EU climate and energy policy:
how to achieve net zero much more efficiently

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The EU has been developing its energy and climate policies since 1990, and over time the climate perspective has become – with the single market – one of the key defining elements of what the EU stands for. Whereas in the 1990s the climate elements were gradually grafted onto the Internal Energy Market (IEM), the climate package in 2007/08 was the point at which these became increasingly dominant. By 2020 they have become the major driver of energy policies, and then spilling over into industrial policies and the recovery programme. They are now getting integrated into trade.

This long-term EU project is about to move up another gear, with the 2030 package and the build-up to COP26, now postponed to 2021. New measures include 2030 targets for emissions and renewables, and a carbon border adjustment, and the consequences for the recovery plans, for the EIB finance and for the EUETS. The EC proposes to tighten its grip on the renewables targets through a Regulation rather than a Directive.

The need for a step change is obvious: the concentration of carbon in the atmosphere has continued to rise since 1990 without a break, not even for the coronavirus. This paper sets out what needs to be done, and why the current proposals are at best inadequate, and in many aspects inefficient.

The steps include: a *net zero carbon consumption target*; a *universal carbon price* applied domestically and at the border, and to both *natural and CCS sequestration* and to emissions; and *establishing markets in negative emissions*, alongside the existing emissions reduction markets. These should be supported by a further evolution of the EUETS, and a Europe-wide infrastructure and R&D programme. The paper provides the rationale for these measures and elaborates on their implementation and implications.

The objective

In order to assess the efficacy of this overall approach, it is necessary to take a step backwards and consider what the objectives are and how effective the EU has been over the past 30 years.

The overarching objective must be to limit global warming, and in particular make Europe's contribution to limiting global warming to the Paris Agreement target of 1.5 degrees as economically efficiently as possible. This requires a recognition that this is a *global* problem and any policy in the EU should be measured in terms of its *global* impact. It does not matter where the carbon is emitted.

In the last 30 years, at the global level, *the concentration of carbon in the atmosphere has gone up around 2ppm every year*, without a blip. This is true even including the coronavirus period up until May 2020. If the aim has been to limit global warming, on the only measurement that counts – the concentration in the atmosphere - progress has been noticeable by its absence.

How can this be when the EU countries have reduced their carbon territorial emissions? The answer is that the 2020-20-20 climate package was set against a soft baseline, 1990, when the eastern European communist regimes collapsed, and at the start of a long and sustained period of de-industrialisation, and within that de-industrialisation a retreat from the big five carbon-intensive industries: aluminium, fertilisers, steel, petrochemicals and cement. The corollary of this retreat was the growth of export-orientated China, and Europe become a big importer from China and especially of its carbon-intensive sectors. Put simply, reducing territorial carbon production does not necessarily reduce global warming. Transferring carbon production to other territories does not reduce carbon concentrations in the atmosphere.

The lessons from the last 30 wasted years

Looking ahead to the design of the 2030 package, there are important lessons to learn from the failure so far to make much impact. This is all the more urgent because in the next 5 years there is a reasonable chance that the world will see the 1.5 degree target breached in at least one year. Although the EU will no doubt want to build upon the

Paris Agreement, *the 1.5 degree target is now beyond its and the world's grasp*, and on current measures it is very unlikely that the line can be held at 2 degrees.

It is also important for the EU to understand not just its own impacts but also what is likely to happen in the emerging economies. China is not committed to peaking its emissions before 2030, by which time it may have doubled the size of its economy again if it maintains a 6-7% economic growth rate. India, Indonesia and a number of other emerging economies promise much larger emissions. Japan is still grappling with the consequences of closing its nuclear industry, whilst the US has continued the switch from coal to gas and now is increasing its renewables capacity.

With this in mind, one clear conclusion is that *more of the same from the EU will not make much difference to global warming,* and to the extent that the EU retreats further from carbon-intensive production, imports could offset some of the gains.

