ETUC Project INDUSTRIAL REGIONS AND CLIMATE POLICIES: TOWARDS A JUST TRANSITION?



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This ETUC project has been coordinated by Benjamin Denis and Agnieszka Sternadel under the political direction of Montserrat Mir and with the support of the members of the steering committee (Bill Adams, Bert De Wel, Bela Galgoczi, Johan Hall, Carlos Martinez Camarero, Guido Nelissen, Yuliya Simeonova, Fredrik Snoeck, Veselina Starcheva, Robert Szewczyk, Grzegorz Trefon, Achim Vanselow, Jose Antonio Iglesias Vazquez). The external expertise has been provided by Syndex.



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1. Europe needs regional strategies for a just transition to low-c
2. Accelerate the deployment of breakthrough technologies
3. Involvement of trade unions and employers
4. Investment in skills
5. Boosting local support for decarbonisation

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INTRODUCTION

Context

The recently adopted Paris agreement on climate change should accelerate the decarbonisation of the global economy since, for the first time, all countries have committed to become carbon neutral by the end of this century. The horizon for Europe is clear. It should approach carbon neutrality by 2050. Whereas these ambitious objectives have been established, the concrete strategy to make the low-carbon industry a reality in Europe is still largely to be developed. This is especially true in regions which rely heavily on carbon intensive activities and which often remain important employment providers. Many uncertainties remain on how to go from the need to reduce emissions to an effective long term strategy for building a low-carbon industry in European regions. The aim of this project is to explore with trade unions what is concretely needed, at subnational level, to keep manufacturing activities – and the related jobs – while drastically reducing emissions.

Methodology

The project is based on two stages. The first stage was a questionnaire about climate policies circulated to ETUC affiliates to get a sense of the debate on low-carbon industrial strategies, at sub-national level, within the trade union movement and also to identify possible best practices and experiences that may be shared. The second stage consisted of a series of seven regional case studies: Yorkshire and the Humber in the UK, North Rhine Westphalia in Germany, Asturias in Spain, Antwerp area in Belgium, Norbotten in Sweden, Stara Zagora in Bulgaria, and Silesia in Poland. These regions have many similarities in terms of industrial heritage and current activity in their energy production and manufacturing industries. They each have their own characteristics due to national policy and history or geography. But for all these regions, decarbonisation at the scale which is prescribed by the European policy framework is a huge challenge which will have major effects on industry and its workforce. Therefore, anticipating the future changes, through a thorough analysis of the regional challenges and opportunities will be essential for the trade union movement.

For each region, a background document has been prepared by Syndex and discussed with local stakeholders during a workshop organised on the spot. A summary of the regional case studies resulting from that process is presented in this report while the full version of these case studies is available on the ETUC website.

Key messages

Even though the aim of the project is not to be prescriptive about what regional strategies should look like, the following points have been identified as key to build a low-carbon industrial strategy which would fit with the trade union's demand for a "Just transition":

- Need for policy planning at regional level
- Governance structures must ensure workers participation
- The EU must accelerate the deployment of low-carbon breakthrough technologies
- A skilled workforce is an asset in the transition of regions towards a low-carbon economy
- · Local support for decarbonisation must be strengthened through the mitigation of its social impact and through the maximisation of its benefits

Summary of responses to questionnaires

As part of this project, European trade union organisations were asked about the existence, in their country or region of origin, of low-carbon industrial strategies and their effectiveness, as well as about the involvement of trade unions in developing these strategies¹. In all, 31 responses were received from 17 countries (17 at the national level, 14 at the regional level).



¹ The questionaires circulated for the survey can be consulted on the ETUC website

Assessment of low-carbon policies

Trade union organisations seem particularly concerned about environmental issues and their consequences on industry, and they possess, both at the national and local levels, extensive knowledge of the national and European regulations pertaining to low-carbon policies and strategies. This interest stems from the major impact these policies can have on employment. On this point, their positions seem mixed. On the one hand, preserving industrial employment, which has decreased in a number of regions, remains the primary concern. At the same time, the green transition is also perceived as a vehicle for growth and job creation. Virtually all respondents provided specific examples of instances where a low-carbon industrial strategy had been successfully implemented.

Overall, trade union organisations have a mixed assessment of the suitability of national regulations that have been adopted in preparation for a low-carbon industrial strategy. Half of union representatives think that the policy framework remains under development (various initiatives at an early stage), a quarter think that these are standard industrial policies with fragmented attempts to reduce emissions, while in two cases (Hungary and one answer from Italy) the legal framework has been deemed non-existent. In contrast, in Scandinavian countries (Denmark, Sweden, Finland) trade union organisations think that the rules in place provide a stable framework and a long-term vision.

What would you say about the current national policy framework in your country to develop a low-carbon industrial strategy?



There remain numerous obstacles to the deployment of a low-carbon strategy. Among those most often cited are the lack of political will and the ineffectiveness of European regulations (Belgium, Sweden, Spain, the Netherlands, Hungary, Greece, Great Britain), the economic crisis and the reticence of industrial players (France, Portugal, the Netherlands, Greece), financing needs and technological obstacles but also, for some, the ineffectiveness of the market in promoting

low-carbon technologies and the necessity of having binding regulations (Belgium, Denmark). In certain cases, the trade unions are also concerned about the adoption of policies that according to them are going in the wrong direction by favouring the use of fossil fuels (Italy, Hungary).

Involvement of trade union organisations

The degree to which trade union organisations are involved in the development of low-carbon policy depends on whether management of the EU ETS or the implementation of an industrial strategy is at stake. Concerning the EU ETS, the majority of trade union organisations try to influence the decisions made by their government (60% of responses received). This lobbying generally concerns questions relating to how the system is structured (France, the Netherlands, Finland), the support provided to energy-intensive industries (Germany, Poland), or seeks to reduce the risk of carbon leakage. In the majority of cases, however, they are not consulted (also 60% of responses). In Austria, Germany and Denmark the trade unions were consulted during the legislative process, as they were in Belgium, France and Spain via specific bodies.



