



European
Commission

Just Transition Platform: Working Group on Chemicals Scoping Paper

May 2022

*Regional and
Urban Policy*

Table of contents

1. Objectives of the Scoping Paper	1
2. Objectives of the Working Group	1
3. Working Group composition.....	1
4. Presentation of the challenges	3
5. Focus areas of the Working Group	5
Focus area 1 – Strengthening the role of regions in the multi-level governance.....	5
Focus area 2 – Enhancing industrial networks for transition	7
Focus area 3 – Supporting innovation at the infrastructure level	9
Focus area 4 – Supporting labour market and employment in the chemical industry	12
Focus area 5 – Supporting welfare systems and care economy for the affected communities in chemicals-heavy regions	16
Workplan.....	19
Deliverables, milestones and timing.....	19
Meetings	20
Annexes.....	20
Annex 1: List of members of the WG	20

Contact:

EUROPEAN COMMISSION

Directorate-General for Regional and Urban Policy
Unit G1 — Smart and Sustainable Growth
B-1049 Brussels
E-mail: REGIO-JUST-TRANSITION@ec.europa.eu

Disclaimer:

The information and views contained in the present document are those of the members of the Just Transition Platform Working Group on Horizontal Stakeholder Strategy and do not reflect the official opinion of the European Commission. The Commission does not guarantee the accuracy of the information contained therein. The Commission nor any person acting on the Commission's behalf may be held responsible for the content and the use which may be made of the information contained therein. Reuse is authorised provided the source is acknowledged and the original meaning or message of the document is not distorted. The European Commission shall not be liable for any consequence stemming from the reuse. The reuse policy of European Commission documents is implemented by Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39)

1. Objectives of the Scoping Paper

This Scoping Paper is the first document of the Working Group (WG) on Chemicals and is based on inputs from a needs assessment that was conducted beforehand by the [Just Transition Platform \(JTP\)](#) Secretariat. This document lays down the foundations of the preparation of an Implementation Plan. The first part of the Scoping Paper focuses on the objectives and composition of the WG, while the second part describes the challenges and focus areas identified by the members of the first circle of the WG, including expected results and the preliminary outcomes of the research and analytical work.

The Scoping Paper has been prepared in March 2022 by the 13 first circle members of the WG, supported by the JTP Secretariat. Between 6 April and 19 April, it entered into consultation with the 7 second circle members (close observers) of the WG¹. Following a final review and validation, the Scoping Paper will be presented at the JTP Meeting in May 2022.

2. Objectives of the Working Group

As a cornerstone of the JTP, four WGs were established in November 2021 to ensure comprehensive stakeholder involvement throughout the activities of the JTP. Three WGs have a thematic focus on a carbon-intensive sector (chemicals, steel, and cement) to exchange and develop practical solutions to ensure that the decarbonisation of the respective industry happens in a fair way, leaving no one behind. This **WG on Chemicals** focuses on developing a common transition vision and approach for the chemical sector.

The objective of this WG is to share knowledge on the social impact and human dimension of the transition towards a carbon-neutral future within the chemical sector. The active promotion of establishing and strengthening the stakeholder network and driving the exchange of best practices among all parties involved in the process is at its core. The WG should further contribute to finding solutions and tools to tackle local challenges and mitigate the adverse effects of transition processes horizontally for all regions undergoing transition. Additionally, the WG should provide support to the Commission in identifying and developing inclusive approaches to transition.

3. Working Group composition

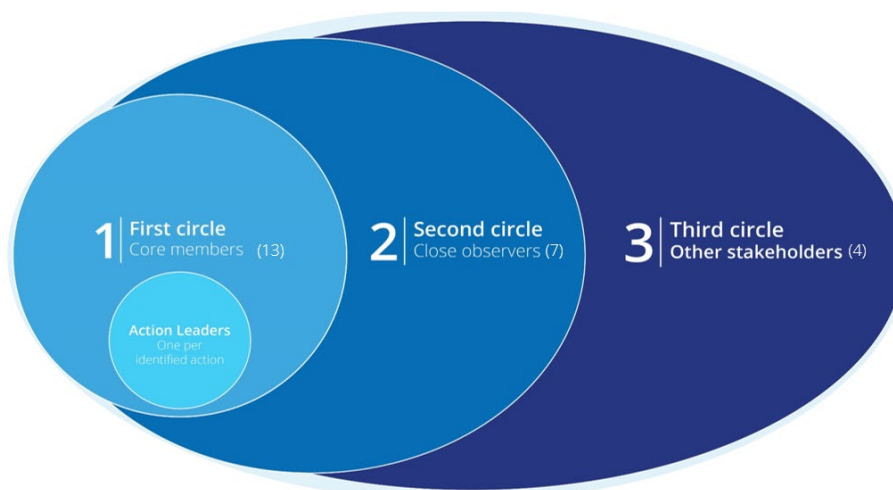
This WG (and the other three WGs) consists of three types of members, namely core members (“first circle”), close observers (“second circle”) and other stakeholders (“third circle”). Within the first circle group, several Action Leaders will be identified to spearhead selected actions (see Figure 1). Notably:

- **Core members of the WG (first circle)** actively participate in all the phases and activities of the WG. They shape and perform the work determined through the various deliverables and actions and participate in WG meetings on at least a bi-annual basis.
- The **second circle of close observers** takes part in some of the work of the WG on an ad hoc basis. Members are kept informed of progress made by the WG, notably through consultations on the WG’s deliverables.

¹ See ‘Section III Working Group Composition’ for more information about the circles of the WG.

- Finally, **the third circle of other stakeholders** remains informed on the mid-term and final results of the WG activities.

Figure 1 Working Group Composition



WG members are organisations/authorities, represented by one person (and if needed by an alternative representative) in the activities and meetings of the WG. Within the WG on Chemicals, 13, 7 and 4 members (for the first, second and third circle, respectively) have been selected following a [call for applications](#) opened in September/October 2021. The group of 13 first circle members, who are the authors of this Scoping Paper, is still open for further applications as of April 2022. There is also the possibility to apply for the second and third circle.

Below is a brief explanation of the five different stakeholder categories that were addressed by the call for applications, including the number of members per circle. In the first circle, geographical, sectorial and gender balance (of representatives) was of utmost importance, as well as an even distribution between stakeholder types, know-how and interest. The complete list of members can be found in Annex 1.

