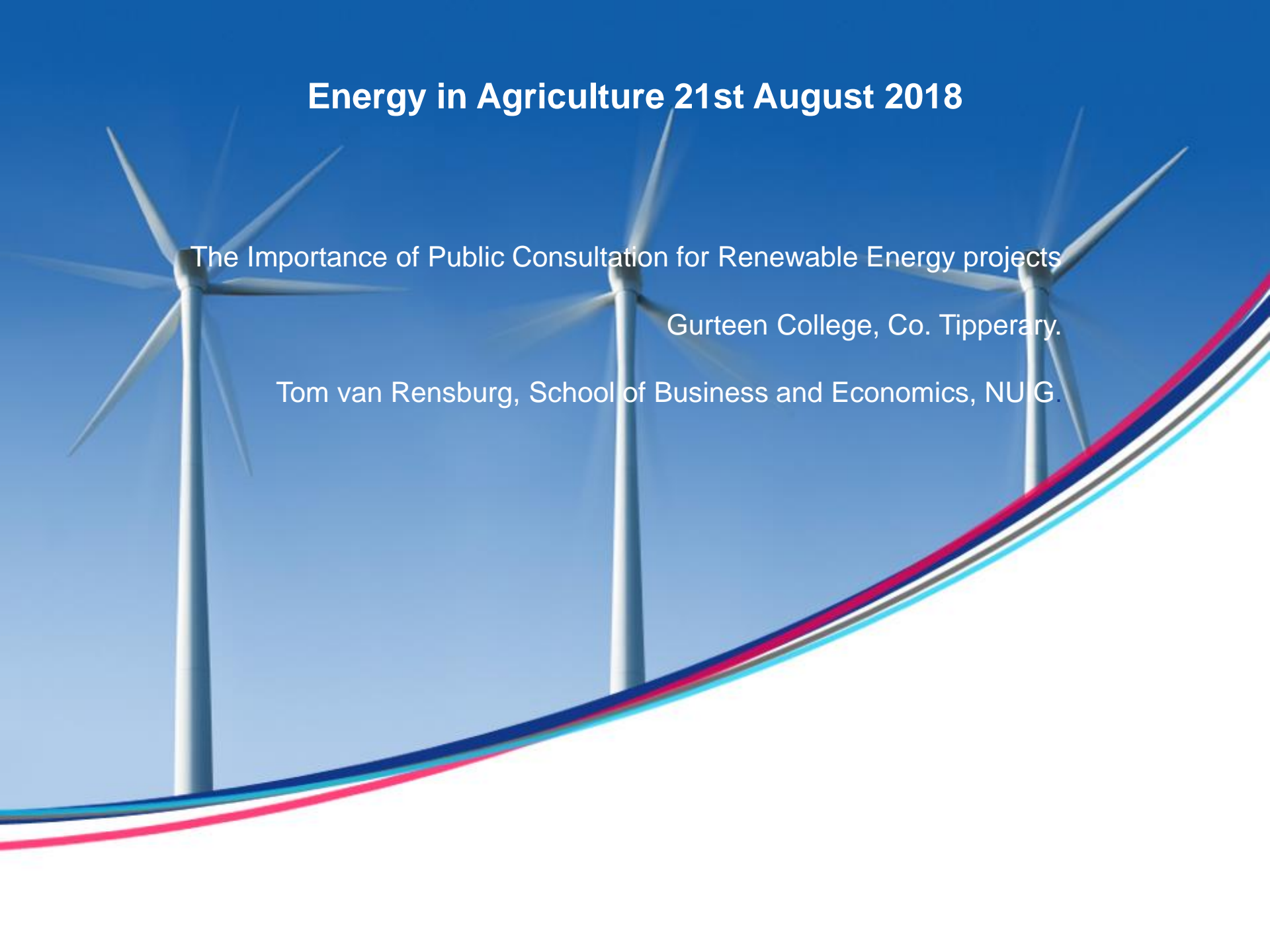


Energy in Agriculture 21st August 2018

The Importance of Public Consultation for Renewable Energy projects

Gurteen College, Co. Tipperary.

Tom van Rensburg, School of Business and Economics, NU G.



Negative externalities

- Evaluating social acceptance of wind farms
- An external effect occurs when production or consumption decisions of one agent affect the utility or production possibilities of another agent in an unintended way, and when no compensation is made by the producer of the external effect to the affected party [Perman *et al.* 1999].
- Role of landscape and biodiversity, noise pollution, shadow flicker, declining residential property values
- Attitudes may be changed with increased consultation, engagement, control or through local benefits and local ownership
- Current debate on setback distance
- NYMBYism



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Choice experiment literature

- WTP for varying environmental and physical impacts (Alvarez-Farizo and Hanley, 2002; Heintzelman and Tuttle, 2012; Jensen et al., 2014; Vecchiato, 2014; Fimereli, et al., 2008)
- Social and institutional aspects (Devine-Wright, 2005; Maruyama et al., 2007; Wolsink, 2007; Ek and Persson, 2014)
- Consumers WTP if wind farm owned/ partially owned by local community (Ek and Persson, 2014)
- Consultation and community representation (Brennan and van Rensburg, 2016)
- Experience (Eltham et al, 2008; Kaldellis et al, 2013)
- Respondents can value participation in the planning process more highly than physical attributes (height, no. of turbines) (Dimitropoulos, and Kontoleon, 2009; Ek and Persson, 2014)
- Export concerns (Meyerhoff et al., 2010; Brennan et al., 2016; Liebe et al. 2017)



Research aims

1. To evaluate to what degree local communities are willing to accept (WTA) compensation for wind farm production in their area, and how this varies according to key attributes of developments such as experience of ownership, consultation, compensation and perception of externalities;
2. Develop a framework to investigate tradeoffs between physical and social attributes that influence social acceptance of wind farms
3. Identify efficient policy scenarios that internalize the social costs associated with Irish wind farms by combining social or institutional factors such as community consultation, engagement with alternative physical attribute levels (setback distance, number of turbines)



Attributes

Attributes	Information provided	Levels
Number of turbines	This indicates the maximum amount of turbines in this wind farm for the project lifetime (20 years).	8 20 40
Export level	Indicates where the energy produced from this wind farm will be used. Could be 100% domestic (used totally in Ireland); 100% Export (used totally outside Ireland); or 50% domestic 50% export. (used both in Ireland and outside Ireland).	Domestic 50%: Export 50% 100% Domestic 100% Export
Setback	This refers to the minimum distance that these new turbines will be required to be spaced from your home.	500m 1000m 1500m
Community engagement & control	Refers to the level of engagement, control and information your local community will have over the planning and development of the wind farm. Levels could be Low (your community are informed about the development but cannot make changes); Medium (your community are informed and consulted and their opinions may be considered) or High (the developer and your community actively negotiate the planned wind farm together and inform one another throughout the development/at all times).	Low Medium High
Electricity discount	This refers to compensation paid to you for this wind farm development, in the form of a discount in your electricity bills each year over the project lifetime (20 years).	€110 €280 €450 €620

