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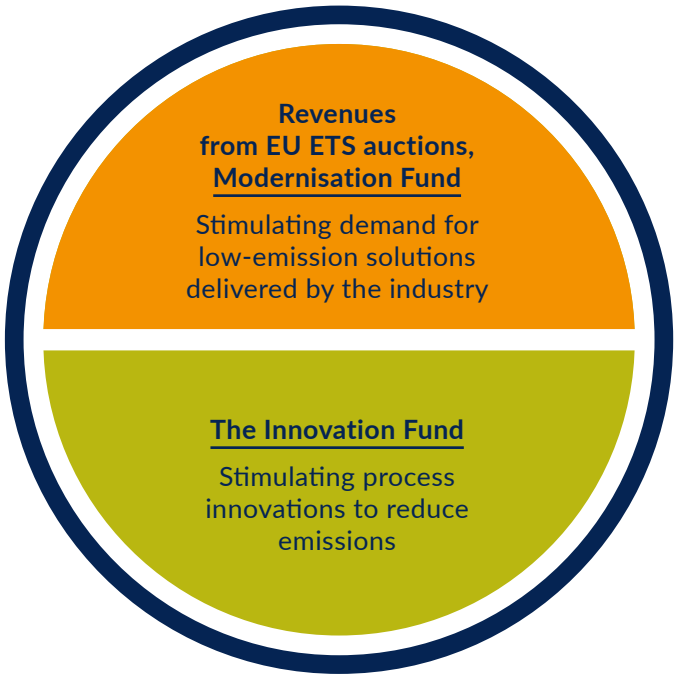
Key points

- The EU ETS has a potential to become one of the key tools of industrial policy in CEE and the entire European Union in the next decade.
- The primary condition is the implementation of comprehensive reform of the system: balancing supply and demand of allowances and enhancing effectiveness of provisions limiting the risk of carbon leakage in certain industrial sectors.
- Combining efficient protection of the industry with solidarity mechanisms ensuring fair allocation of allowances for the CEE region remains a crucial issue to be arranged at the EU level.
- At the national level, it is necessary to embed the EU ETS in the set of instruments provided by the domestic development policies, so that its potential as a modernisation tool is not wasted.

The EU ETS as a comprehensive industrial policy tool



Protection against carbon leakage

Source: WiseEuropa

1. Financing modernisation through EU ETS revenues

Within the European Emissions Trading System (EU ETS) more than a half of allowances are sold in open auctions by Member States. The number of allowances allocated to particular state is calculated on the basis of historical emission levels and solidarity mechanisms that reward countries with a relatively low GDP per capita, notably in CEE region. For example, the allocation of allowances to the Polish government in the years 2021-2030 is more than 1/4 higher than it would be, if calculated based on historic emissions of energy sector and heavy industries. Such rules of distributing emission allowances between the Member States have one important feature: revenues that any given country receives from the sale of allowances do not depend on the actual level of emissions of companies operating on its territory. This feature distinguishes the EU ETS from the carbon tax: even if energy sector and heavy industry of a given country considerably alter their fuel mix, the state revenues from the system will not be affected by this. Furthermore, increases in domestic CO_2 emissions worsen the country's net balance in the EU ETS, i.e. a difference between revenues from the system going to the government and costs being borne by energy and industrial companies purchasing allowances. This is particularly relevant for those EU economies that intend to execute far-reaching investments in new, coal-based production capacities in the power sector.

In the next decade the Modernisation Fund dedicated to Central and Eastern European countries and financed from EU ETS will begin its activity. The net transfer from the Fund constitutes several to dozen per cent of revenues each government receives from the total pool of allowances based on historical emissions. For instance, for Poland – the largest country in the region – the transfer reaches as much as 15%. From this perspective, the region is a net beneficiary of the EU ETS and will remain one if allowance prices go up (additional revenues from auctions and funds available for modernisation will exceed additional costs of purchasing allowances by domestic emitters). This may change, however, if emissions in the ETS sectors in CEE region are reduced significantly slower than in other European countries.

