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# Policy brief

## Decarbonising the European Union credibly, effectively and acceptably



THE LONDON SCHOOL  
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### Headline issues

- Carbon pricing reduces power sector emissions cost-effectively, and is distributionally more equitable for producers than its alternatives.
- Credibility of efforts to decarbonise electricity varies and needs to be improved, including through better and more coherent policies.
- Carbon pricing through taxes on non-ETS sectors can avoid public opposition through tailored design and communication.

### Summary

**Member states should prioritise carbon pricing to decarbonise the power sector, as it is entering a new phase of more mature renewables.** Carbon pricing (embedded in the EU emissions trading system) achieves emission reductions more equitably and at the lowest welfare cost compared with coal taxes, electricity taxes, and subsidies.

**In order to improve the credibility of their efforts to decarbonise the power sector, EU member states need to act in particular on:** creating clear policy and legislation, improving joined-up thinking and scrutiny of decision-making bodies, limiting reversals of policy, and generating buy-in from the private sector and the public.

**Carbon pricing through taxes can be very effective in some sectors not covered by the EU emissions trading system.** Introducing or strengthening carbon taxes is challenging, but taxes can be made more acceptable through improved design and communication, including gradual phase-in and earmarking or redistribution mechanisms.

**Policy briefs** provide analysis on topical issues, presenting specific recommendations to inform ongoing policy debates. Drawing on the Grantham Research Institute's expertise, they summarise either our research findings or the state of knowledge about a particular issue.

This policy brief has been written by **Samuela Bassi, Maria Carvalho, Baran Doda** and **Sam Fankhauser**. It summarises a longer policy report, *Credible, effective and publicly acceptable policies to decarbonise the European Union: Final report*, available at [www.lse.ac.uk/GranthamInstitute/publications](http://www.lse.ac.uk/GranthamInstitute/publications)

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“As subsidies become less necessary for mature low-carbon generation, increasingly the onus will be on carbon pricing to ensure continued decarbonisation of electricity”

## The power sector and decarbonisation in the EU

The EU was at the forefront of the negotiations that led to the Paris Agreement. It has set mandatory internal climate targets for 2020 and 2030, which commit its member states to significantly reduce their greenhouse gas emissions, increase the share of renewable energy sources and improve their overall energy efficiency (European Commission, 2013). The ability to meet these targets depends crucially on the successful decarbonisation of the power sector, which accounts for a large share of EU emissions.

Climate-related policies have already led to significant uptake of low-carbon electricity generation

over the past decade. Currently the EU power sector is transitioning into a new phase, with a growing stock of low-carbon technologies that are becoming increasingly cost-competitive.

This research aims to show how the EU and its member states could feasibly and credibly achieve their medium- and long-term climate change targets, taking into account the opportunities and challenges of this new decarbonisation phase.

### Striking a balance between low-carbon support policies and carbon pricing

Fiscal support will still be needed for nascent technologies that are not yet cost-competitive. However, as subsidies become less necessary

#### Finding out more – Background papers

This policy brief is a summary of the final Statkraft Policy Research Programme report:

- *Credible, effective and publicly acceptable policies to decarbonise the European Union: Final report* (Bassi S, Carvalho M, Doda B and Fankhauser S, 2017)

The report and brief draw on the findings of three research papers, carried out as part of the research programme. They are:

- *The credibility of the European Union's efforts to decarbonise the power sector* (Bassi S, Averchenkova A and Carvalho M, 2017)
- *Energy policy and the power sector in the long run* (Doda B and Fankhauser S, 2017)
- *How to make carbon taxes more acceptable* (Carattini S, Carvalho M and Fankhauser F, 2017)

All are published jointly by the Grantham Research Institute on Climate Change and the Environment and the Centre for Climate Change Economics and Policy and are available to download from [www.lse.ac.uk/GranthamInstitute/publications/](http://www.lse.ac.uk/GranthamInstitute/publications/)

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for mature low-carbon generation, increasingly the onus will be on carbon pricing to ensure continued decarbonisation of electricity. The experience in the power sector also offers lessons for how policy gaps may be closed in sectors outside the EU emissions trading system (ETS) using carbon pricing tools, notably carbon taxes, by making them more publicly acceptable.