Onshore survey

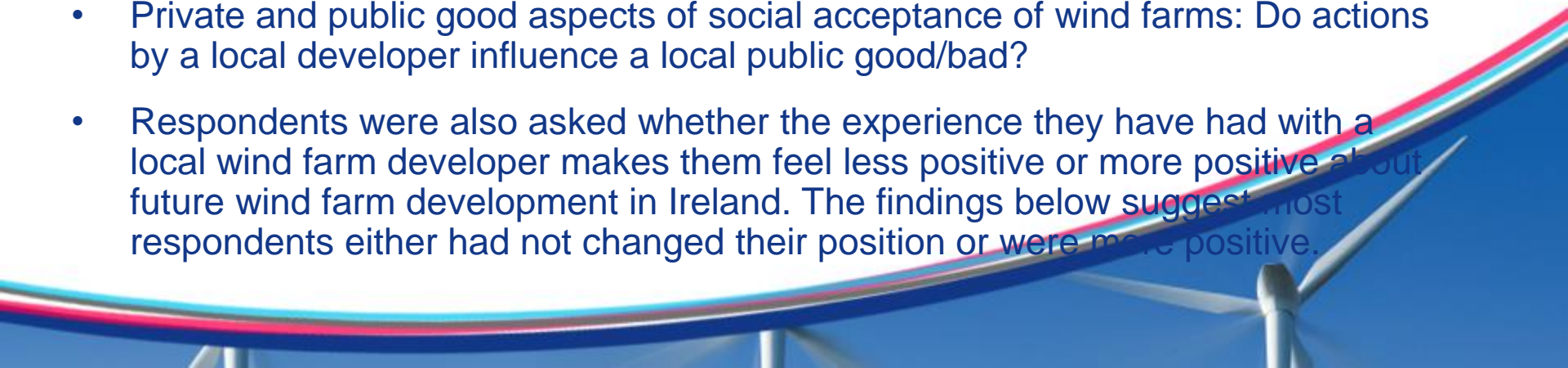
- Survey: 4 sections: attitudes towards environmental issues; personal reactions to local wind farm developments; choice experiments; demographic information.

Features	Option A	Option B	Option C
Electricity Discount	€620	€110	No new wind farm
No of wind turbines	20	20	
Export level	50% domestic, 50% export	No export	
Setback	1500m (0.93 miles)	500m (0.31 miles)	
Community engagement	Medium	High	
Choose	1	2	3

- 250 (onshore) individuals
- 12 choice cards with 3 alternatives: A and B: different combinations of attributes and levels: Option C: Status quo: *No new wind farm.*

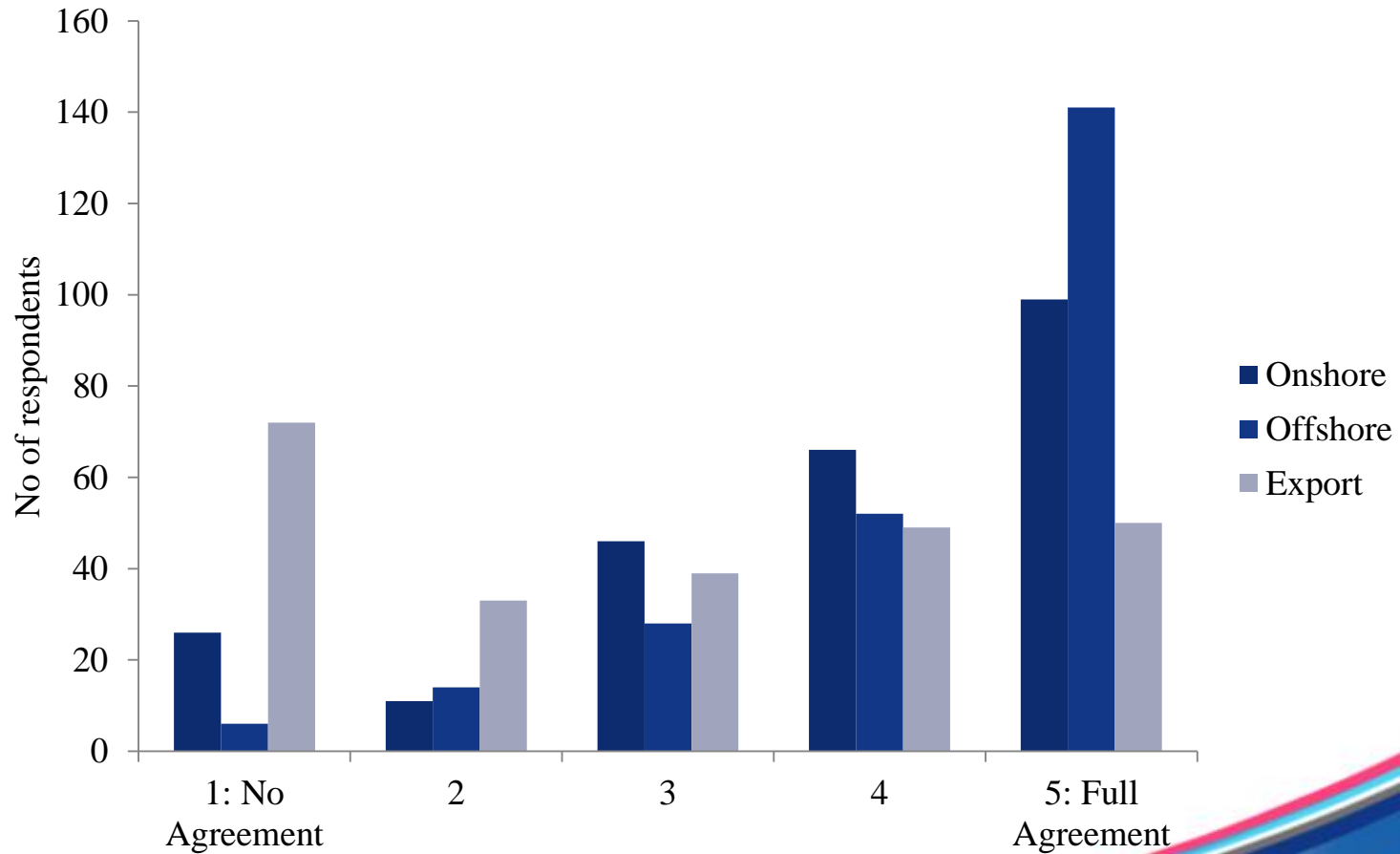
Attitudes and experience of my local wind farm