Is your organisation consulted by the national authorities (or equivalent) on the ETS-related issues they are responsible for?



As for a national industrial strategy, the trade unions stated that they were involved in the development process in 75% of cases. Negative responses were received from Italy, Hungary, Portugal and Lithuania. In most cases this involvement takes place through tripartite bodies, which may be permanent or created ad hoc (as in Denmark, for example). In certain countries, consultative bodies have been created to address specific questions: in France (Strategic Analysis Council, National Council on Sustainable Development and Ecological Transition, National Industry Council and industry-specific committees, etc.), in Germany (discussion platforms on energy, energy efficiency, climate effects, etc.) and in Great

Britain (Green Council work groups on energy-intensive industries). Questionnaire responses also made it possible to identify a few examples of large-scale forums that brought together all interested parties, including representatives from civil society. That is the case, for example, of the energy agreement for sustainable growth signed in the Netherlands, which brought together 47 organisations, including representatives from business, trade unions, regional and local administrations, NGOs and the financial sector. Similar examples exist in Germany (Energiewende) and in France (energy transition) or in Denmark (National strategy for the renovation of buildings).

In your country, is there a national or regional forum or national council involving unions, business and government to develop a low-carbon industrial strategy?



In the vast majority of cases, trade union organisations are also included in the development of a low-carbon strategy at the regional level. This involvement takes place via regional networks (the Netherlands, Poland) as well as through permanent bodies. These may be offshoots of national tripartite consultative bodies (the Netherlands) or regional consultative bodies dedicated to specific subject areas such as employment, industry development, management of European funds (ESF, ERDF) or sustainable development (Spain, for example). Consultations also take place at the company level in most of the regions studied.



Which technologies will be used?

Asked about products and technologies that will drive the low-carbon transition, the trade union representatives questioned favoured technologies relating to renewable energy and energy efficiency. Nonetheless, their answers varied greatly. First, they concerned a large number of sectors (electric energy, automotive, transport, construction, mining, agriculture, medicine, etc.). They also varied by country, with more weight given to national specialisations (manufacturing sector and chemicals industry in Germany, clean coal and automotive sector in Poland, offshore wind farms in the Netherlands, maritime transport in Greece). This variety in the answers, just like the importance that trade union organisations place on recycling and the circular economy, highlights that the low-carbon transition cannot be limited to certain products or technologies and that all economic sectors are concerned when it comes to reducing environmental impact.

What about training?

We received few responses on the question of training or re-qualification programmes relating to the implementation of low-carbon strategies. Certain initiatives of interest were nonetheless mentioned. For example, the financing provided by the National Skills Academy for Power in Great Britain toward the training of 800 trainees and interns. In France the government has embarked on a joint effort to look at the evolving needs in professional skills and qualifications in relation to the implementation of the Grand Paris project and the Regional Outline on Climate, Air and Energy (SRCAE).

REGIONAL CASE STUDIES



Regional composition of CO, emissions 2005-2012 (million tonnes)



Source: Local and Regional CO₂ Emissions Estimates for 2005-2012, Ricardo-AEA, September 2014

Region general description

The Yorkshire & Humber region is home to the full range of the UK's foundation industries (major oil refineries, chemical industry clusters, steel & glass manufacturing sites, cement), to a significant representation of most of energy intensive sectors (ceramics, paper industry) and to a large number of gas and coal-fired power stations. According to the latest data, it is the most industry-intensive region in the UK and the second biggest energy consuming region, accounting for roughly 10% of the UK's CO₂ emissions. Manufacturing as a whole contributes 15% of the region's GVA. Since the new millennium, the region has however experienced a significant decline in manufacturing employment, which fell from more than 380,000 in 2000 to 283,000.

Region and the low-carbon transition

In Yorkshire and the Humber, low-carbon transition is driven through the implementation of both national and local strategies. At national level, emissions emanating from the energy intensive industries (Ells) and power stations in Yorkshire and the Humber pose a challenge to the UK's carbon abatement strategy. In spring 2015,

the government published a series of national low-carbon technology roadmaps, for eight of the energy intensive industries, that identify the technology solutions needed to deliver target emissions abatement. The technology pathways defined in the report rely heavily on four developments: the successful development of CCS, the replacement of coal and gas fired power stations by cleaner renewables, new nuclear power, fuel switching (to biogas or synthetic gases), heat recovery and energy efficiency processes. The value of the investment required ranges from £6bn to £16bn. The implementation of this strategy has already led to significant investment in renewables. At Green Port Hull, Siemens invested £310m in the construction of a new wind turbine manufacturing facility. In 2015, Dong Energy completed the construction of an off-shore wind farm at Westermost Rough, where the 35 turbines of 6MW capacity will provide enough electricity to power around 150,000 homes. This decarbonisation strategy has also been the main driver of the White Rose CCS project, a new, up to 448MWe, coal-fired demonstration oxy-fuel power plant with full CCS equipment. However, the project has been cancelled due to the withdrawal of governmental grants in December 2015, indicating that CCS development is no longer a priority.

National measures may be completed by local decarbonisation strategies implemented by Local Enterprise Partnerships (LEP).² In the Leeds City region, the last Strategic Economic Plan (SEP), adopted in 2014 and which aims at creating 36,000 jobs and increasing the region's economic output, contains measures targeting lower carbon intensity. The objective of the plan is to transform the region into a resilient zero-carbon energy economy through investment in low-carbon energy projects, district heating networks, green infrastructure and resource and energy efficiency. Energy projects worth £300 million are already being developed.

Local stakeholder views

There is considerable appetite amongst local stakeholders to ensure a just transition to a low-carbon economy, the retention and creation of high-quality sustainable employment, and delivery of enhanced productivity and value added. In this regard, the deployment of the 2050 industrial decarbonisation roadmaps is considered to be a key determinant of the sustainable future for the industry.