Thanks to solidarity mechanisms, CEE region is currently a net beneficiary of the EU ETS. This may change, however, if emissions in the region decrease slower than in other European countries.

Regardless of the scale of net financial benefits coming from the EU ETS, CEE countries should make a strategic decision on channelling revenues from allowance auctions and financing available from the Modernisation Fund. The sharper the decrease in revenues from EU structural funds after 2020, the more important the source will become.

While the Modernisation Fund starts its operation only in the next decade, CEE countries continue to sell emission allowances in auctions on an ongoing basis. These revenues can considerably increase after the implementation of the EU ETS reform, which aims at limiting excessive supply of allowances and increasing their price. Thus, it is all the more important to arrange the methods of disbursing funds obtained this way as soon as possible – as key decisions in this area are made at national, rather than European level. The ETS Directive contains only guiding recommendations, the fulfilment of which remains a decision of Member States. Direct sales of allowances in auctions represent a key stream of funds obtained as part of EU ETS. Thus, the national governments' choice concerning which part of revenues should support low-emission transition and which should be dedicated to other objectives financed from the general budget, is crucial.

Within the EU ETS reform negotiations, final decisions concerning the way in which the Modernisation Fund will be managed are still pending. In particular, the influence of the European Investment Bank and representatives of Member States outside the CEE region on the selection of supported projects remains unclear. Negotiators from the region should aim at obtaining broad autonomy in the field of project selection, while taking into account climate policy objectives. One possible compromise would be supplementing the rules guiding the Modernisation Fund with a provision concerning maximum emission intensity of supported activities in exchange for limiting the role of EIB and Member States outside the CEE region in the selection process. Bearing in mind that the Fund would be able to finance numerous applications going beyond supporting emission-intensive investments in energy sector (as discussed below), it seems an acceptable solution from the point of view of national energy and development policies.

The derogation for energy sector is a special, provisional element the EU ETS. It is a free allocation of emission allowances for the power sector in exchange for modernisation investments; this allocation does not depend on a power plant's current emission level. From the economic perspective, this means subsidies in the form of transferring securities (emission allowances) to power companies, provided that projects supported within derogation mechanism are executed. Therefore, the derogation mechanism constitutes an investment subsidy for the power sector. It does not directly lead to the reduction of energy prices on the wholesale market though, since from the perspective of a power company the marginal energy production cost remains unchanged. Derogation can reduce the energy price for consumers, however, since it reduces the need to finance necessary investments in energy sector through household and corporate bills. It is worth noting that other forms of investment support would have a similar effect, e.g. partially covering costs of developing network infrastructure and RES by the EU ETS funds.

Supporting the modernisation of large-scale energy generation is not an optimal way of utilising ETS funds. Other sectors also require high investments in low-emission solutions and at the same time face greater financing difficulties.

Due to the scale of challenges related to decreasing emissions across the different sectors in CEE economies, it is desirable to allocate all revenues coming from the EU ETS to supporting low-emission transformation. However, it should not be limited only to large scale energy generation, which in many countries remains at the centre of the debate concerning climate and energy policy. Due to the need to limit emissions in the entire economy, high investments are also necessary at developing distributed energy generation, modernising district heating, improving energy efficiency of buildings and lowering emission from transport. Plenty of these investments have to face greater financial challenges than the utility companies. Above all, investments in large scale power generation require a systemic reform of the energy market that creates durable incentives for investments ensuring the security of supply and reaching climate targets. Furthermore, energy companies in CEE region already have a dedicated support tool – derogation mechanism. Therefore, consumer bills will remain the key source for financing energy sector development; as regards the majority of consumers, gradual increase in energy prices – corresponding to increased investment in the modernisation of the power system – does not represent a systemic problem: the cost of purchasing electricity does not significantly influence cost competitiveness of industrial enterprises, except for 5-10% of the most energy-intensive sectors; it also remains less significant for households compared to expenditures on heating.