- Social acceptance by local residents is high. Most (72%) are willing to make trade-offs regarding WF attributes
- Most respondents are in favour of WF in Ireland with those in favour strongly preferring offshore WT. Respondents prefer WF for domestic use not exports
- Most respondents who are in favour of WF have not changed their opinions compared to 5 years ago. Respondents who were very positive became more positive with time
- Respondents were asked whether the local wind farm developer cooperates, provides financial benefits or information to local residents. Most respondents are either neutral or appear to strongly agree that developers engage with local residents with respect to these issues.
- With respect to ownership respondents are clearly divided in their preferences. Appear to be a preference for Irish farmers local to the area and purely local community ownership being the least preferred.
- Private and public good aspects of social acceptance of wind farms: Do actions by a local developer influence a local public good/bad?
- Respondents were also asked whether the experience they have had with a local wind farm developer makes them feel less positive or more positive about future wind farm development in Ireland. The findings below suggest most respondents either had not changed their position or were more positive.

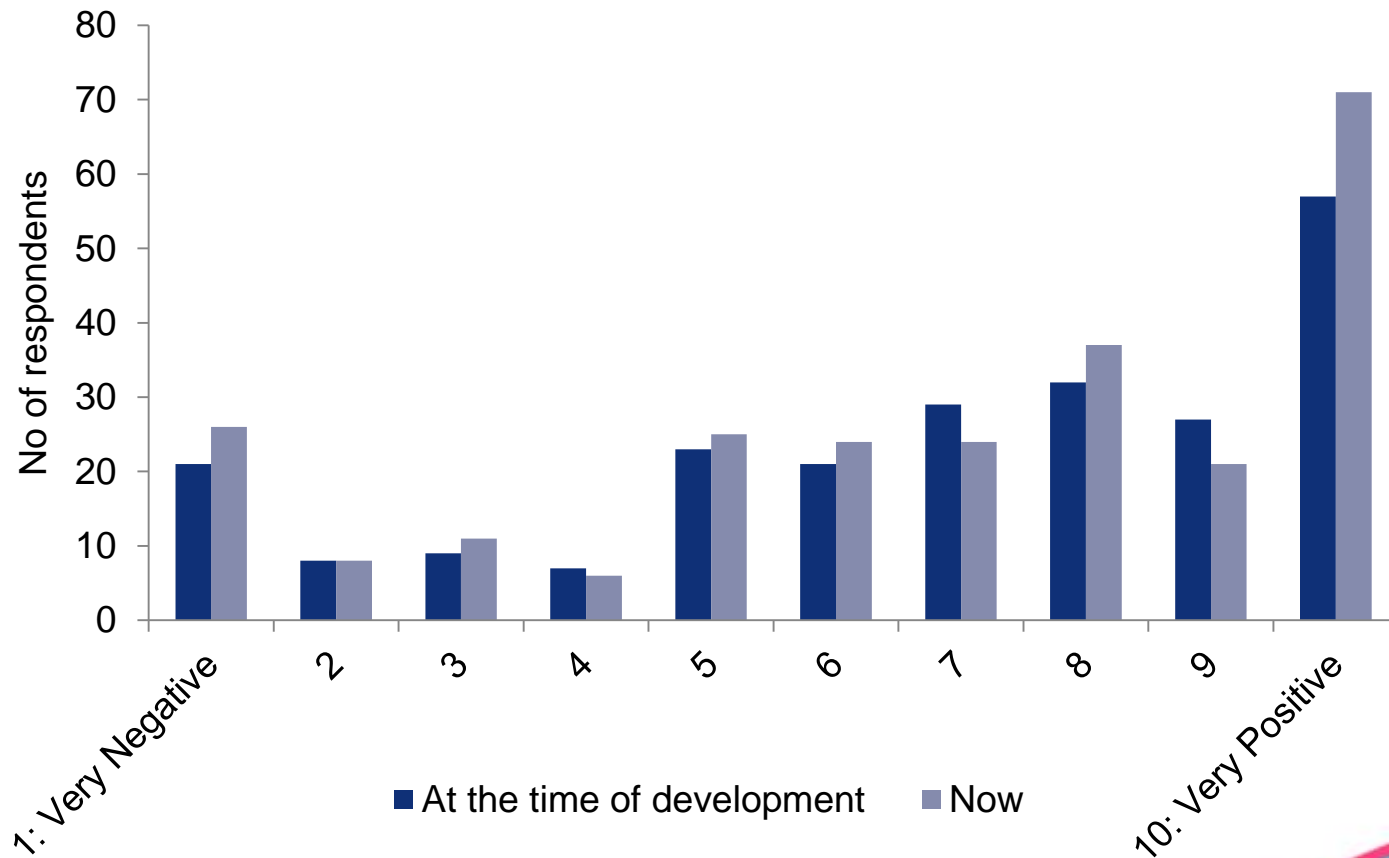


General attitudes towards wind energy

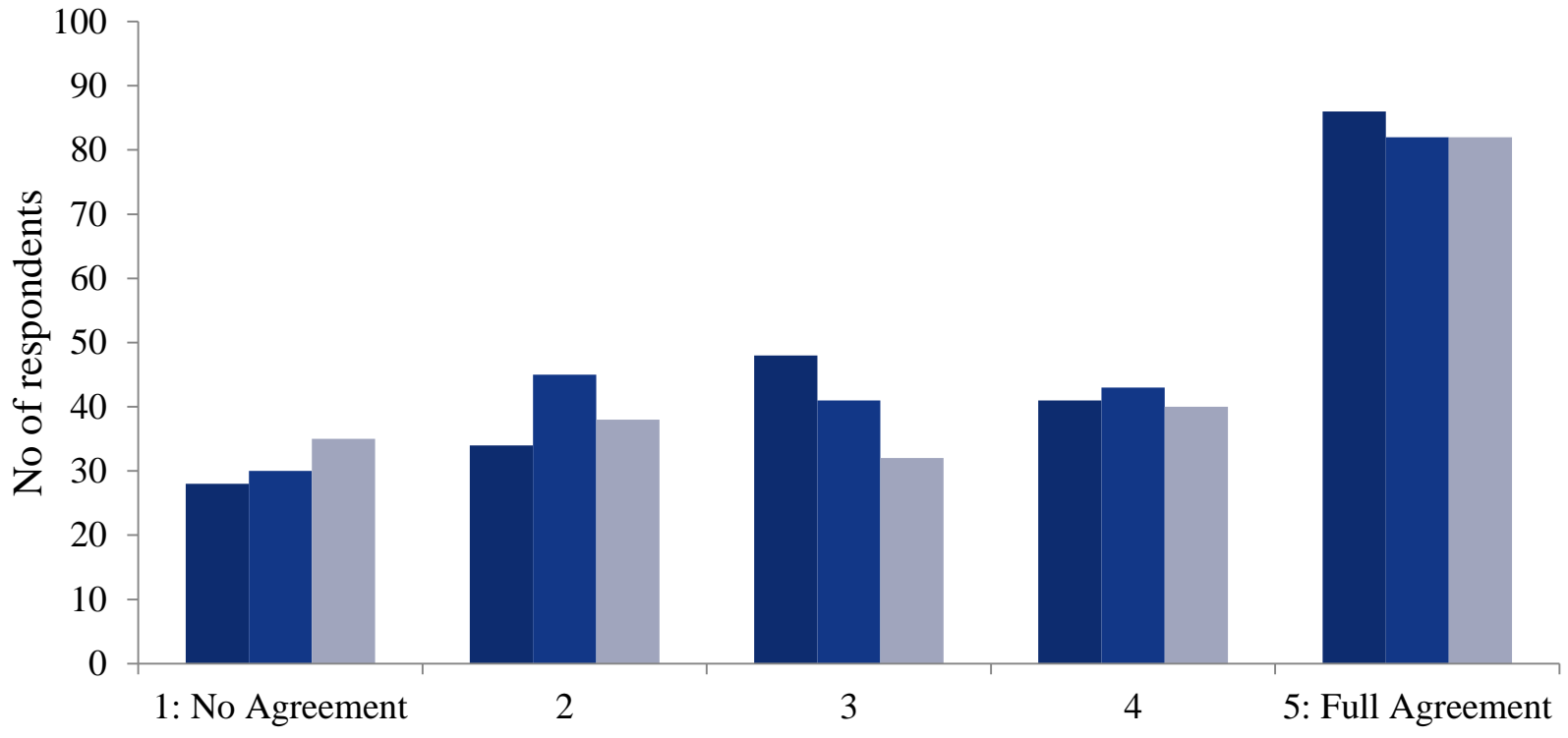
Opinions about the number of wind farms in Ireland with respect to onshore wind farms, offshore wind farms and wind farms dedicated to export.



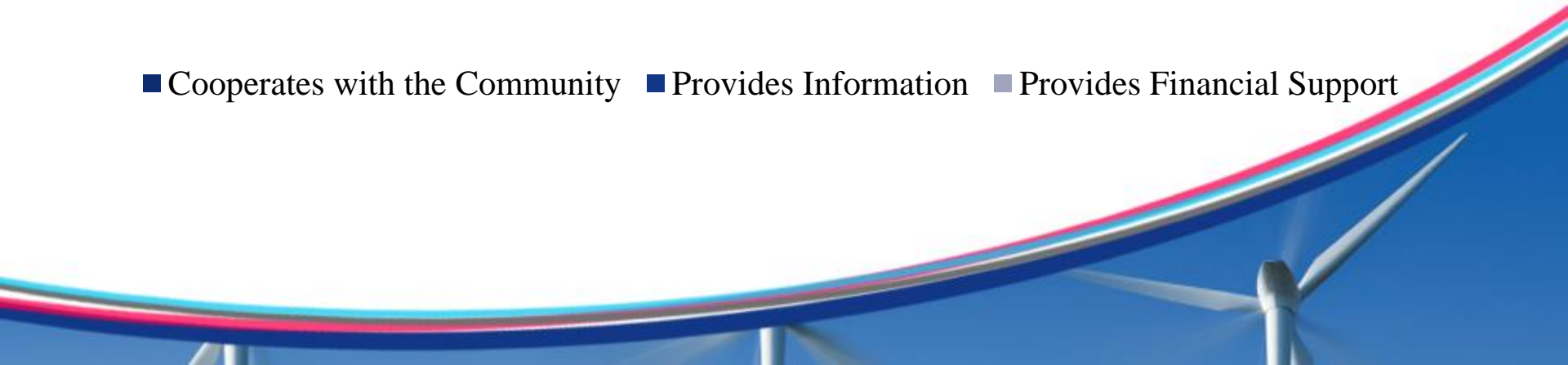
Feelings about wind farms over time in Ireland



