JULIE'S BICYCLE

SUSTAINING CREATIVITY

FACT SHEET:
COSTING THE ENVIRONMENT

Putting a price on what we can't always see

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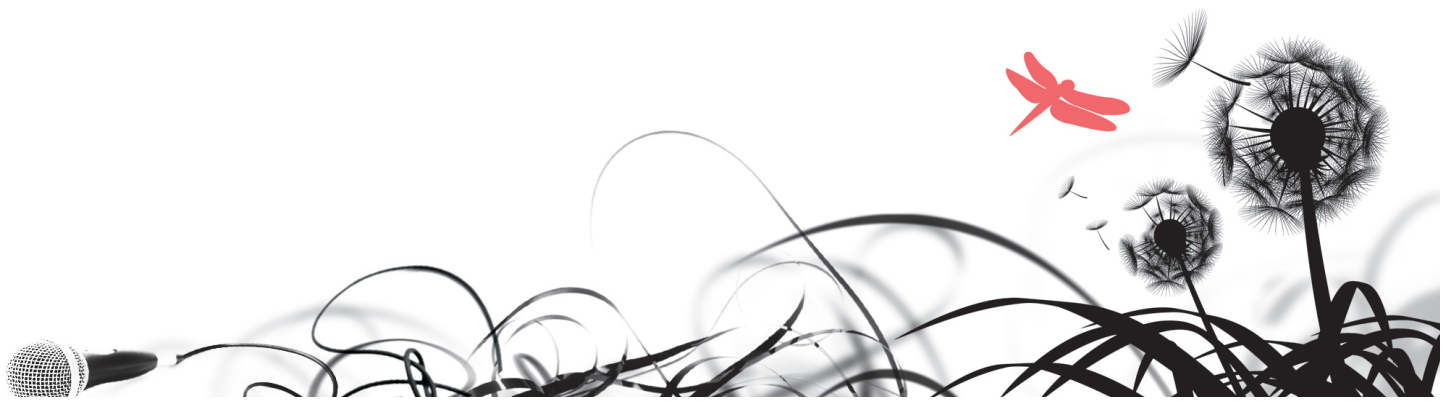
Julie's Bicycle



Our economy is totally dependent upon goods and services from the ecosystems that surround us, such as water purification, soil creation, pollution dilution and waste treatment. One such ecosystem crucial for our carbon cycle is the capacity of our oceans, vegetation and soil to absorb carbon emissions. Despite being completely reliant on these ecosystems, our economy does not recognise, and therefore value these goods and services in financial terms, anything like sufficiently. A United Nations programme is currently seeking to address this problem. The Economics of Ecosystems and Biodiversity (TEEB) study is finding that the costs of conserving biodiversity compared to the benefits of doing so are in a ratio of 1:10 - 1:100. TEEB is expected to report this summer on how policymakers can make sure that business reflects the true costs and benefits.

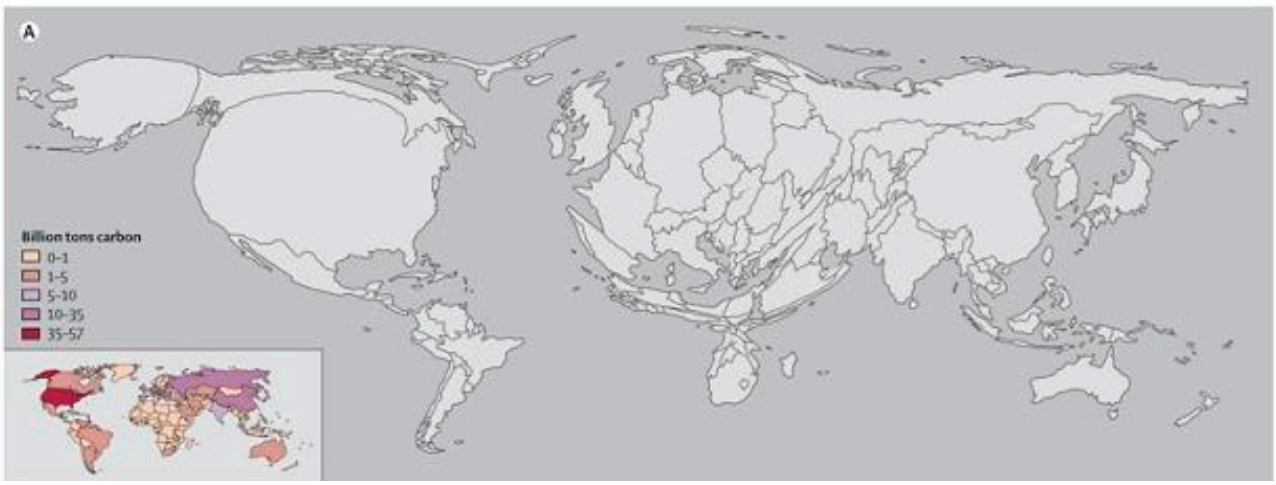
Take for example felling a tree to make a musical instrument or sheet music. Some of the costs included in the financial modelling of this product might be running the chainsaw, paying the lumberjack and transporting the log. Costs excluded might be the loss of rainfall management, a home for an orang-utan, a livelihood for an indigenous person, the soil the tree roots were holding and the future capacity of that tree and soil to absorb carbon from the air. These implicit costs are rarely factored in to the economics of a musical instrument or paper manufacturing.

