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Assembly



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Knowledge Exchange Seminar Series (KESS)

Carbon, economic growth and unsustainability: the inevitable transition to a low carbon economy beyond GDP

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1. The 'beyond GDP' debate. The need for new tools for measuring the economy and social progress

There are fundamental and related problems with how we practice economics and how we measure growth, both have significant implications for environmental and economic policy in Northern Ireland.

While not a new debate, there is an emerging consensus that GDP as measure of social progress and tool of economic measurement is far too narrow and limited. In 2008 the President of France, Nicholas Sarkozy asked two nobel prize winners in economics Joseph Stiglitz, Amartya Sen and Jean Paul Fitoussi to create 'The Commission on the Measurement of Economic Performance and Social Progress' (CMEPSP).¹ The Commission was not concerned with specific policy prescriptions per se, but rather better economic metrics and 'on the way in which policies are designed, implemented and assessed'. Significantly, as an example the report noted:

Choices between promoting GDP and protecting the environment may be false choices, once environmental degradation is appropriately included in our measurement of economic performance. So too, we often draw inferences about what are good policies by looking at what policies have promoted economic growth; but if our metrics of performance are flawed, so too may be the inferences that we draw.¹

This 'beyond GDP' approach and quest for better metrics is not new to Britain or Northern Ireland either. In 2008 Prime Minister David Cameron asked the ONS (Office for National Statistics) to measure wellbeing to get 'a broader picture of how the country was doing'. More locally in September 2013 key findings from the Carnegie UK Trust's wellbeing programme were presented at a 'Measuring What Matters in Northern Ireland' conference in Belfast attended by the Minister for Finance and the Chair of the Finance and Personnel Committee. Representatives of the Scottish and Irish Governments and the ONS examined the policy implications of wellbeing and its utility, and a local perspective with Northern Ireland data was provided by NISRA and academics from Queen's University Belfast. A first step to making the case for more meaningful metrics to measure social progress, this event showed that these ideas at least are now on the agenda in Northern Ireland.² This debate and its ideas need to be more widely disseminated and considered by policy makers in the Assembly.

2. The limitations of modern economics and the 'myths of growth'.

It would be a serious error to think that the questioning of economics is simply a new anti-capitalist discourse. Consider what Ben Bernanke, responsible for conducting the nation's monetary policy as Chairman of the Federal Reserve Board (or 'Fed', the central bank of the United States) said in a speech on August 6th, 2012:

As we think about new directions for economic measurement, we might start by reminding ourselves of the purpose of economics. Textbooks describe economics as the study of the allocation of scarce resources. That definition may indeed be the "what," but it certainly is not the "why." The ultimate purpose of economics, of course, is to understand and promote the enhancement of well-being.³

We need to think more about the 'why' of economics. An influential 2009 book by economist Tim Jackson⁴ did that arguing against traditional economic orthodoxy focused solely on growth and finding that while GDP growth has been the single most important policy goal across the world for most of the last century, prosperity *without* growth is now essential for a planet with finite resources. Jackson's thesis asks what can prosperity look like in a finite world, with limited resources and a population expected to be 9 billion by around 2050. He rejects the continuing call for growth as the means to deliver prosperity – with a continuing rising GDP per capita typically expressed as a proxy for a rising prosperity.

The argument is that the version of social progress that drives us, one based on the continual expansion of material wants, is fundamentally untenable. This is not simply a utopian ideal or a jejune attack against the failings of modernity. It is a very basic thesis; in the pursuit of the good life today we are systematically eroding the basis for well-being tomorrow. This school of thought aims to seek possible responses to a huge dilemma: finding a credible version of what it means for human society to flourish in the context of ecological limits – limits which will be outlined in sections 3 and 4 below.

The modern economy is structurally reliant on growth for stability. When growth falters – as it did starting in 2008 – politicians and the media panic, businesses struggle, people lose their jobs and their homes, recession follows. In this context 'questioning growth is deemed to be the act of lunatics, idealists and revolutionaries'.⁵ But while this model of economic thought matched early twentieth century economies, it is apparent that now it is out-dated, failing in its own terms and exposing a severe inherent weakness.

