# Understanding Support for Different Climate Policies

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# Motivation

- Implementation gap in climate policy
  - Instruments in place not sufficient to achieve global and national emission targets (Fransen et al., 2023; Lecocq et al., 2022; Liu and Raftery, 2021; Perino et al., 2022; Rogelj et al., 2023; UNEP, 2023)
- Implementation of more ambitious policies is difficult due to lack of support or fear of opposition (Carattini et al., 2019; Douenne and Fabre, 2022; Le Yaouanq, 2023)

→ It is important to understand how and why individuals decide between different climate policies

# This paper

## Research Questions

- How do people decide between different climate policies?
- How does information provision affect choices between different climate policy instruments?
  - What role does motivated reasoning play in choices about climate policies?

- Incentivized choice between 3 climate policy instruments
- Within variation: 2 subsequent choices with information treatment between first and second choice
- Between variation: 4 treatment groups with different framings

# Experimental Design

Data

- Large-scale online survey in Germany in summer 2022
- 6,583 participants, 2,001 randomly assigned to experiment

Experiment with 4 choice options (1 out of 60 implemented at no cost for respondents):

1. *ETS:* Retire 10 ETS allowances to save 10 tons of $CO_2$
2. *COAL:* Reduce emissions from a coal-fired power plant by 10 tons
3. *MIX:* Retire 5 ETS allowances to save 5 tons of $CO_2$ + reduce emissions from coal-fired power plant by 5 tons
4. *NONE:* No climate action

All options mimic real climate policies.

# Experimental Design

| BASE | MARKET | SHAME | REFORM |
|---|---|---|---|
| Questions on attitude towards large firms and market economy, participation in protests for climate protection and coal phase-out | | | |
| | | | Info on impact of options on total CO2 emissions in EU under current rules |
| | Framing: ETS as an instrument restricting markets | Framing: Highlighting contribution of coal-fired power plants to CO2 emissions | |
| First choice (d=1) | | | |
| Elicitation of belief about effectiveness of options in reducing CO2 emissions | | | |
| Info on impact of options on total CO2 emissions in EU under current rules | | | Info on impact of options on total CO2 emissions in EU under proposed reform |
| Second choice (d=2) | | | |

Figure 1: Experimental design

# Abatement Impact

| | Reduction of emissions | | | |
|---|---|---|---|---|
| | Under current rules | | Under reform | |
| Option | Nominal | Real | Nominal | Real |
| *ETS* | 10 | 10.0 | 10 | 10 |
| *COAL* | 10 | 4.2 | 10 | 10 |
| *MIX* | 10 | 7.1 | 10 | 10 |

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- How do people decide between different climate policies?
- How does information provision affect choices between different climate policy instruments?

- For most analyses: Exclude respondents who chose option *NONE* or "Don't know / No answer" in $d = 1$ or $d = 2$
- Define dummy variable for each climate policy option and choice $d = 1, 2$

# Condition BASE

## Hypothesis

Individuals choose the option they believe to be most effective.

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| | (1) | | (2) | | (3) | |
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| Dependent variable | *ETS* | | *COAL* | | *MIX* | |
| Overall margin | 0.251 | (0.010)*** | 0.218 | (0.011)*** | 0.531 | (0.013)*** |
| Effect of belief about single most effective option | | | | | | |
| Option *ETS* | 0.516 | (0.041)*** | −0.144 | (0.032)*** | −0.372 | (0.043)*** |
| Option *COAL* | −0.167 | (0.032)*** | 0.402 | (0.043)*** | −0.234 | (0.046)*** |
| Option *MIX* | −0.196 | (0.030)*** | −0.162 | (0.031)*** | 0.358 | (0.037)*** |

$n = 945$, $\log \mathcal{L} = -609.79$, Wald $\chi = 456.93$, Wald $p = 0.000$, pseudo $R^2 = 0.364$. In parentheses are the standard errors clustered at the individual level. Stars indicate that a Wald test rejects the null that the respective margin is uniform or the respective effect is equal to zero at conventional significance levels ($^*$ at $p < 0.1$, $^{**}$ at $p < 0.05$, and $^{***}$ at $p < 0.01$).

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| | (1) | | (2) | |
|---|---|---|---|---|
| Dependent variable | *ETS* | | *ETS + MIX* | |
| *BASE* margin | 0.240 | (0.020)*** | 0.777 | (0.020)*** |
| Effect of negative attitude towards markets | 0.056 | (0.049) | −0.061 | (0.049) |
| *MARKET* effect: | | | | |
| At negative attitude | 0.155 | (0.094)* | 0.086 | (0.090) |
| At positive/neutral attitude | −0.035 | (0.036) | 0.013 | (0.033) |
| Covariates | Yes | | Yes | |
| # observations | 716 | | 716 | |
| log $\mathcal{L}$ | −392.65 | | −360.40 | |
| Wald $\chi^2$ | 34.42 | | 21.84 | |
| Wald $p$ | 0.003 | | 0.112 | |
| Pseudo $R^2$ | 0.043 | | 0.030 | |

In parentheses are the standard errors clustered at the individual level. Stars indicate that a Wald test rejects the null that the respective margin is uniform or the respective effect is equal to zero at conventional significance levels ($^*$ at $p < 0.1$, $^{**}$ at $p < 0.05$, and $^{***}$ at $p < 0.01$).