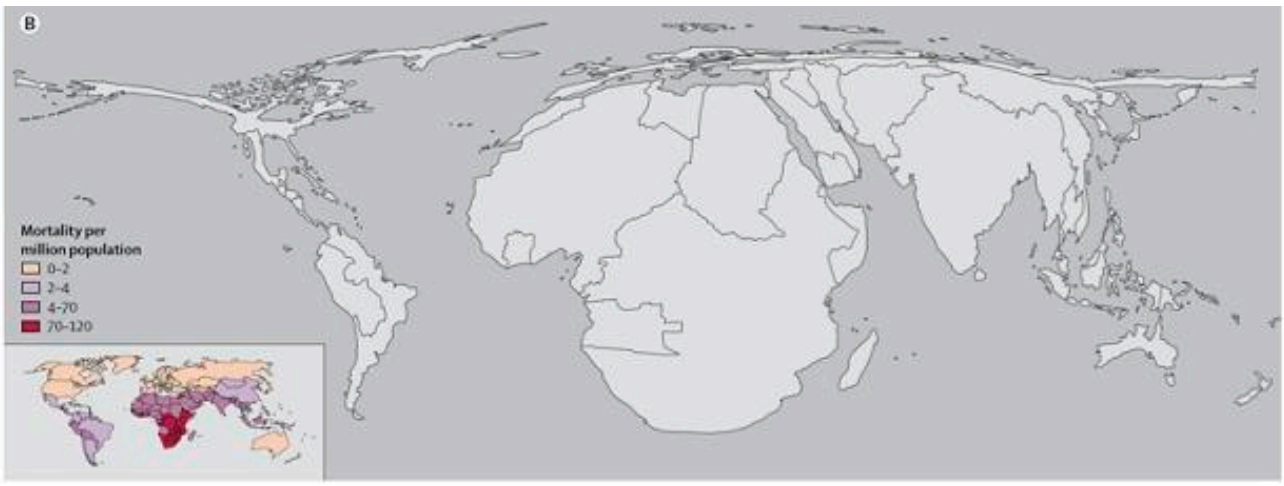
Economists have termed this an externality: simply put, when a price does not reflect the full costs. Positive externalities are commonplace and unnoticed: for example a beekeeping business generating revenues from honey while the surrounding farmers receive a free pollination service.

The classic negative externality is the example of a factory polluting a river and, as a consequence, fishermen downstream catching fewer fish. The factory pollutes for free while the fishermen pay the costs of that pollution.

Climate change is perhaps the most dramatic example of global negative externalities. The illustration below (Figure 1) depicts country size according to responsibility for climate change 1950- 2000 and highlights the distribution of four climate-sensitive health impacts during the same period. This shows that those generating the emissions are not those suffering the consequences.

Figure 1: Comparison of undepleted cumulative CO2 emissions by country for 1950 (A) - 2000 (B) and the distribution of climate-sensitive health consequences (deaths from malaria, malnutrition, diarrhoea and inland flood) Source: Lancet 2009





If the negative externality of the factory versus fisherman is compared with the externalities associated with climate change it becomes clear what the scale of climate change externalities might be:

Factory v fishermen	Climate change
Only the factory is polluting, the factory will understand this, know it can stop and how much it will cost.	Everyone is responsible for emissions, we rarely have much information about how much of emissions we are responsible for, we are uncertain how we can emit less and there is huge uncertainty of what it costs in externalities.
Only the fishermen are affected and they know how much the pollution is costing as a result of loss of fish.	Everyone is affected – people are dying now as a result of climate change and it will affect all of us in the future though we are not sure exactly how or when. It is difficult to put a value on human life and whole ecosystems such as coral reefs.
The fishermen have a legal and financial system that can help identify the factory, the harm and demand damages.	Those affected now often have less economic and political power than the large emitters. Our economic and political systems are poor at accounting for future costs to ourselves.
The pollution has a short term impact and then the fish stocks bounce back.	We are now feeling the impact of emissions from 30-40 years ago. Our current emissions will have impacts for centuries. Some impacts are irreversible, such as species extinction and loss of land to sea level rise.

