# The NEW DEAL

## An Enlightened Industrial Policy for the EU through Structural EU ETS Reform

PUBLICATION BY THE CENTER FOR CLEAN AIR POLICY-EUROPE




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# About CCAP-Europe

The non-profit Center for Clean Air Policy-Europe (CCAP-Europe) is the sister organisation of the Washington, D.C.-based CCAP. CCAP-Europe is based in Brussels, Belgium. Established in January 2008, the purpose of CCAP-Europe is to significantly advance cost-effective and pragmatic air quality and climate policy through research, analysis, dialogue and public education. CCAP-Europe actively educates and involves a broad range of stakeholders worldwide in the formulation, promotion and adoption of such initiatives, in each case with a specific focus on Europe and other areas of the world which are particularly impacted by air quality and climate issues.

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This paper was published with the support of the European Climate Foundation.

# Vision for Europe

## This paper is the Center for Clean Air Policy (CCAP) Europe's contribution to the European Commission's stakeholder consultation into structural legislative changes to the EU Emissions Trading Scheme (ETS).

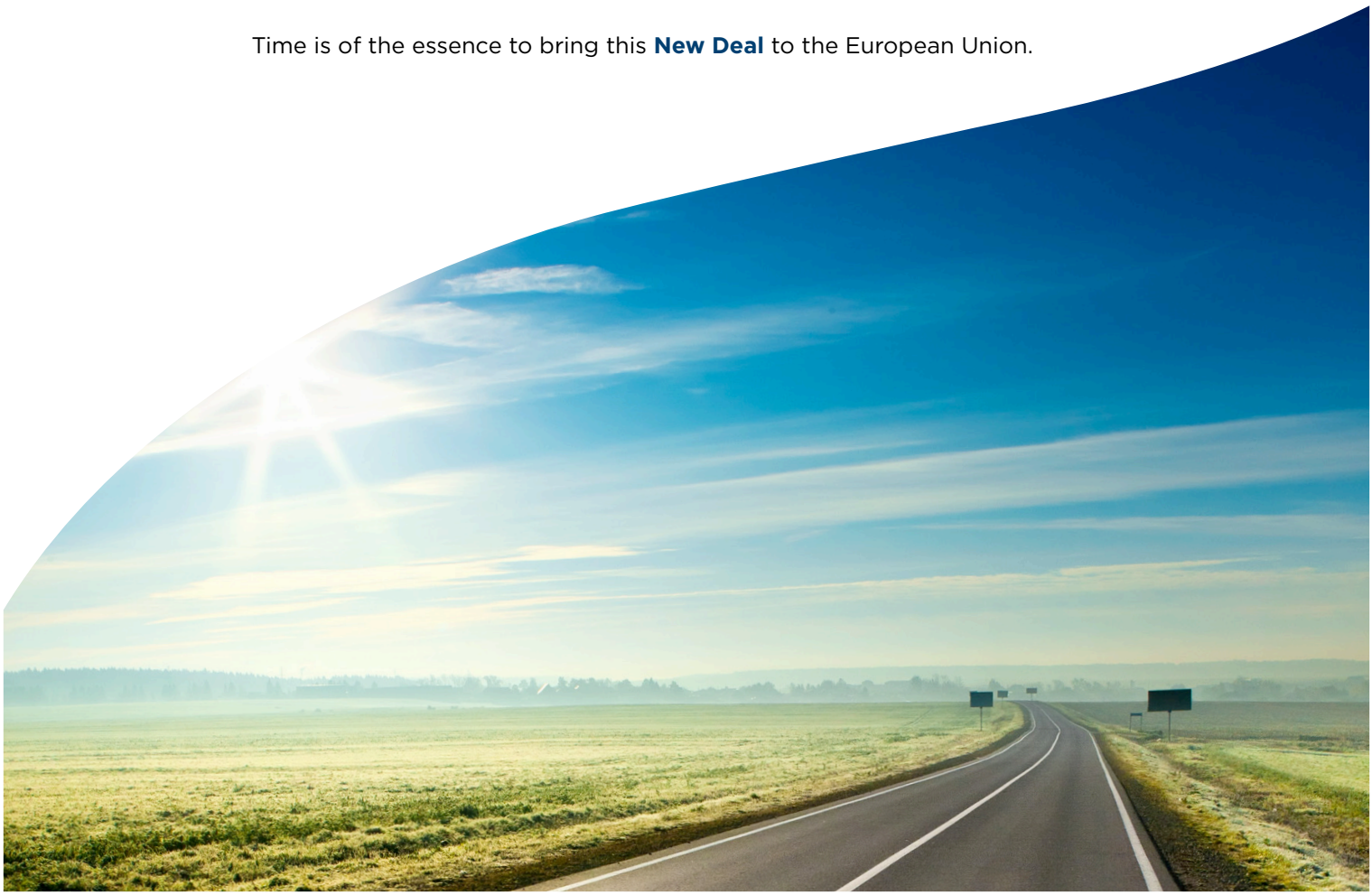
In this paper, CCAP-Europe presents a future for Europe's industrial policy which integrates **climate policy, innovation** and the Europe 2020 **smart green growth** agenda.

This new policy would take pressure off the EU and Member State budgets. It would **generate income** - up to €18 billion between 2015-2023 - to be redistributed through tools to support innovation-driven industrial policy. This vision serves the dual goal of helping **decarbonise Europe's economy** and **maintain competitiveness**.

Our proposal is **timely** and we believe will receive support from a wide range of stakeholders, including SMEs, industry, researchers and policymakers.

We urge the European Commission to consider this proposal and **mainstream climate policy** into **industrial policy** to build a cleaner, more innovative and competitive future.

Time is of the essence to bring this **New Deal** to the European Union.



# Introduction

**The European Union (EU) is currently facing multiple challenges on a range of fronts. Firstly, the recovery from the financial, economic and sovereign debt crises is ongoing and the current economic conditions in Europe have a dramatic impact on its industrial activities, particularly on new investments and access to financial capital.**

This economic fall-out is visible in rising unemployment, feeble economic growth or even decline in many EU Member States, structural austerity measures which could threaten social cohesion and an entrenched fight over the next EU budget.

The economic crisis has also exposed structural design deficiencies in the EU Emissions Trading System (EU ETS), to the point where a possible collapse is actively discussed within the climate policy arena. Such a collapse would be devastating for European climate policy cohesion and for the political momentum towards the implementation of cap and trade systems outside the EU, as well as the achievement of a global climate change agreement under the UNFCCC by 2015.



# Introduction

We have called this paper 'The New Deal' for two reasons. Firstly, the goal of this paper is to outline a compromise that would mitigate most of the concerns about structural intervention in the EU Emissions Trading System, in particular objections related to the possible loss of EU competitiveness. The current political divisiveness inside and between the European institutions and their stakeholders shows that the EU urgently needs to work towards a new climate consensus as the one reached in the first years of this century and which delivered the EU ETS and later the EU 2020 Climate and Energy Package has come under pressure recently.

This paper sets out targeted and innovative changes to the current emissions trading system which would be required to make such a 'New Deal' possible. To become a reality, this 'New Deal' needs support from a wide range of stakeholders.

While climate action is being mainstreamed in other European policy areas like development aid, energy and innovation, there is a 'reverse mainstreaming' which should also be considered. The designers of the EU ETS have been struggling for years to correctly address how an EU carbon price could affect the competitiveness of European industries and how to respond appropriately to this challenge. The EU ETS includes some so-called 'stop-gap measures' such as free allocation of allowances (where allowances are allocated freely rather than auctioned) to mitigate impacts on competitiveness. A structural and comprehensive approach to mainstream competitiveness into climate policy has not yet happened.

The second reason we have named this paper 'The New Deal' is inspired by the US response to the Great Depression of last century and the need for a consolidated economic EU response to its own, more recent Great Recession. We propose that through mainstreaming industrial policy and innovation into European climate policy, the EU ETS could become an important tool for assisting structural economic recovery and the build-up of a European competitive advantage in the new economy of the 21st century.

This policy paper does not address the specific challenges related to the EU power sector although indirectly, an enhanced EU emissions trading system addresses some of the sector's concerns related to a low carbon price and long-term uncertainty.

This paper puts forward measures to mitigate the surplus of EU allowances (EUAs) in the system and align the EU ETS caps with the long-term EU climate goal of 80% to 95% reductions by 2050 compared to 1990 levels. For smooth structural reform, intervention needs to be implemented by 2015 and should not impact the political status quo regarding the level of free allowances for energy-intensive sectors up to 2020.

It also outlines elements that should give the EU a smarter way to assess the risk of so-called 'carbon leakage' and how trade-related measures can be evaluated as a possible response. We finally introduce a new mechanism under the form of an Industrial Low-Carbon Transition Fund that should structurally address the mid and long-term challenges related to decarbonisation and competitiveness.

We outline the new European industrial policy that would be assisted through the proposed Industrial Low-Carbon Transition Fund. This list of proposed policy initiatives is broadly consistent with the European Commission's 2012 Industrial Policy Communication 'A Stronger Industry for

Growth and Economic Recovery' and would bring the necessary funding for proper implementation of this industrial policy.

Further inspiration for an enlightened European industrial policy is taken from three new and groundbreaking publications. Firstly, the McKinsey Global Institute report 'Manufacturing the future: The next era of global growth and innovation'. This publication shows how developing countries, emerging economies and mature markets such as the EU face different challenges following the economic crisis and how differentiated approaches are needed to address these. Secondly, the recent work 'Innovation Economics: the race for global advantage' by Robert D. Atkinson and Steven J. Ezell offers a so-called 'third way' toward new industrial policy and innovation. This innovative work places itself in the middle of the neo-liberal 'laissez faire' politics and the stark interventionism of 'picking the winners' by introducing a framework of policy measures that will facilitate and accelerate innovation and therefore improve the competitiveness of the manufacturing industry.

Finally, there is the fresh view on a sustainable future for key industries such as the steel, cement, paper, aluminium and chemical sectors in the book 'Sustainable Materials: Wth Both Eyes Open' by Julian Allwood. This work demystifies the concept that the low-carbon industrial revolution can only come from important and necessary breakthroughs in industrial processes. Looking at the future of low-carbon and sustainable materials with both eyes open includes implementing policies which dramatically enhance the overall resource efficiency of the whole economy.

**In line with this new thinking on industrial policy, we set out a holistic or broad-spectrum approach to mainstreaming industrial policy into climate action. This paper addresses the following themes:**

- **Process innovation** with the goal of bringing low-carbon breakthrough processes to the market within the next 15 years
- **Product innovation** with the goal of increasing value-added in products essential to a low-carbon and resource-efficient society
- **Value chain** and **business model transformation** with the goal of further reducing emissions, enhancing resource efficiency and finding new and smart opportunities for energy-intensive industries in a mature market
- **De-risking (venture) capital and debt** as a tool to facilitate access to finance, promote entrepreneurship and accelerate the market readiness of low-carbon products and processes
- **Social innovation** is needed to train and re-train the skills needed for the transition to a low-carbon economy

For each of these solutions, we propose a list of policy options that by using the means available in the new Industrial Low-Carbon Transition Fund could be implemented by 2015.

This paper also touches on the possible political dynamics between a structural EU ETS reform and the currently-stalled negotiations on the next EU Multiannual Financial Framework, also known as the EU budget 2014-2020. The combination of austerity at EU level, driven by smaller Member States' budgets, and embedded interests in the current budget are putting financial pressure on the EU budget for innovation and related industrial policy. The next EU budget could become another example of the vicious circle in which mechanisms for future growth are sidelined due to current economic circumstances.

# Introduction

We offer a solution to get out of this 'Catch-22' situation by proposing an increase in the European Union's own resources through the introduction of an 'Industrial Low-Carbon Transition Fund'. This approach has two clear benefits. Firstly, it will not directly affect the budgets of the EU Member States. Secondly, through earmarking the funds for industrial innovation, it will safeguard the funds in the proposed EU budget aimed at stimulating growth and innovation. We estimate that between €10-15 billion could be provided for in this manner in the period 2015-2020 and €18 billion in the period 2015-2023. This figure could be even higher through the financial leveraging mechanisms offered by the European Investment Fund (EIF).

