



THE GREEN PARADOX

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Environmental policy must be turned on its head: instead of mulling over for the thousandth time about which technical measures can be applied to reduce carbon dioxide emissions, we should turn to the core question of how to induce the resource owners to leave more carbon underground, as that is the sole possible way to solve the climate problem.

The simple but usually overlooked fact is: other than the useful but limited afforestation efforts, there are only two ways to curb the accumulation of carbon dioxide in the atmosphere and, with it, slow down global warming. We either temporarily refrain from extracting carbon from the ground, or we stuff it back into the ground after having extracted its energy. All the technical endeavours to develop alternative technologies and all economic incentive systems to curb the greenhouse effect must subordinate themselves to this fundamental fact.

Bringing carbon dioxide back underground is easier said than done. One third of the primary energy in the original fuel will be consumed by scrubbing CO₂ from the exhaust and subsequently compressing it into a liquid. On top of that, the amount of storage volume required is gargantuan, as each carbon atom has been joined by two oxygen atoms upon combustion – and they all need to be stored. Thus, in the case of anthracite coal more than five times as much volume is required as the original fuel occupied underground, while in the case of crude oil the proportion is more than three-fold. According to estimates by the IPCC (Intergovernmental Panel on Climate Change), the Earth's depleted coal mines and oil and gas deposits will offer room for only some 600 gigatons of carbon, barely one tenth of the recoverable carbon resources (6,500 gigatons). For that reason, if we are to curb climate change, carbon extraction

rates must be slowed down. The resource owners must be prompted to temporarily leave more carbon underground.

Those convinced that with the brave new technologies proudly displayed in many newspapers' special sections we can avert climate change should specify how they would move resource owners to extract less fossil fuel. And that is precisely the sticking point. Politics so far exhibits not the slightest glimmer of thinking in this direction. From the Environmental Agency through the Greens to the relevant European Commission there is not a thing on the matter. Even science itself overlooks the issue. Energy models depicting the long-term extraction path of fossil fuel resources do not concern themselves with the climate. Climate-theoretical models, in turn, do not concern themselves with the extraction of such resources; they are in fact atemporal models that, by their very nature, are not in a position to analyse decision issues that have an intertemporal dimension. Only now, thanks to the influence of the current German debate, a bit of movement is becoming apparent in the model front.

This silence goes hand in hand with the acknowledged difficulty of being able to do something in this regard at all. What we in Europe and Germany have set in motion with untold billions invested is geared at gradually reducing demand for fossil fuels by developing alternative energy sources and strategies. The range of initiatives goes from biofuels through wind power to better insulating homes and capping vehicles' CO₂ emissions. The measures to reduce consumption exert an increasingly stronger downward pressure upon the world's fossil fuel market price and dampen the rate of increase in such prices.

Resource owners regard this development with concern. They rightly fear the erosion of the rate of capital gains on the resources still *in situ*, moving them to react by bringing forward their extraction plans and converting a larger portion of their wealth into cash and securing it as financial capital. They thus

increase their fossil fuel supply when demand for them decreases. This is the green paradox: environmental policies that turn increasingly greener over time operate like announced expropriations. They prompt resource owners to try to escape this by accelerating extraction of their fossil fuels, which in turn speeds up the warming of the planet.

Small wonder then that the massive efforts of Europeans have delayed the peaking of the world's carbon dioxide emissions curve to the future. In fact, they have not been able to cause even the tiniest dip in this curve.

By saving ever more energy we are raising fears of the future among resource owners and leading them to increase the extraction rate. This has been music in the ears of Americans, Chinese and all other environmental sinners. They have enjoyed the resulting lower energy prices and raised their consumption by *even more* than we have reduced ours.

Some observers pin their hopes on a different effect: that the green policies push the price of fossil fuels in the world market so far down that they fall below the extraction costs, making extraction unprofitable. Demand would then drop, as green policies intend. This hope is baseless, however, because, like old Rembrandts, resource prices are not driven by cost but by scarcity, and these hover always far above the extraction costs. That is even now the case, in the midst of the dramatic fall in prices triggered by the current economic crisis. With oil prices slightly below 60 dollars per barrel, the extraction costs including exploration in the Gulf (but not mining rights, which are part of the profit) amount to around one to one-and-a-half dollars, and even the extraction of the Canadian tar sands costs, including exploration, no more than 15 dollars. In due course, fossil fuel prices will steadily increase as the resources become scarcer. At the same time, extraction will progress in the direction of increasing extraction costs, as resource owners save interest costs by beginning with the sites that are more easily accessible. Presumably, however, there will never be a point when extraction costs overtake product prices – or even come near them. An environmental policy based upon pushing prices below production costs would need a big hammer. Marginal measures as those currently in force are plainly insufficient for that purpose.