It is crucial to move this debate forward in meaningful terms that we understand that this is not just the view of deep green environmentalists, 'idealists or revolutionaries'. Business now also sees the unsustainability of continuing to pursue carbon-fueled growth. Consider the case of Jeremy Grantham, co-founder and chief strategist of GMA, a Boston based global investment group, who manages \$106 billion of assets on behalf of 1,000 institutional investors –

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an unashamed capitalist who amassed his fortunes spotting 'bubbles' in markets and commodity prices. Now an environmental philanthropist, albeit a unique one, he focuses on carbon bubbles and still makes millions out of his investments (including buying oil companies), but is an analyst who understands the inevitable trajectory of carbon markets.

Grantham notes that there is no single theory used in economics that considers the finite nature of resources, that economics has wasted the last 50 years with a blind faith in 'rational expectations' which allowed a generation of central bankers to believe that the market is efficient; the problem being 'that none of it applies to the real world, to messy human beings. Modern economics is belief in a perpetual motion machine. Capital and labour, but no mention of energy. Without energy the whole thing grinds to a halt and the whole theory is demonstrated to be totally false'.⁶ In short, current economic thinking which does factor in energy in the shape of finite carbon resources, is no longer fit for purpose.

Some acknowledgement in public policy of the new reality came with the Stern Report in 2006: 'Climate Change presents a unique challenge for economics: it is the greatest and widest-ranging market failure ever seen'.⁷ And more recently one of the world's leading economic experts on environmental economics, William Nordhaus from Yale University, argues that we are now entering 'the climate casino' by which he means that economic growth is producing unintended but perilous changes in the climate and earth systems.⁸ For Nordhaus the problem is that 'markets do not automatically solve the problem they generate. In the case of harmful externalities like CO₂ unregulated markets produce too much because markets do not put a price on the external damages from CO₂ emissions'. Modern economics is thus fundamentally flawed and ill-equipped when facing the scale and complexity of global climate change.⁹ Nordhaus concedes: 'Economists talk about an invisible 'hand' of markets that sets prices to balance costs and desires. However the unregulated invisible hand sets the prices incorrectly when there are important externalities.' His solution is that governments must step in and regulate or tax activities with significant harmful externalities because 'it requires affirmative governmental actions to reduce harmful spillovers'. So conventional economics, the role of the markets as a perfect and neutral balancing mechanism with an invisible hand, does not work for climate change. There is a strong role for devolved governments to shape, direct and take responsibility for economic policies on climate change.

Policy makers should be less preoccupied with an uncritical focus on growth for reasons of equality as well. Growth has also created huge inequalities, not simply in the very poor areas of the world – where one billion of people worldwide live in extreme poverty (the World Bank calculate the extreme poverty line at \$1.25/person/day and the moderate poverty line at \$2.50/person/day) – but even within advanced economies inequality is on the increase¹⁰. While comprehensive and detailed information and statistics exist on poverty and inequality in Northern Ireland (Hillyard et al, 2003 and 2005) middle class incomes in the UK are also stagnant in real terms and were before the recession which started in 2008.¹¹ PriceWaterhouseCoopers (PWC) recently reported that Northern Ireland workers have had a drop in the real value of their wages for the sixth year in a row and that salaries are unlikely to increase until 2015.¹²

Moreover, previous growth leading up to the recession in 2008 was based on an unstable foundation, namely debt. By the end of 2008, cumulative consumer debt in the UK stood at almost £1.5 trillion, a figure higher than GDP, and the average savings ratio in the UK fell below zero for first time in 40 years. So clearly conventional growth was problematic and not bringing widespread prosperity, only an increase in debt-funded consumer spending and inflated house prices. Returning to such scenarios of growth is not tenable.

