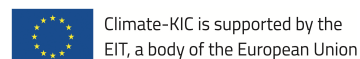


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Industrial Transition in high-carbon industry regions – the EU policy framework

Working Paper by:

Lena Tholen

Michaela Roelfes

Timon Wehnert

with support from Lukas Hermwille, Dagmar Kiyar, Stefan Lechtenböhmer, Philipp Schepelmann and Johannes Venjakob,

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How to read this report

This policy report has a two-fold purpose: First, it takes stock of the current European political framework, which influences the pending low-carbon transition of Europe's industry and the policy measures in place to intercept the various anticipated adverse effects on the social and economic performance of high-carbon industry regions. Understanding the current political framework is necessary to fully comprehend and appreciate the current dynamics regarding industry transition and just transition on the European level, which is the second purpose of this report. The European Green Deal proposed by the new European Commission under President Ursula von der Leyen is discussed as an attempt to integrate various policy areas and re-direct policy efforts to climate and sustainability mainstreaming. It is a very ambitious project and only time will tell if the Commission can deliver on the promise of a climate-neutral Europe by 2050.

As such, this policy report is a follow-up to a working paper developed last year that reflects on the main challenges high-carbon industry regions are facing. These are regions with an economy that is built around the extraction and burning of fossil fuels – in particular coal – to provide a reliable, constant and cheap source of energy. Coal and carbon-intensive regions face important challenges when it comes to successfully coping with structural change: the development of effective regional innovation systems, the development of capacities to handle transition, and the political will (on all levels of the European system) to drive this transition.

1 Introduction

Climate change and the need to mitigate its extent and effects put high pressures on our current political system to react quickly and efficiently. In a previous working paper, we argued that high-carbon industry regions face three main challenges due to these pressures (Roelfes et al 2018, see also **Fehler! Verweisquelle konnte nicht gefunden werden.** for a summary). One challenge is related to the political will and determination to mainstream climate change targets and policies across the multiple governance levels of the European system (vertical integration) as well as all policy areas (horizontal integration). Only within such a long-term and integrated political framework, the necessary conditions for effective regional innovation systems targeting industry transition and capacity building in high-carbon industry regions can be met.

Table 1: Challenges identified for low-carbon transitions in high-carbon industry regions

Challenge: Lack of low-carbon innovations
High-carbon industry regions, which are not characterised by dynamic industry clusters, often lack the innovative capacity to drive low-carbon transitions.
A success factor for low-carbon innovation is established and well-coordinated networks that include R&D institutions as well as industry clusters. If such networks are weak, inefficient, lack critical mass or are not specifically geared towards a low carbon development, then a high-carbon industry region may lack the innovative capacity to drive low-carbon transitions.
Intermediaries (like regional development agencies) can strongly support low-carbon industrial innovations. However, to do so, such intermediaries need to be carefully designed and their activities need to be geared towards low-carbon innovations (in contrast to high-carbon economic development).
Challenge: Low capacity for low-carbon transition
If a high-carbon industry region is already structurally weak, it may lack the human and social capital needed to drive a low-carbon transition.
If a high-carbon industry region is already structurally weak, it may lack the resources and capacities to access funding at the required scale and use it in a systemic way.
Challenge: Lack of political will
Often regional climate mitigation policies focus on specific sectors (power generation, transport, housing) and are not integrated into economic, industrial, innovation and/or structural policies. To support a transition to a low-carbon economy in a timely manner, climate related targets should be mainstreamed into all policy areas specifically those relating to regional economic development and support for structural change.
Civil society and NGOs can assume the role of enablers but also that of opponents to ambitious low-carbon transitions. If unions and industry associations join forces as 'organised cost bearers' and are supported by a majority of people in high-carbon industry regions, regional representatives will lack the political will necessary for mainstreaming climate policy in economic/industrial and structural policy.

The newly instated European Commission under leadership of President Ursula von der Leyen proposed a European Green Deal in December 2019. This deal represents an integrated approach at the European level, taking into account national responsibilities as well as Europe's global responsibility. It draws together key policy areas, proposes integrative measures to support climate mainstreaming and just transition. In doing so it represents a shift in paradigm: the low carbon transition is not to be supported by climate and energy policy alone anymore but supposed to be mainstreamed across all areas of the European political framework.

The European Green Deal acknowledges that effective policy-making for the just transition of high-carbon industry regions requires an integrated approach. In particular, industry policy and regional policy cannot be done in isolation from each other but need to be harmonised: The need to decarbonise the carbon-intensive industries is equally pressing as it is deeply interlinked with the economic and social development of some of Europe's regions and, as a results, with the well being of many individuals and families. The benefits but also the challenges of this transition are geographically unequally distributed. Some regions will face stronger challenges in the process of an industrial transition than others (JRC 2018).

In this context, it is not only essential to bring together regional policy and industrial policy but also to have a closer look at the numerous other policy areas that influence the industrial transformation. This is particularly relevant since the EU has only competence to "support, coordinate or supplement actions of the Member States" in the field of industrial policy. This policy area is thus characterized by overarching goals and strategies. Although, the EU has a "shared competence" with Member States with regard to regional policy, cohesion policy is also characterised by funding programmes, strategies and capacity building measures. In contrast, the EU has much more influence in other policy areas, which also have an impact on the timely decarbonisation of industries and the just transition of regions. For the purpose of this paper, an approach developed by Schneidewind (2018) is used for the further analyses: Industrial transition, from Schneidewind's perspective, cannot be understood when only looking at industry policy in the narrow sense. There are other key policy areas, like climate policy, energy policy, resource policy and research policy, which have a significant effect on the industrial transition (see Figure 1).

