BiGGAR Economics

# Onshore Wind Finances and Economic Development

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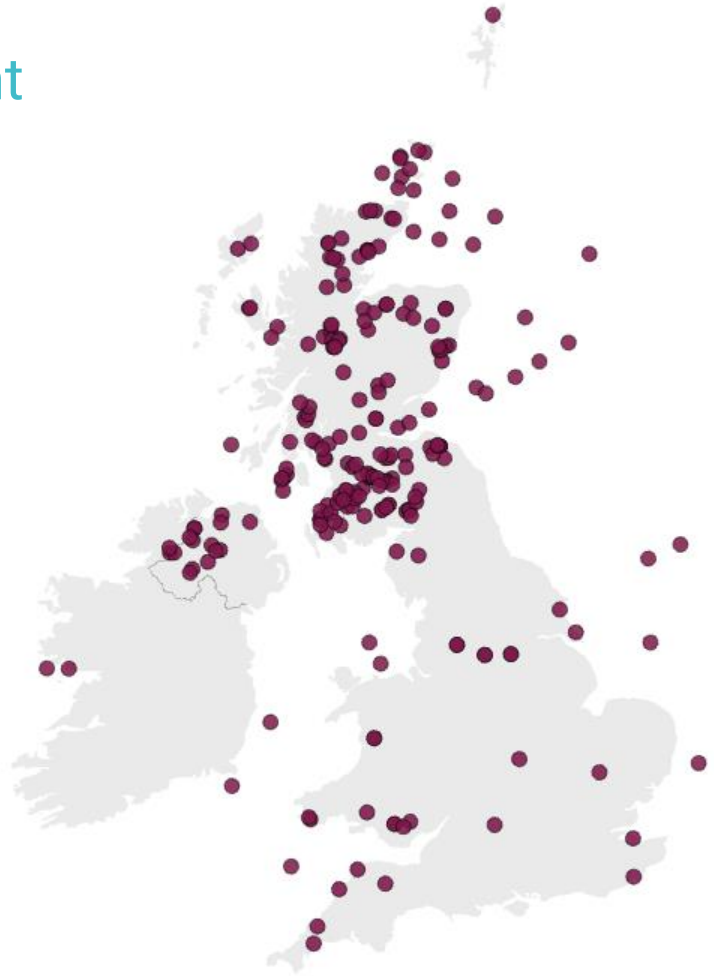
# BiGGAR Economics Experience – Energy Transition

## BiGGAR Economics is the leading economic development consultancy in the UK for the energy transition

- Assessed the impact of over 200 energy projects
- Leading the development of guidance for the assessment of socio-economic impacts of onshore wind
- Have worked on onshore wind since 2004 and the construction of Clyde Wind Farm
- Have considered the impacts of projects prior to construction and then evaluated these impacts post construction



# What is the value in an onshore wind farm?

**Every time a wind turbine rotates, it generates value. It is valued by electricity consumers like us, who use the power generated to wash our clothes, cook our meals and power our cars.**

# How is the income of an onshore wind farm distributed?

## The Government will earn more from an onshore wind farm than the developer

A 5MW turbine going at full pelt will generate about **£100 worth of electricity every 10 minutes**. The distribution of costs and gross profits for an onshore wind farm will vary depending on the approach taken to financing the project, the level of grid charges and the wind resource. This distribution is indicative of what a project in Highland might look like.

The largest section of this income will be used to cover the costs of building the wind farm. Onshore wind is infrastructure. As a result, it requires a significant upfront capital investment followed by ongoing operational costs, like other infrastructure sectors in the economy such as telecoms, water and railways. This will include the turbines, the civil engineering and the planning permission.

The people who prepare the site, design the project, manufacture and install the turbines all generate economic value.

There will be variation in both construction and operational costs, depending on where projects are. For example, an onshore wind project in Highland will have higher operational costs than projects elsewhere in the UK. This is because the grid connection charges for Highland projects are significantly higher than elsewhere in the UK. The grid connection charges in the UK (TNUoS) are essentially designed depending on how far away from London the electricity is generated. **This puts Scottish projects at a disadvantage** and projects in Highland are impacted more than most.

# How is the income of an onshore wind farm distributed?

Approximately 2% will go to the community if the project has a Community Benefit Fund worth £5,000 per MW, 12% will be paid in taxes and 6% will be profit for the developer.

