GREEN VALUES IN COMMUNITIES: HOW AND WHY TO ENGAGE INDIVIDUALS WITH DECARBONISATION TARGETS

Centre for Business Research, University of Cambridge
Working Paper No 398

by

Michael Pollitt
Judge Business School
University of Cambridge
Trumpington Street
Cambridge
CB2 1AG
m.pollitt@jbs.cam.ac.uk

March 2010

This working paper forms part of the CBR Research Programme on Corporate Governance

Abstract

We suggest that engaging individuals and changing norms of behaviour will be crucial if substantial decarbonisation is to be achieved and if the full costs of climate change and related development challenges are to be willingly met by societies around the world. Engaging individuals and changing norms fundamentally relate to individual moral values. This brings us to a consideration of how organised religion can play a role in providing the moral basis for individual action in this area. We also suggest implications for how business will need to engage with the challenges posed by decarbonisation. Our discussion links the underlying ethical issues raised by *The Economics of Climate Change* (Stern, 2007) with Vandenbergh's (2005) emphasis on the need for 'personal norm activation' to engage individuals in protecting the environment.

Keywords: Stern Review, decarbonisation, environmental ethics, personal norm activation.

JEL Classification: D63; Q54, Z12

Acknowledgements
The author acknowledges the encouragement of Christos Pitelis and the CIBAM 'Green Values and Green Business' colloquium and the comments of Ian Jones. He wishes to thank Miriam Pepper for kind access to her work and the ESRC Electricity Policy Research Group and the 'Ethics, Regulation and Globalisation' project at the Centre for Business Research for their ongoing support.

1.Introduction

This paper is an attempt to discuss some of the ethical issues associated with climate change and to emphasise one important way forward towards a solution. The substantial decarbonisation of the global economy required by an effective climate change policy has at its heart some highly debateable ethical assumptions. If anything the ethical challenges raised by climate change are even greater than is generally acknowledged. There is a general assumption that macro-level policy will be able to achieve decarbonisation at reasonable financial cost and with limited impact on lifestyles. However this is unlikely to be the case, with a clear trade-off between higher financial costs and lesser behavioural impacts on lifestyles.

Instead we need a much more open and honest discussion of the significant likely financial and lifestyle costs of tackling climate change. We suggest that engaging individuals and changing norms of behaviour will be crucial if decarbonisation is to be achieved and if the full costs of climate change and related development challenges are to be willingly met by democratic societies around the world. Engaging individuals and changing norms fundamentally relate to individual moral values. This brings us to a consideration of how organised religion can play a role in providing the moral basis for individual action in this area. We also suggest how business will need to engage with the challenges posed by decarbonisation.

The paper is organised in five sections. Section two looks at the ethics behind the recent Stern Review on *The Economics of Climate Change* (Stern, 2007) which makes the case for early action on decarbonisation. Section three examines how to individual ethics and behaviour can be changed to meet climate change policy targets. Section four looks at the implications for company behaviour of these ethical changes and section five is a conclusion.

2.Ethics and the Stern Review

The Stern Review, initially published in 2006, was a UK Treasury sponsored document produced by a team of civil servants led by Lord Nicholas Stern. It was an important document in providing a basis for UK policy towards climate change and in laying out a case for early action on decarbonisation. It laid the basis for the Climate Change Act 2008 which sets a binding commitment to reducing UK emissions by 80% of 1990 levels by 2050. Under the Climate Change Act the UK now produces five year carbon reduction budgets, recommended by the Committee on Climate Change, which set targets for keeping the UK economy on track to achieve its 2050 targets. The first three draft budgets were published in late 2008 (Committee on Climate Change,

2008). The government is legally required to take policy action to ensure that the UK is on track with its carbon budgets. The recent annual government budget included a substantial discussion of policy measures shaped by the Committee's recommendations (see HM Treasury, 2009). The Stern Review has partly inspired international discussions on a 'Global Deal' on climate change which formed an important input into the UN climate conference in Copenhagen in late 2009. Indeed in subsequent work Lord Stern clearly lays out the suggested elements of a 'Global Deal' in the light of the original Stern Review (see Stern 2008a, b).

