

# Science for Environment Policy

## Low-carbon technology policy success factors assessed

**Policies** to promote low-carbon technologies are more likely to be successful if they are flexible, have clear timeframes, and are mandatory, a recent study suggests. The researchers reached their conclusions by studying cases of low-carbon policies from around the world.

**Climate change governance** uses a huge, and growing, range of policies designed to support the development and use of low-carbon [technologies](#). However, there have been few systematic efforts to assess what makes a policy successful.

To help fill this gap in knowledge, the researchers gathered 165 studies that evaluated the effects of such policies. They looked for patterns across the policies examined in these studies to identify factors linked with each measure's effectiveness.

The research they used had been conducted by academics, international organisations (such as the [World Bank](#) or [UNEP](#)) and governments. All studies had been published since 1970 and the policies were aimed at businesses, citizens, industry associations and governments. The researchers highlight some limits to their study, which arise from a lack of information. For instance, they could only assess long-standing policies and those with published performance data.

Some clear patterns emerged from their analysis. For example, flexible measures, allowing different approaches to reaching the same goal, are more likely to achieve their objectives. They are also more cost efficient.

Examples of flexible policies include carbon taxes (which put a price on carbon) and cap-and-trade systems (which create a price for carbon-emission permits). Both are designed to encourage companies to cut their emissions and, in both cases, companies can choose how to do so cost-effectively, which may involve low-carbon technologies.

However, the researchers caution that flexibility does not guarantee success. Furthermore, flexible policies can also be difficult to design and manage. Emissions-trading schemes, for instance, have detailed administrative and technical requirements.

Financial instruments, such as subsidies and taxes, were also slightly more effective than either regulatory measures, which ban or permit certain types of behaviour, or informational measures, such as education campaigns.

However, there were only small differences in success rates between these three types of measures: 52% of finance-based policies were judged as successful, compared with 49% of informational instruments and 44% of regulatory instruments.

Policies with clearly-defined, long-term timeframes were also more likely to reach their goals. The study highlights the case of Feed-in-Tariff programmes, in which people can sell electricity generated with their own renewable technologies back to the grid. Many of these have been successful because they provide long-term certainty for investors. There can also be a downside to long-term certainty though, the study's authors warn, as it can 'lock' a country into policy pathways that may become undesirable at a later date.

Voluntary carbon-reduction schemes, although low cost, also risk being low impact, the study finds. Under schemes where, for example, companies voluntarily report on green improvements, there is little incentive to comply. Schemes where it is mandatory for companies to report improvements are more likely to have positive impacts.

Future research should focus on the collective, interacting effects of all policies, the study suggests. This would improve our understanding of how an issue as large and complex as climate change should be governed.



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