The EU's counter to this argument is that its 2020-20-20 policies were an industrial strategy as well as a climate one, on the assumption that renewables would turn out to be cheaper than fossil fuels, and that it would build the new global industrial champions of the renewables sector. Both of these assumptions have turned out to be wrong once the full system costs have been properly taken into account. Oil and gas prices have been falling since the peak in 2014, and fell again before the coronavirus had its impact on global fossil fuel demand. Indeed, as the share of renewables rises, and in particular the share of zero marginal cost renewables, the price of oil and gas is likely to carry on falling for the next decade and beyond. Were decarbonisation to be ultimately successful, the price of oil and gas would fall back to their own marginal costs from the cheapest remaining resources meeting a falling demand. In the case of oil this may be below $5 a barrel.

On the industrial strategy assumption, the great new renewables businesses have turned out to be outside the EU, notably in China and potentially in the US (after recovering from the dumping practices by China's solar industry in particular). *After 30 years there are very few EU global renewables industry champions.*

Three aspects of EU policies have proved notably counterproductive: the definition of renewables for energy; the renewables fuel approach for transport; and the closure of

existing nuclear power stations. The first allowed biomass to take a centre stage in the 20% 2020 renewables target, the second encouraged palm oil production, and the third cut out significant low carbon generation. Some biomass materials are questionable as ways of reducing emissions, palm oil is grown on cleared rainforests contributing to soil and peat emissions, and the closure of functioning and well-regulated nuclear is more about activism and politics rather than science and decarbonisation.

The great – but slow - success of the last 30 years has been the start of the exit from coal – in the US especially but also in the UK and some other EU member states.

The new challenges of the coming decade 2020-2030

If the EU is to decarbonise going forward in ways that will contribute to mitigating global warming, there needs to be a ruthless focus on the contribution of each and every policy to lowering the increase in carbon concentration in the atmosphere and then stopping it, and perhaps eventually using sequestration, natural and industrial, to start to reduce that concentration. It is the only question that matters. *Net zero should be net zero carbon consumption.*

This means that the EU has to have a carbon policy framework which addresses carbon consumption: it is the carbon footprint of the EU that matters, not where the emissions take place to produce the goods and services that EU citizens consume. This means that there needs to a strategy which addresses all the dimensions of that consumption, most notably including carbon embedded in imports. Fortunately and belatedly, the EC has recognised this. The next step, discussed below, is to ensure that this is implemented quickly and on a level playing field with domestic production.

The second related requirement is that, in doing this, the EU applies the polluter pays principle, and the polluters are ultimately EU consumers.

In tackling EU carbon consumption and treating imports on the same basis as home production, the EU can pursue a *unilateral* policy in the safe knowledge that it would not be contributing to further global warming.

The third related requirement is R&D and the public goods which the EU can contribute to the world in the form of new and innovative technologies, and infrastructure. There is here a conflict of objectives: if the R&D leads to patents and competitive advantages to EU companies, then it is not being given freely to countries where emissions reductions are required. The R&D question is similar to that of vaccines for coronavirus. Public goods should be publicly and freely given away if the aim is to reduce global warming.

These policies will have to stretch well beyond energy in general and electricity in particular. Transport is a major emitter of carbon, and there has been very little progress in reducing the domestic emissions from the transport sector, or addressing the carbon emissions embedded in the globalisation of trade.

Changes in the concentration of carbon in the atmosphere are the outcome of two conflicting processes: there are the emissions upon which all the focus in the EU has so far been concentrated; and there are the natural processes of sequestration. Nature is overwhelmingly dependent on carbon: it is the building block of life, and plants are continuously drawing down the carbon from the atmosphere. Climate change is the result of this balance of forces being out of kilter. Mitigation is as much about stopping the damage to key parts of the natural environment which inhibit the take-up of carbon, and enhancing that take-up through policies to increase trees, grasslands, the take-up of carbon in the soils, and the protection and enhancement of peat bogs. Whilst the EU has been trying to slow down the emissions, its agricultural policies have sped up the loss of carbon from soils, and overgrazing has damaged the great peat stores of carbon.

Though sequestration is frequently referred to as offsetting emissions, it is in fact half the carbon problem, and as with the emissions of carbon, location is not important to the total concentration of carbon in the atmosphere. However, sequestration capacity varies enormously across the natural environment, as do the co-benefits than come from natural carbon sequestrations, including water management and flood prevention, physical and mental health, air quality, and most importantly biodiversity. The rainforests are, in particular, not only a crucial part of the climate, but are also the hot spots for biodiversity.