Stakeholder group		Description	Number of members per circle		
			First	Second	Third
Member State authorities		These are national authorities from the EU27, such as ministries or national agencies.	0	0	0
Local and regional authorities (LRAs)		These are regional authorities, national representatives of local authorities, local authorities representing cities and urban areas, or other bodies organised at national, regional or local level and authorities representing the territories covered by Territorial Just Transition Plans (TJTPs) with relevance for the specific carbon-intensive sector(s).	2	1	0
Associations representing regional, local, urban and other public authorities		These include associations representing higher educational institutions, educational and training providers, think tanks and research organisations, active and knowledgeable in the field of just transition; as well as associations representing other public authorities having an active role or expertise in just transition matters, including public procurement offices, and bodies for	4	0	1

Stakeholder group	Description	Number of members per circle		
	the promotion of equal treatment established in accordance with Directives 2000/43/EC, 2004/113/EC and 2006/54/EC.			
Organisations representing economic and social partners	These include social partners' organisations, in particular those active in just transition, associations representing stakeholders; association of chambers of commerce, associations representing business, financial sector actors, consultancies representing the general interest of industries and branches and active in the field of just transition, as well as representatives of the social economy, and associations representing thematic networks representing specific economic sectors.	5	4	3
Bodies representing civil society, such as non-governmental organisations	These are bodies involved in the development of just transition, taking into account representativeness, geographic and thematic coverage, management capacity and expertise, as well as organisations or groups that are significantly affected or likely to be significantly affected by the implementation of the just transition strategy.	2	2	0
Total		13	7	4

4. Presentation of the challenges

The transition to climate neutrality poses a major challenge to the EU chemical sector as the sector is highly dependent on raw materials for production and is considered an energy-intensive industry. There has been already some progress towards the European Green Deal goals² to achieve climate neutrality by 2050 and reduce EU-wide emissions by at least 55% by 2030. Some of the regions with an important chemical sector have already issued their own TJTPs, which should illustrate in detail how to approach the region's transition challenges. The regions with a high employment share and emissions per capita in chemical manufacturing are mainly located in Central and Western regions. Here, the focus lies on general challenges for the chemical industry that apply to most EU chemicals regions.

In the chemical sector there is a high level of direct and indirect employment, as 95% of companies are SMEs and the sector has a very strong link to other value chains. The transition process is especially challenging for the sector as it is an energy-intensive industry that is highly influenced by climate and energy policies. In general, the transition to a circular economy and implementation of the objectives of the European Green Deal are highly important. Almost all regulations related to the European Green Deal will affect players in the chemical sector. There has already been a push for transformation specifically in the chemical sector with the Chemicals Strategy for Sustainability (CSS)³ (supporting innovation for the green transition) of 2020 and the European Clean Hydrogen Alliance,⁴ also set up

² Available online at: https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

³ Available online at: <https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf>

⁴ Website: <https://www.ech2a.eu/>. Both initiatives belong to the most recent developments. There have already been several previous initiatives that are relevant for the chemical sector, such as the [SusChem](#) platform by the EC of 2004 or national initiatives such as [Chemie](#)³ of 2013 in Germany.

in 2020. Such developments are important for the sector as new technologies enable the transformation towards a climate-neutral economy. New developments in the chemical sector require undertaking decisive actions at all stages of the product life cycle (design, obtaining raw materials, processing, sustainable consumption, waste management for further use as secondary raw materials).

The chemical industry is facing a **fivefold transformation**:

- the **demographic situation** makes recruiting more and more of a challenge, especially concerning workforces at production sites;
- **Digitisation/Industry 4.0** offers new opportunities, but implementation requires large investments of time, qualification and money;
- **Circular economy**, especially for plastics and rubber products, **carbon capture and storage**, and last but not least **climate action and CO2 reduction** are enormous regulatory, financial and technical challenges.

This transformation process leads to significant changes for enterprises and the workforce, but not necessarily to job losses, if done in an adequate manner. It should be the aim of all actors involved to protect the international competitiveness of the chemical industry in the affected regions and thereby protect and create jobs. However, the chemical industry is heterogenous in nature, with different subsectors and diverging company sizes. Therefore, the different actors are affected to different extents and challenges that might be relevant for large enterprises might not be relevant for SMEs and vice versa. Supporting innovation is another crucial factor for successfully mastering the transformation challenges. Furthermore, qualification, training and social support, if needed, are important instruments for just transition processes. All these aspects are highly interlinked and need a coherent approach.

In the WG meetings and further interactions, the WG members have identified areas in which they see particular **challenges for the chemical sector**. Those challenges are related to a **social dimension, infrastructure needs and replacing carbon intensive energy sources**. The shift from fossil fuels towards carbon-free energy sources is a major challenge for the sector as the dependence on fossil fuels is still high. Closely related is the availability of renewable energy, which is a decisive factor for the transition. In order to develop and use new technologies and ensure the competitiveness of the chemical sector, investments to change and/or modernise infrastructure are deeply needed. Central challenges are also observed in the social dimension of transition. In order to, in the wider context, avoid heavy job losses as well as make chemical workers ready for employment in other sectors (as per the Just Transition Fund (JTF) Regulation⁵), investments in re-/upskilling and new jobs are critical. Past transition processes have shown the destabilising impacts such processes have on the workforce and consequently, support to the labour market is a crucial challenge to be overcome. As all challenges are highly interconnected, simultaneous work on all of these aspects is needed in order to mitigate

⁵ REGULATION (EU) 2021/1056 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 June 2021 establishing the Just Transition Fund. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1056&from=EN>

the impact of the just transition on the chemical sector and the regions highly dependent on this sector.

5. Focus areas of the Working Group

The following five focus areas have been identified during the needs assessment interviews and the subsequent second WG meeting. The focus areas aim at addressing some of the challenges identified in the section above. All five focus areas address different challenges in the chemical sector – one is directed at governance, two at networks and infrastructure and two at the social dimension, namely welfare and the labour market. A complete description of each topic and issues that the WG would like to tackle can be found below. Where already possible to identify, problem description of the focus areas is complemented with examples of good practices from the local/regional level and with preliminary approaches to actions.

The problems and approaches presented within this scoping paper include ideas:

- within the scope of the JTF Regulation
- broader views going beyond the JTF Regulation that could serve as the basis for future regulation.

These points will be further specified at the next stage of work of the WG Chemicals, that is during the preparation of the Implementation Plan.

