

Economic Growth and the Environment

Defra response to peer review comments

1. The Defra Evidence & Analysis Series paper, “*Economic Growth and the Environment*”, was peer reviewed by Professor Paul Ekins of UCL. Advice was also received from Dr Cameron Hepburn of University of Oxford. The paper has been revised, taking these comments and suggestions into account.
2. This short note explains the key issues raised by Professor Ekins and Dr Hepburn and provides a brief summary of how these have been addressed.

3. Economic growth is typically taken to mean growth in Gross Domestic Product (GDP), a measure of the goods and services produced by an economy. GDP measures only market-based activity and government spending, and does not reflect many of the factors that affect a society’s wellbeing. The paper has been revised to make clearer that, although wellbeing is a multi-dimensional concept and economic growth is not sufficient to ensure improvements in wellbeing, ***economic growth remains an important factor in driving or enabling improvements along many of these dimensions.*** For example, it enables improvements in material wellbeing, health, education and economic opportunity. It also provides an increasing pool of potential innovation funding, enabling increases in spending on environmental innovation whilst allowing the government to pursue a range of other economic, social and environmental objectives.

4. Looking beyond the UK, growth provides developing economies with the opportunity to improve the quality of life of their citizens, developing institutions and industries, raising incomes and providing the means by which they can meet the environmental challenges they face. Through trade, investment, aid and remittance flows, continued growth in advanced economies has an important role to play in reducing poverty and raising standards of living across the world.
5. The *primary purpose of this paper is to analyse the relationship between economic growth and the environment*. Defra is currently exploring further the relationship between economic growth and the determinants of individual wellbeing, as this is an important issue crucial to achieving the goal of sustainable development.
6. The *goal of environmental policy is to protect and manage environmental assets sustainably and efficiently*, a point now made throughout the paper. The natural environment provides benefits to individuals, for example in terms of improved quality of life and enjoyment of the environment through recreation. It also enables and supports economic growth, which itself contributes to wellbeing (as discussed above).
7. Critical thresholds in some natural assets and the finite quantity of non-renewable natural resources have implications for sustainable economic growth. There is strong evidence that we are approaching a number of these thresholds, such as in terms of the level of CO₂ in the atmosphere and the degrees of degradation of many of our ecosystems. *Natural assets must be used efficiently, respecting critical thresholds, finite limits and non-substitutability where they exist*, and the section of the paper discussing this has been revised to make these points more clearly.
8. The *challenge of reducing the environmental impacts of production and consumption to achieve sustainable economic growth are substantial*, especially given rising levels of global consumption and wealth. Section 2.2 has been amended to make this point more strongly.
9. A review of the evidence suggests that *there may be some trade-offs between environmental policy and economic growth in the near-term*,

for example, due to the many non-market benefits from environmental policy and the up-front costs of investing in new technologies. The paper has been significantly restructured to include a more detailed and nuanced analysis of the impacts of environmental policy on investment and innovation, productivity and competitiveness, and economic growth (see Section 5).

10. Whilst short-term trade-offs may exist, they tend to be small and can be minimised through good policy design, such as setting a clear regulatory framework and using international agreements to ensure a 'level playing field'. ***Moreover, the long-term costs of inaction are likely to far exceed the costs of acting now.***
11. The paper now also includes a summary of the evidence on the impact of shifting innovators from other areas to environmental technologies and ***whether investment in environmental innovation 'crowds out' other types of investment.*** Recent evidence suggests that this crowding-out effect may not be a significant issue, due to technology spillovers and increasing returns to environmental R&D.
12. The paper does not discuss ***whether increasing levels of natural capital necessarily supports higher levels of economic growth or whether cross country studies show a correlation between higher natural capital and higher rates of economic growth.*** There is some evidence that countries with high natural capital endowments suffer from lower economic growth (often referred to as the 'resource curse'). However, these studies often focus on only a narrow element of natural capital, and many other variables are important in determining growth rates in resource rich countries, including political liberty, institutional quality and educational levels.
13. This is clearly a relevant area for further research and important for understanding the relationship between natural assets and sustainable economic growth, in both developed and developing countries.