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How to eat an elephant: a bottom-up approach to climate policy

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A longstanding, alternative approach is offered to the existing UNFCCC international policy regime as a viable policy option. This ‘bottom-up’ approach has been neglected in policy discourse until now. The alternative approach is a ‘clumsy’ proposal, which emphasizes the ‘direction of travel’ over targets and timetables. It places an immediate emphasis on adaptation and the development of effective measures to minimize global warming through a diverse range of policy actions, originating from the ‘bottom up’ within nations, based on their own institutional, technological, economic and political capacities. Cumulatively, this would lead to a fundamental technological shift in global patterns of energy and land use. It would also encourage practical cooperation among the large emitters to control greenhouse gases and support the formation of regional collaborations on adaptation. Climate change is framed as a strategic challenge rather than an optimizing problem for analysts and policy-makers. Hence, policy is no longer obsessed with issues of leakage and concerns about free-riders, but greater explicit recognition is given to the fact that development is inevitably uneven and that different actors have very different motivations for action and capabilities to contribute to the climate change challenge.

Keywords: bottom-up strategy; climate negotiations; climate policy; climate regimes; climate targets; COP-16; local strategy; post-Copenhagen

Une approche de long terme, est proposée en tant qu’option politique viable a la place du régime de politique international actuel de la CCNUCC. Cette approche ascendante a été négligée jusqu’à maintenant dans le débat sur les politiques. Cette autre approche est une proposition « bancale », qui met l’accent sur la « trajectoire » le long de cibles et de calendriers. L’accent est tout de suite mis sur l’adaptation et l’élaboration de mesures tangibles pour minimiser le réchauffement climatique, à travers un éventail varié d’actions politiques ascendantes propres aux différents pays, en fonction de leurs propres capacités institutionnelles, technologiques, économiques et politiques. L’effet cumulé devrait amener à un changement technologique fondamental dans la structure mondiale en énergie et en utilisation des terres. Ceci encouragerait également une coopération réelle entre les gros émetteurs dans le contrôle des gaz à effet de serre et alimenterait la création de collaborations régionales en ce qui concerne l’adaptation. Le changement climatique est cadré, pour les chercheurs et les décideurs, en tant que défi stratégique plutôt que problème d’optimisation. De ce fait, la politique n’est plus polarisée par les questions de fuite et les préoccupations relatives au phénomène de passager clandestin, mais on admet plus expressément l’inévitable inégalité de développement et la nature très différente des motivations des différents acteurs en ce qui concerne l’action et les capacités à fournir dans la lutte contre le changement climatique.

Mots clés: cibles pour le climat; COP-16; négociations sur le climat; politique climatique; post Copenhague; régimes climatiques; stratégie ascendante; stratégie locale

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Q. How do you eat an elephant?
A. One piece at a time.

1. The failure of the ‘top-down’ approach

Since the adoption of the Kyoto Protocol in December 1997, the dominant architecture for global climate policy has been a universally inclusive regime with legally enforceable emission reduction targets for Annex I countries, facilitated by a global market in carbon emission permits. Supporters of this ‘elegant’ top-down approach have consistently underestimated the institutional complexities of making markets, while overestimating the ability of politicians to prioritize climate to citizens concerned with more immediate welfare issues such as employment and competitiveness (Laird, 2000; Sarewitz and Pielke, 2000; Benedick, 2001; Victor, 2001; Prins and Rayner, 2007).

The faulty UNFCCC architecture was exacerbated at Kyoto by hasty borrowings from other international governance regimes addressing stratospheric ozone and nuclear weapons as well as the USA’s experience with SO₂ emissions trading (Prins and Rayner, 2007). The ozone regime provided the model of a global treaty with staged implementation protocols (Parson, 2003). Senator Al Gore Jr had an influence on establishing the Strategic Arms Reduction Treaty (START) negotiated between the USSR and USA between 1982 and 1991. This was based on the idea of targets and timetables for phased mutually verifiable reductions. The 1993 Acid Rain Program in the USA established a cap-and-trade programme to enable electric utilities to trade SO₂ emissions permits as part of a national strategy to allow generators in the eastern states to continue to burn high-sulphur coal from the west (Burtraw and Palmer, 2003).

These analogies proved to be misleading. Ozone-depleting substances consisted of a few artificial chemicals for which alternatives were readily available. START only involved two countries focused on a single technology (nuclear weapons) under direct government control. There was no obvious conflict between arms reduction and broader economic and development goals, and actual use of the technology was basically unthinkable anyway. The US experience with SO₂ trading only involved a single gas being traded within a unified legal system that was able to enforce contracts and impose sanctions on defectors. None of these conditions applies to proposed GHG emissions trading under the Kyoto Protocol.