In the following chapters of this report, we will take stock of the European political framework in all of these policy areas. We will look at industry policy, which remains a rather weak policy competence of the EU and has increasingly focused on strengthening new industries and enabling them to compete in the international innovation competition since the 1990s (Meyer-Stramer 2009). At the European regional and cohesion policy, which is a rather important policy area of the EU budget-wise and for which decision-making competence has been transferred subsequently to the European level. And at the European climate, energy, resource as well as research and innovation policies, all of which have important impacts on industry transition. Understanding the status and function of these policy areas is necessary to fully appreciate and understand recent dynamics and developments on the European level, most importantly the European Green Deal.

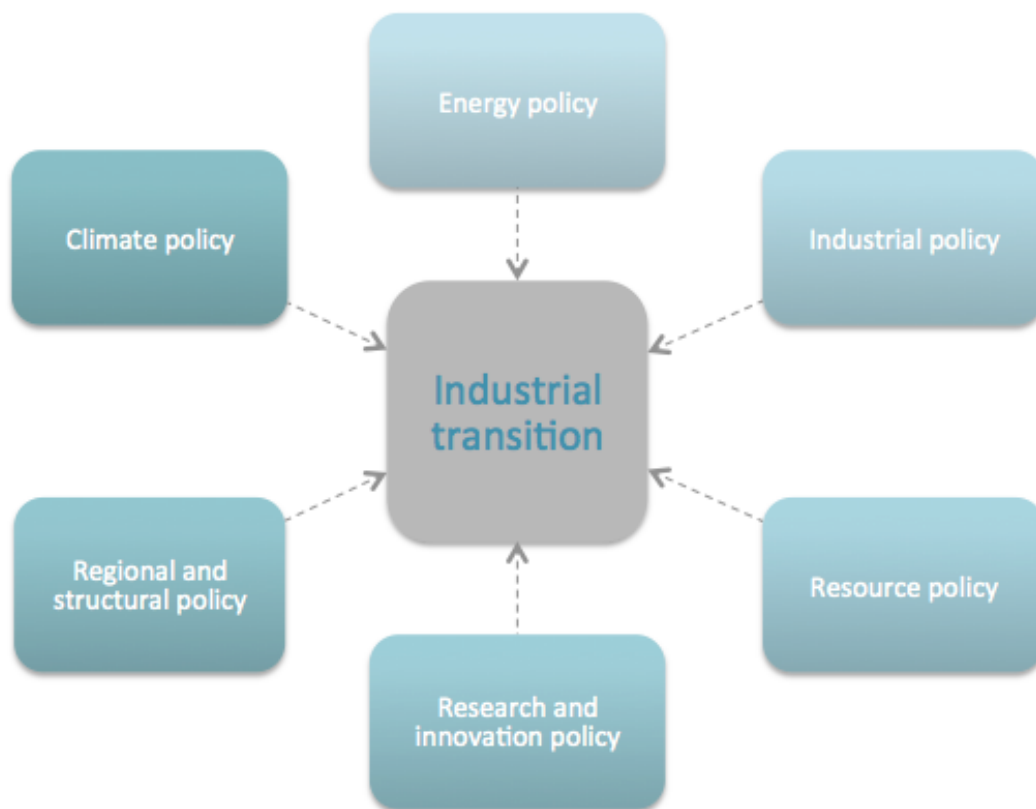


Figure 1: Industrial transition is influenced by various policy areas
Source: own figure, based on Schneidewind (2018).

2 Industrial policy and regional policy in the European Union

As explained above, this working paper tries to take stock of the policy framework for industry decarbonisation and just transition in the European Union. For that purpose, the following chapter will look back at two crucial policy areas of the European Union to foster a better understanding of the general policy framework. As such, this chapter provides the necessary background knowledge to understand the current dynamic processes, the possibilities as well as the limits. To be precise: Understanding the limits of European industrial policy is crucial for appreciating current dynamic developments. In the area of industrial policy, the primary competences and responsibility lie with the Member States; the EU has very limited influence and scope for action. In the area of regional or rather 'cohesion' policy on the other hand, the EU shares the competences with its Member States and, therefore, has a much bigger sphere of influence. For an overview, see Figure 2.