The main conclusion of this paper is that the economic crisis should not be used as an excuse to postpone structural measures leading to an enhanced EU Emissions Trading System. Mainstreaming long-term industrial competitiveness into the EU ETS, through the Industrial Low-Carbon Transition Fund offers the opportunity to do more than just fix the EU ETS. It can transform the EU ETS into a tool that helps European industry build a competitive advantage in a global economy that will face more and more carbon and resource constraints over time. The EU ETS could then be a tool which finally serves the objective of decarbonising the European economy.

# Multiple challenges for Europe's climate and industrial policy

**As an introduction to the possible solutions for enhancing the EU ETS through structural reform, including the mainstreaming of industrial competitiveness into climate action, we outline the current and long-term challenges faced by both EU climate policy and European industry. We address the following issues:**

- Is the current low EU carbon price really a problem and if so, why?
- The risk of re-nationalisation of European climate policy
- Current and structural challenges for the European energy-intensive industries
- The challenge of achieving long-term decarbonisation targets, in particular through industrial roadmaps, whose implementation needs support from the EU innovation programmes
- Why the EU ETS will not guarantee the development and deployment of breakthrough technologies
- The link between the new EU budget and EU innovation and industrial policy

While the above points may look quite diverse and at first sight disconnected, we believe a short introduction to these issues is required to fully understand the climate and industrial policy concepts developed in this paper.

## Climate Challenge: Is the low EU carbon price really a problem?

Following the current economic crisis in the Eurozone, the EU ETS is facing a significant surplus of EU allowances. This surplus is estimated to be between 1.4 and 2.5 Gt and will depend significantly on how the European economy evolves or recovers in the next year. This surplus accrual is most likely to continue until the end of Phase III. The question is whether such structural surplus really is a problem.

In itself, a certain surplus quantity of allowances is not necessarily a problem. What is important is how the carbon market and therefore the carbon price responds to this surplus and what impact this has on climate action in Europe. While the European Commission projected an EU allowance (EUA) price of around €30/tonne by 2020 when it presented its updated EU ETS legislation in 2008, the current estimates by carbon market experts are much lower, going down to an average EUA price of around €12/t in the period 2013-2020.

A low carbon price would not need to be a problem if, for example, a higher than expected take-up of renewable energy and energy efficiency in Europe led to greater emission reductions. This in turn would lead to an EUA surplus and subsequently a lower carbon price. Such an evolution would not be seen as problematic from a policy perspective as the ETS would have succeeded in reducing emissions and boosting the adoption of renewable energies. To understand what is happening with the EU ETS and how it impacts EU climate action now and in future, we need to look at how the carbon price influences emission reductions in the sectors covered by the EU ETS. There are approximately four levels at which the carbon price affects short, medium and long-term mitigation behaviour.

The **short-term impact** of a carbon price is most easily seen in the power sector through a phenomenon called 'merit order switching'. With a sufficiently high carbon price, it is possible - depending on the relative gas and coal prices - for power producers to choose to switch power production away from coal power plants onto natural gas power production. A natural gas plant on average emits around one-third of the $CO_2$ emissions per kWh compared to a coal-fired power plant. The default merit order currently is that coal-fired power plants are switched on before natural gas-fired power plants. It is clear however that the current and projected carbon prices for Phase III of the EU ETS will be insufficient to switch the power production merit order towards natural gas which explains why the short-term impact of the current carbon price on $CO_2$ emissions is very low.

A higher carbon price could lead to tens of millions of tonnes fewer emissions in the EU only through the effect of merit order switching. At current gas and coal prices in Europe, this merit order switching would happen with a carbon price of €20-30/t. A carbon price of €20-30/t would start to close the gap between the so-called clean-spark and dark spread. The current difference between the clean-spark and clean-dark spreads in Germany is around €25.

The **medium-term impact** of a carbon price relates to the effect it has on energy-efficiency investments made by installations covered by the EU ETS. It is clear that a higher carbon price makes investments in energy efficiency more attractive through shorter payback times. The higher the carbon price, the greater this effect. For installations covered by the EU ETS, there are relatively short payback times in general, as shown in research from Climate Strategies.

The Climate Strategies findings were based on interviews with hundreds of company managers in the EU and show an average payback time of 3.76 years for energy-saving measures. To put this in perspective, a project with a four-year payback and constant annual cash flow over a 15-year lifetime has an internal rate of return (IRR) of 24%. Current payback times could be even lower due to the difficulty companies have gaining access to capital, e.g. loans, following the banking and economic crisis.

Putting a price on carbon evidently pushes more energy-saving measures into a company's acceptable payback time or IRR. This presents a double setback. Not only are companies taking fewer energy-saving measures following the economic crisis, but the serious drop in the EU carbon price has made energy-saving measures which would have been taken in 2008 at a carbon price of more than €20/tonne, unattractive for companies in 2013.

The **long-term impact** of the current low carbon price is by far the most dangerous. There is a risk that for large-scale projects with a long lifetime, e.g. large industrial installations like coal-fired power plants, the current carbon price is an insufficient deterrent towards carbon-intensive investments. If the low carbon price results in new investments in coal-fired power production in Europe, we risk locking ourselves in to a **high carbon pathway**. Over time, such ill-informed investments will lead to higher reduction costs or even stranded assets. They will also feed political resistance against more ambitious emission reductions in the future. It is even possible that the current situation, if not corrected, will make the agreed 80% to 95% reductions by 2050 technically and economically-impossible. **A lost decade on climate action** between 2010 and 2020 would be felt throughout the first part of the 21st century.

Finally, there is the missed opportunity of investing more in low-carbon breakthrough technologies. From 2013 onwards, European governments will receive billions of euro from auctioning EU allowances to the power sector. Some governments will earmark these revenues for the development of renewable energy and innovation. It is clear that a low carbon price will seriously harm the level of investment and innovation and could hamper the EU's competitive edge in research and innovation globally.

One example of such a setback is lower revenue coming from auctioning around 300 million allowances (informally known as the New Entrants Reserve 300 or NER 300) at EU level for a list of Carbon Capture and Storage (CCS) and innovative renewables projects. If the surplus of EU allowances and the low carbon price is not corrected, we might face what the European Commission in its 'Roadmap for moving to a competitive low-carbon economy in 2050' called a 'delayed Carbon Capture and Storage scenario' with EU carbon prices going up to €200-300/t. Such a scenario will, over time, be one of the most expensive ways to meet the 2050 targets.

We conclude that a sustained depressed carbon price in Phase III (2013-2020) of the EU ETS is a scenario that will endanger low-carbon investments, energy savings and finally the cost-effective implementation of long-term mitigation targets in Europe.

## Risk of losing of EU climate policy cohesion

As shown above, the current state of the EU ETS risks destabilising Europe's climate policy for decades. Some EU Member States realise this and have taken (or will take) steps to hedge the risk of not meeting their domestic climate targets. The UK recently introduced a carbon floor price to do exactly that. We also know that the German energy plans, including the nuclear phase-out and increased use of renewable energy, depend heavily on a higher EU carbon price. The current and projected price levels risk derailing the German energy future as laid out by German Chancellor Angela Merkel after the nuclear disaster in Fukushima in 2011. If Germany were to follow the UK example and act in a unilateral way, the EU would see more similar national-based approaches, moving away from a harmonised EU approach through the EU ETS and effectively **re-nationalising EU climate policy**. Such a re-nationalisation of EU climate policy would create an unlevel economic playing field across Europe at a time when more economic integration and streamlining seems to be a priority. In short, it could mean **the end of the EU ETS**.

For European companies, this might turn out to be a nightmare scenario as in the worst case, they would have to deal with 27 different carbon taxation and legislative systems across the EU. This would have a detrimental impact on the EU internal market and add an administrative burden to companies.

## The economic crisis hitting Europe's industrial sectors

The European manufacturing industry and in particular most of the energy-intensive sectors are currently facing multiple challenges. Since 2008, the financial and economic crisis since 2008 has led to a decline in production in important sectors in Europe. Most of this decline is due to a lack of downstream demand in Europe e.g. in the automotive, building and construction sectors.

Investments in the EU are not only hampered by this lower demand for products but also by the restricted access to capital, both loans and venture capital. To make matters even worse, the shale gas revolution in the US and the subsequent renaissance of the US manufacturing sector are having a negative impact on the competitiveness of the EU energy-intensive sectors.

Furthermore, the budget adjustments at Member State and EU level and the lack of private investment come with a clear risk that the EU will miss its Europe 2020 goal of spending 3% of its GDP on Research and Development. At the same time, we see other emerging economic regions approaching the current EU R&D spend of 2% of GDP (in 2010) while other major trading partners have gone beyond the EU level, such as the US (2.8%), Japan (3.4%) and Korea (3.4%).

**In the report 'Manufacturing the future: The next era of global growth and innovation', the McKinsey Global Institute identified the following essential factors which determine the competitive strength and hence influence the location of the energy-intensive sectors:**

- Access to raw materials
- Proximity to demand
- Transport costs and infrastructure
- Cost and availability of energy

### *Access to raw materials*

Access to raw materials plays a significant role in the EU steel and chemical sectors. For steel, the access to iron ore has guided investments towards Brazil in the past decade. However, the iron ore price collapsed from its all-time high in 2007, following the economic crisis. For the petrochemical sector, access to cheap feedstock for the production of olefins is an important factor determining the overall competitiveness of the sector. In the past decade, this has guided investments towards the Middle East and more recently the United States following the shale gas boom there.

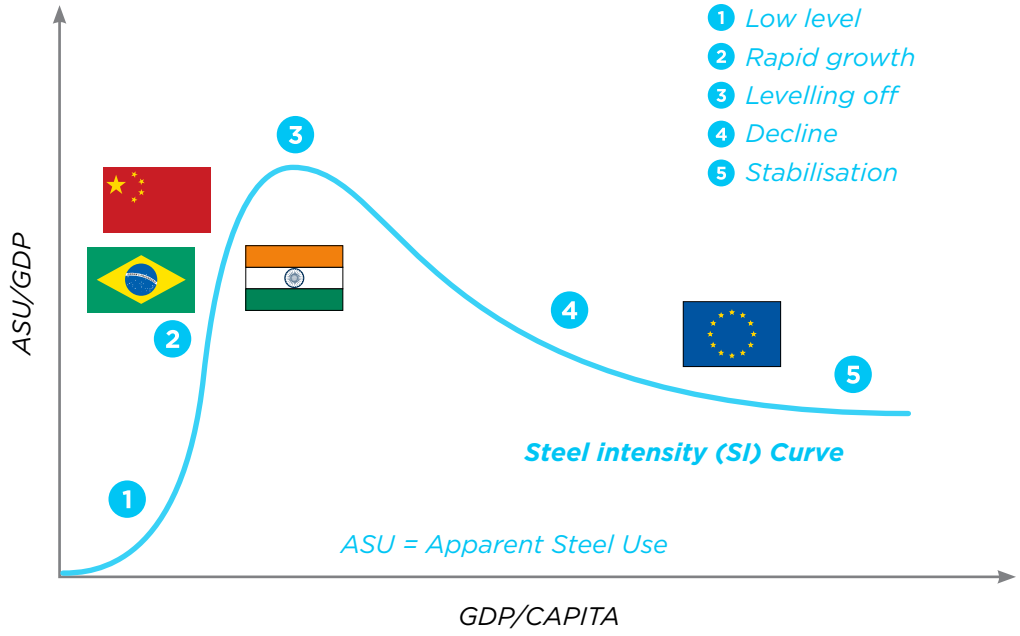
The EU paper sector has the benefit of having access to its main resource - wood - in Europe. However, cost-efficient access to this resource is threatened by EU renewable policies in some EU Member States, in particular subsidies for biomass co-firing in coal-based electricity production increase competition for the raw materials. The ceramics and cement sector still draw most of their raw materials from Europe.

