Accounting for the triple bottom line of capital projects

How a major energy provider values its total impact

pwc

New data driving optimal decisions

Infrastructure: we all need it, but do we all want it?

Infrastructure can play a vital role in providing us with what we need to function. Railways allow freight to be transported and people to get to their jobs and families. The electricity network provides power to homes and businesses. Flood defences stop damage to property and land, and can save lives.

But people's lives are affected in different ways when new infrastructure is built. There may be positive effects, such as supporting jobs and the economy from construction activity and supply chains. But there can also be negative effects, such as impacts on landscapes, archaeological sites and ecosystems. Negative perceptions of projects can result in planning delays and higher costs, or may stop a project going ahead at all. Whilst negative impacts can be reduced, this often comes at a cost that may eventually be borne by the tax payer or consumer.

So how can you manage these different impacts, minimising the negatives whilst maximising the positives? When you spend money to manage these impacts, how do you know whether this delivers value for money? And how do you communicate these different positive and negative impacts, to different stakeholders, in way that is easy to understand? …. By putting a value on the environmental, social and economic impacts using a framework like PwC's Total Impact Measurement & Management (TIMM); the so called 'triple bottom line'.

Upgrading a transmission line is no easy task. It takes a long time, it is expensive and there are many risks involved with getting it right. With so much at stake, how does the Board develop the optimal solution for all its stakeholders?

The UK energy company SSE Plc found themselves with such a challenge in constructing one of their biggest capital projects: the Beauly to Denny electricity transmission line upgrade. Their solution? … to understand what kinds of impacts the line had on society, the environment, the economy and the exchequer; and to put a value on them using PwC's TIMM framework, so that they could use this to help design future transmission lines

We believe this is the first time that an analysis of this kind has been completed for an infrastructure project.

The challenge

SHE Transmission, part of SSE Plc's electricity networks business, had to build a new transmission line to connect new renewable – or 'green' – energy capacity in the north of Scotland to the rest of the electricity network. In conjunction with Scottish Power they upgraded the Beauly to Denny line, a 220km transmission line from the Highlands to the Central Belt of Scotland, including several areas renowned for their natural beauty and cultural heritage.

This involved replacing around 1000 towers that had been there since the 1960s with around 600 newer towers that were almost twice as high. Planning permission was originally requested in 2005. But, due to widespread opposition, this was referred to a public enquiry, which received over 17,000 objections. Planning permission to build the upgrade was eventually obtained 5 years later, in 2010, but only with conditions.

SHE Transmission had already taken steps to mitigate the negative impacts from the line. The outcome of the public enquiry resulted in a requirement to undertake further mitigation measures, adding almost a sixth to the overall cost of the project that, ultimately, goes on to energy bills.

Putting a value on impact

SHE Transmission knew that upgrading the line was essential to transmit the supply of new green energy. They also knew that a 5 year delay was regrettable for all involved and wanted to find ways to both improve the way they designed infrastructure; and communicated their plans to better engage stakeholders such as government, customers or communities.

To do this, SHE Transmission wanted to understand what kinds of impacts the line had on society, which of these had the greatest impact, and whether the measures they had implemented delivered value for money.

Measuring impact with a metric we all understand … money

We used our TIMM approach to identify the most material impacts from the Beauly-Denny upgrade, and then measure them in a consistent, comparable and easy to understand metric: money.

Step 1

We first identified what's material

We wanted to know the most material impacts from the line's construction: those that would affect the most people in the greatest way. These included the visual impact the line would have on the Scottish landscape, the impact it would have on a number of historic sites, and the impact on the economy (both positive and negative). In addition, we looked at the impact on the environment, including GHG emissions, land use change and waste production; impacts on the local community from traffic disruption; and impacts on construction workers from health and safety incidents.

Step 2

We collected data

Our TIMM framework used existing data, from SHE Transmission, some of their suppliers as well as other recognised sources. In a number of places we also developed new techniques to collect data that were tailored to the project. For instance, we carried out a survey of over 1,500 tourists who had recently visited Scotland, to see how their behaviour would be affected by the presence of the line. We also used established non-market valuation techniques, such as Contingent Valuation and Choice Modelling, to derive a statistically significant monetary value, held by people, for the impacts on the landscape and historical sites (based on responses from over 4,000 people).

Step 3

We crunched the numbers

We then applied our TIMM valuation approaches to express these various impacts in monetary terms. We have developed these over the years to value natural capital, social capital and economic impacts and they build on widely accepted approaches such as the UK Government's Green Book on policy appraisal and evaluation, our Total Tax Contribution approach, as well as our experience of delivering Environmental Profit & Loss accounts, social impact valuations like Social Return on Investment (SROI) analysis, and economic impact assessments.

