TIR-H

Transporting Industrial Relations towards Hydrogen

Report on EU Initiatives, Policy Recommendations, and Mapping of EU Social Dialogue Developments

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Abbreviation

AE	Affiliated Entity
CA	Consortium Agreement
DoA	Description of the Action
EC	European Commission
EPSR	European Pillar of Social Rights
GA	Grant Agreement
IEA	International Energy Agency
ILO	International Labour Organization
JTF	Just Transition Fund
OECD	Organisation for Economic Co-operation and Development
PC	Project Coordinator
WP	Work Package
WPL	Work Package Leader

1. The frame of EU initiatives and policy recommendations in the field of ecological transition with a focus on the role of hydrogen

1.1. EU initiatives on green transition

Climate change is the most serious crisis our planet is facing nowadays. As Secretary-General António Guterres pointed out in September 2019, "*the climate emergency is a race we are losing, but it is a race we can win*"[1]. Hence, it is crucial to build a new sustainable economy model. Different policies were launched at international and national level to tackle this emergency.

The Paris Agreement[2], adopted in 2015 by 195 countries, stands out as the first, legally binding deal on climate change. Among the different goals set by the agreement, the principal aim is to "strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty"[3]. As Article 2 of the agreement underlines, this goal includes keeping the global average temperature below 2 °C above pre-industrial levels and pursuing extra efforts to limit the increase to 1,5 °C; but also strengthen the ability to adapt to the consequences of climate change reducing greenhouse gas emissions and steering finance towards a development that consists in low greenhouse gas emission. To meet these ambitious targets, the agreement requires to prepare and to adopt national action plans, whose progresses have and will have to be reported to the other signatory parties and to the public. Furthermore, from 2023, the agreement includes the goal of conducting, every five years, a planet-wide report, to monitor the results achieved and consequently set further targets in the fight against climate change. All the goals and the objectives of the agreement are implemented, also, through a practical and financial support to developing countries, to help them adapt to climate change.

Hence, the Paris Agreement draws a clear path towards low-carbon and greener economies and productions, though this transition demands a crucial shift and great challenges in relation to technology, energy, the economy, finance, and society[4].

[1] United Nations, The Climate Crisis – A Race We Can Win. The speech is referred to the Remarks at 2019 Climate Action Summit.
[2] United Nations, Paris Agreement, Official Journal of the European Union, 2016.
[3] See art. 2, Paris Agreement.
[4] From 2015, 20 of the world leading economies launched "Mission Innovation" to improve public and private clean energy innovation, to develop shattering technologies and also achieve a reduction in costs. European Commission, Communication from the Commission to the European Parliament and the Council, The Road from Paris: assessing the implications of the Paris Agreement and accompanying the proposal for a Council decision on the signing, on behalf of the European Union, of the Paris Agreement adopted under the United Nations Framework Convention on Climate change.

Almost 4 years after the Paris Agreement, in December 2019, another crucial document was launched: the Green Deal[5], an EU project, whose goal is to reduce emissions by at least 55% by 2030, compared to 1990 levels, with the final aim of completely eliminating emissions by 2050.

The Green Deal represents the answer to the compelling necessity to tackle the increasing temperature of the atmosphere and, more generally, climate change and environmental degradation[6]. The plan has various objectives: clean air and water, healthy soil and biodiversity; renovated and energy efficient buildings; healthy and affordable food; more public transport; cleaner energy and cutting-edge technological innovation, such as to accompany transition paths easily and without major impacts on economies; greater durability of the products, so that they can be repaired, recycled and reused[7]; jobs adapted to future needs, therefore, consequently training the skills needed by the transition and, at the same time, a globally competitive and resilient industry.

To concretize these targets, the EU Green Deal provides an investment plan composed by three principal key points: increasing funding for the transition and mobilize at least €1 trillion to support sustainable investments over the next decade through the EU budget and associated instruments, in particular Invest EU; creating an enabling framework for private investors and the public sector to facilitate sustainable investments; and, providing support to public administrations and project promoters in identifying, structuring and executing sustainable projects[8].

There is no doubt how the green transition impacts and will impact the economic-productive markets, and therefore on the employment, professions, and skills of those already inserted in the labour markets, as well as those entering the new production cycles and sectors in transition[9]. The Commission highlights how the green transition will generate higher or less employment[10], depending on the management of the reconversion and transformation processes.

Therefore, while it is important to underline that tackling climate change requires an economy with a low consumption of carbon, there is no doubt how the challenges also in the productive-economic and social spheres will have to be considered and faced. Therefore, to face the social, economic, and environmental impact of the transition, the European Commission established, in January 2020, the Just Transition Fund (JTF)[11].

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[5] European Commission, Communication from the Commission to the European Parliament and the council, The European Green Deal, 2019.
[6] European Commission, Priorities 2019-2024, Delivering the European Green Deal.
[7] This approach is defined as circular economy: see European Parliament, Circular economy: definition, importance and benefits, 2015.
[8] European Commission, Questions and answers, The European Green Deal Investment Plan and Just Transition Mechanism explained, 2020.
[9] «Sustainable development is only possible with the active engagement of the world of work», ILO, Guidelines for a just transition towards environmentally sustainable economies and societies for all, 2015, p. 4.
[10] European Commission, Priorities 2019-2024, Delivering the European Green Deal, § *Leading the third industrial revolution*.
[11] European Parliament, A just and green transition for all regions of Europe – The Green Transition in regions and cities is already happening.

The JTF aims to provide support to those territories and regions who are struggling to achieve climate neutrality in relation to their dependence to fossil fuels. The fund is pointed towards guaranteeing the achievement of the climate neutrality (promoted by the Green Deal) in an equal way according to the central and programmatic motto: *Leave no one behind*[12]. Again, if policies and actions against the effects of climate change are now needed, it is equally true that there is a close link between green transition and socio-economic transitions. Promoting actions to reduce gas emission and encouraging climate-neutral activities also means identifying and providing adequate tools to protect citizens, workers and in particular vulnerable groups involved in (or, in some cases, *affected by*) the transitions, allowing them to accede to the necessary tools to retrain their skills in new production chains, according to the skills and qualifications required by green jobs and green sectors[13]. Therefore, to benefit from this fund, the member States will have to present their territorial plans for a just transition, including strategies to face the challenges connected to the period of transition. In particular, the support provided with the JTF consists in diversification and economic modernization of those countries which are hardly hit by the climate transition, in professional requalification and inclusion of their employees and of the ones seeking an employment.

Compared to the European Commission's initial proposal, the scope of the Fund is broader, including sustainable investments in: SMEs, including microenterprises and start-ups; research and innovation activities; renewable energy and energy efficiency; smart and sustainable local mobility, including the decarbonisation of the local transport sector and its infrastructure.

On the issue of partnerships, the Commission services recall that "the participation and engagement of the public and all stakeholders is essential to the success of the JTF". They also add that "Local stakeholders, in particular economic and social partners (such as trade unions, including those representing miners), and bodies representing civil society (including youth organizations, environmental NGOs, etc.) should be systematically mobilized in the debate on the future of their territories".

In this spirit of the EU policy to fight against the climate change, the financial package is also composed of proposals whose aims concretizes in the "Fit for 55" plan, a program to deliver the transformational change needed across our economy, society and industry and, consequently to create new opportunities for innovation, investment and jobs[14].

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[12] United Nations, Sustainable Development Group, Universal Values - Principle Two: Leave No One Behind.

