

## The Role of Clean Hydrogen in achieving a Just Transition to a climate neutral industry

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### 1. Introduction

The EU will need clean hydrogen to achieve carbon neutrality by 2050. With its *Hydrogen Strategy for a climate-neutral Europe* (hereafter Clean Hydrogen Strategy), the EU acknowledges the important role that clean hydrogen will play, not only in decarbonising our energy system, but also in the decarbonisation of the hard-to-abate energy intensive industries, like chemicals, cement and steel, and the mobility sector, with long distance and heavy-duty vehicles, ships and airplanes. Indeed, achieving a decarbonisation target of at least – 55% by 2055, as suggested by the European Commission in September 2020, and climate neutrality by 2050 poses major challenges to the EU industry, energy system and mobility sectors that need to be addressed urgently.

The Clean Hydrogen Strategy, together with the EU Strategy for Energy System Integration that promotes a circular approach to energy supply and demand through the “*integrated planning of the energy system as a whole, across multiple carriers, infrastructures and consumption sectors*”, are important elements in this decarbonisation puzzle.

The EU economy will not be able to decarbonise through electrification alone. Indeed, in its Long-term Climate Strategy, the EU Commission estimates the share of hydrogen in the EU energy mix to increase from today’s less than 2% to 13-14% by 2050.

In its Clean Hydrogen Strategy, the Commission intends to build a capacity of 40 GW of electrolyzers in Europe by 2030 and to scale up clean hydrogen to all hard-to-decarbonise sectors by 2050.

By Clean Hydrogen, the Commission refers to hydrogen that is produced with electrolyzers using renewable energy that splits water into its elements, hydrogen and oxygen.

The Commission also considers blue hydrogen to be an essential element for the transitional phase to scale up clean hydrogen. Blue hydrogen is produced from fossil fuels, predominantly from natural gas through steam methane reforming, with carbon capture and storage.

Yet, in order to promote green hydrogen as an integral part of the decarbonisation of our economy, there are several challenges that need to be tackled:

- ➔ The Supply-demand deadlock: Today, hydrogen production is insufficient as demand for it is low. That is also because clean hydrogen is not cost-competitive to promote big volume applications. In its communication, the EU Commission estimates that the price for one

kilogram of green hydrogen (€2.5-5.5/kg) could be 3-4 times higher than fossil-based hydrogen (€1.5/kg), while it estimates one kilogram of blue hydrogen at €2/kg.

- ➔ Massive technological upscaling will be needed to push down the production costs of renewable hydrogen and increase the demand.
- ➔ The third crucial element in the puzzle is the scaling up of renewable energy production in order to boost domestic production of clean hydrogen.

The EU Clean Hydrogen Strategy aims at setting out a strategic roadmap to “turn clean hydrogen into a viable solution to decarbonise different sectors over time, installing 6 GW of renewable hydrogen electrolyzers in the EU by 2024 and 40 GW of renewable hydrogen electrolyzers by 2030”, by overcoming the many existing challenges, including investment needs, developing an enabling regulatory framework, creating new lead markets, sustaining research and innovation in breakthrough technologies and their market uptake, large-scale infrastructure networks and cooperation with third countries. According to the Commission’s communication, investments in renewable hydrogen could reach €180-470 billion by 2050 and the emergence of a clean hydrogen value chain could employ 1 million people.

The importance of hydrogen in reaching the EU’s climate objectives but also in terms of maintaining European technological leadership has been underlined by several Member States’ announcements of multi-billion Euros strategies as part of their national recovery programmes and their National Climate and Energy Plans, such as Germany’s strategy to invest 9 billion Euros in renewable hydrogen, equalled by France’s ambition to invest 7.2 billion Euros in carbon-neutral hydrogen.

## 2. IndustriAll Europe’s perspective

IndustriAll Europe welcomes the Clean Hydrogen Strategy and considers it to be an essential element in decarbonising industry, while maintaining and creating quality industrial jobs in Europe. We welcome the ambition to build a hydrogen ecosystem in Europe and the priority of the EU Commission to develop renewable hydrogen, produced mainly using wind and solar energy. The progressive large scale deployment of green hydrogen until 2050, alongside the roll-out of renewable power generation, will not only contribute to decarbonise our energy system, but also decarbonise hard-to-abate energy-intensive sectors and the transport sector.

