

Appendix

This is the Appendix for the Hitachi-Imperial College London Evidence Brief '*From Cost to Gains - Fair benefit sharing in local energy transitions*', authored by Sandra Bernick.

The Appendix includes:

1. Methodology description
2. Endnotes

1. Methodology description

This section describes the research process underlying the evidence brief. The evidence brief has four parts, and the methodology for each is described below.

The first part of the evidence brief is based on an in-depth literature review, to provide an evidence synthesis focusing on the impact of clean energy technologies on costs and benefits to host communities. The impacts considered are limited to economic costs and benefits, and do not, for example, cover issues such as environmental impacts on which there are already many reviews available elsewhere.

The review is also selective in several other ways. First, the review is restricted to studies on the most mature clean energy technologies, meaning those that have been rolled out at some scale. This includes onshore and offshore wind, utility-scale solar (especially solar farms), battery systems, transmission, distribution and any other grid infrastructure. We therefore explicitly exclude other technologies even those that can be considered clean. Second, we only include recent studies. In the first instance we focus on studies published in the last five years. Where evidence is non-existent or is thin, we extend this to ten years. This is done to ensure that the evidence we present reflects the current state of the technologies, which are still changing considerably, for example in terms of size. Third, we only focus on empirical studies that provide ex-post estimates, as opposed to modelling-based ex ante studies. This choice is made as we are interested in the documented response to infrastructure under real world conditions. Among the ex-post studies we focus on high quality studies, only including those that have both a before and after and a treatment and control group. Finally, the review only uses studies from the countries the evidence brief focuses on, that is Europe and the United Kingdom. The only exception is where no studies on a specific outcome of interest exist for this geography. In these rare instances the set of countries is broadened to other mature economies with relatively high levels of renewables.

The second part is based on a review of mandatory financial benefit policies in eight European countries.³ Here, we identified all financial benefit sharing policies currently in force or at advanced stages of the legal process for each of the countries. We achieved this by conducting a review of legal documents. This is supplemented with additional desk-based review and conversations with stakeholders. The identified policies were then classified into broad categories: direct compensation, bill discounts, taxation and fiscal devolution measures, community funds, shared ownership, and community ownership / criteria. We collected additional information on characteristics of each of the identified policies, which Figures 1 and 2 are based on.

The third part provides case summaries from in-depth case studies.⁴ The case studies are selected from the policies identified in the second part. We completed case studies on six policies, focusing on implemented policies. Only one policy studied was not implemented, which we included as its failure provides useful lessons in itself. The cases were selected to provide one example per category defined in the second part. We cover all categories, apart from community funds. The case studies are completed using desk-based research and, where feasible, original data analysis.⁵

The fourth part summarizes original research by Sandra Bernick and Mirabelle Muuls. These findings are based on micro-econometric analysis of the effectiveness and unintended consequences of the Danish package of policies implemented in 2009, and especially the impact of the compensation measures on the characteristics of future developments.

³ It is important to note that we only focus on mandatory policies throughout the evidence brief.

⁴ Extended case studies are available upon request for four of the case summaries.

⁵ Available upon request for cases 1 and 5.

2. Endnotes

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- ^{xii} Gillespie, T., McHale, P., 2023. Wind turbines and house prices along the West of Ireland. *CERIS Working Paper Series* 01.
- ^{xiii} The importance of siting decisions is underscored by Dröes and Koster (2021) recent study showing that 50% of total property value losses are attributable to just 1% of wind turbines in the Netherlands. See Dröes, M.I., Koster, H., 2021. Wind turbines, solar farms, and house prices. *Energy Policy* 155, 112327.
- ^{xiv} Research from Denmark demonstrates that house prices decrease by 3–6% when there are at least two turbines installed within a radius of one kilometre and this increases with each additional turbine. See: Jensen, C., Panduro, T., Hedemark Lundhede, T., Elberg Nielsen, A., Dalsgaard, M., Jellesmark Thorsen, B., 2018. The impact of on-shore and off-shore wind turbine farms on property prices. *Energy Policy* 116, 50–59. doi:10.1016/j.enpol.2018.01.046.
- ^{xv} Research from the Netherlands shows that the sites with the largest number of turbines, 30 or above, have the largest effect, though the difference to sites with the lowest number of turbines, where there is only one, is rather minimal (2.8 vs 2.4 percent). See: Eichholtz, P., Kok, N., Langen, M., van Vulpen, D., 2023. Clean electricity, dirty electricity: The effect on local house prices. *J. Real Estate Finance Econ.* 66, 743–777. doi:10.1007/s11146-021-09878-6.
- ^{xvi} Turbines above 120 metres in height result in a sales price response of 12% within 1 kilometre and 10% within 2 kilometres in a study on Denmark. See: Andersen, C., Hener, T., 2025. Wind turbines, shadow flicker, and real estate values. *Environ. Resour. Econ.* 88, 731–759. doi:10.1007/s10640-024-00947-x.
- ^{xvii} Turbines above 150 metres in height create outsized house price responses of 5.4% within 2 kilometres in a study on the Netherlands. See: Dröes, M.I., Koster, H., 2021. Wind turbines, solar farms, and house prices. *Energy Policy* 155, 112327. doi:10.1016/j.enpol.2021.112327.
- ^{xviii} The role of visibility was established early on and a sharper decrease in value is documented across countries, though first in Sunak, Y., Madlener, R., 2016. The impact of wind farm visibility on property values: A spatial difference-in-differences analysis. *Energy Econ.* 55, 79–91. doi:10.1016/j.eneco.2015.12.025. and Gibbons, S., 2015. Gone with the wind: Valuing the visual impacts of wind turbines through house prices. *J. Environ. Econ. Manag.* 72, 177–196. doi:10.1016/j.jeem.2015.04.006.
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- ^{xx} With the most recent evidence coming from a Danish study from 2014 largely conducted on much smaller turbines than usual today. See Jensen, C., Panduro, T., Lundhede, T., 2014. The vindication of don quixote the impact of noise and visual pollution from wind turbines. *Land Econ.* 90, 668–682. doi:10.1353/ide.2014.0038.
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- ^{xxii} Dröes, M.I., Koster, H., 2021. Wind turbines, solar farms, and house prices. *Energy Policy* 155, 112327.
- ^{xxiii} Maddison, D., Ogier, R., Beltrán, A., 2023. The disamenity impact of solar farms: A hedonic analysis. *Land Econ.* 99, 1–16. doi:10.3368/le. 071220-0105R.
- ^{xxiv} Ibid. The authors attribute the observed impacts of solar farms primarily to glint and glare effects. Differentiating by installation size, they document property value losses for homes located south of larger solar farms, defined as those with an installed capacity of at least 5 MW, in England and Wales. Within 750 metres, property values decline by 5.4% compared to similar properties not exposed to such installations. Losses almost double for solar farms exceeding 10 MW in capacity.
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- ^{xliv} See <https://www.collectivites-locales.gouv.fr/ifer-imposition-forfaitaire-des-entreprises-en-reseau>.
- ^{xlvi} The average treatment effect refers to municipalities where wind turbines are not locally owned. Germeshausen, R., Heim, S., Wagner, U., 2025. Support for renewable energy: The case of wind power. *J. Public Econ.* 250, 105468. doi:10.1016/j.jpubeco.2025.105468.
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