

I would however like to highlight two features of the map – which for me represent two of the most important learnings I have gained over the last few years with regard to what is needed to combat climate change.

1. Measuring consumption emissions rather than production emissions

There is a loop in the diagram which starts with “Demand” for products, which then feeds into “Trade Flows” which in turn feeds into “Central(ised) Carbon Generation”. This in turn feeds back into “Carbon Emissions” which increases “Climate Change” and then destroys “Value” for humankind.

This refers to the trend manifest in the UK between 1990 and 2005 when carbon production fell by 15% - but carbon consumption went up by 19%¹. De-industrialisation caused energy intensive industry to migrate to China where not only were the goods produced using less efficient coal fired power stations – but additional carbon is expended in transporting the goods from China to the EU.

The UK, and the EU, is focused on its own internal carbon emissions. But with a population of less than 1% of the world, and a shrinking manufacturing base – these are of lesser importance in the global warming context. What is paramount is the impact of UK economic activity on Global Warming – and over the past 25 years that has been to increase global warming rather than to decrease it.

Policies need to be framed in terms of their impact on the Global system otherwise the Law of Unintended Consequences may well kick in. For example high carbon taxes on local emissions, aimed at reducing local emissions and their contribution to global climate change, can drive manufacturing to China where the goods are then produced using coal fired generation. On the global stage we will have swapped Gas (and renewables /nuclear) for Coal to produce our energy intensive goods which makes global warming worse not better.

What is needed is a switch to measuring a nation’s climate change impacts by looking at the carbon content of its consumption not its emissions production.

Any levy’s and taxes need to be focused on consumption enabling consumers to make informed choices when looking at the true costs of alternative products based on their relative carbon content.

If Carbon is not priced in this way the Law of Unintended Consequences kicks in again and production gets exported to high carbon energy countries causing not only an increase in global warming but increases in local unemployment. If Carbon is not priced properly the market cannot work effectively since buyers cannot see the true cost differences between products again most likely favouring high carbon production centres.

2. Decentralised Generation

If we look at centralized coal, oil, and gas fired generating stations the usable energy extracted in the home is typically just 35% of the energy input due to the losses in power generation, transmission and distribution.

A home based or community based Gas CHP solution eliminates many of these losses due to being able to use most of the heat produced during generation and by moving the energy around the country in the form of gas rather than electricity thus eliminating the significant losses in electricity transmission and distribution. Typical efficiencies lie in the 80-90% range for home based and community based decentralized solutions.

This would suggest that a wholesale move from centralized to de-centralized generation has the potential to eliminate 40% or so of carbon emissions (moving from 65% losses to 25% losses). However, there may well be an economic value penalty for this in terms of the loss of scale economies.

There appears to be a trade-off here between the cost of carbon, and the cost of scale. Where should the balance lie?

Do we have a true cost of carbon in the market today in order to make a rational trade-off?

I would argue that the answer is an emphatic “No”. The unintended consequence of this is that centralised generation has a greater share of the market than it should have. This in turn leads to greater energy wastage, higher carbon emissions, and more climate change destroying value for society.

If you look at the other feedback loops in the system, as depicted in the Value Map, you will see that a lack of system understanding leads to the Law of unintended consequences being alive and well.

Only when policy makers have an understanding of the system as a whole will they promote policies that truly combat climate change and create value for global society.