EEAC Working Group on Energy and Climate Change

Subject: Mainline summary of outcomes of EEAC round-table meeting on 'Energy-Intensive Industries: (Economic) Opportunities for Decarbonization and the Role of Government'

The Hague, The Netherlands, June 2018

Dear members and participants of the EEAC Working Group on Energy and Climate Change,

With over 30,000 European companies and four million jobs in the EU[1], the energy-intensive industries are an important actor in the European economy. Although Greenhouse Gas (GHG) emissions decreased in nearly all energy-intensive industries[2], the sector still produces a quarter of all GHG emissions in the EU.[3]

In the next few decades, energy-intensive industries – from steel and aluminium to cement, chemicals and refineries – will have to continue making a contribution to the outcome of the Paris Agreement and the targets defined in the Energy Union strategy. At the same time, energy costs and policy measures should not harm the competitiveness of energy-intensive industries in the European Union vis-à-vis their global competitors. The central objective is to create a sector that is sustainable from an ecological, social as well as economic perspective.

To this end, the Working Group on Energy and Climate Change of the European Environment and Sustainable Development Advisory Councils Network convened a round-table meeting with a variety

[1] http://www.cepi.org/taxonomy/term/17

[2] The greenhouse gas emissions of the chemical industry have decreased by almost 60% compared to 1990. Greenhouse gas emissions resulting from ammonia production have decreased by almost 16% compared to 1990. Greenhouse gas emissions resulting from steel production have decreased by almost 39% compared to 1990. Greenhouse gas emissions resulting from cement production have decreased by almost 40% compared to 1990.

[3] file:///C:/Users/Eigenaar/Downloads/SPEECH-16-314_EN.pdf

of stakeholders to discuss possible ways to enhance the position of energy-intensive industries in a sustainable low-carbon economic future. In this letter, you will find a mainline summary which includes a brief description of the state of play, followed by an analysis of possible actions to enhance a successful industrial transformation process. The concluding part of this letter lists a number of possible government interventions.

State of play

Theory vs. practice

When studying the initial phases of decarbonization, it becomes clear that (theoretically) efficient policies – such as the Emissions Trading Scheme or energy efficiency measures – have not been as successful as expected. In addition, the use of coal has not been phased out, nor has emissions capture been widely implemented. Both were also considered efficient policies (in case of stable and higher CO_2 prices). On the contrary, (theoretically) less efficient initiatives, such as increased use of renewable energy, were successfully implemented. In the light of this situation, Europe is keeping all its options open. For example, Carbon Capture & Storage (CCS), nuclear energy, fracking, diesel, green gas and biofuels are all still being considered. However, not all options are considered in all countries.

Although considered (theoretically) less efficient, policy initiatives focusing on renewable energy contributed to a situation in which large-scale market-driven deployment of renewable energy is possible. This has helped to make renewable energy a competitive energy source. With the use of renewable energy on the rise – especially for electricity production – a further increase of electrification is expected. There are similar expectations for the role of electricity in energy-intensive industries.

Moreover, it should be noted that any increase in electrification (heavily) depends on electricity prices. Furthermore, it should be noted that there are possible trade-offs between solutions. For example, how will energy reduction requirements relate to increased electricity demand as a result of further electrification? These possible tensions should be duly noted and taken into account when progressing on the pathway of transformation.

What is Brussels doing?

The European Commission is currently developing a long-term emissions reduction strategy for 2050. An important element in this strategy will be the role of industries and the use of raw materials. The strategy is expected to aim at net zero emissions by the middle of the 21st century and will be based on a profound transformation of the European economy.[4] The strategy is expected to be presented by the European Commission by the end of November 2018 and will be a topic of further discussion in the course of 2019.

Although most industrial sectors have drawn up their own decarbonization strategy, the large number and variety of these strategies makes it hard to develop coordinated plans for 2050. To that end, energy-intensive industries are now working on compiling the different roadmaps at the technical level. More specifically, each sector is providing input in six areas.[5] The goal is to identify commonalities and synergies which may provide a basis for an initial outline of the industry input to be submitted to the European Commission for assessment.

[4] https://www.europeanfiles.eu/energy/new-ambition-energy-efficiency-europe-2

[5] Historical figures on emissions and electricity consumption; key mitigation technologies; abatement potential; investment costs; energy, feedstock and infrastructure needs; and regulatory framework.

