



Onshore wind and solar farms in Great Britain: an energy justice analysis

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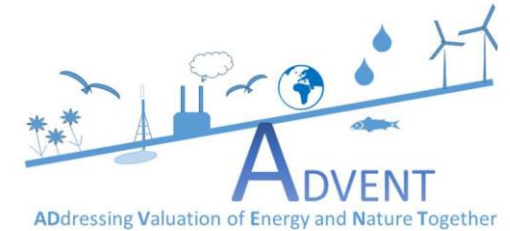


UFZ EnergyDays 2018
Energy Landscapes of Today and
Tomorrow

24 and 25 September 2018, KUBUS Leipzig

Overview

- **ADVENT project** (Addressing Valuation of Energy and Nature Together)
- Project focus: UK energy pathways – implications for **ecosystem services** and **natural capital**
- UK Energy Research Centre (UKERC)
- UK Natural Environment Research Council (NERC)
- PhD focus: relationship between **public acceptance** of energy technologies and ecosystem services (**landscape/visual impacts**)



UKERC





Rationale

“The transition towards a low carbon economy will require the reappraisal of the **form, function and value** of some contemporary and familiar landscapes [...]

For many people, ‘low carbon energy transition’ is experienced as the **transformation of landscape**”

Bridge et al, 2013 (p.335)



Technologies



Most common
land-based
renewables
in the UK



Theory



Wüstenhagen et al, 2007

Research questions

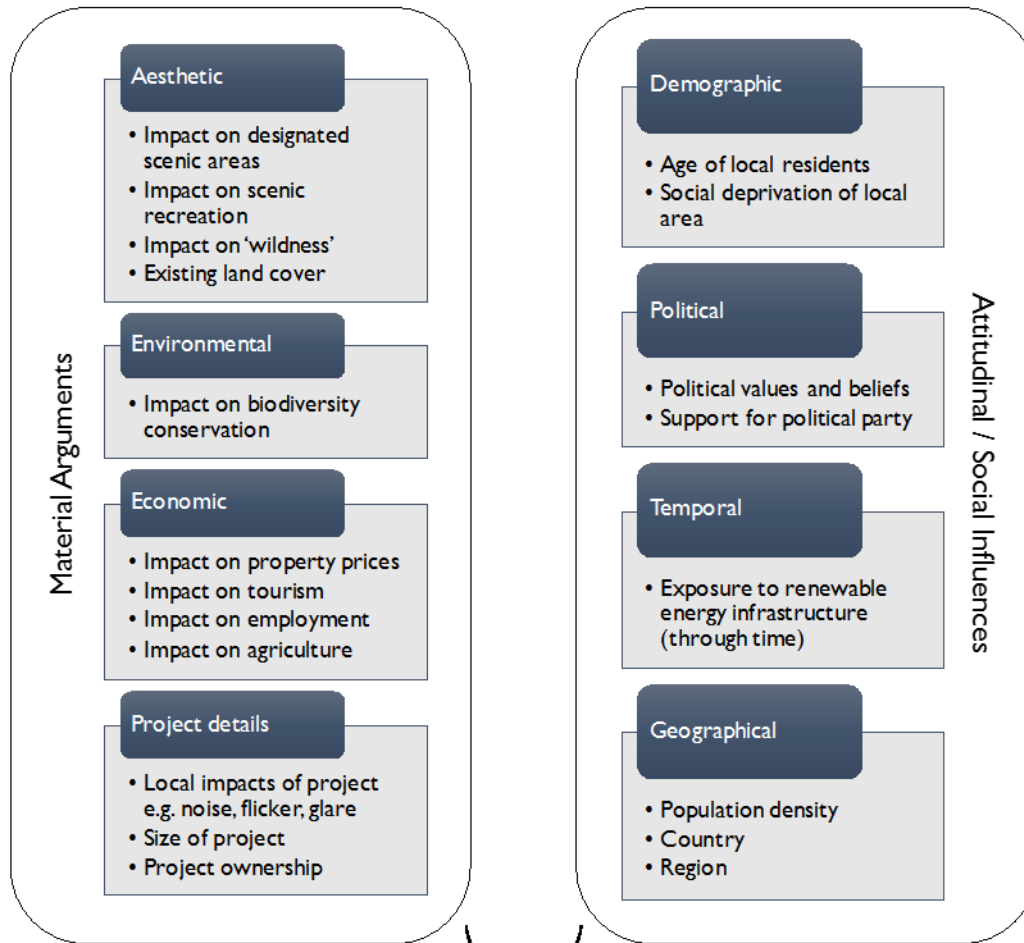
1. Does **community acceptance** play a role in **planning outcomes** for onshore wind/solar farms in Great Britain?
2. What are the consequences of (1) for where onshore wind and solar farms are **sited** across Great Britain?
3. What are the **energy justice** implications of (1) and (2)?