**Distribution of income for an onshore wind farm (CAPEX Split)**

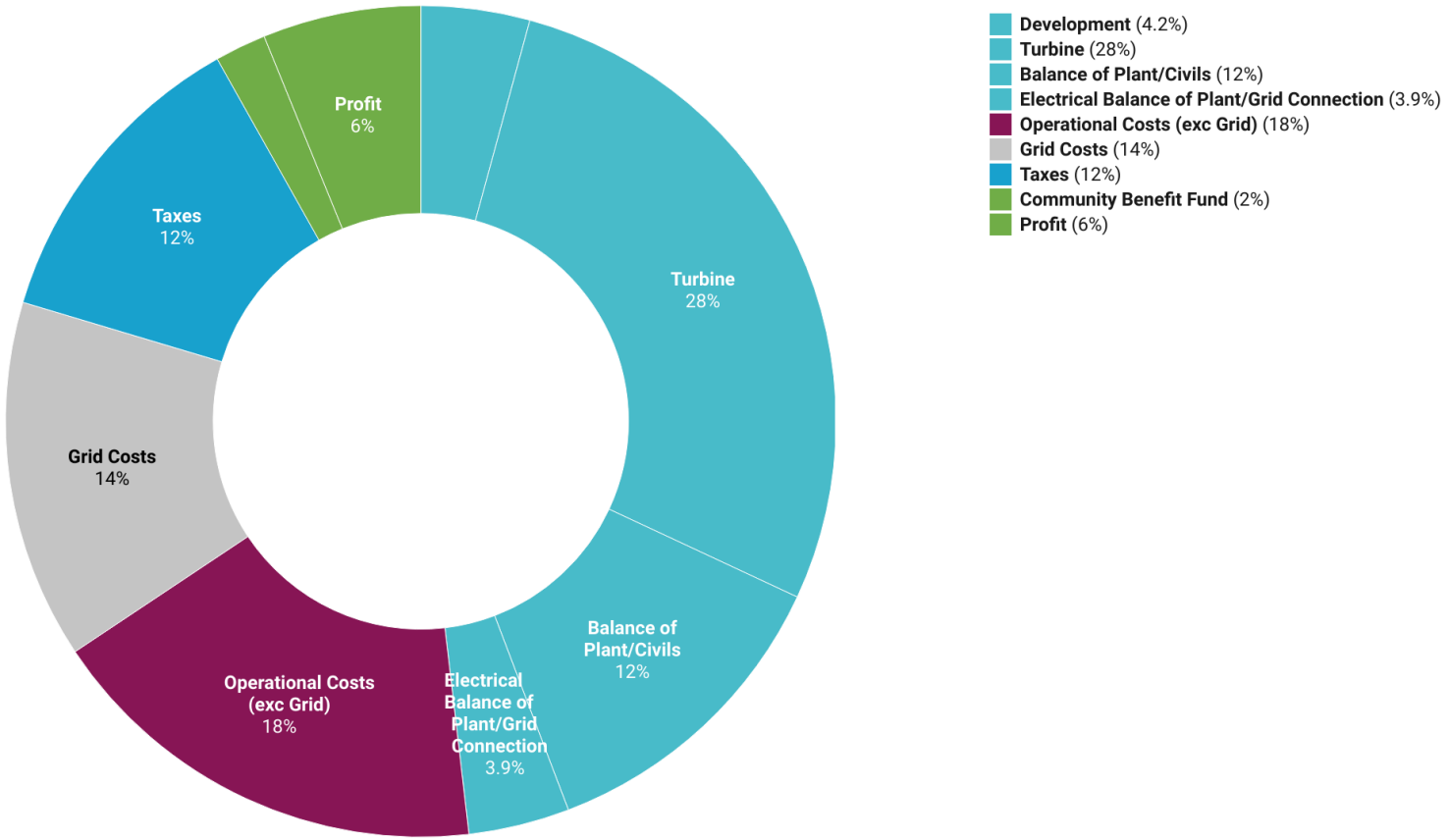



Chart: BiGGAR Economics • Created with Datawrapper

# How does onshore wind compare to other industries?

## Electricity generators like onshore wind farms, make less Operating Surplus per £100 of income than the average of the UK economy

The Operating Surplus of a company is the income it receives less what it spends on supplies and staff costs. This will include the profits that it makes and the taxes it has to pay.