Among the participants in our project, there is consensus that it is not possible to look at energy, environment and industrial policy separately from one another. There is also widespread concern that current UK energy and environmental policies are having a serious and detrimental impact on the energy costs, competitiveness, and ability and willingness of Ells to make long-term investment in the UK. The issue of who bears the cost of industrial decarbonisation has still to be resolved. This is true especially for industries that operate in globally competitive markets, where the absence of suitable policies brings the risk of causing "carbon leakage".

Yorkshire and the Humber is seen as having substantial strategic advantages in terms of access to energy resources, infrastructure, and the breadth and strengths of foundation industries. Ensuring that these foundation industries develop and invest in the most technically advanced and energy efficient processes and technologies creates the need for a clearly defined, long-term, low-carbon industrial strategy and leadership for its implementation (whether at a regional or national level). Policies must deliver decarbonisation and energy security without undermining the competitiveness of UK industry. To this end, investment in the accompanying skills and training is needed as well as ready access to substantial investment finance, as the cost of capital for investment in low-carbon solutions may be very high.

For many foundation industries, notably steel, chemicals and cement manufacture, delivery of the government's 2050 industrial energy efficiency roadmaps is highly dependent on access to CCS infrastructure. The cancellation of the White Rose CCS project has been seen negatively. The TUC for example has urged the government to back the project, arguing that thousands of new jobs could be created through a CCS network, plus 25,000 jobs in energy-intensive industries would be protected through new technology investment.

Finally, it is essential to favour consultation and engagement between working people, trade unions and employers in order to ensure a just transition that builds high-value jobs, and enhances productivity. LEPs are believed to offer a useful platform and to have the potential to provide an appropriate regional governance structure. However, there is a need for stakeholders, including trade unions, business and others, to take a proactive approach to exploiting these governance structures. To this end, a number of stakeholders recommended the creation of regional forum to work with the LEPs, and low-carbon working groups focused on mutually beneficial projects.

² LEPs are voluntary partnerships between local authorities and businesses, set up in 2011, that aim at determining local economic priorities.

GERMANY: NORTH RHINE-WESTPHALIA (NRW)

S		
	GDP (bln €, 2015)	645.6
	Population (mln, 2015)	17.6
1	Unemployment rate (2015)	8.2%
	Industry's share of region's GDP (2015)	57%
	CO ₂ emissions (mln t., 2013)	308

Economy and industry in NRW

The heartland of highly energy-intensive industry in Germany, North Rhine-Westphalia (NRW) was the first of the country's states to adopt its own climate protection legislation. At the same time, industries in the state support emissions reduction through developments in technology, low-carbon products and enhanced material efficiency.

Distribution of total emissions in NRW in 2012



Source: LANUV Fachbericht 2012, our presentation

Historically the "land of coal and steel", the state has been badly affected by industrial transformations. Although the share of the industrial sector in NRW's GDP has been cut in half since 1970, it remains high compared to the figure at German level or to EU industry as a whole. The state's most important industries include the chemical industry, mechanical construction, metalworking, electronics, the automotive industry and the energy sector.

NRW plays a key role in Germany's carbon footprint and the implementation of energy transition policies. Greenhouse gas emissions in the state represent one third of the country's total emissions. The state consumes 40% of energy nationally and its electricity generation capacity is the highest in Germany. Moreover, 90% of coal mining activity is located in the state, with this fossil fuel generating 80% of electricity. As a result, the energy sector is by far the largest source of greenhouse gas emissions in NRW, representing 55% of total emissions, ahead of the industrial sector (17.5%).

Energy sector
Industry
Transport
Households / Small-scale consumption
Liquid emissions from fuels
Product applications / other

A proactive climate policy founded on the state plan for climate protection and the development of resource efficiency

The climate protection law, which was adopted on 23 January 2013 by the state parliament, provides for a 25% reduction in greenhouse gas emissions by 2020 and 80% by 2050 through a Climate Protection Plan, scheduled for implementation at the end of 2015 - early 2016. The Plan's objective is to define the guiding principles under which the objective of reducing emissions can be attained without creating social injustices, and while improving energy security, favouring opportunities and limiting the social and economic risks of a transition to a low-carbon industrial model. The result of a long dialogue process, which included an important contribution from social partners (participation of DGB in work groups and discussion groups), the principles include, in particular, the need to increase the professional skills of workers and create appropriate training programmes.

At the same time, the state's industry supports emission reductions through the development of low-carbon products and technologies, namely:

- Significant investments in R&D and product and process innovations in the mechanical engineering sectors, the production and processing of base metals and the chemical industry. In particular, a Dialogue Platform (state, community organisations, universities, social partners, NGOs) bringing together multiple industrial fields (chemistry, steel, aluminium, glass, cement and paper pulp) has been put in place.
- The development of industries providing equipment and components for wind energy (50,000 industrial jobs at the end of 2013), advanced thermal insulation materials for buildings, energy-saving electrical and electronic equipment.

Significant efforts have also been made to improve material efficiency. The stakes are high: material-related costs represent 44% of manufacturing industry's cost structure. Despite the highly energy-intensive nature of the industrial and energy sectors, NRW succeeded in increasing resource productivity by 28% between 1994 and 2010. This result is nonetheless lower than that achieved at national level (+47%), while the federal government had set a target of doubling the figure during the period in question.

Trade union positions

The trade union organisations were involved in preparing the state's climate plan: IG Metall, IG BCE, Ver.di, IG BAU and DGB NRW participated in all 6 work groups, with DGB NRW also being represented within the central coordination platform. In the end, the trade unions deem positive the fact that they were able to influence the decision-making process and note with satisfaction the convergence of viewpoints that resulted from the inclusive consultation process. On the other hand, they remain sceptical of the plan's expected positive effects on energy-intensive industries and regret that the contribution of those industries to emissions reduction through the commercialisation of environmentally friendly products was not sufficiently taken into account.

Following the consultation, the trade union organisations, under the coordination of DGB NRW, adopted a common position in which they declared that they found the plan's objectives reasonable and suited to the state's economic structure. They also restated their commitment to combining climate protection with acceptable work, as well as the need to safeguard industrial and energy-related activities within the framework of a socially sustainable and job-creating transition.