[13] On this topic, see: Communication from the Commission, Energy for the future: renewable sources of energy. White Paper for a Community Strategy and Action Plan, COM(97)599 def.; UNEP, *Are you a green leader? Business and biodiversity: making the case for a lasting solution*, 2010; ILO, *Skills for a Greener Future – background country studies*, May 30, 2019. See also O. Strietska-Ilina, C. Hofmann, M. Durán Haro, S. Jeon, *Skills for Green Jobs. A Global View. Synthesis Report Based on 21 Country Studies*, ILO, 2011; P. Tomassetti, *Labor law and environmental sustainability*, in *CLLPJ*, 2018, vol. 40, n. 1, p. 61 ss.

[14] European Commission, Communication from the Commission to the European Parliament, the Council. The European economic and social committee and Social committee and the Committee

In particular, this package strengthens eight existing pieces of legislation and presents five new initiatives, across a range policy areas and economic sectors: climate, energy and fuels, transport, buildings, land use and forestry. The innovation that comes up from this package is the interconnection of the topics. Therefore, the chosen policy mix is a careful balance between pricing, targets, standards, and support measures[15].

Alongside this first funding fund, in 2021 the European Parliament approved the Invest-EU[16] program, with the aim of mobilizing € 400 billion to be invested across the Union between 2021 and 2027[17]. The new program makes part of the 750-billion-euro Next Generation EU recovery package and will promote strategic, sustainable and innovative investments as well as addressing market liquidity difficulties, non-optimal situations and investment care in specific sectors. The objectives of the project are aimed, in particular, at: sustainable infrastructures (about 38%); research, innovation and digitization (about 25%); investments in SMEs (about 26%); social investments and skills (for the remaining 11%). If eligible beneficiaries can be private entities, public sector entities, mixed and non-profit organizations, in the scope of application of the Program several investments to address the social, economic and environmental challenges arising from the transition process in the four main themes of the programme are eligible. Between the various investments, it must be acknowledged the centrality of those ones in the energy sector, in critical and in sustainable transport infrastructures[18].

1.2. EU Hydrogen Strategies

Already in 2015, the European Commission stated how "the development and deployment of climate technologies have an essential role to play in meeting climate change objectives, as well as in contributing to job creation and sustainable economic growth. The combination of research funding, market uptake measures, education programmes, finance and policies that impose a price on emissions create an enabling environment for a broad spectrum of technologies. This includes technologies to promote resilience to extreme weather impacts, climate services and water management systems, as well as energy production, industrial processes, transport, agriculture, and reducing deforestation"[19].

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of the regions, 'Fit for 55': delivering the EU's 2030 climate target on the way to climate neutrality., July 14, 2021.

[15] European Commission, Communication from the Commission to the European Parliament, the Council. The European economic and social committee and the Committee of the regions, 2021: 'Fit for 55': delivering the eu's 2030 climate target on the way to climate neutrality, July 14, 2021.

[16] European Commission, InvestEU, 2021.

[17] European Commission, European Semester 2020, Overview of Investment Guidance on the Just Transition Fund 2021-2027 per Member State, annexes D, 2020.

[18] IndustriAll, Sydex, Financing the Just Transition: An EU overview, October 2021.

[19] European Commission, Communication from the Commission to the European Parliament and the Council, The Paris Protocol – A blueprint for tackling global climate change beyond 2020, February 25, 2020, p. 11.

Considering that the objectives dictated by the EU towards a zero economy requires a fair and rapid transition, that simultaneously protects sustainability and health, both protecting the production and aiming at the reduction of energy poverty across the EU, ensuring the security of its supply, and widening accessibility, also from an economic point of view, there is no doubt that in the plan hydrogen must be considered in the share of clean sources and alternative fuels. In particular, renewable hydrogen has an untapped potential to be such an alternative.

In all the scenarios considered for sectoral emission abatement, several researches have considered a mix of innovative and technological levers and tools, such as "electrification, hydrogen use, biomass, alternative materials, energy efficiency, recycling and CCS"[20].

"A hydrogen strategy for a climate-neutral Europe" is therefore the programmatic strategy and mix of policies adopted by the EU in July 2020, in the specific issue of hydrogen, its production and its uses.

The first goal is the "planning of hydrogen infrastructure, including in the Trans-European Networks for Energy and Transport and the Ten-Year Network Development Plans (TYNDPs) (2021) taking into account also the planning of a network of fuelling stations. Furthermore, the acceleration of the deployment of different refuelling infrastructure in the revision of the Alternative Fuels Infrastructure Directive and the revision of the Regulation on the Trans-European Transport Network (2021). Last designing market rules to the deployment of hydrogen, including removing barriers for efficient hydrogen infrastructure development (for instance via repurposing) and ensure access to liquid markets for hydrogen producers and customers and the integrity of the internal gas market, through the upcoming legislative reviews (for example review of the gas legislation for competitive decarbonized gas markets (2021)."[21].

According to the same report, "hydrogen is enjoying a renewed and rapidly growing demand (we are talking about 94 million tonnes (Mt) in 2021) in Europe and around the world. Hydrogen can be used as a feedstock, a fuel or an energy carrier and storage, and has many possible applications across industry, transport, power and buildings sectors. Most importantly, it does not emit CO2 and almost no air pollution when used. It thus offers a solution to decarbonize industrial processes and economic sectors where reducing carbon emissions is both urgent and hard to achieve. All this makes hydrogen essential to support the EU's commitment to reach carbon neutrality by 2050 and for the global effort to implement the Paris Agreement while working towards zero pollution"[22].

In addition, "there are many reasons why hydrogen is a key priority to achieve the European Green Deal and Europe's clean energy transition. Renewable electricity is expected to decarbonise a large share of the EU energy consumption by 2050,

[20] B. Kiss-Dobronyi, D. Fazekas, Modelling the decarbonisation of energy intensive industries in the EU The potential effects of a carbon border mechanism, ETUI Report No. 03, 2022, p. 11.
[21] European Commission, Communication from the Commission to the European Parliament, the Council. The European economic and social committee and Social committee and the Committee of the regions, A hydrogen strategy for a climate-neutral Europe, 2020, § 1, *Introduction*, p. 22.
[22] *Ibid*., p. 1.

but not all of it. Hydrogen has a strong potential to bridge some of this gap, as a vector for renewable energy storage, alongside batteries, and transport, ensuring back up for seasonal variations and connecting production locations to more distant demand centres"[23].

However, the European Commission, while emphasizing on the one hand the advantages and the wide possibilities in the transition processes of hydrogen, on the other hand it underlines that "it (still) represents a modest fraction of the global and EU energy mix, and is still largely produced from fossil fuels, notably from natural gas or from coal, resulting in the release of 70 to 100 million tons CO2 annually in the EU".

Despite this still little use of the hydrogen source, it must be underlined how important it would be to firstly invest in the green hydrogen. Hydrogen can be produced through several processes, which are associated with different ranges of emissions, depending on the technology and energy source used and with different costs implications and material requirements. What is considered clean hydrogen is renewable or green hydrogen, produced through the electrolysis of water, whose full life-cycle greenhouse gas emissions of the production of renewable hydrogen are close to zero. Therefore, the priority of EU must be the development of renewable hydrogen (produced using mainly wind and solar energy), since it represents one of the most compatible options within the climate neutrality goal.

