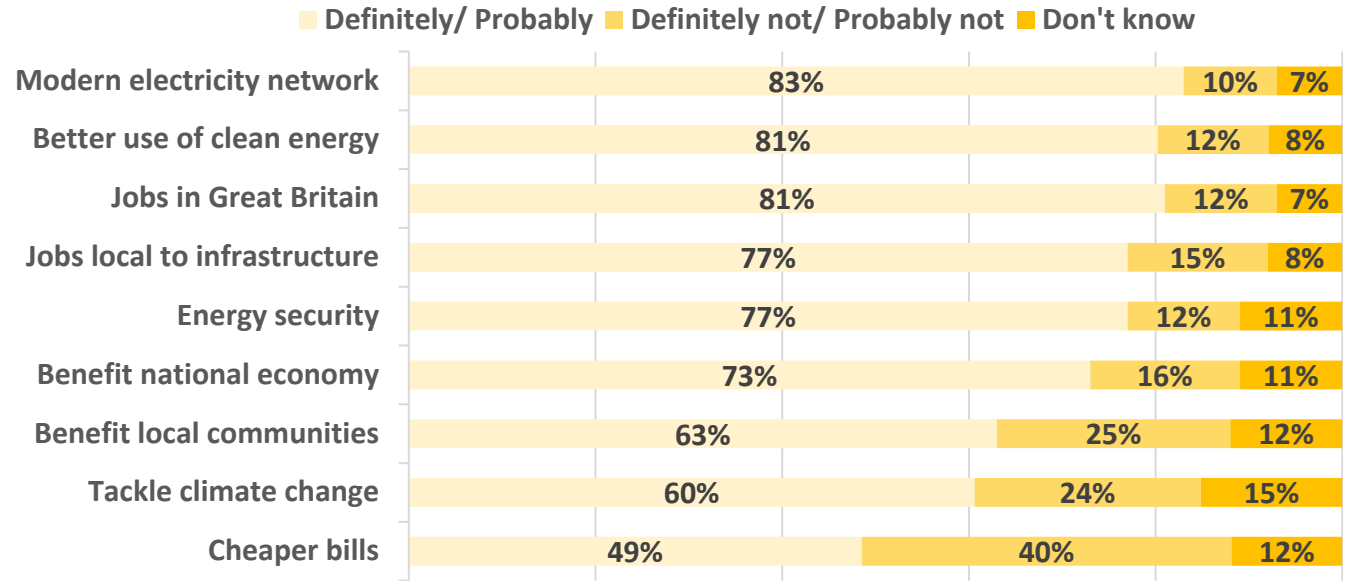
Note: Weighted base: Those who would find it unacceptable to build new electricity infrastructure in their local area N = 741.

Figure 4 shows the proportion of respondents who thought some of the main potential benefits of building more network infrastructure would, or would not, occur. The top three benefits most thought would definitely/probably occur were: modernising the electricity network by replacing aging infrastructure (overall 83%, CONTROL 81%), the creation of jobs for people in Great Britain (overall 81%, CONTROL 79%), and better use of clean energy sources (such as wind, solar, and nuclear) (overall 81%, CONTROL 75%). For all but one of the benefits specified, more than twice as many respondents thought the benefit would probably/definitely occur as thought it probably/definitely would not.

The exception to this was cheaper energy bills, on which views were more mixed. Only 49% of all respondents (46% in CONTROL) thought that new infrastructure would lead to cheaper energy bills and 40% (42% in CONTROL) thought this would not happen.

Figure 4. Perceived benefits of more network infrastructure.

Q: If new electricity transmission infrastructure such as substations and pylons were to be built in Great Britain, in your opinion, to what extent do you feel that each of the following will occur?



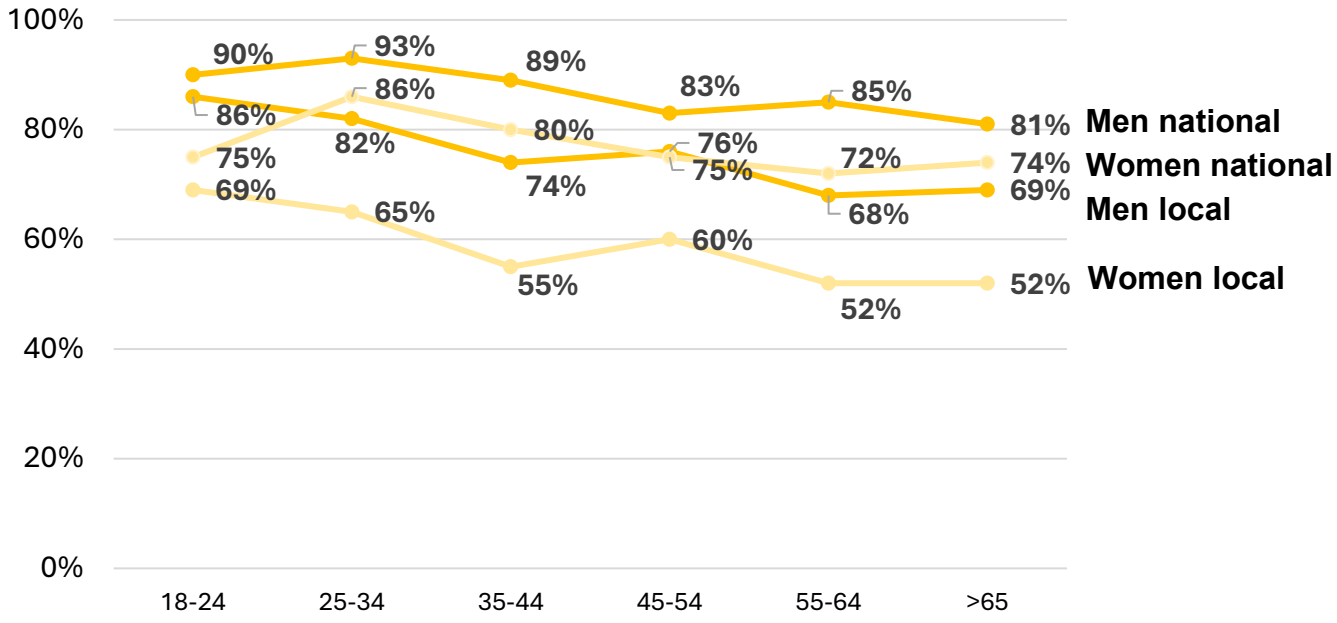
Note: Weighted base: All respondents N = 3,673.

Levels of acceptability of building new network infrastructure varied across demographic groups. Figure 5 shows attitudes expressed by respondents split by age and gender. Four trends stand out:

1. A majority of respondents in all sub-groups said new development was acceptable, whether national or local.
2. Older respondents were slightly less accepting of new development than younger respondents.
3. More men said new infrastructure development was acceptable than women, and this held true for every age band; and
4. Within every intersection of age and gender, more respondents said it would be acceptable for new network infrastructure to be built across Great Britain than for building in their local area.

Figure 5. Acceptability of building new network infrastructure nationally and locally by age and gender.

Q: How acceptable or unacceptable would you find the construction of new electricity infrastructure in areas across Great Britain in general/in your local area?