The Stern Review was noteworthy partly because it focussed on the *economic case* for *early* action on decarbonisation. In contrast to much earlier economic work it suggested that the social cost of tonne of CO2 (and other greenhouse gases – GHGs) produced now was much higher than previously calculated. This calculation lies behind its call for deeper cuts in GHG production sooner rather later. In broad outline, the Stern Review suggested the cost of climate change under a business as usual trajectory could rise to 5% of world GDP per annum (which a significant chance of costs up to 20% of world GDP per annum), while the cost of mitigating GHG reduction was around 1% of world GDP per annum, if we started to invest now. At the real social discount rate assumed in the Review – 1.4% - this implies a strongly positive net present value (NPV) of action. Critics of the Review focussed their discussions on the calculation of the social discount rate, on which the case for early action turns. According to the theory of social discounting (see Evans, 2008):

SDR = $r + e.g$

SDR = social discount rate

r = pure rate of time preference

e = inequality aversion parameter

g = growth rate of consumption per head

r is a measure of extinction risk, i.e. the extent to which future generations will be around to enjoy the benefits of investments made now. It reflects the risk that human civilisation may disappear and hence it is not worth making social investments at the expense of current consumption.

e reflects societal preferences towards inequality across and between generations. A lower value implies we care less about inequality in the sense that we would prefer to make investments rather than simply transfer current

consumption. Thus low discount rates driven by this parameter mean more investment and less current consumption and more current inequality.

g is a measure of economic growth. Higher expected growth rates mean that future generations will be richer than the current one, and hence for given preferences towards inequality, society should be less willing to reduce current consumption to improve the wealth of future generations.

For many studies (see Weitzman, 2007) a common assumption is that $r = g = 2\%$ and $e = 2$. This implies SDR = *6%*.

The Stern Review assumes that $r = 0.1\%$, $g=1.3\%$, $e=1$. This implies SDR = *1.4%*.

Thus the Stern Review assumes that global society faces a low extinction risk (*r*). The low inequality parameter (*e*) implies that we don't care that much about inequality (though we do care somewhat). The low growth rate (*g*) parameter assumes much lower levels of world GDP growth than in the recent past. The overall implication is that we are more happy than previously assumed to transfer consumption to future generations and we care less than previously about dealing with current inequality.

The underlying ethical assumptions implicit in the 1.4% discount rate have been severely criticised, on a number of fronts. Nordhaus (2007) points out the inconsistency between this discount rate and the discount rates used in earlier economic analyses of climate change for which a higher discount rate (in the region of 6%) has been typical. Dasgupta (2007) highlights a fundamental problem with a low inequality parameter, which is that it implies much more saving for the future than we actually observe. Dasgupta suggests that setting e = 1 might suggest we should be saving up to 97.5% of our GDP to invest in social projects with positive returns in the future. Dasgupta's ethical point is that doing something about climate change at the same time as not doing much about global poverty implies ethically questionable value judgements. Rich westerners are prepared to reduce their consumption now to save their own children's children but are not prepared to reduce their consumption now to save poor nations' children now. This echoes the arguments of Lomborg (2001) who suggests that there are more pressing threats to global development (such as tackling HIV in Africa) than climate change.

Weitzman (2007) makes a rather different point about the use of discount rates. He suggests that the Stern Review may have arrived at the right answer by the wrong method. For him the key problem is uncertainty. The introduction of uncertainty about future growth rates, including the introduction of the

possibility of negative growth rates leads to much lower values of the discount rate than 6% even if $e = 2$ and $r = 2\%$. It is also the case that with 'fat tails' in the distribution of climate impacts such that the probability of really extremely negative for GDP outcomes remains significant (rather than tending to zero as in a normal distribution) then the discounted damages may be extremely large even at higher discount rates. The appropriate way of handling such uncertainty is via purchasing catastrophe insurance which argues for early action on decarbonisation to reduce the probability of extremely negative outcomes (arising from very high temperature rises).