Focus area 1 – Strengthening the role of regions in the multi-level governance

Problem description/Issues to be tackled

Regional resilience should be strongly supported given that it responds to the challenges on the ground, and regions and local authorities should have greater influence on the decisions undertaken. It is necessary to strengthen the link between economic growth and territorial development, and to support economic diversification, modernisation and reconversion, favouring sustainable activities.

- **A coherent and integrated policy for chemical regions is needed to address the impacts of the transition towards the Union's 2030 targets**, including constructive collaboration between policy for research and innovation, economy, environment, transportation, digitalisation, materials, raw materials, energy decarbonisation, supply and efficiency, education and taxation, and policy aligned with European regulations and developments. Other policy instruments need to ensure the international competitiveness of key industries such as the chemical industry.
- **A close relationship between LRAs and residents is essential**, and the direct knowledge of the specific features of individual regions highlights the possibility of preparing and conducting campaigns to raise public awareness of the principles and objectives of the energy transition. Direct cooperation between local authorities and businesses operating in their region makes it possible to assess the most useful measures to counteract the sectoral changes rendered necessary by the transition to a climate-neutral and circular economy. At regional level, authorities, chemical enterprises and associations can deeply understand and assess the needs and consequences, i.e. to find the right steps in energy and climate policy. Plans and regulations at national and supranational level define the high-level aims, but often articulate

no or limited insights on specific measures for the implementation in the region. Close coordination and exchange of the regional actors with national and European policy-makers is extremely important and does not happen enough at the moment. Therefore, it is key to enable real participation and influence on undertaken actions by territories and regions and local authorities. In this context, one needs to take into account the local specificities and capabilities of a region.

- **Close coordination and exchange of knowledge and experience** between regional and national authorities, chemical enterprises and associations and EU policy-makers has a crucial role and needs to be strengthened.

Approaches for action and first ideas for the implementation phase

Within the scope of the JTF Regulation:

- Additional support from the EU is needed to those regions that are making the transition from the production of fossil fuels to alternative fuels. There is a need for recognising at the EU level the important role of regional and local authorities in the energy transition and allocating more resources to support renewable energy projects, from large-scale interregional projects to small-scale initiatives at local level. Moreover, LRAs should be involved to a larger extent in the definition and implementation of the plans, and they should be granted direct access to EU funds.
- LRAs should be taken into account, especially when implementing the activities that LRAs are coordinating and where they have competences such as waste, water, infrastructure and buildings.
- The local and regional guidance and promotion of best practices can help to accelerate the shift towards energy transition, for instance on spatial planning and on sustainable construction. In addition, cross-border and interregional cooperation is ideal to share best practices and helps reduce the costs of implementation of the new solutions.
- LRAs should have concrete targets on public procurement (promote the use of Green Public Procurement, e.g. to drive energy efficient solutions).
- Measures and instruments are needed that can be adapted to local needs and complement national efforts, in line with the principle of subsidiarity.
- Grants and technical assistance will enable LRAs to support investments related to the energy transition.
- Regional administrations should provide a contact point for networks (ideally 1-2 people) that are well-informed about the situation in the region.

Broader views:

- Stressing the importance of the involvement of public authorities in carrying out information campaigns to raise awareness about the transition process (including among SMEs and citizens). Such exchanges between regional authorities and the chemical industry would facilitate understanding and needs assessment regarding the transformation in line with the region-specific context.
- Encouraging specific sectors of the economy to substitute harmful chemicals with alternative substances and to use sustainable energy sources. A close dialogue and exchange should be implemented between LRAs and enterprises in the region on the one hand, and on the other

hand, the national and European policy-makers on subjects such as climate and energy policy, CSS, and circular economy.

Good examples/practices from other regional or thematic contexts

- In Rhineland-Palatinate, a “Transformation Council” was established at prime-minister level with associations and trade unions of the chemicals and metal/automotive industry. Furthermore, the establishment of a “Transformation Network” with broader participation is on the way, organised by the associations and trade unions working together in the Transformation Council.

<i>Issues to be tackled</i>	<i>Proposed approaches for action</i>
<ol style="list-style-type: none"> 1. Coherent and integrated policy development for chemicals regions to address transition impacts 2. Stronger involvement of regions in EU decision-making process 3. Strengthen cooperation between regional and local authorities, residents and businesses 4. Increase coordination and exchange between regional actors with national and European policy-makers 	<ol style="list-style-type: none"> 1. EU: Recognise role and allocate more resources to LRAs (especially concerning their fields of responsibility) 2. Sharing of best practices among LRAs and in cross-border/interregional cooperation 3. LRAs: have targets for public procurements and regional adaptable instruments 4. LRAs: provide contact points for networks and increase use of information campaigns 5. Set up a dialogue and exchange formats (between LRAs, enterprises, national, European level) → good practice: establishment of Transformation Councils and Transformation Networks.

Focus area 2 – Enhancing industrial networks for transition

Problem description/Issues to be tackled

The transformation of the chemical industry towards a low-carbon and sustainable one is a significant challenge. Reducing and then completely moving away from fossil fuels requires many years of change and the implementation of new technologies and industrial processes around the world. This transformation will be accompanied by changes in the legislation and the building of key industrial and other infrastructure. The energy sector will be transformed at the same time, as well as the chemical industry. Such changes cannot be achieved by some companies. The transformation requires the engagement and support of LRAs that can help to remove the legislative boundaries, provide financial incentives and facilitate cooperation and build a trustful platform between companies. LRAs should ensure that financial means are adequately distributed to the activities that can be supported in the TJTPs.

Therefore, a new approach of cooperation between various stakeholders will be needed. Traditionally, companies have emphasised in-house technology to gain the key competitive advantage that allows them to succeed in business. However, the just transition requires going beyond bilateral projects and joint ventures, hence more companies will need to join forces to transform the entire sector.

Less so than the energy sector, the chemical industry's shift towards clean energy and away from traditional fossil raw materials will see entirely new value chains and collaborations being built. The structure of producers of energy carriers and new raw materials (e.g. hydrogen, organic/agricultural wastes, natural oils, etc.) will change. It will be more difficult to monopolise supply chains, as competitive advantages will not be determined by mineral deposits, but by innovation, technology, agricultural production, climate, including sunshine (photovoltaic plants) or conditions for wind farms. Almost every country in the world will be able to be a producer of green hydrogen, hemp and flax fibre or waste biomass.