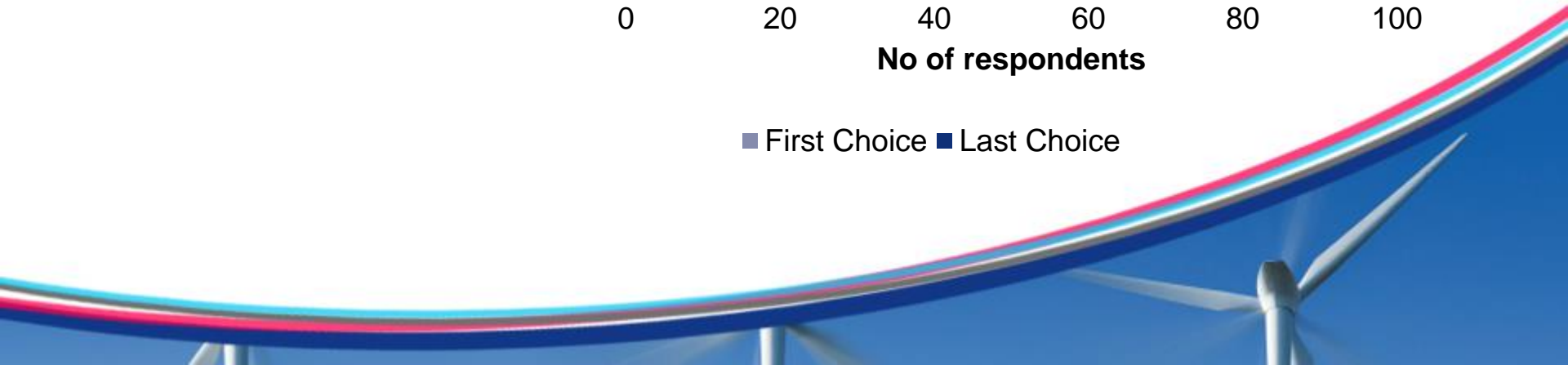
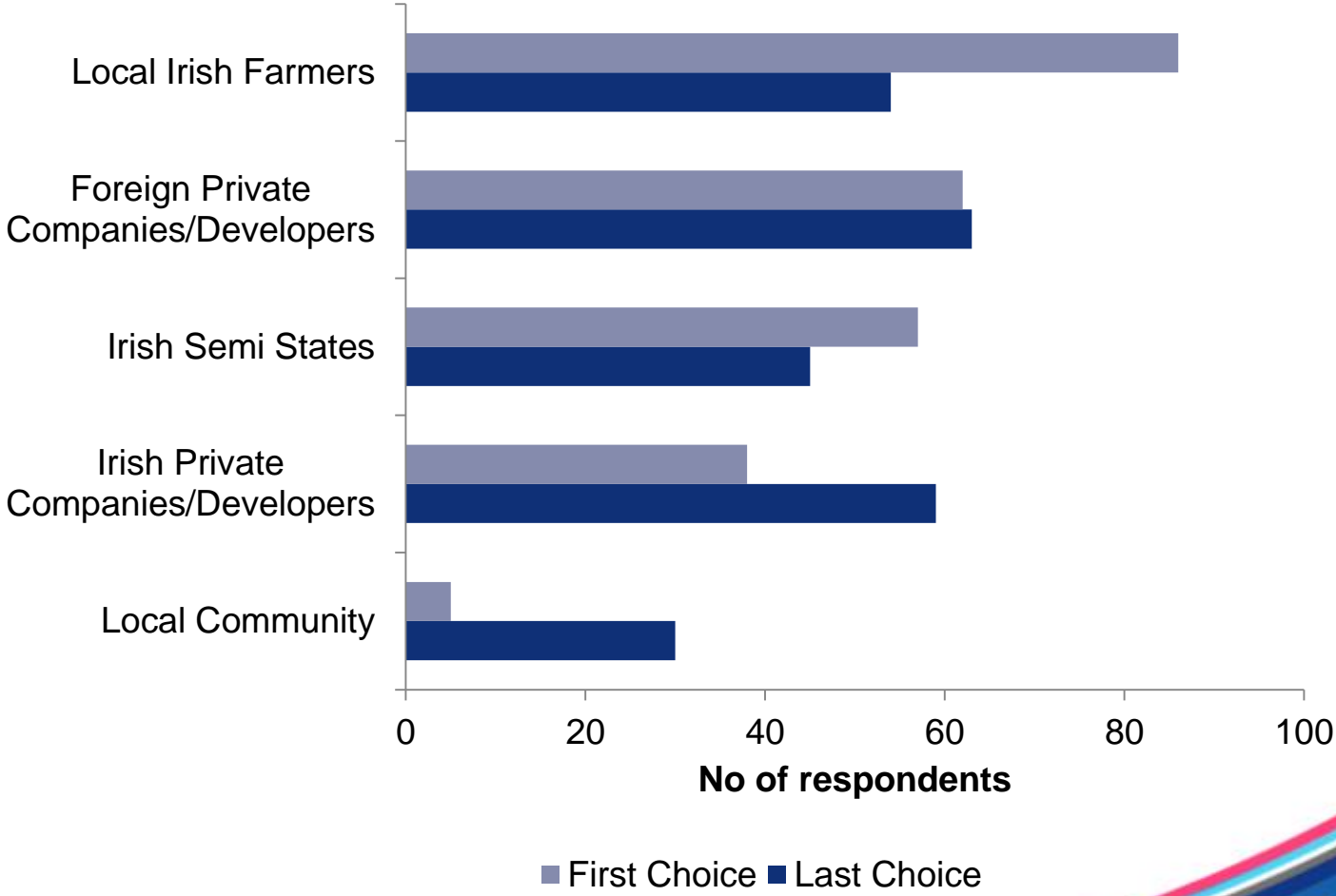
My local wind farm: Perceptions about local developers engagement with the community



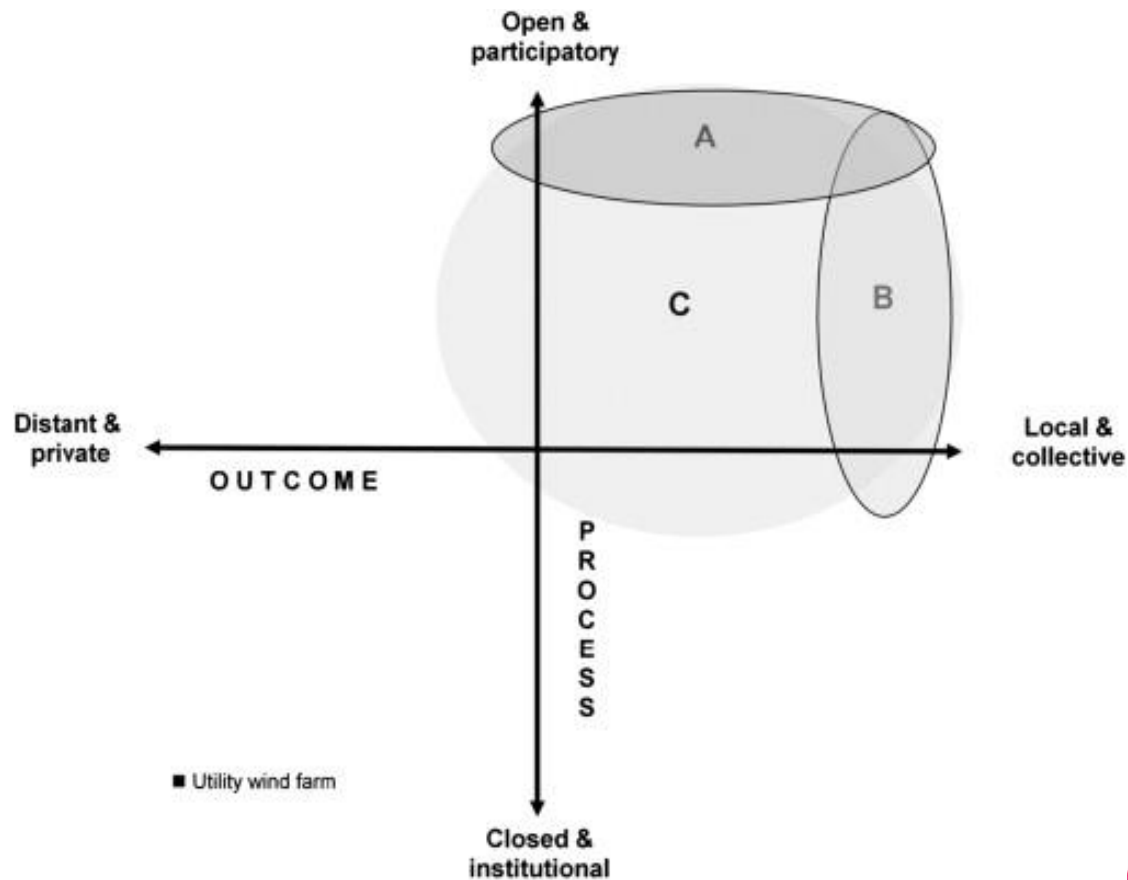
■ Cooperates with the Community ■ Provides Information ■ Provides Financial Support