For the trade unions, the success of the low-carbon transition rests first and foremost on strengthening the ability of companies to innovate and invest in sustainable product and process technologies. Implementing climate protection measures makes sense only if the measures are compatible with the activities of the target companies. As such, improving resource efficiency seems like an effective long-term solution. It allows for a reduction of costs other than personnel costs, and is often accompanied by other improvements due to its cross-sector nature. It also allows for the direct association and involvement of workers and works councils on which improvements to adopt.

Thus the state has numerous examples of trade unions and works councils involved in plans to increase energy efficiency and material efficiency (technology, organisation, training and raising awareness among workers), especially in the aluminium and plastics sectors. While much remains to be done, this involvement illustrates how the role of trade unions and works councils has gradually shifted toward less traditional areas. It also shows the key role that workers may play in identifying and implementing measures aimed at improving the efficiency of a production process (for example by modifying the way work is structured).

SPAIN: REGION OF ASTURIAS

GDP (bln €, 2014)	21.4
Population (mln, 2014)	1.051
Unemployment rate (2015)	20%
Industry's share of region's GDP (2015)	20%
CO ₂ emissions (mln t., 2013)	24

Source: INE



2

Economic and industrial profile of Asturias

Although the contribution of Asturias to Spain's GDP is only 2%, this north-western region has a strong industrial base, predominantly focused on the iron, steel and metallurgy sectors, which make up 22% of regional GVA, comprising 15% from industrial activities and 7% from the energy sector and the extractive industry.



Low-carbon policies and initiatives

Asturias has the highest per-capita emissions (22.7 tCO₂eq per inhabitant) in the country. By 2012, the region had managed to reduce emissions by 11% with respect to the 1990 baseline. The sectors responsible for the highest proportions of CO₂ emissions in Asturias are energy (65%), industry (19%) and transport (12%).

National and regional policies

At national level, the government launched the Spanish Climate Change and Clean Energy Strategy, the Energy Savings and Efficiency Action Plan (obtaining energy savings of 9.2% and 12 Mt of CO₂ emissions reduction by 2010), three consecutive Renewable Energy Plans (aiming for renewables to represent 20% of final energy consumption by 2020) and the State Waste Prevention Programme (reducing waste by 10% between 2010 and 2020). The latest national plan for the restructuring of the mining industry, with a huge impact on Asturias, includes €400mln for reactivation plans and business projects, with an 8% reduction in the workforce and the goal of removing government aid by 2019.



At regional level, the Asturias government launched the Energy Strategy 2008-2012 aiming to maintain coal as the main energy source in the region, to improve energy efficiency, to develop renewables, to improve transport infrastructure and to balance the primary energy structure. The Sustainable Development Strategy contributed to improving energy efficiency, to developing energy technologies and to promoting renewables targets. The Industry Strategy for Asturias contains objectives and measures agreed by employers and trade unions. There is also a Strategy for the Smart Specialisation of Asturias 2014-2020 and a Regional Strategy for the Sustainable Use of Forest Biomass 2011-2020 to exploit the region's forestry resources.

Industrial initiatives

The most important actors for a low-carbon strategy in the region are:

- The public mining company, Hunosa, has an experimental CO₂ capture plant with the goal of 90% CO₂ capture from coal burning. It is also part of the PELET IN project aiming to manufacture pellets using forest residues. Hunosa has launched new business lines in fields such as biomass (replacing conventional boilers by biomass boilers and promoting "heating districts" through large biomass boilers), geothermal (pumping mine water to provide air conditioning), biogas and wind power.
- Ence, the number one producer of eucalyptus pulp in Europe, is involved in forest management activities and generating power from forest biomass. It has two power plants in Asturias and 220MW of total installed power from biomass in Spain.
- The agri-food companies Reny Picot and CAPSA each have cogeneration plants in their facilities. CAPSA applies low-carbon strategies which have cut 1.8 kt of CO₂ emissions per year and Reny Picot plans investments to power boilers with natural gas instead of fuel.
- EDP, the Portuguese group, has invested €600mln since 2009 in combined cycle systems to increase gas consumption while reducing carbon.

Other notable initiatives in the region are the operation of wind farms, development of mini-hydro plants and the reuse of iron-making gases.

Trade union positions

CCOO and UGT are in favour of low-carbon policies and applaud some regional achievements, but also maintain there is a considerable level of non-compliance with the objectives of the regional policies. The main demands are the need for a long-term integrated industrial and environmental strategy and the lack of a strategic vision to maintain employment after the industrial restructuring suffered by the region. Proposals and projects of all types have been backed without ensuring coherence between the various public and private initiatives. This lack of vision is partly a product of multiple changes of government at national and regional level, affecting the continuity of the previous policies. The trade unions highlight as a priority the need to find a balanced energy mix, in opposition to recent regulatory changes at state level that have favoured large electricity companies at the expense of renewables, the combined cycle and cogeneration. The unions also believe a comprehensive and rational restructuring of electricity tariffs is required to meet the national tariff deficit (€3.6 billion in 2014).

Regarding CO₂ ETS, the trade unions demand a reform of the current structure because is not really helping to reduce emissions and is susceptible to speculative trading. Some unionists are also critical of the Coal Restructuring Plans and Mining Funds³ because they should have been developed with greater involvement of actors and regions, and more closely monitored.

The unions were informed and consulted through social round tables on ETS, the National Climate Council and the Environmental Advisory Council, but they regret the suspension of the 8 sectoral round tables⁴ in which unions participated. The trade unions believe it is necessary to devise a clear integrated strategy that includes the concept of a "just transition" at its core and puts forward a new model; universal and linked to climate targets; in-depth and with real measures (regulatory, budgetary and tax related); planned, long-lasting, stable and predictable; involving all levels of government and sector areas; involving participation and dialogue; free of pressure from oligopolies and big business; and guaranteeing protection and guality jobs for workers.

³ These state plans aim at regulating the coal mining industry until 2018, as required by European legislation. They include measures to promote the competitiveness of the largest possible number of mining sites, measures for planned closure of non-competitive sites and actions to reactivate mining reaions.

