

From Cost to Gains - Fair benefit sharing in local energy transitions

Author: Sandra Bernick, PhD
(Imperial College London)¹

Scan for digital version with references and appendix including methodology, extended case studies and full literature review.



Introduction

Local resistance is a key bottleneck in the clean energy transition, delaying planning decisions and thereby increasing uncertainty and costs. While clean energy technologies are crucial to mitigating climate change, a global problem, their disamenities are highly concentrated in space, creating concerns especially among nearby residents. Solutions that improve the acceptability of power infrastructure are much sought after. At the core of this issue is the question of what those living near infrastructure can fairly be asked to accept, and how the costs and benefits of the clean energy transition should be shared. Financial benefit-sharing policies are a set of solutions to redress this balance and include compensation, taxation and fiscal devolution, bill discounts, community funds or shared ownership arrangements. Benefit sharing has often been voluntary, but countries across Europe, including the UK, are increasingly mandating it, making it a direct policy lever. This evidence brief focuses on what mandatory schemes achieve.

Do clean energy technologies support host communities?²

Finding 1. Local disamenities – negative effects on nearby residents - strongly depend on time, distance and design choices, many of which can be mitigated.

Renewable energy and grid infrastructure can impose local disamenities during operation. Evidence on the disamenity from onshore wind shows small, time-decaying negative effects on nearby residents^{i,ii,iii,iv,v,vi,vii,viii,ix,x,xi,xii} but impacts can be much larger when poorly sited^{xiii}. Larger wind farms tend to generate larger disamenities^{xiv,xv} as do taller modern wind turbines^{xvi,xvii} and greater visual exposure to them^{xviii}. Additional visual disturbance like shadow flicker increases the visual disamenity still^{xix}. For turbine noise, recent evidence is limited^{xx}. Offshore wind is understudied, with the only evidence pointing to no effects^{xxi}. For utility scale solar, as for onshore wind, disamenities are also larger near larger installations^{xxii,xxiii}. Again, this is attributable to visibility, namely glint and glare from the panels^{xxiv}. Grid infrastructure, especially high-voltage transmission lines, creates local visual and noise disamenities^{xixv,xxvi}. Mitigating the disamenity by undergrounding is rarely cost-effective, as its high installation costs are not offset by benefits^{xxvii}.

Finding 2. Renewables generate some local employment across all project phases, but net effects are small and specialised skill needs can limit local gains.

Solar creates more local jobs than wind during construction, and gains from wind are smaller, decreasing^{xxxvii} and transient^{xxxix}. Similarly, onshore wind reduces unemployment only in two pre-operation years, with no post-opening effects^{xxx}. The small job gains from installing onshore wind are offset by reductions in other sectors^{xxxii}, indicating a temporary reallocation of economic activity. This temporary nature means job quality is generally low, skewing toward lower-skilled workers^{xxxiii}. Higher-skilled, higher-wage local jobs in operations and maintenance are limited: these skills are scarce locally, so developers bring in outside specialists, which reallocates workers rather than increasing net employment^{xxxiiii}. Renewable installations can raise local incomes, though these gains are modest^{xxxv,xxxvi}.

Finding 3. Boost in local budgets driven by renewables tax contributions increases projects' attractiveness, especially in more rural and depopulating areas, though this depends on scope, size and level receiving tax.

Evidence from Southern Europe suggests onshore wind projects can substantially increase municipal revenues via local taxes and fees, especially in sparsely populated areas^{xxxv,xxxvii}, or create indirect benefits from generally higher revenues^{xxxviii}. Such local fiscal gains from renewables reflect not just a larger tax base but also policy responses. Because local tax systems vary widely, fiscal benefits from renewables may not translate equally across countries unless reforms ensure the local level receive the associated tax revenues.