Preferred ownership

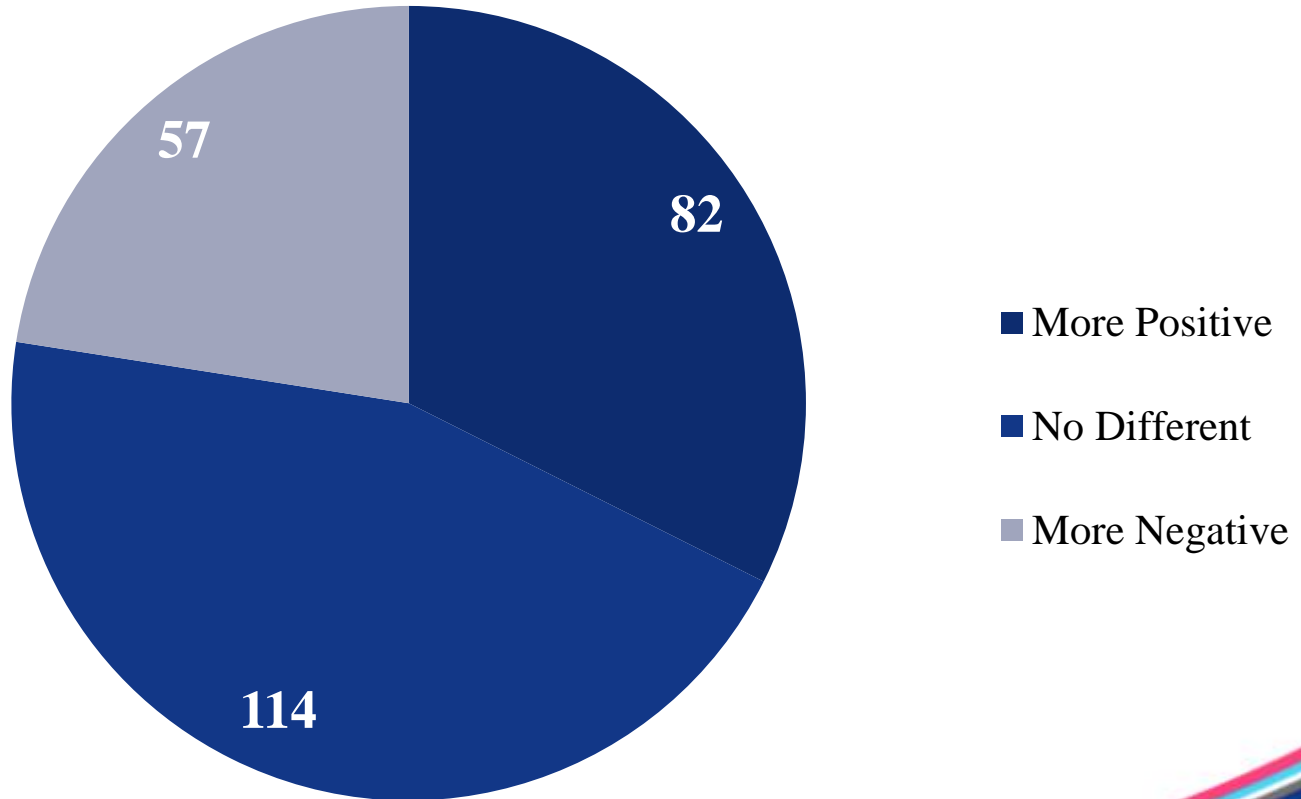


Measuring “Community” Involvement: Process vs. Outcome



Source: Walker and Devine-Wright (2008)

Impact of experience with local developer on my views of wind energy



Welfare estimates

	MNL	RPL
	€ /H.H,P.A	€ /H.H,P.A
TURBINES	-1.15 (1.72)	-0.82 (1.88)
EXPORT MEDIUM	36.93 (58.30)	93.82 (58.80)
EXPORT HIGH	111.90** (56.52)	148.32*** (54.85)
SETBACK 1000M	-476.25*** (71.73)	-503.82*** (67.43)
SETBACK 1500M	-701.76*** (83.07)	-705.13*** (80.93)
CITIZEN MEDIUM	-234.99*** (56.74)	-212.83*** (53.29)
CITIZEN HIGH	-12.36 (54.68)	14.41 (58.10)
Log- Likelihood	-2127.249	-1896.317
McFadden Pseudo R ²	0.11	0.20
No. of respondents	1.968	1.761
No. of observations	181	181
No. of Halton draws	2172	2172

Notes: Level of significance, ***=p<1%, **=p<5%, *=p<10%

Policy simulations

Attribute	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
SETBACK	500m	500m	1000m	1000m	1500m	1500m
CITIZEN ENGAGEMENT	No	Yes	No	Yes	No	Yes
WTA	-16.34 (37.56)	-229.17*** (65.54)	-520.16*** (81.65)	-732.99*** (95.88)	-721.46*** (94.75)	-934.30*** (115.91)
CONF INTERVALS	-89.96 57.28	-357.63 -100.72	-680.19 -360.12	-920.91 -545.07	-907.17 -535.76	-1161.49 -707.11

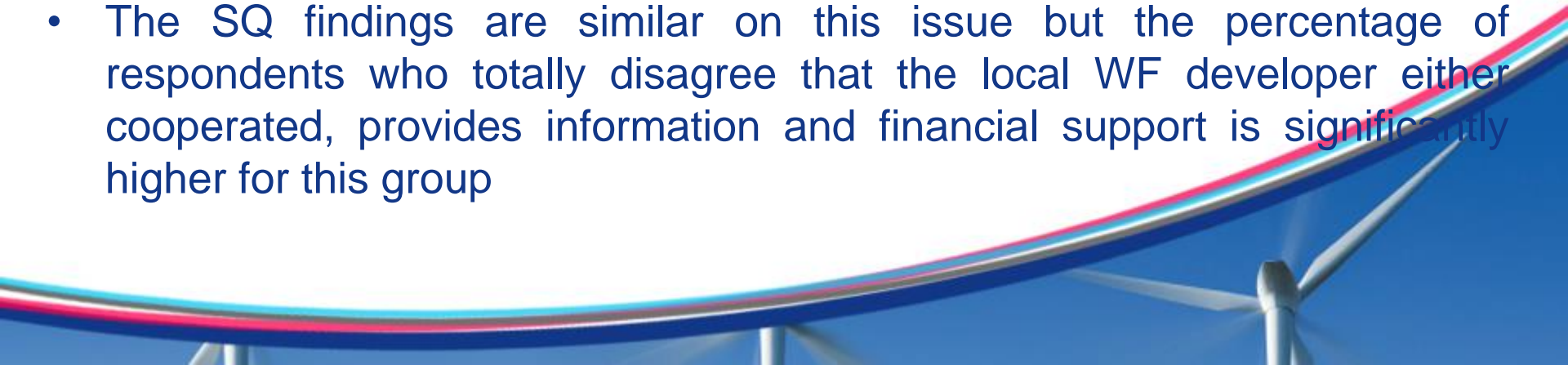
Policy simulations (standard errors within parenthesis).