IndustriAll Europe fully supports the EU’s climate neutrality target, provided it is achieved guaranteeing a Just Transition for the workforce. For us, it is not a question of whether to achieve climate neutrality by 2050, but rather of how to achieve that target while maintaining the competitiveness of EU industry and keeping quality industrial employment in Europe. The massive scale-up of clean hydrogen, and fostering a hydrogen ecosystem in Europe, is an essential element in achieving this. IndustriAll Europe agrees with the Commission’s analysis that, in the short or medium term, other forms of low-carbon hydrogen will inevitably be used to reduce emissions from existing

production and support the further parallel development and uptake of green hydrogen, with the objective of scaling up renewable hydrogen to reach all hard-to-decarbonise sectors after 2030.

IndustriAll Europe considers that the EU clean hydrogen strategy must be based on a climate-neutral technological neutrality approach. Therefore, clean must mean climate-neutral.

The use of all carbon free technologies is vital to quickly provide the EU with competitive and clean hydrogen in large quantities and to base the European hydrogen strategy on strong and sustainable business models. Indeed, any hydrogen strategy must be based on strong and sustainable business models and on a consistent application of the energy efficiency principle.

Compared to other existing technologies electrolyzers have low efficiencies, between 60 – 80 percent. As demand for climate-neutral electricity will increase radically due to electrification of society at large, in particular renewable sources of energy, strategies must also consider how to best use renewable electricity in the next 30 years with policies that are crafted now. Due to the large quantities of electricity needed to produce hydrogen, direct use of climate-neutral energy is more efficient and where possible must be prioritised.

While access to clean electricity is vital, the sustainable management of water will be an equally determining factor in the deployment of hydrogen.

Whereas the Clean Hydrogen Strategy estimates that potentially up to 1 million new jobs will be created, it remains silent as to the wider social dimension. In our view, the Hydrogen strategy must be fully based on the three sustainability pillars, integrating environmental, economic and social aspects in its planning.

IndustriAll Europe is committed to contributing to strengthening the strategy with the following points.

### 2.1. Clean hydrogen - a means to a green and social (!) recovery

However disastrous the shock to our health systems and economies, the onset of the COVID-19 pandemic and the response of the EU to address the recession also provides a unique opportunity for a green recovery, in which the further development of renewable hydrogen, alongside the continued upscaling of renewable energies, plays an essential role. IndustriAll Europe welcomes the special focus of the European Recovery Plan on the implementation of the Green Deal and the proposed 30% earmarking for climate related spending through the Multiannual Financial Framework and Next Generation EU.

Indeed, the new Strategic Investment Facility is set to “invest in technologies key for the clean energy transition, such as renewable and energy storage technologies, clean hydrogen, batteries, carbon capture and storage and sustainable energy infrastructure”.

However, in order to fully live up to these commitments, additional funding is needed for strategic programmes for the future of EU industry, such as Horizon Europe, Connecting Europe Facility-Energy (Projects of Common Interest PCIs/Trans European Network-Energy) or Invest EU. This is especially

relevant as the Council Agreement in July has significantly reduced the amount initially dedicated to these programmes. Also, the Just Transition Fund resources must be commensurate with the challenges that the 2030 and 2050 climate targets entail for the regions and sectors most impacted by decarbonisation.

For industriAll Europe, it is of utmost importance that the EU recovery strategy boosts the EU industrial strategy and strengthens industrial value chains, while maintaining and creating stable and high-quality jobs. To that end, Member States should ensure synergies between provisions of their National Climate and Energy Plans (NECPs) dealing with hydrogen and their Resilience and Recovery Plans.