Hence, for contributing to climate neutrality processes, hydrogen needs to achieve a far larger scale and its production must become decarbonized, throughout the use of clean energy sources. Whereas hydrogen can be used as a raw material or a source of energy in industrial and chemical processes, in air, sea and heavy road transport, in heating applications, also acting in industrial processes and economic sectors where reducing carbon emissions is both urgent and hard to achieve and decarbonising sectors in which electrification is not technologically possible or competitive, as well as for the storage of energy to balance the energy system where necessary, it plays a significant role in the integration of the energy system. Therefore, in the last years, different countries have understood the breakthrough strength of hydrogen and have, developed plans and projects to take advantage of this important resource. Even some of EU's current gas suppliers and countries with a strong potential for renewables are considering opportunities to export renewable electricity or clean hydrogen to the EU[24].

In its strategic vision for a climate-neutral that the European Commission has published in November 2018[25], the share of hydrogen in Europe's energy mix is projected to grow from the current less than 2% to 13-14% by 2050. Only looking at the economic issue, according to a study of the IEA (International Energy Agency) concerning the possible positive economic effects produced by the increasing use of hydrogen, renewable hydrogen could compete not only with the other energy sources but also with hydrogen produced from fossil fuels. For this reason, almost all

[23] *Ibid*.
[24] *Ibid*., § 7, *The international dimension*.
[25] European Commission, Communication from the Commission, A Clean Planet for all - A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, November 28, 2018.

the Member States have elaborated programmes to produce clean hydrogen in their national Energy and Climate plans[26].

Besides the production of hydrogen, with all its criticalities, it is necessary to also consider the trade of hydrogen. From another research of IEA, it has been highlighted that 12 Mt of hydrogen could be exported annually by 2030, with 2.6 Mt/yr planned to come online by 2026. Nevertheless, the hydrogen market it's nascent and still needs governments trade policies for its regulation.

In particular, the European Commission has highlighted the need to provide for common market rules in the EU to allow the development of the hydrogen strategy, including in the disciplines policies for the removal of the barriers to the efficient development of hydrogen infrastructure (e.g. through reuse) and guaranteeing access to producers and customers. In addition, the Commission underlines the importance to "explore additional support measures, including demand-side policies in end-use sectors, for renewable hydrogen building on the existing provisions of the Renewable Energy Directive; work to introduce a common low-carbon threshold/standard for the promotion of hydrogen production installations; work to introduce a comprehensive terminology and European-wide criteria for the certification of renewable and low-carbon hydrogen; develop a pilot scheme – preferably at EU level – for a Carbon Contracts for Difference programme, in particular to support the production of low carbon and circular steel, and basic chemicals"[27].

Moreover, to make so that hydrogen an essential tool in climate neutrality policies, it is necessary an effective international cooperation between different countries, especially with southern and eastern neighbourhood partners. This cooperation must come with the strengthen of the EU leadership in international fora for technical standards, regulations, and definitions on hydrogen[28].

Therefore, if hydrogen can be a great solution in order to switch economies and sectors in climate neutrality transformation firstly because: its use, as an energy source, does not emit greenhouse gas; it can be used to produce other gases, such as liquid fuel; the existent infrastructure (stockage and gas transport) can be reconverted to hydrogen; its energetic density is more than the one of batteries, so it can be used for long-distance transport and for heavy goods[29], it is necessary to build strong policies in order to effectively exploit all its potential.

As for the ecological transition, even looking at the new hydrogen strategy it is at least equally necessary to look at the effects on employment of the use of this new technology, consequently intervening to protect the worker and his employability in the modernized labour markets.

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[26] European Commission, Communication from the Commission to the European Parliament, the Council. The European economic and social committee and the Committee of the regions, A hydrogen strategy for a climate-neutral Europe, 2020, § 1, *Introduction*, and § 2, *Towards a hydrogen ecosystem in Europe: a roadmap to 2050*.
[27] *Ibid*., § 7, *The international dimension*, p. 13.
[28] See, IEA, Global Hydrogen Review 2022, September 2022.
[29] European Parliament, Renewable hydrogen, any benefits for EU?, 2021.

Investment in hydrogen can foster sustainable growth and jobs, which is an essential context of recovery from the COVID-19 crisis. The European Hydrogen strategy already stresses that "in order to have a properly functioning EU hydrogen market, people with specialised skills are needed, especially with regard to safety, underlining the necessity of a strong public and free vocational training system and (calling) on the Commission to adopt an action plan aimed at guiding Member States to develop and maintain dedicated training programmes for workers, engineers, technicians, and the general public, and to create multi-disciplinary teaching programmes for economists, scientists and students"; the strategy also "stresses that more must be done to promote equal opportunities in the hydrogen sector, and calls for the launch of an EU initiative focused on employment, training and development for women, with a view to identifying and removing obstacles and building networks and models" .

1.3. EU climate neutrality strategy in the transport sector

Within the framework outlined, in the realization of the ecological transition goals, there is no doubt that one of the central sectors is the transport sector. One of the main goals of the EU Green Deal is making transport sustainable for all (even in the most remote areas). The European Commission aims, by 2026, for road transport to be covered by emissions trading, putting a price on pollution, stimulating cleaner fuel use, and re-investing in clean technologies[30].

As underlined in one of the European Commission reports, "since road transport is responsible for over 70% of transport greenhouse gas emissions and much of the air pollution, action will focus on this area, while all sectors of transport can and must contribute"[31].

Furthermore, as the same report of the European Commission suggests, in UE the energetic needs of transports is still satisfied with oil for almost the 94%, the highest percentage compared to any other sector). This dependency to oil also makes the transport sector reliant mostly on importations[32].

The "Fit for 55" package, therefore, already includes four proposals promoting cleaner vehicles and fuels in a technologically neutral way. The revision of the CO2 emission standards for new cars and vans aims at further reducing the greenhouse gas emissions of these vehicles, providing a clear and realistic pathway towards zero-emission mobility.

In addition, as the report of the European Commission "A European strategy for low-emission mobility" suggests, three priority areas must be pursued for a focused

[30] European Commission, Priorities 2019-2024, Delivering the European Green Deal, § *Make transport sustainable for all*.
[31] European Commission, Communication from the Commission to the European Parliament, the Council, The European economic and social committee and the Committee of the regions, A European Strategy for low-emission mobility, July 20, 2016.
[32] *Ibid*.

action for the decarbonization of the transport sector: improving the transport system thanks to digital technologies, smart pricing and encouraging the shift from fossil fuels to lower emission transport models; accelerating the deployment of low-emission alternative energy for transport, such as advanced biofuels, electricity, hydrogen and renewable synthetic fuels and removing obstacles to the electrification of transport; moving towards zero-emission vehicles. The European Commission report carefully underlines the crucial role that cities and local authorities play in delivering this strategy[33].

In this perspective, as the European Hydrogen strategy underlines, hydrogen "can offer solutions for hard to abate parts of the transport system, in addition to what can be achieved through electrification and other renewable and low-carbon fuels"[34]. Also, the "Global Hydrogen Review 2022"[35] underlines the role of hydrogen. Not only "in existing hydrogen applications, the sharp increase in fossil fuel prices observed since the end of 2021 has significantly closed the gap between low-emission and unabated fossil-based hydrogen"; but also "in new hydrogen applications, the policy action should be completed by innovation and demonstration efforts, with a focus on sectors where hydrogen can both support decarbonisation and reduce dependency on fossil fuels, such as heavy industry, heavy duty road transport and shipping". Even looking at the factual data we can see how there is a progressive increase in the use of hydrogen in the transport sector. Faced with an overall increase in hydrogen demand in 2021 (equal to + 5%), the transport sector has won an increase in the use of this technology equal to about 40%. The so-called fuel cell electric vehicles have increased from 33,000 in 2020 to more than 51,000 in 2021.