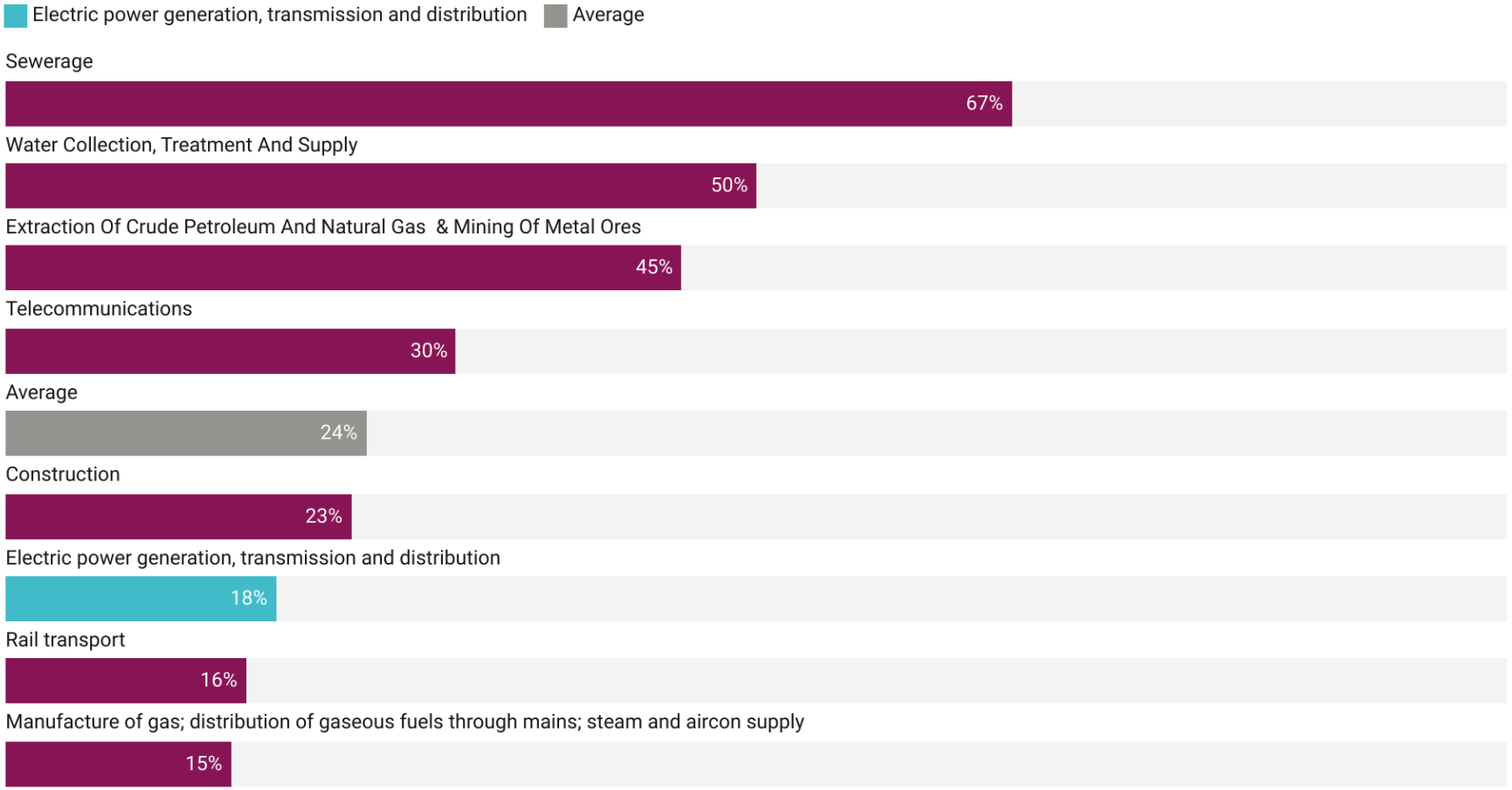
An onshore wind project will earn between £15 - £20 of Operating Surplus on every £100 of income it receives. (Note that this is not normally how developers assess projects, however, this allows us to compare with other sectors). This will vary depending on factors such as grid charges, the wind resource at the site and the approach the developer has taken to financing the project.

This is less than the average for the UK economy, which is £24 of Operating Surplus for every £100 of income. Sectors such as telecommunications, forestry and oil and gas extraction will earn considerably more than this.

# How does onshore wind compare to other industries?

## Operating Surplus as Share of Turnover, by Industry

The percentage of income that is "Operating Surplus" by the ONS Input-Output Tables. This is broadly equivalent to Gross Profits. For electricity generators, such as onshore wind farms, this is equivalent to 18%. This is compared to selected other industries and the UK average in this chart.



# Where does the Operating Surplus go?

The largest share of the operating surplus for onshore wind projects is taxes. This will include corporation tax, business rates and the electricity generator levy.

The developer will receive around a third of the surplus as profits and approximately 10% will be allocated to the Community Benefit Fund.