### *Proximity to demand*

Declining demand in Europe is a major threat to the profitability of the European energy-intensive industries in recent years. The economic crisis has impacted downstream demand for many products such as steel for automotive and construction or cement and ceramics for the building sector. Since 2008, Europe's cement sector has been seriously impacted by the financial and economic crisis, due mainly to the decline in the European building and construction sector. Cement production stabilised in 2011, but declined once more in 2012, especially in southern Europe.

The European ceramic sector has seen a similar evolution to the cement industry in the past years. However, the ceramic sector is a highly-diverse industry with the more high-tech technical ceramic sectors such as aerospace, electronics, security and transport growing steadily. The crisis however is only one factor impacting the competitiveness of the EU region.

The EU is a mature market compared to emerging economies with increasing population growth and heavy investment in infrastructure for economic development. In the figure below, we show the example of how the Apparent Steel Use (ASU) per unit of GDP evolves following the development of economies around the world. The EU ASU/GDP has peaked while emerging economies such as China, India and Brazil are still seeing a rise in ASU/GDP following their economic development. It is however certain that the ASU/GDP in all these economies will level out and start to decline at a certain point. While the example of steel is telling, similar graphs can be replicated for many of the basic materials feeding our economy.




*Source: DG Enterprise and Armand Sadler, Former Chief Economist, Arcelor (2006)*

From this perspective, predicting higher demand for steel (or other basic materials) in Europe in the near future seems unreasonable. While on a global scale, the steel sector produced 1.2% more steel in 2012 compared to 2011, in Europe, production declined by 2.7% to 320 million tonnes of crude steel, almost 40 million tonnes less than the bumper year of 2007, according to the World Steel Association. Most of the growth in the steel sector is currently taking place in China, the Middle East and the United States. The declining demand in Europe is clearly linked to low sales volumes in the EU automotive sector and the slump in the building sector, both traditionally major consumers of steel.

Rising demand in China is, as always, linked to high economic growth and the specific development stage of China which requires large amounts of steel for construction, major infrastructure projects and more recently the automotive sector. The growth in the Middle East and the US seems also to be related to the low cost of energy. In the US, cheap shale gas is driving a so-called renaissance of the manufacturing sector with at least one new large-scale steel plant being announced in the US by NUCOR in Louisiana and other investments pending.

For instance, the ongoing crisis in Europe has led to an actual reduction in the crude steel production capacity through the permanent closures of blast furnaces. As such, it is physically impossible for the EU to go back to the steel production of the growth years 2006 and 2007. Having said this, it also is not true that demand for these basic materials will disappear in Europe. Even mature economies have a structural need for all of these materials, albeit lower than in emerging economies. The main question to be addressed is how these industries can meet the specific demands of a mature economy such as the EU.

Part of the solution lies in innovations related to the production processes, the products themselves but also in reshaping the value chain and business models within an economy that not only has limited demand for these products but also specific requirements in its overall development such as decarbonisation, energy security and resource efficiency.

### *Transport costs and infrastructure*

Transport costs and their impact on competitiveness are a double-edged sword for the EU's energy-intensive industries. A decline in international transport costs e.g. shipping would impact the amount of products imported into the EU. On the other hand, facilitating the transport of products within the EU through enhanced railroad and waterways networks could improve the overall productivity and cost in the industrial value chain.

### *Access to energy*

Last but not least, access to relatively cheap energy seems to be one of the major competitiveness constraints of the current European industry and in particular the energy-intensive sectors. In this, the EU is at a structural competitive disadvantage compared to the Russian Federation, the Middle East and more recently the United States. The consultancy Booz & Company explains the recent decline in EU chemical production by pointing out the investments in new production facilities for ethylene polymers in the US, again driven by the attractive low-cost feedstock shale gas. EU chemical production fell by 2.4% in the first nine months of 2012 and grew only modestly in 2011 by around 1.4%. The largest decline in production was seen in the polymers and speciality chemicals sectors, while other chemical production declined slightly less.

The chemical specialities are moving towards commoditisation implying that profit margins are shrinking. The production of other petrochemicals seems to be hindered by the oil price volatility and the move toward natural gas-derived chemicals. Booz & Company also noted that some European chemical companies still succeeded in finding value-added margins in new speciality products aimed at the green economy through smart acquisitions of smaller innovative companies or through acquisitions which offered access to consumers in emerging markets.

Unless Europe massively and unsustainably subsidises energy prices for decades to come, there is **no short-term solution** to address this challenge. Shale gas reserves in Europe could potentially be exploited, but most likely not at the scale that has been seen in the US. The controversial expansion of LNG capacity in the US could mitigate part of the higher natural gas price. However, the latter is not a given seeing the possible increased demand from Asia. There seems to be only one long-term and sustainable solution for Europe's energy-intensive sectors and that is dramatic **process and product innovation** through the research, development and deployment

of breakthrough technologies which have a much lower carbon and energy footprint or which use renewable energy and sustainable feedstocks.

For the steel sector, this could still involve the use of coal but in combination with advanced and more efficient blast furnaces and **carbon capture and storage** (CCS). The alternative solution would be the production of steel using electrolysis. This technology faces a steep development and deployment curve. The cement sector still has signficant room for progress in the use of existing and newly-developed substitutes for the energy and process emissions from heavy 'clinker' production.

The chemical sector is currently researching the replacement of natural gas or naphtha (hydrocarbons) feedstocks with bio-based feedstocks or biomass. To avoid excessive pressure on food production and other biomass-based industries like pulp and paper, the EU will have to make important policy choices such as giving preference to the deployment and use of sustainable biomass as an industrial feedstock compared to lower value-added biofuel production or burning biomass for electricity production. For the paper sector, its main feedstock - wood - is also an important energy source. The sector is currently exploring how it can diversify into higher value-added products by extracting more of the chemical value out of forest fibres. Potentially, the paper sector could transform itself into a sector which resembles the current chemical industry.

### *Conclusions*

We conclude that many of the critical competitiveness factors for the energy-intensive sectors in Europe are 'strained'. However, this pressure also offers important opportunities for new demand, innovation and transition. It must be acknowledged that activating this specific type of innovation and breakthroughs is not straightforward. Before we outline how structural EU ETS reform and the supporting industrial policy can be instrumental in this transition, we feature some of the key elements that could be part of such an industrial transition.

The recent report 'Manufacturing the future: The next era of global growth and innovation' by the McKinsey Global Institute shows that the manufacturing industry, following the disruptive economic crisis, can now enter an era of growth and innovation in both the developed and developing world saying "In mature economies, government policies aim to increase competitiveness through focused policies such as funding for R&D projects, tax breaks, import restrictions, and subsidies. Access to capital, cost of capital, and capital efficiency can also drive footprint decisions in some cases".

For mature markets such as the EU, a specific approach based on process and product innovation including the smart integration of the knowledge-based services sector and manufacturing industry are recommended.

The European Commission's most recent Industrial Policy Communication 'A stronger Industry for Growth and Economic Recovery', published in 2012, offers a similar, more holistic approach towards a competitive and sustainable future for the European industry. It states, "Europe needs new industrial investment at the time when lack of confidence, market uncertainty, financing problems and skills shortages are holding it back. Europe needs to reverse the declining role of industry in Europe for the 21st century.

Reindustrialisation is a way to deliver sustainable growth, create high-value jobs and solve the societal challenges we face. To achieve this, a comprehensive vision is needed, focusing on investment and innovation, but also mobilising all the levers available at EU level, notably the single market, trade policy, SME policy, competition policy, environmental and research policy, in favour of European companies' competitiveness."

**We support the ambition towards a new enlightened industrial policy which ensures a competitive and sustainable EU industry. This implies the need for enhanced modernisation of industrial processes and development and specialisation into higher value-added products relevant for a mature economy. In particular, this innovation and industrial policy programme should be guided by some of the major challenges faced by the EU economy:**

- The ability to achieve an economically-acceptable profit margin in a mature market
- The fact that the EU will have to compete with major economies which have a structural competitive advantage when it comes to energy costs and/or access to natural resources
- Related to the above, the need to maximise resource efficiency and reach almost full decarbonisation within the next 3-4 decades
- The need for new and advanced skills and skilled workers

More fundamentally, the European energy-intensive industries themselves need to develop a long-term vision to meet the challenges set out above. In the next section, we look at the status of these long-term visions within European industry.

## Achieving the 2050 reduction goals

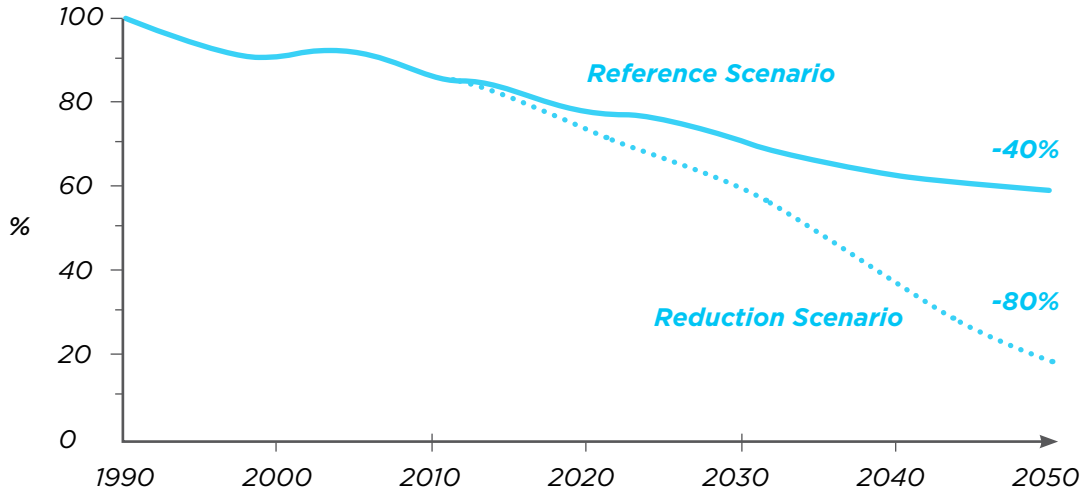
### *The EU 2050 low-carbon roadmap*

In March 2011, the European Commission presented 'A Roadmap for moving to a competitive low-carbon economy in 2050'. This low-carbon roadmap modelled and demonstrated the different trajectories leading to an 80-95% reduction goal by 2050 compared to 1990 emissions levels.

**According to the European Commission, the top line conclusions from this Roadmap are that:**

- The most cost-effective pathway to the 2050 reduction goal includes reduction milestones of 25% in 2020, 40% in 2030 and 60% in 2040
- To achieve the 2050 goal, an average of €270 billion investments are required each year e.g. in infrastructure and R&D
- The implementation comes with the benefit of average cost savings related to lower energy consumption of €170-320 billion per year and by 2050, €88 billion cost savings related to reduced health impacts through better air quality

The Roadmap contained 2050 emission trajectories per sector. According to the European Commission, the power sector will be almost completely decarbonised by 2050. For the EU industrial sectors, we see a scenario leading to 35-40% emission reductions by 2030, followed by steeper reductions of 83-87% reduction by 2050, as shown in the graph below. This post-2030 evolution is interesting as it points to the deployment of breakthrough technologies leading to a much smaller carbon footprint.




*Source: A Roadmap for moving to a competitive low-carbon economy in 2050, European Commission*

### *The development of industrial sector low-carbon roadmaps*

The European Commission's low-carbon roadmap is an interesting tool for assessing different policy choices for the future. However, a comprehensive roadmap for Europe's industrial sectors, including policy recommendations, was not developed. In its own report on 2050 decarbonisation, the European Parliament asked the EU's industrial sectors to develop their own low-carbon roadmaps. In this section, we briefly touch upon the state of play of these sector roadmaps and the EU innovation instruments which are being deployed. Although there are limited results so far, we can already draw some conclusions.