Other criticisms have been levelled at the calculations of the costs of climate change by Carter et al. (2006). They argue that the Stern Review was systematically biased in its use of scientific evidence on climate change, and made use of the most pessimistic scenarios of the temperature impacts of anthropomorphic carbon emissions. Byatt et al. (2006) examining the cost and benefit calculations in the Review suggest that it combines pessimistic scenarios as to the climate impact and economic cost of climate change with optimistic scenarios as the cost of mitigation (i.e. low costs). They also suggest that it ignores an earlier more sceptical report by the House of Lords Select Committee on Economic Affairs (2005). Neumayer (2007) makes a rather different criticism pointing out that the Stern Review assumes the substitutability of financial and natural capital. Neumayer argues that assuming non-substitutability of the two types of capital would be a better assumption (and would also support early action to stop natural capital loss).

Indeed to suggest the cost of mitigation could be as low as 1% of world GDP rather obscures the likely true cost. As Dasgupta (2007) points out this becomes 1.8% of the GDP of developed countries, if they have to bear all of the cost (which seems likely initially). If one assumes optimism bias in the costing of mitigation projects this could double the cost (given that many involve large capital cost programmes or high transaction costs). If one further assumes that many of the least cost responses, while technically possible are not implemented and adjustment is required by second best means then costs could easily be doubled again. Given that the difference in the cost of their budget programmes between the two main political parties seeking election in advanced democracies is usually of the order less than 0.5%-1% of GDP, a policy which could ultimately cost of the order 5% of GDP is one which will require a significant individual engagement with and belief in it. This is especially true given the fact that keeping the overall cost down requires high actual or implicit transfers from rich to poor countries which are likely to be significant as a percentage of rich countries GDP. The development aid budgets of rich countries are currently a small fraction of 1% of GDP. Therefore it is clearly a leap of faith to assume that all developed countries will necessarily be willing to

spend large sums solving global climate problems rather than adapting their own economies to the reality of climate change as it emerges.

Stern (2008a) robustly responds to his critics. He recognises the need to include uncertainty in calculating the discount rate, but argues that this lowers it. He acknowledges and defends the role of his low assumptions of *r* and *e*. He suggests that it is easy to justify a discount rate in the range of 1.5-5%. In a further paper (Hepburn et al., 2008) he (and his co-authors) recognise that standard market economics as embodied in the social discount rate is not enough to handle the values of society with respect to climate change. Stern (2009) goes further suggesting that discounting cannot adequately handle the climate problem and that taxes are only part of the solution. He suggests that changed individual attitudes have a role to play in reducing the cost of public policy (p.33): 'The more that people take on board damages to others, through discussion and information, and worry about them directly, the less need for other public policy actions.'

Stern (2008a) contains a summary of his suggestions for the key elements of a Global Deal on Climate Change (which are expanded in Stern, 2008b) – see Box 1 below. To put the size of the flows of payments from developed to developing countries to pay for carbon reduction activity. The size of total aid flows from developed to developing countries is currently of the order of $100bn.

The size of the programme envisaged under the Global Deal is clearly substantial. However while the Stern Review focuses on global ethical assumptions, there are important additional distributional issues between nations when it comes to how the burden should be shared between them. While developed countries might accept the principle of converging on the same level of emissions per head across all countries (taking trading into account) by 2050, this neglects the fact that this implies inequality in the cumulative emissions per head taking into account emissions history since the Industrial Revolution (see Johansen, 2007). Even to achieve equity in the final per head emissions target the US might need a 90% cut in GHG emissions by 2050 (which is much more severe relative cut than any other major country). Developing countries might find it difficult to neglect the issue of taking cumulative emissions into account, especially as it is cumulative emissions that cause global warming.

The policy challenge posed by the need to decarbonise the world economy is huge. The costs to individuals within advanced economies are likely to be noticeable and significant. They will require rises in the price of energy, transport and energy intensive goods to finance supply side changes to production methods (or to purchase offsetting emissions reductions abroad).

They will also imply significant demand side response in terms of shifting consumption to less energy intensive goods and associated behavioural change (such as using public transport more often). They will also require individuals to support investments which have significantly higher global benefits than national benefits, and may often be located abroad. This will require society within developed countries, such as the UK, to actively support the policies that are required to achieve the goal of decarbonisation over a long period.

Box 1: The Suggestions for a Global Deal on Climate Change (Stern, 2008a, p.31)

'Targets and Trade:

• 50 percent cuts in world emissions by 2050 with rich country cuts at least 75 percent.