A coherent EU climate policy, which aims at limiting the rises in carbon concentration in the atmosphere, can be unilaterally successful if it has regard to consumption, not territorial production, places a uniform price on carbon, provides the global public goods of R&D and the necessary infrastructure, and tackles transport and agriculture alongside energy. The gap between what such a coherent unilateral policy would look like and what the EU is doing is beginning to close with the new proposals through to 2030 and 2050, but it is so far edging forward at a glacial pace, and is nowhere near sufficient to significantly contribute towards the 2 degree limit.

The border adjustment

The EU has, after 30 years, finally grasped that carbon imports matter, and hence that there has to be a consumption basis to carbon mitigation. It has proposed a carbon border adjustment. The reason for this new-found enthusiasm for such a critical part of any coherent unilateral policy is twofold: the EU otherwise risks continuing to undermine the competitiveness of its energy- and carbon-intensive industries (directly, and also indirectly through electricity and energy prices), in effect encouraging the switch from home production to overseas production in countries like China without a coherent carbon price of their own. This is an export subsidy to China.

It has been argued that the import and carbon consumption point is less than it might seem, and that in any event EU climate policy supports these internationally traded industries, sheltering them against the full impact of the carbon export subsidy granted to overseas producers.

This argument is deeply flawed. First, carbon consumption, even very poorly measured as it is in the EU, is greater than carbon production, and it is net zero carbon consumption that ends the contribution to global warming. Second, although there is protection for some of these industries, the EU carbon policies pervade many of the inputs to these industries. It is not just a question of whether the carbon price domestically is applied to these companies, but rather whether it is applied to all their inputs too.

The second reason why the EU is now keen on a border adjustment is that it may provide an independent source of revenue to the Commission, which can then form part

of the underpinning of its borrowing and recovery programme (along with a possible digital tax and even, as has been proposed at one stage, a plastics tax too).

To these two reasons – the industrial competitiveness and the tax revenues – might be added the greater concern with trade agreements and trade practices in the debates between the EU and both the US and China.

The necessary conditions for a border adjustment are that the price is set at the same level as the price of carbon domestically and that it is as comprehensively applied as possible.

Some argue that even if justified in theory, a border adjustment is very difficult in practice. There are two responses: first, customs duties are common across wide ranges of products and indeed the mere location of production does not intrinsically make emissions any harder to measure at home and aboard. Second, even if the border adjustment is not comprehensive of all goods and services, it is better to be roughly right, capturing the big internationally traded pollution products – aluminium, steel, cement, fertilisers and petrochemicals – than precisely wrong by ignoring them.

The carbon border adjustment has one final and powerful argument in its favour: it encourages other countries to adopt carbon pricing. If imports come from a country with a similar carbon price to that in the EU, then they would be exempt. The incentive is then to impose a carbon price to pay to the government of the exporting country rather than to the European Commission. This incentive may have a much greater impact than trying to agree top-down targets through the COP process, post the Paris Agreement. Indeed the striking feature of the UN-led COP process since 1990 is that it has failed to stop the relentless rise in emissions and in the concentration of carbon in the atmosphere. It has not worked, and is very unlikely to work in the medium and perhaps even the longer term.

The centrality of the price of carbon

It is increasingly recognised that without a price on carbon there is little incentive to search out the most cost-efficient emissions reductions. What is also important is to *incentivise the most efficient sequestration options*. The price of carbon is both a tax and a

subsidy. By internalising the cost of carbon pollution, the resulting prices are economically efficient: put simply, not to price carbon is inefficient.

Pricing a commodity means that it has to be owned by someone, so that there is a party who is the polluter, and therefore has to pay. A great illusion is that the polluters are companies and if only business pays a carbon tax, all will be well. But businesses in an important sense do not pay taxes: taxes are either ultimately levied on consumers or shareholders, since businesses produce stuff ultimately for us consumers, and if costs cannot be recovered then they will fall on the owners of the businesses by reducing dividends. A carbon price is a core part of a consumption approach to climate change.

Efficient pricing means that carbon attracts the same price wherever and whenever it is emitted. This needs to apply at the same rate to all emissions – from electricity power stations, to delivery vans, to farmers who emit carbon from the soils, to road users. *Everything everywhere should have the same carbon price, including sequestration*.