**The development of sectoral industrial low-carbon roadmaps is not straightforward. Successful roadmap development has to deal with several critical issues such as:**

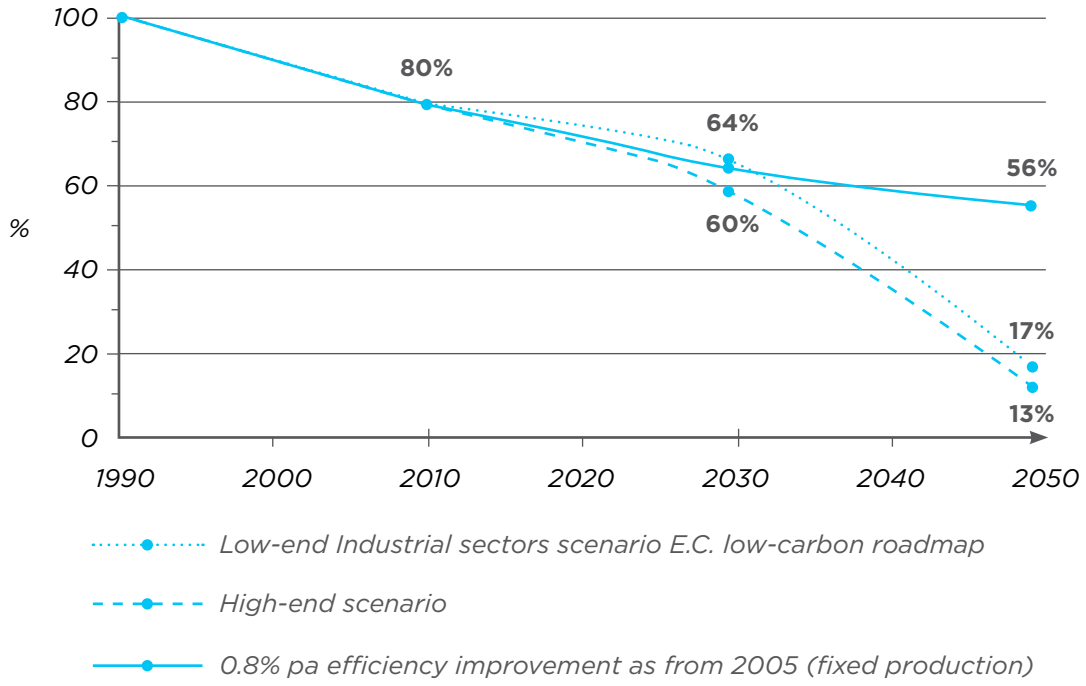
- Enabling the participation and support of the majority, if not all, of the companies and countries covered by the sector, including SMEs
- The acquisition of necessary data which is sometimes competition-sensitive
- Issues related to intellectual property rights (IPR) on the development of certain technologies

However, since these roadmaps deal with a longer horizon, some of the IPR and competition issues are less of a concern and therefore enable broad company and country participation.

The usefulness of industrial sector roadmaps will depend on their actual scope. There is a risk that roadmaps will be developed in a narrow fashion with the purpose of demonstrating that only limited progress in reducing emissions is possible in the short-term or if the Roadmap is used only for public relations and perception purposes and to give the sector a 'greener' image. Roadmaps also need to include an action plan for their implementation.

Roadmaps with reduced scope are missing out on the broader benefits of advanced long-term thinking within an industrial sector. An industrial low-carbon roadmap should not only be about assessing the technological potential for emission reductions but has to place itself within the broader economic challenges of a mature economy like the EU. Some of these challenges were outlined in the beginning of this section. The development of an industrial low-carbon roadmap is only the beginning of a transformation process within the industrial sectors. A good roadmap must already include the outline of an implementation plan and therefore needs to highlight the specific policy and other barriers that stand in its way.

**INDUSTRY 2050 REDUCTION PATHWAY**




*Source: A Roadmap for moving to a competitive low-carbon economy in 2050, European Commission*

Commitment is needed across the industry to implement the vision set out in the Roadmap.

### *The paper industry*

In November 2011, the Confederation of European Paper Industries (CEPI) was the first energy-intensive sector to present a 2050 low-carbon Roadmap. 'Unfold the Future' clearly set the benchmark for Roadmaps as it applies broad scope into its development. Its strength lies in the holistic approach that includes broader market developments and opportunities in a challenging mature EU market and through the transformative thinking that is presented. The CEPI Roadmap states that additional capital expenditure and operational costs can only be financed by moving into higher value-added products.

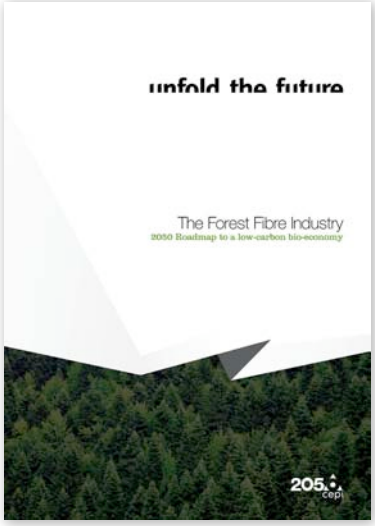
The transformation of the paper sector into the 'forest fibre industry', which aims to extract the most value-added from wood into advanced chemicals and materials is the driving force behind this quest for higher added value in the final products. The forest fibre sector seems committed to meeting the challenge of reducing its emissions by 80% in 2050. However, according to CEPI, that will not

be possible without the research, development and deployment of breakthrough technologies related to the pulp and paper-making processes. The development of these technologies will, due to their high upfront cost and related risks, require active support from the EU and national policies.

The EU paper sector has started to implement its low-carbon roadmap through an innovative '2-team project' which aims to crowdsource and select breakthrough ideas to help the sector achieve a 80% decarbonisation of the industry combined with a 50% value creation by 2050.

To bring the necessary breakthroughs to market, the EU paper sector is supporting the development of BRIDGE (Bio-based and renewable industries for growth in Europe), a joint technology initiative (JTI) and institutional public-private-partnership (PPP).

The scope of the BRIDGE PPP is broad and ambitious. We highlight a few key goals below.




The BRIDGE PPP activities will help guarantee a secure and sustainable supply of lingocellulosic biomass including waste for European biorefineries through the development of integrated and sustainable agricultural and forestry value chains. Its results will contribute to achieving a 10% increase in biomass supply in Europe by 2020 and 20% by 2030 by increasing productivity and mobilisation in a sustainable manner, while making best use of innovations in agriculture and forestry practices.

Activities under BRIDGE will stimulate the mobilisation and utilisation of by-products and waste from various bio-based sources, including agriculture, forestry, waste water treatment, sludge, organic household waste, yard waste, food processing waste and debarking waste, to be increased to 15% of the total amount in 2020 and 25% in 2030.

The PPP will contribute to protein isolation and valorisation from additional biomass processing that will result in a 15% reduction in imports of protein e.g. soy for feed in Europe in 2020 and 50% by 2030. Optimisation of soil fertility programmes including the recovery and use of phosphate and potash will lead to 10% lower imports of these components for fertilisers applied to feedstock production and 25% by 2030.

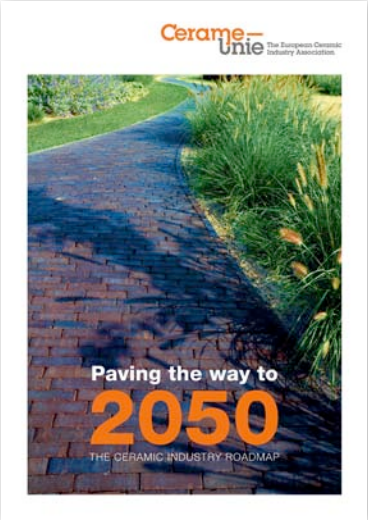
An important goal of the BRIDGE PPP is to contribute to and trigger the industrial deployment of bio-based chemicals, bio-materials and advanced biofuels, so that 20% of chemicals and materials production in Europe will be bio-based by 2020 and 30% in 2030, compared to the current situation where only 10% of chemicals and materials are bio-based.

In particular, at least seven 'first-of-its-kind' flagship plants will be constructed to optimise technology for lignocellulosic conversion and to ensure price competitiveness for a second wave of commercial production, expected to kick-in from 2017.

Finally, the BRIDGE PPP will bring forward a new generation of bio-based materials and composites, allowing the production of better-performing components for application in several industries. The ambition is that in

2020, the market supplied by bio-based polymers and composites with a comparable quality-price ratio to petro-based alternatives will be five times higher than today, and by a factor of 10 in 2030.

### *The ceramic industry*




In November 2012, the EU ceramic industry trade association Cerame-Unie presented its 2050 low-carbon roadmap 'Paving the way to 2050: The Ceramic Industry Roadmap'. Although the ceramic sector roadmap is a bit more modest in its scope compared to the EU paper sector's roadmap, it reaches similar conclusions. In particular, the sector identifies pathways that will help achieve emission reductions in the order of 70-80% by 2050 but through the deployment of key low-carbon breakthroughs in the production of ceramics, such as the use of low-carbon syngas.

However, these technologies are currently not market ready or market-competitive and require policy support for their commercial deployment. The EU ceramic sector is investing in the proposed EU SPIRE (Sustainable Process Industries through Resource and Energy Efficiency) PPP as an instrument to forward these breakthroughs.

### *The steel industry*

Eurofer, the European steel sector trade association is currently developing its 2050 low-carbon roadmap. The roadmap is expected in Spring 2013. However, the European steel sector already has a rich and interesting history when it comes to researching and piloting low-carbon breakthrough technologies.

ULCOS (Ultra–Low Carbon Dioxide Steelmaking), set up in 2004, is a consortium of 48 European companies and organisations from 15 European Member States that have launched a cooperative research and development initiative to enable drastic reductions in the carbon dioxide ($CO_2$) emissions from steel production. The consortium consists of the major EU steel companies, energy and engineering partners, research institutes and universities and is supported by the European Commission. ULCOS' goal is to reduce the carbon dioxide emissions of today's best routes to producing steel by at least 50%.

The development of breakthrough technologies into mature industrial applications involves a level of risk and requires at least one additional scale-up step. This demonstration stage will take the ULCOS programme into Phase II. ULCOS II will explore the potential and feasibility of some of the ULCOS I technologies under large-scale, industrial production conditions. This will involve considerable additional R&D investment by the ULCOS consortium, the European Commission and other funding partners. ULCOS II will run from 2010 to 2015. The results of ULCOS II can potentially be rolled out into production plants 15-20 years from now.

However, there are question marks on the actual deployment of ULCOS II. As a public-private-partnership, the next phase of ULCOS is dependant on the availability of EU and industry funding. The availability of public funding will be impacted by the outcome of the current EU 2014-2020 budget negotiations.

### *The chemical industry*

Like Eurofer, the European chemical industry association - Cefic - is currently developing its own 2050 low-carbon roadmap, expected to be finalised before Summer 2013. At this point, the EU chemical sector is one of the driving forces behind the SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) public-private-partnership.

While the chemical sector is an important player in SPIRE, other process industries such as steel, ceramics, cement and non-ferrous metals are also involved. This PPP will involve large corporates, top academia and high-tech SMEs to develop innovative technologies and breakthrough materials for the future that will modernise the European industrial landscape in becoming a competitive process partnership, as a global solution provider towards a clear set of breakthrough ambitions related to crucial resource-efficiency targets.

SPIRE is aiming to reduce fossil energy intensity by up to 30% from current levels by 2030 through a combination of technologies like cogeneration-heat-power, process intensification, introduction of novel energy-saving processes and progressive introduction of alternative (renewable) energy sources within the process cycle.

It also aims to have up to 20% reduction in non-renewable, primary raw material intensity versus current levels by 2030, by increasing chemical and physical transformation yields and/or using secondary (through optimised recycling processes) and renewable raw materials. This may require more sophisticated and more processed raw materials from the raw materials industries. SPIRE is a contractual PPP with €1 billion public and €1 billion private participation. However, the final budget for SPIRE will depend on the outcome of the EU 2014-2020 budget negotiations.

### *The cement industry*

CEMBUREAU, the European cement sector federation is in the process of developing its low-carbon roadmap, also expected by Summer 2013. The EU cement sector can draw on the work of the Cement Sustainability Initiative (CSI) which developed a global low-carbon roadmap for the cement sector. This roadmap consists of enhanced energy efficiency, the higher uses of clinker substitutes and finally the use of carbon capture and storage as instruments to achieve far-reaching emission reductions.