**Where does the Operating Surplus of an onshore wind farm go?**

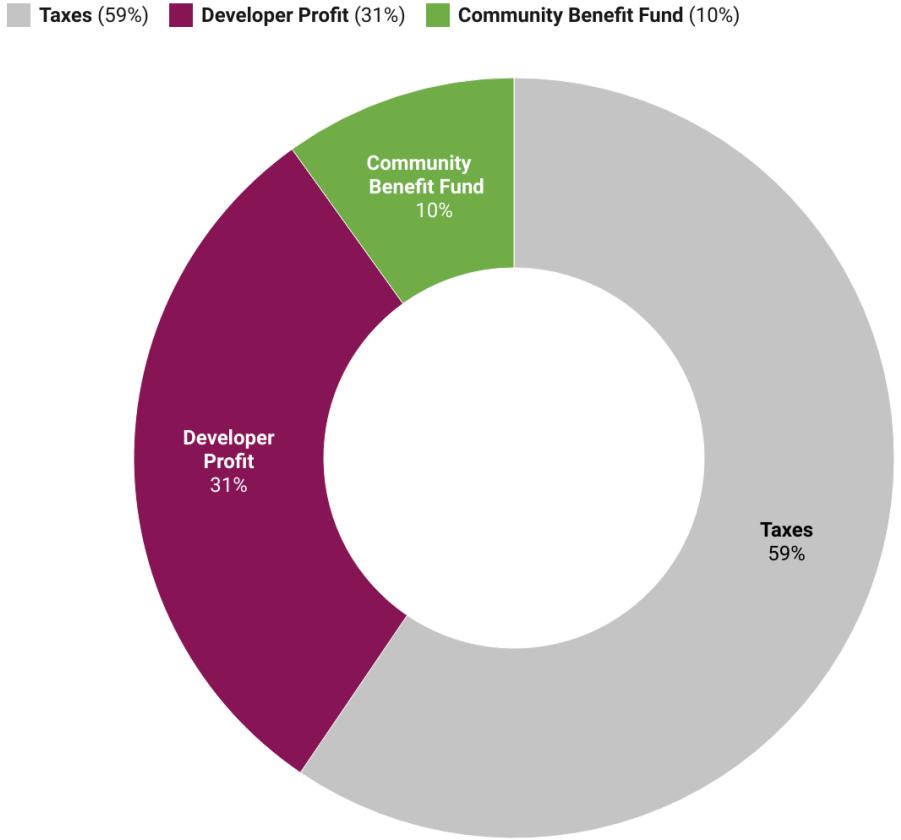



Chart: BiGGAR Economics • Created with Datawrapper

# What about the wider value of onshore wind?

## The value of renewable electricity generation is of course greater than the pounds and pence it produces

Renewable energy is crucial:

- to **tackle climate change** and the potential impacts of continuing to burn fossil fuels for energy;
- to **reduce the long term cost of energy for UK consumers** and mitigate agai ns t global price spikes in gas prices; and
- to **enhance our energy security**.

It is these benefits, rather than the financial case, that means that both the Scottish and UK Governments have made the decarbonisation of the energy sector and achieving Net Zero core objectives which have cross-party support.

# The role of profit in the energy transition

**In the next 6 years, developers will need to invest around £13.5 billion to build the onshore wind projects required to meet Scotland's onshore wind targets for 2030. This is equivalent to building 9 Queensferry Crossings.**

# The decision to invest in Scotland

## Onshore wind developers, either private companies, state-backed enterprises or community based companies, need to make an active decision to invest in Scotland.

If you had £100 million and wanted to fight climate change, what would you do?

If you invested in a profitable project, this would allow you to reinvest the profits in even more projects that tackled climate change. You could also encourage others to invest with you, and therefore multiply the impact of your initial funds and maximise the impact you have on climate change. This is the basic objective of most purpose-driven renewable energy companies.

Purpose-driven renewable energy companies will therefore look to develop projects that allow them to make a profit. Many of the onshore wind developers that are active in Scotland are also active in different countries in Europe. If the objective of these companies is to reduce global climate emissions by displacing fossil fuel generation, then it will not matter where the projects are developed. Therefore, when they are considering investing in the Scottish onshore wind sector they will be comparing Scottish projects to other development opportunities in places like Germany, Spain and Scandinavia.

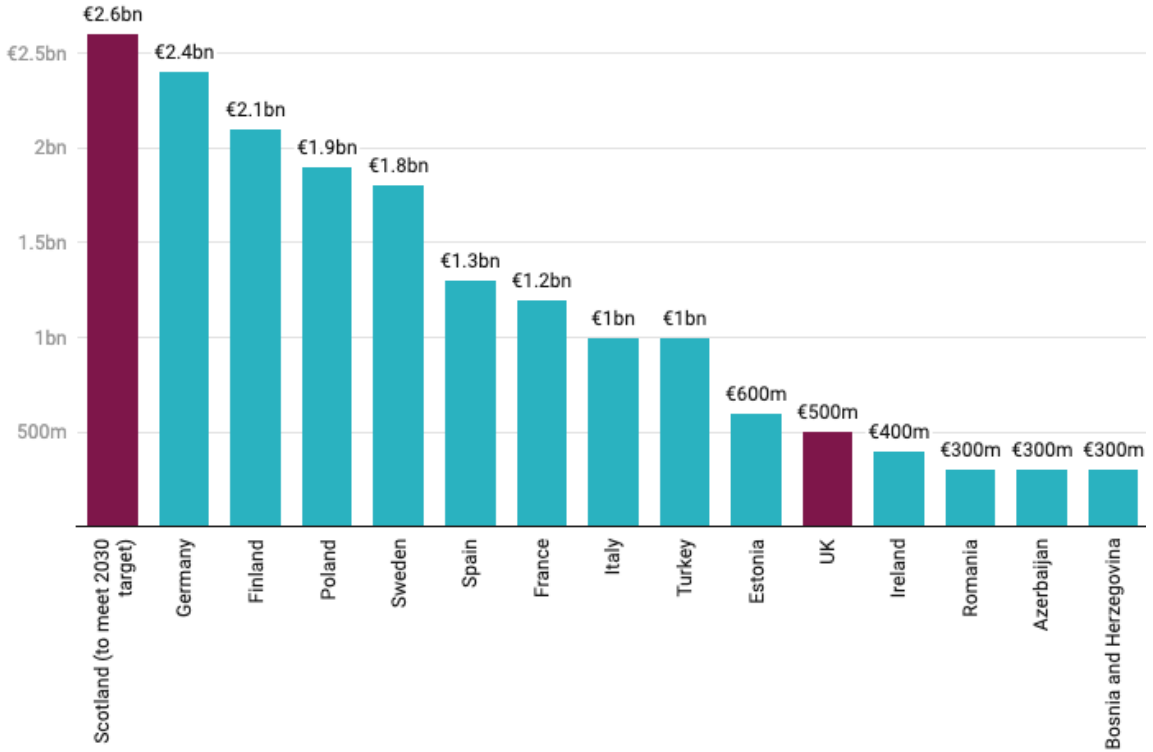
# The decision to invest in Scotland

The returns that a renewable energy developer can make on an onshore wind farm in the UK are currently lower than in other European countries. As a result, the level of investment in the onshore wind sector is lower in the UK, fewer projects get built and meeting domestic Net Zero targets becomes more challenging. Analysis by WindEurope found that in 2022, the UK ranked 10th for the level of investment it was able to attract in 2022.