• Rich country reductions and trading schemes designed to be open to trade with other countries, including developing countries.

• Supply side from developing countries simplifed to allow much bigger markets for emissions reductions: **"carbon flows" to rise to $50–$100 billion per annum by 2030.** Role of sectoral or technological benchmarking in "one-sided" trading to give reformed and much bigger CDM market.

Funding Issues:

• Strong initiatives, with public funding, on deforestation to prepare for inclusion in trading. For $10–15 billion per annum could have a programme which might halve deforestation. Importance of global action and involvement of IFIs.

• Demonstration and sharing of technologies: e.g., $5 billion per annum commitment to feed-in tariffs for CCS coal could lead to 30 new commercial size plants in the next 7–8 years.

• Rich countries to deliver on Monterrey and Gleneagles commitments on ODA in context of extra costs of development arising from climate change: **potential extra cost of development with climate change upward of $80 billion per annum.'**

The recent failure of the UN climate conference in Copenhagen to reach a 'global deal' has only illustrated the difficulties that many countries will have in implementing the drastic cuts in emissions required. Given that the probability of a self-enforcing international agreement to promote radical action is currently low, this further emphasises the need for increased 'grassroots' pressure for climate policy to create sufficient political motivation for action.

3.Individual Values, Behavioural Change and Effective Climate Change Policy

In this section we argue that individual values are important in achieving decarbonisation of the economy and that it is important to understand how these values are formed can be influenced.

Von Storch and Stehr (1997, p.90) provide a helpful framework for thinking about the way that climate policy comes about. They suggest that while it is true that climate policy is notionally based on the optimisation of welfare (as in the Stern Review), there are two important filters through which the calculation of welfare maximisation has to go. First, there are the 'interpretors of climate' – who are the 'experts' who evaluate the information that we have on the climate.

In our age we might see these as mainly being scientists, such as those represented by the UN International Panel on Climate Change (IPCC). Von Storch and Stehr (1997) have a nice illustration from the Middle Ages of the role of Church in interpreting the meaning of series of bad weather induced poor harvests in Europe in the years 1315 to 1319. The Church interpreted the lack of agricultural productivity caused by unfavourable weather as a judgement from God and called on the people to repent. Second, there are the 'interpretative systems of society' which determines what the 'costs' of adaption and abatement are and also defines the welfare function that is being optimised. Thus the interpretative system might hear what the scientists have to say and actually think that the lifestyle changes required to abate carbon are too high and the benefits too uncertain. What is clear from this framework is that 'climate science' and indeed 'economic science' do not determine climate policy, they *merely* inform it. Societal values are the ultimate determinant of climate policy. Different societies and different individuals receiving the same scientific information will come to different conclusions on the actions (if any) to be taken. Recent controversies about the reliability of climate science following the revelations about the alleged manipulation and withholding of climate data by a prominent university research department only highlights the political sensitivity of climate policy to the filtering process through which it passes.[i]

Tjernstrom and Tietenberg (2008) look at how individual values relate to national climate policy. They used International Social Survey Program data on 8000+ respondents from 26 countries for the year 2000. They found that national emissions reductions targets were higher in countries where a higher percentage of individuals think that climate change is important, there is higher press freedom and higher trust in government. Individuals were more likely to think that climate change was important if they were better educated, urban and

had more affinity with other countries. The authors conclude that ‘what citizens believe does matter’ for policy.

Vandenbergh et al. (2008) discuss the role of the individual in taking action on carbon emissions in the US. They outline 7 actions which would have a significant overall impact on US emissions. These include: reducing idling of cars, reducing use of standby power and tyre pressure maintenance among others. Even assuming limited uptake, the total expected emissions reduction from these individual actions could be 7% of US emissions. Vandenbergh et al. (2008) discuss the process by which we get individuals to change their behaviour. They argue that regulation alone is unlikely to work (or even to get enacted). Raising prices (e.g. of gasoline) would be an obvious economic policy but this has serious distributional consequences, especially in the short term. In the absence of effective regulation or high enough prices it is necessary to appeal to a moral imperative to get individuals to change their behaviour. What is needed is ‘personal norm activation’, i.e. a spontaneous change of behaviour created by a sense of duty in the absence of explicit sanctions (Vandenbergh, 2005). The sorts of norms that will be important in encouraging individuals to take actions to curb carbon emissions are those of ‘environmental protection’, ‘personal responsibility’ (for the climate problem) and ‘reciprocity’ towards individuals in developing countries (and other places) who will bear the brunt of the costs of a changing climate. Personal norm activation is closely related to the need to ‘inspire’, to ‘win hearts and minds’ and to ‘instil strong personal and moral values’ in the area of environmental responsibility.