Note: Total ‘acceptable’ is the sum of 'completely acceptable', 'mostly acceptable' and 'somewhat acceptable.’ Weighted base NATIONAL: All respondents N = 3,665 (W x 18-24: N = 154, W x 25-34: N = 342, W x 35-44: N = 389, W x 45-54: N = 223, W x 55-64: N = 271, W x 65 or older: N = 496, M x 18-24: N = 143, M x 25-34: N = 362, M x 35-44: N = 378, M x 45-54: N = 215, M x 55-64: N = 236, M x 65 or older: N = 456). LOCAL: All respondents excluding those who did not think building new infrastructure in their local area was possible N = 3,535 (W x 18-24: N = 149, W x 25-34: N = 331, W x 35-44: N = 374, W x 45-54: N = 217, W x 55-64: N = 253, W x 65 or older: N = 458, M x 18-24: N = 142, M x 25-34: N = 361, M x 35-44: N = 369, M x 45-54: N = 209, M x 55-64: N = 229, M x 65 or older: N = 444).

At both the national and local level, those living in urban areas reported higher levels of acceptability for building new network infrastructure (National: 82%, Local: 69%), compared to those in rural areas (National: 74%, Local: 61%). Similarly, those holding a degree-level or higher qualification were more accepting of new development (National: 85%, Local: 73%) than those without (National: 78%, Local: 65%).

In every region, most respondents would find development acceptable, but the proportion was always lower for local compared to national. The region with the highest levels of acceptability was London (National: 87%, Local: 77%) and the one with the lowest levels was the Southeast of England (National: 73%, Local: 57%).

Both homeowners and renters expressed higher acceptability of new national development (78-81%) than new local development (66-68%), with differences between the two that are likely to sit within the margin of error.

Those who expressed scepticism towards climate change/action were more accepting of building new network infrastructure (National: 84%, Local 73%) than those who did not (National: 76%, Local 62%). (Climate change/action sceptics were defined as those who slightly or strongly agreed with at least one of the following statements: (1) It's not worth doing things to help reduce climate change if others don't do the same, or (2) The media exaggerates the impacts of climate change.) One possible explanation for this finding is that sceptics are less worried about the impact of building new network infrastructure on nature: 72% of non-sceptics who would find local development unacceptable gave the impact on animal and plant life as a reason, compared to 62% for sceptics. The difference is smaller, however, for development across Great Britain (61% for non-sceptics and 57% for sceptics).

Those who said “don’t know” in response to a question about their level of concern about the UK’s dependence on energy from other countries were less accepting of development (National: 58%, Local: 42%) than those who expressed an opinion (National: 78-82%, Local: 68-69%).

Impact of the messages on attitudes towards building new network infrastructure

To test the impact of the intervention messages on attitudes, we compared the CONTROL arm to each of the five-intervention arms. The primary outcome of interest was the average (mean) score for how acceptable respondents would find new network infrastructure development across Great Britain (from 1 to 7), with lower scores meaning greater acceptability. We also explored the same score for development in respondents' local areas as a secondary outcome.

At the national level, JOBS (mean = 2.41), and CLIMATE (mean = 2.47) improved mean acceptability scores relative to CONTROL (mean = 2.66). These differences were statistically significant at the 5% level. While none of the other intervention messages led to a statistically significant improvement in mean acceptability scores for national development, mean scores were numerically lower for all intervention messages than for CONTROL. Please see data tables here for mean acceptability scores for all message groups.

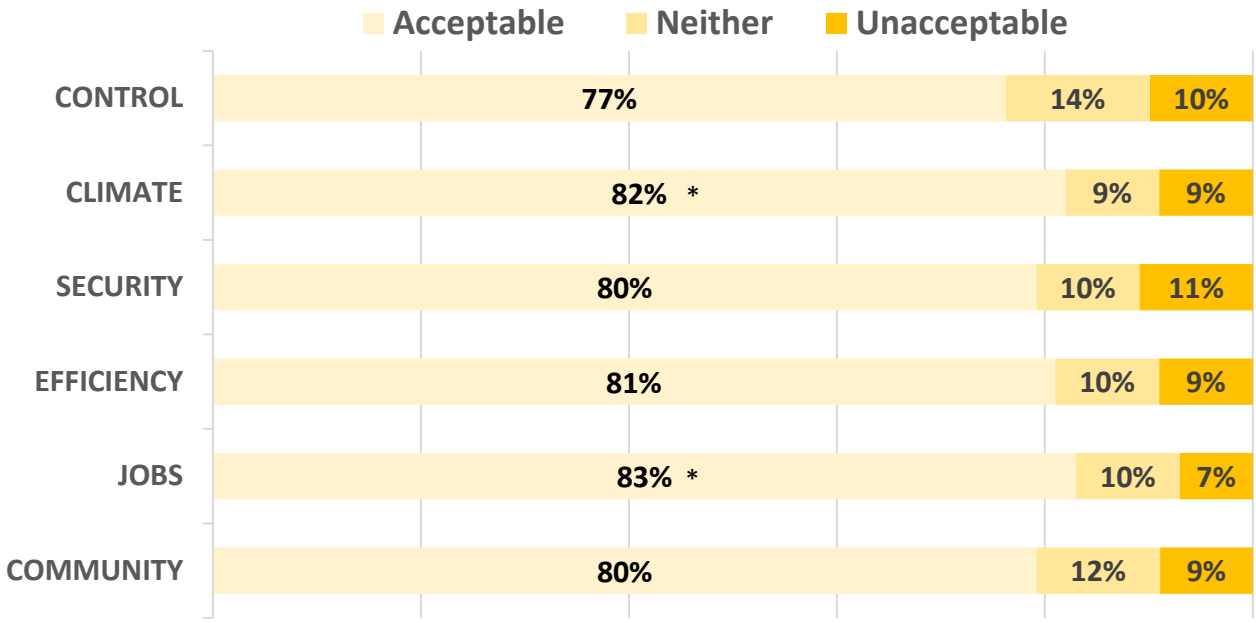
At the local level, only JOBS (mean = 2.87) appeared to improve mean acceptability scores relative to CONTROL (mean = 3.26). Again, while none of the other intervention messages increased mean acceptability at the local level, they did not reduce acceptability either.

Taken together, these results suggest that emphasising the jobs benefits of network infrastructure development may lead to greater acceptance of new network infrastructure. Notably though, none of the intervention messages appeared to decrease acceptability relative to a baseline with no message.

To show the scale of differences in attitudes between the groups, we next explore the same acceptability measures instead as a proportion of respondents in each message group who said they would find development acceptable, unacceptable, or neither. Figure 6 shows these proportions for finding national development acceptable, and Figure 7 shows the same for local development.

Figure 6. Acceptability of building new network infrastructure nationally.