### Assessing EU climate policy: research scope and aims

Our research explored three key challenges the EU faces in meeting its climate change targets for 2030 and beyond:

- **Distributional impacts** – how policy interventions to decarbonise the power sector vary in the way their costs and benefits are distributed
- **Credibility** – the extent to which current institutional arrangements support the credibility of countries' efforts to decarbonise their power sector
- **Acceptability** – lessons on how to design and communicate carbon taxes to directly address concerns held by the general public

### Findings on the cost-effectiveness of decarbonisation policies

Policies to decarbonise the power sector vary in the way their costs and benefits are distributed among government, consumers and electricity producers using different generation technologies.

It is crucial to ensure that the framework of future climate and energy policies is consistent with the reality of the EU's generation mix, which is increasingly characterised by cost-competitive low-carbon technologies, and that it enables countries to achieve the 2030 and 2050 targets at the least cost to society.

We developed a theoretical model to assess the welfare implications of four alternative policies:

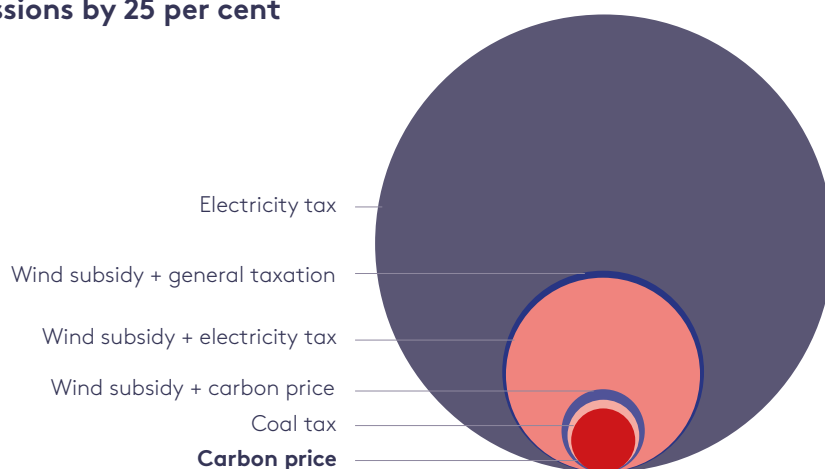
1. A carbon price (which in the EU is embedded in the emissions trading system)
2. A coal tax
3. A tax on electricity consumption
4. A technology-specific subsidy, alternatively financed by the revenues from: a) general taxation; b) an electricity tax; or c) the proceeds from carbon pricing. For illustrative purposes, the subsidy is applied to wind power.

The only policy objective in this model is to reduce carbon emissions. Each policy is set to achieve a hypothetical target to reduce power sector emissions by 25 per cent. Other pertinent issues, such as innovation and network externalities, fall outside the scope of this analysis. We focus on six generation technologies: wind, hydro, solar, coal, gas and nuclear. The model results described below are based on data from Spain, whose generation mix is similar to the EU average. They remain qualitatively valid for other member states we analysed.

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“It is crucial to ensure that the framework of future climate and energy policies is consistent with the reality of the EU's generation mix”

**Figure 1. Welfare costs of select policy packages reducing emissions by 25 per cent**



“Carbon pricing leads to a more even distribution of policy costs and benefits among the different generators and treats all low-carbon technologies neutrally”

**Model results: example of wind power**

Among the instruments considered, carbon pricing achieves emission reductions at the lowest cost to society. Figure 1 illustrates the cost-effectiveness of alternative policies achieving the same target by illustrating the welfare cost of each, relative to that of carbon pricing. Carbon pricing is cost-effective because it directly targets each input that generates carbon emissions, whereas other policies do so with additional distortions, or indirectly. Carbon pricing also leads to a more even distribution of policy costs and benefits among the different generators and treats all low-carbon technologies neutrally.

By contrast, a coal tax ignores (in fact, increases) emissions from gas generation, placing a needlessly high burden on coal generators alone.

A subsidy reduces emissions indirectly by improving the

competitiveness of the targeted low-carbon technology (here, wind). This, however, reduces the market share of not only coal and gas, but also of other low-carbon sources (here, hydro, solar and nuclear power). This is an important difference from carbon pricing, which is only detrimental to fossil fuel generation.

An electricity tax also implements the emissions reduction indirectly, by shrinking the market as a whole. In so doing it negatively affects both consumers and generators (both high- and low-carbon) so much that even the sizable revenues it generates for the government are not worthwhile from society’s perspective, by a wide margin.