The need for personal norm activation suggests that we need to turn to ‘norm’ specialists (see Johnson, 2008). The most obvious places to turn for help (globally) in this area are religious institutions (such as Christian churches). Religious institutions activate norms regularly in their role of interpreting what God may be saying in this generation. They have had an honourable role in many of the most momentous norm changes in society: the civil rights movement, the environmental justice movement, third world debt relief and the collapse of the Iron Curtain. Recently in the US for instance almost all major Christian denominations have expressed strong support for sustainable development and for decarbonisation, and indeed changing public attitudes in the US to taking action on climate change reflect the clear stances of the churches on this issue.

Of course, there is a debate about whether religion is good for the environment. Lynn White (1967) drew attention to the ‘creation ordinance’ in Genesis 1:28 as the Judaeo-Christian justification for exploitation of the natural world and the religious support for industrialisation and the massive growth of economically motivated exploitation of national resources, of which carbon emissions are

merely one consequence. However in reality religion has played a more mixed role (see Berry, 2006). The sustainable development movement traces its intellectual origins back to a Christian philosopher - Rev. Thomas Malthus – who first warned about the likely limits to human exploitation of natural resources (see Mebratu, 1998). The econometric evidence on the impact of Christianity on attitudes to environment is weakly positive (for 1993) in the US (see Boyd, 1999). However for the UK evidence (for 1993) suggests that overall affiliation to a Christian denomination makes no difference to attitudes to the environment, though educational attainment and scientific knowledge about the natural environment are significant and there are some differences between denominations (see Hayes and Marangudakis, 1999). Similar results are found for a 1993 sample covering the US, Canada, Great Britain and New Zealand (Hayes and Marangudakis, 2000). Pepper et al. (forthcoming) find that adherence to Christianity has a positively significant, if small, impact on socially conscious and frugal consumer behaviour for a sample of UK consumers.

Examination of the key religious texts of the three great monotheistic religions – Judaism, Christianity and Islam - shows that they all provide strong support for care of the environment.[ii]

Judaism: 'The heavens declare the glory of God; **the skies proclaim the work of his hands.** Day after day they pour forth speech or language where their voice is not heard. Their voice goes out into all the earth, their words to the ends of the earth.' (*Psalm 19: 1-4)*

Christianity: 'The creation waits in eager expectation for the sons of God to be revealed. For the creation was subjected to frustration, not by its own choice, but by the will of the one who subjected it, in hope that **the creation itself will be liberated from its bondage to decay** and brought into the glorious freedom of the children of God.' (*Romans 8: 19-21)*

Islam: 'The sun and the moon to a reckoning, and the stars and trees bow themselves; and heaven – He raised it up and set the balance. **Transgress not in the balance, and weigh with justice, and skimp not in the balance.'** *(Sura 55: 5-9)*

As with previous religious inspirations for behavioural change connections between taking action and the central tenets of religious faith need to be highlighted and recognised as being important *for now.* It seems to be that science is telling us that the time is coming for action on climate change. It is increasingly clear that only if connections are made with personal norms of behaviour that the required (radical) action will be forthcoming. For many

people (even if they are not religious) a religiously inspired movement may be the only way to bring about the scale of behavioural change that is required via both individual action and individual example. The challenge is that climate change is clearly an international development problem involving actions by and in developing countries. Helping developing countries develop poses conventional challenges which remain difficult or impossible to solve. For example changing incentives within developing countries with rain forests to incentivise their continuation is not just a matter of climate policy but of conventional economic development. However, as all the great religions emphasise, rather than worrying about the action/inaction of others we should start by changing our own actions.

