



Environmental policy mixes have a high potential, but must be handled with care

HIGHLIGHTS

- Implementing different interventions with the same goal simultaneously is required to induce green behaviour and, thus, tackle climate change.
- Combining nudges and monetary incentives is most effective in making decisions greener.
- On average, policy mixes effectively promote pro-environmental behaviour.
- The effectiveness of such policy mixes depends on the regulated environmental behaviour. Stimulating energy conservation appears to profit most from policy mixes.

Policy mixes to tackle climate change

A wide variety of policies and programmes are being implemented to tackle one of the biggest societal challenges the world is facing: climate change. Meeting the European Union's plans of achieving climate neutrality by 2050 requires considerable changes in societal practices and in the behaviour of individuals.

Policy makers are promoting pro-environmental behaviours using a range of instruments, such as mandates or bans, financial incentives (like taxes and subsidies), and mandatory disclosure of information (like product labels). Many governments have also started using behavioural instruments, like nudges and boosts, which change the decision structure and strengthen individuals' core competencies. Behavioral change is critical to tackling climate change and meeting net-zero targets. Currently, it also attracts a great amount of attention in light of the energy crisis, as energy efficiency and

demand side action have a particularly important role to play with global energy prices being high and volatile, hurting households, industries, and entire economies.

Under the prospect of escalating severity of climate change impacts and the challenge of energy provision, interventions targeting the same behaviour will be implemented jointly more often, either on purpose or due to overlapping governance competencies. There is some evidence of the possible advantages of applying policy mixes. Compared to single interventions, policy mixes are expected to better alleviate market failures, or adjust sub-optimal single policies.¹ However, there still is a lack of clarity on whether implementing interventions simultaneously allows for better tailored policy designs to address behavioural changes compared to interventions implemented in isolation. Our research tried to fill in this gap and suggests that different simultaneous interventions can induce green behaviour.

Policy mixes and considerations to engage in pro-environmental behaviours

To understand the effect of policy mixes, we must acknowledge that different factors affect whether individuals engage in pro-environmental behaviour. First, there are two types of motives: **monetary motives** (i.e., to save money) and **non-monetary motives** (i.e., to protect the environment or other people, to conform with what is believed to be socially or morally expected, to gain reputation, or to reduce inequalities). Second, people's abilities to behave pro-environmentally, such as their **cognitive availability** (i.e., know-how) and **perception** of the behaviour (e.g., the framing), and **effort** that has to be provided, play a role. The different interventions combined in policy mixes work through activating these different motives. Thus, interactions between these motives can substantially influence whether policy mixes are effective.

Usually, environmental policies promote pro-environmental behaviours by addressing one of those considerations. As an example, policy makers can induce energy savings through subsidies, which leverage the monetary motive to engage in this activity. Alternatively, policy makers can use normative messages to stimulate energy conservation. Such messages have been used in energy bills, where information about the consumption of similar peers was included to leverage the motive to conform with socially appropriate behaviour.

When, however, policy mixes comprise different interventions, they can address different factors. When different interventions are implemented simultaneously within policy mixes, they might become more or less effective than in single application. In simple words, policy mixes might be more or less effective than the sum of their parts. There might be positive synergies (i.e., mixes might be more effective than interventions implemented in isolation), negative synergies (i.e., the policy mix might be more effective than the most effective single intervention), or even backfiring synergies (i.e., the policy mix could be less effective than the effect of an intervention alone). These synergies might occur due to the interaction of the interventions within policy mixes, addressing different considerations to engage in pro-environmental behaviour (see example in Box 1). For policy makers achieving at least negative synergies appears already sufficient to choose policy mixes over single interventions as the former is more effective in changing environmental behaviour. However, the use of policy mixes comes at the expense of a greater administrative burden and the risk that the regulation becomes overly complex. In the end, whether combining interventions from the comprehensive pool of possible interventions is more beneficial than using single policies depends on the behavioural dynamic of the policy mixes and must be assessed in application to obtain an understanding of the different interactions.