Additionally, the recent socio-economic developments globally have highlighted the extent of the EU's dependence on third countries and the negative economic effects of the interruption of intercontinental trade. This requires diversification production locations, and therefore, to locate production in places that will make it possible to shorten supply chains.

With the above in mind, the new economy after the industrial transformation will have other important features. Supply chains will become much more local, both because of transport costs (but also technical difficulties, e.g. in the case of hydrogen transport) and because of the unpleasant experiences during the COVID-19 pandemic. An important role in the new economy is expected to be played by smaller, innovative companies, often growing out of start-ups. However, for new technologies to be effective, they need to achieve scale. In the chemical industry, scaling up involves extensive amounts of material and labour costs. This is one of the reasons why there is a shortage of start-ups and young technology companies in today's traditional chemical sector. Success in the scale-up phase is a turning point for the transformation of the sector. Therefore, collaboration within the industry will increase the chances of achieving this goal. Creating these linkages will be ineffective without including key, large industrial players to enhance large-scale effects in the transformation process. This will require building a system of incentives by policy-makers at national and EU level, as well as awareness among sector managers. Collaboration across sectors (e.g. chemistry, agriculture, energy, transportation) will also be necessary to achieve the success.

Approaches for action and first ideas for the implementation phase

Broader views:

It is envisaged that the new chemical industry will be built in the form of cross-sectoral technology hubs and clusters, located in a limited area, within which fragments or full value chains will be created. The clean energy and chemical sectors will be strongly linked through the joint use of bio-waste (biomethane, bio-syngas, bio-refineries) and hydrogen (energy storage, chemical synthesis).

Shared infrastructure within the hub (e.g. laboratories, technology incubator, marketing services) will enable optimisation of operating costs and generation of joint ventures and research and development (R&D) projects. For example, hydrogen valleys and hubs are currently being developed around the world and in Europe where hydrogen, CO₂, biomethane, etc. will be produced (and/or stored, e.g. in underground caverns) and energy companies, producers and distributors of gaseous and liquid fuels and other chemical companies will be located in close proximity to produce intermediates or chemical products based on the green raw materials available in the hub.

Good examples/practices from other regional or thematic contexts

Not all chemical regions have strong industrial networks implemented. For example, Rhineland-Palatinate has networks in the automotive and IT sectors, but not for the transformation issues of the chemical industry. Therefore, the establishment of a Transformation Network (see above) is on the way, organised by associations and trade unions of the chemicals and metal/automotive industries. It aims to establish exchange between the key players at regional level, linking enterprises and politics, providing advice, finding solutions and supporting innovation and R&D.

<i>Issues to be tackled</i>	<i>Proposed approaches for action</i>
<ol style="list-style-type: none">1. Transformation will require intensified (international) cooperation between companies that are originally competitors2. Supply and value chains will change, opening opportunities for almost all countries in the world3. Growing importance of local, small, innovative companies that need to be scaled up through involving large companies in order to implement successfully new technologies → collaboration within and across sectors and among small and large market participants will contribute to this process.	<ol style="list-style-type: none">1. Support for Transformation Networks2. New financial instruments to strengthen cross-sectoral links (e.g. energy and chemicals)3. Building mechanisms for the creation of start-up technology companies in an environment of key partners in the chemical sector (e.g. technology incubators created by industry and university partners)

Focus area 3 – Supporting innovation at the infrastructure level

Problem description/Issues to be tackled

Climate change and the rapidly growing public awareness of the need to reduce greenhouse gas emissions and promote a circular economy across all industries will require chemical companies to make massive changes and invest in innovation. The chemical industry is additionally facing the problem of the depletion of certain natural resources (so-called critical elements) and the shift away from fossil raw materials such as oil and natural gas. It is at a turning point where the demand for disruptive innovation is rapidly increasing and the traditional 'produce more and cheaply' approach is no longer sufficient.

In the chemical industry, many of the generated pollutants (e.g. gases) are an inherent part of the conducted processes and result from the specificity of the chemical reaction on which the process is based. In such cases, it is necessary to develop completely new pathways for obtaining products based on new raw materials and technologies. Depending on the field, new technologies are at different levels of readiness from basic research to the commercialisation stage.

Published reports and analyses indicate that the industry must quickly and consistently move away from the traditional approach and focus on developing breakthrough innovations. There is no doubt that this provides exciting opportunities for the sector as a whole, but future growth will require companies to deliver a wide and constantly evolving range of innovative new products, processes and services. Demand for chemical products and new technologies will be driven by factors such as greenhouse gas emission prices, the development of electric transport, the production of bioplastics and composites based on natural raw materials and waste, 3D printing technologies, the development

of clean energy and the hydrogen economy. New chemical products and breakthrough technologies will be based largely on completely different, differently sourced raw materials and intermediate products.

We can already see growing momentum for investment in new areas such as batteries, material recycling and pyrolysis. Even greater changes in the chemical industry are expected in connection with the global development of hydrogen technologies, including the production of green hydrogen.

Additionally, the development of carbon capture and utilisation (CCU) technologies or optimisation of processes is particularly important. CCU, even when using CO₂ from fossil point sources, can reduce the CO₂ emissions if renewable energy is used. The challenge is the possibility to use CO₂ from biogenic, air or water which allows to be perfectly circular in terms of carbon emissions and thus allows for carbon neutrality. Direct Air Capture (DAC)-CCU makes the design possible of an auto-thermally operated process for the production of molecules based on CO₂ and water from the ambient air. The business model for CCU fuels and materials remains challenging and only works today for few niche products, despite increasing CO₂ prices, decreasing renewable energy costs and increasing fossil fuel costs. The fact that CCU allows leveraging existing energy transport and storage infrastructure improves the viability of the business model and is expected to lead to the large-scale breakthrough of CCU in the near future.

The conjunction of production of hydrogen with CO₂ management will create entirely new pathways for the development of so-called green chemistry, i.e. chemistry based on these gases, displacing products based on fossil raw materials: natural gas, oil and coal. Intermediate products (e.g. ammonia/urea, methanol, chlorine, ethylene/propylene, benzene/toluene/xylenes) and products (fertilisers, hydrocarbon fuels) of green chemistry obtained in this way will be characterised by a zero or negative carbon footprint. Rare earth technologies (including their recycling) will also become increasingly important with the digitisation of industry (Industry 4.0) and the growing use of the Internet of Things and artificial intelligence in all industries.