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| Dep. variable | *COAL* | | *COAL* + *MIX* | |
| *BASE* margin | 0.227 | $(0.020)^{***}$ | 0.764 | $(0.020)^{***}$ |
| *SHAME* effect | −0.021 | (0.031) | 0.012 | (0.031) |
| Covariates | Yes | | Yes | |
| # observations | 737 | | 737 | |
| log $\mathcal{L}$ | -379.95 | | -376.96 | |
| Wald $\chi^2$ | 14.91 | | 37.88 | |
| Wald $p$ | 0.313 | | 0.000 | |
| Pseudo $R^2$ | 0.018 | | 0.053 | |

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| Dep. variable | Option *ETS* | | Option *COAL* | |
| $d = 1$ margin | 0.231 | $(0.019)^{***}$ | 0.229 | $(0.019)^{***}$ |
| $d = 2$ effect | 0.221 | $(0.020)^{***}$ | −0.105 | $(0.017)^{***}$ |
| # observations | 968 | | 968 | |
| log $\mathcal{L}$ | -595.12 | | -442.00 | |
| Wald $\chi^2$ | 107.89 | | 35.61 | |
| Wald $p$ | 0.000 | | 0.000 | |
| Pseudo $R^2$ | 0.043 | | 0.020 | |

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## Exploratory Hypothesis

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| | (1) | | (2) | |
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| Dependent variable | *COAL* | | *COAL + MIX* | |
| Reference margin | 0.227 | $(0.021)^{***}$ | 0.753 | $(0.021)^{***}$ |
| Ruhr Area effect | −0.016 | (0.072) | 0.184 | $(0.073)^{**}$ |
| $d = 2$ effect: | | | | |
| Outside Ruhr Area | −0.106 | $(0.019)^{***}$ | −0.225 | $(0.023)^{***}$ |
| In Ruhr Area | −0.045 | (0.045) | −0.087 | (0.0.058) |
| Covariates | Yes | | Yes | |
| # observations | 856 | | 856 | |
| log $\mathcal{L}$ | -374.34 | | -499.41 | |
| Wald $\chi^2$ | 45.83 | | 132.96 | |
| Wald $p$ | 0.000 | | 0.000 | |
| Pseudo $R^2$ | 0.050 | | 0.098 | |

Reference margin is the first decision ($d = 1$) of respondents outside the Ruhr Area. In parentheses are the standard errors clustered at the individual level. Stars indicate significance levels ($^{*}$ at $p < 0.1$, $^{**}$ at $p < 0.05$, and $^{***}$ at $p < 0.01$).

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| Dependent variable | *NONE* | | *NONE* | |
| $d = 1$ margin | 0.100 | $(0.012)^{***}$ | 0.110 | $(0.015)^{***}$ |
| $d = 2$ effect | $-0.019$ | $(0.008)^{**}$ | $-0.021$ | $(0.008)^{***}$ |
| Covariates | No | | Yes | |
| # observations | 1,126 | | 851 | |
| log $\mathcal{L}$ | -341.58 | | -254.16 | |
| Wald $\chi^2$ | 5.98 | | 35.13 | |
| Wald $p$ | 0.014 | | 0.000 | |
| Pseudo $R^2$ | 0.002 | | 0.081 | |

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| Dependent variable | *ETS* | | *COAL* | | *MIX* | |
| Overall margin at $d = 1$ | 0.365 | $(0.027)^{***}$ | 0.139 | $(0.020)^{***}$ | 0.497 | $(0.028)^{***}$ |
| $d = 2$ effect | −0.080 | $(0.022)^{***}$ | 0.056 | $(0.019)^{***}$ | 0.024 | (0.023) |

$n = 576$, $\log \mathcal{L} = -547.84$, Wald $\chi = 56.85$, Wald $p = 0.001$, pseudo $R^2 = 0.056$. In parentheses are the standard errors clustered at the individual level. Stars indicate that a Wald test rejects the null that the respective margin is uniform or the respective effect is equal to zero at conventional significance levels ($^{*}$ at $p < 0.1$, $^{**}$ at $p < 0.05$, and $^{***}$ at $p < 0.01$).

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# Conclusion

- Individuals prefer climate policies they consider more effective.
- Highlighting that the EU ETS restricts markets can increase its acceptance among skeptics of the market economy.
- Highlighting the pollution by coal-fired power plants does not induce an urge to reduce emissions directly at those plants.
- Individuals respond to information about the effectiveness of policies.
- Information provision leads to a general increase in support for climate policies.
- Respondents prefer concrete over abstract measures and/or are concerned over local externalities.

# Policy Implications

- Information provision can increase support for effective climate policies.
- Communication about climate policies should address individual concerns.

# Thank you!

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