Total Impact Measurement and Management – why impact matters

It's impossible to please everyone all of the time, but it is possible to identify the optimal approach to address a problem, a useful starting point for any discussion with stakeholders about change. PwC's Total Impact Measurement and Management approach allows impacts (negative as well as positive) to be measured and valued. So when it comes to decision making and weighing up the pros and cons of different options, it's easier to see the merits of viable options.

So what do we mean by 'total impact'? It's about taking a holistic view of a company's overall impact. By measuring business success beyond financial analysis, and calculating a value (and a cost) for the social, environmental, tax and economic activities of a company, business can see at a glance the total impact it's making. It's a more innovative approach that also means companies can see the trade-offs between choosing different strategies, allowing them to make the optimal decision for themselves and all their stakeholders.

TIMM compares impacts directly

Figure 1: The original plan

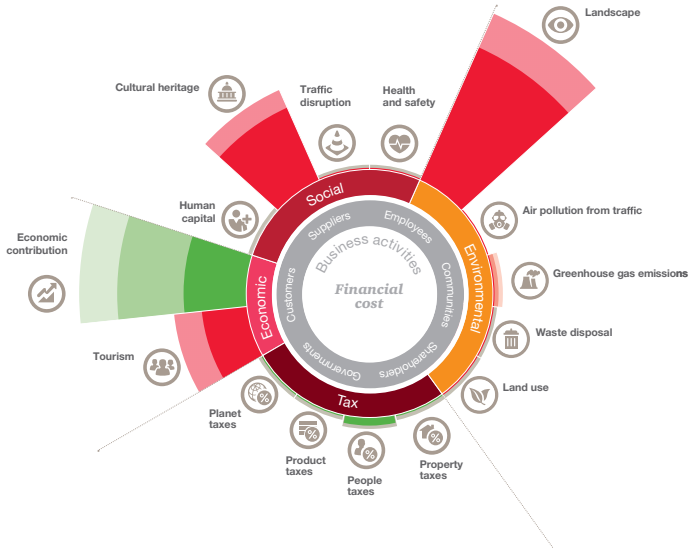


Figure 2: The new plan mitigation measures (as built)

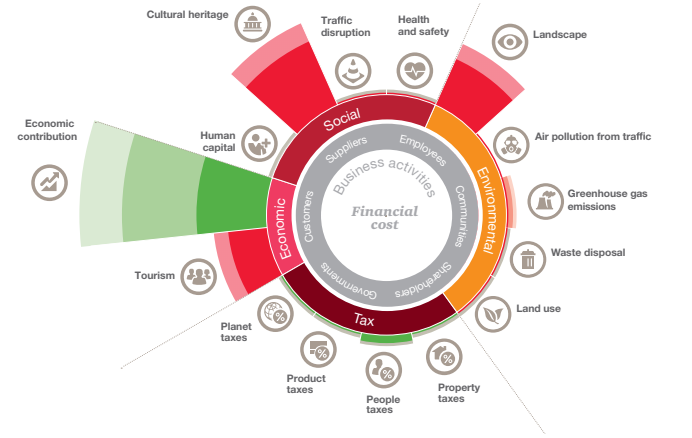
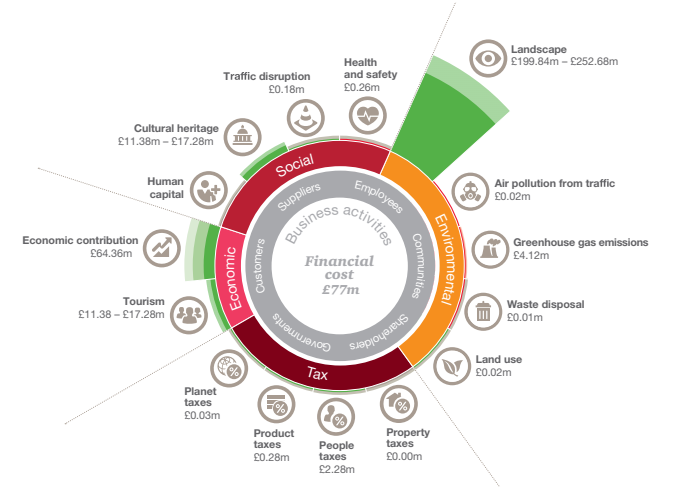


Figure 3: Measuring the impact of the mitigation measures



Key

- Direct negative impact
- Indirect negative impact
- Induced negative impact
- Negative impact upper bound
- Direct positive impact
- Indirect positive impact
- Induced positive impact
- Positive impact upper bound
- Not estimated
- Dotted grey lines represent material impacts where we don't yet have robust enough data to report

All figures stated as Net Present Values in 2010 prices

We used our TIMM approach to value the environmental, social, economic and tax impacts from upgrading the line and produced analysis for not only the original plan for the line (Figure 1) but also the line that was actually built (Figure 2).

