European University Institute

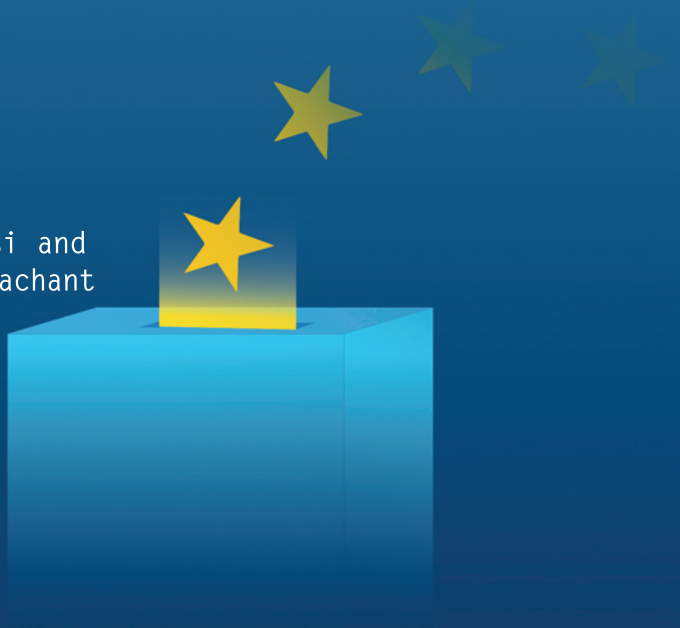
ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES

RSCAS POLICY PAPERS

Special Edition for the EP Elections 2019

RSCAS PP 2019/10
Robert Schuman Centre for Advanced Studies

Carbon Pricing, Decarbonisation, Digitalization: The Future and the Challenges of the EU Climate & Energy Policy



Simone Borghesi and
Jean Michel Glachant

European University Institute

Robert Schuman Centre for Advanced Studies

Carbon Pricing, Decarbonisation and Digitalisation: The Future of and the Challenges to the EU Climate & Energy Policy

Simone Borghesi and Jean-Michel Glachant

RSCAS Policy Paper 2019/10

ISSN 1830-1541

Printed in Italy, February 2019
European University Institute
Badia Fiesolana
I – 50014 San Domenico di Fiesole (FI)
Italy
www.eui.eu/RSCAS/Publications/
www.eui.eu
cadmus.eui.eu

European Parliament elections in May 2019 come at a critical time in the evolution of the EU as these will be the first elections after the expected departure of the UK (March 2019) and at a time when divergence on many issues characterises member state relations. Wider global developments weigh heavily on Europe with the return of hard geopolitics and efforts to undermine the global multilateral order. The European University Institute (EUI) wants to highlight the major issues that are at the heart of the political agenda at this juncture as a contribution to the debate. The papers are part of a wider programme on the elections including the development of a Voting Advice Application (VAA), euandi2019, and an online tool specifically tailored for mobile EU citizens voting either in their country of citizenship or residence, spaceu2019.

This initiative on the European Parliament elections in 2019 is part of the Schuman Centre's European Governance and Politics Programme (EGPP) egpp.eui.eu. Launched in 2018, the Programme aims to foster high-quality academic research and reflection on the European Union and European integration with a medium to long-term perspective. The EGPP also promotes engagement on contemporary issues through various events, including blog debates and thematic conferences and workshops.

Robert Schuman Centre for Advanced Studies

The Robert Schuman Centre for Advanced Studies, created in 1992 and currently directed by Professor Brigid Laffan, aims to develop inter-disciplinary and comparative research on the major issues facing the process of European integration, European societies and Europe's place in 21st century global politics.

The Centre is home to a large post-doctoral programme and hosts major research programmes, projects and data sets, in addition to a range of working groups and ad hoc initiatives. The research agenda is organised around a set of core themes and is continuously evolving, reflecting the changing agenda of European integration, the expanding membership of the European Union, developments in Europe's neighbourhood and the wider world.

For more information: http://eui.eu/rscas

The **Policy Paper Series** of the Robert Schuman Centre for Advanced Studies complements its Working Papers Series. This series aims to disseminate the views of a person or a group on a particular policy matter, specifically in the field of European integration.