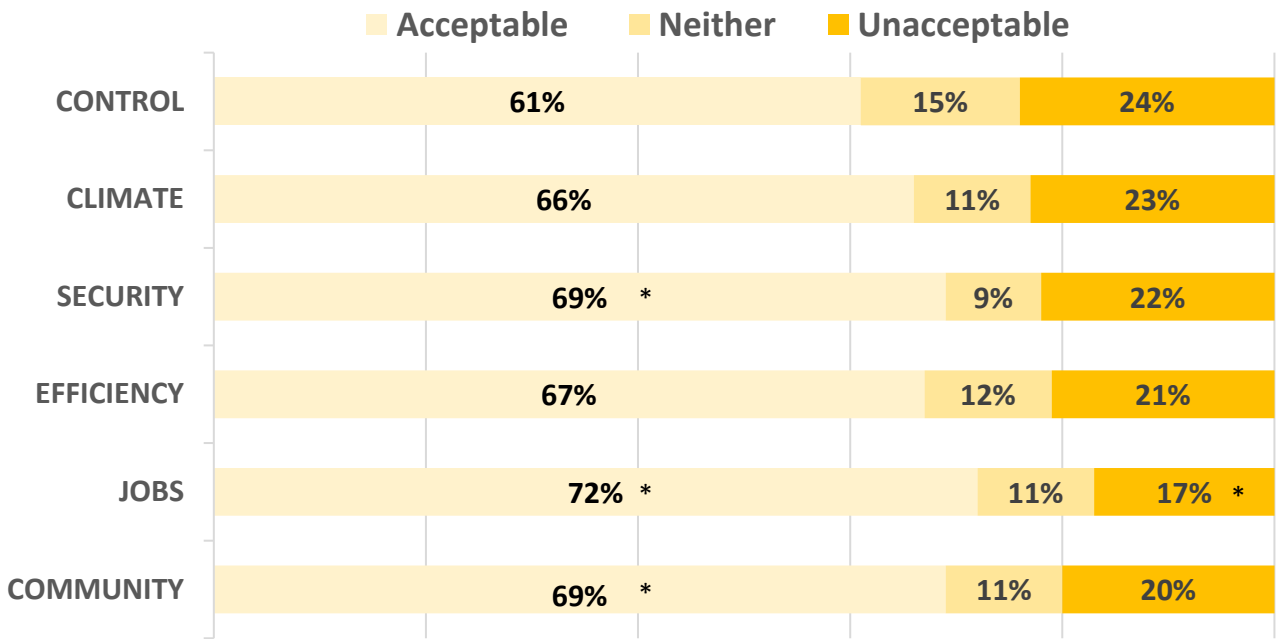
Q: How acceptable or unacceptable would you find the construction of new electricity infrastructure across Great Britain?



Note: Total ‘acceptable’ is the sum of 'completely acceptable', 'mostly acceptable' and 'somewhat acceptable’. Total ‘unacceptable’ is the sum of 'completely unacceptable', 'mostly unacceptable' and 'somewhat unacceptable’. Weighted base: All respondents N = 3,673 (CONTROL N = 586, CLIMATE N = 581, ENERGY SECURITY N = 610, EFFICIENCY N = 612, JOBS N = 595, COMMUNITY N = 689). * Indicates a statistically significant difference from CONTROL at a 5% level.

Figure 7. Acceptability of building new network infrastructure locally.

Q: How acceptable or unacceptable would you find the construction of new electricity infrastructure in your local area?



Note: Total ‘acceptable’ is the sum of 'completely acceptable', 'mostly acceptable' and 'somewhat acceptable’. Total ‘unacceptable’ is the sum of 'completely unacceptable', 'mostly unacceptable' and 'somewhat unacceptable’. Weighted base: All respondents excluding those who did not think building new infrastructure in their local area was possible N = 3,544 (CONTROL N = 563, CLIMATE N = 564, ENERGY SECURITY N = 584, EFFICIENCY N = 590, JOBS N = 576, COMMUNITY N = 666. * Indicates a statistically significant difference from CONTROL at a 5% level.

JOBS was the group with the highest proportion of respondents who reported they would find new national and local development acceptable (National: 83%, Local: 72%), and the lowest proportion who would find this unacceptable (National: 7%, Local: 17%). This is consistent with the results from the mean acceptability scores and underscores the main finding that this message had the greatest discernible impact on attitudes.

Attitudes in the CLIMATE group were more mixed. This group had the second highest proportion of respondents who viewed national development as acceptable (82%). However, acceptance of local development was lower in CLIMATE (66%) than in any of the other intervention message groups (67-72%).

SECURITY and COMMUNITY performed similarly. In both groups, 80% of respondents said building new network infrastructure across Great Britain was acceptable, compared with 69% for development in their local area. EFFICIENCY was not markedly different, with 81% and 67% accepting of national and local development, respectively.

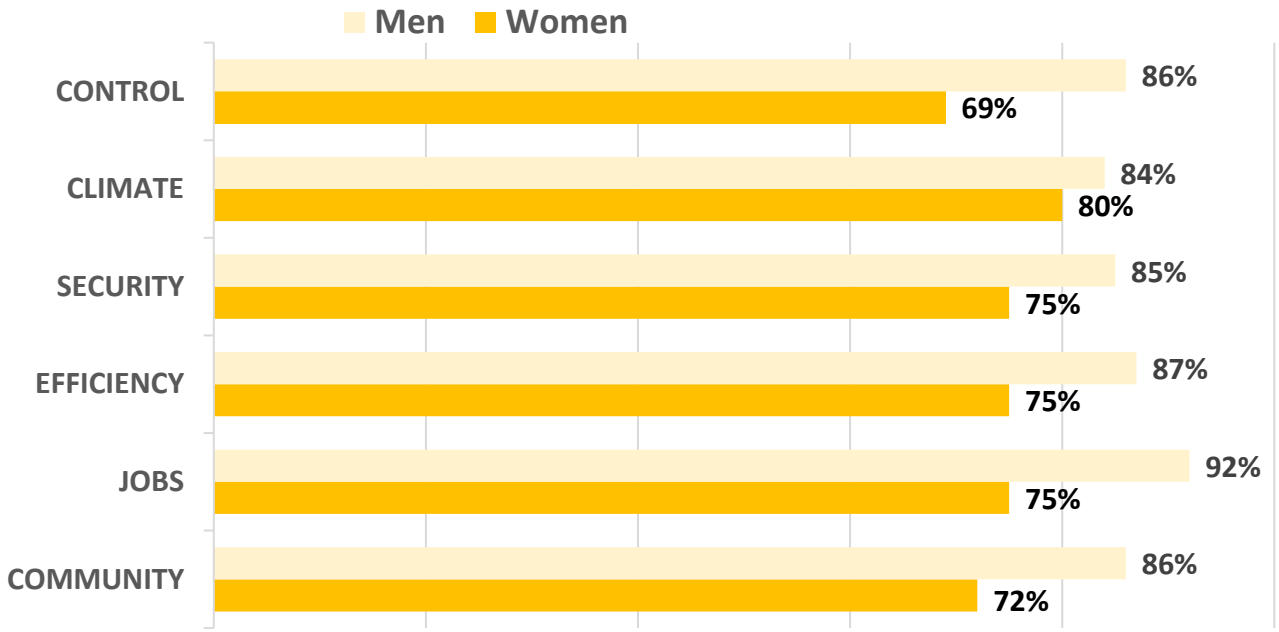
Overall, the differences between the message groups are modest, and in most cases do not meet the threshold for statistical significance. This may be largely attributed to the generally high levels of acceptance seen in every arm, most respondents said they thought new network infrastructure development was acceptable, whether nationally or in their local area.