To meet its targets for installed onshore wind capacity for 2030, Scotland will need to attract more investment than Germany did in 2022 for the next 6 years.

**Investment in new wind farms by country in 2022**

In 2022, the UK attracted significantly less investment in onshore wind farms than other European countries.



# Clearing the Hurdle Rate

## Onshore wind projects in Scotland need to become more attractive to meet our domestic climate goals

For an onshore wind project to attract investment, it needs to generate a better return than alternative uses for the money. Why would a company build a Scottish onshore wind farm that generated a return of 5%, when it could achieve the same objective and generate a return of 7.75% from a European Green Bond?

The minimum level that a project needs to reach before the developer decides to progress with its construction is called the **hurdle rate**. This rate will vary between developers, depending on their attitude towards risk, the approach they take to financing projects and the types of investors that are likely to support the project.

**Typically the hurdle rate for onshore wind developers in Scotland is between 6% and 8%**

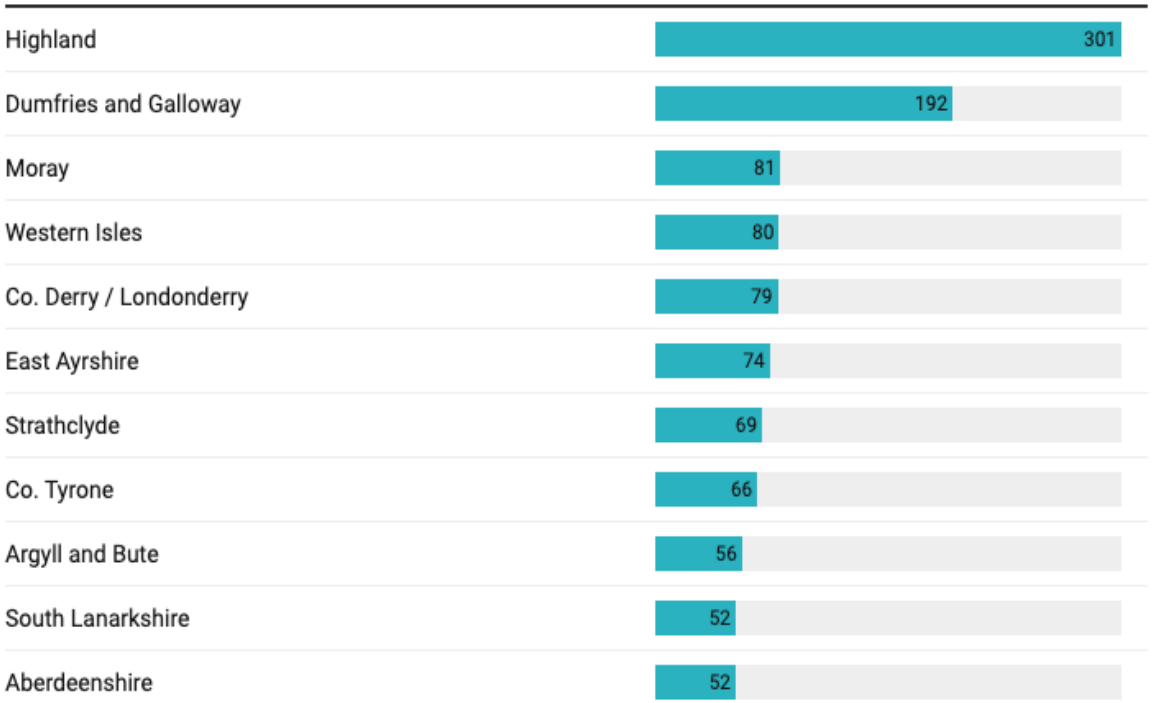
# Clearing the Hurdle Rate

Approximately 40% of consented onshore wind projects in Scotland will not proceed because they will not meet the hurdle rate of the developer. Some of these projects will be redesigned in such a way that they become profitable, and resubmitted. While others will be abandoned.

It is not possible to tell from the planning database which projects have been put on hold because they can not raise finance or where they are in the country. However, there are more turbines in Highland potentially in this position, in that they have planning permission but have not been constructed, than anywhere else in the UK. If projects remain unable to raise finance this list of stranded turbines will grow. To clear this backlog, and start building at the rate needed to meet our targets, the financial viability of projects needs to improve

**Number of turbines awaiting construction**

Total number of turbines that have received planning permission but have not progressed to the construction phase. There are more turbines in Highland in this position than anywhere else in the UK.



# Implications of Highland Council's Social Value Charter

**Highland plays a crucial role in Scotland's energy transition and the area will be critical for Scotland to meet its onshore wind targets by 2030.**

# Highland Council's Social Value Charter

In June 2024, the Highland Council published the Social Value Charter (SVC). This charter includes a provision of £12,500 per MW in Community Benefit Funding (including £7,500 to a core Strategic Fund facilitated by the Highland Council):

The objective of the Social Value Charter is to:.