### 2.2. Upscaling of hydrogen supply and demand

The supply-demand deadlock in the uptake of clean hydrogen won't be solved by the market. A EU strategy for hydrogen that addresses technology upscaling to factory size and makes it competitive is absolutely critical to ensure that the EU retains global leadership in technology development and provides a sustainable future for its industrial base. This requires a strong industrial policy toolbox, providing the right framework conditions to help a EU hydrogen ecosystem develop. Such conditions have to include adapted state aid guidelines and a renewable energies directive.

Due to the significant investment costs, as well as the increased operating costs, corresponding (research and demonstration) projects must be supported by adequate funding at both national and European level (e.g. through Important Projects of Common European Interests). Support systems must cover the various elements of the hydrogen value chain. Public authorities have a specific role to play in this context to accelerate the roll-out of necessary transport and storage infrastructures through public investment.

New Hydrogen demand can only be triggered by policies that ensure new uses for hydrogen are commercially attractive. Long haul transport on roads, waterways, marine, steel, titanium, iron production can become major users of hydrogen with policies that are targeted to these sectors. At the same time, policies for new hydrogen demand should be benchmarked up against other low to zero emissions fuels and energy storage solutions.

IndustriAll Europe would explicitly welcome the creation of tendering systems for Carbon Contracts for Difference (CCfDs) to support bridging cost gaps with the conventional production of hydrogen. The Clean Hydrogen Strategy mentions possible pilot schemes to accelerate the existing hydrogen production in refineries and fertiliser production, low carbon and circular steel and basic chemicals, the deployment of hydrogen and derived fuels in the maritime sector and synthetic fuels in the aviation sector. We believe that CCfDs will be instrumental in supporting the EU low-carbon industrial base.

In order to meet the targets of upscaling electrolyser capacity and domestic hydrogen production in Europe, we need an equally ambitious expansion of renewable energies in Europe: the upcoming Offshore Wind Strategy and the review of the Renewable Energies Directive expected in June 2021 must live up to that goal.

However, the upscaling of hydrogen to meet the growing industrial demand in Europe will not be possible with domestic production alone, and the Commission already outlined the external dimension of its hydrogen strategy, highlighting cooperation opportunities with neighbouring countries and regions of the EU.

Imports of hydrogen will indeed be necessary to meet the growing demand of EU industry. IndustriAll Europe calls upon the EU to carry out a comprehensive impact assessment before planning imports and projects with third countries, to avoid that our domestic production and workplaces are negatively impacted by lower production costs and labour standards.

At the same time, industriAll Europe refuses to accept that the Clean Hydrogen Strategy is based on any form of neo-colonialism. We therefore highlight the importance of a comprehensive cooperation agreement with neighbouring countries and regions that takes due account of those countries' own energy demands and ensures fair ecological, social and employment standards. The Clean Hydrogen Strategy must be based on solidarity and embedded in a global vision on hydrogen production taking in due account the implications for the producing countries in terms of benefits for local communities and employment and working conditions.

industriAll Europe reiterates its demand to maintain and develop a fully-fledged energy industry inside the EU. IndustriAll Europe insists that EU hydrogen strategy must give the priority to hydrogen produced in the EU and by European infrastructure. Furthermore, we believe that the climate challenge will only be tackled by favouring a public service and interest approach. This will be vital for the further development for the hydrogen industry to prevent making the same mistakes as in the development of the photovoltaic manufacturing. In our view it must be Europe's ambition to keep global leadership in hydrogen technology manufacturing while maintaining Europe's strategic autonomy.

### 2.3. Maintain and create high quality jobs in the EU hydrogen value chain and industry

There are significant employment opportunities in the hydrogen value chain: new jobs can be created in hydrogen production and infrastructure but the greater goal, surely, is to retain high-quality employment in existing energy-intensive industries and secure Europe's role as 'the low-emissions workshop of the world'. Clean Hydrogen will support technological change in wider industrial production, in line with Europe's decarbonisation targets: projects linking renewable energy and electrolyzers to existing industrial production plants (e.g. those converting to produce low-carbon automotive and aviation fuels and low-carbon steel or cement).

The strategy's potential to create new decent jobs and maintain existing ones is of paramount importance in demonstrating that a Just Transition is possible in the pursuit of carbon neutrality.