Abstract

Carbon pricing is of crucial importance for decarbonisation and provides a solid economic framework for unifying the EU climate and energy policy strategy. The EU ETS is the main instrument for this purpose as it leads to a unique carbon price all over Europe. Given the difficulties it has encountered over the years, however, a set of additional 'fragmented' policies are also needed for decarbonisation. Among these, particular attention should be devoted to digitalisation as a promising tool that can radically innovate both the climate and the energy sectors in a more sustainable direction.

Keywords

Carbon pricing; decarbonisation; digitalisation; Europe; climate and energy policy.

Introduction

Nowadays, climate and energy issues are so strictly related that they can almost be regarded as two sides of the same coin. Energy production and consumption have a key influence on the ongoing global warming process. At the same time, climate change affects the whole energy system, requiring low-carbon technologies that deeply modify the way energy is produced and transmitted.

The climate and energy issue is particularly relevant for the EU for several reasons: (i) a high vulnerability of specific areas to climate change (e.g. the Mediterranean region); (ii) large and increasing migration flows towards Europe, which are often directly or indirectly related to environmental problems (so-called environmental refugees); and (iii) the European scarcity of natural resources and dependence on imports of energy sources from non-European countries, which increases European vulnerability to energy price fluctuations.

These problems call for a rapid transition towards renewable energy sources that can reduce climate change and the other negative externalities provoked by the use of fossil fuels, and can lower the European dependency on imports of fossil fuels. Such a transition requires a coordinated intervention on both the climate and the energy sides. In this respect, carbon pricing plays a crucial role. Indeed, carbon pricing provides a solid economic framework for unifying EU climate and energy policy strategy and for paving the way towards a sustainable decarbonisation around 2050. However, additional policies are also needed to walk along this long 'paved way' towards the 2050 target. In what follows, we first investigate the features of and prospects for the European Emission Trading System (EU ETS), the main carbon-pricing tool adopted by Europe more than a decade ago, and then discuss the additional 'fragmented' policies that will probably be needed to complement carbon pricing. A few concluding remarks will follow.

The climate side of the coin: Carbon pricing and the prospects for the EU ETS

In the last decade, the EU has largely relied on its Emission Trading System to achieve carbon pricing. The EU ETS covers more than 11,000 installations in various emission-intensive sectors which account for around 45% of overall European greenhouse gases (GHG). Introduced in 2005, the EU ETS was divided in phases of increasing length to give a longer time horizon and more certainty to investors. It is now in its third phase (2013-2020), but a new Directive reforming the EU ETS for Phase IV (2021–2030) has recently been adopted (European Parliament and Council of the European Union, 2018) so that the following phase is already on the way.

The EU ETS experienced several difficulties and a remarkable fall in the carbon price during the economic recession. This led the EU to pass a few reforms of the system to address the problems that emerged during the functioning of this mechanism. After more than a decade of application, it can be said that the EU ETS has gone through a continuous learning process. But this aspect, which could be interpreted as a drawback of the system, probably represents its strength. After years of low carbon prices in which the EU ETS was given up for dead by its critics, the price of the European allowances has risen remarkably (from below €5 per tonne of CO2 to around €20/tonne at the time of writing) after the announcement of the last reform. This confirms the crucial role expectations can play in anticipating a policy when it is perceived as sufficiently stringent, credible and long-term. The system obviously needs to be 'handled with care,' leaving the market free to adapt, but also with continual monitoring to ensure its proper functioning, and that is exactly what the EU is trying to do.

For these reasons, despite its ups and downs, the EU ETS has become a prototype for other countries that are progressively setting up their own ETSs (Ellerman, 2010). Today there are 21 ETSs operating in the world, the share of global emissions covered by ETSs has tripled since 2005 reaching nearly 15% of total emissions, and the overall number of carbon pricing instruments has increased by 90% since

2012 (ICAP, 2018). This rapid 'sprawling' of carbon pricing is of primary importance in reducing the risk that unilateral policies may cause carbon leakage, inducing firms to delocalize their production to other areas of the world in which environmental policies are absent or less stringent. The diffusion of carbon pricing, however, is occurring in different ways in different countries. Some countries rely on carbon taxes, though the levels differ substantially across different regions (World Bank, 2017). These carbon pricing initiatives that are rapidly arising in developing countries can be interpreted as a transition phase, possibly leading to their own ETSs in the near future. For instance, the Pacific Alliance (encompassing Chile, Mexico, Colombia and Peru) is leading regional carbon pricing efforts in that part of the world. In particular, Mexico has already implemented a carbon tax and is planning to adopt a mandatory ETS after a three-year pilot phase to start in 2020, and is aiming to link it to the Western Climate Initiative in the years to come. In the near future, the same might apply to Chile and Colombia, which have introduced similar carbon taxes and are now considering the implementation of cap-and-trade systems.

