Green Innovation

What is green innovation?

Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. Increasing concern about the future sustainability of economic growth patterns underpin the demand for a greener model of growth. Existing production technology and consumer behaviour can only be expected to produce positive outcomes up to a point; a frontier, beyond which depleting natural capital has negative consequences for overall growth. By pushing the frontier outward, innovation can help to decouple growth from natural capital depletion. Innovation and the related process of creative destruction will also lead to new ideas, new entrepreneurs and new business models, thus contributing to the establishment of new markets and eventually to the creation of new jobs. Green innovation is therefore the key in enabling environmentally sustainable growth.

Figure 1. Renewable energy supply, % of total primary energy supply

What is the role of innovation in green growth?

Recent OECD analysis suggests that without intensified policy action, global greenhouse gas (GHG) emissions are likely to increase by 70% by 2050. Other environmental and social challenges are equally demanding, including improving the quality and availability of water, dealing with the use and disposal of toxic products and maintaining or increasing biodiversity.

Green growth implies policies that either reduce resource use per unit of value added incrementally (relative decoupling) or keep resource use and environmental impacts stable or declining while the overall economy is growing (absolute decoupling). Over recent decades, OECD countries have been able to achieve absolute decoupling of GDP growth and emissions of certain acidifying substances, such as sulfur oxide (SOx) and nitrogen oxide (NOx). However, they have only been able to achieve a relative decoupling of GDP growth from GHG emissions, as these have continued to rise. Indeed, in many areas environmental pressures have continued to increase as economies have grown, notably in non-OECD countries (OECD, 2010).

A pre-crisis, business-as-usual growth route that undervalues environmental capital will at some point deplete and/or degrade the natural resource base. This will limit growth prospects in the long term. Decoupling growth from environmental pressure requires establishing incentives and institutions that lead to significant green innovations and their widespread adoption and diffusion.

What are the sources of green growth?

Green growth has the potential to address economic and environmental challenges and open up new sources of growth through the following channels OECD (2011):

- **Productivity**. Incentives for greater efficiency in the use of resources and natural assets: enhancing productivity, reducing waste and energy consumption and making resources available to highest value use.
- **Innovation**. Opportunities for innovation, spurred by policies and framework conditions that allow for new ways of addressing environmental problems.
- **New markets**. Creation of new markets by stimulating demand for green technologies, goods, and services; creating potential for new job opportunities.
- **Confidence**. Boosting investor confidence through greater predictability and stability around

how governments are going to deal with major environmental issues.
- **Stability**. More balanced macroeconomic conditions, reduced resource price volatility and supporting fiscal consolidation through, for instance, reviewing the composition and efficiency of public spending and increasing revenues through the pricing of pollution.

Figure 2. Environmental productivity, USD per Kg of CO2 emitted, 2005 constant USD PPPs

Policy intervention on green innovation

- **Public governance** plays an essential role in transitioning to green technology and innovation. A country's capacity to innovate is to an extent determined by the quality of the governance of STI, i.e. the set of largely publicly defined institutional arrangements, incentive structures, etc., that determine how the various public and private actors engaged in socioeconomic development interact in allocating and managing resources devoted to STI. (See Public governance for green innovation [1].)
- **Policy instruments** can help encourage an optimal level of innovation in view of market and systemic failures for green innovation. Supply-side innovation policies play an important role in orienting innovation efforts to help address green growth challenges. However, innovative solutions to meet the green growth challenge are hampered not only by technological barriers but also by the lack of supporting market conditions (i.e. demand). (See Policy instruments for green innovation [2].)
- The context of **developing countries** requires special considerations for policy design and implementation. Technology transfer and adaptive R&D aimed at building local capacities may be more effective for boosting the use of environmental inventions. (See Green innovation in developing countries [3].)

What factors affect green innovation?

- International linkages can promote international co-operation in a range of policy areas, not least environmental regulation. International co-operation is necessary for setting global standards on environmental and energy technologies, environmental regulations on industrial production, trade policy and technology deployment mandates. (See International linkages for green innovation [4].)
- Technologies like ICTs (see ICTs and green innovation [5]) and have the potential to improve the environment and tackle climate change. Like ICTs, biotechnology and nanotechnology (See Bio-, nano- and converging technology for green innovation [6]) may also develop into “general purpose technologies” since they can be applied in a broad range of sectors, including the green economy.

References

- OECD (2010), “Interim report on the Green Growth Strategy”, C/MIN(2010)5, OECD, Paris.

- OECD (2011), Towards Green Growth, OECD Publishing, Paris.
- OECD (2012), “Transitioning to green innovation and technology”, in OECD Science, Technology and Industry Outlook 2012, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_outlook-2012-5-en *[7]*.

Links
[1] https://www.innovationpolicyplatform.org/topic-menu/public-governance-green-innovation
[2] https://www.innovationpolicyplatform.org/topic-menu/policy-instruments-green-innovation
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