Sandelands and Hoffman (2008) lay out the key role for religion in tackling climate change very clearly. They note that encouraging people to take action on climate change will only work if environmental sustainability is seen as part of a true sustainability. Individuals are not motivated by economic social cost benefit analyses, what they need is an appeal to their 'hunger for meaning'. As Fromm (1977, p.137) puts it: 'Only a fundamental change in human character from a preponderance of the having mode to the predominantly being mode of existence can save us.' The Global Deal will founder if it is ultimately merely based on an economic analysis of the climate problem. What is needed is an engagement of the mass of individuals in advanced countries (and eventually in developing countries) in a movement towards a more sustainable world. As Sandelands and Hoffman (2008, p.13) suggest this will require a desire to help others across borders and be based on a politics which is based on hope rather than fear. This is because if people lose hope that meaningful decarbonisation can be achieved (because of a lack of trust in their own and other countries' governments), then it will never be achievable, as a lack of belief will give rise to a self-fulfilling prophecy.

It is important to point out that the suggestion that religiously inspired changes in personal behaviour and attitudes are likely to be important in tackling climate change only highlights the difficulty of bringing about radical action on climate. Indeed Pepper et al.'s (2009) survey of consumer attitudes in Woking, England, highlights that a reduction in consumerism (or an increase in frugality) was only significantly impacted by a personal motivation to frugality or a reduction in income. Adherence to organised religion is on the decline in many western countries (though not in many rapidly developing ones) and religious institutions are inherently conservative and subject to the same sorts of obstacles to behavioural change as the individuals who support them (Douglas and Pepper, forthcoming). Douglas and Pepper suggest that what is needed is a 'green' religion that combines the personal environmental commitment of non-institutional eco-spirituality (in some New Age movements) with the significant

transformative social and community movements born out of organised religion. In this way positive personal attitudes to the environment might be translated into support for effective action. The issue is how to harness both the considerable power of organised religion to bring about social change (by engaging committed adherents *and* other people of goodwill) in order to win hearts and minds to the considerable behavioural changes and economic costs required in tackling climate change.

This view is supported by Pope Benedict in his 2009 letter *Caritas in Veritate* or 'Charity in Truth'.[iii]This thoughtful document highlights the difficulty of global economic development in the absence of a truly integral humanism. It addresses, among other things, the need to address global environmental problems and recognise 'covenant between human beings and the environment' (para 51). The Pope concludes: 'Openness to God makes us open towards our brothers and sisters and towards an understanding of life as a joyful task to be accomplished in a spirit of solidarity. On the other hand, ideological rejection of God and an atheism of indifference, oblivious to the Creator and at risk of becoming oblivious to human values, constitute some of the chief obstacles to development today.' (para 78). In other words, religion can help us to overcome our indifference to the plight of others and to tackle global development problems, such as climate change, rather than to focus on our own personal and local self-interest.

4. Implications for Companies

Companies can help or hinder the accumulation of institutional, relational, moral and spiritual capital in society as constituent parts of their total impact on social capital (Heslam, Jones and Pollitt, 2009). Firms build institutional capital by adherence to the laws of the country and supporting legitimate authority. Firms build relational capital by having strong stakeholder relationships internally and externally. Firms build moral capital when ethics are embedded in core business operations and when accountability structures are put in place that will keep the moral dimensions of the company's core operations under review and in development as new ethical challenges emerge. Firms exhibit spiritual capital when they pay attention to their 'soul', and articulate and develop their – and by implication their employees - sense of ultimate purpose and have strategies to ensure that this is shared throughout the company. All of these types of social capital building by firms will be needed to address issues of environmental sustainability.

These four capitals will each be shaped by the sort of world which is engaged with climate change policy. Responsible large, and particularly multinational, companies will be increasingly impacted and required to respond via the way in

which they build social capital. Thus, *institutional capital* building by firms will involve participation in emissions trading schemes, standards and adherence to environmental laws as facts of life. Firms should comply with these schemes and be responsible in their lobbying towards (against?) them. *Relational capital* building will bring firms increasingly into contact with a post-materialist (see Inglehart, 1990) and personal environmental norm activated world. Both customers and employees will expect firms to take decarbonisation seriously. *Moral capital* building will require companies to have values and set examples which actively promote environmental sustainability. All companies, but particularly, multinationals should demonstrate integrity, consistency and transparency of actions towards the environment. *Spiritual capital* building will require companies to have an inspiring vision about why the company exists and what drives it, *other than* the quest for profit. This will be because society will/should increasingly recognise that participation in this sort of vision is central to its survival.