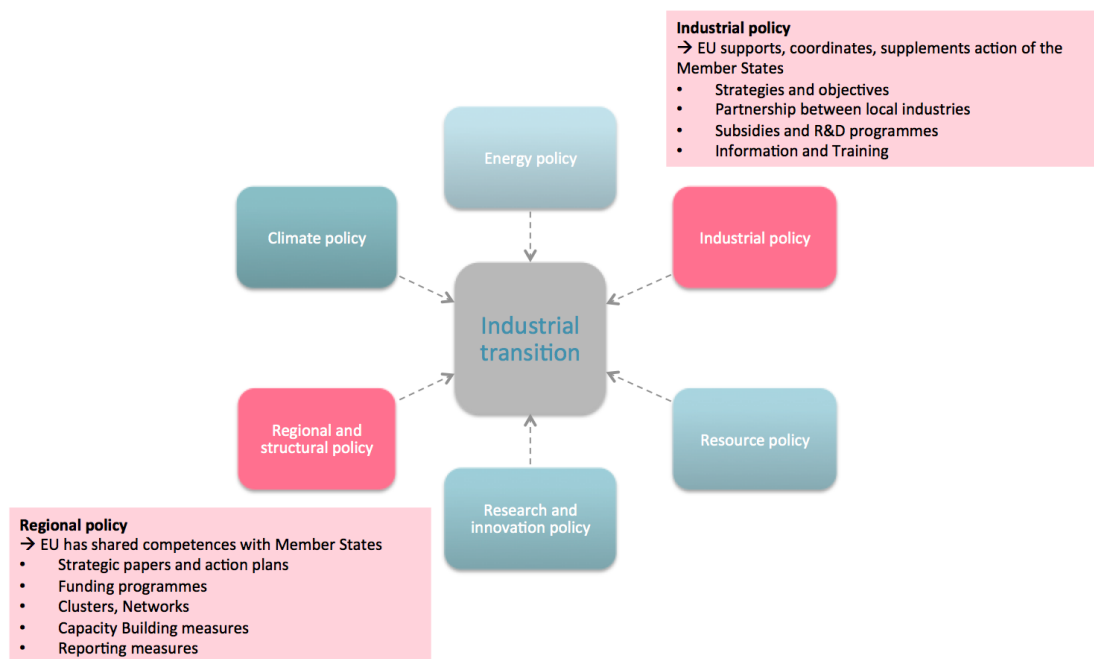


Figure 2: EU competences in Industrial policy and Regional policy in a nutshell
 Source: own figure, based on Schneidewind (2018).

2.1 EU Industrial policy

Industrial policy, one could argue, lies at the heart of the European unification endeavour: What we call the EU today, started out as the European Coal and Steel Community (ECSC) in 1951. Nevertheless, the EU never had the competence to actively shape and design industrial policy. Instead industrial policy was considered as part of the general economic policy, which constituted a primary competence of the Member States (European Commission 2019, European Parliament 2019c). Moreover, while the European integration and the transfer of competences to the supranational level proceeded in many policy areas, the EU's role in industrial policy is still limited to its "competence to carry out actions to support, coordinate or supplement the actions of the Member States" (Art. 6, TFEU), with Article 173 of the *Treaty on the Functioning of the European Union* defining the particular objectives, tasks and instruments of the EU (see Box 1). In consequence, the EU's options to exert influence are rather limited to the publication of strategic documents and targets, to capacity building and funding programmes.

Box 1: Legal basis of the European Industrial Policy

The **legal basis** for European industrial policy is **Article 173 of the Treaty on the Functioning of the European Union (TFEU)**. The overarching objective is to strengthen industrial competitiveness through measures that are predominantly horizontal and cross-sectoral (European Commission NA). The first paragraph already states that:

“in accordance with a system of open and competitive markets, [the European Union and the Member States’] action shall be aimed at speeding up the adjustment of industry to structural changes.” Other objectives are

- “encouraging an environment favourable to initiative and to the development of undertakings throughout the Union, particularly small and medium-sized undertakings,
- encouraging an environment favourable to cooperation between undertakings
- fostering better exploitation of the industrial potential of policies of innovation, research and technological development”

The EU, nevertheless, has made rather active use of its strategy competence since the turn of the century (see Table 1): Over the first decade, it published a number of comprehensive strategies and clear targets as well as more specific communications on sectoral specificities and technological issues (European Commission NA, European Parliament 2019c). These strategic communications are accompanied by various funding schemes for innovation via – for example – Horizon 2020, the EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME), and the Investment Plan for Europe as well as the European Fund for Strategic Investments (EFSI). Investments are also being made in capacity building programmes aiming at the improvement of quality and relevance of training and education. An example for such a training programme is the "New Skills Agenda for Europe" (European Commission 2016a).

Since 2010, the European Commission has raised awareness on the undeniable links between industry policy and other policy areas. Aiginger (2014) goes as far as arguing that the EU places ‘sustainability’ together with ‘competitiveness’ at the ‘centre stage’ of industrial policy already. While it is evident that the emphasis of EU industrial policy remains on the topics of economic development, labour markets and the promotion of innovative technologies, other policies play an increasing role: structural and regional policy as well as climate, energy resource, and environmental policy.

A prominent milestone was the strategy “Europe 2020” with its three priorities of 1) smart, 2) sustainable and 3) inclusive growth published in 2010 (European Commission 2010). It can be considered a key enabler for the industrial development in Europe paving the way for the period between 2010 and 2020. The aim of the strategy was to improve Europe’s competitiveness and productivity, to develop a knowledge-based economy, to achieve a reduction of greenhouse gas emissions and to underpin a sustainable social market economy by investing in Research and Development (R&D), structural reforms and the completion of the internal market (Pianta et al. 2016).

Since then, numerous communications were published with different foci. Among the most important was the Communication “Industrial Policy: Reinforcing Competitiveness (COM(2011) 642)” calling for deep structural reforms and coherent and coordinated policies in the whole of Europe in 2011. One year later, the Commission Communication “A Stronger European Industry for Growth and Economic Recovery” (European Commission 2012) highlights investments in innovation, better market conditions, access to finance and capital and human capital and skills (Lechtenbömer 2018). In 2014, the Commission called “For a European industrial Renaissance” (European Commission 2014b) prioritising industrial competitiveness, the potentials of the internal market, instruments to support innovations for regional development, skills, and entrepreneurship. The Communication “Investing in a smart, innovative and sustainable industry – A renewed EU Industrial Policy Strategy” (European Commission 2017) goes in a similar direction. The document focuses on globalisation, climate change and new technologies. It aims at re-organising selected policies and to strengthening the cooperation and partnership within Member States, regions, cities and the private sector (European Parliament 2019c, EC 2017). Although the objectives of the Communications are often ambitious and the links between policy areas are apparent, they often fall short of a clear implementation plan due to the transnational character of EU industry policy.