Box 1. Examples of positive and negative synergies between interventions within policy mixes

Positive synergy:

Issuing rewards for a desirable behaviour (e.g., through a subsidy), like saving energy, to individuals who already engage in this behaviour due to their environmental concerns, can actually *reduce* energy-saving behaviour (this is called motivation *crowding out*). This might happen when, for example, people cannot convince themselves or others any longer that they save energy because they are "a good person" (but also to gain money). Combining such a subsidy, which bears the risk of crowding out pro-environmental motivation, with a normative message re-establishing and supporting the positive self-image of a person as "a good person" could potentially offset motivation crowding out.

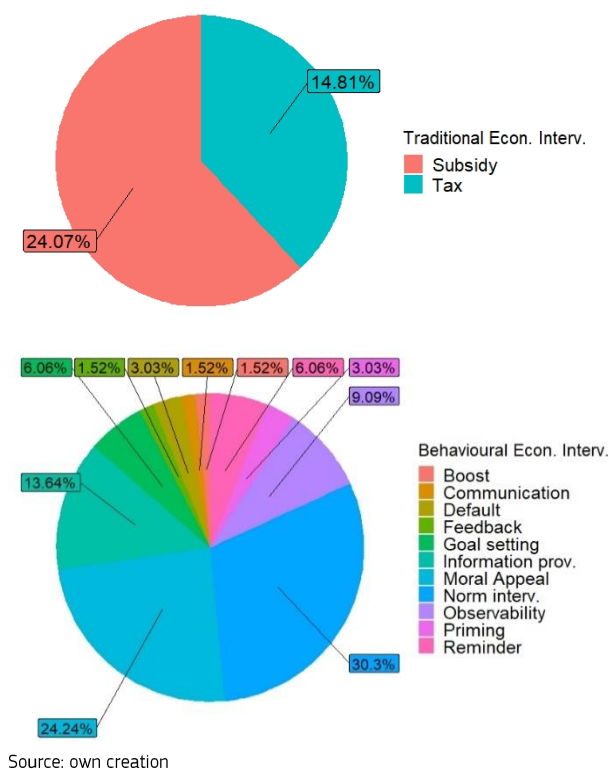
Negative synergy:

As described above, people who already save a lot of energy can reduce this behaviour when a subsidy is put in place. Using a norm intervention to inform these high-achievers about the low efforts of others in protecting the environment might actually decrease their own efforts even more, being discouraged by the lack of energy saving by peers.

Policy mixes are more effective than single interventions

We screened more than 5000 scientific articles and identified 54 studies from 30 articles, which investigate synergy effects of different interventions regarding pro-environmental behaviour. Figure 1 provides an overview of the type of interventions used in the studies. They comprise traditional economic policies in the form of subsidies and taxes as well as behavioural economic policies containing different types of nudges.

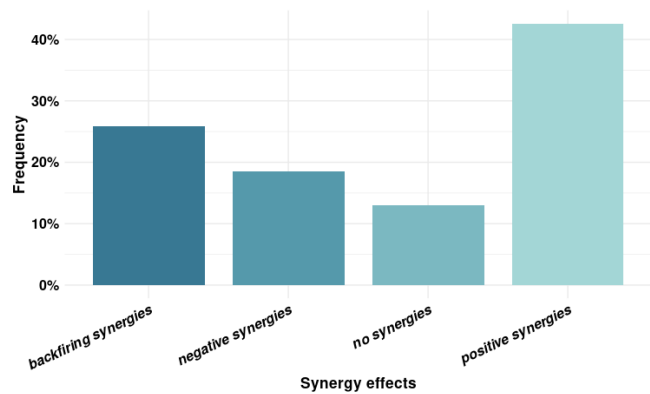
Figure 1 – Types of interventions studied



Overall, we find evidence that policy mixes are on average substantially more effective than their respective single interventions, being almost as effective as the sum of these intervention effects. Figure 2 reports the distribution of synergies observed. In the vast majority, it is highly beneficial to combine different interventions as it led to positive synergies, i.e., policy mixes are more effective than the sum of their constituent effects. Thus, on average combining

interventions has a high potential to more effectively change behaviour in the desired direction. However, there is also the threat of causing detrimental effects, since in every fourth attempt to combine interventions in policy mixes, the usage of a single intervention would have had a larger effect.