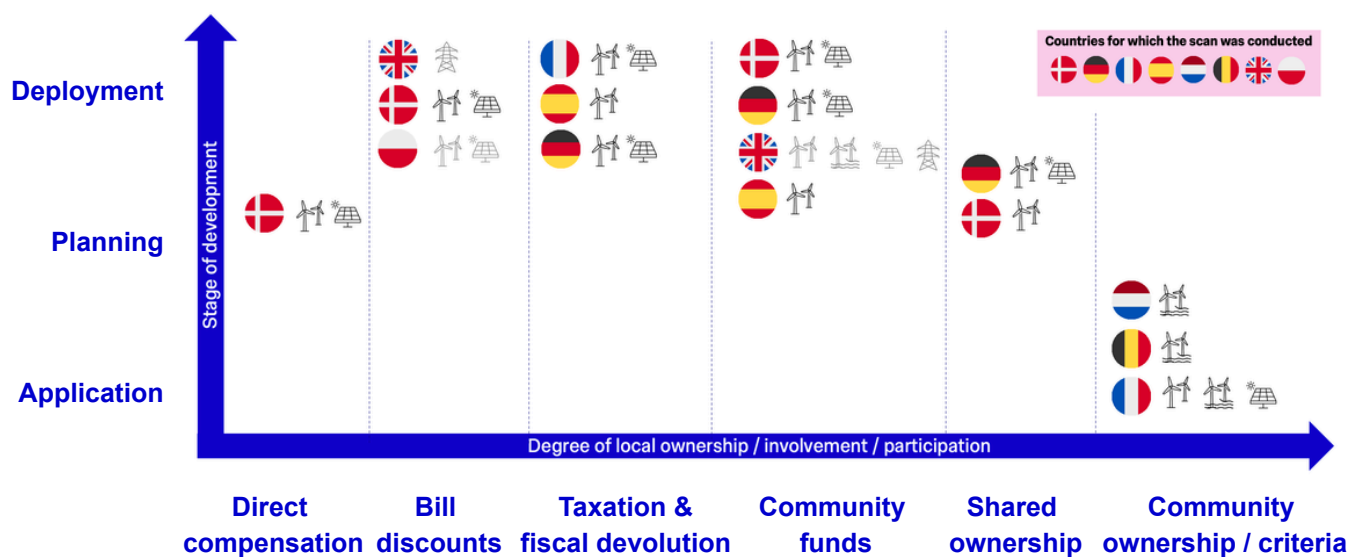
Germany undertook such a reform in 2009, increasing the local tax base by 5.2%^{xxxix}. Without this, local government may still benefit from higher local value generation, such as higher gross value added per capita^{xl}. Renewables also boost specific sectors, primarily agriculture. On-farm income increases from land leases, agrivoltaics benefits^{xli,xlii} or wind subsidies^{xliii}.

Policy options to retain benefits locally

Finding 4. Few mandatory schemes offer mechanisms for local communities to shape them, especially at an early point in the development process.

The continuing rollout of renewables across Europe has led policymakers to implement policies that shift some benefits to local communities, and especially those directly affected. These so-called financial benefit policies range from providing compensation, to (re)designing taxes, establishing community funds, creating bill discounts for residents, and providing purchase options. They differ by who shapes them, who benefits from them, and the benefits provided. Who shapes them often differs along two important dimensions (shown for schemes from eight European countries in Figure 1). The degree of local participation is often limited, especially in direct compensation and taxation schemes that are decided at a central government level. Local communities usually have an active role in shaping shared or full community ownership. The stage of the planning process also matters to the role local groups can take. In most of the mandatory schemes studied, communities are only brought in at an advanced planning stage, leaving little room to shape arrangements that are often designed as one-size-fits-all. An important exemption is where infrastructure is awarded competitively, and evaluation includes community-related criteria. Although these schemes are still developer-led, they give local communities more scope to be involved.

Figure 1. Benefit sharing policies by degree of local ownership and development stage