Furthermore, all of these analogies framed the climate policy challenge almost exclusively in terms of imposing emission controls. Little attention was paid to adaptation, discussion of which was actually suppressed in many quarters out of fear that it would deflect attention from the perceived priority of establishing emission reduction targets (Thompson and Rayner, 1998).

This initial mischaracterization of the challenges was understandable. What has been more difficult for critics of the UNFCCC Kyoto architecture to overcome has been the doctrinaire defence of that architecture as ‘the only game in town’, despite an overwhelming accumulation of evidence that it could be doomed to failure. Such evidence includes the infamous CDM scams (see, e.g., Wara, 2007), the double collapse of the carbon price in the ETS, the persistent rise in worldwide emissions (currently running close to 3% per annum) and, most recently, the undeniable failure of the Kyoto route in Copenhagen. A few still cling to the Manichean fantasy that all would be well were it not for the intransigence of first the USA and now China. However, others are coming around to the view that a radical change in approach will be necessary in order to come to grips with climate change. For instance, Der Spiegel (26 April 2010) reports that the German Chancellor, Angela Merkel, has abandoned her commitment to a universal binding agreement on emission reductions and has reluctantly embraced ‘realpolitik’. She is not alone, as the undeniable and highly public collapse of the Kyoto route has opened a space within which...
open-minded reappraisal of the basic policy architecture is possible for the first time in over a
decade. We should not shrink from this task.

An approach to climate policy is proposed in this article that differs in many fundamental
respects from the UNFCCC Kyoto orthodoxy. In their most basic form, these ideas have existed
since the mid-1980s (Gerlach and Rayner, 1988); more than a decade before Kyoto was formulated.
In contrast with the elegant universal framework of carbon trading, this is a ‘clumsy’ proposal
(Verweij et al., 2006), which emphasizes the ‘direction of travel’ over targets and timetables and
approaches the development of effective measures to minimize global warming through a diverse
range of policy actions, originating from the ‘bottom up’ within nations, based on their own
institutional, technological, economic and political capacities; but which cumulatively will lead
to a fundamental technological shift in global patterns of energy and land use.

2. A bottom-up approach

The basic proposition of a bottom-up approach is that climate change policies should be designed
and implemented at the lowest feasible level of organization. This does not mean that everything
should be done at the local community level, but that where something can be done at a local,
city, regional or single-nation level, then it makes sound sense to focus policy attention there,
without the need to fit it into a formal global charter for action. There may well be some aspects
of climate policy that require international agreements between many countries, for example the
deployment of sulphate aerosols to deliberately cool the planet (Shepherd et al., 2009). However,
the basic assumption here is that these instances are far fewer than conventional climate policy
supposes and that such an agreement need not be the starting point for effective climate policy.

3. Beginning with adaptation

A bottom-up approach to climate policy begins with adaptation. For many years climate policy
advocates shied away from discussing adaptation, due to a belief that to do so would weaken
political resolve to pursue effective mitigation (Thompson and Rayner, 1998). Even today, the
need for adaptation is largely seen as a failure of mitigation. For example, the Stern Review (Stern,
2006) argues that adaptation ‘is crucial to deal with the unavoidable impacts of climate change
to which the world is already committed’. Adaptation is not a substitute for successful mitigation,
but it is more urgent for saving lives.

Better adaptation to current conditions and to anticipated changes has the potential to bring
real, immediate and visible benefits to humanity. The case for adaptation does not depend on
improvements in climatology or greater certainty about the causes of temperature or precipitation
change. Nor does it require a universally binding treaty negotiated by nearly 200 governments.
Individual countries, and even regional and city administrations, have the ability to revise and
implement zoning, planning and building regulations and invest in infrastructure in ways that
drastically reduce vulnerability to climate change in the short and medium term.

4. A bottom-up approach to mitigation

A bottom-up approach to mitigation abandons the idea that climate change policy requires a
universal framework. Developing a global agreement that requires the consent of all national
governments inevitably results in the lowest of common denominators. Since fewer than 20
countries account for some 80% of the world’s emissions, it makes sense to focus on these big
hitters (Prins and Rayner, 2007). There have been several false starts in this direction, but to date
such efforts have been somewhat half-hearted concessions to Kyoto’s failure rather than being embraced as viable alternatives.