Table 2: Commission Communications during 2000 and 2010

Year	Title	Number
2002	Industrial Policy in an Enlarged Europe	COM(2002) 714
2003	Key Issues in Europe's Competitiveness	COM(2003) 704
2004	Fostering Structural Change: an Industrial Policy for an Enlarged Europe	COM(2004) 274
2005	Implementing the Community Lisbon Programme: a Policy Framework to Strengthen EU Manufacturing -Towards a more Integrated Approach for Industrial Policy	COM(2005) 474
2008	The raw materials initiative: meeting our critical needs for growth and jobs in Europe	COM(2008) 699
	Sustainable production and consumption and Sustainable Industrial Policy Action Plan	COM(2008) 397
2009	Preparing for our future: Developing a common strategy for key enabling technologies in the EU	COM(2009) 512

2.2 EU Regional and Cohesion Policy

Historically, the European industry, especially the carbon- and energy-intensive industry, is located in certain regions providing access to reliable and cost-effective energy. As a result, some of Europe's regional economies were built around and are still heavily dependent on certain carbon-intensive industries, e.g. coal mining and basic industry. As a result, such high-carbon industry regions face very specific challenges in the age of decarbonisation (see our previous working paper: Roelfes et al. 2018). For that reason, this working paper will take a closer look at the functioning of the European regional and cohesion policy.

Cohesion policy is – for all intents and purposes – designed to ‘level the playing field’ between different regions in Europe. Currently, the allocation of funds is largely based on GDP per capita and the determination of the Member State being either more developed, in transition or less developed. But this is about to change: The Commission pledged to add new criteria like youth unemployment, education levels and climate change to better reflect the complex realities of regional disparities (European Commission 2019b). Moreover, the European Parliament recently highlighted that the aim of the Cohesion Fund must be to strengthen the “economic, social and territorial cohesion of European Union **in the interest of promoting sustainable development**” (European Parliament 2019d). This mirrors one of the investment priorities of the Cohesion Fund, which is the “shift towards a low-carbon economy in all sectors” (Art. 4, European Union 2013), alongside climate change adaptation, environmental protection, and sustainable transport.

As European policy task, cohesion policy has a long and equally contested history originating with the Treaty of Rome signed in 1957. The treaty marginally acknowledged the existence of socio-economic disparities between different regions of the EU and addressed these inequalities only indirectly and in rather noncommittal manner via other policy areas. Until the 1980s, regional and cohesion policy remained intergovernmental in nature and occupied by national interest rather than oriented towards common goals. This only changed successively until the “economic and social cohesion” of the EU became formally one of the core objectives with the Maastricht Treaty in 1992 (see for a more encompassing evolution of today's EU regional and cohesion policy Manzella & Mendez 2009).

Currently, the EU budget dedicated to support “job creation, competitiveness, economic growth, improved quality of life and sustainable development” amounts to EUR 358.1 billion (programming period 2014-2020) equalling almost a third of the total EU budget (see European Commission 2014). Most of the budget is allocated to various projects and regions by one of the funding schemes under the European Structural and Investment Fund (ESIF): European Regional Development Fund (ERDF), European Social Fund (ESF), Cohesion Fund (CF), European Agricultural Fund For Rural Development (EAFRD), European Maritime and Fisheries Fund (EMFF). The allocation of these funds is governed by the European Union with its ordinary legislative procedure, meaning that the European Parliament and the Council of the European Union co-decide on policy measure on equal footing based on a proposal by the European Commission (see European Union 2013). This marks an important difference to the deliberately weak competences of the supranational European institutions regarding industry policy.

Similar to any other policy area of the European Union, regional policy is shaped by a number of strategic communications, objectives and programmes over the years. Most recently, the European Commission published a brochure declaring cohesion policy “the main instrument to support industrial transition” via its capacity to foster innovation. In this programmatic document, the European Commission directly links industrial transition and regional development and argues “Europe’s regions need a clear vision on how to modernise their economies by embracing digitalisation, technological and social innovation, decarbonisation and the circular economy for the benefit of all”. To that end, the former Commissioner for Regional Policy, proposed a thematic concentration of funding allocation towards two policy goals: Developing a smarter Europe and a greener, low-carbon Europe (European Commission 2019d).

Additionally, the Directorate General for Regional Development (DG Regio) fostered networks and mutual learning experiences for regions, thereby hoping to stimulate the development of these regions: The pilot action “Regions in Industrial Transition” supports ten regions and two small Member States to boost the innovation capacity and to overcome existing barriers in joint workshops and discussions. Another pilot action is “Coal Regions in Transition” platform, which was established in 2017 targeting 41 coal regions in Europe and focusing on overcoming challenges generated by the energy system transition. The idea is to “ensure a fair and socially acceptable transition for all” (European Commission 2019b). Simultaneously, the EU supports cluster development in regions via its Smart Specialisation Strategy and Platform as a place-based approach for regional innovation policy (European Parliament 2019c).

3 Other EU policy areas influencing industrial transition

As outlined at the beginning, we consider the industrial transition to be driven by several policy areas simultaneously (see Schneidewind 2018). The transition of high-carbon industry regions to low-carbon regional economies is influenced by climate policy, energy policy, resource policy and research and innovation policy as well. In some of these policy areas, the EU has a greater level of competences and possibility to implement concrete policies and measures.