Approach to analysis

- Developed **conceptual framework**: indicators of community acceptance
- Obtained **planning data** from UK Renewable Energy Planning Database
- Calculated independent variables from a range of **geospatial datasets**
- Used **binomial logistic regression** to test association between them
- Scope: 1MW+ projects in **Great Britain** (applications lodged 1990-2017)
- Tested **hypothesis** that community acceptance has a role in planning outcomes

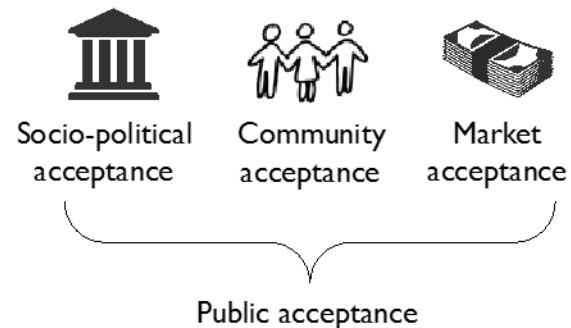


Specific arguments or reasons used to support and/or oppose projects



Factors which influence positive / negative social responses to projects

Conceptual framework



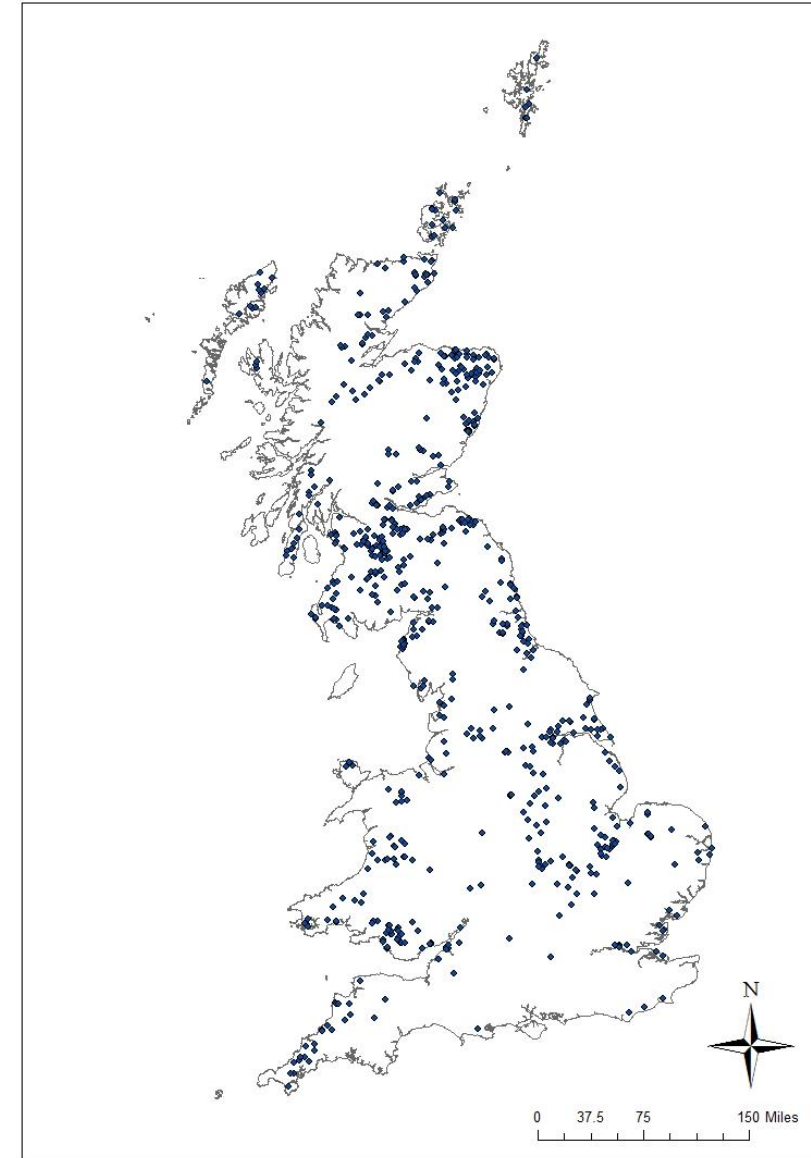
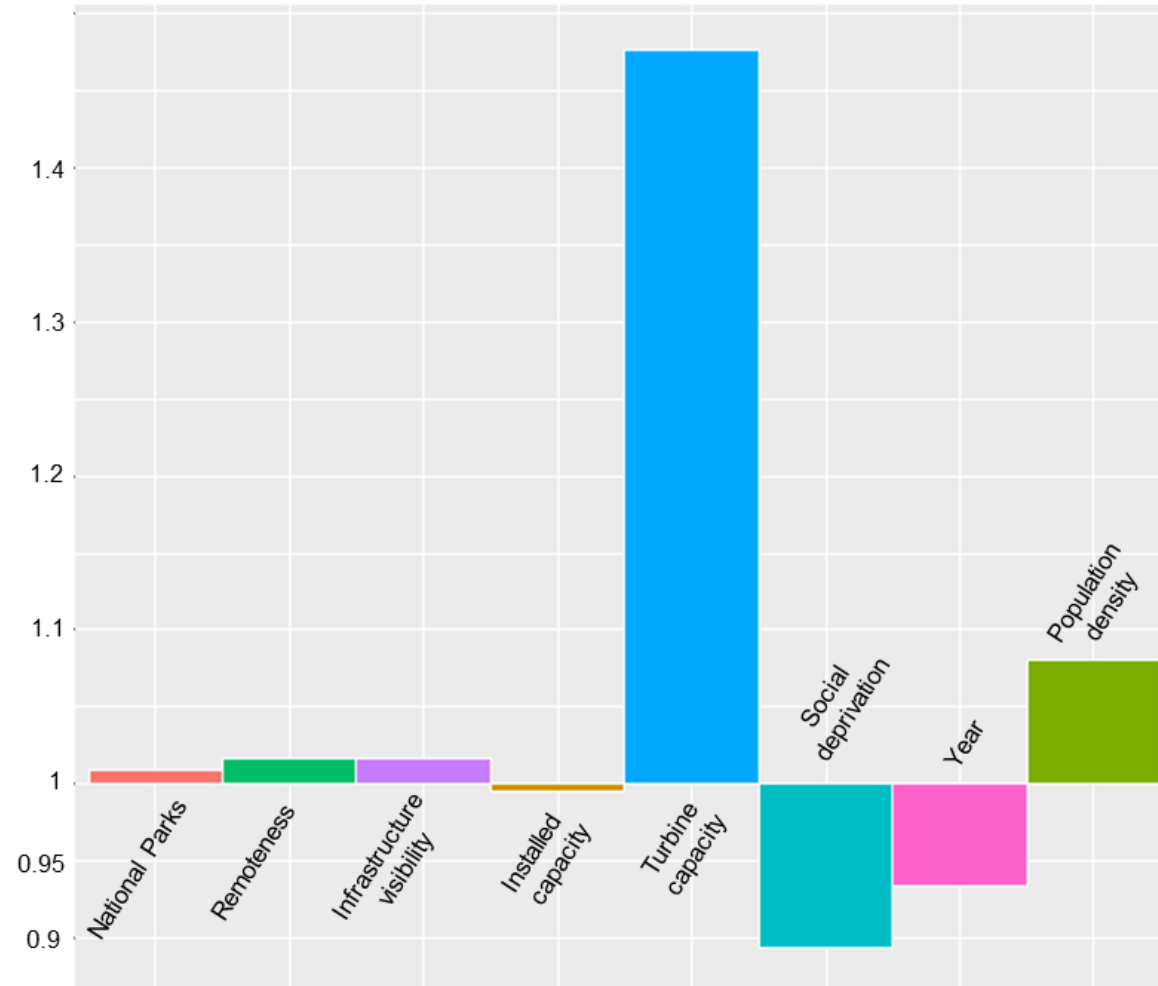