Fiscally-neutral subsidies perform somewhat better. Financing such subsidies with the proceeds from carbon pricing is more cost-effective than raising funds through an electricity tax. This is because the former policy package gives a competitive edge

to a low-carbon technology by providing financial support via the subsidy. At the same time, it reduces emissions from coal and gas generators through the carbon price by raising their costs.

### Findings on the credibility of decarbonisation efforts

Credibility is vital for building trust among investors and the international community, and for helping to increase the ambition of political commitments over time. Credibility, in this assessment, means ‘the degree of likelihood that policymakers will keep their promises to implement their announced pledges or policies’ (as defined in Averchenkova and Bassi, 2016).

We investigated the credibility of eight member states’ efforts to decarbonise their power sector in accordance with the EU’s medium- and long-term climate change objectives, and identified areas of strength and weakness. To do this, we developed a framework to assess credibility along seven determinants:

1. A coherent and comprehensive legislative and policy basis
2. Dedicated public bodies supported by consultative mechanisms
3. No history of policy reversal
4. A track record of delivering on past climate change commitments
5. An effective decision-making process
6. Private bodies supportive of climate change action
7. Public opinion supportive of climate change action

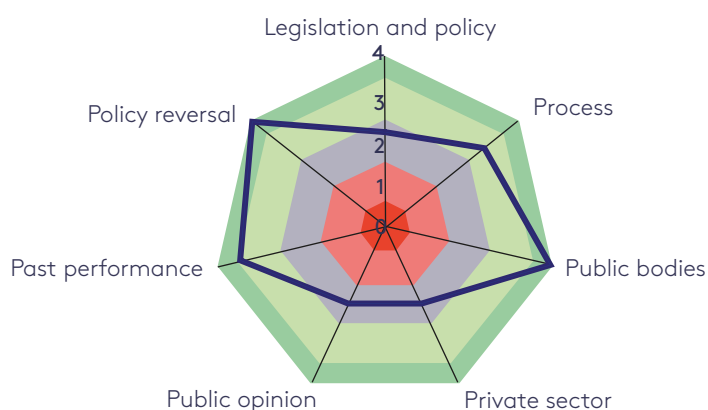
Each of the member states analysed, as well as the European Union as a whole, was scored against these determinants, on a 5-step scale from ‘not supportive’ to ‘fully supportive’ of credibility.

#### Results for the EU as a whole

The EU performs best overall on the public bodies and policy reversal dimensions (see Figure 2), which appear to be strongly supportive to credibility.

“Credibility is vital for building trust among investors and the international community, and for helping to increase the ambition of political commitments over time”

**Figure 2. Credibility scores for the EU as a whole**



**Key: Degree of support to credibility**

- 3.5–4: fully supportive
- 2.5–3.5: largely supportive
- 1.5–2.5: moderately supportive
- 0.5–1.5: slightly supportive
- 0–0.5: not supportive
- EU score

Source: Authors

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## “Policy and legislation need to be strengthened in some countries, by improving long-term vision and low-carbon policies”

This reflects the quality of its institutions. The need for strong consensus in the legislative process and the balance of veto power of the member states also means that EU legislation affecting the decarbonisation of the power sector has never been reversed (although it may have induced some unintended policy reversals at member-state level).

The EU performs less well on the private sector, public opinion and policy and legislation dimensions.

### Results for individual states

Credibility varies across member states. Among the eight countries analysed, Denmark, Germany and the UK are the top performers, while Poland and the Czech Republic appear to be those where credibility is least supported. Italy, France and Spain fall in the middle.

Policy and legislation need to be strengthened in some countries, particularly in Poland, by improving long-term vision and low-carbon policies. Public institutions could also be improved, in particular in Poland and Germany, by joining up climate and energy policies in a single department, and by ensuring government action is scrutinised by independent bodies. Good examples of the latter are found in Denmark and the UK.

Frequent policy reversals are a challenge to the credibility of decarbonising efforts in most of the member states analysed, in particular in the Czech Republic

and Spain. To a lesser extent, policy reversal also affects credibility in France, Germany, Italy and the UK. Planned and transparent mechanisms are required to allow for policy adjustments without unintended consequences.