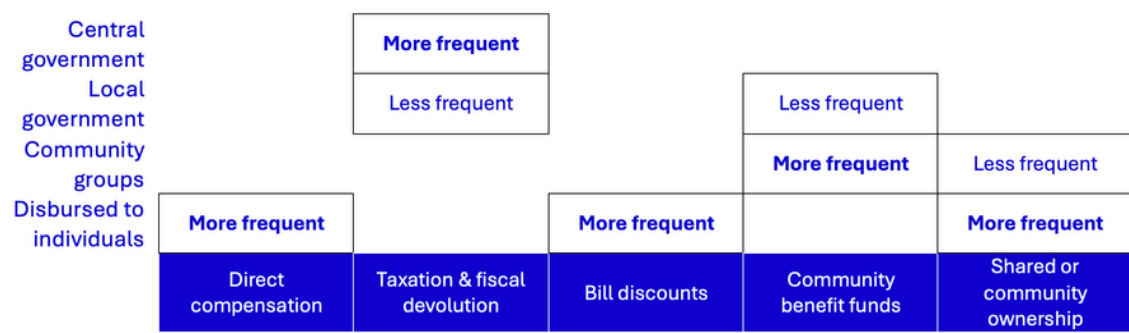


Review of mandatory enacted or planned schemes in Denmark, Germany, France, Spain, the Netherlands, Belgium, United Kingdom and Poland. In the category 'shared or community ownership', we focus on shared ownership schemes. Dark grey denotes enacted schemes, light grey schemes under discussion.

Finding 5. Community benefits do not necessarily benefit all of the community. Where benefits increase entrenched inequities, polarisation and resistance continue, contrary to intent.

Once the infrastructure is installed, benefit-sharing policies also differ in who receives the funds. The first important difference is the level at which funds are received. At the extreme, for taxation, a share can flow to the central government. Other schemes target people in the area but differ in who they aim to benefit: the wider community, specific groups or individuals. Payments to individuals are most common where the aim is to compensate for exposure to disamenities, as with direct compensation and bill discounts. They are also frequently the unit chosen in shared ownership schemes, as selling shares to individuals is administratively easier than requiring the establishment of financial structures for groups or communities. This creates a second important difference between schemes. Where only a few or specific groups benefit, this has been shown to create resentment against the technology in non-recipients (see Case study 5). However, in schemes where funds are received by a local administration, evidence suggests residents do not make the link between the technology and the influx of funds.

Figure 2. Disbursement recipient across reviewed implemented schemes



Review of mandatory enacted or planned schemes in Denmark, Germany, France, Spain, the Netherlands, Belgium, United Kingdom and Poland. In the category ‘shared or community ownership, we focus on shared ownership’.

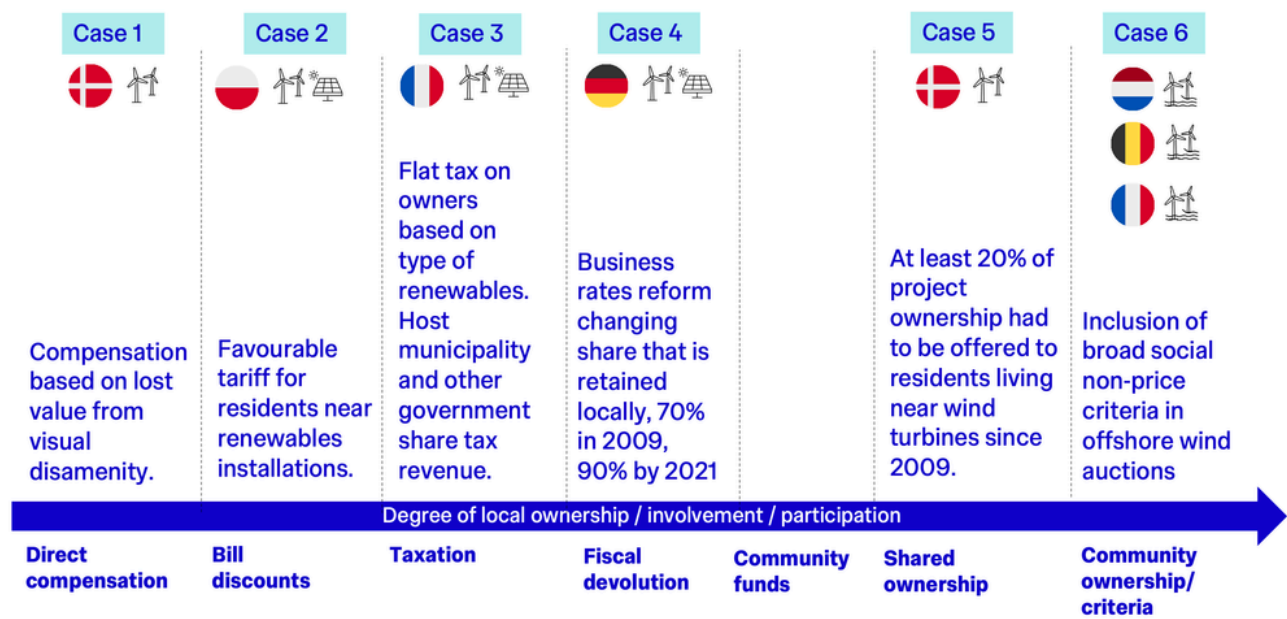
Finding 6. Developers and asset owners almost always pay for any benefit provision, though other groups also generate rents from the clean energy technologies.