At the same time, deep thermal renovation and switching heating sources in buildings currently constitute the greatest challenge in the scope of energy and climate policy of numerous Central European countries, with Poland at the forefront. Financing thermal insulation of residential infrastructure, investments in district heating and replacement of heating systems in households is difficult for a number of reasons: high capital intensity, sensitivity of households to heating costs, limited access to credit and investors' inclination to cling to well-known solutions with lower upfront costs, disregarding long-term economic, energy, and environmental benefits (the case of shallow thermal insulation). Therefore, a significant part of revenues from EU ETS auctions in CEE region should be dedicated to financing comprehensive programmes for retrofitting buildings, replacement of obsolete sources of heat with low-emission technologies and development of district heating. At the same time, it is crucial that activities co-financed from the public funds adopt a comprehensive approach to solving the problem of low energy efficiency in households and low air quality due to obsolete heating methods. It is worth combining building retrofit investments with deployment of distributed energy generation to obtain synergy effects at the local level. This may be achieved, for example, through the integration of electricity and district heating systems (energy storage, coordination of distributed generation sources within the smart electricity and district heating networks). Some revenues from EU ETS auctions can also support investments in low-emission mobility, in particular in the area of public transport and development of charging infrastructure; however, this should not represent the main point of the programme, as the environmental, social and health potential exhibited by modernisation of housing infrastructure is particularly high.

It is worth emphasizing that the ETS Directive allows using auction revenues to support the restructuring of labour markets, which is especially important for local economies heavily dependent on coal mining and traditional industries (e.g. some areas in Silesian region in Poland). At the same time, we need to note that from the perspective of the state budget, the EU ETS system might not only generate direct revenues, but also costs related to the protection of energy-intensive industries which face carbon leakage risks related to indirect emission costs. The decision to introduce protective measures is made at the national level, while the European regulations determine their maximum amount on the basis of product benchmarks and emission-intensity of price-setting power plants. Both revenues from auctions and the cost of protective measures for energy-intensive industries are proportional to allowance prices.

Therefore, linking these two instruments provides a predictable and continuous source of financing of protection against carbon leakage in case of energy-intensive industries. The measures aimed at protecting sectors with high process emissions is discussed in the next chapter.

Box 1. Scale and possible allocation of the EU ETS funds in 2021-2030: Polish example

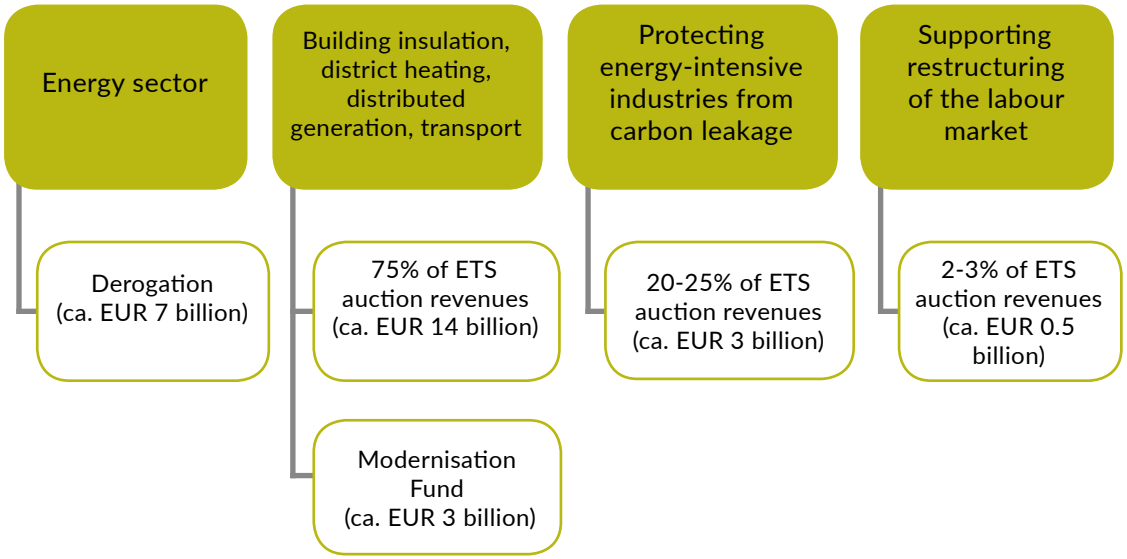
Table 1. Total value of the EU ETS funds for low-emission modernisation in Poland, 2021-2030, in EUR billion