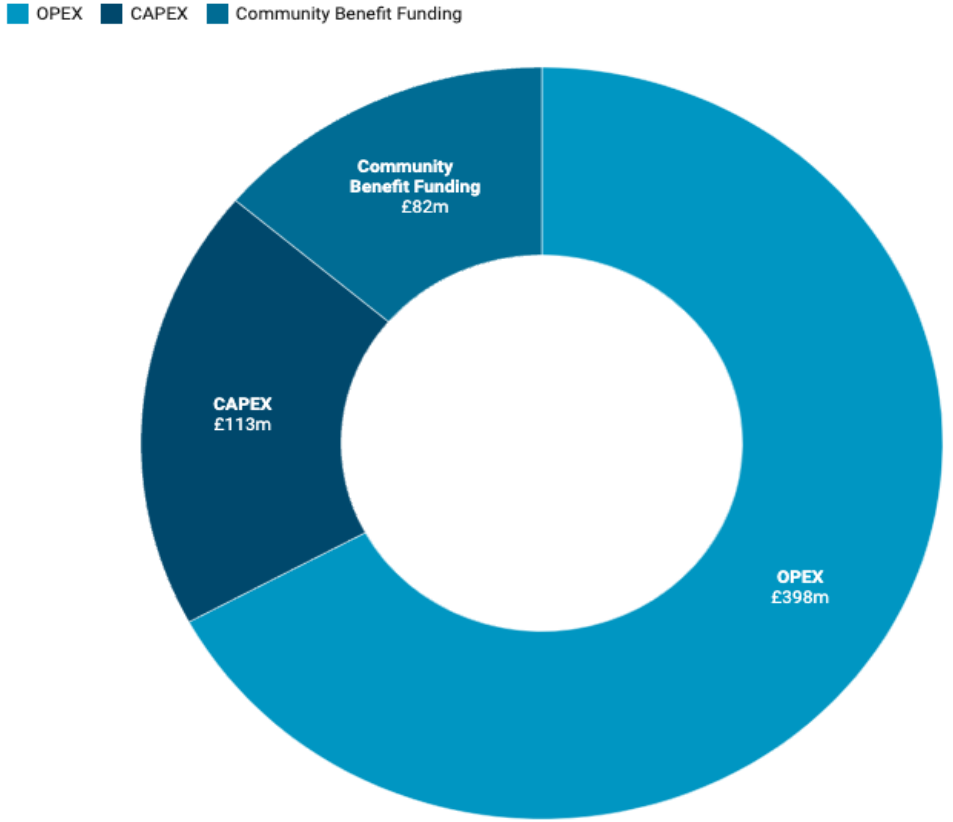
- to embed an approach to community wealth building into Highland;
- maximise economic benefits from our natural environment and resources;
- engage and involve relevant stakeholders to understand how we can continually improve our impacts; and
- unlock economic opportunities for the area..

# What are the economic impacts of onshore wind in Highland?

As part of our recent experience in onshore wind farms in Scotland, we have analysed the expenditure and economic impact of seven onshore wind farms in Highland using actual supply chain data. This included projects in the Great Glen and Sutherland. Over the lifetime of these projects, the majority of the economic Gross Value Added (GVA) benefit comes from the supply chain. This includes companies that work on the development and construction of the projects, and those that work throughout the operational lifetime of the wind farm.

The analysis of the projects found that the impact within the supply chain was 6 times greater than the value of the community benefit funding. Therefore, if a project does not go ahead for whatever reason, the people who stand to lose out the most are those who work for these supply chain companies.

Split of the economic impacts of Stronelairg, Bhlaraidh, Strathy North, Gordonbush, Achany, Dunmagalss, Godonbush and Gordonbush Extension Wind Farms within the Highland economy.



# What does the Social Value Charter mean for onshore wind projects?

The SVC could reduce the financial viability of onshore wind projects in Highland by increasing operational costs over the lifetime of the asset. This will decrease the profitability of the wind farms because the competitive nature of the Contracts for Difference rounds means that these costs can not be passed on to the consumer. The SVC could increase the effective hurdle rate (or decrease the IRR, depending on the angle you look at it) that onshore wind projects will need to clear before they are built by at least 0.6%.