### *The European Commission*

On its side, the European Commission launched the SILC (Sustainable Industry Low Carbon) initiative to help energy-intensive sectors to achieve specific GHG emission intensity reductions in order to maintain their competitiveness. The SILC scheme is intended as a practical, industry-based initiative at EU level to identify, develop and deploy both technological and non-technological innovation measures. It is foreseen that the EU will co-finance up to 75% of the costs of the industry-led projects respectively.

The SILC initiative is implemented in two steps. SILC I (2011-2013) aims to find technological and non-technological innovation measures to reduce the carbon intensity for a wider range of sectors which can be implemented in the short-term i.e. immediate to three-year horizon and which do not require a further demonstration programme before their industrial implementation.

SILC II (2014-2020) focuses on further progress on measures or possible breakthrough solutions which require demonstration programmes and validation prior to their industrial implementation. SILC explicitly aims to develop and deploy innovation measures, technological and non-technological, provided these lead to a demonstrable and quantifiable reduction of specific GHG emission intensities in an industry sector covered by the EU ETS Directive. Currently around €90 million in public co-financing is foreseen for SILC II. This figure depends on the outcome of the ongoing negotiations on the EU 2014-2020 budget and in particular the funding under the research and innovation programme Horizon 2020.

One of the main red lines to be drawn between the existing low-carbon roadmaps and industrial policy programmes is the **need to invest** in the research, development and deployment of low-carbon **breakthrough technologies**. This is a de facto acknowledgement of the **limits of the EU Emissions Trading System**. While the EU ETS has been successful in setting a price on carbon and hence a visible opportunity cost for its participants, it will not be the main tool to bring industrial process and product breakthroughs to market. However, once these technologies have reached the market, the EU ETS will ensure faster and wider deployment.

The main reason the EU ETS cannot tap into these breakthroughs is the risk and related cost barriers. For individual companies, the risk of betting on new and expensive process breakthroughs is too high. If the technology fails, a significant proportion of shareholder value could be lost. If the expensive 'first of a kind' technology does function, there is the risk that through knowledge-leakage, a 'second of its kind' installation is built by a competitor at lower cost. This is where targeted public support through policy programmes can help bridge the gap. In the section on 'An Enlightened Industrial Policy', we outline proposals for enhanced European industrial policy, building on existing programmes and how EU ETS auctioning revenues can become the catalyst to kickstart and execute this breakthrough technology revolution.

## EU 2014-2020 budget stand-off

This section concludes by highlighting the link between industrial low-carbon roadmaps, low-carbon breakthrough technologies, EU innovation programmes as mentioned above and the next EU budget.

European leaders are currently deciding on the new EU Multiannual Financial Framework (2014-2020). These EU budget negotiations have proven to be very difficult but should be concluded in the first half of 2013. A combination of unwillingness to increase the EU budget while at the same time wanting to maintain financial flows from the EU into national budgets particularly for agriculture and cohesion funding has resulted in the proposed budget for the EU innovation and growth flagship Horizon 2020 coming under pressure.

Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Running from 2014 to 2020 with a proposed €80 billion budget, this new programme for research and innovation is part of the drive to create new growth and jobs in Europe. Horizon 2020 will combine all research and innovation funding currently provided through the Framework Programmes for Research and Technical Development, the innovation-related activities of the Competitiveness and Innovation Framework Programme (CIP) and the European Institute of Innovation and Technology (EIT).

**The proposed support for research and innovation under Horizon 2020 aims to:**

- Strengthen the EU's position in science with a dedicated budget of €24.6 million. This will provide a boost to top-level research in Europe, including a 77% increase in funding for the European Research Council (ERC)
- Strengthen industrial leadership in innovation by €17,938 million. This includes major investment in key technologies, greater access to capital and more support for SMEs
- Provide €31.7 million to help address major concerns shared by all Europeans such as climate change, sustainable transport and mobility, affordable renewable energy, food safety and security and the ageing population

Horizon 2020 aims to tackle societal challenges by helping bridge the gap between research and the market by, for example, helping innovative companies to develop their technological breakthroughs into viable products with real commercial potential. This market-driven approach will include creating partnerships with the private sector and Member States to bring together the resources needed.

Internationally-renowned innovation economists see Horizon 2020 as a decent initiative as it streamlines Europe's innovation funding but also mainstreams the EU's innovation project with major economic and environmental challenges, growth and energy security and climate action and resource efficiency.

Cutting back on innovation spending in the next EU budget could therefore not only be detrimental for the economic outlook of our economy, but would also be a body blow to the objective of making the EU a frontrunner in addressing the technological challenges related to reducing greenhouse gas (GHG) emissions. In particular, the SILC II, SPIRE, bio-based industries and ULCOS II PPP projects which will derive their funding from the Horizon 2020 budget could see their already modest financial means further reduced.

Currently, EU heads of state and government and European Parliament are still divided on the level of the next EU budget and on how it should be spent. The European Parliament has shown disappointment with the EU budget compromise reached at the 7-8 February 2013 European Council meeting. In particular, the reduction of the overall EU budget, cuts in innovation and growth spending compared to the original proposal and the lack of more EU financial instruments and resources are of major concern.

In the following sections, we show how part of the stalemate related to the EU's 2014-2020 budget can be overcome through innovative EU ETS and industrial policy reform. We outline how earmarking part of the EUA surplus can enhance the European Union's own financial resources. We will also show how these new revenues should best be spent to enhance the low-carbon transformation of our industry while maintaining and improving Europe's industrial competitiveness.

# Structural EU ETS reform

## The framework for structural EU ETS reform

**We have outlined the reasons in favour of structural intervention in the EU ETS. We concluded that a sustained depressed carbon price in Phase III (2013-2020) of the EU ETS would put low-carbon investments, energy savings and finally the cost-effective implementation of long-term mitigation targets in Europe at risk.**

At this point, short-term intervention to support the EUA price is being debated between EU Member States and the European Parliament. Initiated by the European Commission, this short-term measure aims to postpone auctioning 900 million allowances from 2013-2015 until 2019-2020, by which point demand is expected to have picked up. This 'backloading' of auctions would be done by amending the EU ETS Auctioning Regulation. However, backloading does not reduce the overall number of allowances to be auctioned during Phase III, only the distribution of auctions over the period.

The backloading approach comes with the risk that if measures leading to structural change in the supply of allowances are not implemented before the backloaded allowances are added to the market, another price collapse could happen.

According to the European Commission, "This risks undermining the orderly function of the carbon market. Moreover, if these imbalances are not addressed, they will profoundly affect the ability of the EU ETS to meet more demanding emission reduction targets in future phases in a cost-effective manner."

To anticipate this problem and as a kick-off to the process that will inform the proposal of structural legislative changes to the EU ETS, the European Commission launched an official stakeholder consultation on possible structural solutions. This paper is the Center for Clean Air Policy Europe's contribution to that process.

**In its November 2012 report on 'The state of the European carbon market', the European Commission identified six options which could potentially correct the surplus:**

- Increasing the EU's GHG emissions reduction target for 2020 from 20% to 30% below 1990 levels
- Retiring a certain number of Phase III allowances permanently
- Revising the 1.74% annual reduction in the number of allowances to make it steeper
- Bringing more sectors into the EU ETS
- Limiting access to international credits
- Introducing discretionary price management mechanisms such as a price management reserve

In our view, most of these options look interesting, however a structural and powerful reform of the EU ETS that meets the multiple challenges which the EU is currently facing will require a combination of the policy options proposed. Also and more importantly, the EU ETS reform must be embedded in a broader and holistic industrial policy vision consistent with the structural transformation and decarbonisation of the EU economy, while at the same time improving Europe's economic competitiveness. The European Commission has successfully implemented the mainstreaming of climate action into other policy areas, but the opposite movement of mainstreaming competitiveness and innovation economics into climate policy and the EU ETS in particular is lagging behind.

**The structural EU ETS reform as proposed by the Center for Clean Air Policy Europe is built around the following framework:**

- Structural intervention needs to be agreed on and implemented as soon as technically possible and preferably before 2015 to give market participants and investors the prospect of long-term legal certainty within the shortest possible time
- Structural EU ETS reform has to make the long-term cap trajectory consistent with achieving the EU 2050 climate target in a cost-effective manner
- The comprehensive structural reform of the EU ETS should eliminate the need for major new interventions beyond 2020, even under diverse economic situations
- The direct impact of structural ETS reform before 2020 on sectors exposed to carbon leakage has to be minimal
- The structural ETS reform has to include new (financial and non-financial) tools that address and enhance the long-term competitiveness of European industry by mainstreaming economic development and innovation into European climate action

## Proposals for structural EU ETS reform

We believe that the six options presented by the European Commission as guidance to the stakeholder consultation are not fully consistent with the framework for structural reform outlined above. Successful long-term EU ETS reform will require the combination of different options and the introduction of new tools and instruments under or linked to the EU ETS.

We propose a combination of changes to the EU ETS and to Europe's industrial policy. In this section, we will focus on technical changes to the existing EU ETS. In the next section, we link these changes to the development and implementation of an enhanced European industrial policy.

***We propose the following technical changes to the EU ETS:***

### 1 Set aside the 1.4 billion allowances which are supposed to be auctioned in period 2013-2020

The first step in our structural reform proposal is to set aside 1.4 billion EUAs which were intended to be auctioned in the period 2013-2020. This can be achieved in two different ways. Firstly by reducing the planned auctioning volumes by EU Member States and secondly to change the EU ETS Directive so that the remainder of allowances in the New Entrants Reserve does not enter the market all at once at the end of 2020. This last measure alone could allow up to 400 million EUAs to be set aside.

In order not to disrupt the annual entrance of EAUs to the market too much, the 1.4 billion EUAs should be set aside in parts of 200 million EUAs, set aside each year from 2015 until 2021.

### 2 Create an EU-wide Industrial Low-Carbon Transition Fund using set-aside allowances

Out of the 1.4 billion EUAs set aside, 900 million EUAs would be transferred to a new Industrial Low-Carbon Transformation Fund. This fund can be constructed similar to the EU ETS New Entrants Reserve 300 (NER 300).

The NER 300 set aside 300 million allowances in 2008 in the Revised EU ETS Directive. These 300 million EUAs will be auctioned early in the period 2013-2020 and revenues will go towards the development of carbon capture and storage installations in Europe and to innovative renewable energy technologies. The European Investment Bank (EIB) was responsible for raising the funds from this NER 300 by auctioning the EUAs in this reserve.

From 2015, the new Industrial Low-Carbon Transition Fund will gather financial revenue in a similar fashion, through the annual auctioning of 100 million EUAs. This fund would become the key driver for low-carbon innovation in Europe's energy-intensive industries if its resources were invested in a targeted and smart manner.

The following sections show how smart implementation of this new mechanism can enhance the long-term competitiveness of Europe's industry and how it can play a role in breaking the political deadlock around the EU's Multiannual Financial Framework for the period 2014-2020.

## 3 Create a special reserve for quantitative easing

The remaining 500 million EUAs set aside would be quarantined into a new Quantitative Easing Reserve. This reserve would mitigate the impact of future spikes in carbon prices. It would require the legal design of an automated mechanism which activates the auctioning out of the Quantitative Easing Reserve, including a price ceiling moving upwards in time. The revenues that come with the activation of the Quantitative Easing Reserve should be used to buy back allowances in case the EU allowance price drops below a certain level e.g. a price floor. The introduction of an EUA supply side response in the EU ETS would ensure a higher level of price stability. That in turn will de-risk investment decisions which are related to an EU carbon price, such as investments in energy efficiency measures.

## 4 Adjust the linear reduction factor as from 2015

The main structural measure and the most transparent way to both enhance scarcity in the EU carbon market and to align the EU ETS long-term reduction trajectory with Europe's 80% to 95% 2050 goal is the adjustment of the annual linear reduction factor of the EU ETS cap. The fact that we suggest implementing the higher linear reduction factor will ensure smooth absorption of the EUA surplus which accumulates over the period 2008-2014. Delay in its implementation would lead to higher correction factors if we are to achieve the same result.