One aspect that links new technologies in the chemical industry is the need to incur huge expenditures on these activities. Often, the amount exceeds the capabilities of companies. Therefore, there is a need to guarantee financial resources for the transformation and regulatory facilitation throughout the entire period of transition of companies, with priority for those which are already producing and have the knowledge and facilities, including storage facilities, and want to transform towards climate neutrality.

Moreover, the upcoming revolutionary changes in the chemical industry will require managers and investors to adopt new approaches to risk-taking, new technologies, and agile R&D teams focused on innovation. Cooperation with research centres and universities will take on a new, much more important meaning. Management of companies and production processes are expected to take into account disruptive changes, and short-term profit orientation will need to give way to a strategy of implementing innovative solutions, which involves greater investment and postponing profits.

If this type of change does not occur in the current chemical sector companies, it may result in their demise, and they might be replaced by new market players, including fast-growing start-up companies

that will be able to develop sought-after technologies and innovations more quickly. Already today, there is an increase in the number of start-up companies in the chemical industry that fill in the gaps not taken by the traditional chemical industry; for example, start-up companies (often from outside the chemical industry) are globally more actively involved in the development of recycling and closed loop economy technologies than traditional chemical corporations. Moreover, they are more likely to use new computational chemistry and artificial intelligence tools in their R&D work, which significantly lowers research costs, reduces risks and lowers barriers to entry. Nevertheless, a radical transformation of the chemical industry will not be possible without the inclusion of its key players in this transformation, hence increased cooperation between various market participants will be required for the innovation at the infrastructure level to succeed.

Approaches for action and first ideas for the implementation phase

Within the scope of the JTF regulation:

The above-described transformation of the chemical sector into a green technology sector will require the construction of local, open research infrastructures necessary for experimenting in the search of new solutions. This can be an important complementary element to the infrastructure of research units and universities in the region. This type of solution exists in some countries in the form of “test bed” facilities, or Living Labs, and is a key element of the local innovation ecosystem. Support should not only be given to start-ups, but also to research and development centres that are located on companies or to projects developed in partnership with research institutes and universities.

The related social acceptance of industrial investments in the field of chemistry will lead to the implementation of new technologies with added value as promoting education of society in the development of new technologies and added value of such solutions. Also, the entire approach is validated this way and unrealistic promises and expectations can be avoided. The lack of such acceptance is increasingly becoming a barrier to investors, due to public concern about the state of the natural environment and the potential threat of environmental accidents from chemical plants. Legislation in the EU is moving in the direction of preventing this type of disaster and further works within this area should be strengthened.

As a result of transformation, new innovative sectors of the economy will emerge, such as advanced alternative fuels (e.g. green hydrogen), renewable energy sources, and circular economy solutions. These areas have a huge potential for development and may in the future become the main direction of human and technological resources management, which may become obsolete as a result of leaving behind the "old" technologies. The key issue again is financing research, which aims to develop and commercialise large-scale "green" and economically efficient production technologies, and the construction of new installations and retraining of human resources.

Broader views:

- H₂-pipeline and production infrastructure, linking the production sites at regional level. As there will not be enough energy production at regional level, the pipelines must be linked with the neighbouring countries (France, Belgium, the Netherlands).

- Enhancement and establishment of the electricity networks from neighbouring countries into core chemical regions, e.g. the Rhineland-Palatinate area, and from northern Germany to the Rhineland-Palatinate area.
- Coordination and planning of renewable energy production in the region. At the moment a requirement plan for the future need of energy is lacking. Some single projects are on the way, but not coordinated. A plan to ensure sufficient renewable energy in the region needs to be drafted and implemented.
- The national gas pipelines should be adapted to hydrogen pipelines and the construction of new hydrogen pipelines should be eligible under the TEN E scheme⁶.
- Introduction of minimum shares of renewable hydrogen in specific end-use sectors, and paying greater attention to the consumer side and putting in place incentives to stimulate the demand for hydrogen products.

Good examples/practices from other regional or thematic contexts

- Hydrogen Valley North Netherland (Groningen), New Energy Coalition⁷
- Sectoral agreement for the development of hydrogen economy has been established, in which 200 entities participate. At least five hydrogen valleys are expected to be established in Poland. There is also a concept of establishing a hydrogen valleys operator, which is to enable exchange of knowledge and experience on projects.

<i>Issues to be tackled</i>	<i>Proposed approaches for action</i>
<ol style="list-style-type: none"> 1. Innovation management in sector 2. Development of local ecosystem for new chemical technologies (for instance based on locally available waste) 3. Involvement of local universities in transformation of chemical sector 4. Education of society aiming in growing awareness about green chemistry 5. Education of managers for future chemical industry, incl. knowledge and new cross-sectoral linkages within energy, hydrogen and non-fossil raw materials. 6. Development of carbon capture and utilisation technologies and/or processes optimisation. 7. Development of hydrogen technologies. 	<ol style="list-style-type: none"> 1. Pipeline, e-grid and RE (RenewableEnergy)-planning 2. Concept of Living Lab 3. Financial and infrastructure instruments for supporting chemical start-ups 4. MBA programme for green chemistry at local university (international) 5. Concept of "Regional H2 Lab" for technologies based on green hydrogen 6. New hydrogen pipelines eligible under the TEN E scheme 7. Stimulation of demand for hydrogen products

Focus area 4 – Supporting labour market and employment in the chemical industry

Problem description/Issues to be tackled

The chemical industry provides high added value and comparatively good jobs locally in European regions. Closures would not only impact not only workers directly, but also the entire supply chain and

⁶ https://energy.ec.europa.eu/topics/infrastructure/trans-european-networks-energy_en

⁷ <https://www.newenergycoalition.org/en/>

local businesses. Therefore, the Just Transition Mechanism, along with other EU funding programmes, is an essential element in transforming the sector and safeguarding quality employment in Europe's regions.

In the framework of a twin transition (climate neutrality and circular economy), the ability of the sector to withstand these transformational challenges depends on multiple factors, such as European and national policies and legislation, international competitiveness and trade, development of demand, market requirements and public opinion. In addition, to the availability and price of renewable energy and electricity and green hydrogen, Research and Development and innovation, investments, and funding, as well as cooperation among sectors and strong social dialogue.

