

Would You Like to Trade Your Energy? A Comparative Survey Experiment on Energy Trading Platforms

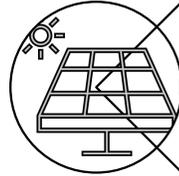
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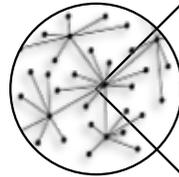
Background and Motivation



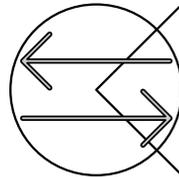
Net Zero Emissions Transition



New Energy Market Participants:
Active Consumers and Prosumers



New Energy Markets:
Local energy markets emerging to coordinate
decentralized generation



Peer-to-peer (P2P) and local energy trading among
prosumers and traditional consumers



Lack of research on how prosumers and consumers
will engage with these platform markets and the
incentives that would encourage their participation

Background and Motivation

- Investigating consumers' and prosumers' behaviour and decision-making would allow for a better understanding of opportunities and challenges associated with energy trading platforms
- Need for an investigation of the behavioural drivers affecting both consumers' and prosumers' willingness to participate
- Behavioural economics can investigate how behavioural biases and social norms affect decisions
- It can provide new perspectives that can inform policy and behaviour change, and can allow for an understanding of decision-making in energy trading

Research Aims

Our Contribution

Investigate both consumers' and prosumers' willingness to participate in energy trading platforms

Compare across three European countries

Determine the socio-economic factors and individual preferences which would motivate their participation, while also studying the behavioural components that motivate individual decisions

Methodology

Survey-Experiment

Collected information on individuals' willingness to join P2P energy trading platform, their behavioural biases, individual preferences and socio-economic characteristics

Vignette Experiment

Used to extract information about individuals' preferences and to investigate how people make choices

Hypothetical scenario with information about a P2P energy trading platform that contained reference to important factors in the decision-making process

Respondents asked if they would be willing to join based on a 5-point Likert Scale

Contrastive vignette technique (CVT) where the information within the vignette is varied, so that the effect of different attributes of the platform within the vignette could be examined

Vignette Experiment

Consumer Vignette Variables	Levels	Prosumer Vignette Variables	Levels
<i>Platform Trading Partner</i>	Neighbour Friend Relative	<i>Platform Trading Partner</i>	Neighbour Friend Relative
<i>Savings</i>	£75 £90 £115	<i>Earnings</i>	£125 £175
		<i>Trading Process</i>	Manual Automatic

- Variables chosen based on neoclassical and behavioural economic theory but also based on prior research on consumer behaviour in electricity markets.
- The variables also allowed us to investigate different aspects of their decision making.

Data and Empirical Methodology

Sample

Consumers: 1044 - 356 (UK), 338 (Italy), 350 (Spain)

Prosumers: 194 (Across all three countries)

Random sample, representative sampling and quotas to achieve a nationally-representative sample for each country