We propose a two-step adjustment. From 2015, the annual reduction factor would be changed from 1.74% to 2.5%. This change means that the annual cap reduction would increase from around 38 million EAUs to around 58 million EAUs from 2015.

Until 2020, this adjustment is only subtracted from the amount of allowances to be auctioned. The level of free allocation, including the cross-sectoral correction remains untouched. As from 2020, the linear factor of 2.5% is applied to all sectors.

Although enhancing scarcity in the short term in the EU ETS, the direct impact on energy-intensive industries would be minimal. The short-term uncertainty for energy-intensive sectors introduced by amending the EU ETS can be further limited through suspending the planned review of sectors deemed to be exposed to carbon leakage and therefore eligible for 100% free allowances from 2014 until 2020.

## 5 Leave the amount of free allowances untouched up to 2020 and link to the international framework

As mentioned above, the two-step introduction of the enhanced linear reduction factor will have no impact on the level of free allowances up to 2020. We suggest that the review of the level of free allocations beyond 2020 should be linked to the outcome of the UNFCCC climate negotiations in the next eight years. It should be further linked to the assessment of the way and level in which a carbon price is introduced by the EU's major trading partners by 2020.

## 6 Avoid external credits generating another EUA price slump

One of the reasons EUAs are currently trading at an extremely low price, in addition to the effects of the economic crisis, is because up to 1.9 billion external credits (CERs and ERUs) are able to be used in the EU ETS between 2008 and 2020. This in essence adds the equivalent of more than a year of GHG emissions to the EU ETS cap under the EU ETS.

To both enhance scarcity as outlined in our proposal above and allow greater influx of external credits at the same time would negate the effect of the first measure. As such at this time, we cannot support the use of more external credits under the EU ETS.

However, if there is political will to allow more external credits, this should be compensated through a higher linear correction factor. An alternative option for Member States willing to use more external credits is the introduction of the obligation to cancel one EUA (from the auctioning volume) for each additional external credit that enters the EU ETS.

After 2030, the option of enhanced flexibility through external credits could be revived. In the European Commission's 2050 low-carbon roadmap, the EU 2050 reduction goal of 95% allows for up 15% use of external credits.

## 7 Evaluate and consider implementing trade-related instruments to negate carbon-related distortion of competition

The EU has been too modest in assessing the impact on trade flows related to the introduction of the EU ETS in Europe and the absence of carbon pricing in most of the EU's international trading partners' economies.

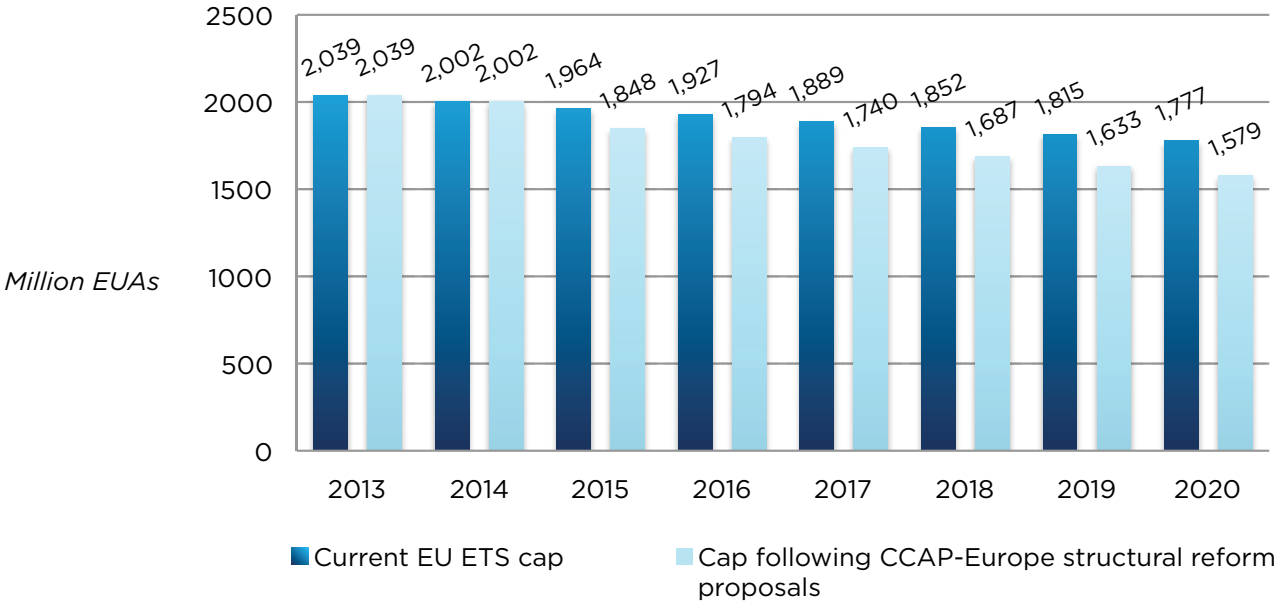
The current criteria to assess the risk of carbon leakage are useful but they are blunt and according to some economists not the right tools for measuring this risk. These criteria need to be reviewed by 2020 at the latest and should include regional differentiation within the EU. For example, due to the technical and cost constraints related to moving cement over larger distances, a cement plant in the middle of Germany would have a lower risk of carbon leakage compared to one on the EU's borders. Furthermore, the new analysis must include the recent evolutions related to emissions trading systems being developed and implemented across the world. Finally, the assessment must include realistic carbon prices and direct cost calculations.

In the run-up to a new international agreement on climate change under the UNFCCC in 2015 and the implementation thereof by 2020, the European Commission has to explore the full range of trade-related measures that could be deployed with respect to international climate action 'free-riders'. This assessment needs to be transparent in the way that it assesses both the benefits and/or the negative impacts of such measures and its consistency with international trade agreements. While it can be complicated to implement a Pareto optimal policy, this must be explored. Only when the most complete and up-to-date information has been collected can a sensible and well-informed policy debate take place.

## Expected results of the proposed structural reform

**The combination of structural measures as proposed above is presented in the table below. The top line results are as follows:**

- In the period 2013-2020, around 900 million EUAs would be kept out of the EU ETS compared to the current EU ETS caps for the same period
- In the period 2013-2030, EUA scarcity is enhanced by 2.7 billion
- The EU ETS long-term cap trajectory is consistent with almost complete decarbonisation by 2050
- At an average carbon price of €20/t, the 900 million EUA Industrial Transition Fund (to be auctioned in 100m chunks in the years 2015-2023) will result in €18 billion in financial revenues. Over the period 2015-2020, this amounts to €12 billion
- The auction revenues for EU governments, even with the reduced level of auctioning of around 25% compared to the current EU ETS rules, should increase due to the fact that the carbon price is expected, percentage wise, to go significantly higher, e.g. from the current level of less than €5/t to more than €20/t in 2020




*Source: CCAP-Europe*

In this table, we show the impacts on the EU ETS cap between 2013 and 2030 following the structural adjustment proposals as mentioned above.

| Year | Current ETS caps (with 1.74% linear reduction) Mt $CO_2e$ | 1.4 Gt set-aside (spread in 200 Mt parts over 2015-2021) [A] | 900 Mt of set-aside auctioned for Low-Carbon Transition Fund (spread in 100 Mt parts over 2015-2023) [B] | Total cap linear adjusted (from 1.74% to 2.5% as from 2015) [C] | NEW EU ETS caps = linear adjusted cap – set-aside & delayed auctioning ([C]-[A]+[B]) | Difference between original ETS caps and new EU ETS caps (Mt $CO_2e$) |
|---|---|---|---|---|---|---|
| 2013 | 2,039 | | | 2,039 | 2,039 | 0 |
| 2014 | 2,002 | | | 2,002 | 2,002 | 0 |
| 2015 | 1,964 | 200 | 100 | 1,948 | 1,848 | 116 |
| 2016 | 1,927 | 200 | 100 | 1,894 | 1,794 | 133 |
| 2017 | 1,889 | 200 | 100 | 1,840 | 1,740 | 149 |
| 2018 | 1,852 | 200 | 100 | 1,787 | 1,687 | 165 |
| 2019 | 1,815 | 200 | 100 | 1,733 | 1,633 | 182 |
| 2020 | 1,777 | 200 | 100 | 1,679 | 1,579 | 198 |
| 2021 | 1,740 | 200 | 100 | 1,625 | 1,525 | 214 |
| 2022 | 1,702 | | 100 | 1,571 | 1,671 | 31 |
| 2023 | 1,665 | | 100 | 1,518 | 1,618 | 47 |
| 2024 | 1,627 | | | 1,464 | 1,464 | 164 |
| 2025 | 1,590 | | | 1,410 | 1,410 | 180 |
| 2026 | 1,552 | | | 1,356 | 1,356 | 196 |
| 2027 | 1,515 | | | 1,302 | 1,302 | 213 |
| 2028 | 1,478 | | | 1,249 | 1,249 | 229 |
| 2029 | 1,440 | | | 1,195 | 1,195 | 245 |
| 2030 | 1,403 | | | 1,141 | 1,141 | 262 |
| **Total** | | **1,400** | **900** | | | **2,724** |

*Source: CCAP-Europe*

# An enlightened industrial policy

## Creating the right investment climate in Europe

**Earlier in this paper, we highlighted the structural challenges faced by European industry and in particular the energy-intensive sectors. These factors include access to raw materials, local demand, transport and infrastructure and last but not least, access to competitively-priced energy.**

According to the McKinsey Global Institute, governments in mature economies like the EU can respond to these challenges which threaten competitiveness and delocalisation by imposing import restrictions, introducing corporate tax breaks, using subsidies, funding R&D projects, facilitating access to capital, reducing the cost of capital and improving capital efficiency.

Imposing import restrictions was briefly touched upon in the previous section. In this section, we develop other possible responses on how EU ETS auctioning revenues can play a catalytic role in activating and implementing them. Before we outline these industrial policy initiatives at EU level, we want to highlight one of the above responses that still mainly resides under the competence of the Member States.

Making smart use of EU ETS auctioning revenues in the EU Member States is a non-trade related measure which can mitigate some concerns about carbon leakage in the energy-intensive sectors. Member States still have limited discretion to change corporate taxation. A well-targeted intervention through a significant corporate tax rebate aimed at physical investments and deployment of low-carbon research and development could rebalance the possible competitive distortion coming from uneven carbon pricing between the EU and its trade partners. It is important that this taxation intervention is extremely refined and well thought through to prevent it from backfiring.

Some EU Member States have implemented such tax rebates but failed to set conditions related to real physical investments (not just financial services) and actual physical investments linked to corporate research and development. Such generic corporate tax rebates which lack a physical investment component have failed to prevent major delocalisation and closures because they did not come with the risk of embedded corporate stranded assets. A similar argument can be made when it comes to compensating the energy-intensive industries for the indirect carbon price paid through their power bills.

This measure could be implemented in the short term and without significant EU ETS reform. We do suggest however that the European Commission and in particular DG Competition provide more specific guidance to the EU Member States on how EU ETS auctioning revenues can be used for low-carbon innovation investment related to corporate tax rebates without breaking EU competition rules.

## EU ETS structural reform to catalyse a competitive EU low-carbon industry

A major part of the structural reform we propose is the introduction of an Industrial Low-Carbon Transition Fund. **This fund could generate around €18 billion** in the period 2015-2023 through the gradual auctioning of 900 million EUAs.

The challenges at hand and in particular the **market failure** to address breakthrough low-carbon transformation in European industry will require financial support. In this section, we will formulate a set of industrial policies that both address the issues related to EU industrial competitiveness and low-carbon transformation using the financial means in this proposed new fund. We strongly believe that this new fund, if implemented in a smart way, will not only safeguard Europe's future climate goals but will also enable the EU's energy-intensive industry to build a significant competitive advantage in a global economic environment that will become more carbon-constrained over time.