New technologies linked to transformation also involve new business models and new roles of the company's employees, which will change faster and more often than before. Skills used in industry should be compatible with the evolving technology and production processes, therefore it will be necessary for employees to engage in a continuous process of their development. New job profiles will emerge and there will be the need for new skills and competences. Social partners have to anticipate and manage this change together – on national, sectoral and company levels. The role of social partners lies especially in works council initiatives, professional training plans, joint projects, skills forecasting, joint recommendations, etc.

It is evident that companies in the sector need to not only choose between different technological pathways but also ensure sustainable business models and working methods.

More specifically, the following elements are key for this focus area:

- Up-skilling and re-skilling chemical industry workers and technologists is a strategic precondition for improving sectoral competitiveness towards world-wide competitors.
- Human capital is an important area in the implementation of the transformation. We see the need to ensure continuity of staff in connection with the digital and green transitions, as well as with the transformation/redesign of the area. It is also important to provide the time for workers to be properly trained.
- The labour market must be versatile enough to adapt to the changes that the transition will bring. A clear picture will be needed of the skills and talents that will be vital in the transition of the chemical sector of the future, to enable a proactive approach.
- One of the crucial aspects is to increase the digitalisation of the EU chemical industry for its future competitiveness. Big data can improve manufacturing processes and lower the environmental impact of the sector through a more efficient management of resources, materials, and energy use.
- The innovations are more and more detailed and sophisticated, so a well-qualified labour force will be required even more in the future.

Approaches for action and first ideas for the implementation phase

Within the scope of the JTF regulation:

- The JTF needs to make it easier for the regions in need to tap into the European Skills Agenda: a five-year action plan with 12 actions to help equip people in Europe with better skills, in addition to the Pact for Skills model for a joint skills endeavour. The Pact aims to mobilise and

incentivise upskilling and reskilling, and, when relevant, pool financial and/or in-kind efforts across the partnerships.

- The JTP, via its network, can help to create inter-regional learning communities that combine innovating, working and learning to create a long-term impact and eliminate the differences that exist across Europe. The JTP can become a platform that can bring together different stakeholders, such as social partners, education providers (higher education institutions, VET and others), industry, policy, and decision-makers on the regional and European levels. That kind of cooperation needs to be enhanced and supported across the EU and across the whole ecosystem. One of the ideas might be the creation of inter-regional learning communities that combine innovating, working and learning to create a long-term impact and eliminate the differences that exist across Europe. With the cumulative expertise from the JTP members and secretariat, a productive cooperation can grow which would allow to address further challenges caused by the transition.
- Advice to regions who want to submit a TJTP: Despite the importance of the industry and scale of the transformation underway, a clear, granular mapping of the employment consequences of a shift towards climate-neutral industries at the regional level is still to be carried out. Without understanding where exactly the workers impacted are, just transition plans, including reskilling and upskilling programmes, cannot be tailored to ensure job-to-job transitions. This analysis must be conducted by public authorities in coordination with social partners. The implementation phase should set out the minimum requirements to be included in granular mapping exercises.
- Advice to regions who want to submit a TJTP: Anticipation of change and social dialogue for all workers must be at the heart of a just transition. In 2013, the European Parliament proposed a European legal framework on the anticipation and management of change – this should be created to ensure workers have the right to co-decision during the transition in their workplaces and regions, strengthening social dialogue and collective bargaining. This is already the case in some EU countries, e.g. in Germany. Sectoral and company decarbonisation strategies must be complemented by just transition strategies setting out the job-to-job transition, including re- and upskilling programmes, job-transfer plans, etc., of workers. Trade unions and worker representatives must receive timely information and be effectively consulted on those programmes. The implementation phase should consider and outline the positive benefits of a European legal framework on the anticipation and the management of change on workers and their regions. A meaningful and effective participation of workers in developing just transition plans at sectoral and company level must lead to the co-creation of job-to-job transition plans.

Broader views:

- Additional financial support from EU funds for the upskilling and reskilling of workers involved in the production, distribution and use of chemicals would be welcome. These actions will create new economic opportunities while fostering social justice and resilience, especially in the most vulnerable regions. The future brings challenges for companies and the labour market, including the emerging competence gap in digital and technical competencies, so support is needed in this area.
- The proper risk assessment, the prioritisation of measures, the search for safe and sustainable substances and materials and the discussion of advantages and disadvantages in any

particular instance require complex knowledge, specialist expertise and investment of time on the part of companies and authorities, and there is a constant need for information, advice and further training.

- The creation of a budgetary framework that ensures a level playing field for the safe and sustainable transformation of industry, encouraging behavioural change while ensuring competitiveness on the European and global markets. These actions aim to ensure a sustainable transition capable of supporting social and economic cohesion. The establishment of a dedicated fund for EU-wide human and environmental (bio)monitoring as part of the Horizon Europe programme (which is outside the scope of the JTF Regulation).

Good examples/practices from other regional or thematic contexts

- In Rhineland-Palatinate, the establishment of a Transformation Network is on the way. It consists of the social partners of the chemical and metal/automotive industry and local players in science and training. The application for financial support has not been decided yet, but the action plan is almost finished and could be provided if desired.
- The industriAll European Trade Union and the European Chemical Employers Group (ECEG) have created a toolbox of good practice examples (updated annually), which includes examples of attracting talent to the industry from a young age, e.g. via open chemistry classes or open company days.
- Another example of attracting and retaining the workforce comes from the Spanish chemical social partners' collective agreement. It foresees the involvement of students in the working life of companies from the beginning of their studies, which gives them the possibility to work in companies while combining academic education with hands-on technical experience.
- ECEG, jointly with the industriAll European Trade Union and 34 consortium members, will apply for the Blueprint initiative in 2022. Within the framework of this project, the applicants will develop sector-specific green and digital skills alongside those that would enable them to produce safe and sustainable-by-design chemicals.
- ECEG, jointly with Feccia, is finalising an EU-funded project that is developing digital skill sets for blue and white-collar workers alongside managers. The project's objective is to present skills curricula for the abovementioned three groups of workers in June 2022. Hubs for Circularity (H4C) will be a key instrument to advance the research and innovation agenda of European industries towards the European Green Deal's objectives.
- Finnish social partners are managing to facilitate such cooperation between technological companies and universities, in this case the University of Applied Sciences in Finland, where thanks to EU funds, technical solutions are being developed.
- The Euroclusters initiative (DG GROW) aims to create partnerships of cluster organisations and implement supporting measures for companies in and beyond their industrial ecosystem, reinforcing vital collaboration networks at EU level with a view to improving the resilience of the European industrial ecosystem and boosting their green and digital transformation.
- Digitalisation is essential for the industry to retain its competitiveness and keep pace with societal developments. European Digital Innovation Hubs (EDIHs)⁸ will function as one-stop

⁸ Some DIHs are focussing on the chemical sector or on topics that are relevant for the chemical industry, e.g. the DIH "[Axelera](#)" in France (in preparation) or the DIH "[Biorizon](#)" in the Netherlands.

shops that help companies dynamically respond to digital challenges and become more competitive.