Therefore, this new tool must be highly valued in the decarbonization processes especially in those sectors, such as aeronautics, long-haul road, maritime transport, and railways, where batteries are an impracticable solution to substitute fossil fuels, due either to the large amount of energy required or the long distance that needs to be covered. It must be underlined how hydrogen technology must be integrated, and not being in competition with electrification processes, therefore filling that gap that could not be technically or cost-effectively covered by batteries.

Before renewable or green hydrogen can effectively become a central energy source in the transport sector, significant barriers, mainly related to storage, infrastructure, and costs, will need to be addressed. Technological challenges around weight and hydrogen storage need solutions, mainly in the maritime and aviation sectors.

In the general picture outlined, it must be underlined how "to date technological factors, economic considerations, and consumer choices have hindered the adoption of hydrogen at scale in the transportation sector. New geopolitical forces such as the challenges of sustainable development and climate change are reshaping the playing field". Therefore "stakeholders (and also unions and

[33] *Ibid*.
[34] European Commission, Communication from the Commission to the European Parliament, the Council. The European economic and social committee and the Committee of the regions, A hydrogen strategy for a climate-neutral Europe, 2020, *Introduction*, p. 1.
[35] IEA, Global Hydrogen Review 2022, September 2022.

employers' associations around the world must decide their role in the transition to a decarbonized transportation sector"[36].

Furthermore, it is crucial to combine the green transition with the right transition: as underlined by the social partners at the end of October 2022, the inclusion of a Just Transition framework for Europe's automotive workforce is urgent. In a sector that currently employs more than 16 million workers in Europe, and that accounts for more than 6% of European employment overall and 8.5% of European manufacturing jobs, there is a need to look at the transition holistically, therefore also to potential job losses, gains and changes in the automotive sector due to the current transformation[37]. As it has been underlined by the social parties, "a Just Transition framework must support the anticipation and management of change, including, but not exclusively, skills and training, and be underpinned by strong social dialogue"[38].

2. The EU cross-sectoral and sectoral social dialogue developments in the field of ecological transition

A just transition to a low carbon economy requires, besides and in addiction to legislative disciplines, the social dialogue anticipating and managing the restructurings and greening processes resulting, inter alia, from the transformations of productive cycles, of the economy, and the creation of more sustainable workplaces as well as training courses and career crossovers to help workers from sectors that are shrinking to find quality jobs in expanding sectors. The ecological and just transition must deal with adaptation and transformative processes, regarding both the restructuring of activities and the upskilling and reskilling training programmes towards green professions[39], according to the central dictate of "leaving no one behind".

The European Union itself asks for meaningful and effective social dialogue at all levels (European, national, sectoral, regional and workplace level), for both ensuring the concretization of the European Social Model and as a source and tool for European productive system and its competitiveness[40]. At the European level, effective policies have been created in support of social dialogue, included in the

[36] Harvard and Kennedy School, Belfer Center for science and international affairs, Sustainable Mobility: Renewable Hydrogen in the Transport Sector, June 2021, p. 5.
[37] See also United Nations, Just Transition of the Workforce, and the Creation of Decent Work and Quality Jobs, April 2020.
[38] IndustriAll, CO2 standards trialogue: Urgent need for inclusion of a Just Transition framework for Europe's automotive workforce, October 21, 2022.
[39] L. Casano, *Skills and Professions for a "Just Transition". Some Reflections for Legal Research*, in *EJICLS*, 2019, vol. 8, n. 3.
[40] European Economic and Social Committee, Social dialogue within the green transition (Exploratory opinion requested by the Czech Presidency), September 2022.

European Pillar of Social Rights (EPSR) (and the Action Plan for implementation) and the Employment Policy Guidelines. In particular, EPSR Principle 8 states that "the social partners shall be consulted on the design and implementation of economic, employment and social policies according to national practices. They shall be encouraged to negotiate and conclude collective agreements in matters relevant to them, while respecting their autonomy and the right to collective action. Where appropriate, agreements concluded between the social partners shall be implemented at the level of the Union and its Member States"[41]. Guideline 7 of the Employment guidelines underlines the necessity of "enhancing the functioning of labour markets and the effectiveness of social dialogue"[42].

It must be clarified what do we mean when talking about social dialogue. Social dialogue, according to the definition of the ILO, includes "all types of negotiation, consultation and information sharing among representatives of governments, social partners or between social partners on issues of common interest relating to economic and social policy"[43]. Social dialogue, therefore, is defined and takes place in various and different forms and with various outputs, from negotiations between the government and the social partners (often including other and additional stakeholders), or in forms of bilateral confrontation and negotiation[44]. The objective is common: the creation of co-determined and inclusive disciplines of all the instances of the social partners involved. In addition, social dialogue can take place at super-national, national, sectoral or company level, also depending to the form, level, involved actors, processes and topics and on the strength of parties involved[45].

Several European Economic and Social Committee (EESC) opinions[46] have recently emphasized the importance of social dialogue in the transformations. There is no 'one-size-fits-all-solution', only looking at different levels of capacity and influence

[41] Also "workers or their representatives have the right to be informed and consulted in good time on matters relevant to them, in particular on the transfer, restructuring and merger of undertakings and on collective redundancies", European Commission, The European Pillar of Social Rights in 20 principles, 2017.

[42] European Commission, Proposal for a Council decision on guidelines for the employment policies of the Member States, May 23, 2022, recently integrated by European Parliament, Draft European parliament legislative resolution on the proposal for a Council decision on guidelines for the employment policies of the Member States, October 12, 2022.

[43] ILO Declaration on Social Justice for a Fair Globalization, ILC, 2008; ILO Resolution concerning the Recurrent Discussion on social dialogue, adopted at the ILC on 13 June 2013; ILO Resolution concerning the second recurrent discussion on social dialogue and tripartism, adopted at the ILC on 8 June 2018. See also ILO Centenary Declaration for the Future of Work adopted at the ILC, 108th Session, 2019.

[44] See also European Commission opinion Social dialogue within the green transition, 2022; Global Deal for Decent Work & Inclusive Growth, Social Dialogue and the Future of Work, Thematic Brief, 2020.

[45] M. Hermans, H. Huyse, J. Van Ongevalle, Social dialogue as a driver and governance instrument for sustainable development, KU Leuven-HIVA, ILO-ITUC Discussion Note, November 2016.

[46] European Economic and Social Committee, Industrial transition towards a green and digital European economy: regulatory requirements and the role of social partners and civil society, Opinion, OJ C 56, February 16, 2021, p. 10; European Economic and Social Committee, No Green Deal without a Social Deal, Opinion, OJ C 341, August 24, 2021, p. 23; European Economic and Social Committee, Social dialogue as an important pillar of economic sustainability and the resilience of economies, Opinion, OJ C 10, January 11, 2021, p. 14.

of institutions and actors across Member States, due to diverse social and industrial relations models, so that each and every situation must be evaluated in order to ensuring a well-functioning social dialogue[47].

The changing role of trade unions and the importance of co-operative industrial relations can also be based on national and sectoral or cross-sectoral case studies of social dialogue, in accompaniment of all the transitions requested by sustainability disciplines. We can see examples of social dialogue related to the achievement of sustainable development goals, both in workplace level dialogues as in national tripartite dialogues.

If effective social dialogue is requested in supporting all adaptation activities at each step in the process, along the engagement of stakeholders, including management of knowledge for adaptation, also relevant multilateral, international, regional, national sub-national and local organizations, public and private sectors, civil society, and other relevant stakeholders are invited to undertake and support enhanced action on adaptation at all levels.