As part of the drafting process, the European Commission has introduced several relevant questions: How can the decarbonization process be successfully finalized while maintaining competitive industrial activity within the EU? How can the demand for low-carbon products and services be enhanced while maintaining a secure and affordable energy supply? For now, the European Commission seems to have opted for a strategy which can be adjusted 'on the go' to ensure sufficient flexibility for accommodating the level of uncertainty that occurs when preparing a strategy for 2050.

Which actions can be taken to enhance a successful transformation process?

There are several options which can contribute to emissions reduction in order to support a successful industrial transformation process. The different options discussed in the workshop are listed below:

Markets for low-carbon products must be further enabled

Insufficient progress has been achieved in developing the demand side of the markets for low-carbon products. These products are still up to 80% more expensive than similar, conventionally manufactured products. It is considered challenging to re-fit production pathways and production sites to ensure increased low-carbon production, if the major investments required for this purpose can hardly be earned back due to insufficient demand for low-carbon products. This raises the question of how markets for low-carbon products can be created in the EU and globally. This may ultimately require full carbon cost pass-through, among other measures.

Markets for low-carbon products can be enabled, for example by a reduction of the free emission allowances allocated to producers under the Emission Trading Scheme. Strategies such as public procurement processes or labelling efforts must also be included. Any strategies aimed at more expensive non-sustainable production must take international competitiveness issues into consideration.

Increased energy efficiency

Energy efficiency should be further improved. Several examples and ideas were shared at the meeting, including improved utilization of residual heat originating from energy-intensive industries. This would ensure that residual heat from industrial activity would not end up unused, while simultaneously allowing consumers to heat and/or cool their homes in a much more efficient way. Such arrangements are expected to remain beneficial, although industrial sectors are expected to reduce their energy consumption (and therefore the resulting residual heat). In turn, households are expected to experience a comparable decline in demand for heating and/or cooling, ideally equalizing the trends.

Increased material efficiency

Increased material efficiency is another development that is expected to contribute to a reduction in carbon emissions. A strong increase in material efficiency requires the successful implementation of a circular economy strategy. In practice, this means reducing material losses during production and enhanced circular design, among others. For this purpose, companies need to (and do) reach out throughout their value chains, examine (their own) use of raw materials, look at their customers' products, and make/suggest improvements along the chain.

Furthermore, interesting examples were put forward with regard to increased emission efficiency. However, concerns were also raised. If society wishes to achieve 95 percent emission reductions or more, it is expected that (energy-intensive) industries will need to reduce their emissions to virtually

zero in order to ensure a successful overall decrease. When residual greenhouse gas emissions are factored in, total decarbonization is considered – by some – to be nearly impossible.

In addition, increased efficiency in the use of products can make tangible contributions to emission reduction. To that end, products need to be used more intensively and planned obsolescence must be prohibited.

Circularity

Besides efficiency, there is a need for increased circularity. To this end, the reuse of CO_2 emissions (Carbon Capture & Utilization, CCU) was presented as a possible opportunity. If a link can be established between steel production and the chemical industry, for instance, the production of base chemicals using ethanol could then be based on CO_2 emissions originating from steel production. The same goes for the production of plastics.

However, major GHG emission reductions can only be achieved when the chemicals (containing CO_2) are recycled to ensure that the carbon dioxide is contained in a continuous loop (and not released into the atmosphere). Nevertheless, this strategy has its limits. It is expected that sooner or later there will be no more room for additional carbon in the product cycle. Alternatively, Carbon Capture & Storage (CCS) could be used to store excess carbon.

Strengthening partnerships

There is a need to strengthen cooperation between industry and the scientific community in order to advance knowledge about ambitious transformation pathways, and to build partnerships around new value chains. Interesting examples of such new partnerships can be found in the German state of North Rhine-Westphalia, where different processes have brought together a range of stakeholders from industry, science and politics to enhance cooperation and to overcome information silos (whether policy-related, industrial or cultural).

Besides partnerships around new value chains and between the scientific community and industry, there should also be a solid dialogue with (organized) civil society. The exchange between industry and (organized) civil society should be strengthened to help obtain the required support for a future license to operate, as well as the required support for investments and infrastructure build-up.

Increased electrification

There seems to be a widespread consensus that increased electrification is part of a successful transformation of energy-intensive industries. However, increased electrification has a significant impact on the demand for electricity. Some argue that the electricity demand will increase by approximately five times the current level of electricity consumption in Germany. This future demand requires substantial investments in electricity generation, transmission and storage/reconversion in Europe. These investments need to be made, also by governments. A serious challenge faced by all stakeholders is the existence of current assets that are still profitable, but that cannot be included in future production capacity. A transition strategy needs to be developed which takes this aspect into account.