<i>Issues to be tackled</i>	<i>Proposed approaches for action</i>
<ol style="list-style-type: none"> 1. Attracting and retaining the workforce 2. Shortage of versatile labour market to be able to adapt to the changes that the quadruple transition brings with it 3. The half-life of knowledge across any profession is shortening; rapidly up-skilling and re-skilling chemical industry operators – especially in the areas of digital and green skills – is important, alongside the identification of new skills, such as for carbon footprint calculation and reduction (skills needed for reduction are different to those needed for calculation). 4. Lack of a clear picture of “transitional” skills to enable a proactive approach to the transition of the chemical sector of the future 	<ol style="list-style-type: none"> 1. Establishing the JTP with its network as a platform for educational providers. 2. Clear, granular mapping of employment consequences of the transition 3. European legal framework on the anticipation and the management of change on workers and their regions

Focus area 5 – Supporting welfare systems and care economy for the affected communities in chemicals-heavy regions

Problem description/Issues to be tackled

Transition is change. Change is, by its nature, disruptive. There is no change without the prospect of anxiety, adaptation and re-evaluation. Change is within persons, families and community. When a person suffers a transitional change process, its entire systems go into re-evaluation and all their resilience mechanisms are put to the test. Social systems, family systems and educational systems play a crucial role in easing the transition process. In order to create the framework where the transition becomes just, we have to analyse the specificities of the community where the person has lived and worked and the consequences of change not only for its professional future but also in terms of quality of life. A successful transition depends on professional reintegration, but at the same time we cannot have professional reintegration without looking at what the affected systems are at a personal, family and community level, and dealing with them accordingly.

As a general rule, we strongly believe that before we engage in the first steps into community transition, a **study** is needed to bring to attention its specificity. No community is the same; each has different engagement levels, traditions and heritage, human and material potential. This study must reveal the SWOT points on which furthermore we will design our future. Whilst a competitive profile, natural resources and skills base are important to project an economic transition, we need to measure aspects like motivation, family dynamics, social support network and more in order to ensure that the measures taken will lead to a just transition.

Approaches for action and first ideas for the implementation phase

Within the scope of the JTF Regulation:

Because workers are people and people live in different systems, we have identified the following levels on intervention:

- **Personal level:** We define and explain what the consequences of the transition are for an individual worker when facing a transition process.
- **Family level:** Usually in communities dependent on industries affected by transition there is a more accentuated traditional model of families and the functions and structure can be affected by changes. This is not the case in all chemical regions; nonetheless there is in general an impact on family level and risk of dysfunctionality and change of roles.
- **Community level:** Transition brings a lot of changes at community level; the engagement of people is directly connected on the effects of transition and understanding of the process. Thus, the success of transition in a community depends on the members' engagement in the process and the manner of bringing concepts at grass-roots level.

Good examples/practices from other regional or thematic contexts

To be identified at a later stage

<i>Issues to be tackled</i>	<i>Proposed approaches for action</i>
<p>Personal level:</p> <ol style="list-style-type: none"> 1. Material deprivation. Usually, a transition process is accompanied by a period of material hardship for the workers that have to be laid-off, as they need to restructure their personal budgets and therefore have to change their personal expenses. 2. Depression and sense of uselessness. Given the specificity of the jobs, especially in energy-producing industries, the status of the job is directly linked to two aspects: its importance for the energetic security of a country and its camaraderie-specific relationships between workers. Losing both these, we create a fertile ground for depression and a feeling of not being important for the community for each of the workers. 3. Lacking motivation. As a direct consequence of transition, the motivational system suffers. A worker realises that what he/she has done before is now not important and reality requires him/her to develop new competencies. This process results for a lot of persons in discouragement and unwillingness to be proactive, depending on their resilience and adaptability skills. We believe it to be the most important aspect for up-skilling and re-skilling of workers; without it the process is not complete and sustainable. Re-skilling must be targeted, i.e. lead to skills that can actually lead to new employment in the region. 4. Social habits change. Usually, in communities that contain large industries (e.g. the chemical industry) there are social activities that are being developed around it – clubs, sports, thematic activities and so on. This forms a common ground that provides the social opportunities for interaction for a worker and these are affected, once a transition process is in place. As a result, the social life of the workers is affected. This leads furthermore to isolation and a weakened social life. 	<p>Personal level:</p> <ol style="list-style-type: none"> 1. Subsidies for layoffs, i.e. compensatory payments, at least in two-year instalments, and budget counselling combined with family assistance 2. Individual and group counselling and social programmes/activities (educational, cultural) in the community for former employees related to their working experience 3. Individual and group counselling; Community-organised centres that focus on re-skilling, professional guidance and orientation, designed especially for members of the community affected by industrial transition and encouraging the development of formal and non-formal groups of former workers (e.g. ex-chemical industry workers) at a community level 4. Encourage development of formal and non-formal groups of former workers (e.g. ex-chemical industry workers) at a community level; promote social events and offer discounts to cultural and social events in the community and engage former workers in industrial heritage events, and create instruments to