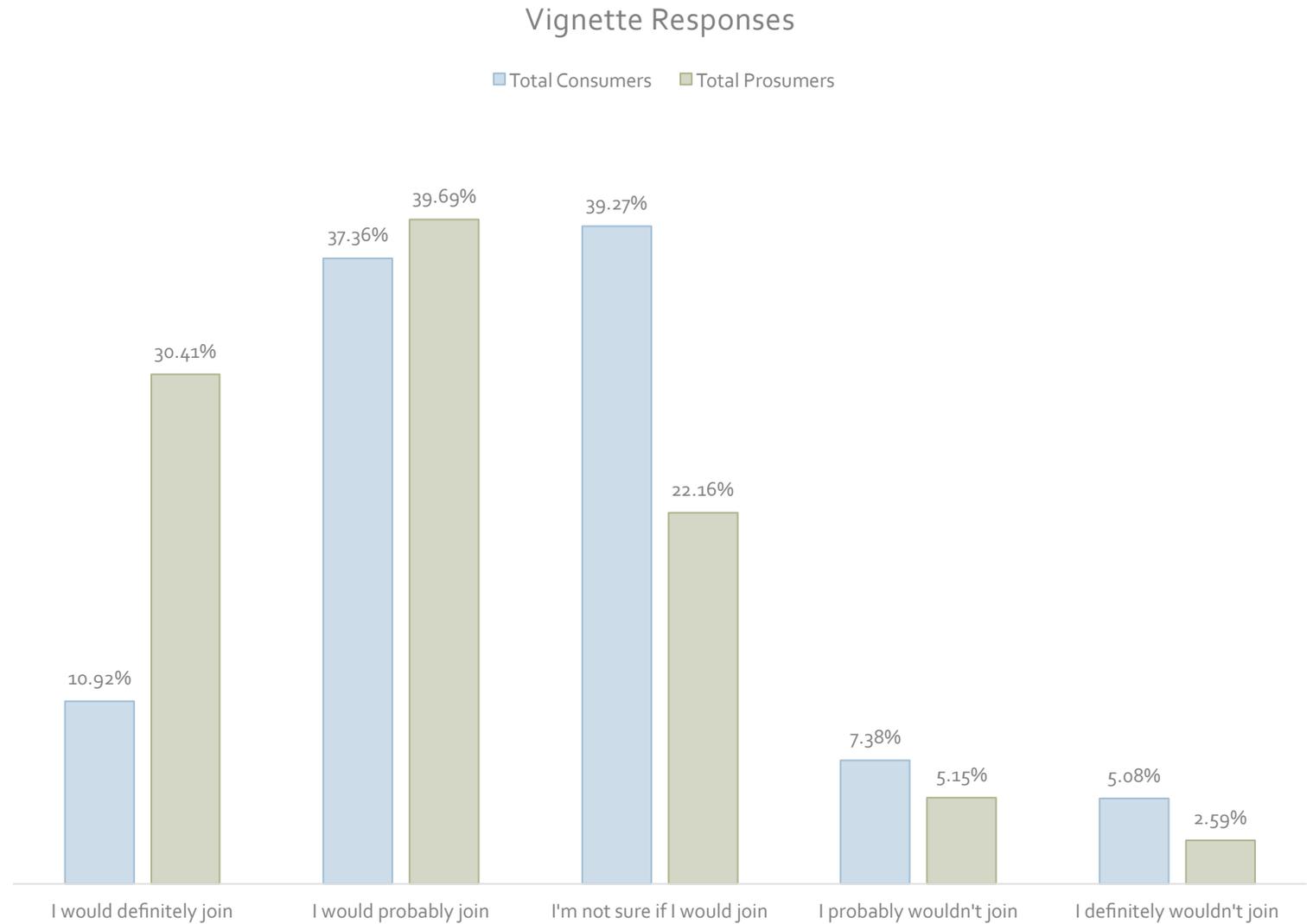
Empirical Analysis

Probit regression to determine the relationship between respondents' willingness to join and the vignette experiment, behavioural bias, individual preference and socio-economic variables

Binary Dependent Variable - 1 represents respondents giving a positive response for their decision to participate

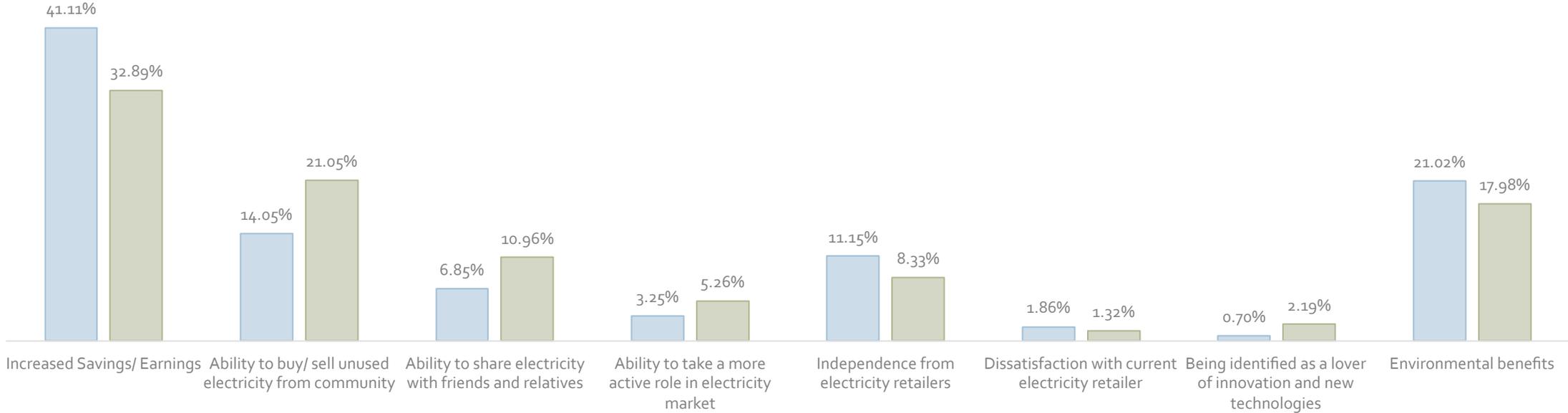
Results

- 48% of consumers gave positive response
- 70% of prosumers gave positive response