Key findings

- For both technologies:
 - the **visibility** of a project
 - its **installed capacity**
 - the **year** of the application
 - the **social deprivation** of the area
- For onshore wind:
 - **turbine capacity**
 - the project's **remoteness**
 - its distance to **National Parks**
 - the **population density** of the local area
- For solar farms:
 - the **ruggedness** of the landscape
 - the **grade of agricultural land**
 - the number of **tourist visits** to the area
 - distance to **Special Areas of Conservation (SACs)**

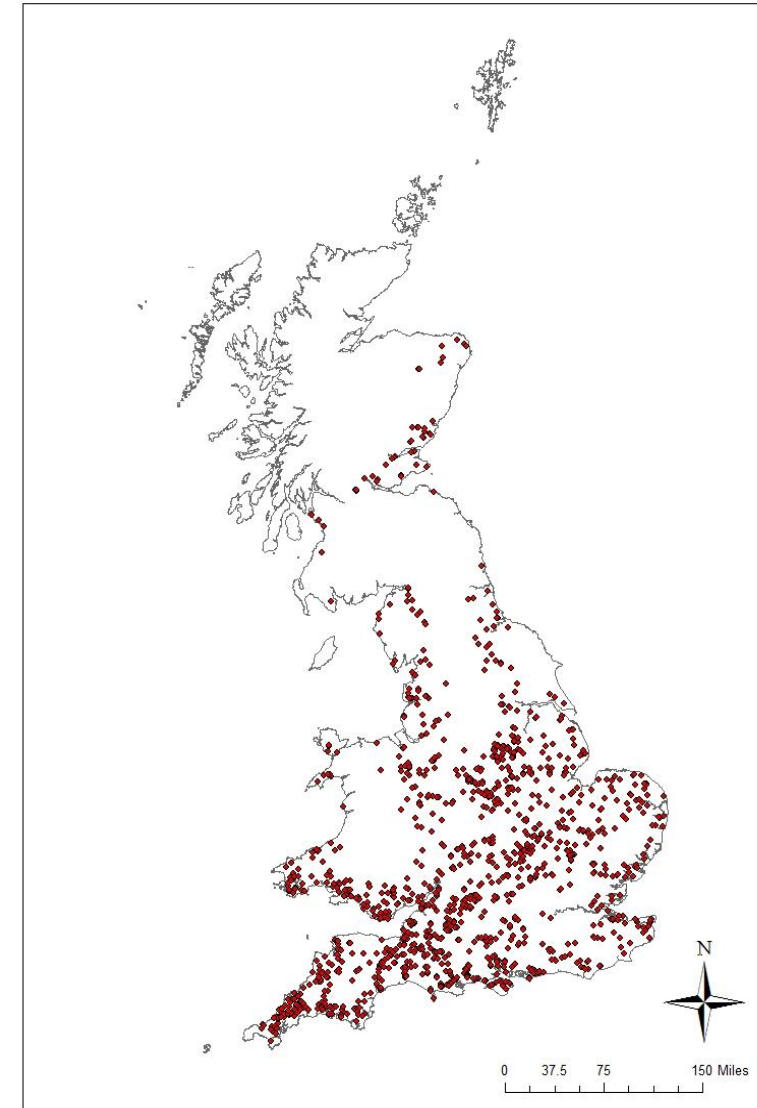
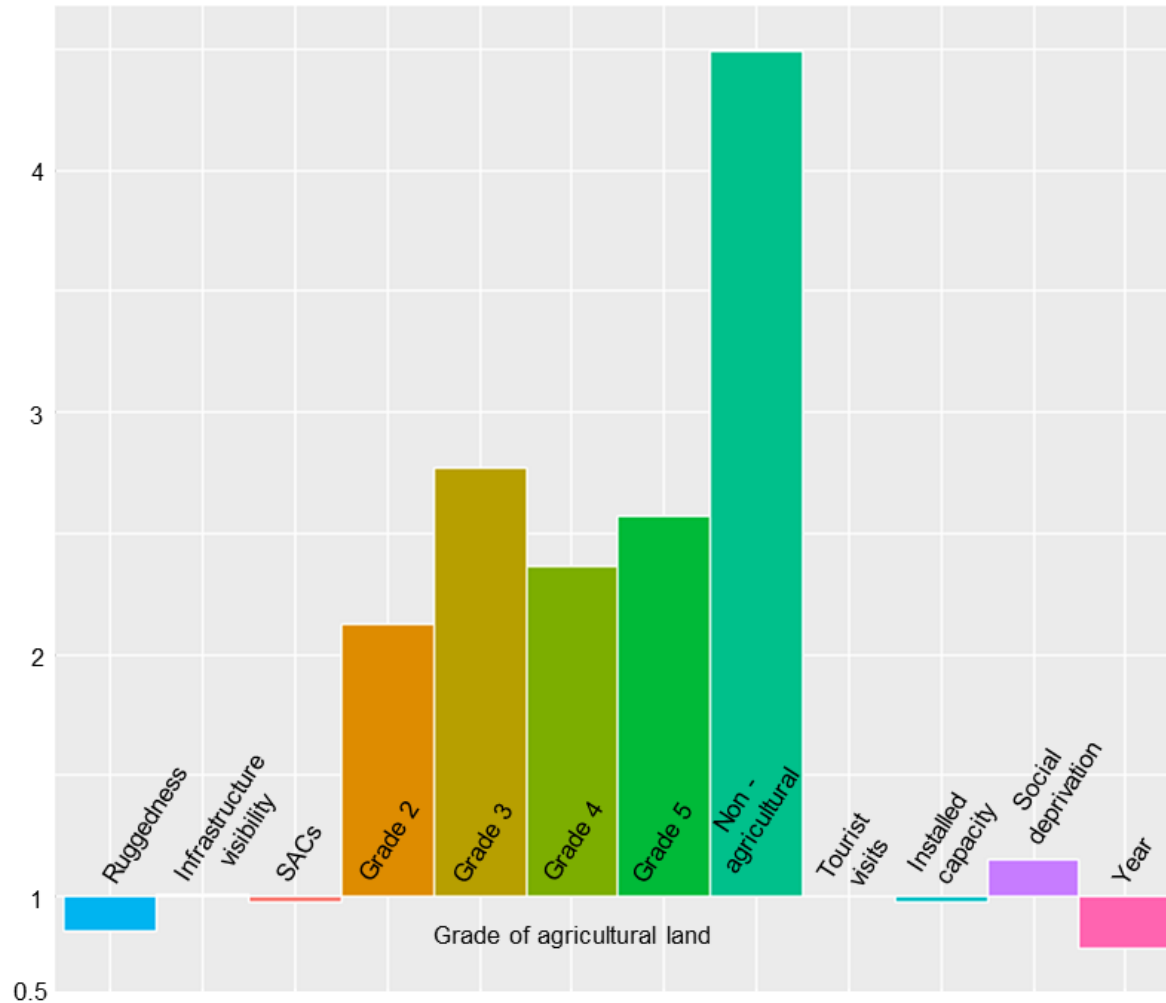