^{4 8} sectoral round tables: Steel and coke; Cement and lime; Ceramics; Paper pulp and packaging; Glass; Fuel refining; Electricity and Diverse sectors.



Economy and industry in Antwerp province



Source: Port of Antwerp

Antwerp province is one of Belgium's main economic centres. Its GDP per capita is the second highest in the country (€41,900). This situation is partly due to the diamond trade, but also to a strong presence of the chemical/pharmaceutical/plastics sector. Other important industries include metallurgy, food processing and the automotive sector. Located on the Scheldt estuary, the port of Antwerp is the second largest European port, after Rotterdam, and also home to the second largest petrochemical cluster in the world.

Low-carbon policies

In 2011, CO_2 emissions in Flanders accounted for 61% of the country's emissions. Emissions from industries located in the port area account for 25% of the province's emissions, so there are major stakes involved, particularly for the energy sector, companies participating in the EU ETS and the transport industry.

In Flanders, improving energy efficiency is the most common way of applying emissions reduction measures. In the port of Antwerp, chemical companies aim at developing circular economy practices and the use of renewable sources of energy.

Energy efficiency improvement measures

In 2015, Flanders enabled industry to participate in voluntary agreements on energy policy. Those agreements, which go beyond legal obligations, provide for a 3-year energy plan involving measures with a significant return on investment, as well as the implementation of energy management systems. In exchange, participants receive energy tax exemptions and are considered eligible for different subsidies. These agreements have replaced the energy benchmarking commitments that made possible an increase in energy efficiency of 0.84% per year between 2002 and 2014 and a reduction in CO_2 emissions of 4.36 Mt.

Circular economy

Faced with the economic crisis and the development of European environmental legislation, Flemish chemical companies have gradually shifted their strategy toward eco-design, which involves using renewable materials in production on the one hand and working on increasing material efficiency and recycling on the other. Recent developments in the port and the Antwerp industrial cluster offer a few examples, such as:

- The creation of Blue Gate Antwerp, an industrial eco-park designed to create a green industrial zone with negative carbon emissions and that encourages material efficiency, recycling and the minimisation of industrial waste products (closed cycle).
- Research on capture, use and storage of CO₂ and methane (CH4). In 2014, port authorities undertook a feasibility study with the aim of identifying potential suppliers, building a CO₂ purification plant, identifying possible storage options in the North Sea and looking into industrial uses for recovered gases.
- The ECLUSE project, which aims to provide heat to 6 companies in the chemical cluster through a wasteto-energy plant. The project should make it possible to use 80-90% of the energy produced, reduce CO₂ emissions by almost 100,000 tonnes and generate close to 5% of the green energy produced in Flanders.

Use of renewable energy sources and the development of LNG

Several projects initiated in the port of Antwerp focus on the development of renewable sources of energy. For instance, they relate to the construction of a new wind farm and the promotion of sustainable modes of transportation. Moreover, the authorities have built an LNG fuelling station for barges to reduce the use of fuel oil and diesel.

Trade union positions

What the future holds for employment in Flanders is the central focus of trade union demands. While industrial production increases steadily, the number of jobs in the field is decreasing. Trade union organisations complain at the lack of a strategic vision and the too-timid support of authorities for innovative initiatives. For their part, they are betting on sustainable innovation and see industry as the driving force behind the transition to a low-carbon economy. For them, the decarbonisation of production must be the primary objective and the transition should rely on ecologically sustainable production, recovery and recycling, the circular economy, renewable energy and sustainable transport.

The trade unions, moreover, would like to see a public debate in Flanders on the European Union Emission Trading Scheme (EU ETS) which, according to them, has been redirected toward purely speculative purposes. Concerning tax exemptions for the chemical industry, the granting process should be stricter and the benefitting industries should truly be exposed to international competition. The sector must be a player in decarbonisation at the European level. In addition, concrete commitments should be formulated by companies in favour of energy efficiency and workers should be involved in strategic decision-making.

However, consultation with workers on these questions seems to be decreasing. At the national level, the Flanders Social and Economic Council (SERV) is consulted on environmental and industrial questions. However, the Flemish Council for Science and Innovation, with which the trade unions were associated, has been dismantled and is to be replaced by the Flemish Industrial Council for Enterprises and Innovation (VARIO), made up of industrial companies only. Nevertheless, trade unions would like to be social partners when it comes to industrial change. As such, the effectiveness of their participation rests on increasing their knowledge of complex technical subjects, which in turn involves having employers and public authorities make substantial investments in their training.



Economy and industry in Norrbotten province



Source: Swedish Energy Agency

Norrbotten, located in the north of Sweden, is the largest province in the country, covering one quarter of its total surface area. Characterised by a particularly low population density, it is blessed with bountiful natural resources (iron ore, timber, water) on which its industrial development has been based. Among the most important employers are mining companies Boliden Mineral and LKAB and steel manufacturer SSAB. In the meantime, the timber industry employs close to 4,000 people in forestry, production of wood pulp, paper and packaging and construction. Strongly export-oriented, Norrbotten is also characterised by a high number of research and development centres.

Low-carbon policies

Norrbotten has one of the highest emissions rates in the country, despite 91% of its electricity being generated from hydropower. Primary industry is responsible for 75% of final energy consumption, a large part of which is related to the use of reducing agents in metallurgy. In the region, low-carbon technology projects are directly related to the new Swedish climate policy, primarily affecting the production of metals and the transport sector.

Swedish climate policy

Second-ranked economy in the OECD in terms of carbon intensity, Sweden has already greatly exceeded its objectives stemming from the climate action plan. Its low CO₂ intensity is the result of structural factors (abundance of renewable energy, nuclear energy, small share of fossil fuels in industrial consumption), but also of the implementation of an integrated policy on emissions reduction that is based on the taxation of carbon and polluting emissions. By 2045, the country plans to become carbon neutral. To that end, it is aiming for an 85% reduction in CO₂ emissions and zero emissions in the transport sector by 2030.