Furthermore, beyond a certain point, continued pursuit of economic growth doesn't appear to advance and may even impede human happiness and well-being. Research by Wilkinson and Picketts¹³ and Richard Easterlin both show that there is a diminishing return, when incomes reach a certain level, increased income does not actually increase well-being. The 'Easterlin paradox' shows that 'at a point in time both among and within nations, happiness varies directly with income, but over time, happiness does not increase when a country's income increases'.¹⁴

Drawing on research from Picketts and Wilkinson we can also see the assumption that higher incomes mean richer lives and an improved quality of life across a range of metrics (excluding the world's very poorest countries) simply does not hold. Their findings show that eleven different health and social problems (physical health, mental health, drug abuse, education, imprisonment, obesity, social mobility, trust and community life, violence, teenage pregnancies, and child well-being), outcomes are significantly worse in more unequal countries.

In summary we need to rethink how we measure social progress, reconsider the 'why' of economics and the myths of growth, recognise the implications of inequality and accept that unregulated markets are not able to address the economics (externalities) of climate change.

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3. Questions of Limits and Scarcity

Modern versions of this debate about 'limits to growth' concern peak oil, although food scarcity should not be ignored. The price of grain rose three fold between 2002 and 2008 and these sudden huge price rises led to riots in several countries in the Middle East in 2008 and continued worries about global food supply shortages in the future. The peak oil debate is fiercely and continually contested, with some arguing that peak oil production is only a matter of years away, or possibly already here. Opponents point to massive reserves still to be discovered and those lying in tar sands and oil shales.

James Murray and Sir David King (the UK's climate change envoy and former chief scientific officer) published new research in a 2012 study and concluded that a 'tipping point' in the global supply was reached in 2005 from when conventional crude-oil production has not risen to match increasing demand.¹⁵ They argue that the oil market has tipped into a new state, production is now 'inelastic' – unable to respond to rising demand and leading to wild price swings, and that the future economy is unlikely to bear what oil process have in store. King and Murray argue that 'only by moving away from fossil fuels can we both ensure a more robust economic outlook and address the challenges of climate change'.¹⁶ So even if governments and societies don't accept the environmental reasons for the curb of fossil fuels, the economic cost of a flattening supply will force the issue. An even more recent multi-disciplinary study (Kerschner, et al., 2013) also contradicts the oil industry claims that peak oil is decades away and has been offset by tar sands and shale gas. It posits an even worse case scenario concluding that a production peak for conventional oil is likely before 2030 and with a significant risk it could occur before 2020.¹⁷

Murray and King agree that we are not running out of oil yet, but rather running out of oil that can be produced easily and cheaply. And non-conventional oil won't make up the difference, for example oil derived from Canadian tar sands is expected to reach just 4.7 million barrels per day by 2035. And while US Shale Gas resources are immense, reports they cite suggest that both reserves and future production rates have been substantially overstated. (Where sites with a long production history have been studied there is a very large rate in annual decline in production rates – in the range of 60-90%).

This data shows we must reduce our dependence on oil. There is a close correlation between the performance of the global economy and the price of oil, of the eleven recessions in the US since 1945 ten of them were preceded by a spike in oil prices. More locally higher energy prices erode family budgets. The recent PWC economic analysis on the UK economy showed that housing and utility bills account for 26% of family budgets and add to fuel poverty, with Northern Ireland already having the highest levels of fuel poverty in the UK.

The response required for tackling the economic impacts of resource scarcity and climate change is the same: a move away from a dependence on fossil-fuel energy. The difference is that while the implications of climate change drive only slow policy responses, economic consequences tend to drive shorter term action.¹⁸ Governments like Northern Ireland that fail to plan adequately for decline in fossil fuel production will face huge threats to their economies before the wider impacts of climate change are felt. In Northern Ireland, where we are so dependant on imported oil for our energy requirements what now may be seen as academic and speculative debates about peak oil in 20-30 years times will have enormous implications for our economy and society much sooner.