Reason for Positive Response

■ Total Consumers ■ Total Prosumers



Results

Probit Results

Experimental Variables

Consumers		Prosumers	
Variable	Coef. (Std. Err.)	Variable	Coef. (Std. Err.)
Neighbours		Neighbours	
Relatives	-0.027 (0.105)	Relatives	0.151 (0.098)
Friends	-0.055 (0.105)	Friends	0.126 (0.093)
£/€ 75		£/€125	
£/€ 90	0.151 (0.105)	£/€175	0.061 (0.076)
£/€ 115	0.113 (0.104)	Automatic	-0.035 (0.083)

Note: Statistical significance at ***1%, **5%, *10%.

Probit Results

Experimental Variables

Social Norms/ Relationships

H: Individuals more likely to join if they can trade with those whom they have closer relationships with, individuals follow social norms of their groups

Results: Ability to trade with friend or relatives compared to neighbour doesn't affect decision

Maximise Financial Benefits

H: Rational consumers and prosumers will be more likely to join if they are able to gain more savings or earnings from participating

Results: Increase in savings/ earnings from the platform within the range presented doesn't affect decision to participate

Minimise Effort

H: Rational prosumer more likely to join the energy trading platform if process is automatic and they can minimise effort

Results: Automatic compared to manual doesn't affect decision

Probit Results

Other Variables Affecting
Positive Decision to Join
Platform

Consumers	
Variable	Coef. (Std. Err.)
Climate Concerned (Binary)	0.206* (0.109)
Desire for Independence (Binary)	0.846*** (0.111)
Early Adopters (Binary)	0.279*** (0.090)
Risk Preference (1-10)	0.084*** (0.019)
35 to 44 years (Ref: 25 to 34)	-0.213* (0.121)
45 to 54 years (Ref: 25 to 34)	-0.519*** (0.125)
55+ years (Ref: 25 to 34)	-0.326** (0.137)

Note: Statistical significance at ***1%, **5%, *10%.

Prosumers	
Variable	Coef. (Std. Err.)
Climate Concerned (Binary)	-0.386** (0.179)
Energy Community Member (Binary)	0.136* (0.079)
Not present biased (Binary)	-0.281* (0.108)
Spain (Ref: UK)	0.207** (0.096)
Italy (Ref: UK)	0.165* (0.096)
Degree (Binary)	0.132* (0.079)

Note: Statistical significance at ***1%, **5%, *10%.

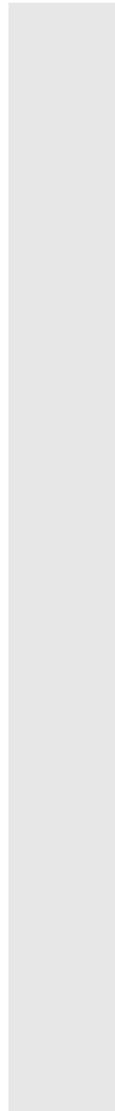
- The general responses of the experiment seem to point towards a positive attitude to the platform under the suggested scenarios.
- Despite claims that earnings and savings are a key driver for participation, the decision to join was not influenced by the levels of monetary gains shown to them, but was influenced by other characteristics, preferences and biases.
- If consumers/prosumers are to contribute to the achievement of zero emissions targets, it is necessary to account for these preferences, behavioural biases, cultural and social norms in addition to the more traditional monetary considerations which can drive participation in the energy market.
- In light of the evidence provided in our study it possible that participation in energy platforms are promoted by creating incentives and regulatory frameworks which reflect consumers' preferences for green generation which is independent of traditional incumbents and which is beneficial to the local and global environment.

Conclusion



Work in Progress

Analyse each country separately to account for differences in willingness to participate, preferences, behavioural biases across countries, while considering country contexts (different energy and environmental policies, cultural and social norms and energy industry innovation, etc.).



Thank You!

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