This is just as well so, as the argument for permanently sealing off part of the resources still *in situ* to

the detriment of generations far in the future finds neither economic nor ethical justification. What we need is a measured green policy that slows down resource extraction and, with it, global warming, but the green paradox shows that this goal cannot be achieved with the policies currently in place in Europe. The question is then, what brings us truly closer to the goal?

If a steadily greener policy accelerates resource extraction, it may be worth thinking about a green policy that turns to pale green as time goes by. Such a policy would exert much higher pressure on prices at the beginning but let up gradually over time, with the effect that world market prices would drop quickly to a fairly low level only to rise afterwards at a steadily increasing rate. Climate change would be slowed down, as intended.

But that is unfortunately only a theoretical solution that is well nigh impossible to attain, as a steadily less green policy would have difficulty gaining credibility among the resource owners. The many proposals concerning the long-term goals of climate policy made by politicians all go in the opposite direction. Energy consumption is to be reduced a little at the beginning but with increasing zeal as time progresses. From the G8 Summit at Toyako in July 2008, in which the participating countries committed to a 50 percent reduction goal up to 2050, to the ludicrous proclamations of the German Left Party, who want to reduce emissions by 90 percent by 2050, policies follow the same pattern. The largest reduction efforts are to be made in the far future, while the current generations are largely spared. Politicians cannot do otherwise, alas, as they do not want to inflict the pain of immediate reductions upon their voters. The year 2050 is so far in the future that the boldest policy proposals can be made now without scaring voters off. After all, the onus will fall later on other citizens and other politicians who will have to tighten their belts. The consequence of this delaying policy is that the resource owners will move forward the extraction of their resources. The quantities that the politicians announce for future restriction spring from the ground all the more copiously today.

An environmental policy subjected to the constraints of democratic discussion and that limits itself to influencing the demand for fossil fuels cannot persuade resource owners that the price of their products will be less affected in the far future than now or in the near future. On the contrary, the resource

owners will be plagued by the fear that, as the planet becomes warmer and the resulting climate damage more apparent, this policy will be tightened up even further. As a result, it can hardly be expected that a demand policy that attempts to influence supply through price signals will ever make a contribution towards curbing climate change.

A possibility to overcome this problem is to make it unattractive for resource owners to convert their fossil fuel wealth into financial investments. A global shift from the residence to the source-country principle in taxing interest income could achieve this goal. This would not alter the tax on interest income for the residents of consumer nations but would levy higher taxes on interest income for the resource owners, giving rise to an incentive to leave more of the resource *in situ*, slowing down extraction and, with it, climate change.

Another possibility is the formation of a seamless consumer cartel in which all consumer countries take part. Demand policies are ineffective if they only encompass some of the countries, as they will then only operate through price signals and are likely to cause the green paradox. The non-participating countries will then, at lower prices, not only gobble up the fossil fuel quantities that are set free thanks to the efforts of the Kyoto countries, but also the additional quantities the resource suppliers bring to the market out of fear of a deteriorating business environment for their products.

The situation is different if all consumer countries accept a cap on consumption, as then the suppliers will find no takers for their products and will have to reduce extraction whether they want it or not. Expectations regarding the future will no longer play any role. With consumption caps valid for all consumer nations the playing field will be tilted in a direction that does something for the climate.

These consumption caps could come about through a global certificate trading system, extending the one introduced by the UN for a number of countries in 2008. Granted, it would still be a market system that allocates carbon volumes to the individual countries, but now it would not be the resource owners who set the extraction path, but the United Nations. The resource owners could not wriggle free of the power of the UN.

During the forthcoming world climate summit in Copenhagen later this year the EU will try to create

such a Super-Kyoto system, given that it has been working intensively towards such a goal for several years. But it will probably fail again, as the road to an all-encompassing consumption cap is still far away. Thus far only the 27 EU nations, Canada, Australia, Iceland, Japan, New Zealand, Norway, Russia and Ukraine have accepted a cap on CO₂ emissions. The rest of the world, including the United States, South America, Africa and Asia from Turkey to China, responsible for 70 percent of CO₂ emissions, have kept well clear of such a commitment.