Development of low-carbon technologies in the transport sector

R&D initiatives for reducing emissions in the transport sector essentially concern the development of biofuels produced from biomass:

- The most significant project is the work of the Swedish Centre for Gasification, which is managed by Lulea University of Technology, Using thermochemistry, its objective is to produce a synthetic gas from wood or black liquor (a residue from the timber and paper industry) which, after cooling and treatment, can be converted into biofuels, fuels to generate energy and heat, as well as into renewable chemical products. The research conducted by Lulea, focused on the production of second-generation biofuels, is taking place at a pilot plant supplied with black liquor by the SmurfitKappa paper production site.
- In 2010, the Sunpine project allowed a consortium made up of the refiner Preem and logging companies to build a biodiesel production plant using tall oil, also a by-product of the paper industry. With a production capacity of 100.000 m³, the plant required an investment of €23 mln.
- With the large-scale production of biofuels requiring advance planning, IIASA and the University of Lulea developed Bewhere, a techno-economic engineering model designed to optimise renewable energy-based power systems. Gradually extended Europe-wide since 2010, it now covers not only biomass but also other areas such as solar, wind and hydroelectricity.

Development of low-carbon technology in metallurgy

In the metallurgical sector, significant efforts have been underway for a number of years already to reduce the levels of CO₂ emissions. In Norrbotten, the main initiatives include, among others:

- Within the framework of ULCOS, the implementation of LKAB's experimental blast furnace, aimed at conducting associated with the process and of 76% in the case of carbon capture.
- The Stepwise project, financed by the European Horizon 2020 programme, and which led to the construction, on the Swerea MEFOS site, of a plant converting gas from blast furnaces into hydrogen and nitrogen-rich fuel.
- The use of biomass in the direct-reduced steel process, the region's participation in the BASTOR CO₂ capture project, and the use of residual heat produced by metallurgy in the district heating system.

Trade union positions

In Sweden, trade union organisations participate in the dialogue on low-carbon strategies, both at the national level and local level, by exercising their bargaining power and rights to information and consultation. The two trade union organisations we interviewed, LO and Sveriges Ingenjörer, are in favour of low-carbon policies. In this context, LO is calling for the implementation of an ambitious decarbonisation policy, seen as a driver of growth. This transition must nonetheless satisfy certain conditions such as encouraging exports, allowing for adjustments depending on reduction efforts in other countries, not compromising national production (and particularly that of sectors falling under the EU ETS) and focusing on cost-effective measures.

The trade unions nonetheless emphasise that such measures require real political will, both in terms of industrial strategy and shared financial efforts. Investment in R&D is of fundamental importance and should favour the circular economy, the transport sector and the development of CCS technology, which is essential to attain a 90% reduction in emissions.

Full case study available on the ETUC website.

research on top gas recycling. The work carried out has helped to identify a potential reduction of 24% in emissions





Economy and industry of Stara Zagora region



The region of Stara Zagora is one of the main industrial centres in Bulgaria due to the power production facilities based on coal mining. The Maritza Iztok Basin supplies lignite coal to the Maritsa Iztok industrial complex which provides 30% of Bulgarian electrical power, making it the largest energy complex in South Eastern Europe.

Low-carbon policies

The emissions of greenhouse gases in Bulgaria decreased by approximately 52% in 2009 compared to levels in the base year 1988 due to several factors such as transition to a market economy, restructuring of industry and liberalisation of energy markets.

National Action Plan on Climate Change

The Third National Action Plan on Climate Change (NAPCC) for the period 2013-2020, adopted in 2012, outlines the framework for action to combat climate change and provides specific measures for reduction of greenhouse gas emissions across all sectors. The authority responsible for the implementation of climate change policies in Bulgaria is the Ministry of Environment and Water. The position of the authority is strictly in line with EU policy, in spite of its coal intensive energy system.

The evaluation of the implementation of the Second National Action Plan on Climate Change has however concluded that climate change was not among the top priorities of the government. The public awareness of problems related to climate change was rather low and government authorities encountered difficulties in performing their tasks and responsibilities in this regard.

Regional Development Plan for South-eastern Region

The South-eastern region is covered by a Regional Development Plan, which was approved for the period 2014-2020 and is based on the Europe 2020 strategy and on the National Strategy for Regional Development of the Republic of Bulgaria for the period 2012-2022. Progress under the Regional Development Plan is reviewed annually.

The Regional Development Plan for the South-eastern region recognises that "the region has a high risk related to climate change. It emits most of the greenhouse gases and SO_2 in the country. There are three polluted air pools – Burgas, Stara Zagora and Maritsa Iztok, where the biggest areas damaged by coal mining are situated".

Regional policies for Stara Zagora

The regional strategy for Stara Zagora province was adopted in 2013. It does not contain specific measures related to climate change. The Programme for Decreasing Pollutants in the Atmosphere and Reaching Established Norms for Harmful Substances, 2011-2015, mentions a range of climatic factors that influence the dispersion of harmful substances in the region, but does not directly address the issue of climate change and greenhouse gas emissions.

Trade union position

Trade unions are involved in discussions on issues related to climate change in Bulgaria, but at confederal and international rather than at local level. At company level, the impact of climate change policies is not usually an issue for dialogue between management and trade unions. Nevertheless, trade union leaders and experts are willing to contribute in a constructive manner to the ecologic and climate changes' policy-making. The two trade union confederations CITUB and Podkrepa clearly express the view that in the framework of common European and global policies, Bulgaria has to protect its right to be energy independent. In this respect, coal mining and thermal electricity produced with local coal is a matter of national security.

They envisage no alternative solutions to thermal power in the short and medium term: nuclear projects are more and more controversial at European level and renewable energy has approached a peak capacity where new projects are less sustainable due to high costs of investments and a reduction in state subsidies. Moreover, thermal power ensures a stability of supply that renewable energy cannot guarantee.

Both Bulgarian trade union confederations express their objections on the existing model of the European carbon emission trading. Trade union objections are based on experts' analyses and impact evaluation and if things will not change, in 15-20 years Bulgaria will have to shut its mines and thermal power plants, which will immediately increase dependence on foreign energy sources. Energy dependence of Bulgaria is currently at 33%, compared to an EU average of 54%.