As indicated by the ILO: "Given the scale and urgency of these environmental challenges, it is clear that the world will have neither the resources nor the time to tackle them separately or consecutively. Tackling them jointly is not an option, but a necessity"[48]. This statement underlines the importance of social dialogue as a shared decision-making tool. Therefore, as the ILO points out in its Guidelines for a Just Transition, "Strong social consensus on the goal and pathways to sustainability is fundamental. Social dialogue has to be an integral part of the institutional framework for policymaking and implementation at all levels. Adequate, informed and ongoing consultation should take place with all relevant stakeholders"[49].

But how does the social dialogue contribute to the development of ecological transition and sustainable development? Firstly, social dialogue in the specific theme of the green transition allows the inclusion of different viewpoints in the assessment of environmental issues and sustainable development, promoting a better understanding between different interests and the different actors of each other's opportunities, challenges and needs, therefore increasing the possibility of adopting binding agreements and concrete implementation. If the most evident areas of contribution are strictly linked to social development, in particular regarding employment protection, training, other benefits, or the promotion of the workplace democracy, it is undoubtable how social dialogue also strengthens economic development, through an ever greater collaboration of the parties also aimed at developing competitiveness, contributing to improving productivity and economic growth on the one hand, and the stimulation of innovation during economic activity on the other hand.

By differentiating the social dialogue by parties involved and by level, it is appropriate to evaluate concrete examples of dialogue starting from the site

[47] United Nations, What do adaptation to climate change and climate resilience mean?
[48] ILO, Frequently Asked Questions on just transition, n. 4.
[49] ILO, Guidelines for a just transition towards environmentally sustainable economies and societies for all, 2015.

level[50], where the social dialogue is useful to both share on-site transition of the productive processes, accompanying and strengthening it, while creating decent jobs, reskilling, and retaining workers, ensuring a social floor for workers involved in renovations.

The role of employers' associations and trade unions in the management of green and just transition is realized first and foremost at the site level, where the territory, the size of the production, the specific characteristics of the production itself affect in terms of methods and degree of concretization, management and implementation of green and just transition towards climate neutrality goals.

So, for enterprises, social dialogue means, among other things, "to agree concrete, time-bound and enterprise-wide plans for emissions cuts while creating decent jobs, reskilling and retaining workers, ensuring a social floor for workers who are retrenched and investing in communities"[51].

The development of hydrogen heavy-duty mobility in Iveco

IVECO is one of the largest manufacturers specialized in the heavy transport of goods and people. The group is composed of eight brands, specialized, specifically, in the production of Light, Medium and Heavy Commercial Vehicles (IVECO), Powertrain (FPT Industrial), Buses (Heuliez, IVECO Bus), Financial Services (Iveco Capital), Specialty Vehicles (IDV, ASTRA and Magirus). The group has twenty-eight production plants and even twenty-nine Research and Development centres, centres in which more than 34,000 workers collaborate[52].

In 2021, training programs worth more than 1.9 million euros were promoted: "The Company strongly believes that business growth is made possible through personal growth, which is why it invests business gains in the development of its people, creating a virtuous circle".

In the same year alone, various development and training programs were promoted throughout the group, with the aim of responding to the individual needs of the workers themselves. Specifically, the so-called *Action learning projects* and *Coaching and mentoring initiatives* were therefore promoted. The 2022 target was instead set to involve 100% of workers in effective training programs worldwide, even if the target has not been reached for now.

There was also a moderate increase in R&D personnel to strengthen the pool of skills and competencies in view of technology transitions, particularly electrification, autonomous

[50] "Negotiations at company or workplace level are typically concerned with adapting the rules stemming from legislation or higher-level collective bargaining to local conditions. They can encompass both pay (company level enhancements to the rates set nationally, bonus arrangements, etc.) and non-pay issues (such as skills development, work organization, the introduction of new technology, and working time arrangements). Such local negotiations can foster a constructive dynamic within companies between developing productivity and improving working conditions", Eurofound, Reinforcing social dialogue in the context of the move towards the green and digital transitions: Background paper, February 14-15, 2022.
[51] OECD, Just transition centre, Just Transition A Report for the OECD, May 2017.
[52] Iveco group, Overview.

driving, alternative propulsion solutions, digitalization, and cloud-based software technologies.

The training and educational processes and programs have therefore focused their attention on upgrading the skills of workers and on programs capable of assisting the transition of subjects in the modernized production cycles. Also "The Company has specific programs in place to manage career endings, helping employees transition to new jobs and find their bearings in the job market. Outplacement services, outsourced to carefully selected external partners, are available in 26 countries. Based on specific needs, and at the Company's discretion, CNH Industrial offers outplacement services to managers"[53].

The programmes outlined above are also important because IVECO and Air Liquide, a world leader in gases, technologies and services for Industry and Health, at the end of 2021, have signed a Memorandum of Understanding to develop hydrogen mobility in Europe[54], therefore highlighting the necessity of a continuous training of the workers for the innovative tools used in the sector.

Stellantis transition towards greener technologies

Stellantis[55] is one of the world leaders in vehicle manufacturing, providing sustainable, connected, safe and affordable mobility services.

Beyond the electrification processes of the sector, there is no doubt that the company has promoted and is increasingly promoting a broad spectrum of energy carriers and powertrain technologies to address to the Green transition, and to provide and proposing proper answers to address the widest range of mobility requirements, including hydrogen.

Stellantis, working on the hydrogen strategy, has developed a Hydrogen Fuel Cell Zero Emission solution, combining the advantages of hydrogen fuel cells and electric battery technology.

To ensure a transition that also accompanies workers in the green transition of the sector, towards an ever-greater use of new technologies (including hydrogen), the Company promotes a continuous and effective social dialogue with trade unions.

In particular, the management, through the Human Resources and Transformation Division, contributes to and promotes the Company's transition to a low-carbon economy by providing the necessary skills through the attraction of talent, the upscaling of employees and the co-construction of the Company's future via social dialogue with employees' representatives.

Constructive and responsible social dialogue is considered necessary and central "to lead the changes and unleash new expertise in technologies and services to offer competitive mobility solutions".

[53] CNH Industrial, 2021 Sustainability report.
[54] Iveco Press, Air Liquide and IVECO collaborate to accelerate the development of hydrogen heavy-duty mobility in Europe, December 14, 2021.
[55] Stellantis, 2021 Corporate Social Responsibility Report, Powered By Our Diversity, We Lead The Way The World Moves, 2021.

Starting from the major challenges of the sector, including, in particular, environmental protection and sustainable development, digitalisation processes, as well as digitalisation phenomena, the company affirms how social dialogue can be a tool capable of responding, on the one hand, to the needs of transition in production processes, on the other hand, to the needs of upskilling or reskilling of workers' skills. In order to ensure the transition to employment (as well as production), it is necessary to promote and act jointly in order to respond to the new needs of skills and professions, thus protecting employability.

Therefore "Stellantis promotes and support to conduct constructive, trustful and responsible social dialogues with employee representatives at each level of the Company. In this way, management and employee representatives are able to tackle the major ongoing and upcoming challenges together and provide economic and social performance for a sustainable future".

Volkswagen sustainable transition

Mercedes-Benz Group AG is one of the world's most successful automotive companies, with 2,330,169 vehicles sold in 2021, between cars and vans. Mercedes, in the last years, has deeply worked on technology innovation and its impacts in terms of sustainable development. The climate change is one of the greatest challenges that sectors have ever dealt with and, as it is underlined by the chairman of the board of management of Mercedes-Benz group, "when it comes to promoting sustainability, it is not solely about products".

