March 19, 2015

**Simon Upton**

***The Future of the Green Growth Paradigm***

**March 26th , 2015**

Grantham Research Institute on Climate Change and
the Environment & Global Green Growth Institute, London School of Economics

I have been more worried than normal about my ability to do justice to this closing session. It has something to do with the fact that I am surrounded by economists while not being a member of the priesthood. But it also has something to do with the use of the 'P' word.

I arrived at the OECD in 2010 halfway through the development of our Green Growth Strategy. One of the first things I did was ban use of the word paradigm. What I inherited seemed to me to be a thoughtful but not terribly ground-breaking re-exposition of environmental economics 101. As befits a conservative organisation that derives its strength from the potentially constraining requirement of eliciting consensus (or at least acquiescence) from 34 Member Countries, the OECD had set about starting from where it stood: it had an in-house model of growth, a deep understanding of the contribution of structural reform to productivity growth, a conventional understanding of how to apply Pigouvian taxes to externalities and a linked economy-environment modelling capability that enabled it to say some interesting things about the consequences for long-run growth of mounting environmental pressures.

Nothing in that tool kit was going to lead to paradigmatic change. But its familiarity enabled us to speak to policy makers who were scarcely going to jettison the existing paradigm in the face of the deepest (and as it has turned out) longest downturn since the 1930s.

In truth, the green growth label served several purposes that did not necessarily share a common motivation. Some policy makers (facing the Copenhagen conference) wanted to keep their negotiations on-course in the face of the crash by saying we needed both green and growth and that going green could create huge new commercial and employment opportunities. There was no decisive evidence to support those hopes at the time, and indeed subsequent work we have done suggests that the sort of industrial transformation climate change demands will create plenty of labour market churn, but no jobs bonanza that can justify some of the claims that were made.

Others were more interested in growth and saw in the green growth work a fresh opportunity to focus on a familiar reform agenda targeting growth inhibiting policies – everyday things like poorly targeted subsidies, burdensome regulations and restrictive practices. If they were coloured green, so much the better.

Others seized on the green label to justify a raft of measures designed to pump up demand and save jobs in beleaguered flagship industries. And so we had a raft of 'cash-for-clunkers' schemes whose cost benefit robustness was rarely better than middling. These soon ran out of fiscal headroom.

Finally, those of us concerned about long-run environmental risks saw the opportunity to find some way of linking what we knew about inefficient resource use and the costs of rising externalities to the sustainability of the growth dynamic.

In the end we came up with a very pragmatic diagnosis that offered a smorgasbord of issues that policy makers should tackle: pricing externalities, taking the contribution of natural resources to growth seriously, eliminating economically and environmentally harmful subsidies and trying to understand better the role of innovation in finding our way out of environmental problems while at the same time delivering economic benefits. It didn't add up to a paradigm then and it doesn't now.

But we have done a huge amount of work since and I don't believe the relationship between core economic policy advice and environmental policy advice will ever be the same again. It has changed forever. So if we can dispense with the idea of paradigms as top-down, all-embracing systems, I would be prepared to concede that green growth has started to become a real part of the policy debate that could in time be viewed as helping to effect a paradigmatic shift in the way we understand growth. So the future of the green growth paradigm, if it has one, is as an emergent phenomenon, a piece of mental furniture under construction.

So let me come back to the pragmatic – and frankly tactical – way in which we have tried to make sense of green growth.

One strand has been to address directly the immediate and unreflective question with which proposed environmental regulations are routinely confronted: "what's the trade-off in terms of growth?" In a country like China where the toxic state of the atmosphere is palpable this may be less of a concern. But in OECD countries with high levels of unemployment and barely perceptible output growth, the challenge is unflinching - notwithstanding a worrying number of slow sleepers like fine particulate or endocrine disrupters.

It has to be said that modelling based assurances that "global GDP growth will only be 0.2% lower per annum as a result of the costs of climate change " don't seem to be compelling. The scale of measured losses to GDP coming out of our own latest modelling on climate (which seeks to internalise the compounding impact of environmental damage through to 2060) is too aggregated and too far away to allay much concern even as we warn that this doesn't include the consequences of extreme events and can't account for non-linearities.