One of the secondary research questions was the extent to which the impact of the different messages varied between people. Here, we discuss two key demographic factors – gender and whether the respondent lives in a rural or urban area. Further cross breaks can be found in the full weighted tables here.

In every group, men were more accepting than women of new network infrastructure development across Great Britain. However, for most messages it was in women that we observed the largest increases in acceptability over CONTROL. This was most notable for CLIMATE, which had an increase of 11 percentage points in women and a decrease of 2 percentage points in men. This means that the statistically significant effect of CLIMATE on mean acceptability scores was driven entirely by women. Conversely, the JOBS message appeared equally effective for both men and women, yielding a 6 percentage point increase in acceptability for both (Figure 8).

Figure 8 Proportion who would find building new network infrastructure nationally acceptable by gender.

Q: How acceptable or unacceptable would you find the construction of new electricity infrastructure in Great Britain in general? (% Acceptable)

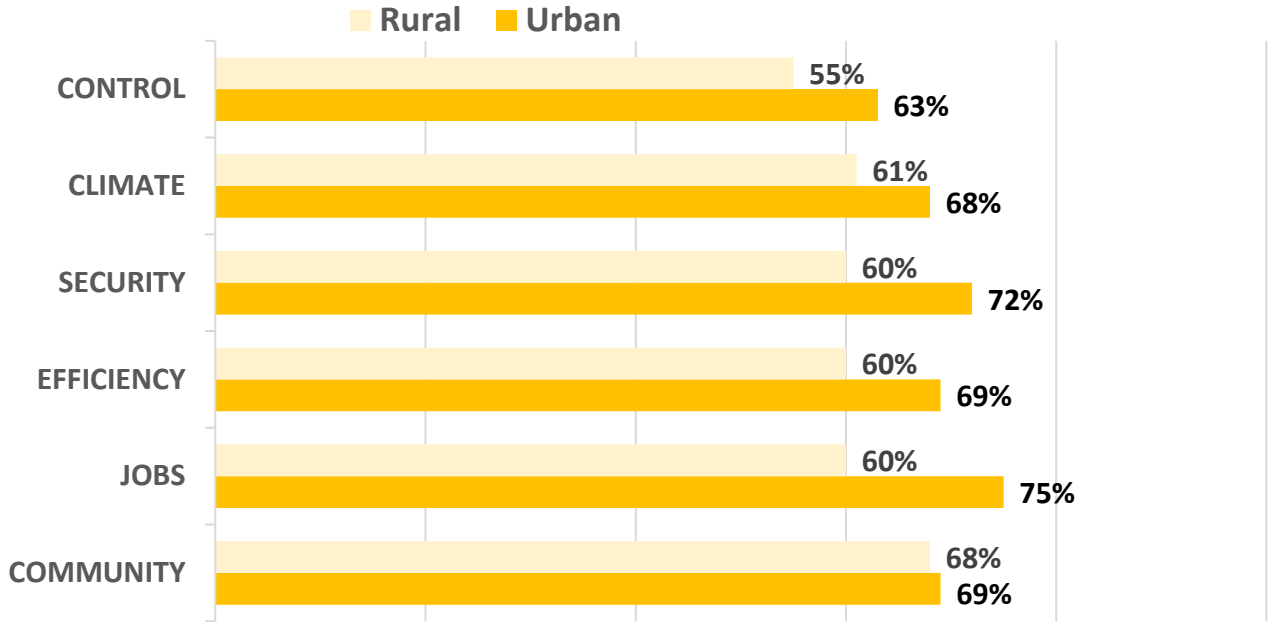


Note: Total 'acceptable' is the sum of 'completely acceptable', 'mostly acceptable' and 'somewhat acceptable'. Weighted base: All respondents who are women N = 1,876 (CONTROL N = 317, CLIMATE N = 296, SECURITY N = 326, EFFICIENCY N = 315, JOBS N = 300, COMMUNITY N = 321). Weighted base: All respondents who are men N = 1,790 (CONTROL N = 270, CLIMATE N = 285, SECURITY N = 282, EFFICIENCY N = 294, JOBS N = 294, COMMUNITY N = 365)

We might also expect those in rural areas to have different concerns around construction work in their local area to those in urban areas. Indeed, in every group, rural respondents were less accepting than urban respondents of local network infrastructure development. However, while the best performing message for urban respondents was JOBS (+12 percentage points), for those in rural areas it was COMMUNITY (+12 percentage points). By contrast, the increase for COMMUNITY in urban respondents was smaller (+7 percentage points). The full sample results are heavily skewed towards urban respondents because they outnumber rural residents in the target population by a large margin (Figure 9).

Figure 9 Proportion who would find building new network infrastructure locally acceptable by area of residence.

Q: How acceptable or unacceptable would you find the construction of new electricity infrastructure in your local area? (% Acceptable)



Note: Total 'acceptable' is the sum of 'completely acceptable', 'mostly acceptable' and 'somewhat acceptable'. Weighted base: All respondents who live in a rural location excluding those who did not think building new infrastructure in their local area was possible N = 681 (CONTROL N = 95, CLIMATE N = 96, ENERGY SECURITY N = 115, EFFICIENCY N = 134, JOBS N = 113, COMMUNITY N = 129). All respondents who live in an urban location excluding those who did not think building new infrastructure in their local area was possible N = 2,840 (CONTROL N = 465, CLIMATE N = 464, ENERGY SECURITY N = 464, EFFICIENCY N = 452, JOBS N = 462, COMMUNITY N = 533)

The messages targeted different rationales for building new network infrastructure, so we may expect to see differences in the benefits respondents perceive to be likely depending on the message they saw.

Unsurprisingly, the JOBS message was the most effective message at convincing respondents of the benefits to job creation of building new network infrastructure: 87% of those in the JOBS group thought that jobs would be created nationally (relative to 79% in CONTROL), and 82% thought that jobs would be created in areas local to where the infrastructure is built (75% in CONTROL). SECURITY may have also conveyed a job boost as a benefit at the national level (85%), but less so at the local level (80%).

In all intervention groups, the proportion of respondents who thought development would benefit the national economy was higher (72 – 77%) than in CONTROL (68%). Of these, JOBS and SECURITY had the highest proportion of respondents who thought the national economy would benefit, 77% and 74% respectively.

JOBS and COMMUNITY were the best at conveying that the local communities would benefit from development. With 67% in JOBS and 65% in COMMUNITY thinking local communities would benefit, compared to 59% in CONTROL.

COMMUNITY was the only message that explicitly mentioned local energy bill discounts and was also the message with the highest proportion of respondents who felt development would lead to cheaper bills (54%). All other messages performed similarly to CONTROL (46%) with 41 – 51% of respondents thinking cheaper energy bills could be a benefit of development.

All messages out-performed CONTROL in terms of communicating the potential for new infrastructure to help tackle climate change: 52% of respondents in CONTROL and 60 – 65% of those in an intervention group thought building new infrastructure could help address climate change.