3.1 Climate Policy

Compared to 1990, the EU wants to reduce its greenhouse gas emissions by at least 40 % by 2030. The primary instrument to achieve this transition is, so far, the EU Emissions Trading System (EU-ETS), which was introduced in 2005. This instrument targets the power generation industry and the energy-intensive industries (such as refineries, metal production,

cement and lime production, glass and paper production). In total, around 11,000 installations are covered by the EU-ETS, which are responsible for 40 % of the EU's overall greenhouse gas emissions. The EU-ETS operates on the cap and trade principle. It is based on the principle that an operator of a registered plant must submit a valid certificate for every tonne of CO₂ emitted; the quantity ("cap") of new certificates per year is limited. Some of the allowances are allocated free of charge to plant operators, the remainder are auctioned. Certificates are tradable, i.e. operators can sell surplus certificates or have to buy additional ones. By mid-2019, the price was around EUR 28. Emissions, thus, have a price and plant operators an incentive to reduce their emissions. (European Commission 2019j)

So far (the third trading period runs until 2020), the EU ETS has often been criticised due to the low prices and the fact that allowances are given out for free. (Edenhofer et al. 2017) With these deficits the instrument has only a minor influence on the transition of industry toward a low-carbon economy. As caps will be significantly lowered as of 2021, the instrument's effectiveness is expected to increase by setting a stronger incentive to reduce emissions. For some sectors and energy-intensive companies, this can lead to a considerable reorganisation of industrial production, including processes, value chains and business models (Bardt et al 2019).

For sectors not covered by the EU-ETS (such as buildings, transport, agriculture and waste), additional targets were defined to reduce emissions by 30 % compared to 2005 levels. In order to meet this target on EU level, individual binding targets have been set for each Member State.

In addition to the emissions trading, there are several other specific climate policy requirements in place that impact Europe's industry, such as the Directive 2010/75/EU on industrial emissions, which regulates pollutant emissions from industrial installations or Directive 2015/2193 on medium combustion plants, which regulates pollutant emissions from combustion of fuels in plants with a rated thermal input equal to or greater than 1 Megawatt thermal (MWth) and less than 50 MWth.

3.2 Energy policy

The energy policy of the EU covers energy supply, energy demand, grids, energy prices and energy efficiency. Correspondingly, the policy instruments are numerous and several of the implemented policies directly affect the industry sector. The following chapter will give an overview on the policy strategies and measure that do employ a direct effect on the industrial transition.

A comprehensive strategy covering the different areas is the "Clean Energy for all Europeans" package (COM(2016) 860) (European Commission 2016b) which includes proposals for energy efficiency, renewables, electricity market design (including proposals for new business models), security of supplies and governance. The governance system proposed by the Commission's Communication was adopted in 2018 (EU(2018)1999 (European Parliament 2018) and requires each Member State to draw up integrated climate and energy plans including concrete implementation measures tailored to reach the following objectives:

- Reduce greenhouse gas emissions by at least 40 % compared to 1990 levels;
- Increase the share of renewable energy sources in energy consumption by 32 %;
- Improving energy efficiency by 32.5 %;
- Completion of the internal energy market by achieving the existing electricity interconnection target of 10 % by 2020, with the view to reaching 15 % by 2030.

Furthermore, many concrete and binding directives and regulations are in place which directly influence the industrial sector: The Energy Efficiency Directive (European Commission 2019f), for example, mandates measures for the energy management of companies and holds Member States accountable for the achievement of energy efficiency obligation schemes corresponding to 1.5 % of the annual sale volume. For the years 2021 to 2030, the amount will be lowered to 0.8 %. Member States may also choose alternative measures to achieve the target.

In addition, the Ecodesign Directive (European Parliament 2009a) also has an increasing impact on industry. With the introduction of minimum energy performance requirements for energy-related products, mainly household appliances were regulated. In recent years, the focus has shifted strongly towards industrial products (examples are boilers, electric motors, lighting, pumps, heating products, air conditioning and ventilation systems, and machine tools). The minimum requirements are regularly adapted and tightened.

The Renewable Energy Directive (European Parliament 2009b) defines minimum shares of renewable energies in the Member States. The overall aim is to cover 32 % of the EU electricity consumption by renewable energies by 2030. For this purpose, specific targets for each Member State were formulated. The Directive will have a considerable impact on future business models, especially for energy companies.

Also relevant for the industry sector is the Energy Tax Directive (European Council 2003), which imposes minimum rates of taxation on motor fuels, heating fuels and electricity. However, these have little practical impact, as almost all EU countries already have much higher tax rates. There are also special exception rules for certain sectors (like energy-intensive industries).

3.3 Resource policy

Recently, the postulate of establishing a circular economy has experienced a strong tailwind as an important strategy for reducing greenhouse gas emissions and for saving natural resources. Today, only 14 % of the raw materials used in industry come from recycling – the rest are primary raw materials. An increasing number of measures are therefore being implemented at EU level in order to minimise resource consumption and to realise a circular economy. The European Union aims to reduce waste to a minimum and to promote repairing, re-using and recycling of materials and products in order to save CO₂, resources and to establish competitive advantages.

The Commission Communication published in 2014 "Towards a circular economy – A zero waste programme for Europe" (European Commission 2014c) presented potential for

resource efficiency and recycling at the various stages of the value chain and linked this with concrete measures in each case. In 2018, the “Circular Economy Package” (European Commission 2018b) included a plan for addressing plastics in the circular economy, options to address the interface between chemical, product and waste legislation, a monitoring framework, and a report on the potentials to make the use of critical materials more circular. On 4 March 2019, the European Commission adopted a report on the implementation of the Circular Economy Action Plan (European Commission 2019a; European Parliament 2019c).