Much more interesting to policy makers has been empirical work that seeks to detect the consequences of environmental stringency for productivity growth by looking at data over a lengthy period. The work, undertaken by my colleague Tomasz Kozluk, is based on a new indicator of environmental policy stringency which shows that in surveyed OECD countries these policies have become more stringent since 1990.

The indicator is a proxy, focusing on selected policy instruments and environmental domains and covering only a subset of OECD countries. However, it is the broadest, most comprehensive cross-country and over-time measure of environmental policy stringency to date and supports business perceptions that stringency has increased. The indicator needs more work which we are undertaking. But the first results of analysis based on it are striking.

In short, the increasing stringency of environmental policies has not harmed productivity levels. Based on the indicator, OECD research finds that the aggregate effects of environmental policy tightening in OECD countries over the past two decades have been negligible in the medium run. There have been some short-term adjustments, and the impacts have differed across firms and

industries. In particular, less productive firms have seen a temporary fall in productivity growth, while the most productive firms and industries have actually seen positive effects.

The most technologically advanced firms in an industry may indeed be better suited to take advantage of the new market opportunities created by environmental policies, to cash in on the most advanced technologies and R&D. They may also be outsourcing part of the dirtier, less efficient production. At the same time, less advanced firms may require more investment or more adjustment in general, to cope with regulation. If they can't cope, some of them may indeed exit from the market. In principle, this is a natural outcome, which should not result in aggregate harm if resources are swiftly allocated to new entrants and growing firms. The research is only a first step, hence we are not able to pinpoint these channels – but ongoing work on the investment and trade effects of environmental policies should help.

Importantly, while this research does not focus on the specific effects of individual policies, it does find some general support for the proposition that market-based instruments tend to have a more robust positive effect on productivity growth.

These findings, together with a more detailed empirical analysis of the competitiveness impacts of the German electricity tax, provide policy makers with grounds for questioning some of the claims business makes about the competitiveness impacts of environmental policies.

That doesn't mean there won't be winners and losers among companies. It will be important to ensure that economies are flexible enough to be able to facilitate adjustment. This goes to the heart of a long OECD history of supporting reforms in product and labour markets to facilitate adjustment and benefit productivity growth and competitiveness.

As a companion to the work on environmental stringency, we have developed a simple indicator designed to capture some of the aspects of environmental policies related to administrative burdens, practices that provide advantages to incumbents (for example, vintage differentiated regulations and tax advantages) and the process of policy making. Again, it is early days, but the initial conclusions are that such burdens are not a necessary feature of stringent, ambitious environmental policies.

This work carries many health warnings, not least the fact that it is only examining the observed historical tightening of environmental policies and cannot necessarily be extrapolated to more rapid and potent increases in environmental stringency that might be called for given the scale of some of the problems we face. And by no means do the results indicate that any environmental policy tightening is economically harmless – good design and implementation of policies, as well as the overall policy framework will be crucial.

But the essential point of this line of work is that it emphasises the dynamic nature of firm responses to environmental regulation and gives some confidence that growth is compatible with policy interventions designed to significantly green the economy.

But green growth envisages much more sweeping changes to production than the sort of environmental regulation that even leading countries like Sweden and Germany have imposed. It is ultimately motivated by a concern that there really are some planetary boundaries – in the sense that beyond a certain point, non-linear change in natural systems could render the planet a less familiar and much less productive place (from a human point of view). In these circumstances, growth that looks anything like business as usual is unlikely to steer us off the rocks.

It is here that the going gets particularly tough for policy makers. They are being asked to take profound decisions today to head off consequences that are not yet apparent – at least to large numbers of people. Developed countries face chronically low growth, high debt, high

unemployment and in some cases major infrastructural run-down. Developing countries face demands for improved living standards that imply very large increases in material consumption.

I know this is not the conventional wisdom, but green growth seems to me to be an easier call in emerging economies. Development is a dynamic process and where patterns of production and consumption have not been hard-wired it is possible to nudge the development path onto a different trajectory. The New Climate Economy has a lot of good advice to give on this score. Developed societies are in a different position and, notwithstanding the huge stock of intellectual capital on which they should be able to draw, there is a real fear that green growth is not about growth at all.