We found that the biggest negative impacts from the line were from its impact on the landscape, on local historic sites and on local tourism. And, that these impacts would all have been even bigger if the original plan had gone ahead – particularly the impact on landscape. But we also found that there were positives too, from the impact on the economy from spending with UK business during construction.

We also used our TIMM approach to value the impacts from SHE Transmission's mitigation measures (Figure 3). We estimate that the mitigation measures delivered between £2.90 and £3.70 of value to UK society and stakeholders for every £1 they cost (Figure 4): the result of adding up the value of all these impacts, and ignoring any that might have happened from other similar public works.

Our analysis included valuing the impacts that were avoided by the measures, to see which had the greatest impact and were value for money – useful information for designing future transmission infrastructure.

We found that the impacts on landscape and historic sites, which were avoided by re-routing or undergrounding the line, or dismantling other lines nearby, were valued the most by people. This was because they focused on the landscape and sites people cared most about (e.g. that of the Cairngorms National Park) and offset 35% of the overall impact on the landscape and historic sites – basically, reducing the negative impact by one third.

Figure 4: Value to society delivered by each pound spent on mitigation measures

Viewing 'intangible' impacts through a new lens

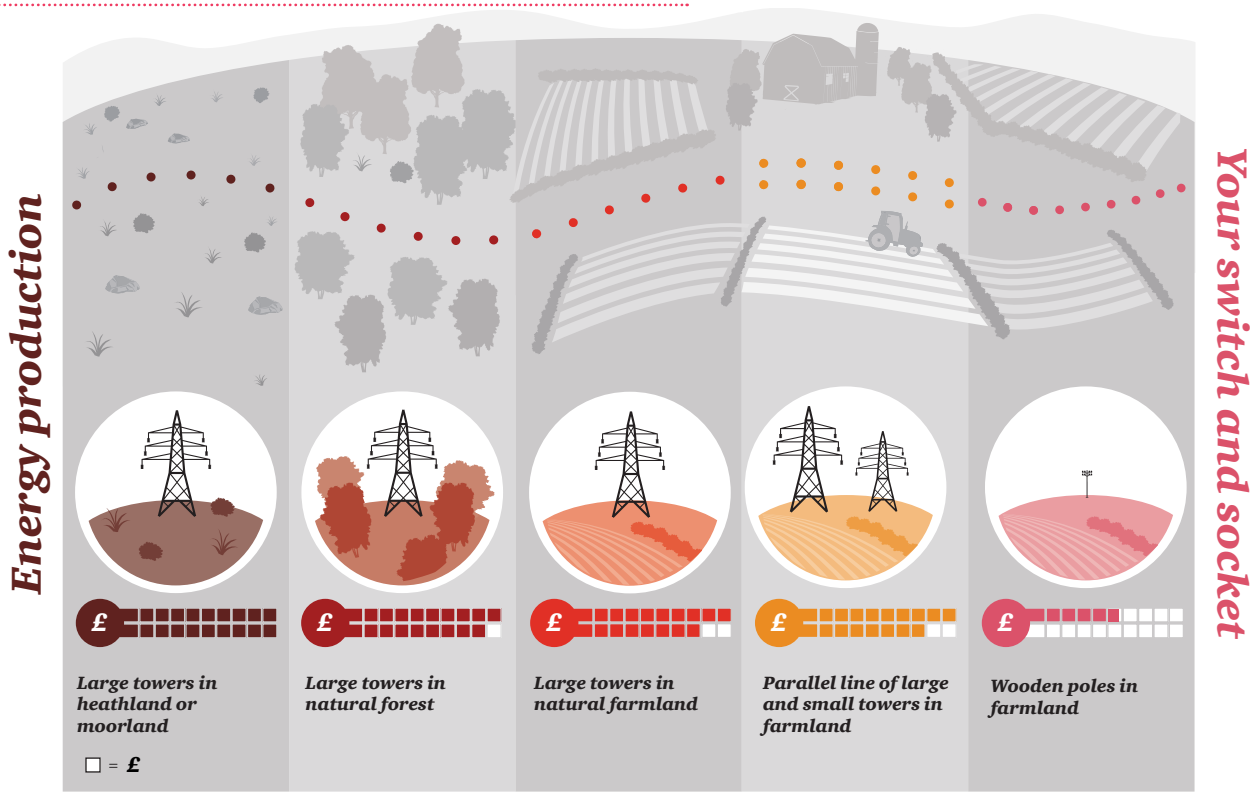
Our TIMM framework can be used to quantify and monetise impacts that are conventionally viewed as being 'intangible', so that new information about them can be included alongside conventional financial analysis. This new information can provide deeper understanding about how impacts may differ with context, such as where they occur and who they affect.