It is perhaps over-optimistic to hope that the signatories of the Copenhagen Accord will prove more effective in establishing a viable club of big emitters capable of establishing a regime committed to developing and implementing emission-free technologies at a price that smaller nations can afford. But even if that hope is not fulfilled, a bottom-up approach can still be built on smaller bilateral or multilateral arrangements among countries with complementary capabilities and interests. Indeed, they need not be countries at all. There is vast potential for cities to collaborate on climate change (Bulkeley and Betsill, 2005). Cities are centres of innovation and can advance clean energy systems, sustainable transportation, waste management and spatial-development strategies to reduce GHGs. Local authorities can also work with local stakeholders to design and implement effective adaptation strategies (Corfee-Morlot et al., 2009). For example, the C40 Climate Leadership Group has brought 18 of the world’s leading cities together to coordinate actions on climate change since 2005. In the USA, the most effective action so far has been taken at the level of city and state governments, regardless of the positions taken in Washington, DC (Rabe, 2004).

These examples of municipal initiatives remind us that a bottom-up approach is just that – it deals with problems at the lowest possible level of decision-making. Climate change is a multilevel governance problem. Where mitigation policy includes establishing a carbon price, then it should be devolved to the lowest practicable jurisdiction and tailored to local practicalities. There is evidence that concerns about leakage under these conditions may be misplaced. Sales taxes vary significantly in states and cities around the USA but are still generally between one-quarter and one-half of the VAT charged in Europe; neither the local nor the global economies seem to be falling apart as a result. Where it is believed that carbon prices are better established through cap-and-trade than through taxation, and where the conditions exist to enforce contracts, then these carbon markets too can be built from the bottom up, just as other markets in goods and services have been throughout history (Cantor et al., 1992). Functioning markets could link up with each other to form regional, and perhaps eventually global, trading systems. But all this will take time – the evidence indicates several decades – which suggests that effective market prices for carbon are likely to be part of the end-game for a mitigation strategy (as suggested below), to encourage a rapid shift to new technology once it becomes available at a competitive price, rather than as the initial stimulus for innovation.

This leaves a major gap in mitigation, which is how to stimulate the necessary R&D and, even more importantly, the demonstration and deployment of carbon-neutral technology that will bring it to the scale where it can potentially displace fossil energy. This is no small challenge. Based on the analysis of Hoffert et al. (1998), Galiana and Green (2009) calculate that with just a 2% growth rate in energy demand over the next 40 years, the world would require an increase in carbon-neutral energy from 2.5 TW today to 15 TW, to get on to a stabilization pathway by 2050. Since almost all of the carbon-free energy currently consumed comes from nuclear and hydro, this suggests that there will need to be nothing short of an energy technology revolution in the next four decades.

Despite repeated assertions to the contrary, non-carbon technologies are not presently sufficiently developed to be able to provide this revolution. Many are still at the R&D stage, but even those that are apparently sitting on the shelf are either too expensive to compete with a rising fossil fuel price in the near term or may not be scalable due to the absence of enabling technology, such as grid integration and storage for intermittent and variable sources such as solar and wind power (Hoffert et al., 2002).

The time constraint is critical. The logic of cap-and-trade is that once a trading system is established, the limited availability of emissions permits will drive up the price of carbon-emitting
energy and so send a signal to industry to conduct the R&D necessary to bring down the cost of expensive sources or provide links, such as storage, necessary to make others viable. Over time, R&D will bring down the price of alternatives to meet the rising price of carbon. However, to avoid a 2°C average temperature increase in the decade 2040–2050, this will entail achieving a sixfold increase in installed carbon-neutral energy capacity. Given the failure of efforts to create a price signal over the past 10 years and the inevitable time lags between the creation of a market and the political feasibility of applying a sufficiently tight cap to create a compelling price signal to even initiate the necessary research effort, a global top-down cap-and-trade system seems unlikely to deliver the necessary technological miracle in anything like the necessary time span.

Last, but not least, there is the issue of energy justice. About 1.5 billion people presently lack access to mains electricity. Under the top-down mitigation strategy, many of these will literally be left in the dark. It is an imperative of human dignity that the needs of the world’s poorest people should be attended to. A recent high-level UN report (UN AEGC, 2010) identifies two key goals: ensuring universal energy access and reducing global energy intensity. However, the high-quality fossil fuels are already in tight markets, which leaves them inaccessible to the world’s poor, who continue to use fuelwood, dung, and highly polluting brown coal. Increasing world energy demand will only make the high-quality fuels more expensive and therefore even less accessible to the poor. If access to decent and reliable energy is to be provided for the world’s poor, then it is imperative that widely available, low-cost alternatives are created. In short, we need a strategy of energy modernization. Such a strategy, driven by hope and higher aspirations for human welfare, may well prove a more inspiring agenda for people than the vocabulary of limits driven by fear that is commonly invoked to provoke support for Kyoto-style emissions targets, which have proved consistently unattainable.