Therefore, the ecological transition does not only deal with the transformation of production cycles, or with the new technologies included, but must also necessarily take into account their impacts on workers, the emergence of new professions and skills, or the effects of the transition on the community. and on the territory.

Not only in November 2021 Mercedes signed the "COP26 Declaration on Zero-Emission Cars and Vans" at the world climate conference in Glasgow, being the only German car manufacturer to sign; in this view of evaluating and strengthening the social dialogue for the protection of production and competitiveness and at the same time social protection, the company also underlines how "only through collective action by governments, business and civil society we can achieve the goals of the Paris climate agreement".

In terms of new technologies in 2016 Daimler Trucks was the first manufacturer in the world to present an electric-powered heavy truck; also, in September 2020 it presented the Mercedes-Benz GenH2 Truck, a concept truck powered by fuel cells with a range of up to over 1,000 kilometres with its series version for complex long-range applications, available from 2023, thus modifying the group strategy from the electrification of the system only to a new focus on strategies for hydrogen[56].

[56] Mercedes-Benz, I truck più innovativi per un futuro all'insegna dell'elettricità: il Mercedes-Benz eActros ed il Mercedes-Benz GenH2 Truck si aggiudicano il Truck Innovation Award 2021, November 30, 2020.

However, because the transition processes and the use of new technologies involves both a change in production, but also a change in professions and skills, training programmes must be evaluated.

The 2021 sustainability report[57] therefore highlights how the company is counting on employees' lifelong learning programmes, which the company support with customized qualification programs and integrated learning formats. The goal is to shape their competences and the changes responsibly, and in a socially acceptable and future-oriented manner. As it is stated by S. Kohleisen, member of the Board of Management of Mercedes-Benz Group AG and Mercedes-Benz AG responsible for Human Resources and Labour Director "by orienting our corporate strategy towards a sustainable future, we're securing the success of the company and employment at the same time".

In particular, employees at Mercedes-Benz Group AG, Mercedes-Benz AG and Daimler Brand & IP Management GmbH & Co. KG have been given a job-security guarantee for the period until 2029. To balance this policy, always through social dialogue processes and consequent agreements between the social partners, corporate management and the employee representative body concluded a company-wide agreement in July 2020 that made it possible to reduce labour costs in the period until the end of December 2021. This agreement, which applies to all employees at Mercedes-Benz Group AG, Mercedes-Benz AG, Daimler Brand & IP Management GmbH & Co. KG, and Daimler Gastronomie GmbH in Germany was concluded in response to the various challenges associated with both the transformation of the automotive industry and the covid-19 pandemic. The agreement, which went into effect on 1 October 2020 and remained valid until 31 December 2021, provided for reduced working hours with no wage or salary compensation until the end of September 2021. Due to the positive economic development, the regulation for reduced working hours was terminated ahead of time on 1 April 2021. The policies just described are, therefore, a valid example of how social dialogue has accompanied economic and social sustainability at the same time, thus looking at the interests of workers and management at the same time.

In addition, next to formal training courses, not only the company has increasingly promoted dual training programs, in close collaboration with universities in Germany, but, precisely because of the extensive transformation of the company, which is changing the nature of professions, activities, and requirements profiles, the company and the unions have intervened with training courses in the company, or with the re-evaluation of qualifications in the individual units.

For example, Mercedes-Benz Group AG, Mercedes-Benz AG and Daimler Brand & IP Management GmbH & Co. KG in Germany structure the training and qualification processes with an overall system of rules and regulations, reaching the agreement in cooperation with our employee organisations. In particular, "the agreement strengthens the joint responsibility of managers and employees for qualification and thus the competitiveness of our company. In addition, it serves to further standardise the qualification process and structure it more efficiently. Finally, the agreement regulates collaboration with the Works Council on the main aspects of qualification and defines the process for the needs-based planning of qualification measures".

[57] Mercedes-Benz, Sustainability report 2021 – Mercedes Benz Group, 2022.

At the sectoral level[58], too, social partners have discussed the management of green transition. Undoubtedly, social dialogue is central and necessary for the sectors, in promoting the green and just transition, at the same time as the development of collaborations for the competitiveness of the sector and the protection of the subjects active in it (therefore looking at the contextual development of new technologies and the know-how necessary to manage them in workers). "Greening the economy will have an impact on the structure and organisation of the sectors and on the skills needed to retain employment"[59].

There are several challenges to which the sectors must respond in the rapid change in the fast-changing world of work and in the trends of diversification of the world of work, digitalization, automation and the need for new skills on the labour market.

Social dialogue is a tool in the broader process of green transition of production and the economy, since the effects will concern not only a change in skills and professions, but also, and first of all, changes in the structure and organization of the entire sectors, such as to materialize in the emergence of new productions or in the dismissal of those no longer in line with the green objectives.

Recovery plan for the automotive sector at the European level

On May 2020, IndustriAll Europe, Ceemet, ACEA, CLEPA, CECRA and ETRMA, the European business organizations and the trade unions for the sector call on the European Commission for a bold industrial recovery plan for the automotive sector[60].

The European automotive sector has been and is one of the key pillars of the economic and social welfare of Europe, providing indirectly, employment to more than 13,8 million workers.

As we can read from the press releases, "such a plan should be based on two objectives. First of all, bringing the industry back on track by stimulating sales and reviving production, and secondly, supporting the industry in its journey towards a carbon-neutral future, based on the Green Deal and Europe's climate objectives", therefore preserving both competitiveness and employment.

The parties agree on the various areas in which to intervene in order to ensure a good and just transition in the sector, on the one hand recognizing how the automotive sector can actually be central in the green transformation of the sectors, on the other, consequently and towards the new paradigm of a carbon-neutral and digitalized economy, promoting the attention and implementation of innovations such as, among

[58] "The most important level in many countries is the sector, where pay negotiations can provide both a level playing field for competition, and a framework for negotiations at lower levels. Where the sectoral level plays an important role in pay determination, negotiations typically cover other key issues for the sector, such as working time, training and employment rights, and facilitate joint approaches by the sectoral social partners to the government", Eurofound, Reinforcing social dialogue in the context of the move towards the green and digital transitions: Background paper, February 14-15, 2022.

[59] ESDE, Sustainability and governance: the role of social dialogue, Chapter 6, 2019.

[60] IndustriAll Europe, Ceemet, ACEA, CLEPA, CECRA, ETRMA, Saving jobs while reducing emissions - IndustriAll Europe, Ceemet, ACEA, CLEPA, CECRA and ETRMA call for an ambitious recovery plan for the automotive sector, May 26, 2020.

others, alternative powertrains, batteries, connected cars, mobility services, and automated driving.

Therefore, in support of the green transition, the parties underline the importance of adopting "coordinated measures to support the relaunch of the industry; measures of support for viable companies to maintain their resilience" at the same time, ensuring, with the collaboration of individual companies and employers' associations in the sector, the maintenance and development of human capital; again, the declaration underlines how it is necessary to establish collaboration also with European or national bodies in order to introduce and / or reinforce temporary measures to accompany transition policies in the economic and social sphere.

The possible solutions for a better accompaniment of the transition in the sector, "have to be found through timely anticipation of change, an effective social dialogue at all levels, active labour market policies, up-and re-skilling, and support to redevelopment plans for automotive regions" once again, therefore, underlining the importance of social dialogue and the collaboration of the social partners for a green and just transition.