As part of the implementation of a circular and resource-efficient economy, numerous directives were issued in addition to the overall targets and strategies described above:

- The Waste Framework Directive (European Parliament 2008) includes recycling targets, requirements on the separate collection and preparation for re-use of certain wastes
- The revised Ecodesign Directive (European Commission 2019g) on energy-using products put a stronger focus on resources and recyclability
- Directive (EU) 2019/904 (European Parliament 2019e) focuses on the reduction of the impact of certain plastic products on the environment.
- Directives 2012/19/EU (European Parliament 2012) on waste electrical and electronic equipment (WEEE)
- Waste Shipment Regulation (EC) No 1013/2006 (European Parliament 2006) prohibits exports of hazardous waste to countries outside the OECD and exports of waste for disposal outside the EU/European Free Trade Association.

These directive and regulations have a direct effect on Europe’s industry. Manufactures have to comply with the requirements and, if needed, change the design and recyclability of products. However, the regulations and incentives are still insufficient to realise a comprehensive circular economy.(Kirchherr et al. 2018)

3.4 Research and innovation policy

Against the background of changing conditions (e.g. due to decarbonisation, globalisation, reindustrialisation), the EU has to deal with new issues: examples are the loss of competitiveness, structural change issues and a lack of know-how in high-tech industries. Furthermore, industrial actors have to comply with new regulations and minimum requirements. This calls for a stronger focus on the research and development efforts to increase the innovative capacity of the European economy (BPB 2013).

The European Commission committed itself to invest up to EUR 960 billion in “Europe’s future” for the period 2014 to 2020. Out of this budget, the implementation of the Europe 2020 strategy accounts for a share of 87 % to realise smart, inclusive and sustainable growth (Directorate General for Internal Policies 2015).

There are several funding programmes in the EU to contribute to industrial innovation. Some of the most important programmes are Horizon 2020, the Health Programme, the European Structural and Investment Funds (as already mentioned in chapter 2.2), the Environment and

climate action (LIFE), the programme for Competition of Enterprises and Small and Medium-sized Enterprises (COSME), and the Research Fund for Coal and Steel. For the period 2021 to 2027, EUR 90 billion is available for the Cohesion Policy funds and EUR 100 billion for the Horizon2020 programme (European Commission 2019e).

4 The European Green Deal

The conjunction of climate change, structural change and industrial transition is rapidly gaining importance in the European debate and strongly connected to the concept of enabling a just transition of high-carbon industry regions. The European Green Deal proposed by the new European Commission in the second half of 2019 is not more, but also not less than the ambitious continuation and integration of a debate that was already taking place in various separate policy arenas and circles.

Already in November 2018, the European Commission presented a long-term vision for a prosperous, modern, competitive and climate-neutral and named it “A Clean Planet for all” (COM(2018)773). It is a strategy, that is a) in line with the Paris Agreement, b) includes almost all EU policy areas, and c) describes the efforts to realise a climate neutral Europe by 2050 through a socially-fair transition in a cost-efficient manner. It describes investments in technological solutions, policy coordination between different areas (including industry, mobility, building, finance and research) as well as citizen empowerment as crucial approaches. The strategy highlights the opportunities of a green economy, but also the challenges associated with industrial transition – in particular for fossil fuel-based industries. While some branches, like coal mining, will need to be phased out completely in order to comply with climate targets, other industrial areas such as steel, cement, chemicals and car manufacturers can shift to new production processes. “[I]n the spirit of inclusiveness and solidarity”, the strategy elaborates on the goal of designing and implementing this transition in a fair and socially-acceptable manner and points to the EU budget dedicated to social as well as cohesion policy as funding pools to bridge adverse regional effects (European Commission 2018a).

In parallel to the development of the “A clean planet for all” strategy a roundtable was established by the European Commission to ask for independent advice on future EU industrial policy action. It consists of 20 experts representing small and big businesses, traditional and disruptive industries, trade unions, the innovation and research community, as well as banks and academia. In June 2019, the group published its final report, 'A vision for industry until 2030' which supports a European commitment to re-develop its industry in line with the Paris Agreements and the postulations of establishing a circular economy. The roundtable identified challenges and threats to a timely industry transition as well as possible drivers (opportunities): A lack of properly skilled workers, general or region-specific demographic trends, the risks of social polarisation as well as difficulties to access public and private finance are described as weaknesses and possible threats to this transition. In turn,

leadership in technology, innovation and sustainability, the anticipation and development of skills, networks (or clusters) for strategic value creation, a fair, competitive and agile business environment, and social fairness and well-being are described as opportunities that need to be fostered by the EU. Ambitious levels of funding as well as the establishment of modern and strategic infrastructures are considered prerequisites for a timely and successful transition of Europe's industry. Moreover, turning to the issue of just transition, the roundtable recommends re-development plans and particular investment programmes that foster specialisation for those regions that will be hit disproportionately hard by the economic restructuring due to industry decarbonisation (European Commission 2019b).