There are practical considerations, but the important point is how remote the EU policy framework is from this requirement for an efficient economy. The carbon price set by the EUETS is not the same price that faces transport, and farmers are subsidised to pollute.

R&D and infrastructure: the public goods

R&D is insufficiently supplied by private markets because it has public goods characteristics. It is costly to develop ideas and develop new products, but once the magic secrets of the invention are known, anyone can copy the results at no extra marginal cost. For this reason, private companies will inadequately invest in R&D unless they can patent the results and capture the rewards. Furthermore, R&D by the private sector is likely to be shorter-term because the capturing of the economic rents may be harder further into the future, and, because there is so much failure, the cost of capital will rise the longer the time horizon to the expected benefits.

For this reason, all states invest in public research through universities and research centres, and subsidise R&D in companies. Some countries even make a business of stealing these publicly generated R&D products and outputs.

In trying to reduce the concentration of carbon in the atmosphere, there is a clear and obvious need for new technologies, to develop batteries, storage, electric motors, hydrogen, new nuclear and other electricity generation and new materials.

If the aim is to reduce the concentration of carbon, and it does not matter where it happens, then there is a strong case for the EU to subsidise R&D and make the results open-source and publicly available. In this case, copying results is part of the objective of the policy.

It is a mistake to confuse R&D with industrial policy. There is a case for industrial policy but it is not because industrial policy creates public goods. It does not: it creates private goods, and if the state wants to capture the benefits then state ownership is one mechanism, through equity stakes and outright nationalisation.

In addition to R&D, infrastructure systems display similar cost characteristics. There are large upfront sunk and fixed costs, but then very low marginal costs, except at points of congestion. Even here, for reasons of security of supply, there is a public good in resilience through excess capacity margins, so rendering the marginals costs almost always below the average cost.

The reason this matters for climate change is that decarbonisation requires both the adaptation of existing infrastructures and new infrastructures such as electric car charging networks, hydrogen networks and fibre communication. The state has a critical role in providing these.

The EU has focused on unbundling energy (and transport) networks to promote third-party access and competition. It has placed less emphasis on funding and financing infrastructure networks and adapting the IEM network rules to take account of the priority of enhancement for transport charging in particular.

Transport

Transport is a serious laggard in EU carbon policy. The renewable fuel obligations applied in the early carbon policy context have largely been a failure, and have perhaps increased global warming. Bio-fuels have not been significant net contributors to lower

global emissions. The European Commission has pursued vehicle standards with mixed success, but the falls in the price of oil have not seen a significant switch away from SUVs to all-electric vehicles. The growth of internet shopping has spawned multiple delivery services, increasing van usage and with more packaging.

As the price of oil has fallen (and probably will continue to fall for the reasons discussed above), the price of carbon becomes more important to prevent the substitution towards SUVs and fossil fuel engines.

Agriculture, land use and natural sequestration

In spending terms, the EU has for much of its history been primarily a means to subsidise farmers. In the first two decades, farm subsidies made up over 70% of the EU's total budget, and even now it hovers around 40%. Currently this subsidy goes primarily as a payment for land ownership. In addition, there are a host of subsidies including cheap diesel and the encouragement of intensification.

The Common Agricultural Policy (CAP) has caused major carbon loss from soils. Soil holds roughly four times the carbon as the atmosphere, and hence this neglected source of emissions will have to be addressed urgently if the EU is to achieve net zero territorial emissions, even before considering the carbon consumption dimension. Even on the consumption side, some food imports come from agricultural practices that are based on destroying rainforests and depleting soil carbon. Palm oil, coconut oil, soy and sugar cane are examples.

To encourage the reduction of emissions in agriculture, there needs to be a carbon price applied, especially to the fertilisers and pesticides, as well as to the fossil fuels used in tractors and farm machinery. This price should apply to imported food too.

Farmers have the opportunity to play a big part in sequestrating carbon, putting back what has been stripped out and planting crops and trees with a view to increasing sequestration. They should be paid a price for doing this. To achieve this, there needs to be baseline carbon (and natural capital) assessments, and then accreditation for carbon sequestrated.

This natural carbon sequestration can be augmented by industrial carbon-capture sequestration through CCS. Using an identical carbon price, the market can sort out which is the most cost efficient, though both will in due course probably be needed.