Figure 2 – Synergic effects



We identified several factors that increase the likelihood of observing positive synergies in policy mixes. In fact, combinations of traditional economic policy tools with behavioral interventions are as effective as the sum of their constituent policies. In contrast, combining either two traditional or two behavioural economic policies within a policy mix often results in negative or backfiring synergy effects. This is particularly the case for combinations of different monetary incentives.

Apart from the type of interventions, the particular environmental behaviour targeted by the policy mix is of importance as well. There are particularly promising synergetic effects regarding the regulation of energy conservation. Policy mixes applied to this behaviour are on average substantially more effective than their single policy constituent interventions and even as effective as the sum of the constituent interventions. Green consumption, however, has shown to be the least effective in terms of being regulated by policy mixes, which might be due to the limited attention of consumers during the shopping process.

Policy Implications

The analysis shows encouraging results on the usage of policy mixes for policy makers, who aim at steering environmental behavior. However, they need to be handled with care to avoid detrimental effects.

In particular, when choosing the type of interventions, policy makers should aim to implement a mix made of a traditional economic intervention (like a nudge) and a behavioral economic intervention (like a monetary incentive). Applying rather similar interventions in policy mixes is more likely to backfire. This implies that particularly the combination of monetary incentives in the form of taxes and subsidies is constrained. Although they have proven to be effective in single policy applications, increasing monetary incentives even further or adding another monetary incentive is likely to be of little effect. This might be driven by the fact that to most people additional money being paid for a certain behaviour is valued less than a similar amount that was paid initially for this behaviour. Another reason for the lack of effectiveness of policy mixes with similar mechanisms might be the limited attention paid to both interventions at the same time. Recognizing the different interventions within policy mixes is more difficult if the policy constituents are rather similar in the motive they address. From this, we can extrapolate to the general implementation of policy mixes. Careful attention should be paid to conveying the particular interventions within policy mixes since combinations of different interventions are often more complex to comprehend and take into account for the target population. In line with this, policy makers should also consider the particular kind of behaviour being regulated as different behavioural contexts can be more or less intricate.

To address these challenges of implementing policy mixes, it is recommendable to use policy mixes mostly in environments in which taking environmental decisions is not cognitively burdensome. Additionally, it is paramount that the respective policy is communicated comprehensively and in detail to fully fledge the potential of a policy mix.

REFERENCES

[1] van den Bergh, J. C. J. M., et al. Designing an effective climate-policy mix: accounting for instrument synergy. *Climate Policy*, 2021, 21. Jg., Nr. 6, S. 745-764.

DISCLAIMER OR OTHER FINAL DETAILS

The authors of this brief are Nives Della Valle, Marius Alt, Hendrik Bruns, and Ingrida Murauskaite-Bull. The results have been derived within the project **PoliSpill** "Policy mix and Behavioural Spillovers", and are part of a larger study that will be published in due time. Should the reader require further clarifications they can contact Nives Della Valle (nives.della-valle@ec.europa.eu) or Marius Alt (marius.alt@ec.europa.eu).

To cite this science for policy brief: Alt, M. DellaValle, N., Bruns, H. and Murauskaite-Bull, I. (2022), "Environmental policy mixes have a high potential, but must be handled with care", JRC131209, European Commission.

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CONTACT INFORMATION

Nives.della-valle@ec.europa.eu & marius.alt@ec.europa.eu

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