Notes: Level of significance, ***=p<1%, **=p<5%, *=p<10%

The standard errors (within parenthesis) were calculated using the WALD command in Nlogit and values were obtained using the Krinsky and Robb method with 1000 draws.

- Assume 100 residents: 20 year project, at 20 turbines per farm for domestic use:
 - €458, 340 (case 2) [less densely populated areas]
 - €1,465,980 (case 4) [more densely populated areas]
 - Case 4 may be preferred (by developers) to case 6 in densely populated areas (Ireland's one-off housing policy)

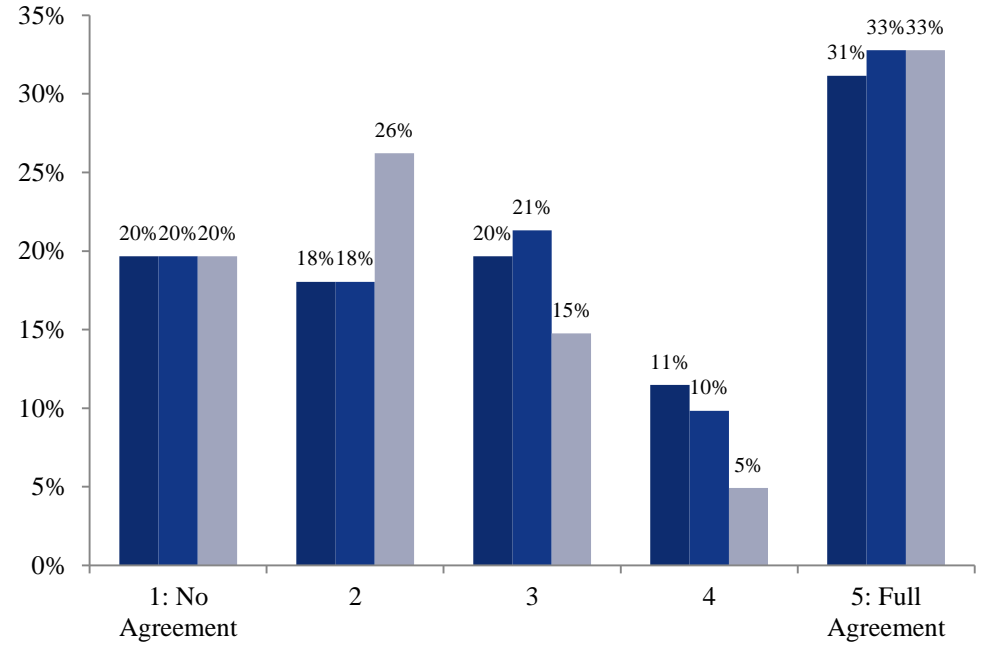
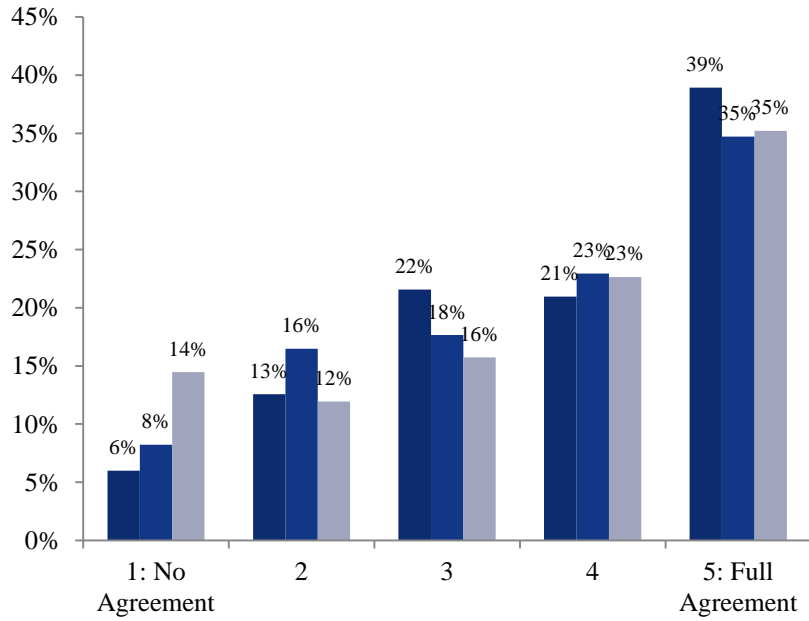
Status Quo Respondents

- 28% of respondents picked the SQ option
 - Most respondents are willing to make trade-offs regarding wind farms and their attributes
 - SQ respondents feel there is no need to increase wind energy and would not accept any amount of compensation
 - SQ respondents are much more negative regarding local farm developers actions compared to non-SQ counterparts
 - Over half of the non-SQ respondents fully agreed that the local WF developer engaged with the local community in terms of information, cooperation and financial support
 - The SQ findings are similar on this issue but the percentage of respondents who totally disagree that the local WF developer either cooperated, provides information and financial support is significantly higher for this group
- 
- A decorative graphic at the bottom of the slide features a stylized wind turbine on the right side, with its blades extending upwards. A thick, curved line in shades of blue and red sweeps across the bottom of the frame, curving from the left towards the right.