	Scenario of emission allowance prices*		
	Low	Central	High
1. Modernisation Fund	2	3	5
2. Investment subsidies for the power sector (derogation)	4	7	10
3. Revenues from allowance auctions less derogation costs	10	17	24
4. Minimum allocation of auction revenues to modernisation (50%)	5	9	12
Total modernisation funds - minimum variant (1+2+4)	**11**	**19**	**26**
Total modernisation funds - maximum variant (1+2+3)	**17**	**28**	**39**

*Prices of allowances in 2030: low scenario - 20 EUR/t, central scenario - 35 EUR/t, high scenario - 50 EUR/t

Source: Bukowski et al.[1]

Potential allocation of the EU ETS funds in Poland, 2021-2030



1 Bukowski, M., Siedlecka, U., and Śniegocki, A. (2016), *Revenues from ETS auctioning as source of financing for low-emission modernization in Poland*, WiseEuropa for Forum for Energy Analysis, Warsaw.

Source: WiseEuropa

Summing up, it is worth emphasizing that funds from the EU ETS can support investments both in energy generation and other areas requiring modernisation, at the same time protecting energy--intensive industries and facilitating necessary changes on the labour market. From the point of view of the manufacturing sector, it means both an incentive to adjust its product offer to demands for new, low-emission solutions. At the same time, despite a large pool of available funds, the EU ETS should not be treated as the sole source of financing low-emission modernisation in CEE region. The key role should be played by private funds mobilised by the regulatory framework, complemented by public procurement. Revenues from the EU ETS auctions should rather be perceived as a source of financing activities that support transformation in places where a gap in private funding is the largest: poorer or short-sighted households, industrial sectors under restructuring and infrastructure that facilitates opening the market to e-vehicles. Therefore, this is a complementary role, streamlining the acquisition of capital by private entities and supporting public investments (mainly on the local government level) and low-income households; additionally, it contributes to the popularisation of emerging technologies.

Table 2. Examples of linking domestic regulatory instruments with the EU ETS funds

Area	Main instruments	Role of the EU ETS funds
Building insulation	Environmental standards, taxation of emissive fuels	Easing credit constraints, financing public investment, support for low-income households
Heating system modernisation		Easing credit constraints, financing public investment, support for emerging technologies
Distributed energy generation	Auctions, energy market reform	
Low-emission transport	Diversified taxation of vehicles based on emission performance, low-emission zones in cities	Construction of infrastructure, public investment

Source: own study by WiseEuropa

2. Protection of emission-intensive industries against carbon leakage

The lack of global uniform climate policy means that some European enterprises facing disproportionate costs of greenhouse gas emissions may decide to relocate production outside the EU ETS area, leading to carbon leakage. Such risk concerns only a few industrial sectors. The majority of companies - ca. 90-95% of the manufacturing sector and nearly 100% of the service sector – are characterised by very low direct CO_2 emission and modest demand for electricity. However, the EU ETS and environmental regulations (e.g. emission standards) are important for investment decisions in sectors where process emissions or energy consumption is high enough to make the risk of environmental dumping exercised by foreign competitors a real threat. It concerns, above all, certain sectors of the heavy industry, such as steel and cement producers. The historic role of these industries in shaping European industrial landscape is indisputably crucial. Although their economic significance is currently far smaller than in the past, their transfer outside the European Economic Area would be undesirable for both socio-economic and environmental reasons. Therefore, European regulations attempt to react to the carbon leakage through measures that protect most energy- and emission-intensive sectors from the risks of unilateral climate policy.