<p>Family level:</p> <ol style="list-style-type: none"> 5. <i>Incapacity to ensure financial role of the family – material deprivation of the members of the family.</i> Job losses create material problems for the entire family and its possibility to ensure the basic needs of the members, plus they are usually accompanied by inability to restructure family budget, prioritise expenses and evaluate current family status (affordability, new income opportunities). 6. <i>Distress between parents and child neglect. Risk of becoming a dysfunctional family.</i> Change often brings discussions, conflicts in the family and insecurity for the future. The relationship between the members of the family weakens and there is a proper ground for child neglect, alcoholism and/or domestic violence. 7. <i>Change in roles.</i> Experience shows that once the layoffs take place, a family reorganises its functions. Therefore, there is a need for more flexibility from parents to change their roles within the family. Often there were cases where the mother was the sole provider of income and the father needed to develop skills that would ensure the educational role of the family. This is a shift that needs accommodation guidance and reskilling for adults. <p>Community level:</p> <ol style="list-style-type: none"> 8. <i>Weak participation in community decision-making.</i> Community members who are not feeling “rooted”, do not see their future clearly, and have been “victims” of a transition process do not engage inside the community, do not participate constructively in decision-making processes and have mainly grievances that are wrongly addressed. It is then very hard to engage them in a discussion about the future of the area if they still haven’t accepted change and made amends that there is a new future ahead. This creates multiple problems in drafting new local strategies, and weak participation in public consultation. 9. <i>Unwillingness to accept the transition process.</i> Change at community level is the same as for an individual, a shift that has great influence in community mechanisms. The first reaction to change is anxiety and distress. Seldom has this kind of transition come from inside the community (e.g. Green Deal), therefore it is very hard to ensure a critical mass of people that are convinced that they need to change most of their habits, work placements and place in the community. As a result of change, inevitably public opinion is negatively influenced and this must create different coping mechanisms in the community. Too many times, the transition process has been not sufficiently explained and/or its concepts 	<p>underline the heritage (albums, exhibitions, tours, etc.).</p> <p>Family level:</p> <ol style="list-style-type: none"> 5. Subsidies for layoffs, compensatory payments, at least in two-year instalments, family assistance programme developed at a local level. This programme would support and guide the family as a whole from a social point of view, until its ability to self-sustain. 6. Family assistance programme and financial help for day-care, counselling and other social services of members. This help must be dependent on the fulfilment of the reskilling process. 7. Family assistance programme and soft skill training in accordance with evaluations on functional roles in the family after layoff. <p>Community level:</p> <ol style="list-style-type: none"> 8. Encourage development of former worker associations and gathering points (clubs and events); a simpler and human-based approach of explaining transition in public communication of concepts like “transition”, “strategic planning”, “competitive profile”, etc. Focus more on community gains, importance of participation and diversify channels and make them simple for members of community to have their voice heard (D2D approach, neighbourhood talks, etc.). 9. A simpler and human-based approach of explaining transition in public communication of concepts like “transition”, “strategic planning”, “competitive profile”, etc.; focus more on community gains, importance of participation; a local presence of leaders (national, European) explaining transition, protection scheme and benefits; designing a public informational plan
--	---

<p>weakly objectified for people, at multiple layers of understanding.</p> <p>10. Demographic backlash/problems. A community in transition is one that needs to be aware that demographic processes will occur. Most of the time, the mindset that communities need to face is one of a “shrinking city”. Migration, possibility of marginalised community emergence, and a rise in social housing are dimensions that take their toll in the process. How fast a community can adapt its public services, how resilient and flexible the social sector is, the public policies that focus on brain retention, etc. are aspects greatly that influence the quality of life and status quo of a community in transition.</p>	<p>(community talks, events), focused on good practice examples in other areas; public authorities should avoid generic concepts and be transparent and direct.</p> <p>10. Adequate legal framework to minimise the negative impact of brain drain on the regional economies; ensure sufficient and flexible social services that can respond to needs that will emerge and prevent marginalisation, forming of ghettos and other anti-social behaviours (e.g. provide social housing, access to canteens, etc.); Create a communicational pathway that involves relevant public authorities (school, security, medical) and design case managers for each individual cases, and supports the migration of families (inside and outside of the community) as a result of new social status after transition.</p>
--	--

Workplan

The following section includes an overview of deliverables, milestones and WG meetings both completed and outstanding, alongside a timeline.

Deliverables, milestones and timing

The following table gives an overview of the achieved/outstanding milestones and deliverables (to be) reached by the WG throughout the next two years. The timing of milestones and deliverables after mid-2022 is indicative, hence in *italic*.

	Time	Milestone (M) / Deliverable (D)
a	September/October 2021	M: Call for applications for JTP WGs
a	15 November 2021	M: Formal establishment of WGs – at public JTP event, session “Launch of JTP Working Groups on carbon-intensive regions”
a	February 2022	M: Five needs assessment interviews held with first circle WG members
	5 April 2022	D: Draft Scoping Paper
	6 April – 22 April 2022	M: Scoping Paper consultation with the second circle
	10 May	D: Final Scoping Paper + presentation at public JTP event, session “Getting started! JTP Working Groups: scope and engagement”
	<i>October 2022</i>	D: Draft Implementation Plan
	<i>January 2023</i>	D: Final Implementation Plan
	<i>From January 2023</i>	M: Implementation of actions
	<i>December 2023</i>	M: Finalisation of all activities

Meetings

Below is a table of WG meetings both held so far and to be held in the future. Again, the timing of meetings after May 2022 is indicative, hence in *italic*. The last column indicates the format of the meetings.

Time	Meeting	Format
a 18 November 2021	First WG meeting	Virtual
a 25 February 2022	Second WG meeting	Virtual
<i>w/c 16 May 2022</i>	Third WG meeting	Virtual
<i>November 2022</i>	Fourth WG meeting	<i>Physical (tbd)</i>
<i>May 2023</i>	Fifth WG meeting	<i>Virtual (tbd)</i>
<i>November 2023</i>	Sixth WG meeting	<i>Physical (tbd)</i>

Annexes

Annex 1: List of members of the WG

Organisation
Local and regional authorities
Mažeikiai district municipality
Town Hall in Wałbrzych
Associations representing regional, local, urban and other public authorities
Forschungszentrum Jülich GmbH
European Chemical Regions Network
University of Bari Aldo Moro
Interuniversity Consortium on Chemical Reactivity and Catalysis (CIRCC)
IN4climate.NRW (chemicals)
Organisations representing economic and social partners
Bulgarian Chamber of Chemical Industry
industriAll European Trade Union (chemicals)
European Chemical Employers Group (ECEG)
European Cluster Alliance
Arbeitgeberverband Chemie Rheinland-Pfalz e. V.
Bulgarian Industrial Association (chemicals)
Bulgarian Chamber of Chemical Industry
Austrian Mining and Steel Association & Austrian Non-Ferrous Metals Federation
Bodies representing civil society, such as non-governmental organisations
European Environmental Bureau chemicals
Associația Umanitară Kandila
Branch Association Polymers
Instrat Foundation
Province of Groningen
SC Achema
Lithuanian Confederation of Industrialists
Polish Chamber of Chemical Industry
Chamber of Commerce and Industry of Slovenia – Association of Chemical Industries of Slovenia (CCIS-ACIS)