What mix of government policies is needed to achieve low-carbon production by energy-intensive industries?

Several types of governmental interventions were submitted for discussion by the stakeholders present at the round-table session.

Economic instruments

Various stakeholders argued that (public) money should be made available for investments in innovative pilot projects, in order to prevent the so-called 'valley of death' phenomenon frequently encountered in the innovation process, and to upscale technologies in support of market uptake. At the EU level, ETS innovation funds and the Horizon 2020 budgets should be utilized. Moreover, funding should not solely be granted to industries. Other stakeholders in the value chain should also be eligible to apply for such funding.

Furthermore, many participants underlined that public money is needed to support the development of new infrastructure and to develop key technologies such as Carbon Capture & Storage (CCS), Carbon Capture & Utilization (CCU) and hydrogen value chains. The participants in the session did not unanimously support CCS, however. Some considered CCS a 'back-stop' technology which should only be applied in those cases where no alternative mitigation options are available, for example because they are extremely expensive or insufficiently supported in society.

Session participants also raised the question whether subsidies / investment programmes are the only feasible way to promote innovation. Some stakeholders questioned the argument that costs could be socialized on the one hand, while on the other hand no proper taxation schemes apply to energy-intensive industries. Moreover, others argued that support for subsidies would be very low among EU governments, especially in countries where major austerity measures have been or will be implemented.

Fiscal instruments

It was also debated whether higher and stable CO_2 allowance prices or CO_2 tax increases would be a desirable incentive. Some participants argued that such measures would provide a meaningful incentive for innovation and to increase low-carbon production. By shifting the taxation burden from labour to emissions, for example, jobs would be protected while emissions would be discouraged. Others, however, argued that such measures would destabilize a level playing field and would harm the competitive position of European industries.

Institutional frameworks

An orderly phasing out of old energy regimes over several decades will involve redundancies along the value-creation chain in sectors such as coal and lignite.[6] Structural changes will inevitably have socio-economic consequences, which are expected to include both job transformation and losses in the affected sectors.

The socio-economic dimensions of the phase-out of the old energy regimes should not be underestimated. For example, in Germany alone some 48,000 people are currently employed in the lignite and coal sectors, according to the Federation of German Industries (BDI). In addition, an estimated 40,000 to 86,000 people work in industries linked to both sectors.[7] However, Germany is not the only country that will face significant challenges.

Consequently, governments should ensure a stable framework that can cope with the expected social impact of changes in industries, in the labour market, and in skills required. Possible governmental interventions may include support for job and skill transitions. This is one of the topics to be further elaborated by the EEAC Working Group on Energy and Climate Change in the course of 2018.

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[6] https://www.umweltrat.de/SharedDocs/Downloads/EN/05_Comments/2012_2016/2015_09_KzU_14_Future_of_ Coal.pdf?__blob=publicationFile&v=2

[7] Refer to R2B Energy Consulting and HWWI (2014), p. 38

Public procurement

The role of governments – on the demand side – was mentioned quite frequently. Existing public procurement policies are still predominantly price-driven. Consequently, governments do not support the demand side of industry decarbonization, nor do governments act as the launching customer. There is a need for green public procurement policies that assign priority to sustainability. By adopting such policies, governments can support growing markets, enabling more products to be manufactured at lower prices, ensuring further market uptake.

Spatial planning

Governments also have a role to play in spatial planning. To further enhance industrial collaboration and to ensure emission reductions, physical connections between industrial and non-industrial activities should be ensured through smart, future-oriented and sustainable spatial planning.

To conclude

I wish to thank all participants – including a variety of stakeholders – for their contributions. Furthermore, I would like to extend special gratitude to the experts who shared their insights with us during their introductions.

In line with the EEAC Network's aim of contributing to a transition to a more sustainable Europe that addresses the environmental, economic, social and cultural dimensions of sustainability, the EEAC Working Group on Energy and Climate Change will focus on a number of transition trajectories, with special attention devoted to the socio-economic challenges arising from these transitions.

Folmer de Haan
Chairman of the EEAC Working Group on Energy and Climate Change
Deputy Director of the Dutch Council for the Environment and Infrastructure (Rli)