It means a more informed decision can be reached when comparing the impacts from different infrastructure options; helping to maximise positives and manage negatives. It also provides new quantitative data about these impacts that can be used to help navigate the planning process.

In this case, SHE Transmission is using new data about the impacts that transmission lines have on people (e.g. the impacts that the size and location of towers has on the landscape, tourism and cultural sites) to help design new projects. Measuring these impacts in the same way – using their monetary value – gives a new dimension to use in project appraisal; for example allowing trade-offs between different designs to be identified and considered.

For example, our approach for valuing the landscape impact was also able to identify which kinds of landscape people valued the most, and what kind of infrastructure design had the greatest negative impact on the landscape (See Figure 5). Some findings were obvious; eg. large towers are not a favourite and people put the greatest value towards avoiding their impact on the landscape. But other findings revealed more surprising insights – such as that people valued protecting heathland and moorland landscapes more than natural forest landscapes or farmland landscapes; and that people put the same value on the impact from parallel lines of towers as a single line of large towers.

Figure 5: Using TIMM data a value on landscape impact



Total impact – a better way to evaluate

Financial metrics alone were useful to provide a base line but fell short in creating a complete picture of impact. The efforts in supplementing this with non-financial data (which has only recently being recognised as relevant and is all too often left in the 'too difficult' box) have proved invaluable and led to improvements across SHE Transmission's approach to stakeholder engagement and process, as well as reducing costs.

PwC understands total impact

Working closely with business and academics, PwC has developed the TIMM framework over a number of years. It enables industry to tap into expertise across a broad range of valuation methodologies from an organisation that understands business, decision making, and the big picture.

TIMM: Shaping best practice

Understanding the impact of a massive infrastructure project is valuable in itself, but it's the lessons learned and how these influence best practice and drive decision making that's really interesting. SHE Transmission sees the value in a total impact approach and is using it in a variety of ways:

- **Embedding into the energy infrastructure design process:** The economic, environmental and social impact valuations from our work are being used in SHE Transmission's infrastructure design process to identify measures that will minimise negative impacts and maximise positive impacts. This has led to SHE Transmission winning the Prince of Wales's Accounting for Sustainability 'Finance for the Future' award.
- **Helping move the industry forwards:** SHE Transmission has shared the TIMM approach as an example of best practise in transmission design with other transmission operators (its competitors and peers).
- **Enhancing credibility:** SHE Transmission has shared the TIMM approach with Ofgem and the Scottish Government to show innovation in transmission network design and its broader impact.
- **Communicating the contribution SSE makes to the economy:** SSE Plc, SHE Transmission's parent company, has seen the value of using the TIMM approach to communicate the economic contribution of the entire SSE Group to its stakeholders. It has now reported in this way for four financial years and, for FY15[1], published the analysis alongside its annual results (the first time we believe that a company has done this).
- **At the leading edge of human capital accounting:** SSE Group have also asked us to value its human capital using learnings from the Beauly-Denny TIMM analysis[2]. By publishing the report, SSE Group has positioned itself at the leading edge of social capital accounting; so much so it was cited as the reason its HR Director was nominated as HR Director of the Year 2015[3].
- **Producing new information that creates business value:** SSE Group's sees the value of using non-financial metrics in addition to traditional financial metrics to make better decisions; so much so that it has increased the size of its Sustainability Accounting team. By growing the team, SSE Group is building capacity in house to do more of this kind of work – evidence of its appetite to embed total impact thinking into its strategic decision making.

[1] http://sse.com/media/324390/FINAL-economic-contribution-FY15-report.pdf
[2] http://sse.com/media/306295/SSE-Human-Capital_Final_For-Web.pdf
[3] http://sse.com/newsandviews/allarticles/2015/05/sse-recognised-for-pioneering-human-capital-report/

If you would like to find out more about how measuring your total impact and using the results to manage your business, please contact:

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