In December 2019, a new college of European Commissioners has taken office in Brussels. The designated President of the European Commission, Ursula von der Leyen, introduced herself to the European political community in July 2019 with a programme called "A Union that strives for more" (von der Leyen 2019) already outlining her vision of Europe being the first climate-neutral continent in 2050. On December 11th, shortly after the inauguration, the new Commission provided a comprehensive communication to the other European institutions outlining the *European Green Deal*. The communication describes this deal as "a new growth strategy that aims to **transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy, where there are no net emissions of greenhouse gases in 2050 and where economic growth decoupled from resource use**" (European Commission 2019h, p. 2). As a milestone, the Commission proposed to increase the EU GHG reduction targets and to strive for 50 % to 55 % emissions reduction by 2030.

The proposed Deal describes six policy goals, which are guided by two principles and supposed to culminate in a European Climate Pact making EU the global leader for a sustainable future (see Figure 3). Key instruments to follow up on the promise of climate-neutrality until 2050 according to the Commission are (see European Commission 2019i for the complete roadmap):

- the first European Climate Law (March 2020)
- a comprehensive plan to increase the EU 2030 climate target to at least 50% (compared to 1990)
- a review and possibly revision of all relevant climate-related policy instruments by summer 2021 (including the EU-ETS and the Energy Taxation Directive)
- the implementation of a carbon border adjustment mechanism for selected sectors

Certainly, the European Green Deal deserves in-depth analysis and reflection. For this working paper, however, we would like to focus on three elements: the goal to mobilise industry for a clean and circular economy as well as the principles to "leave no-one behind" and to "mainstream sustainability".

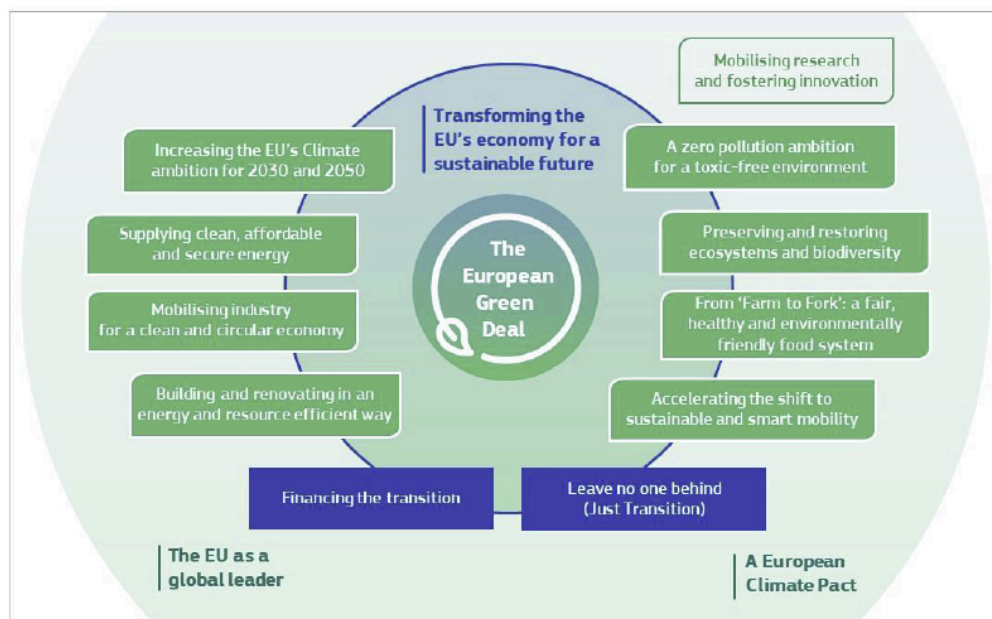


Figure 3: The European Green Deal
Source: European Commission (2019h).

Acknowledging the lifespan and, as consequence, prolonged investment cycles of industrial facilities, the Commission argues that crucial decisions need to be taken within the next five years for the **industry transition** to be realised in time. Digitalisation and ecological sustainability are described as the “twin challenge of the green and digital transformation” (European Commission 2019h, p. 7) with the latter potentially functioning as the key enabler to the former. An industry transition until 2050, according to the Commission, entails the establishment of a circular economy and production of circular and climate-neutral products as well as the decarbonisation of industrial processes particularly in the basic industries. A plan of action to realise the European circular economy including a ‘sustainable products’ policy is promised for March 2020 as part of a renewed and comprehensive industry strategy. Particularly, the commitment to “prioritise reducing and reusing materials before recycling them” (ibid) is noteworthy here.

Regarding mainstreaming of sustainability on the one hand and guaranteeing a just transition on the other hand, the Communication proposes a “green oath: [to] ‘do no harm’” (ibid., p. 19) reflecting on environmental, social and economic impacts simultaneously via its better regulation tools. Moreover, the Commission promises to develop a Sustainable Europe Investment Plan, which will include a Just Transition Mechanism targeting the most affected regions and sectors, to dedicate 25 % of the EU budget to climate mainstreaming across all EU programs and 30 % of the InvestEU Funds to fighting climate change. As national budgets play a crucial role, it is the Commission’s ambition to support the EU Member States in “greening” their national budgets and taxation systems. Last but not least, research and innovation are underlined as critical to enable this transition, which is why the upcoming Horizon Europe will include four ‘Green Deal Missions’ dedicated to bring about much needed knowledge, provide room for experimentation and cumulate in necessary innovation.

The European Green Deal can be understood simultaneously as a climate, social, economic, European and international project, argues Gaventa (2019) and is “[in] the first instance an attempt to hold together a fragile political coalition” (ibid: 4). Many of the goals or instruments discussed in the Commission new communication are not entirely new: Some were already on the agenda of the former Commission; others were discussed and debated in various policy arenas (see analysis in chapters 2 and 3). What is new, though, is the attempt to look at these multiple challenges in an integrated manner and to approach them from a system’s perspective.