Findings: onshore wind





Findings: solar farms



Energy justice analysis

| | Distributional justice | Procedural justice | Recognition justice |
|----------------------------------|--|--|---------------------|
| Definition | Distribution of the impacts (+/-) of renewable energy | Fair representation of all stakeholders in energy-related decision-making (and who is recognised as a relevant stakeholder) | |
| Relevant findings | Visual impacts are being concentrated in certain locations | Onshore wind farms are more likely to be sited in wealthier areas, solar farms more likely to be sited in more deprived areas | |
| Key questions raised by analysis | Are renewables an environmental benefit or burden? | Are solar farms less popular with wealthy communities than onshore wind farms? What is the relationship between public acceptance and energy justice? | |

Heffron and McCauley, 2017

Recently published paper



Applied Energy

Volume 226, 15 September 2018, Pages 353-364



The role of community acceptance in planning outcomes for onshore wind and solar farms: An energy justice analysis

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Future work

- Viewshed analysis (who is exposed to most visual impact?)
- Spatial and temporal analysis of the UK Energy and Climate Change Public Attitudes Tracker survey
- Case studies of renewable energy planning applications

Thank you

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References

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Wüstenhagen, Rolf, Maarten Wolsink, Mary Jane Burer (2007) 'Social acceptance of renewable energy innovation: An introduction to the concept' *Energy Policy* 35: 2683–2691.

Heffron, Raphael J., Darren McCauley (2017) 'The concept of energy justice across the disciplines' *Energy Policy* 105: 658–667.