Regarding indirect emissions (related to the increase in energy prices produced by emission-intensive power plants), these regulations allow the introduction of compensations to energy-intensive sectors by Member States. Companies that directly emit greenhouse gases as part of own production processes are protected in yet another way. They receive free allowances on the basis of product benchmarks, whereas the allocation rules are common for the entire European Union. Such free-of-charge allocation decreases the auction pool of allowances sold by Member States, therefore it constitutes a fiscal cost they have to bear. At the same time, the current rules of allocating free allowances are characterised by a number of shortcomings. The pool of free allowances for the industry covers only a part of the needs of the most efficient, low-emission producers. This results from the lack of a realistic mechanism of setting product benchmarks and too mild criteria of classifying particular sectors to groups exposed to carbon leakage, which leads to a shortage of free allowances for the most sensitive production processes. Another systemic flaw is the fact that allocation of free allowances takes place on the basis of historical production levels. This means that the marginal costs of emissions resulting from increased production scale is the same as it would be without applying free allocation. At the same time, limiting emissions due to reduced production does not result in limited free allocation, despite the reduction of actual demand for allowances.

Proposed changes in protection of emission-intensive sectors after 2020 address the key shortcomings of current solutions. It would be most beneficial for CEE region to strengthen industrial protection without weakening solidarity mechanisms within ETS.

Such situation occurred in recent years, when due to the economic crisis and decrease in investment activity in Europe the heavy industry had to considerably reduce the production of steel, cement and other materials. It led to excessive allocation of free allowances to production companies. However, maintaining these solutions would lead to a situation where in subsequent years, due to gradual decrease in the number of allowances, the whole system would face a lasting shortage of free allocations compared to actual needs of the emission-intensive industry. Currently negotiated proposals for the amendment of rules of protecting these sectors after 2020 take account of, among others, better conjunction of allowance allocation with an actual production level in particular systems, diverse rate of decreasing emission-intensity in particular sectors and a different level of exposure to carbon leakage. Moreover, proposals of the Council of the EU and the European Parliament foresee the possibility to enlarge the entire pool of free allowances at the cost of the pool sold by Member States in auctions.

This solution is an element of a broader compromise concerning the direction of changes in the EU ETS: stimulating increase in allowance prices (which is supposed to support broad implementation of low-emission solutions) while providing adequate protection to those branches of the industry that are exposed to carbon leakage. The heavy industry will benefit, but revenues of Member States from auctions will decrease. From the perspective Central and Eastern Europe – as well as Southern Europe – the reallocation of allowances for the industry from the pool of 90% of allowances allocated on the basis of historical emissions would be a preferred solution. It would safeguard reinforced protection to emission-intensive sectors without limiting benefits reaped by CEE region from solidarity mechanisms as part of EU ETS.

Despite the direction of changes in the carbon leakage protection that is beneficial for the industry, the long-term perspective remains problematic. The following disadvantages of free allocation wiil remain after the reform:

- weak incentives to innovate in the area of consumption of emission-intensive materials (improved efficiency of use, substitution), as price signal is not transferred down the value chain,
- the resulting unequal division of reduction efforts between sectors,
- decreased revenues from the EU ETS that could support modernisation in other sectors.

These weaknesses also apply to protecting energy-intensive industries from indirect costs of emissions. The problem will worsen as climate policy targets become more ambitious, increasing costs of unequal

distribution of mitigation efforts for the economy. One possible solution to these problems – discussed for years – is replacing current protective measures with instruments that equalise emission costs at the EU border, i.e. border carbon adjustments. It is worth noting that the total equalisation of competitive conditions between European and non-European producers would have to cover not only taxing emission-intensive imports, but also providing compensations for European exporters. In practice, it would likely lead to a conflict with trade partners and generate considerable administrative challenges. An interesting alternative would be to introduce a tax on consumption of emission-intensive materials as a measure supplementing free allocation to the heavy industry. This solution is not likely to cause a trade war, generates additional revenues for modernisation and incentives for more efficient use of emission--intensive materials; moreover, it equalizes mitigation costs between energy sector and heavy industry, whereas related administrative challenges are comparable to other taxes[1].