The challenge and opportunity to the Assembly and Executive is that there is still time to do something about it. Government plans like the 2010 DETI *Strategic Energy Framework for Northern Ireland* and the *Northern Ireland Greenhouse Emissions Action Plan* have some welcome, if unambitious targets, and are a small step in acknowledging these issues but are far too tentative, lacking urgency and sufficient impact.¹⁹ The Executive's *Sustainable Development Implementation Plan 2011-2014* is even weaker in this regard.²⁰ Much bolder, more ambitious and rigorous policy responses are required. This inertia in Northern Ireland is exemplified by the Assembly's lack of decisive action, after much well-informed consultation, for the need for a Northern Ireland Climate Change Bill in response to the UK Climate Change Act 2008. Sarah Turner has comprehensively analysed and critiqued Northern Ireland's engagement (or lack thereof) with the climate governance issues associated with the UK Climate Act 2008.²¹

4. Some Troubling Numbers when we 'Do the Maths'.

This lack of urgency is compounded and put into sharp relief when we consider some recent research and financial analysis based on estimates of world carbon reserves. The problems of resource scarcity discussed above is only part of the wider debate driven by the problem of the capacity of the planet to assimilate the environmental impacts of economic activity, specifically the accumulation of greenhouse gases in the atmosphere which have been accelerated by human activities, especially the burning of fossil fuels.

This analysis, by leading US environmental activist in the US, Bill McKibben, which has attracted strong international credibility and traction, is based on three key important numbers.²²

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1. The first of these numbers is 2 degrees. While the Copenhagen climate conference in 2009 was widely acknowledged to be a failure in terms of achieving effective international action, the accord did formally recognise 'the scientific view that the increase in global temperature should be below two degrees Celsius.' Despite misgivings that even this may be too high, the two degree target has become the de facto policy aim internationally, even if it is only a target with no sanctions to make it enforceable.

2. The second number is 565 gigatonnes. Scientists estimate that humans can put roughly 565 more gigatonnes of carbon dioxide into the atmosphere by 2050 and still have some reasonable hope (80% likelihood) of staying below two degrees. Carbon emissions are predicted to grow approximately by 3% per annum and at that rate we will use up our 656 gigatonne allowance in 16 years.

3. The third and arguably the most worrying number of all highlighted by McKibben was produced by the Carbon Tracker Initiative, a team of London financial analysts and environmentalists who publish reports to show investors the possible risks that climate change poses to their stock portfolios by analysing the carbon embedded in equity markets²³. The number describes the amount of carbon already contained in the proven coal and oil and gas reserves of the fossil fuel companies, the fossil fuel we're currently planning to burn. This number is 2,795 which is 5 times more than 565. So there is five times as much oil, coal and gas in reserve as climate scientists think it's safe to burn. Therefore to meet the 2% target we need to keep 80% of those reserves underground. While this coal, oil and gas is still in the ground, economically it already 'exists' because it is counted into share prices, companies borrow money against it, nations are basing budgets on potential returns from it.²⁴

This carbon bubble is enormous and these numbers neatly encapsulate the huge problem of international climate change policy. If advocacy and campaigning from the environmental movement and NGOs is often ignored, or at least not acted on, the extent to which these 'stranded assets' and 'wasted capital' have caught the attention of the City has at least brought the debate onto the agenda of international finance.

5. Solutions: Technology and Decoupling

But perhaps there is no need for such a negative outlook. Even analysts and economists who broadly accept these figures from the Carbon Tracker Initiative and McKibben think that there are solutions at hand and no need for prophecies of doom.

The conventional response is that improved efficiency in technology, and new technologies yet to be discovered, will allow for 'decoupling' and this will transform the production processes. Jackson outlines this case: economic output becomes progressively less dependant on material throughput. These technological advances will mean the economy can continue to grow without breaching ecological limits – or running out of resources.