The problem is in no small way tied up with the way an entire political and business class thinks about growth. GDP growth has become the almost overriding measure of the success or failure of governmental economic management. To amend Dickens, 0.5% quarterly GDP growth, electoral fortune; -0.5% GDP growth, electoral ruin. Never mind that we live in a globalised economy with trade, currency, geopolitical and natural shocks reverberating up and down value chains. Governments seem somehow transfixed by national GDP numbers. And they haven't been stellar for some time – even before the GFC.

So to start talking about a radical change in the composition of growth – and that is what green growth is all about – is for many decision makers, alien territory, particularly when the case for doing so is driven by trends that are developing over timeframes of decades while it is on the basis of quarterly results that businesses report to shareholders and politicians report to voters.

The truth is that the composition of growth has changed radically over time and will continue to do so. Ageing will ensure that. And so will the environmental pressures that drive the green growth debate – whether decision makers like it or not. What is needed is a much more nuanced understanding of what productivity growth is, and why it is needed.

This brings me to a second strand of our work – trying to re-frame the measurement agenda which inevitably underlies public policy debate.

The OECD's Green Growth Strategy proposes 26 indicators to track progress across four areas: (1) the transition to a low-carbon, resource-efficient economy; (2) the maintenance of the economy's natural asset base; (3) the [environmental] quality of life benefits gained from effective policy; and (4) the economic opportunities gained from effective policy. These indicators aim to help determine policy's effectiveness in delivering green growth.

Work is progressing on a smaller representative set of "headline" indicators that can be used to help crystallise and track central elements of green growth, and enhance understanding by policy makers and the general public. These six indicators cover: carbon productivity; material productivity; environmentally-adjusted multifactor productivity growth; a natural resource index; changes in land use and cover; and population exposure to air pollution. A seventh headline indicator on economic opportunities remains to be selected.

The first three of these are particularly important because they start from a familiar understanding of growth and start to unpack its composition. They do not contest the utility of productivity growth as the engine for higher per capita income and rising living standards. But by identifying the sources of growth they help shed light on its sustainability.

The carbon productivity and material productivity measures are familiar and easy to explain – but suffer, like any single productivity measure, from the partial story they tell. By contrast, the

environmentally adjusted multi factor productivity indicator is comprehensive and, since MFP is a key measure of economic performance, it is closely linked to material living standards.

Because traditional MFP fails to account for the use of natural capital and for environmental by-products, we adjust the measurement framework to also account for environmental services – both environmental inputs (natural capital) and environmental outputs (undesirable outputs like emissions). The environmentally adjusted MFP then measures a country's ability to generate income from a given set of inputs (typically, labour and produced capital) while accounting for the consumption of natural resources and production of undesirable environmental outputs.

The adjusted measure allows us to avoid over-estimating productivity growth in countries that rely heavily on natural capital depletion and heavily polluting technologies and underestimating growth in countries that invest in more efficient use of domestic natural resources and pollution abatement.

Not surprisingly, preliminary results show that countries that have relied the most on natural capital to generate growth (e.g. Russia, Chile, Australia, Canada, Norway) will need to consider how they will be able to sustain their current growth rates if natural capital becomes scarce. Similarly, the real growth performance of countries that have relied heavily on polluting technologies is called into question.

**Preliminary findings s**how that historically the **adjustment** of productivity growth for environmental services has been relatively small. This is not surprising given that growth accounting only captures the "direct" effects of factor inputs on output growth while the overall importance of natural capital and environmental sinks to output growth is obviously much greater. So far our framework is limited to only a few pollutants ($CO_2$, SOx, NOx) and natural assets (fossil fuels and selected minerals); environmental services provided by soils, water, land, and ecosystems are currently not accounted for. The adjustments might be greater when better and more extensive data become available.