**The new industrial policy proposed by CCAP-Europe does not focus on 'picking winners' but would create an investment climate in which opportunities are created for the industrial low-carbon transformation. Therefore, our proposed new industrial policy programme is built around the following themes:**

- **Process innovation** with the goal of bringing low-carbon breakthrough processes to market within the next 15 years
- **Product innovation** with the goal of increasing value-added in products essential to a low-carbon and resource-efficient society
- **Value chain and business model transformation** with the goal of further reducing emissions, enhancing resource efficiency and finding new and smart opportunities for energy-intensive industries in a mature market
- **De-risking (venture) capital and debt** as a tool to facilitate access and enhance entrepreneurship and the market readiness of low-carbon products and processes
- **Social innovation** to train and re-train the skills needed in the transition to a low-carbon economy

The concepts and ideas presented in the next sections are one input to the debate on the future of industrial policy. The proposed financial model from the Industrial Low-Carbon Transition Fund is illustrative. In general, the following proposals should be considered as a 'proof of concept' for a more enlightened EU industrial policy.

### *Process innovation*

As set out earlier, there is limited time to bring low-carbon breakthrough technologies to market. If we want to achieve full deployment across the EU by 2050 to meet a 80% reduction goal, these technologies need be market ready by 2025-2030 at the latest. This can be clearly seen in the industrial emission reduction trajectory set out in the European Commission's 2050 low-carbon roadmap.

The good news is that EU programmes such as SILC II, SPIRE, BRIDGE and NER 300 are mostly aimed at facilitating major improvements and breakthroughs in production processes. However, the financial resources that are put into those projects are limited and not guaranteed.

# An enlightened industrial policy

Out of the €18 billion potentially available in the Industrial Low-Carbon Transition Fund, around €5 billion could be reserved for the expansion and enhancement of these EU programmes. In practice, this implies doubling the planned budgets for SILC II, SPIRE and BRIDGE. The goal would be to have 10-20 low-carbon demonstration plants operational within the next 10 years. We also suggest streamlining and coordinating the different programmes better to maximise their efficiency.

While the deployment of process innovation through building pilot and demonstration plants using these new technologies is required, the downstream process and product innovation cannot be ignored. It is this basic research that will lead to breakthrough processes and products. We therefore propose the introduction of an EU Advanced Research Projects Agency for Industrial (ARPA-I) high-potential, high-impact technologies, both processes and products that are too early for private-sector investment, similar to the successful US Advanced Research Projects Agency-Energy (ARPA-E).

The US ARPA-E agency aims to advance high-potential, high-impact energy technologies that are too early for private sector investment. Projects selected by ARPA-E must have the potential to radically improve US economic prosperity, national security and environmental wellbeing. ARPA-E focuses on transformational energy projects that can be meaningfully advanced with a small investment over a defined period of time. APRA-E has a streamlined awards process that enables it to act quickly and catalyse cutting-edge areas of energy research. ARPA-E's goal is to empower America's energy researchers with funding, technical assistance and market readiness.

The key success factor for the EU ARPA-I would be a 'lean and mean' approach to innovation support with smaller grants being disbursed on relatively short timescales and with a strict milestone-based implementation regime. An example of this approach would be to incentivise basic research. In particular, the EU ARPA-I would reach institutions, researchers and companies which are directly covered under the current EU Research and Innovation Framework Programmes. As a ballpark figure, €2 billion could be made available under the Industrial Low-Carbon Transition Fund in the next 10 years.

Another proposal is the introduction of a temporary feed-in tariff for industrial carbon capture and storage (CCS). It is clear that some industrial sectors will need to use carbon capture and storage at the final stage to meet emission reductions of 80% and beyond. A full-scale demonstration of industrial CCS will be difficult at this time. While capture technology could be partially subsidised and demonstrated, the full cycle of transport and storage still involves financial thresholds and risks. The carbon price incentive could be increased by introducing a feed-in tariff for stored $CO_2$ on top of the EU ETS carbon price. Over time, the EU ETS carbon price should be able to generate a sufficiently high opportunity cost to enable this. As an additional incentive, the CCS feed-in tariff would ensure that a full-scale 'source to sink' demonstration is built in Europe in the next 10 years.

As such, €2 billion from the Industrial Low-Carbon Transition Fund could be used for this. A feed-in support tariff of €30/tonne would guarantee the storage of 60-70 million tonnes of $CO_2$, equal to the storage of emissions from two to three industrial plants over 10 years. A €30/tonne $CO_2$ stored feed-in tariff in combination with an EUA price of €20/tonne would generate a total $CO_2$ opportunity cost of €50/tonne. Such full deployment of 'first of its kind' industrial CCS projects could facilitate wider scale deployment beyond 2030.

### *Product innovation*

While process breakthroughs are required to facilitate a move to low-carbon industrial production, low-carbon **product innovation** and the impact these could have in the downstream value chain are at least as important. More importantly, product innovation offers the potential of making higher value-added products, increasing profit margins and enhancing competitiveness.

Product innovation presents an opportunity to Europe's energy-intensive sectors to develop new products aimed at downstream users who themselves are driven by low-carbon and resource efficiency constraints e.g. in the automotive, building, construction and electronics sectors.

Product innovation fits well under the development of the Key Enabling Technologies (KETs) initiative by the European Commission and in particular the crossover between those technologies. KETs include nanotechnology, microelectronics and nanoelectronics including semiconductors, advanced materials, biotechnology and photonics. In its 2012 strategy for KETs, the European Commission acknowledges that mastering these technologies means being at the forefront of managing the shift to a low-carbon, knowledge-based economy. They play an important role in the R&D, innovation and cluster strategies of many industries and are regarded as crucial for ensuring the competitiveness of European industries in the knowledge economy.

The new EU ARPA-I set out above could play a significant role in advancing the research for some of these key industrial enablers.

Furthermore, due to the challenging nature of this high-end research, it would provide EU support for the development of regional research hubs which integrate industrial and institution-based research and development. This should enable the efficient alignment between industrial R&D and the forefront of research in universities and their spin-offs across Europe.

Finally, the European Union can create a competitive advantage to these home-grown innovations through the introduction of downstream product standards that embed low-carbon and resource efficiency requirements. An ambitious 2030 EU renewable energy target the particular sector can offset part of the structural decline in steel demand in the automotive sector through the higher deployment of on- and offshore wind energy. Energy efficiency standards for new and especially for existing buildings offer interesting business opportunities for sectors such as cement, ceramics and advanced chemicals. Finally, enhanced $CO_2$-efficiency targets for vehicles offer the promise of demand for advanced steel and chemical products.

### *Value chain and business model transformation*

We expect major contributions from **process and product innovation** to a future low-carbon and resource-efficient EU economy. However, as mentioned in the excellent and provocative book 'Sustainable Materials: with both eyes open' by Julian Allwood, new processes and products will not be sufficient to achieve these goals. A lot will depend on how the consumption of energy-intensive goods such as steel, aluminium, plastics, cement and paper can be further reduced. To reduce consumption, a transformation is required in the downstream value chain through better and smarter use of these basic materials. While such a significant reduction in demand, for example, for steel and basic chemicals might look disruptive and threatening, it actually presents an opportunity to transform existing business models in the energy-intensive sectors.

This paper has already mentioned that product innovation can lead to higher value-added and not necessarily a higher volume of products or consumption. Deeper value chain transformation will involve industry and service sector hybridisation. In particular, sectors producing basic materials e.g. steel and chemicals could start deploying services to their consumers to enhance the use of their products and reduce waste, e.g. through advanced recycling programmes but also to support in the design and production processes downstream e.g. to move from extractive manufacturing to more resource-efficient additive manufacturing such as industrial scale 3D printing technologies. Sectors like the steel industry could also start developing lease contracts for specific consumer industries e.g. the automotive industry.

While a significant proportion of the Industrial Low-Carbon Transition Fund is aimed at process innovation in the energy-intensive industries, it cannot be ignored that low-carbon product and value chain innovation will happen downstream at the SME level. We suggest that around €2 billion of the Industrial Low-Carbon Transition Fund be disbursed to EU, national and regional initiatives which promote and support SME entrepreneurship aimed at enhancing the low-carbon and resource-efficient value chain.

Finally, Europe's energy-intensive industries can play an important role in the transition of EU power production towards higher levels of renewable energy. One of the main issues related to the deployment of renewable energy is the fact that the control of supply and demand of electricity is restricted. While renewable energy might become less intermittent through better connectivity of EU grids and advanced storage, demand side management is still under-explored.

Europe's energy-intensive industries have relatively stable and continuous electricity demand. An EU programme could be developed to encourage the energy-intensive industries to slow production at moments of high demand or low power supply and therefore when electricity prices are higher. In this way, the energy-intensive industry could become a service provider to the European power sector. Further exploration into the business model is recommend if this could facilitate the deployment of passive grid storage by European industry. Industry-linked Smart Grids also have potential for managing the uneven drain on the power grid.

### *De-risking capital through capitalising the European Investment Fund*

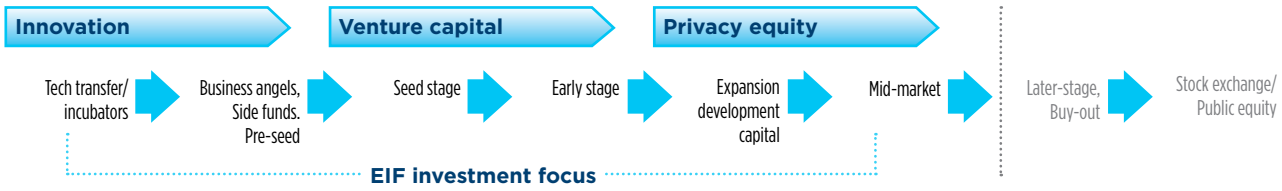
One of the main factors slowing Europe's economic recovery is access to capital. In 2012, bank loans to non-financial corporations in the Eurozone were at their lowest since 2003. Without easier access to capital, industrial investments and the economic recovery will be difficult. This also impacts smaller companies developing innovative low-carbon solutions as venture capital funding is becoming increasingly difficult to access. For example, in the biotechnology sector, a number of IPO bids have been withdrawn due to lack of venture funding.

Until now, many of our recommendations have focussed on the research and development side of low-carbon innovation, yet access to capital including venture capital, debt and equity is essential for full market deployment of these technologies. Bringing new processes and products to the markets brings with it financial risk. De-risking access to financial capital is crucial.

The European Investment Fund (EIF) has developed significant expertise in this area and seems to be the right institution to meet both our goals, namely the transition to a low-carbon economy and providing the necessary

financial support mechanisms to enhance industrial investments. EIF's role need not be limited to the more advanced stages of the deployment of innovative technologies. It has significant expertise with supporting technology transfer and technology incubators and working with business angels and seed funds.

*EIF's market coverage*




*Source: EIF*

Part of the Industrial Low-Carbon Transition Fund could be used to capitalise the EIF by around €5 billion over a period of nine years through its majority shareholders i.e. the European Investment Bank and the European Commission. If the EIF maintains its current financial leveraging factor, this could lead to another €10 billion in private/financial sector investments, bringing the total support for marketisation of low-carbon technologies to €15 billion in the period 2015-2023.

### *Social innovation to meet industrial transformation and skills shortage*

While some of the issues affecting EU competitiveness such as access to raw materials and low-cost energy are a challenge in the short term, the EU has the opportunity to address the pressing problem of advanced skills shortages in the manufacturing industry. Furthermore, the transformation outlined in this paper will lead to a more knowledge-based, more specialised and high-tech industry. The demand for these specific skills will only increase over time. The availability of such a skilled and specialised labour force may even become one of the elements restricting competitiveness in the EU in the near future.

The good news however is that compared to the challenges related to energy and resources, the EU can shift its comparative advantage when it comes to skilled and specialised labour. We also note that the low-carbon industrial transformation is likely to be disruptive in some cases. Some types of industrial production will decline or disappear, to be replaced with more productive, low-carbon and resource-efficient alternatives.

The need for more specialised skills on the one hand and the risk of part of the EU's labour force becoming redundant in old, high-carbon production sites requires specific policy intervention and support.

