

## Timing and efficiency of policy for green innovation

### Why is timing and efficiency relevant for policy intervention on green innovation?

Apart from considering the policy mix for innovation, policy also needs to consider the innovation timeframe and the respective benefits and risks of specific policies. Some innovations are already available commercially and may need no or only limited policy action to become effective in improving environmental performance. Other technologies are still under development, and may be in pre-demonstration or demonstration phases. And yet other technologies will only emerge over a much longer term horizon, although some of these could potentially have a large impact.

This timing of innovations may precipitate an advantage of one technology or innovation over another (Newell, 2009). For example, a technology having greater short-term advantages over another technology may become established and “lock out” other technologies. Even if the long-term benefits of the “locked in” technology would result in lower overall social benefits, it succeeds at the exclusion of other technologies. However, technologies dropped at an early stage may reassert themselves at a later date and become successful. OECD (2003) describes this path dependence effect in greater detail, highlighting the example of the electric car, a technology which may be in resurgence after initial lock-out decades ago. Another aspect of this situation of lock-in is the impact on incentives for further innovation. If policy focuses on the deployment of currently available technologies, it could reduce the market for future innovations, which will reduce incentives to invest in R&D and efforts to develop such innovations (David, et al., 2009). There are no simple answers to this problem.

### How can timing and efficiency be achieved?

One approach that can help inform long-term investment decisions associated with the introduction of new technologies and innovations involves the use of scenario studies, technology foresight and roadmapping. This can provide insights on the scope for technological progress and innovation in different areas and may therefore help in guiding decisions. The IEA’s Energy Technology Perspectives provides an important example of such an approach. This can also point to options that may be available at little or zero cost, which could be implemented with relative ease, such as improvements in energy efficiency in existing buildings (e.g. McKinsey, 2009, IEA, 2010).

Fostering a diverse portfolio of potential options for action, and carefully considering the timing of the most lumpy and irreversible investments, may also help in preserving options for new innovations as they emerge. This is one more reason for a strong focus on research, innovation and entrepreneurship, as they all contribute to the process of experimentation that is key to the emergence of new options that can help address global environmental challenges.

In addition, having a strong focus on demand-side policies, aimed at strengthening the markets for green innovations, might also help avoid policy from getting unduly locked into poor supply decisions. By inducing strong market signals for potentially promising technologies, the risk of getting locked in may be mitigated. However, strong demand-side policies are not without difficulties, as indicated above. Government-led demand-side policies, e.g. involving regulatory and public procurement policies, may end up being too much guided by political considerations and vested interests rather than emerging market demands. On the other hand, as noted above, market-based economic instruments such as carbon taxes, may not be sufficient to change current trajectories and may end up favouring technologies with known and relatively low costs. Striking the right balance in the use of demand-side policies clearly remains a challenge.

As already noted above, policies to foster green innovation will also benefit from continued evaluation and monitoring, to improve the effectiveness and efficiency of policies over time, and to

benefit from the development of new scientific insights and new technologies and innovations. The required policy changes resulting from evaluation will have to be balanced against the need for policy stability over time.

## References

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