Climate change awareness among the public in Poland and the Czech Republic is among the lowest in the EU. Furthermore, in these two countries, as well as in Italy and Germany, carbon-intensive sectors are important sources of jobs. Pressures from the general public and industry could undermine policymakers' appetite for bolder low-carbon policies.

### Findings on the public acceptability of carbon taxes

As discussed above, putting a price on carbon can be the most cost-effective ways to incentivise the reduction of greenhouse gas emissions. For some of the sectors outside the EU emissions trading system, such as transport and waste, this can be achieved through domestic carbon taxes. However, proposals for carbon taxes are often difficult to pass, for reasons that go beyond a general aversion to new taxes.

Empirical studies are beginning to shed light on people's wariness towards carbon taxes and our extensive literature review unpacks these attitudes. In light of these findings, we spell out the key challenges for member states in introducing carbon taxes, and

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identify policy design options and communication devices that could make carbon taxation more acceptable.

### Reasons for public aversion to carbon taxes

Evidence shows that opposition to carbon taxes is based on the following widely held perceptions:

1. The personal costs of a tax would be too high.
2. Carbon taxes are regressive, having a disproportionate negative impact on low-income households.
3. Carbon taxes are not an effective way to discourage high-carbon behaviour.
4. Government's 'hidden' motive is to increase fiscal revenue rather than curb emissions.

How far are these concerns valid? Evidence shows that carbon pricing, either in the form of taxes or through carbon trading, does in fact reduce emissions and so far has had a minimal impact on the wider economy (Dechezleprêtre and Sato, 2017). On the other hand, individuals are right to suspect that governments would probably welcome the extra revenues. Indeed, the benign fiscal implications of a carbon tax are often highlighted as one of its merits (Bowen and Fankhauser, 2017). Also, carbon taxes without countermeasures may be regressive. However, the accuracy of these views is less important than the fact that they are widely held.

There is growing evidence that particular policy designs can help overcome some of these concerns, highlighting the following:

- **People do not like high environmental taxes.** Acceptability depends heavily on policy stringency, in particular the proposed tax rate and implied costs to consumers.
- **Public acceptance for a carbon tax is higher if the use of proceeds is clearly specified.** Earmarking revenues to support emission reduction projects is the method preferred by the general public to overcome their lack of trust in governments, followed by redistribution and revenue neutrality.
- **Public attitudes are not necessarily persistent.** People's aversion to carbon taxes tends to abate once the policy is implemented, as individuals become more familiar with its costs and benefits. Similarly, providing information about the effectiveness of different tax designs can improve individuals' responses to carbon taxes.

### Conclusions and recommendations

Our assessment points towards three key messages:

1. **The existing imbalance between carbon pricing and subsidies for the decarbonisation of electricity in the EU is costly. In future there should be more emphasis on carbon pricing, which is determined in the EU**

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“People’s aversion to carbon taxes tends to abate once the policy is implemented, as individuals become more familiar with its costs and benefits”

emissions trading system, for the following reasons:

- As low-carbon technologies become more mature and cost-competitive, carbon pricing is the most cost-effective policy to reduce emissions from the power sector.
- Carbon pricing treats low-carbon generators neutrally; this implies a more even distribution of policy costs and benefits among generators.

## 2. To improve the credibility of member states' efforts to decarbonise their power sectors, policymakers should focus on:

- Improving policy and legislation, by setting a long-term vision and strengthening low-carbon policies.
- Strengthening joined-up thinking on climate change and energy in public bodies and enabling independent scrutiny of their work.
- Introducing commitment devices that prevent sudden policy reversals that destabilise investors.
- Engaging in dialogue and consultations with stakeholders to generate policy buy-in.

**3. For sectors outside the EU emissions trading system, economically 'optimal' carbon taxes are often difficult to pass into legislation. Alternative design options have shown greater acceptance levels to enable their introduction.** They include:

- Phasing in carbon taxes over time through trial periods, or introducing the tax at a low rate but having commitment devices to increase the rate to more efficient levels.
- Earmarking carbon tax revenues to finance mitigation projects when this enhances acceptability.
- Alternatively, and preferably, using the carbon tax revenues for social redistribution and revenue neutrality, whenever possible.
- Using information-sharing and communication devices to improve trust and credibility, before and after the introduction of a carbon tax.

## References

See the box on page 2 for details of the final project report and background papers.

### Additional references

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