The circumstances could change, however, if it appears that the United States under the Obama Administration sets off on a new course. In any case, the new Director of the White House's National Economic Council, Lawrence Summers, has announced that the United States, after having overcome the crisis, will introduce its own emissions trading system in 2011. After this, the step towards a globe-spanning Super-Kyoto system should become easier.

In principle a Super-Kyoto system would be similar to the rationing that was practised after the war in many European countries, when in order to buy food one needed ration coupons or stamps that were issued by governmental agencies according to social criteria. To buy a pound of butter, a person had to pay the proprietor the regulated price of the product and at the same time give him a butter coupon. If one did not have enough coupons, it was necessary to trade coupons with other coupon recipients. The mechanism would be very similar if trade in UN certificates were extended to all countries of the world. The total amount of carbon that is available to the countries could be rationed this way, and the distribution of the certificates via the UN trading system and subordinate, regional trading systems, such as that of the EU, would determine where carbon is burnt.

The result would be attractive for the consumer countries in two ways. Fossil carbon would not be extracted so quickly, which would slow down climate change. Secondly, the consumer countries would no longer have to pay so much for their fuel. To be sure, the energy costs for individual consumers would be higher because they would also have to buy the certificates, but the state treasury of every country would have more revenue and citizens would benefit by the additional provision of public goods or from lower taxes. The consumer countries as a whole, both

citizens and the state treasury, would pay less for fossil resources because they would reduce their demand, thus driving down world market prices.

From an economic viewpoint this Super-Kyoto system basically amounts to a partial expropriation of the resource owners and a partial substitute of the market mechanism by a centrally planned control of quantities. Since one is only allowed to use the resources if one can produce the UN rationing coupons, the UN will become, in economic terms albeit not legally, the joint owner of the fossil fuel. If it gives the national governments the right to sell these rationing coupons, as will be the case at least within the EU for the third trading period as of 2013, then it will of course transfer its ownership rights to the national governments. The revenue that these governments achieve from the sale of the certificates comes at the expense of the resource owning countries and would lower the market value of the stocks *in situ*.

Whether we should set out along this path, in light of the negative experience we have had with centrally planned strategies, is a highly complex issue that is difficult to decide. In the final analysis we will probably have no choice but to let the UN take over the central planning.

This will certainly produce various negative behavioural effects, as we know from central planning systems. A power centre will grow up around the UN that will try to extricate itself from democratic controls. The countries will begin to struggle with each other over who is to be favoured in the allotment of the certificates and will seek to obtain exceptions from the necessity to purchase certificates. This in turn will further strengthen the power of the UN bureaucracy. Possibly a worldwide black market for carbon will arise with a Mafia-style counter force arising that escapes democratic controls.

The resource countries will do all they can to resist such a solution. They will try to prevent the UN from forming a worldwide demand cartel, and by granting special deliveries of carbon fuel they will try to keep as many countries as possible out of the cartel. They will also try to form a counter cartel. The fact that the OPEC is flirting with the idea of admitting Russia is not surprising in light of these developments. Moreover, the countries with the resources will attempt to develop their own economies such that they will be able to exploit their own fossil fuels

without limitations from the UN. Bearing these considerations in mind, Dubai's breathtaking economic development can surely be understood as a rational counter-strategy of a significant resource supply country.

However, these avoidance manoeuvres will in turn induce the demand countries to develop their own counter strategies. The countries participating in the cartel will not allow individual countries to acquire fossil carbon without the proof of certificates, and they will build up trade barriers to punish those who deviate. All this will create a considerable conflict potential that could lead to outbreaks of military force.

Only the horror of a further warming of the atmosphere combined with the fact that the consumer countries will have to keep on spending considerable parts of their real income for the acquisition of constantly dwindling amounts of carbon makes the worldwide demand cartel that the UN is planning attractive. Policy-makers have the choice between Scylla and Charybdis.

If we wish to pursue the path to a Super-Kyoto system, it is important that we do it quickly. Any delay is poison for the climate, not only because in the meantime emissions will continue unabated but especially because a piecemeal inclusion of more and more countries would have the ironic effect of stoking the green paradox even further. If the number of countries accepting caps on their emissions increases only bit by bit, this will give rise to an increasingly larger price pressure over time that will induce the resource owners to anticipate the worsening of their profit margins by speeding up extraction. Paradoxically, the more successful the world climate summit is in gaining members to the worldwide demand cartel over the coming decades, the more rapidly will the world's climate warm up in the initial stages. Only taking the resource owners by surprise, with an immediate completion of the cartel that proceeds so rapidly that the resource owners no longer have the time to react by accelerating the extraction of their resources, can bring about the desired effects.