Companies will need to support and respond to the personal norm activation of employees and customers, and to some extent participate in it. A good example of this is the UK High Street retailer, Marks and Spencer's Plan A[iv]. This is a comprehensive set of commitments to a whole range of environmental targets including carbon reduction, aimed at responding to and anticipating rising consumer sensitivities.

5. Conclusions

The economic case for early decarbonisation is highly debateable, with a financial social cost benefit analysis capable of being subjected to a wide range of criticisms which make the use value of such analysis for policy questionable. However the moral case for early action on the grounds of environmental sustainability and economic and environmental justice is overwhelming.

It is undeniable that the costs of decarbonisation will be substantial and involve a significant political cost. Even if the cost were only 1% of world GDP per annum this would involve much higher costs in advanced countries, historically large international transfers to developing countries and significant redistributional consequences between sectors and individuals within advanced countries.

The current vision for action is narrowly focussed on the scientific case for convergence in emissions per head by 2050. This raises major ethical issues to do with historical emissions and the conflicts between the environment and development within developing countries. The slow progress towards a 'Global Deal' on climate change only highlights the difficulty and vulnerability of

effective climate policy and the requirement to gain and maintain active public support for decarbonisation.

We have argued that we need to seriously engage with ethics, morality and religion in tackling environmental issues. Individual behaviour will need to change and there will need to be significant individual engagement with the climate change issue in order to ensure support for the expensive international policies that are required. If we do not engage in this sort of personal norm activation there is no chance we will meet the targets suggested by climate scientists. In parallel, companies will increasingly be called on to support the building of the sort of institutional, relational, moral and spiritual capital that supports climate change action.

Notes

[1] See for example, Ben Webster and Jonathan Leake, 'Scientists in stolen e-mail scandal hid climate data', *The Times*, 28th January 2010: http://www.timesonline.co.uk/tol/news/environment/article7004936.ece Accessed February 2nd, 2010.

[2] For some good resources on 'Religion and Environment' see http://daphne.palomar.edu/calenvironment/religion.htm

[3] Available at: http://www.vatican.va/holy_father/benedict_xvi/encyclicals/documents/hf_ben-xvi_enc_20090629_caritas-in-veritate_en.html Accessed 2 February 2010.

[4] See http://plana.marksandspencer.com Accessed 2 February 2010.

References

Berry, S. (2006), 'Is Religion Bad for the Environment', *The Bible In Transmission*, Autumn.

Boyd, H.H. (1999), 'Christianity and the Environment in the American Public', *Journal for the Scientific Study of Religion*, Vol.38, No.1, pp.36-44.

Byatt, I., Castles, I., Goklany, I.M., Henderson, D., Lawson, N., McKitrick, R., Morris, J., Peacock, A., Robinson, C. and Skidelsky, R. (2006), 'The Stern Review: A Dual Critique, Part II: Economic Aspects', *World Economics*, Vol.7 (4), pp.199-229.

Carter, R.M., de Freitas, C.R., Goklany, I.M., Holland, D. and Lindzen, R.S. (2006), 'The Stern Review: A Dual Critique, Part I: The Science', *World Economics*, Vol.7 (4), pp.167-198.

Dasgupta, P. (2007). "Commentary: The Stern Review's economics of climate change", *National Institute Economic Review, 199: 4-7.*

Dietz, S., Hepburn, C. and Stern, N. (2008), *Economics, ethics and climate change*, mimeo.

Douglas, S. and Pepper, M. (forthcoming), 'Is 'green' religion the answer to the ecological crisis? A reflection in the context of the English-speaking West', in B. Mukherjee, R. Ray and S. K. Basu (eds), *Environment: Gathering Crises*, Akansha, New Delhi, India.

Evans, D. (2008), 'Social Project Appraisal and Discounting for the Very Long Term', *Economic Issues*, Vol. 13, Part I, pp.61-70.