Local WF developer and SQ vs. Non SQ respondents

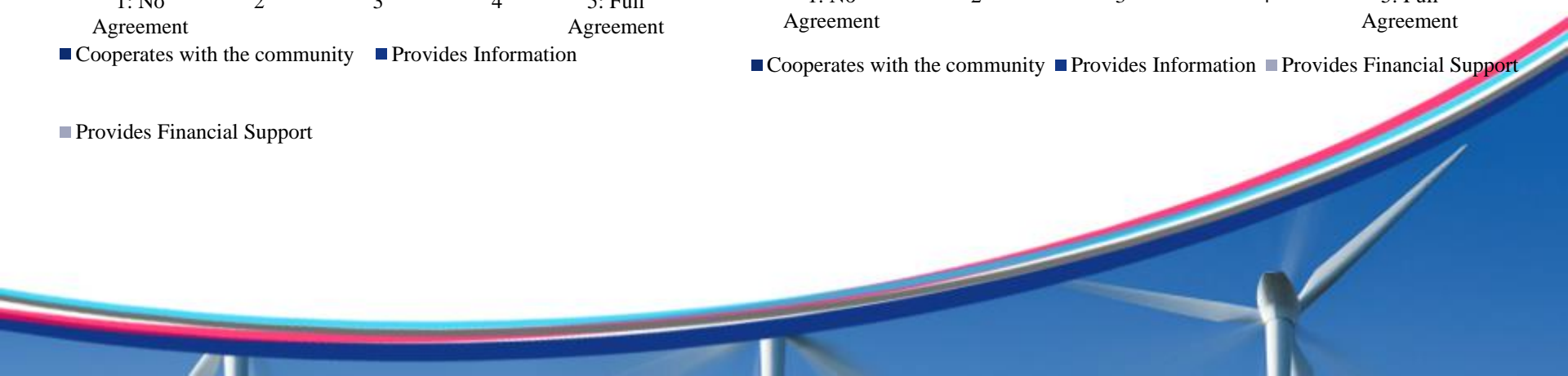
(a) Non SQ respondents

(b) SQ respondents



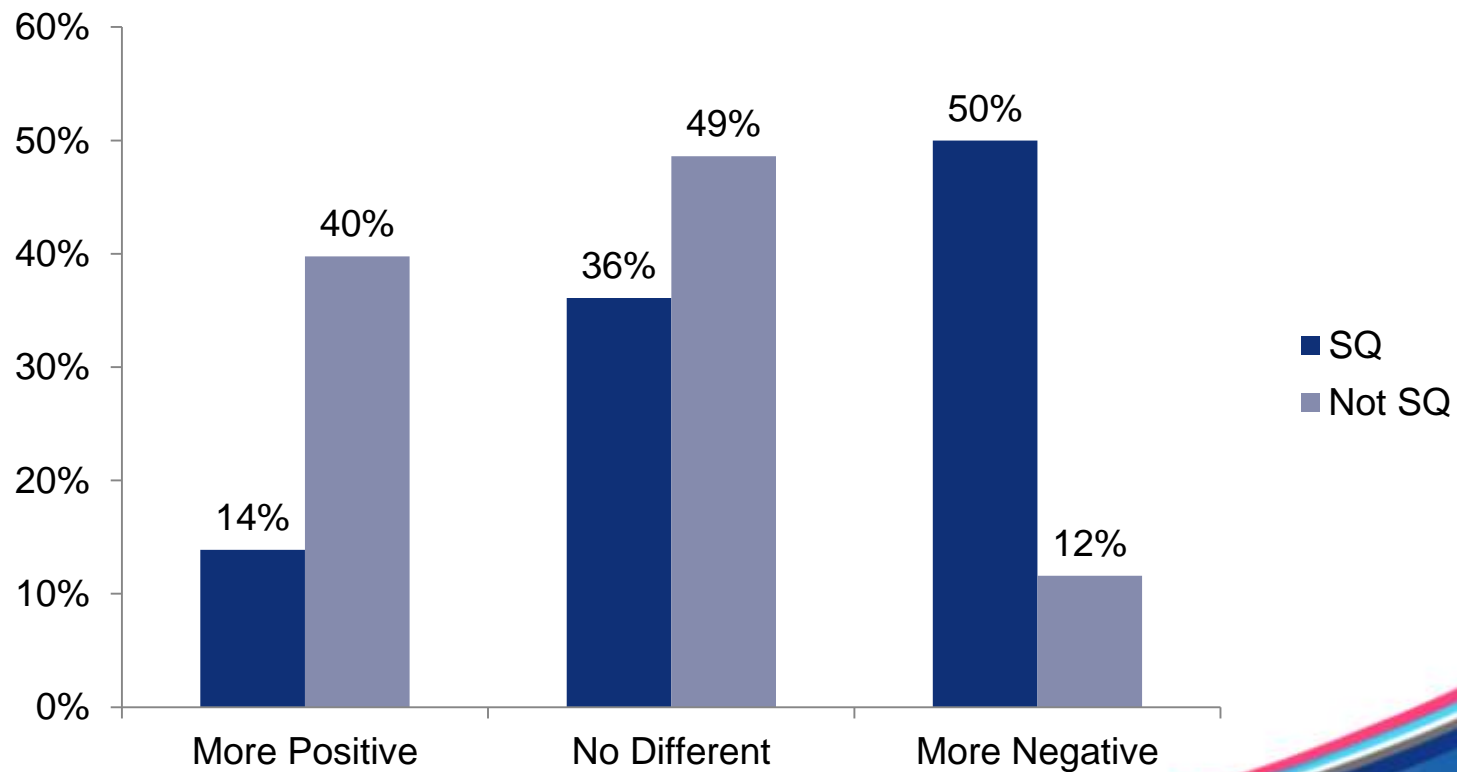
■ Cooperates with the community
 ■ Provides Information
■ Provides Financial Support

■ Cooperates with the community
 ■ Provides Information
 ■ Provides Financial Support




Attitudes to WF in general based on my experience

- Percentage of SQ and non-SQ respondents who feel that the behaviour of the local WF developer made them feel more positive, no different or more negative about wind energy in general in Ireland



Conclusions and policy implications

- Majority of respondents (72%) are willing to make (monetary) tradeoffs to allow for wind power initiatives, most individuals surveyed are generally supportive of WF
 - Negative externalities identified include visual dis-amenities, setback distance, electricity export.
 - Respondents are willing to make (monetary) tradeoffs to allow for setback distances to be changed.
 - Between €476 and €504 less in annual compensation is required P.H.P.A. if setback distances are increased from 500m-1000m. Recommended that the guideline minimum setback distance be increased from 500m to 1000m for moderately densely populated communities.
 - Between €213 and €235 less in annual compensation is required if provision is made for community engagement. Information and engagement between stakeholders and the wind farm developer may be a cost effective approach for many developers. Public good benefits of enhanced community engagement may be significant.
 - Recommended that alternatives to the private developer model be considered. Ownership appears to be linked to control, accountability, engagement. Preferences to broaden WF ownership model especially to include semi-state bodies and farming groups, or Co-ownership arrangements which speak and respond to concerns regarding control, accountability and engagement.
 - Heterogeneity with respect to preferences: Group with landscape and environmental interest vs. development interest. Both want engagement but to different ends.
 - External costs are broadly in line with community benefits proposed by the RESS
 - Implications for planning, wider technology adoption and low carbon transitions in Ireland (van Rensburg et al. 2015).
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Related References

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Brennan, N., van Rensburg, T.M., Morris, C. 2017. Public acceptance of large-scale wind energy generation for export from Ireland to the UK: evidence from Ireland. *Journal of Environmental Planning and Management* 60(11), 1967-1992.

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