How respondents viewed the messages

After answering questions on their attitudes towards network infrastructure, respondents who saw an intervention message were asked to evaluate the message on five dimensions of perceived persuasiveness:

1. I believe the information is true (True)**,**
2. I find the information easy to understand (Easy to understand),
3. I learnt something new from the information (Something new),
4. I think the information makes a good argument for building new electricity network infrastructure (Making a good argument),
5. This information makes me want to seek out more information about plans to build new electricity network infrastructure (Motivating to seek more information)

These questions address the second main research question: which messages are perceived as most persuasive? Figure 10 shows the proportion of respondents in each intervention message group who agreed with the above statements.

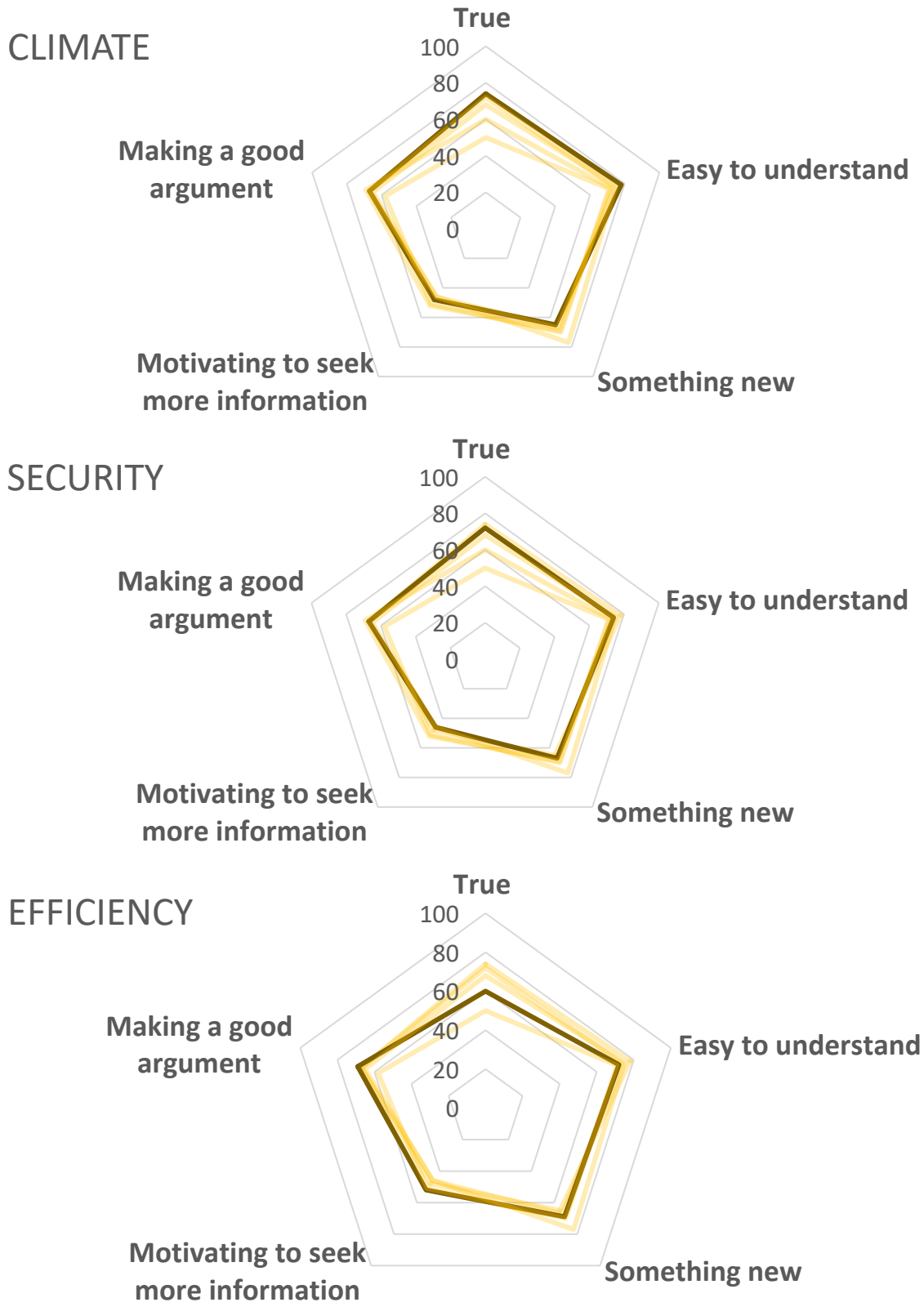
While JOBS performed well on all dimensions, it performed exceptionally well on the “something new” dimension. In JOBS, 77% of respondents reported that the message was new information, which was more than any other group (65 – 70%).

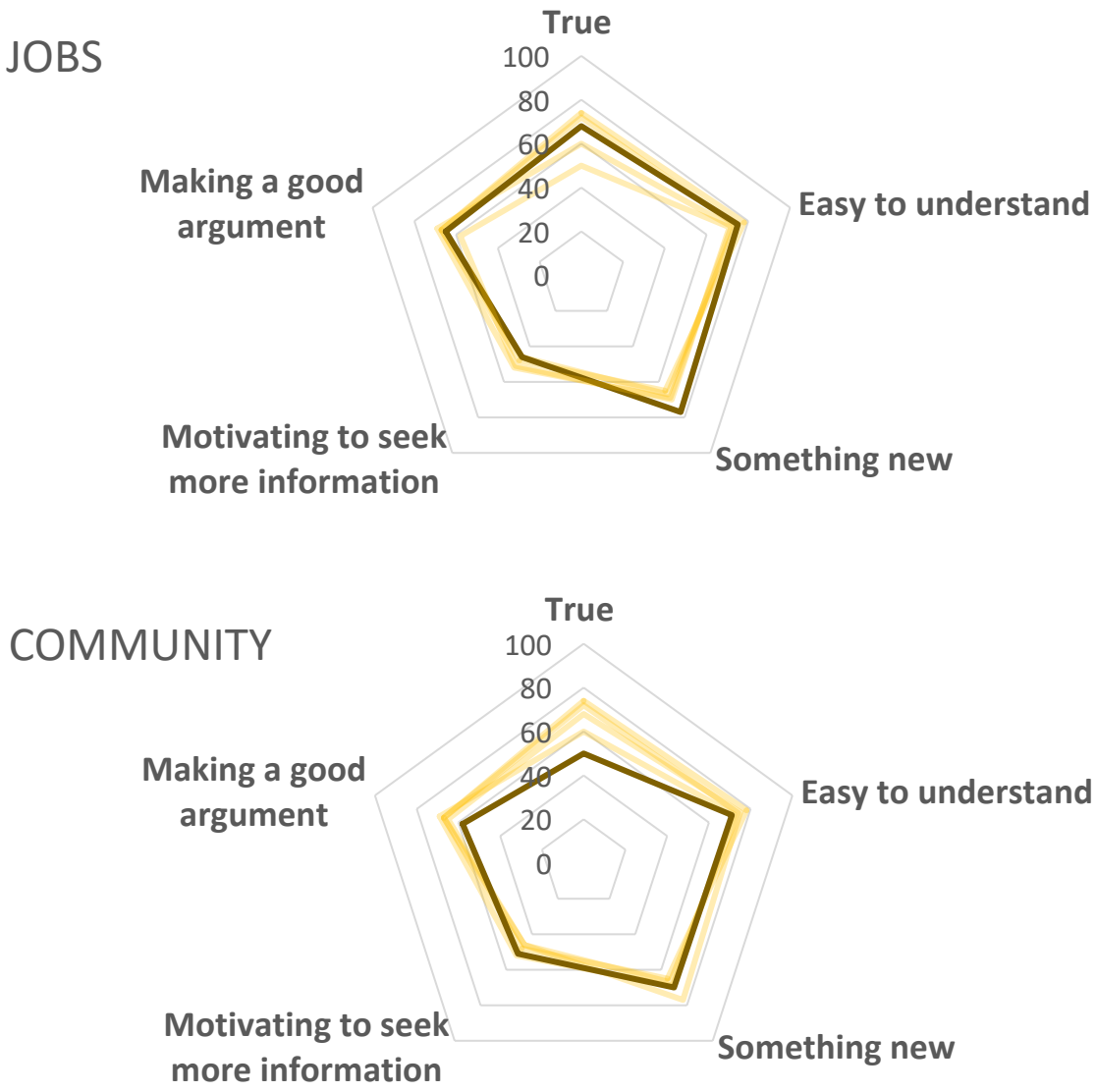
CLIMATE and SECURITY also performed well on all dimensions and had the highest proportion of respondents who believe the information was true, 74% and 72% respectively.