Who provides benefits is much more uniform across reviewed schemes than who receives them. Usually this either falls to developers or asset owners. Who is held responsible is determined by two features. First, the point in time at which benefits are shared. Second, the length of time over which benefits are dispersed. Only in a few cases is this structured as a one-off, and mostly this is the case for compensation schemes. In many other cases the provision is ongoing, creating a stream of payments or income received annually. Most frequently this continues for the entire life time of the infrastructure, which can be several decades. This is in line with economic theory, in so far as the regulation of externalities, such as the negative externalities that can be associated with clean energy technologies, normally applies the polluter pays principle. This means that those causing a negative externality pay for it, creating incentives on their part to internalise the costs. Yet, there are also others that benefit, and even extract economic rents. This is the case for land-based renewables where landowners hosting them receive payments for leasing their land. Taxing rents is often favoured, as this does not distort economic incentives. Our review of schemes found no real world examples of the latter.

Do benefit sharing mechanisms achieve their goals?

In many countries, resistance to grid infrastructure and renewables has already led policy-makers to introduce financial benefit-sharing mechanisms, or to seriously consider doing so. Highlighting lessons from the implementation of mandatory schemes, the cases selected are shown in Figure 3 and then short case summaries are presented.

Figure 3. Implementation examples chosen as case studies



Finding 7. A key tradeoff for benefit sharing mechanisms is balancing the interests of the most directly exposed and the wider local community, and multiple constraints can limit operationalising exposure-based schemes.

Finding 8. Maintaining the link between clean energy technologies and any benefits provided requires visibility but this can limit the flexibility of the use of funds, and thereby their most effective use for the local community.

Case summary 1. Direct compensation – compensating for established disamenities

Takeaway. Establishing compensation mechanism may escalate compensation over time, as they may reinforce arguments about the extent of harm.

Departing from standard Danish nuisance law, a compensation mechanism for residents near planned wind turbines was established in 2009. This allowed homeowners to claim for potential visual disamenities late in the planning process. Compensation is based on the monetary amount by which the disamenity reduces the home's value, and is paid by the developer. This is assessed by professional property assessors at newly established valuation authorities. Claims are free for those in close proximity, and for a fee for those further away. Successive revisions to the law have increased the scope and coverage of the mechanism. The most recent change is the addition of a sales option, where the developer must buy out the property owner at the full assessed value of the home prior to the placement of renewables.

Case summary 2. Taxation – providing income to local administrations

Takeaway. The collective nature of taxes allows flexible use of funds but weakens the direct link between the renewable development and the benefit.

France uses a mandatory fiscal mechanism to ensure that communities hosting renewable energy projects share the economic benefits they generate, through a set of local taxes levied directly on renewable energy installations. Tax revenues are distributed among the host municipality, the host department, and the inter-municipal authority following a 20/30/50 split^{xliv}. This provides a reliable income stream over the lifetime of a project, and funds for long-term investment priorities at the inter-municipal level. The system is administratively straightforward as it builds on existing fiscal institutions and requires no financial investment from residents. However, residents are less likely to make a direct connection between the revenues and the wind farms generating them.

Case summary 3. Fiscal devolution – business rate reform for producers of renewable energy

Takeaway. Tax reforms favouring host communities can better match benefits to costs, and rebalance revenues towards left-behind places.

As in many countries, business rates in Germany benefit the headquarters location. In the case of renewables, this is rarely the same as where generation occurs. To improve the acceptability of renewable energy, a reform sought to change this. From 2009, 70% of business rates generated from a renewable energy installation were retained locally, while 30% were passed to the municipality hosting the asset owner's headquarters. As a result, the local tax base increased by 5.2%, approximately 85,000 euros per turbine^{xlv}. Such amounts are significant for the budgets of the often rural areas that host renewables, and they shift resources from wealthier regions to the East. In a 2021 reform, the retained share was raised further still, to 90%.