Table 3. Effectiveness of selected options of protecting emissive industry from carbon leakage

	Carbon leakage protection	Incentive for process	Incentive for saving and substituting emission-intensive materials	Efficient division of climate policy costs between sectors	Revenues from the EU ETS	Ease of implementation
Lack of free allocation of allowances	- -	+/-	+/-	+/-	+/-	+
Free allocation - current solutions	+/-	+/-	+/-	+/-	-	+
Free allocation - after 2020 (according to currently proposed reforms)	+	+	+/-	+/-	-	+
Lack of free allocation + bilateral adjustments on the border (import taxes and subsidies for exporters)	+ +	+ +	+	+	+	- -
Free allocation of allowances + taxes on consumption of emission-intensive materials	+ +	+ +	+	+	+	+/-

Source: WiseEuropa

We recommended public administration and industrial milieus from CEE region to consider this concept, since it can emerge during subsequent revisions of the European climate policy that can take place before 2030. From the perspective of domestic heavy industry, on the one hand

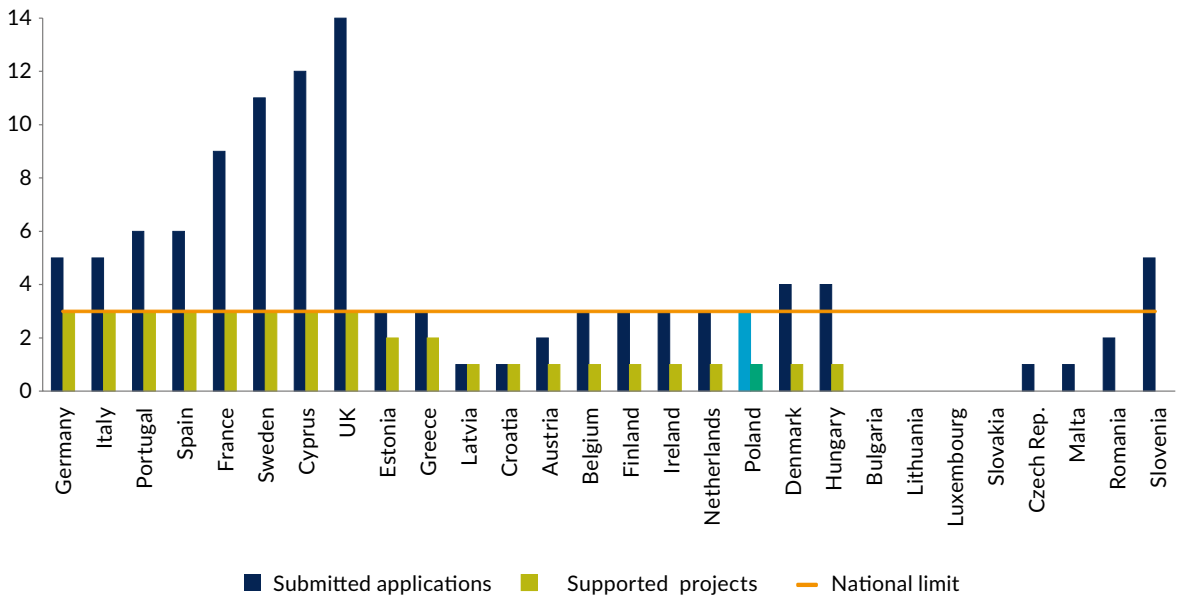
1 Neuhoff, K. et al. (2016), *Inclusion of Consumption of Carbon Intensive Materials in Emissions Trading – An Option For Carbon Pricing Post-2020*, Climate Strategies and DIW Berlin.

it would mean a slight reduction of demand, on the other hand though, it would create a stable environment for implementing low-emission technologies and would guarantee effective protection against market loss. It seems particularly significant for CEE producers, as they typically lack opportunities to relocate production to plants outside the EU.

3. Low-emission industrial innovations

The reform of EU ETS covers not only amendments of carbon leakage protection rules, but also direct support for process innovations in the heavy industry. They can be co-financed – together with innovative energy technologies – by the Innovation Fund. This instrument is an extended version of the previously operating pan-European NER300 programme, which supported investments in innovative RES and CCS power plants and was financed by revenues obtained from the sale of a dedicated pool of allowances. Despite a smaller than expected scale of funds available as part of the programme (due to the low allowance prices), 37 large RES projects and one CCS project were supported by NER300 with over EUR 2 billion. The programme included national limits: no more than 3 projects from one country could receive support. This rule was beneficial for the CEE region. Nevertheless, most countries of the region demonstrated moderate interest in NER300. A significant barrier for other enterprises (both in the field of RES and CCS) in many cases was the lack of domestic regulatory framework that would adequately support the implementation of new technologies.