Fromm, E. (1977), *To have or to be*, London: Continuum.

Hayes, B.C. and Marangudakis, M. (1999), 'Religion and attitudes towards nature in Britain', *British Journal of Sociology*, Vol. 52 (1), pp.139-155.

Hayes, B.C. and Marangudakis, M. (2000), 'Religion and Environmental Issues within Anglo-American Democracies', *Review of Religious Research*, Vol. 42 (2), pp.159-174.

Heslam, P.S., Jones, I.W. and Pollitt, M.G. (2009), *How a Social Capital Approach can help Multinationals show Ethical Leadership*, University of Cambridge, mimeo.

House of Lords Select Committee on Economic Affairs (2005*), The Economics of Climate Change, Vol.1: Report; Vol.2 Evidence*, London: The Stationary Office.

Inglehart, R. (1990), *Culture Shift in Advanced Industrial Society*, Princeton, NJ: Princeton University Press.

Johansen, I. (2007), *Ethics of Climate Change: Exploring the principle of equal emission rights*, Norwegian Academy of Technological Sciences, NTVA.

Johnson, S.M. (2008), *Is Religion the Environment's Last Best Hope? Targeting Change in Individual Behaviour through Personal Norm Activation*, Working Paper Mercer University Law School.

Lomborg, B. (2001), *The Skeptical Environmentalist: Measuring the Real State of the World*, Cambridge: Cambridge University Press.

Mebratu, D. (1998), 'Sustainability and sustainable development: Historical and conceptual review', *Environmental Impact Assessment Review*, Vol.18, Issue 6, pp.493-520.

Neumayer, E. (2007), 'A missed opportunity: The Stern Review on climate change fails to tackle the issue of non-substitutable loss of natural capital', *Global Environmental Change*, Vol.17, Issue 3-4, pp.297-301.

Nordhaus, W. (2007). "A Review of the Stern Review on the Economics of Climate Change." *Journal of Economic Literature, 45(September): 686-702.*

Pepper, M., Jackson, T. and Uzzell, D. (2009), 'An Examination of the Values that Drive Socially Conscious and Frugal Consumer Behaviours', *International Journal of Consumer Studies*, 33(2), pp.126-136.

Pepper, M., Jackson, T. and Uzzell, D. (forthcoming), 'Christianity and Socially Conscious and Frugal Consumer Behaviours', *Environment and Behavior*, forthcoming.

Sandelands, L.E. and Hoffman, A. (2008), *Sustainability, Faith and the Market*, Ross School of Business Working Paper Series, No. 1107.

Stern, N. (2007), *The Economics of Climate Change*, Cambridge: Cambridge University Press.

Stern, N. (2008a), 'The Economics of Climate Change', *American Economic Review*, Papers and Proceedings, Vol.98 (2), pp.1-37.

Stern, N. (2008b), *Key Elements of A Global Deal on Climate Change*, London School of Economics.

Stern, N. (2009), *Imperfections in the Economics of Public Policy, Imperfections in Markets, and Climate Change*, Presidential Lecture for the European Economic Association, Barcelona, August 2009.

Von Storch, H. and Stehr, N. (1997), 'Climate Research: The Case for the Social Sciences', *Ambio*, Vol.26, No.1, pp.66-71.

Tjernstrom, E. and Tietenberg, T. (2008), 'Do differences in attitudes explain differences in national climate change policies', Ecological Economics, Vol.65, Issue 2, pp.315-324.

Vandenbergh, M.P. (2005), 'Order Without Social Norms: How Personal Norm Activation Can Protect the Environment', *Northwest University Law Review*, Vol. 99, No. 3, pp. 1101-1166.

Vandenbergh, M.P., Barkenbus, J. and Gilligan, J. (2008), 'Individual Carbon Emissions: The Low-Hanging Fruit', *UCLA Law Review*, Vol.55, pp.1701-1758.

Weitzman, M. (2007). "A Review of The Stern Review on the Economics of Climate Change." *Journal of Economic Literature, 45(September): 703-724.*

White, L. (1967), ‘The Historical Roots of Our Ecological Crisis’, *Science*, Vol.155, pp.1203-07.