To solve an externality a value needs to be calculated for the damage so that it can be 'internalised' - i.e. accounted for within our economic system. This is relatively straightforward for the factory v fishermen example: the fishermen sue the factory. However the complexities of climate change expose the legal system as totally inadequate and present many barriers to businesses including externality costs in their prices. Individuals seeking to include environmental and ethical issues in their purchasing decisions are often confused. The size and complexity of the externalities requires centralised government intervention to make prices more accurate.

The previous and current UK governments have recognised their role in internalising the externality of climate change. In 2006 the UK government commissioned a study to consider the external costs of climate change. The resulting Stern Review (after Lord Stern, review lead) was the first attempt by any Government to understand the scale of the global economic impact of climate change. In 2007 Stern reported that if warming of 5°C occurred, the costs of adaption to developed countries would be 5-10% of GDP as compared to a 'no climate change' world, and that developing countries would suffer costs above 10% of GDP. The Stern Review estimated that the costs of avoiding this scale of climate change through mitigation of emissions represented 1%

of GDP, ergo climate change avoidance is cost effective. Since publication of the Stern Review, Stern has acknowledged that his projections were adaptation cost-conservative, underestimated the sensitivity of the climate and too cautious about the benefits of avoiding climate change through emission mitigation.

So how best to internalise the costs of climate change: in other words to put a price on carbon? Economists argue for two approaches:

- Fix the price: estimating the costs of climate change and levying a tax that equals those external costs. For example in the UK, electricity users pay a Climate Change Levy on their bills. Despite best efforts, a tax may still not equal all external costs or reflect everyone's approach to the risks resulting from climate change;

- Fix a limit on the amount of pollution: setting a limit on emissions and then allowing emitters to trade in emissions. This sets a price for emissions through the creation of a market where carbon is traded like any other commodity, such as the EU Emissions Trading System. Industrial lobbying and uncertainty about the extent emissions convert into climate change impacts can result in the limit being too high.

New tools and frameworks to protect the environment we all fundamentally rely upon are urgently needed. Our current economic model, based on the traditional capitalist principles of a free market, competition, and private ownership of the means of production, is unfit for purpose in this new context. It needs to be redesigned to reflect environmental costs and benefits. The UK Government is developing its work on carbon valuation to help design policies effectively: see "How much does carbon cost?" below.

Tours need to recognise that there are costs excluded from the current budgets, and that government action will internalise those costs, penalising activities with high emissions. Cutting emissions now will save costs both to future tours and to the climate.

How much does carbon cost?

The financial valuation of carbon enables both government and market instruments to account for the costs associated with climate change. The value of a tonne of CO2 is contingent on an emerging appraisal of the damage that CO2 does. The UK government's approach to valuing carbon is based on estimating the likely costs of meeting specific emissions reduction targets.
Carbon valuation will ensure that policies the UK Government develops are consistent with the emissions reductions targets that the UK has adopted nationally, as well as with the European Union and United Nations. Giving a value to carbon helps the Government fully account for climate change impacts in appraising and evaluating public policies.

This is a new approach to carbon valuation, which until recently was implemented as a ‘shadow price', and follows the EU's Climate and Energy Package (2008) rationale. It splits emissions into:

1) traded sector - those emissions covered directly or indirectly by the EU Emissions Trading System (ETS);
2) non-traded sector - those emissions not covered by the EU ETS such as transport fuels.

The distinction, which leads to two sets of carbon price estimates, will enable more accurate policy appraisal which will take into consideration the costs and benefits to the UK. These prices will be regularly reviewed and revised.

For the purpose of appraising policies that affect emissions in sectors covered by the EU ETS, the traded price of carbon is recommended. The short term traded price of carbon is currently set at £22 per tonne CO2e, with a range of £12-£27.

For policies that affect emissions that are not traded, the short term non-traded price of carbon is currently set at £52 per tonne CO2e, with a range of £26-£78.

Furthermore, the Government is reasonably assuming that from 2030 a global carbon market will be in place, and therefore a consistent price of carbon will apply to all emissions. The long term traded price of carbon is estimated to be £70 per tonne CO2e in 2030, with a range of £35-£105. This price will be added to the price of goods and services, rather than being used to appraise policy choices.

It is possible to use the government's current estimate to give an illustration of future cost increases, assuming the external costs of climate change are internalised.

For example, the emissions from a tour relate to the transport emissions, which are not traded. Using a tour with emissions of 512 tonnes CO2e, and multiplying that by the current price of non-traded carbon of £52 per tonne of CO2e, will result in £26,624.

This is the amount of money the tour can expect to pay, for example through future tax changes if emissions stay constant. It is therefore a useful figure to consider when investigating emission saving actions, as anything below that amount will be a cost-efficient investment.