Number of submitted applications and projects supported within NER300 programme



Source: WiseEuropa based on the EC data

The Innovation Fund will offer one and a half as many allowances than NER300 (and according to the European Parliament's proposal - twice as many) and the portfolio of supported projects will be extended by process innovations in the industry. The total support from the Fund may exceed EUR 10 billion, out of which a significant part will probably be channelled to the construction of large-scale, low-emission

systems in the heavy industry. Previously, the EU-level instrument supporting industrial process innovations at an early commercialisation stage was missing. It is all the more important, since the heavy industry – contrary to the power sector – lacks well-proven technologies that allow achieving radical reduction of emissions on the sectoral scale. Such solutions may include, for example, new methods of manufacturing cement and steel or tested CCS or CCU systems that allow capturing CO_2 emissions and underground storage or commercial use in other areas of the supply chain (e.g. production of urea or polymers). Previously low allowance prices and lack of dedicated support instruments prevented the development of this type of technologies; however, renewed interest in their deployment can be expected in the next decade. This will be a crucial moment for commencing real actions aimed at reducing industrial emissions, so that in the years 2030-2050 they can be broadly deployed (gradual replacement of technologies in large plants, reorganisation of production, expansion of CCS/CCU infrastructure), as they are indispensable for meeting the objectives of the global and European climate policy. Therefore, the Innovation Fund is there to make sure that the current, "lost" decade for the development of new technologies in industry does not repeat.

Most systems that utilise innovative methods of reducing emissions in the heavy industry will constitute capital-intensive transnational investments that require involving know-how of the best European scientific institutions. It is worth drawing conclusions from the experiences of the NER 300 programme and increase domestic incentives for applying for subsidies offered by the Innovation Fund (including provision of stable national regulatory frameworks), so that such projects may happen also in the Central Europe. The long-awaited qualitative technological change in the heavy industry might be a chance for a new opening on the European market, which is currently characterised by saturation and limited development perspectives concerning new systems based on conventional technologies.

Reaching long-term climate targets requires accelerated implementation of low-emission industrial technologies in the next decade. It can be supported by Innovation Fund, which offers a chance for CEE industry and research institutions.

Early involvement of Central and Eastern European industry and research institutions in the implementation of low-emission industrial technologies will provide time for building competences necessary to obtain access to the global market, including projects outside the EU, by companies and research units enjoying the Innovation Fund's support. Similar opportunities concern arise in other areas of low-emission innovations. The involvement of CEE companies and the research sector in other European collaboration programmes, such as Horizon 2020 or initiatives of the European Institute of Innovation & Technology (e.g. Climate-KIC, EIT InnoEnergy) might play an important role here.

Energy, Climate and Environment Programme

Poland, Europe and the world are currently facing unprecedented challenges associated with the environment and resources. Avoiding dangerous climate change, improving public health and increasing resource security requires a profound economic transition. Taking advantage of opportunities and avoiding the associated developmental traps requires in-depth evaluation of the short- and long-term impacts of environmental protection and natural resource management policies. Under the Energy, Climate and Environment Programme, we prepare comprehensive sectoral and macroeconomic analyses, focusing on the broadly defined low-emission economic transition in Poland and globally. We are active in areas such as: Polish and EU energy and climate policy, domestic resource policy, improving resource efficiency in the economy, protection of the environment and public health by limiting harmful emissions, sustainable transport policy. This paper is a part of the Energy and Climate Project.

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Other publications:

„Coalapse – will fusion with the energy sector save Polish mining?,"
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Bukowski, M., Maśnicki, J., Śniegocki, A., Trzeciakowski, R., WiseEuropa, Warsaw 2015.

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