The situation of Bulgarian thermal plants is made difficult by the cost of carbon allowances under the ETS. With record production volumes, thermal power plants register record losses due to high costs of carbon emissions. Competition from subsidised renewable energy especially in terms of prices has also contributed to difficulties facing thermal power producers. Payments from financially troubled thermal power companies for the coal they receive from the mining complex are also delayed. As a result, the whole coal-related regional economy is suffering.

The two trade union confederations agreed that the government has to set up a new energy policy in order to optimize carbon emission prices for the energy industry. The trade unions are proposing Bulgaria to follow the Polish example on how to protect the national heavy industry.

Finally, coal production is a massive employer in Bulgaria, with around 160,000 persons directly or indirectly employed by the mines and thermal power plants (every fifth person in the regions of Stara Zagora, Haskovo, Sliven, Yambol and Kardjali is economically dependent on coal production). The social impact of losing coal-related industry would therefore be huge.



Economy and industry in Silesia



Silesian Voivodship Province, located in Southern Poland, remains the engine of the Polish industry accounting for 12.7% of Poland's GDP and nearly half a million industrial jobs. It is home to numerous coal mines, energy power stations, steel plants and metallurgical processing units, automotive manufacturers and suppliers (51 automotive companies located in the Special Economic Zone of Katowice) but also to four key coal mining companies employing more than 90,000 people and producing 80% of the national coal production. Numerous companies remain strongly linked to these four big producers, including mining equipment manufacturers and metallurgical plants. The Silesia strategic hub remains by far one of the main contributors to greenhouse gas emissions in Poland.

Low-carbon policies

Poland and the Climate Energy Package 2030

As a fervent opponent of the Climate Package given that reducing greenhouse gas emissions by 40% by 2030 over 1990 levels would further impact on thousands of jobs in the mining industry (direct employment in the sector fell from 400,000 in the late 1990s to approx. 100,000 today), Poland is struggling to draw up a national proactive low-carbon industrial policy and roadmap. So far, intra-EU discussions on the ratification of the Paris agreement have stalled as Poland, along with the remaining big coal consumers, condition their ratification on agreement on the national effort that each state will have to make to achieve the targets set by the Climate Package.





Mining & quarrying

Manufacturing

Production & supply of electricity, gas, steam, hot water and air conditioning Nevertheless, Poland's position as the current largest recipient of EU funds is a driver for a progressive shift to a more environmentally friendly industrial policy for the country in the upcoming years.

Environmental policy and Poland 2014-2020

With €82.5 billion over the period 2014-2020, Poland is again the largest recipient of EU funds. European funding now will go primarily towards infrastructure and the environment but also research, development and innovation in order to upscale the Polish economy. The partnership agreement signed between the European Commission and the Polish government gives space to the 'Infrastructure and Environment' pillar with €27.4 billion, of which more than €9.0 billion is dedicated to investments linked to low-carbon economy and energy efficiency through regional operational programmes. The second pillar is also richly endowed with €13.0 billion. It will target environmental technology, focusing on: waste reduction, sustainable transport, eco buildings, water-saving technologies, raw material substitution, production of healthy food, etc., in order to increase the country's share of GDP devoted to R&D from 0.90% in 2013 to 1.70% in 2020. A particular emphasis will be put on efficiency and renewable energy use in enterprises, energy efficiency in public buildings and in the housing sector, the implementation of low-carbon strategies and high-efficiency cogeneration. Among projects under the priority axis of energy efficiency, the vast majority relate to thermo-modernisation of public buildings such as schools, hospitals, and offices.

Increasing experience in environmental projects

Meanwhile, Poland is adopting a 'greener' tax and financing fiscal system in a bid to move towards more efficient use of available funds, including through the National Fund for Environmental Protection and Water Management (NFOSiGW) and 16 regional funds. In 2012, income from environment-related taxes was 2.2% of GDP and 6.8% of revenue compared with OECD averages of 1.6% and 5.5% respectively. The Action Plan for Energy Efficiency (EEAP), the reform of municipal waste management, the modernisation of the recycling industry, the consolidation of the water management and treatment sector, the modernisation of electricity production, the development of renewable energy and smart grids all remain potential drivers for Polish green growth.

Low-carbon initiatives in Silesia

The Silesia 2.0 plan is a PLN 25 billion plan (approx. €6 billion) dedicated to both Upper Silesia and Lesser Poland, to be financed from the EU as well as state and local governments. It was set up to boost the economic competitiveness of Silesia and Western Lesser Poland, implement energy-efficient low-carbon economy and retraining measures for the workforce, and shape the urban integration of nine towns in Upper Silesia.

The Kędzierzyn Zero-Emission Power and Chemical Complex project is part of the Silesia 2.0 plan. It consists of a carbon gasification project at Grupa Azoty S.A. in Kedzierzyn-Kozle. The facility would produce gas by gasification of hard coal, used for power and heat generation or for production of chemicals.

The Silesia 2.0 plan also covers the Combined Cycle Gas Turbine plant (CCGT) of the Tauron company in Bedzin, to be financed by the European Investment Bank (which will also finance Combined Heat and Power plants for the PGE company outside Silesia in Gorzów and Rzeszów).

Apart from the Silesia 2.0 plan, another local low-carbon initiative was the creation (a few years ago) of the The Clean Coal Technology Centre: combined R&D infrastructure and laboratories created jointly by the Central Mining Institute (GIG) in Katowice and the Institute for Chemical Processing of Coal (IChPW) from Zabrze. This project focuses on prospective technologies for the utilisation of coal, financed by the European Regional Development Fund (ERDF) within the Polish Innovative Economy Operational Programme.

Position of Trade Unions

Protecting jobs remain at the heart of Polish trade union concerns, especially in energy-intensive industries such as coal mining and steel processing, no matter what the energy mix of the region will look like within the next decade, under the impetus of the Climate Package to which they remain opposed. The carbon exit is still synonymous for the unions with a direct threat for the stability of jobs in the Polish coal mining industry.