In terms of perceived credibility (believing the information to be true) the two messages that underperformed compared to the others were EFFICIENCY (60%) and COMMUNITY (50%). COMMUNITY was also the message with the lowest proportion of respondents who thought that the message made a good argument (58%). Despite this, COMMUNITY appeared to increase acceptability for building infrastructure locally for the people who live in rural areas (Figure 9). It is possible that while the message was not seen as persuasive overall, it may

have resonated with the population directly targeted by this message, i.e. people living in rural areas who are more likely to be affected by local development.

Figure 10. How respondents evaluated the messages on five dimensions of perceived persuasiveness.
Q: To what extent do you agree or disagree with the following statements?





Note: The dark lines represent how the title message scored on the dimensions of persuasiveness. Lighter yellow lines show how the other messages scored. Weighted base: Respondents in the message intervention groups N = 3,087 (CLIMATE N = 581, SECURITY N = 610, EFFICIENCY N = 612, JOBS N = 595, COMMUNITY N = 689).

Communication preferences

Finally, we asked respondents questions about what information they wanted about plans to build new infrastructure, and who they would trust to communicate this.

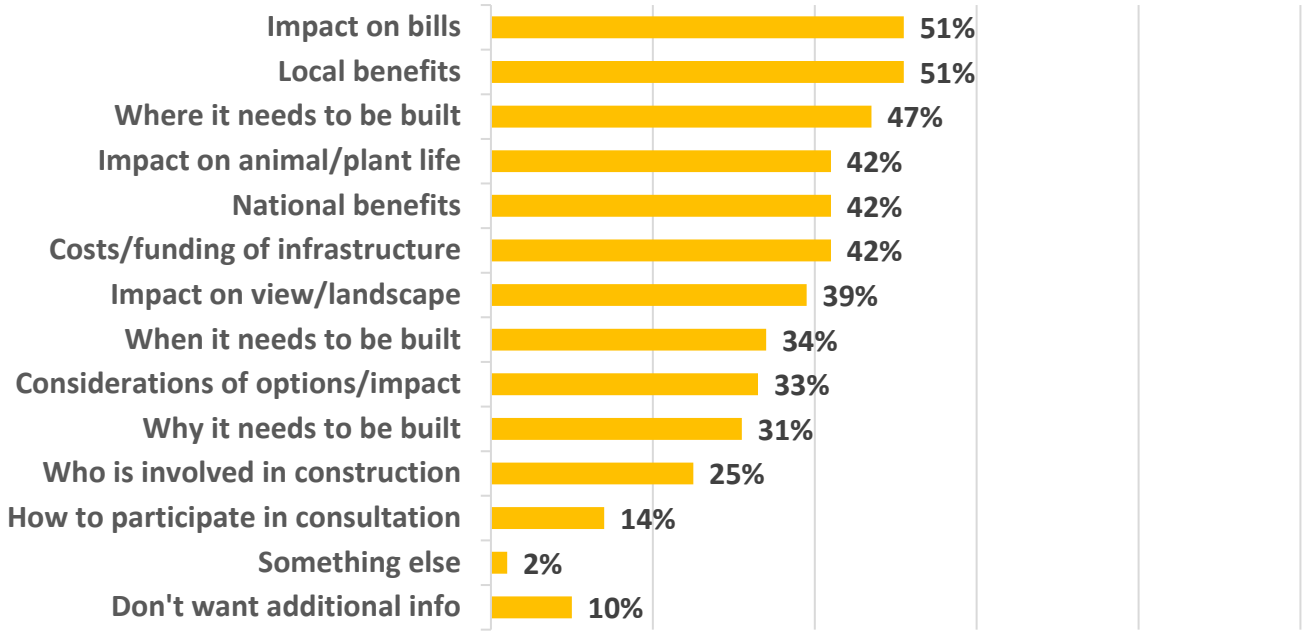
Respondents wanted more information on a range of topics (Figure 11). The top three were clarification on the impact on bills (51%), what the local benefits are (51%), and where the new infrastructure needs to be built (47%).

The topic most respondents wanted more information about differed between those who would find national development acceptable, and those who would find it unacceptable. The top topic for those who would find national development unacceptable was more clarification on the impact of plant and animal life (59%), whereas for those who would find it acceptable, the top topic was clarification on the impact on bills (53%). This mirrors the finding that the impact on plant and animal life was the top reason for finding national development unacceptable.

Additionally, those who would find national development unacceptable on average wanted more information than those who would find this acceptable. Those who would find national development unacceptable on average selected 5.5 topics of the 12 provided, which was one more on average than those who would find this acceptable (mean = 4.5).

Figure 11. Information about plans to build new electricity network infrastructure across Great Britain.

Q: What information would you like to receive about plans to build new electricity network infrastructure across Great Britain?



Note: Weighted base: All respondents N = 3,673.