In order to live up to the principle of Just Transition, employment in the hydrogen ecosystem must be of high quality and based on a strong social dialogue.

### 2.4. Prepare workers for the new skills in the hydrogen ecosystem

Low-carbon technologies are disruptive for skills. Consequently, workers in both new energy sourcing and in industrial applications will need new skills sets. It is crucial that the Hydrogen Strategy, alongside the Industrial Strategy, pays due attention to the new skills dimensions and provides for a comprehensive skills strategy, based on the timely anticipation of skill needs with the involvement of social partners to build up skills intelligence. The focus should also be put on the timely up- and re-skilling of workers, while providing strategies about how to keep the existing workforce at the workplace.

This is also necessary in the light of technological innovations due to the development of Industry 4.0 which sees the massive introduction of advanced technologies (computer science, robotics, internet of things, artificial intelligence, augmented reality and virtual reality, databases).

Indeed, the anticipation of skills needs has to be based on concrete estimations of the number of jobs to be created and specific tasks and profiles of workers in the hydrogen ecosystem taking due account of ongoing digitalisation and automation of manufacturing processes. More jobs will likely be created in industries such as pressure-cylinder manufacturing, valve manufacturing, pipeline building and maintenance, etc. To that aim, a comprehensive impact assessment on the employment impact and structure in Europe will be essential.

### 2.5 Create an occupational health and safety policy for hydrogen industries to protect workers

The Clean Hydrogen Strategy does not take into account new security and safety risks that the production, transport, storage and use of hydrogen poses to workers and the public. Hydrogen storage tanks are high pressure and hydrogen is a gas that requires extraordinarily high quality of steel alloys, carbon fiber, high density gaskets and compressors. Leaks are dangerous and the risk of fire or explosions are present as the recent experience in Norway at a hydrogen gas station reveals. Workers and public safety must be secured as well as a dedicated program to educate users and producers of hydrogen. Therefore we demand that the development of an hydrogen ecosystem must be accompanied by strong health and safety policies.

### 2.6. The problem of structural change

Model projects exist to help decarbonise energy-intensive industrial sites at a local level and thus keep businesses and employment in industrial regions. However, they depend on access to abundant renewable energy. Indeed, the Commission's vision foresees the gradual roll-out of a hydrogen infrastructure and the establishment of a pan-European grid, by partly repurposing the existing gas grid and developing large-scale storage facilities.

The Commission emphasises that “the hydrogen ecosystem in Europe is likely to develop through a gradual trajectory, at different speeds across sectors and possibly regions and requiring different policy solutions.”

Our concern is that not all regions with a high share of energy-intensive industries will be able to build their own clean hydrogen production close to industrial sites because of geological limits, high investment needs and higher operational costs. It is crucial that these regions do not lose out in the transition and that they are able to access the necessary funding to modernise their infrastructure and convert their manufacturing base to the use of clean hydrogen. The means available in the Modernisation Fund and the Just Transition Fund will be crucial in this respect. We emphasise the need to develop regional industrial plans that support the redevelopment of carbon-intensive industrial regions.

The Just Transition Platform for coal- and carbon-intensive regions provides a solid forum for exchange on the challenges of the energy and industrial transition in Europe's regions. IndustriAll Europe would like to see the increased participation of DG Employment and trade unions in the platform to strengthen the social dimension in the regional planning.

### 3. To conclude

We look across the world and see other nations coming up with multi-billion euro, job-creating hydrogen strategies in this technology race. We have long argued that the EU cannot afford to risk being left behind, and failure would result in both not meeting our climate obligations and a loss of high-skilled and quality jobs. Therefore, the Clean Hydrogen Strategy is of vital importance for Europe's industrial and energy workforce.

IndustriAll Europe has committed to becoming a partner in the European Hydrogen Alliance that will support the "ambitious deployment of hydrogen technologies by 2030" and the build-up of EU global leadership in this domain. Our goal is to make the social dimension an integral part of the strategy's implementation and to support our trade unions at national level in being equally involved, in line with the principles of a Just Transition. Nothing about us without us. We are here to play our role!