The extension of carbon pricing to many areas of the world creates an opportunity for coordinating energy and climate policies across different countries with the aim of achieving a unique carbon price in the future. In this regard, the EU can and should play a leading role in the years to come, particularly now that climate does not seem to be an issue on the agenda of the Trump administration. The way forward is still very long and should be pursued with much caution to preserve the transparency and integrity of the EU ETS. However, linking the EU ETS with other countries' carbon markets could be a policy option for the future if we are to achieve ambitious targets in terms of carbon abatement at minimum costs (Borghesi et al., 2016). After all, the EU ETS itself can be seen as an example of linking different national climate policies in the past. Therefore, the EU has the expertise to further extend the scope of the ETS mechanism and proceed along a similar path outside the EU.

Nevertheless, more should also be done inside the EU. Almost half of the emissions are not covered by the EU ETS, including those produced by agriculture, buildings, waste and transport. The latter sector deserves particular attention because of the large health effects generated by increasing traffic volumes. The transport sector at the moment presents much room for efficiency improvement and emission reductions. But this requires support for clean cars and infrastructure, particularly if we want to change the mobility habits of the population. A vast economic literature, in fact, shows that car use is rather inelastic to increases in fuel prices and that people keep using their cars despite increasing traffic volumes. Easier and cheaper access to clean transport modes is therefore necessary to produce a shift in the population's mobility paradigm. In this sense, digitalisation can provide a powerful tool by promoting, for instance, car sharing and bike sharing. However, as we will point out below, this is not the only sector in which digitalisation can make a difference for the decarbonization of our economic system.

The energy side of the coin: fragmented EU policies

As argued above, if policy-makers do not want to or cannot go fast or far along the way of carbon pricing, the general issue of carbon and energy has to be broken into various pieces. These need to be addressed separately and then re-combined as much as possible (given the large number of constraints created by fragmentation of the policies). In this regard, we can identify a set of 'fragmented' policies that should be prioritized in the years to come.

1) The EU is to start its own Climate and Energy Targets 'pledge and review' exercise, as originated at COP 21. It is a 'gathering & coordination' of member states' climate and energy national plans within a new frame that the EU calls 'Energy Union Governance,' which is a key part of the 'Clean Energy for All' package, already agreed via a successful 'trilogue' between the Council, Parliament and Commission.

2) The next big fragment is the EU renewables push, set at a 32% target in 2030 in another successful trilogue. It raises several questions and faces several challenges that will need to be addressed in the future: 1) how to commit at the EU level, when countries are free to define their national energy mix?; 2) how to open a European-wide investment and operation framework for RES deployment, irrespective of nationally 'private' policies?; 3) how to facilitate the creation of a handful of European 'international renewables majors' (in off-shore wind or multi-RES) to become the mid-21st century equivalent to existing oil and gas majors and able to limit the pressure expected from Chinese 'international renewables majors' like Three Gorges?; and 4) how to push our RES potential to a new high, knowing that (for example) our existing solar PV technologies have too low efficiency? How to prepare new solar PV technological waves departing from the currently existing technologies?

3) A companion to this is getting both the distribution and transmission grids reorganised to host the maximum renewables capacity, to collect and route the maximum RES output, and to coordinate both their investment planning and their operation rules to make this RES push work in a secure and efficient manner at the EU level?

4) The next is another push outside the traditional 'electricity utility' sector, as the greening of electricity via RES targets does not address the specific actions needed to decarbonize transport, heating and cooling, etc. In these sectors a serious effort has to be made to push 'electrification' as an easy and efficient way to decarbonize, in parallel with efforts to green electricity. The IEA is already gathering visions, ideas, and first practices.

5) The next close fragment is with energy standards and energy efficiency. How to better promote decarbonisation via regulated standards and norms applied to vehicles, boats, planes and industrial, commercial and home devices and buildings? In addition, how to incentivize the users themselves to consume less and better?

Two other very big fragments of energy policy will have to be carefully addressed by the new Commission.