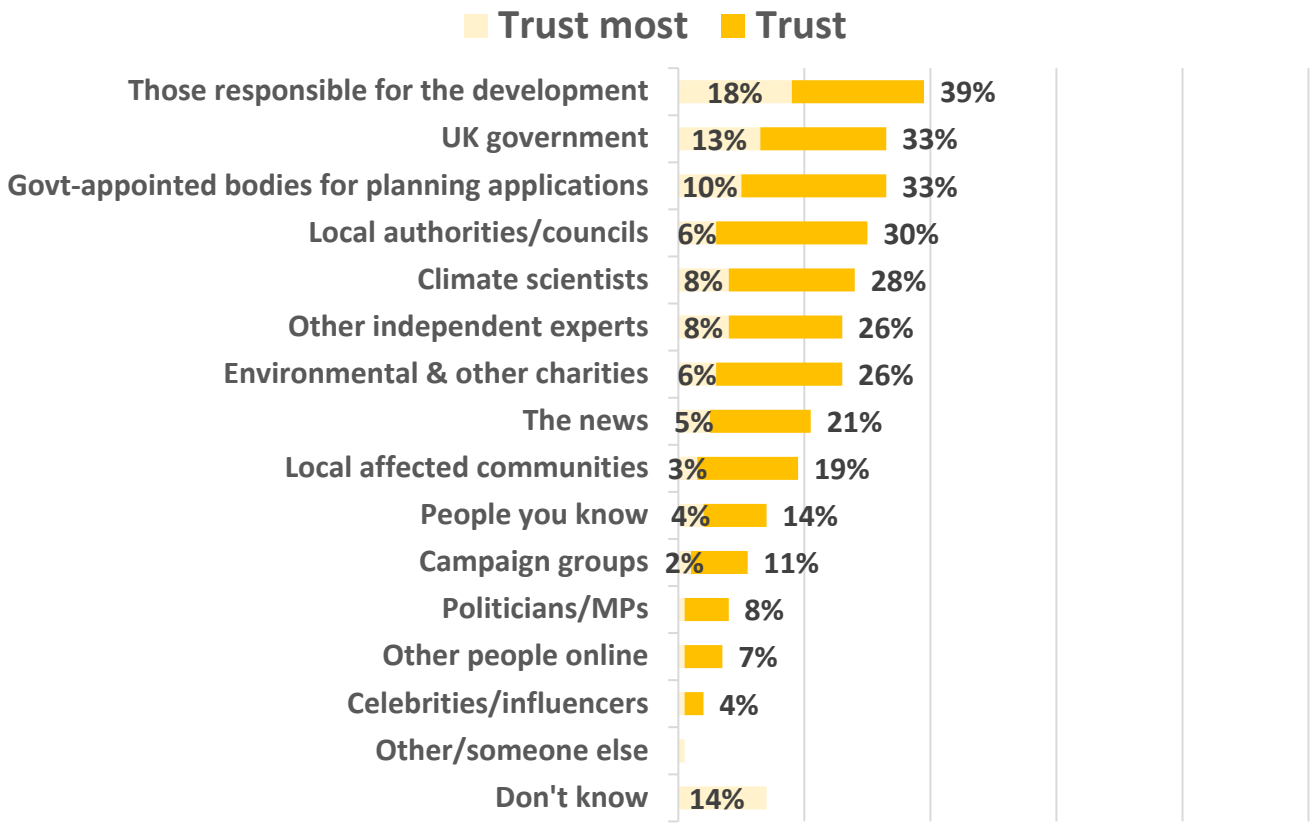
We also asked respondents about their actual experience of communications on network infrastructure development. Only 28% (N = 1,043) of respondents said they had heard or seen something about plans to upgrade the electricity grid across Great Britain. Of these respondents, 43% had heard about this from the news media, 30% from the UK Government, and 21% from people they know (friends, family, neighbours, colleagues, etc.).

Figure 12 shows the sources respondents say they would trust to provide them with information about plans to build new network infrastructure across Great Britain. The top three were those responsible for the development (e.g., National Grid Electricity Transmission (NGET) or Scottish and Southern Electricity Networks (SSEN) and Scottish Power Energy Networks (SPEN)) (39%), the UK Government (33%), and Government-appointed bodies set up to advise and respond to planning applications (e.g. Natural England and Health and Safety Executive) (33%).

The top three untrustworthy sources were celebrities/influencers (46%), politicians/MPs (37%), and people online (e.g. social media posts, blogs, forums) (34%).

Figure 12. Trusted and most trusted sources of information.

Q: Who of the following, if any, would you trust/trust the most to provide you with information about plans to build new electricity network infrastructure across Great Britain?



Note: ‘Don’t know’ was a default option presented for “Trust most” even if not initially selected for “Trust”. It is the only option that could have been selected more times for “Trust most” than “Trust”. Indeed, ‘Don’t know’ was selected by 11% of respondents for Trust. Empty bars represent <2% respondents. Weighted base: All respondents N = 3,673.

Implications

The introduction to this report set out five research questions. We now address how the findings answer each, in turn:

- **To what extent can different messages about the benefits and impacts of network infrastructure affect people's views on its acceptability?**

Two messages were associated with a statistically significant increase in acceptability of new network infrastructure development across Great Britain, over a baseline with no message (CONTROL): JOBS and CLIMATE. The increases were modest in scale, with 83% of respondents who saw the JOBS message and 82% of those who saw the CLIMATE message saying construction of new electricity infrastructure nationally would be acceptable, compared to 77% of those who saw no message (CONTROL). The other message groups did not differ from CONTROL with statistical significance, but we found no evidence that they harmed acceptability either (80-81% acceptable). None of the messages reduced the proportion of respondents who said it was unacceptable to build new infrastructure across Great Britain (7-11%).

The JOBS message was also associated with the highest acceptability for development in respondents' local areas. However, acceptability for local development was higher for COMMUNITY and SECURITY than for CLIMATE, suggesting that different rationales may be more suited for building support at the national and local levels.

- **What types of messages are perceived as most persuasive about the benefits and impacts of network infrastructure?**

When evaluated by respondents, the messages generally performed similarly on dimensions of perceived persuasiveness (e.g., being easy to understand, making a good argument, motivating to seek more information). The exceptions to this were EFFICIENCY and COMMUNITY which were seen as less credible (i.e., fewer respondents said they believed the message was true), than the other messages.

Participants were also asked how likely building new infrastructure would lead to a range of benefits. Using responses in CONTROL as a baseline, JOBS was the best at conveying benefits to the national economy, local communities, and would create jobs nationally and in local areas.

Views were mixed as to whether building new network infrastructure would lead to cheaper bills. However, relative to the other groups more of those who saw the COMMUNITY message, which explicitly stated there would be bill discounts, thought cheaper bills would definitely/probably be a benefit (54%). Nonetheless more than one in three (36%) in COMMUNITY, despite being told about bill discounts for those who would live near the new infrastructure, thought cheaper bills would definitely/probably not materialise as a benefit. In

part, this may be because only 50% of those in COMMUNITY thought the information conveyed by the message was true. Future research could explore why respondents did not believe the information in the community benefits message and to understand how community benefits could be better and more convincingly communicated.

Taken with the results above, these findings suggest that messages emphasising the jobs benefits are most likely to be persuasive. However, it should be noted that this is after a single exposure, and some of the respondents in the qualitative pre-testing (who spent more time engaging with the message) expressed scepticism about whether the proposed benefits would really materialise. Future research could usefully explore whether this message would generate similar scepticism once real communications assets have been developed.

- **How does the impact of different messages on acceptability of network infrastructure vary by background/demographic factors?**

There was some evidence to suggest that the impact of the messages on attitudes may differ between demographic groups.