Nevertheless, a certain awareness of environmentally friendly industry issues is emerging, with a noticeable consensus on the need to breathe cleaner air in Silesia. For the unions, industrial policy has to focus on existing technological solutions for lower emissions as a whole (not just carbon) and create more favourable conditions for the introduction of new clean technologies, promising a better allocation of regional operational programmes in order to give a major lift to technological development in Silesia by 2020. New efficient and clean coal technologies are an important factor promoting sustainable activity and employment in the sector of mining and coal power plants in Poland, provided of course that the EU will fund these investments. This change will, however, require adequate monitoring of skills and training needs as well as suitable training structures in the coming years to facilitate potential retraining for thousands of employees especially in the coal mining sector of Silesia.

KEY PROJECT CONCLUSIONS

1. Europe needs regional strategies for a just transition to low-carbon industry

Industrial regions are of utmost importance to Europe. Economically, they produce a significant share of its wealth. Industrial regions still provide millions of guality jobs despite the impact the crisis and austerity policies have had on employment and working conditions. In the fight against climate change, they represent a significant source of GHG emissions and are therefore at the core of efforts to decarbonise the economy.

Reducing industrial emissions without losing industrial jobs implies a forward-looking approach translated into a policy framework designed and implemented in the industrial regions. Industrial regions require a policy framework which will allow manufacturing activities to flourish and trigger their transformation into low-carbon and sustainable activities. In addition to the necessary reforms of the EU climate policy instruments (notably the Emissions Trading System), it is of the utmost importance to develop holistic policy planning at regional level. Regions often have the policy levers necessary to accelerate the transition towards a low-carbon economy - innovation, education, lifelong learning, transport infrastructures etc., but these elements are too rarely integrated into a coherent long-term strategy. In other words, making low-carbon industrial strategies mandatory at regional level will be absolutely crucial to decarbonise the EU economy in a few decades.

2. Accelerate the deployment of breakthrough technologies

The EU will have to reduce its greenhouse gas emissions by 80-95% by 2050. Given what the EU committed to in the Paris Agreement, the effort for 2050 should be even greater, since keeping global warming well below 2°C means the EU should approach carbon neutrality by 2050. Translated into concrete figures for sectors covered by this project, the estimations of the European Commission 2050 Roadmap (-87% for industrial sectors and -99% for electricity production) need to be a minimum floor.

The contrast between that level of ambition and what seems achievable in industrial regions is striking. Despite years of efforts in many regions to improve energy efficiency, deploy renewables, or promote process innovation, none of the regions visited seems to be able to become carbon neutral in the short term (10 years). In order for low-carbon industry to become a tangible reality in the EU, it is absolutely urgent to accelerate the deployment of low-carbon breakthrough technologies as well as to enhance synergies with resource efficiency, a circular economy and with the bio-economy.

Bearing in mind that there is no one-size-fits-all and that every region will have to build its own technological future, technologies including carbon capture and storage (CCS), carbon capture and use (CCU), electrification of transport and industrial processes - currently receive too little support despite being identified as important building blocks for EU low-carbon industry 5. The European Commission and Member States should dramatically increase the financial support for the swift deployment of low-carbon breakthrough technologies for industry.

3. Involvement of trade unions and employers

Ensuring a just transition to a low-carbon economy means ensuring consultation and engagement of trade unions and employers to deal with the various impacts decarbonisation may have on the labour market. In some places, a strong and well-established culture of social dialogue has allowed existing governance structures to tackle the climate challenge. In others, a lack of political support for such dialogue - sometimes exacerbated by attempts to weaken social dialogue structures – deprives trade unions of a permanent forum to contribute to the design and implementation of climate policies. Given the scale and the pace of the change ahead, ensuring a broad participation of local social partners is essential to the success of low-carbon industrial strategies at local level. The examples we have of regions that build their policy on broad and systematic participation of trade unions should be seen as good practice to be promoted across the EU.

4. Investment in skills

A skilled workforce increases resilience and adaptability to change both collectively and individually. Investment in skills should clearly be seen as a driver of economic performance in industrial regions and should be supported. Gains in energy and resource efficiency require a trained and skilled workforce, in particular since many potential savings will require the deployment of new or emerging technologies (e.g. smart grids, smart meters).

In a context of globalisation and digitalisation, certain skills will play an ever-growing role (maths, computer, sciences, foreign languages). These skills are unevenly shared among countries, among regions, and among social classes and between women and men. Therefore, ensuring improved skills in all regions - through education programmes as well as lifelong learning - is central to making the transition to a low-carbon economy socially fair. Investing in education as well as strengthening the culture of lifelong learning should be a pillar of local just transition.

⁵ See the ETUC position on the reform of the ETS: https://www.etuc.org/documents/position-structural-reform-eu-emissions-trading-system#.V3vAMbh97cs.

5. Boosting local support for decarbonisation

Public support for climate change policies is essential but should not be taken for granted. In regions which still rely heavily on carbon-intensive activities, climate policies are often seen as a threat to workers and the communities they belong to. Massive job losses, rising energy prices, loss of market shares for exporting companies are among the most frequent concerns expressed by workers when discussing the impact of climate policies in their regions. Even though a lack of understanding, or the defence of vested interests, may partly explain local opposition to decarbonisation, workers' fears are well founded, since decarbonisation takes place in the context of globalisation of trade, economic crisis and austerity policies which have created high levels of unemployment, pressure on wages and social protection systems, and the weakening of social dialogue. The EU and its Member States should pay greater attention to the adverse consequences of decarbonisation and address them through concrete and effective policies specifically targeting workers' rom sectors and regions which could be negatively impacted by the transition to a low-carbon economy. Without workers' support, decarbonisation will fail! The EU and its Member States must ensure that the transition to a low-carbon economy will lead to sustainable prosperity shared by all.

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The ETUC is the voice of workers and represents 45 million members from 89 trade union organisations in 39 European countries, plus 10 European Trade Union Federations.