For example Grantham cites the Chinese government who in 2012 announced their plan to increase by 65% their installation of solar power to 36GW by 2015, equivalent to 20 state of the art coal plants. With breakthroughs in storage and smart grids he claims, technology can rise to meet the challenge. Similarly, Murray and King in their research on peak oil cited above also think that 'solutions are not secret or mysterious' with work and investment in reducing energy losses, among other strategies. They cite inefficiencies in the conversion and transmission process in energy production and distribution, noting 'globally we get 55×10^{18} of useful energy from 475×10^{18} of primary energy from fossil fuels, biomass and nuclear energy' so there is clearly enormous scope for efficiencies.²⁵

So this is this discourse of optimism and faith in technology to deliver. But Jackson still argues that the sheer scale of decoupling required to meet the limits and numbers discussed above, and to stay within them while the economy keeps on growing, are highly unlikely. Absolute decoupling (where resource depletion impacts decline in absolute terms) is necessary if economic activity is to remain within ecological limits. Working with the earlier 2007 IPPCC stabilization target of 450 ppm, absolute reductions in global carbon emissions of 50-85 % are required by 2050 in order to meet this target. Jackson questions whether it is really possible for a strategy of 'growth' without decoupling to deliver ever-increasing incomes for a world of 9 billion people and yet remain within ecological limits.

Taking the carbon intensity of economic growth, that is output per dollar per gram of CO₂ (or gCO₂/\$) in 2007 as the base, he projected four scenarios up until 2050 for the world's then 9 billion population. [See graph 'carbon intensities now and required to meet 450ppm target' on accompanying powerpoint slide]. Imagining a scenario in which incomes worldwide are commensurate with a 2 % increase in the 2007 EU average income, this would see the global economy grow by about 15 fold between 2007 and 2050, but to meet emissions targets carbon intensity would need to fall by over 11% every single year up to then. By 2050 the carbon content of each dollar has to be no more than 6gCO₂/\$ (which is scenario 4 on the graph). That is almost a 130 times improvement, ten times faster than anything ever achieved in industrial history according to Jackson²⁶. Perhaps this is perfectly possible, but these figures give us an indication of the scale of the task, the scale of technical improvements and efficiencies required to meet our carbon emissions targets.

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6. What now? Three steps for today... (Nordhaus, 2013)

1. Public awareness

People to understand and accept the gravity of the impacts of global warming – counter the contrarians with public education and the science facts.

2. Pay the cost of carbon.

Countries need to establish policies to raise the price of CO₂ and other GHG emissions. 'Foul medicine now for better long term health'. Global coordination needed.

3. Accelerated research.

Rapid technological change in the energy sector is key to a low-carbon economy. Governments and private sector must pursue low carbon and zero carbon technologies.

Climate change presents us with a unique opportunity to invest in technological change, to move from short term thinking.

7. The Northern Ireland Policy Context

- UK Climate Change Act 2008, Climate Change (Scotland) Act in 2009. Climate Change Bill in Northern Ireland?
- Programme for Government target, Cross Departmental Working Group on Climate Change, etc. But, overall:

'To say that Northern Ireland devolved administration is a Government ill at ease with its commitment to climate governance is something of an understatement' Sarah Turner, (2013)

- Yet, a strong civil society and environmental voluntary sector in NI with viable, costed proposals – e.g. 'Green New Deal' approach.
- Investment in a low carbon economy will bring local job opportunities in housing and renewables, greater energy independence and security, the reduction of fuel poverty. Technologies with potential for deep cuts in GHG emissions especially with improvements in electricity storage and distribution.
- Reduce energy consumption and as well as more efficient production
- Need to show leadership and take ownership of climate change in NI to break the inertia and move beyond vague aspirations and the current cautious approach

To discuss: What's holding us back? **Not** the science.

¹ Stiglitz, J., A. Sen, and J. P. Fitoussi, eds. (2009) *Report by the Commission on the Measurement of Economic Performance and Social Progress*. [Online] Executive Summary, p.7. The report is available in English from <http://www.stiglitz-sen-fitoussi.fr/en/index.htm>

² The presentations from the conference, held in Belfast on Tuesday 10 September 2013, are available from <http://www.carnegieuktrust.org.uk/changing-minds/enterprise-and-society/measuring-progress,-measuring-wellbeing/northern-ireland-conference>

³ <http://www.federalreserve.gov/newsevents/speech/bernanke20120806a.htm>

⁴ Jackson, T. (2009), *Prosperity Without Growth: Economics for a Finite Planet*. London, Earthscan.