For all of these reasons, major public investment in carbon-neutral energy R&D is urgently required. To pay for a publicly funded programme of energy modernization, various commentators (Prins and Rayner, 2007; Galiana and Green, 2009; Prins et al., 2010) have suggested a very modest hypothesized or dedicated carbon tax. Because the initial purpose of the tax is to raise revenue for R&D, it can be set at a level much lower than anything that would have a sustained influence on consumer behaviour. As Galiana and Green (2009: 23) point out, ‘a low tax on each tonne of carbon dioxide is all that is needed to raise tens of billions of dollars globally. A $5 per tonne CO₂ tax would raise $30 billion a year in the USA, about the same in China, almost as much in the EU, and lesser, but significant amounts in Russia, India, and in other countries. Annually as much as $150 billion could be raised in this way worldwide.’

Rather than loading more and more issues onto the climate mitigation agenda, we should, as far as possible, divide climate into a series of more tractable problems, which local or sectional actors have a strong incentive to solve for themselves in efficient ways and at the same time take a bite out of the larger problem. The potential of this approach is illustrated by the fact that the Montreal Protocol to control substances hazardous to stratospheric ozone has actually done more to reduce the increasing rate of global warming than Kyoto could have achieved if it had been fully implemented (Velders et al., 2007).

Although CO₂ from fossil fuels may be the largest single contributor, it is actually responsible for less than half of the human forcing of the climate system. For example, black carbon from sources ranging from domestic cooking fires to coal-fired power plants may be killing nearly 2 million people each year and disproportionately contributing to loss of the cryosphere in the northern hemisphere (Ramanathan and Carmichael, 2008). Much of this could be eradicated by fitting effective scrubbers to large point sources and replacing open cooking fires with cleaner alternatives.

Enforcing existing air pollution regulations could go a long way to reducing global warming contributors such as nitrogen oxides, methane and volatile organic compounds that are known
to be directly hazardous to public health and, therefore, of more immediate concern than the somewhat distant and nebulous threat of climate change impacts.

5. Transitioning from top-down to bottom-up

Within the short space of this article, the weaknesses of a top-down approach to climate policy (along the lines of the UNFCCC and Kyoto Protocol) have been depicted as arising from fundamental flaws in its architecture and not just from political manoeuvring for advantage in its implementation. The broad contours of a bottom-up policy approach have been outlined. This begins with the urgent task of prioritizing adaptation, which is inevitably local in character and quintessentially a bottom-up response to climate variability, with or without the additional challenges of underlying secular climate change. An alternative approach to mitigation has been proposed that is based not on promoting fear of climate change but on the positive imperatives of energy modernization, especially that of providing clean, affordable and reliable energy to the huge number of people who are currently denied it. Instead of loading more and more issues onto the climate policy agenda, we should be unloading as much as possible onto other immediate policy priorities which can be pursued at national and subnational levels.

This is obviously not an agenda that will appeal to tidy thinkers and moralists who seek a coordinated global response to climate change based on common agreement about the underlying causes and the attribution of blame. It is a modest, but practical, agenda rooted in an ethical commitment to human dignity as well as to environmental sustainability, but without indulging in finger-pointing and pointless recriminations.

Some argue that top-down targets are essential to generate policy action. Certainly it is helpful to have widely recognized goals for limiting atmospheric carbon concentrations; ultimately the world should aspire to zero net carbon emissions. Advocates of the bottom-up approach are not opposed to national and local governments setting ambitious policy targets that help movement in that direction. But we do despair of setting grandiose emissions targets without any plausible technological pathway for achieving them. National and local targets for installed technology would provide a more realistic and verifiable mechanism for achieving emission reductions than global targets. At present, it is more important to establish a clear direction of travel for every jurisdiction than to specify the exact point and time of arrival.

It is also clear that the transition from a top-down to bottom-up strategy will be difficult for those who have made enormous investments of personal energy and political credibility in the top-down approach. Whereas it is always rational to abandon sunk economic costs, sunk political costs are political capital. Bottom-up advocates need to recognize this and must seek to construct a golden bridge which the champions of the failed approach can cross with dignity. It is likely that existing negotiations will be allowed to continue while governments increasingly turn to the challenge of energy modernization to do the ‘heavy lifting’. But, in the final analysis, the top-down approach cannot work. The real choice is almost certainly between muddling along with a bottom-up strategy that is adopted piecemeal by default (as top-down failures become apparent through the loss of human life and ecosystem services that will signal such failure) or choosing a deliberate and reflexive bottom-up approach founded in the pursuit of human dignity through improved adaptation to climate and the expansion of non-fossil energy to enable access to all.

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