Automotive industry facing transitions: the joint declaration of the Italian social partners

On February 3, 2022, the Social Partners of the Metalworking and Mechatronics Industry (in particular Federmeccanica, Fim-Cisl, Fiom-Cgil and Uilm-Uil[61]), adopting a shared economic perspective, promoted a joint policy document on the issue of the green transition in the automotive sector. The proposals, collected and built on the basis of what emerged from the Automotive Observatory, have the aim of jointly addressing the challenges and opportunities of the ecological transition of the sector in front of institutions and economic and social actors.

The document is part of the institutional regulatory intervention on the subject that, in the face of the serious environmental emergency linked to consumption of non-renewable energies and the overproduction of CO2, is producing a further acceleration from the outside to the processes of transformation of the markets and of the Automotive players for normal evolution technologies and natural competitive pressures.

The Italian automotive industry has a turnover of 93 billion euros in Italy, equal to 5.6% of GDP and in the sector of the manufacture of motor vehicles, trailers and semi-trailers alone, and it counts over 2 thousand companies and 180 thousand workers, worth 7% of national metalworking exports for a value of 31 billion euros.

Due to the economic and social importance of the sector, the parties therefore shared the responsibility of jointly addressing the transition with the aim of safeguarding and promoting employment and industrial presence.

The parties jointly state various proposals to protect, at the same time, employability and competitiveness and company productivity. In particular, the social partners ask to discuss together initiatives in the context of transitions and the relationship with institutional actors.

[61] Federmeccanica, Fim-Cisl, Fiom-Cgil and Uilm-Uil, Le considerazioni dell'Osservatorio automotive – Una prospettiva condivisa, February 13, 2022.

The objective is to jointly decide and plan the resources and governance of the industrial policies of the sector which, on the basis of specific skills, can contribute to: "activating the synergies of a branched supply chain, promoting business dimensions and culture compatible with the challenges of the sector; manage the industrial crises already open; activate investments to support demand in technologies compatible with the Green Deal and, in parallel, with the introduction of emission restrictions; activate supply support investments for: defense of current installed capacity and employment; the attraction of new productive investments in the competitive context; support for research and development of products that enhance the Italian excellence of technology and style".

The social partners also undertake to jointly define, plan and ensure social safety nets, such as to accompany, both in the short and in the long term, the transitions underway, in particular the digital and ecological transition that will inevitably impact not only on companies but also on workers.

Finally, the parties aim to monitor, highlight and consequently prepare disciplines and programs on the subject of needs and availability of skills, also evaluating forms of collaboration with other and additional stakeholders, including in particular schools and training institutions, to better accompany the transition from both the social and economic sides.

The transport sector: towards sustainable mobility

Underlining the importance of social dialogue in urban public transport, UITP (Union Internationale des Transports Publics, the International Association of Public Transport established in 1885, a worldwide network to bring together all public transport stakeholders and all sustainable transport modes) and EFT (European Transport Workers' Federation, a pan-European trade union organisation which embraces transport trade unions from the European Union, the European Economic Area and Central and Eastern European countries, founded in Brussels on 14-15 June 1999) with a joint statement have called upon the European institutions to take as a priority the development of sustainable urban mobility and to support the modal shift towards cleaner, more efficient, safer, public mass transportation modes.

The social partners, in particular, underline how a strong social dialogue and therefore collaboration between the employers' associations and the trade unions, can be valid tools to respond to the criticalities of the transition in the sector. In particular, the quality of public transport undoubtedly passes and will pass through the use of new technologies; it is also true that workers are particularly important in these processes for the correct and efficient management of these new technologies. Therefore, in the first place, social dialogue can be a tool for "the quality of the working environment as well as motivated, well trained and rewarded staff represent essential elements for delivering quality services to the customers, which are at the heart of the process"[62].

[62] European Transport Workers Federation, European social partners promote sustainable urban mobility, March 16, 2016.

Despite the great developments in social dialogue at the site or sector level, there is no doubt that the green and just transition requires planning and strategy also at European and national level[63]. As the Paris Agreement has stated, ecological transition also requires and means "taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities"[64]. Consequently, "with social dialogue, government, business, trade unions and civil society groups can collaborate in the national, industry and community planning and policies that are necessary for a just transition to zero emissions"[65].

The role of the social partners in managing Just transition therefore means, at national level, the formulation and, subsequently, the creation or implementation of strong policies to support the fight against climate change, or social and economic policies to protect the labour markets. as well as the workers and communities involved in the transition processes.

The national level of social dialogue can affect in terms of, among other things, the definition of investment projects in support of greener productions and professions, in the design of training courses. and skills training, as well as accompanying the transition even more generally with the construction and implementation of all those structures to support the reconversion processes (economic-productive and social).

The national level of social dialogue can and must also deal with all those processes and institutions for the social protection of workers or companies, in the possible criticalities of the transition. Social protection "involves access to health care and income security, particularly in cases of old age, unemployment, sickness, invalidity, work injury, maternity or loss of a main income earner"[66], which in the ecological transition processes translates into workers protection in terms of planning training courses, to respond to the new needs in terms of skills or professionalism required by the sectors in transition, as well as protection in any periods of unemployment, always encouraging more processes to support employability.

Germany and the Recovery and Resilience Facility fund in support of green transition

[63] "National cross-sectoral level social dialogue can be tripartite or bipartite. Tripartite social dialogue in many countries is institutionalized in economic and social councils, sometimes including organised representation of other actors in civil society. In other countries, tripartite engagement is more ad hoc (though often well-established through custom and practice). These arrangements give the public authorities an opportunity to explain policy initiatives to social partners and draw on their knowledge and expertise. Especially if there is consensus between the social partners, they also represent an opportunity for social partners to exert influence on government policy, including legislation", Eurofound, Reinforcing social dialogue in the context of the move towards the green and digital transitions: Background paper, February 14-15, 2022.

[64] Paris Agreement.

[65] OECD, Just transition centre, Just Transition A Report for the OECD, May 2017.

[66] ILO, Facts on Social Security, 2003.

In Germany[67], the Recovery and Resilience Facility fund was generally intended to reduce emissions, although each of the regions has specific priorities, according to the characteristics of the territories and the investments needed for their Just Transition.

It is composed of 10 components grouped in six thematic focus areas: Climate action and energy transition, Digitalisation of the economy and infrastructure, Digitalisation of education, strengthening social inclusion, strengthening a pandemic-resilient health system, Modern public administration and reducing barriers to investment. In particular, it is important to underline how the 40 measures included in the plan cover all the seven European flagship areas, with a particular focus on Recharge and Refuel, Modernise, and, for the hydrogen-related elements, Power Up.

Concerning the fund dedicated to the green transition, it must be highlighted the specific destination of the finances. As it is underlined in the IndustriAll and Syndex report, "3,3 billion euro will be dedicated to decarbonising the economy, especially the industry; 1,5 billion will be invested toward hydrogen alone. Transport is also a strong focus in the plan with 5.4 billion euros devoted to making the transport sector greener by supporting electric cars, clean buses and rail".

Also, the automotive sector is central in declining the Just transition objectives. In particular, in 2020 a fund of one billion euros was allocated for the future of the automotive industry, once again dedicating most of the fund's finances to supporting long-term transition strategies, including the conversion of the production towards increasing production of electric and hydrogen vehicles. Alongside financing for the transition of production cycles, specific funds have been allocated to training processes for workers.