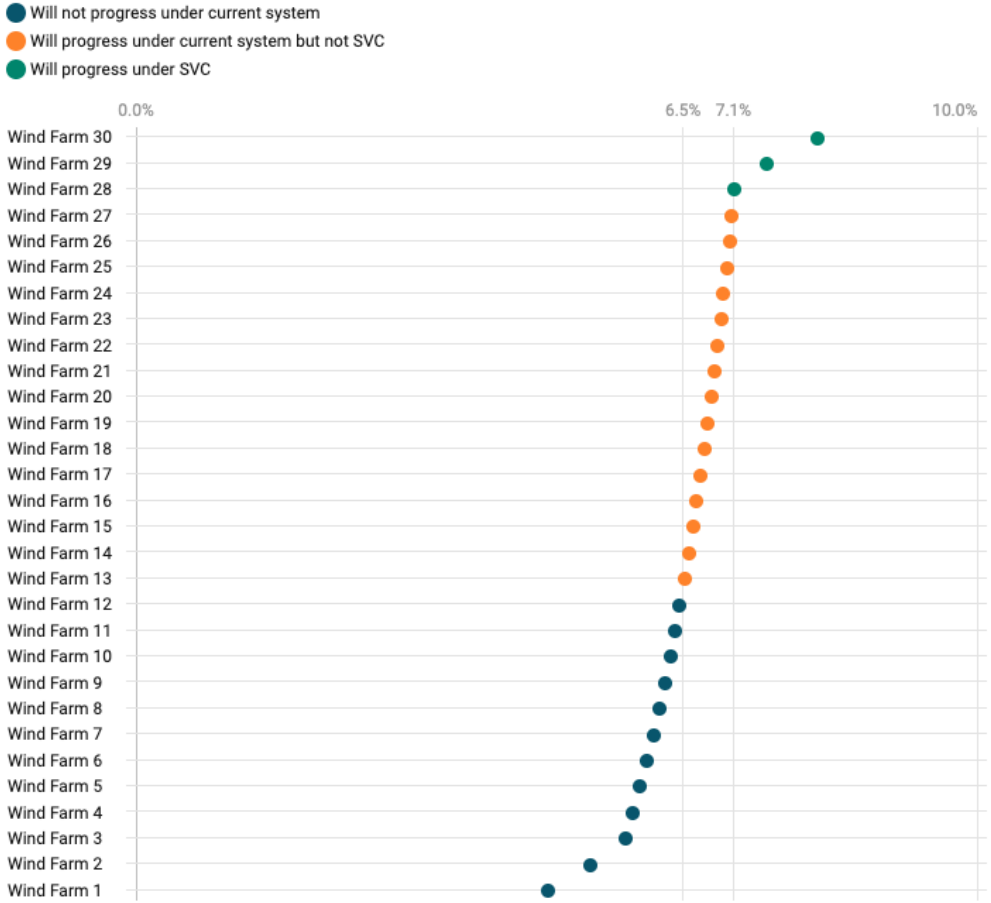
BiGGAR Economics has reviewed the financial viability of onshore wind projects across Scotland. This has projects being developed by large, medium and small developers. The majority of consented projects are viable and clear their hurdle rates, however not by much. **The majority of projects are within 0.6% of the returns** they need to raise finance and are therefore unlikely to be able to raise the finance needed to construct if the effective hurdle rate increased by that amount or similar.

# What does the Social Value Charter mean for onshore wind projects?

There are some outliers, particularly windy or easy-to-access sites, which will go ahead regardless. However, based on our discussions with developers, it is estimated that the SVC could reduce the number of new onshore wind projects developed by 80%.

**Implication of increased effective hurdle rate for onshore wind projects**

The Social Value Charter will increase the effective hurdle rate that onshore wind projects will need to clear before they are built from 6.5% to 7.1%. This could reduce the number of consented onshore wind projects in Highland that proceed to construction.




*Note values have been adjusted to be indicative, rather than exact to avoid disclosing commercially sensitive information.*

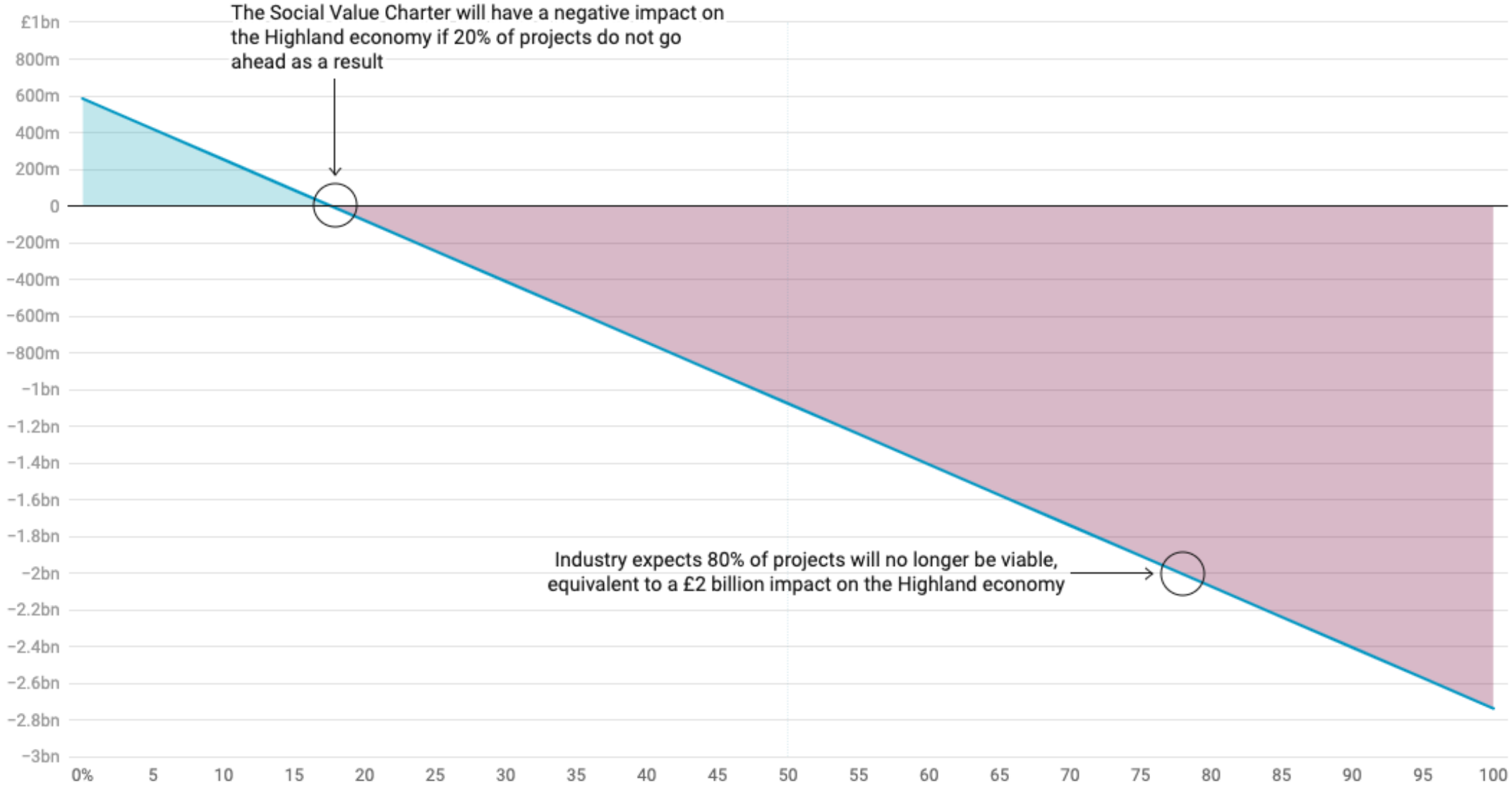
# What does the Social Value Charter mean for the Highland economy?