**We suggest introducing financial support for companies, Member States and regions that actively:**

- Promote and implement structural vocational training and retraining programmes
- Implement education system reforms that address specific industrial needs related to low-carbon industrial transformation
- Seek to address specific skills shortages through public-private implemented programmes
- Implement rapid intervention programmes to retrain and re-employ workers in case of major industrial closures

### *Revisiting the EU budget*

The table below presents an overview of how the Industrial Low-Carbon Transition Fund could be distributed, as outlined above. This assumes an average EU carbon price of €20/tonne, a figure which can be debated. However, if the linear reduction factor is enhanced to 2.5% leading to an overall cap reduction of 2.7 Gt in the period 2013-2030, sufficient scarcity should have been created to absorb the current surplus and hence push EU carbon prices notably higher than their current level of below €5/tonne. This also assumes that 900 million EUAs auctioned for the Industrial Low-Carbon Transition Fund would deliver €18 billion over the period 2015-2023. In the years 2015-2020, this would be around €12 billion.

| **Industrial Low-Carbon Transition Fund Budget Lines (2015-2023)** | **Billion Euro** |
|---|---|
| Enhanced support for process innovation under SPIRE, SILC II and BRIDGE | 5 |
| Advanced (Fundamental) Research Projects Agency for Industrial Low-Carbon Transformation | 2 |
| Support for industrial CCS feed-in tariff to enable and demonstrate full cycle CCS over 10 years | 2 |
| National and regional initiatives to promote and support SME entrepreneurship aimed at enhancing the low-carbon and resource-efficient value chain | 2 |
| Support for education, training and re-training to cope with industrial transformation and skills shortage | 2 |
| EIF capitalisation to de-risk and leverage finance for industrial low-carbon transition | 5 |
| **Total** | **18** |

*Source: CCAP-Europe*

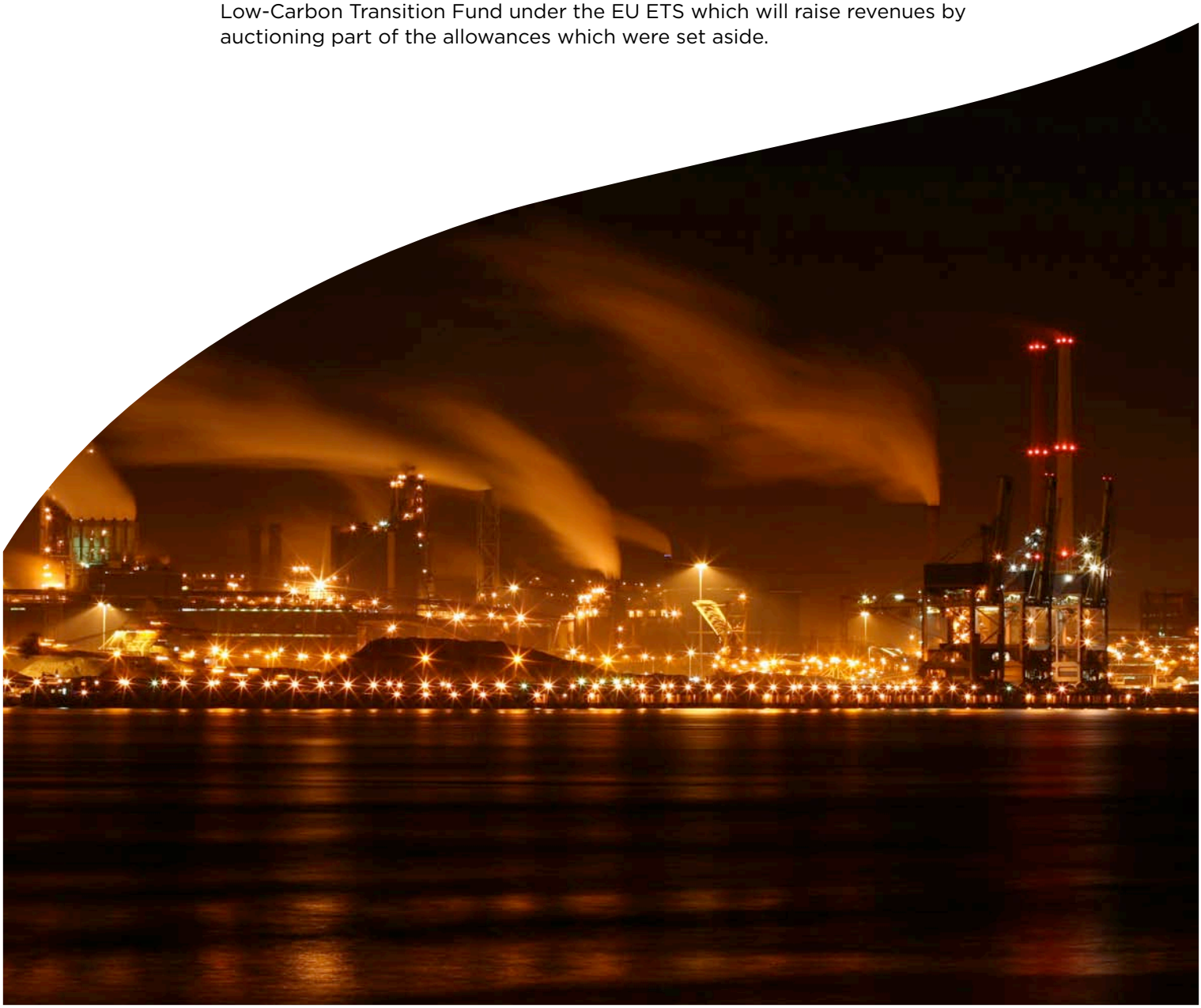
**As mentioned before, this new revenue stream generated through structural EU ETS reform would also be a compromise in the ongoing debate on the EU budget 2014-2020. This approach has the following benefits:**

- Additional revenue streams become the EU's own resources and have no direct impact on Member State budgets
- The revenue stream is aimed at safeguarding and enhancing the low-carbon and resource efficiency projects under Horizon 2020

# A historical opportunity for Europe

**Europe needs a new consensus to repair the EU ETS. The structural changes presented in this paper embed and mainstream the EU's concerns on industrial competitiveness and growth. We have shown that to reconcile competitiveness and growth and the EU budget, restructuring the EU ETS needs to be tackled from two sides.**

Firstly, we propose **technical changes to the EU ETS to support the EU carbon price**, making the EU ETS reduction trajectory consistent with the 2050 EU reduction goals and last but not least enabling the industrial transformation towards a low-carbon and resource-efficient society. This transformation will take place through the introduction of a new Industrial Low-Carbon Transition Fund under the EU ETS which will raise revenues by auctioning part of the allowances which were set aside.



Secondly, we present the need for an **enhanced EU industrial policy** which further streamlines and strengthens European industrial initiatives e.g. in the Horizon 2020 programme which will be the backbone for transformational change in industrial processes, products, value chains and business models. This new industrial policy must ensure the smooth social transition to low-carbon industries by supporting the training and re-training of skills needed in an innovative low-carbon economy. As a proof of concept, we set out what this enhanced industrial policy would look like and how it can be financed through the new Industrial Low-Carbon Transition Fund.

We finally showed how these new resources created by a structural EU ETS reform can be a useful instrument to unblock the current political stalemate over the EU budget negotiations.

We believe these changes to Europe's climate and industrial policy would receive **broad stakeholder support**. Most energy-intensive sectors in Europe have either already published or are in the process of developing their own 2050 low-carbon roadmaps. We anticipate that one of the main conclusions drawn from these roadmaps will be the need for enhanced support for the risk and cost-heavy development and deployment of product and process breakthroughs. This concern is already taken into account in both our proposed EU ETS structural reform and our proposals for an enhanced EU low-carbon and resource-efficient industrial policy.

Structural reform of these EU policies is highly time-critical. If we postpone short-term and structural reforms to the EU ETS, there is a non-negligible risk that the system will become superfluous. This would have a devastating impact on climate policies being developed outside the EU and in the UNFCCC negotiations. By postponing EU ETS reform and the implementation of enhanced EU industrial policy, we risk missing the window of opportunity presented now by the EU budget negotiations. At this moment, there is a relatively high risk that the future EU budget lines for industrial innovation and growth will be cut.

Europe urgently needs a New Deal to enhance its climate and industrial policy and to build its competitive advantage in a global economy that will become more carbon-constrained over time. This paper presents a proof of concept and the first steps towards achieving a New Deal for the European Union.

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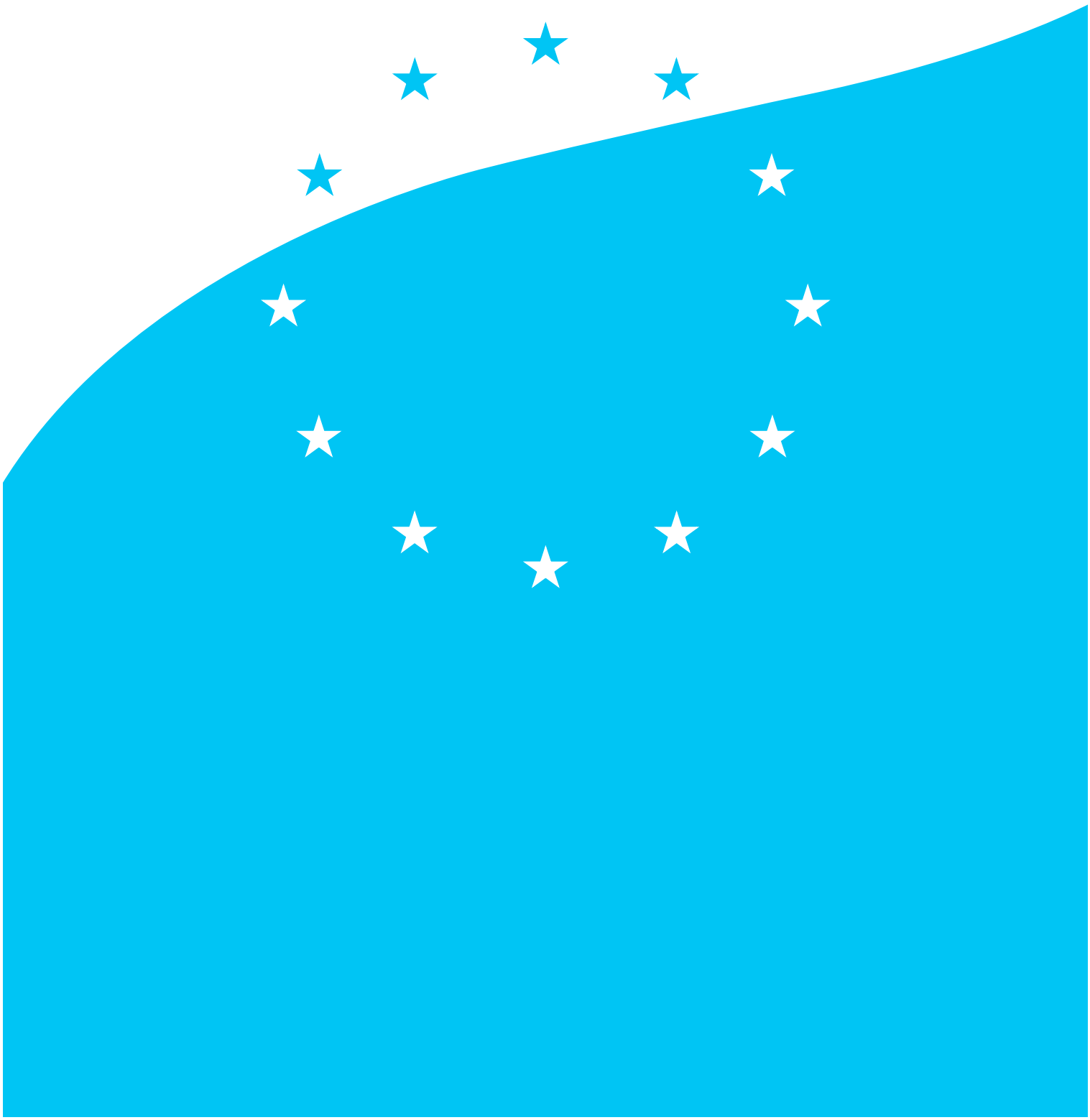
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