Case summary 4. Bill discount – creating electricity bill credits for nearby residents^{xlvi}

Takeaway. Scheme design often depends on data infrastructure. A lack of data and systems can limit complexity such as coverage or differentiating benefits by degree of exposure.

Poland initially passed a benefit-sharing policy for onshore wind in 2023, requiring developers to reserve at least 10% of new projects for local residents through a virtual co-ownership scheme offering electricity bill credits. Despite being enacted in law, the policy never became operational, as implementation depended on a national IT platform that was delayed repeatedly. In 2025, the scheme was rethought as a co-ownership model with an annual cash payment. No scheme is operational today.

Case summary 5. Shared ownership – reserving project shares for the local community

Takeaway. Shared ownership depends on the willingness and ability of residents to invest in renewable energy projects, with ownership concentration a risk.

Denmark's 2009 mandatory local ownership scheme required onshore wind developers to offer nearby residents at least 20% of project shares during the pre-construction phase. Residents could buy cost-price wind project shares; first offered locally, then municipality-wide. This deliberately ensured some ownership benefits were retained locally^{xlvi, xlviii}, just as procuring grew increasingly too complex for local groups of residents. Participation varied and was especially low initially, and the scheme was discontinued by 2020. Even where shares sold out, ownership was often concentrated among a few^{xlix}, prompting later purchase limits. Community participation stayed low due to perceptions of 'bribery'^l, value conflicts among opponents and financial barriers for lower-income residents^{li}, polarising the locals further.

Case summary 6. Delivering broader social outcomes - non-price criteria in offshore wind auctions

Takeaway. Tender evaluation can shape social and ecological outcomes and allows for bespoke solutions on a project-by-project basis, though additional costs are uncertain.

Since 2017, Dutch offshore wind auctions increasingly reward non-price criteria alongside price: ecology, innovation, energy system integration, and local economy contributions. Non-price criteria were introduced to deliver broader social outcomes than just the lowest possible price, but they create more complexity in delivery. Some non-price criteria have been shown to increase cost, such as local content criteria prioritising national suppliers^{lii, liii}, and there are also concerns about competitiveness more broadly. Neighbouring Belgium has also started considering such criteria, until recently planning to include community ownership amongst them. This type of ownership is uncommon for this technology, and generally benefit sharing is more difficult as the host community is less straightforward to define.

Do benefit-sharing mechanisms shape the development of renewables?

Finding 9. When designing benefit sharing mechanisms, impacts on other actors, not just the local community need to be considered to ensure strategic behaviour of other actors is considered.

Of these countries, Denmark has one of the longest track record of using such approaches to retain the benefits akin to ownership locally. It introduced compensation, shared ownership and community funds in 2009, later adding bill discounts. Any of these measures, but especially the compensation scheme (see Case study 1) increase costs to developers. The compensation scheme especially was an unexpected departure from standard Danish nuisance law at the time. Conducting a quantitative analysis comparing projects developed just before and after the 2009 policy change, we show that this policy also produced intended and unintended consequences regarding renewables siting. Intended, as developers decreased the number of properties falling within the zone automatically eligible for compensation. Unintended, as this also means they shifted new wind farms into more sparsely populated area and towards areas with lower house prices and higher deprivation. Overall, there is some evidence that these schemes shift the disamenities towards more marginalised communities, raising the very equity concerns they aim to address.

Conclusion

Benefit-sharing policies are a powerful lever, but their design determines whether they can rebalance costs and benefits, reduce local resistance, and lower inequity, or will inadvertently deepen it. The existing evidence shows that the early inclusion of communities, a fair distribution of benefits within communities, smart siting choices, consideration of strategic behaviour, and delivery readiness are important in assuring their success.

^l We thank Ethan Liu, Mirabelle Muûls, Elina Spyrou and Paul Taylor for helpful comments throughout this project; and for excellent research assistance Abheshek Nath, Annabel Swift and Szymon Kwidzinski.

² To establish findings 1 – 3, we reviewed empirical ex-post studies with robust statistical analysis, at a minimum utilising before and after comparisons with treatment and control groups.