The Scottish Government has a target of 20GW of onshore wind by 2030, which will require almost 2GW of onshore wind projects constructed each year. Approximately 25% of this pipeline is in Highland, and previous work by BiGGAR Economics for Moray and Highland Council has estimated that around 2.6GW will be constructed in Highland between 2024 and 2030 if Scotland were to achieve its targets.

The Social Value Charter could reduce this significantly. If 80% of this pipeline is no longer financially viable under the Charter, this would mean that only 520MW is constructed in this time frame. Onshore wind projects that are currently entering the planning system in Highland typically have an operational lifespan of between 30 and 35 years. Therefore, if only 520MW is constructed, rather than 2.6GW, **the cost to the Highland economy could be £2 billion over the next 30 years**.

## Lifetime Impact on the Highland economy

The combined change in economic value (GVA) in Highland depends on the proportion of onshore wind projects that are no longer financially viable.



# What does the Social Value Charter mean for Community Benefit Funding?

The reduction in economic opportunity also includes a lower level of community benefit funding available. While those projects that do proceed would provide more per MW, the value of funding that would be lost as a result of projects not going ahead would be greater. If 80% of projects do not proceed as a result, this would be equivalent to almost **£200 million less funding** available to communities.

| Lifetime Impact of Social Value Charter on Community Benefit Funding | |
|---|---|
| Additional Community Benefit Funding raised as a result of Charter | £117m |
| Community Benefit Funding lost because projects do not proceed | £312m |
| **Net position** | **- £195 m** |

# Impact and Objectives

The objectives of the Social Value Charter are widely supported and align with the strategic objectives of the Scottish Government and the Onshore Wind Sector Deal. However, our analysis shows that the implications of the Charter could be detrimental to these objectives. Rather than an enabler of economic growth and a source of community wealth, our analysis finds that the Charter will reduce the opportunities for economic development by significantly reducing the amount of new onshore wind projects that are built in Highland.

# An Alternative Approach

## Last year BiGGAR Economics was commissioned to investigate the benefits which have arisen during the construction and operation of energy developments in Moray and Highland, and to consider how benefits might be maximised in the future

This work included consultation with industry, public sector and community stakeholders and building from BiGGAR Economics previous experience in economic development. Our report concludes that maximising impact will require:

- **rapid deployment of the projects needed** to deliver Scotland's target of 20GW installed capacity by 2030;
- **high local content of the supply chain**;
- **bespoke opportunities for local employment and skills development** that reflect the characteristics of the local labour market;
- **fair contributions to the cost of enabling infrastructure** and other interventions necessary to support the sector;
- **fair community benefit packages** that generate tangible benefits for the host community while remaining affordable for the developer; and
- **continued innovation** to support the process of continuous improvement.

# Summary

The three main findings from this analysis are:

- The Scottish and UK Governments will earn more in taxes from an onshore wind farm than the developer will in profits;
- Onshore wind needs to become more profitable to attract the investment needed to meet our energy targets; and
- Our analysis of the Highland Council's Social Value Charter has found that it will cost the Highland economy £2 billion as 4 out of 5 currently viable onshore wind projects will not go ahead.

# Further Reading and References

The references used, data used for graphics and links to all the relevant reports can be found on the BiGGAR Economics blog.

The link to these blogs is below:

- https://biggareconomics.co.uk/category/renewables/onshore-wind-finance

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