Farming with a carbon price in mind will change emissions and sequestration paths, and there is considerable opportunity to make this the first port of call for climate change policy rather than simply ignoring it, or worse (as with the CAP) subsidising pollution.

Raising the EU game: what really needs to be done to bear down on the concentration of carbon in the atmosphere

An efficient unilateral climate change policy is a long way from what is being proposed by the EU in its new climate change package. Though there are obvious small steps in the right direction – notably the manipulation of the EUETS permits to produce the answer that a simple carbon tax would have produced rather than the volatile and short-term prices it has so far, and the proposal for a carbon border adjustment – it is not hard to think how much more an impact on *global* concentration of carbon in the atmosphere could be achieved for all the monies being spent. The Commission's approach tries to "pull every lever" rather than put in place a coherent and cost-effective package. The fact that in the last 30 years the EU has made no discernible impact on global carbon concentrations points to the flawed nature of the approach.

The argument that "one more heave" will get the desired result, and that the failures just mean that we should try to use the current instruments even more, is not going to work. The EU needs to raise its game.

In doing this it needs to be brutally realistic. COP26 will not solve the problems. China and India and Indonesia and Brazil are not about to fall into line. The road to hell (more global warming) is lined with (some) good intentions, but good intentions are not enough.

It is perfectly practical to do much better. This requires a *clear and ruthless focus on the global objective*, a confrontation with us the polluters *by moving to a consumption basis*, a *carbon border tax* and *a uniform domestic carbon price across agriculture, transport*

and energy (and, within energy, heating too). It requires the IEM to focus on ensuring the development and enhancement of the networks, moving on from access competition, and an EU-wide R&D programme.

There will be other additional components of policy, including standards, funding and finance, and industrial strategies, and these should all be set within the climate change policy framework.

More of the same will not deliver the desired results, and nor will policy interventions in all and every aspect of the European economy. The current route leads to incoherence, overlap, waste and much higher citizen bills – bills they may not be able to pay, and, even if they can, probably will not be willing to vote to be forced to do so. There needs to be a relentless focus on the objective and on the most cost-effective ways of achieving it.

What would a credible unilateral EU climate change policy look like? There are a number of elements:

a) The objective would be *net zero carbon consumption*
b) There would be a *universal carbon price*
c) This carbon price would be on imports too: there would be *a carbon border tax equal to the domestic carbon price*
d) The *carbon price would set to rise in a stable and predictable path* to meet the net zero carbon consumption target
e) The price would be set up by an independent public body (akin to the setting of interest rates)
f) *The price would be a tax, and the EUETS would be evolved into a tax*. This could be achieved by setting the price and then issuing and withdrawing permits to meet the tax (analogous to open-market operations by central banks)
g) *There would be a Europe-wide infrastructure systems plan*, and public policies would be designed to deliver these investments in a fashion which maximised interconnection and in standardised designs
h) The *European Investment Bank would be the principle vehicle for financing these infrastructures*

i) *The primary infrastructures would be natural capital and electricity* - the former to speed up natural sequestration, and the latter to facilitate the electrification of almost everything (and especially transport and heating)

j) The EU would set up a *major R&D laboratory or network of laboratories* and provide for a *large-scale R&D fund.*

The merits of this approach would include the following:

a) There would be *no carbon leakage* through imports

b) There would, in consequence, be *no loss of international competitiveness*

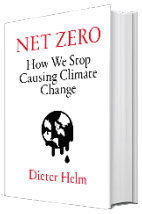
c) There would be *no exclusions from the carbon price*, and no costly special measures and all the lobbying costs that go with these market discriminations

d) *Sequestration and emissions reduction would be on a level playing field*. There would be an automatic market for sequestration at the same price of carbon, and hence price offsetting would be replaced by market transactions

e) EU funds would be concentrated on infrastructure and R&D

f) *There would be major new revenues from the carbon price*, which would both fund the infrastructure and R&D and contribute to general revenues

g) *Other countries trading with the EU would have a major incentive to impose their own carbon prices*, so that they could be exempt from paying to the EU and instead internalise their own carbon revenues.



Net Zero - How We Stop Causing Climate Change will be published by Harper Collins in September 2020