This is a work in progress and the task that lies ahead to fill some of the physical data gaps is daunting. So is the issue of valuation. All this is well known. The essential point I want to make is that by adopting this approach we are directly linking the future fate of economic growth with the natural capital and ecological services on which it depends. It raises much more directly the question, what ***sort*** of growth are you as a policy maker satisfied with? And it is one that is addressed to economic policy makers. Indeed, the indicator has already been trialled in the OECD's 2014 Survey of Norway – a country that has consciously set about substituting financial for natural capital.

Which brings me to the final point I want to make about the future of green growth, paradigmatically or otherwise: that unless it can establish itself in mainstream economic discourse, it will forever remain an academic curiosity.

Once we had delivered our Green Growth 101 strategy we not only realised that we had a massive research agenda on our hands; we also realised that we had to mainstream our findings – and downstream research - since they went to the heart of everything economics in the service public policy was about. In internal OECD terms, that meant ensuring a central role for the Economics Department in the development and application of the work. We have just completed a formal stock-taking of how far green growth has been mainstreamed inside the OECD. The results are impressive. The Chief Economist has been engaged from the outset, green growth has become a standard element of our regular economic surveys of countries and we have instituted a formal

mechanism for identifying the many policy domains in which the consequences of a progression to greener growth will need to be assessed – innovation, social policy, taxation, investment.

Now I rather suspect academics at the end of an academic conference may feel that they don't need to sit through an account of the OECD's internal knitting. So let me reassure you. This is only important, because the OECD plays an important role as a channel for shared practice. And if its in-house analytical teams can mainstream something like green growth, then it has significant ability to influence the way in which policy is considered and executed in countries.

When we talk about the composition of growth, the composition of taxes, the policy environment for investment, corporate disclosure, or innovation, we are consciously doing so with green growth in mind as a major transformational challenge that countries need to consider. I don't have the time to elaborate the breadth of this programme. Let me make just two further points before I close:

The first is that, unquestionably, the focus that we have given to green growth has, inevitably, been strongly influenced by the ever-present and pressing issue of climate change. The need to respond to climate change has been both a help and a hindrance: a help, in the sense that climate change poses such a systemic challenge that it has made it easier to connect policy domains that might otherwise have been regarded as distant; a challenge in that there is a tendency to think of green growth policies as synonymous with climate policies.

There is of course so much more to environmental sustainability than moderating our interference with the carbon cycle. Human interference with the natural nitrogen cycle is an order of magnitude larger. Habitat removal – even without the effects of climatic change – and chemical pollution are weighing heavily on the functioning of the biosphere. We should resist the temptation to 'climatize' everything.

The second is that the need to place economic growth and development on a sustainable path has a time dimension to it that does not permit us a leisurely investigation of the issues. We not only have to fill huge data gaps. We have to provide on-the-job-learning for decision makers who have not grown up linking fields as apparently remote as financial regulation and biodiversity or home ownership, labour market mobility and carbon emissions.

The sheer interconnectedness of policy domains when viewed through a green growth lens has been at the front of my mind in recent weeks as we bring together a huge policy synthesis entitled *Aligning Policies for the Transition to a Low Carbon Economy*. This 200 page report, which we are preparing jointly with the IEA, the NEA and the ITF, will attempt to present policy makers with a chart of the policy terrain they have to be prepared to cover if they want to ensure that their policies are 'climate ready'. And this just focuses on climate.

The policy demands green growth makes are absolutely pervasive. Some may ask how initiating something so pervasive could fall short of being paradigmatic in the scale of its potential impact. I'll leave that point moot. But there is a very important message for researchers here. The immediate and pressing needs of policy makers across a huge terrain guarantee that there is a ready market for your findings if you have thought about their policy relevance. The OECD deals in applied research. We are a valuable – and I hope valued – conduit for the findings of others. But to be transmissible, those findings need to have been generated with their potential value to policy advisers in mind.

We have valued our engagement with the Grantham Institute here at the LSE. I hope it will endure. So let me close with this offer. We have instituted a means of maintaining a constantly updated

inventory of green growth relevant work at the OECD and we can pinpoint some of the most significant knowledge gaps from a policy point of view. If researchers want to consult us about the policy relevance of their research programmes we would be very pleased to hear from them. And, where opportunities arise and resources can be identified, we are very happy to partner with you.