6) One is the whole gas area, which has been voluntarily left outside the current 'Clean Energy Package", a paradox given that the EU 'Union for gas' was a key driver for the Commission-Council-Juncker-Tusk alliance for an 'Energy Union'. The EU is still orphan of a unified external gas strategy, with some EU countries actively pushing their Russian partnership by building joint infrastructures crossing the external EU border, and others pushing a worldwide opening via LNG terminals. The EU is also orphan of an internal gas strategy, with some countries thinking gas beyond 2040 or 2050 and others starting to think where to set its phase-out. Other new fronts are open, with attempts at greening gas to make it a legitimate renewable. Other attempts are trying to closely tie gas use to the needs of a highly renewable generation of power, requiring the high level of operation flexibility that the gas system with its storage can offer ('sector coupling').

7) The last fragment is on everyone's mind but for different reasons and with different names. Let us call it 'digitalisation'. This involves digitalising production, consumption, generators, networks, markets, exchanges, peer-to-peer trade, communities, homes, buildings, vehicles, neighbourhoods and cities up to a full 'internet of things.' A number of digital futures are already facing us in the energy sector: 1) a deep interactive digitalisation of energy markets and consumers' premises feeding aggregation and demand response; 2) organization of the unchartered energy territory which lies 'behind the meter' and would become as interactive as a set of smartphones using internet 24/7 like the 'internet of things' is promising; 3) the opening of a new space of liberty and initiatives for the willing in 'energy communities,' up to the opening of 'peer-to-peer' platforms for trade, exchange and help with no commercial intermediary in between; 4) the building of clubs of sophisticated energy arrangements behind restricted entry, or the creation of 'open resorts' for automated artificial intelligence decision-making, like self-driving cars, self-dealing buildings and voice-driven automated home assistants; and of course 5) a new generation of smart grids able to deliver most of these new services to the other players such as by hosting massive renewables, charging electrical vehicles, facilitating the aggregation

of consumers in demand response schemes, supporting smart buildings and reaching up to zero net consumption, etc. At their best in this new digital era, the grids should become open digital platforms supporting all the other initiatives in front of or behind the meter.

Conclusions

Carbon pricing plays an essential role if we want to decarbonize our economies in the next decades. The EU ETS provides a unifying tool for this purpose that harmonizes the member states' climate and energy policies and stands out for its homogeneity in a 'fragmented' landscape. In the last few years (and especially during the recent recession) the EU ETS has been considered almost irrelevant by its critics due to its low allowance prices. While it has certainly gone through a learning process, it can have a key role in the years to come, as the currently rising allowance prices suggest. However, it might be insufficient on its own to internalize existing negative externalities. This is why we need a richer policy mix. Additional sectoral fragmented policies are therefore needed to complement the EU ETS in several different realms.

All these many fragmented policies touch upon our coming future and the various promises relevant for sustainable human life in a sustainable environment and economy. We, in the EU, are coming closer and closer to identifying the most fundamental set of tools able to transform humans from climate foes into climate friends. The remaining difficulty will be how to combine them in a sensible and meaningful manner.

References

Borghesi, S., Montini, M., Barreca, A., 2016. "The European Emission Trading System and Its Followers: Comparative Analysis and Linking Perspectives", Springer.

Ellerman, D., 2010. "The EU's emissions trading scheme: a proto-type global system?" in Post-Kyoto International Climate Policy, eds. J. Aldy and R. N.Stavins, Cambridge: Cambridge University Press, 88–118.

European Parliament and Council of the European Union, 2018. Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814. Tech. rep. Official Journal of the European Union, 19/3/2018.

Glachant J.M. and Rossetto N., 2018. "*The Digital World is Knocking at Electricity Door: Six Building Blocks to Understand Why*" FSR Policy Brief N°16 /2018, RSCAS/EUI.

ICAP, 2018. Emissions Trading Worldwide: Status Report 2018. Berlin: ICAP.

Meeus L. and Glachant J.M., 2018. *Electricity Network Regulation in the EU. The Challenges ahead for Transmission & Distribution*, Edward Elgar.

Vandendriessche, M., Glachant, J.M. and Saz-Carranza, A., 2017. "*The Governance of the EU's Energy Union: Bridging the Gap?*" RSCAS Working Paper, 2017-51, FSR/EUI.

World Bank, 2017. Carbon Pricing Watch 2017 report, The World Bank, Washington.