⁵ Jackson, 2009, p.14

⁶ Hickman, L., (2013), 'Jeremy Grantham on how to feed the world and why he invests in oil' The Guardian [online] April, 16 2003. <http://www.theguardian.com/environment/blog/2013/apr/16/jeremy-grantham-food-oil-capitalism?uni=Article:in%20body%20link>

See also the Grantham Research Institute at the London School of Economics:
<http://www.lse.ac.uk/GranthamInstitute/About/home.aspx>

⁷ Stern, N. (2006) *The Economics of Climate Change: The Stern Review*, Cambridge, Cambridge University Press.

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⁸ Nordhaus, W. (2013), *The Climate Casino: Risk, Uncertainty, and Economics for a Warming World*. New Haven & London, Yale University Press.

⁹ For a brilliant multidisciplinary examination of what is wrong with the conventional economic paradigm and what an alternative green political economy would be like in contrast, see especially chapters 4 & 5 in Barry, J. (2012), *The Politics of Actually Existing Unsustainability: Human Flourishing in a Climate Changed, Carbon Constrained World*. Oxford, Oxford University Press.

¹⁰ World Bank, (2013), 'Inequality in Focus, October 2013: Analyzing the World Bank's Goal of Achieving "Shared Prosperity"' [Online] . Available from:
<http://www.worldbank.org/en/topic/poverty/publication/inequality-in-focus-october-2013>

¹¹ Hillyard, P., Kelly, G., McLaughlin, E., Patsios, D. and Tomlinson, M. (2003) *Bare Necessities: Poverty and Social Exclusion in Northern Ireland*. Belfast: Democratic Dialogue. Hillyard, P., Rolston, B. and Tomlinson, M. (2005) *Poverty and Conflict in Ireland: An International Perspective*. Dublin: Combat Poverty Agency/Institute of Public Administration.

¹² BBC News [Online] 'NI workers face drop in value of wages for sixth year' <http://www.bbc.co.uk/news/uk-northern-ireland-24841071>

¹³ Wilkinson, R. and K. Pickett (2009), *The Spirit Level: Why More Equal Societies Almost Always Do Better*. London, Allen Lane.

¹⁴ Easterlin et al (2010) 'The happiness–income paradox revisited' Proceedings of the National Academy of Sciences of the USA
<http://www.pnas.org/content/107/52/22463.full.pdf>

¹⁵ Murray, J, & King, D. (2012), 'Climate policy: Oil's tipping point has passed', *Nature*, 481, 7382, pp. 433-435, MEDLINE, EBSCOhost, viewed 22 November 2013.

¹⁶ Murray and King, (2012), p.433

¹⁷ Kerschner, C., et al., 'Economic vulnerability to Peak Oil'. *Global Environ. Change* (2013), <http://dx.doi.org/10.1016/j.gloenvcha.2013.08.015> [in press]

¹⁸ Murray and King, (2012), p.435

¹⁹ Published by DETI, http://www.detini.gov.uk/strategic_energy_framework_sef_2010_-3.pdf

²⁰ Published by OFMDFM, see http://www.ofmdfmi.gov.uk/focus_on_the_future.pdf

²¹ Turner, S. (2013), 'Northern Ireland's Consent to the Climate Change Act 2008: Symbol or Illusion?' *Journal of Environmental Law*, Volume 25, issue 1, pp. 63-93.

²² See his Foreword to Berners-Lee, M. and Clark, D (2013), *The Burning Question*. London, Profile, p.xii.

²³ See <http://www.carbontracker.org>

²⁴ McKibben in Berners-Lee, M. and Clark, D (2013), *The Burning Question*. London, Profile, p.xvi.

²⁵ Murray and King, (2012), p.435

²⁶ Jackson, 2009, p.81. See also TED (2010), 'Tim Jackson: An Economic Reality Check'. [Online] Available at:
http://www.ted.com/talks/tim_jackson_s_economic_reality_check.html