Given the complex and varied objectives of the transition, there is no doubt that social dialogue plays a central role. The German industrial relations system itself confirms this evidence: co-determination system allows unions to assess the transition on the ground and contribute to the debate at all levels from the very beginning

Alongside, therefore, projects closely linked to trade unions, therefore the development and support of projects with the aim of creating "events and publications on structural design, innovation topics and successful approaches (good practice); building local networks, innovation workshops with employees; exchange of information across regions and countries", or to promote training and qualification projects for workers; not only IG BCE and IG Metall have been involved in raising awareness of workers about the green and digital transformation for many years; but also IG BCE (Mining, Chemical and Energy Union, Industriegewerkschaft Bergbau, Chemie, Energie - IG BCE) and DGB (German Trade Union Confederation, Deutscher Gewerkschaftsbund; DGB) are involved in the Zukunftsagentur Rheinische Revier (ZRR), thus participating in projects financed with public funds in the region and also represented on the supervisory board, where they negotiate the project criteria.

Netherland's cross-sectoral task force on green transition

[67] IndustriAll, Sydex, Financing the Just Transition: An EU overview, October 2021.

In the Netherlands, the social dialogue on green transition has been promoted since the definition and implementation of the National Climate Agreement[68], an agreement part of the Dutch climate policy, signed between many organizations and companies in the Netherlands to combat climate change (more than 100 parties), with the central goal of reducing greenhouse gas emissions in the Netherlands by 49 per cent by 2030 compared to 1990 levels.

In addition, the sectors outlined by the Climate Agreement will be the subject of regular cross-sector consultation on the progress of the commitments. To this end, the agreement provides for the creation of a "progress committee", a platform where the parties can increase and jointly plan intervention policies on the subject of ecological transition.

A further shared working group on hydrogen was also created within the Climate Agreement. With specific reference to the use of hydrogen, the agreement underlines how "An increasing number of electric alternatives will be used for heavy road traffic (battery electric and hydrogen). In the interim, heavy road transport will use sustainable and synthetic biofuels / biokerosine / bioLNG as a transition measure toward zero-emissions energy carriers. Sustainable biofuels, preferably for means of transport for which there are no alternatives as yet (shipping and aviation) (including hydrogen); adaptation of charging and refuelling infrastructure". In this sense, the parties have agreed the continuation and integration of the public-private partnership on hydrogen (H2 Platform)[69].

There is no doubt, therefore, how social dialogue can also affect the development of new and green strategies to support the processes of ecological transition. Among these, the hydrogen strategy, which is a "key for the long-term decarbonisation of energy intensive industries and sectors such as heavy transport"[70].

If the European Union and the various member states have already implemented strategies to support this possible new source of energy, it is also true how an approach in terms of social, site, sector and national dialogue can help in the management of productive transformations. to protect workers. The entire hydrogen production and storage chain will require an upskilling and reskilling of workers' skills (looking at the entire value chain, therefore to production, processing, distribution, and end use (upstream, midstream, downstream). Understanding the needs, new skills and professions through a strong, continuous and effective social dialogue, means accompanying companies and workers in the future transition.

[68] Government of Netherland, Climate Agreement, June 28, 2019.
[69] "An ambitious agreement for hydrogen will therefore be entered into with the sector in 2020 in order to achieve the targets set out in the Climate Agreement. The government envisions a major future role for hydrogen as an energy carrier in mobility, especially in heavy transport, such as lorries, public transport buses and as a potential replacement for diesel trains. Hydrogen will also play a role as an energy carrier for sustainably generated energy", *ibid*., p. 54.
[70] International Trade Union Organization, Good jobs and a just transition into hydrogen, May 17, 2022.

3. Conclusions

Significant impulses to the ecological transition have been allowed for some time now by international and EU policies, in particular the Green New Deal, the European program that aims to make the EU climate neutral by 2050. The plan establishes ambitious objectives and challenges primarily for all those sectors directly involved in the energy transition, focusing not only on ecological sustainability purposes, but also devoting strong emphasis on the preservation of existing value chains, although in transition, and in the safeguarding of the employability of workers.

In the general framework it is therefore recognized that the phenomenon of climate change inevitably ends impacting on the world of work. Among the direct effects can be listed, from a side, the changes on the production system, and on individuals' sectors, from the choice of the energy source of supply, passing from the use of the raw material, on the other hand, the changes in the occupational balance of each production area.

Indeed, among the sectors in which the transition is necessary and needed, the European Commission, since before the ratification of the Paris Agreement, had focused on the transport sector. In particular, in the 2011 White Paper on Transport, the Commission had already launched an urgent appeal on the need to significantly reduce greenhouse gas emissions in order to contain the increase in global warming below 2°C, stressing at the same time the absolute need to achieve a reduction of these emissions in the transport sector of at least 60% compared to 1990 levels.

This appeal is based on the data: according to the Commission, about a quarter of greenhouse gas emissions in the EU can be attributed to the transport sector: 12.7% of these total emissions due to transport are produced by aviation, 13.5% % from maritime transport, 0.7% from rail transport, 1.8% from inland waterway transport and 71.3% from road transport, impact not only directly caused by the transport sector, but indeed also linked to indirect emissions, mainly due to the production of energy required for travel.

Furthermore, recording an ever-greater increase in emissions compared to any other sector, the 2011 White Paper already underlined the unsustainability of the sector, inviting, on the one hand, a decrease in the sector's dependence on oil sources, on the other, the ever-decreasing use of energy, improving the energy efficiency of vehicles, without sacrificing efficiency or compromising, more generally, mobility.

Looking, therefore, at the objectives and programmatic purposes already dictated by the European Commission, there is no doubt that hydrogen can represent a valid alternative to the sources already used. From this point of view, road freight transport, aviation or maritime traffic offer a certain potential. If biofuels do not in themselves constitute a solution, it is certain that it is almost mandatory to develop and promote solutions that aim to replace the combustion engine with electric

mobility and / or with hydrogen technologies or other sources. of alternative and sustainable energy.

The European Commission document at the end of 2020 reads as "Manufacturers are also investing into hydrogen fuel-cell vehicles, particularly for use in commercial fleets, buses and heavy-duty transport. These promising options are supported under the EU energy system integration and hydrogen strategies as well as the strategic action plan on batteries. Energy efficiency shall be a criterion for prioritizing future choice of suitable technologies looking at the whole life-cycle. Transitional technological solutions should fully respect the CO2 and pollution standards. Rail transport will also need to be further electrified; wherever this is not viable, the use of hydrogen should be increased"[71].

Precisely with reference to road transport, hydrogen seems to be a good solution compared to the traditional alternatives of petrol and diesel. However, current hydrogen production is still almost entirely powered by fossil fuels, with only 4% of the energy coming from renewable sources. Therefore, for a decarbonization of the global transport sector, as well as with a view to a change in the share of sources from a sustainable perspective, a substantial increase in hydrogen production is needed.

The use of new technologies, including the hydrogen technology in particular, is therefore an essential factor in the decarbonisation of the sector, as well as to contribute more generally to the objectives of ecological transition. There is no doubt that, in parallel, it is necessary to evaluate the impact of these new technologies in terms of new professions, skills and therefore to protect workers in the sector. If then the use of hydrogen in heavy transport represents a considerable opportunity, as well policies and governance must evolve with the evolving technological reality. An effective, aware and joint government of these new mobility systems will require strong collaboration and involvement of all the social partners, including the public body and stakeholders in the dialogue and drafting of shared policies, precisely in order to make the transformation into sustainable all-round mobility, thus looking at the environmental, economic and social side

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