While men were more accepting than women of new network infrastructure development across Great Britain in every group, it was in women that the largest impact of the messages on attitudes was observed. For example, the statistically significant effect of CLIMATE on acceptability was driven entirely by women. Conversely, the JOBS message appeared equally effective for both men and women.

Furthermore, some messages may be more effective depending on whether the respondent lives in a rural or an urban area. For urban respondents, the best performing message was JOBS, while for rural respondents it was COMMUNITY. This is important because baseline acceptability was generally lower in rural respondents, and some critical visible electricity infrastructure will inevitably need to be built in rural areas. There is, however, reason for caution. COMMUNITY focused on a bill discount for local residents near the development work, and the effectiveness of the message is very likely to be contingent on the specific discounts on offer. Additionally, COMMUNITY was also seen as least likely to be true by respondents in both urban and rural areas. If pursued, this line of messaging would benefit from further refinement and research to improve its perceived credibility.

- **What are people’s current views on network infrastructure, in the absence of any messaging interventions?**

Acceptability was high. Even in the absence of any messaging about the benefits of new network infrastructure, most respondents said they would find building new network infrastructure across Great Britain acceptable (77%). This high baseline figure may partly explain the relatively modest impact of the messages – there is less scope for a change in attitudes if most people are positive anyway.

Mirroring previous work (DESNZ, 2023b, 2023c), acceptability was lower for development that might take place in one’s local area (61%). Indeed, 24% of those who saw no message said local construction would be unacceptable.

A consideration for future communications campaigns could be to address the concerns of those who say they find construction of new electricity infrastructure unacceptable. In this study, the top concerns given were the same for development at the national and local levels: concern about the impact on plant and animal life, and impact on the view.

- **What information do people want about plans to build more network infrastructure and who would they trust to communicate them?**

Respondents wanted more information on how development would impact energy bills (51%), what the local benefits are (51%), and where the new infrastructure needs to be built (47%). However, respondents expressed interest in a range of other topics, which suggests future communications may need to address a broad range of information gaps.

The most trusted sources of information were those responsible for the development (e.g., National Grid Electricity Transmission (NGET) or Scottish and Southern Electricity Networks (SSEN) and Scottish Power Energy Networks (SPEN)) (39%), the UK Government (33%), and Government-appointed bodies set up to advise and respond to planning applications (e.g. Natural England and Health and Safety Executive) (33%). However, when we asked respondents about their actual experience of communications about plans to upgrade the electricity grid across Great Britain, only 19% of those who had heard anything had heard from those responsible for the development. By contrast, 43% of that group had heard from the news media, who only 21% thought were trustworthy. These findings suggest there is an opportunity for more communications from the sources most trusted by respondents, which may prove effective at shifting attitudes.

Interestingly, those who would find national development unacceptable on average wanted more types of information than those who would find this acceptable. While we do not know the exact reason for this, it is possible that finding building new infrastructure unacceptable stems from a lack of knowledge on the subject. If this is the case, an information campaign about the benefits of new network infrastructure may increase its acceptability amongst those who would find it unacceptable due to a lack of information. However, this suggestion is speculative and needs to be explored in future research.

Limitations

There are several limitations to bear in mind when interpreting the results of this study. The first three concern how the messages were shown, which could affect what we can infer about their respective impacts.

Respondents saw their assigned message only once before answering the primary outcome question. In the real world, it is possible that the effect of messages may change over time with repeated exposure. Likewise, although the respondents only saw one message, in real life the public may be exposed to a variety of messages simultaneously, which may lead to interactive effects that are hard to predict or test.

We also did not test the context within which the message would be seen. Information seen alongside the messages, who communicates them and where they are presented may affect how the messages are perceived. Regardless this study was based on a hypothetical scenario, and it is possible that within the context of real infrastructure projects, respondents may feel and respond differently to the messages. Respondents saw images of different types of infrastructure at the beginning of the experiment (e.g., a substation, lattice pylon, and t-pylon) to measure existing awareness and provide examples of transmission infrastructure that could be built. For practical reasons, participants were only shown one example image of each type of infrastructure. Therefore, participants did not see a full range of different infrastructure designs, images of the infrastructure from different distances and angles, or infrastructure placed in different landscapes. We cannot rule out the possibility that respondents anchored to these example images and that this affected the attitudes they expressed.

Lastly, while we draw conclusions about the overall messaging themes, each theme was tested with only one message. It is possible that the same messaging theme written differently in terms of content, emphasis, length, or style may have produced a different effect.

There are also two general methodological limitations:

The study used a non-probability sample from an opt-in panel, with demographic quotas and weighting to ensure the achieved sample was representative of the general population with respect to key demographic characteristics. This is common practice, and allows for fast, cost-effective recruitment, but it does have drawbacks. Firstly, we cannot rule out that panellists hold different attitudes or susceptibility to messaging to the general public and that these differences are not fully accounted for by our demographic controls. Secondly, when comparing non-randomised groups (i.e., anything other than comparisons between the experiment groups), it is not possible to calculate confidence intervals and thus any tests of statistical significance should be read as indicative, rather than robust comparisons. This second issue will not affect any of the findings presented in this report because these outcomes were treated as secondary measures, with only descriptive statistics provided.

Finally, running multiple statistical tests within the same dataset can increase the chance of false positive results. To mitigate this, only the primary outcome (acceptability of building new

network infrastructure nationally) informed the main conclusions about the effectiveness of the messages in the study.

References

DESNZ. (2023a). Accelerating electricity transmission network deployment: Electricity Networks Commissioner's recommendations. https://www.gov.uk/government/publications/accelerating-electricity-transmission-network-deployment-electricity-network-commissioners-recommendations

DESNZ. (2023b). Community Benefits for Electricity Transmission Network Infrastructure. DESNZ. https://assets.publishing.service.gov.uk/media/655cda1dd03a8d000d07fe0b/community-benefits-for-electricity-transmission-network-infrastructure-govt-response.pdf

DESNZ. (2023c). Public Attitudes Tracker. DESNZ. https://assets.publishing.service.gov.uk/media/65fc5d35a6c0f7001aef9202/DESNZ_Public_Attitudes_Tracker_Winter_2023_Net_Zero_and_Climate_Change__Revised_.pdf

DESNZ, & Ofgem. (2022). Electricity Networks Strategic Framework: Enabling a secure, net zero energy system. https://assets.publishing.service.gov.uk/media/62eb9bd78fa8f503349631c5/electricity-networks-strategic-framework.pdf

Electricity Commissioner. (2023). Electricity Networks Commissioner report. https://esc-production-2021.s3.eu-west-2.amazonaws.com/wp-content/uploads/2023/08/03165030/Electricity-Networks-Commissioner-Companion-Report-by-ESC.pdf

National Records of Scotland. (2022). Mid-2021 Population Estimates Scotland [Dataset]. National Records of Scotland. https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2021

ONS. (2020). Estimates of the population for the UK, England, Wales, Scotland, and Northern Ireland (Mid-2020 edition) [Dataset]. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populat

ionestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

ONS. (2023). Labour Force Survey (Jan—March 2023) (11th Release) [Dataset]. UK Data Service. https://doi.org/10.5255/UKDA-Series-2000026

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