The various and integrated policy projects described by the European Commission are highly dependent on political decisions taken in Europe’s complicated legislation procedures, where – depending on the policy area – the Member States have more or less power to prevent ambitious policy projects. Moreover, the European Green Deal as proposed shows some shortcomings already: Gaventa explains, for example, that the approach to “increase climate action, but not yet” (2019, p. 8) might prove as a trap in the long run. Similarly, while the focus on transitioning coal regions is justified at the moment, phasing-out coal and restructuring coal-dependent regional economies will not be enough. Future transitions, he argues, might be even more complex and pro-active structural policy needs to be designed now rather than later (see Gaventa 2019 for a comprehensive analysis of the European Green Deal).

President von der Leyen described the European Green Deal as *Europe’s man on the moon moment*; a description, which characterises both the ambition of the transition, but also hints to the determination and political leadership needed to live up to this ambition.

5 Conclusion

Whether the European Union can adapt its current policy framework to be successful in terms of realising a truly sustainable development of high-carbon industry regions and Europe as a whole, will depend in no small parts on the question if the way policies are being made can be adjusted. Politics and efficient policy-making will play a crucial role when it comes to mainstreaming climate reduction targets as well as the goals of a just transition; this is especially true for the necessary industry transition, which requires a reliable long-term policy framework.

As we have seen, several policy areas play a role with regard to the sustainable development of high-carbon industry regions as the industrial transition is connected to various interlinked issues and challenges. Although, the EU has no direct regulatory power with regard to industrial policy and the prime regulatory competence is located in its member states, it has an influence in some other policy areas like energy policy, resource policy, regional policy,

research policy and climate policy. These areas are directly related to industrial policy and have an impact on the industrial transition.

The European Green Deal can be understood as a fundamental paradigm shift in the Commission's ambition to tackle climate change. Especially the promise to realign existing policy with climate mitigation targets, the pledge to realise a European Climate Law and to restructure funding and budget to reflect the importance and magnitude of the sustainability challenge, support this perspective. The European Green Deal, if the Commission is successful in bringing all Member States as well as the European Parliament on board, could serve as the integrated long-term strategy that is called for. Such a long-term strategy will support carbon-intensive industries in implementing the transition towards low-carbon products and processes that is overdue. It will also help adversely affected regions in dealing with the negative impacts of such an industry transition. This also requires finding answers to difficult decisions and to make tough decisions: The looming isolation of comparatively remote high-carbon industry regions, the lack of alternative business models, the insufficient education of people, a lack of required infrastructure, unclear regulations as well as a lack of necessary infrastructure as well as funding.

But such a strategy or set of strategies need to be co-ordinated between different policy areas and economic sectors (European Environment Agency 2019), at different levels in the European governance system as well as connected with specific, measurable, achievable, reasonable, and time bound goals. This is not to say that there are no targets on EU or on regional level. Targets, especially regarding the reduction of greenhouse gas emissions, already exist the various level of the European system – sometimes even at the regional level. But, for many cases these targets are either short-term and very specific or long-term but very unspecific. Some targets are embedded in a clear and implementation-oriented path coupled with an extensive and periodic monitoring of implementation and the corresponding room for adjustment – others are not. The goals need to be ambitious enough to solve the complex issues at hand, but they need to remain realistic to avoid raising the level of frustration and ignorance. It is a balancing act to implement strategies planned on the EU level and to keep the regions with their specific circumstances in mind. The acceptance is often higher if strategies are not implemented top down but in accordance with regional efforts.

Moreover, the impact of decarbonising the European industries will be geographically diverse: Some regions will face heavy challenges while others will fairly easily manage and benefit from the transition. Some of the former regions have already started in organising and preparing for the structural change to come, others are still clinging to their carbon-intensive industries or the mining of coal. There may be several reasons for this, such as the strong focus and specialisation on one topic, the limited financial possibilities or the lack of political will to invest in new business areas. Further development perspectives and the development of new business models, e.g., are linked with the qualification of people and the necessary infrastructure. Moreover, it is essential to understand the region-specific opportunities and potentials but also limitations and risks and plan policies accordingly. This includes, amongst other indicators, demographic trends, the overall economic performance, the number of start-ups, the level of digitalisation in a region as well as the accessibility of

higher education. Knowing the specific developmental profile of these regions is necessary in order to facilitate learning and transfer of solutions between these regions. Understanding the regions also includes the involvement of different actor groups. This opens new perspectives and increases the acceptance of policy measures (European Environmental Agency 2019). An adapted strategy for every region is needed in order to increase the potentials of the regions and to minimise the risks.

In conclusion, the European Green Deal is a good starting point and also a prime example: It is build around the very ambitious goal of a climate-neutral continent in 2050 and the idea of a just transition. However, the new Commission will have to work hard to satisfy the expectations and spell out in detail how the continent can implement such a just and ambitious transition. It needs to provide a clear vision, smart goals for the short-term, medium-term and long-term. It needs to establish the required monitoring system and campaign for acceptance amongst its member states and the affected regions. Although the EU cannot regulate some of the policy areas that remain national competence, it can – at any rate – provide guidance and support through a shared vision and narrative as well as by flanking the national and regional efforts and by financing programmes with good prospect of success. For this purpose, strong leadership and superb governance will be essential. Dedication needs to be mirrored by sufficient budget and a framework which ensures that support and investment across all sectors and policy areas are dedicated towards coordinated, target-oriented and thoughtful actions in line with a Paris compatible net-zero economy by 2050.

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