TIR-H

Transporting Industrial Relations towards Hydrogen

Final Report

Deliverable 4.4

Co-funded by the European Union

Project acronym: TIR-H | Project No. 101048682

PROJECT CONSORTIUM

Coordinator

Beneficiaries

Affiliated Entities

Associate Partners

D4.4 FINAL REPORT

Document Information

Project Acronym	TIR-H
Project Number	101048682
Deliverable number and title	D4.4 Final Report
Dissemination level	Public
Organisation Name	ADAPT (IT) [WPL]; Fondazione ADAPT [AE]
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Submission date	28/06/2024

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Abbreviation

AE	Affiliated Entity
BEN	Beneficiaries
CA	Consortium Agreement
CCS	Carbon Capture Storage
COO	Coordinator
CSDDD	Corporate Sustainability Due Diligence Directive
CSRD	Corporate Sustainability Reporting Directive
DoA	Description of Action
EC	European Commission
EESC	European Economic and Social Committee
EPSR	European Pillar of Social Rights
ESG	Environmental, Social, Governance
EWC	European Work Council
GA	Grant Agreement
HDV	Heavy-Duty Vehicle
IEA	International Energy Agency
ILO	International Labour Organization
LNG	Liquefied Natural Gas
NFRD	Non Financial Reporting Directive
NGO	Non-Governmental Organization
OECD	Organisation for Economic Cooperation and Development
PC	Project Coordinator
R&D	Research and Development
SME	Small and Medium Enterprises
SET	Strategic Energy Technology
WP	Work Package
WPL	Work Package Leader

1. Introduction

The TIR-H: Transporting Industrial Relations towards Hydrogen project was designed with the objective of equipping trade unionists with sufficient information and training to manage the dynamics of the "green" transition, particularly focusing on the shift from fossil fuel-powered vehicles to hydrogen-powered ones. The project adopted a sectoral approach in all the stages of research and training, concentrating on the heavy transport of goods and people, while also employing a local- analysis perspective for research, focusing on the collection and sharing of best practices.

The primary goal of the project was to identify specific challenges and potential solutions for promoting and managing the transition to hydrogen-powered heavy transport vehicles.

In this regard, an initial research phase was promoted, during which the main initiatives, regulations and directives concerning the green transition, the use of hydrogen, strategies for the heavy transport sector, as well as the role of social dialogue and collective bargaining in ensuring a just transition were collected, catalogued, and analysed. Also, key issues and successful practices were identified in selected regions and shared among all participants.

The second phase involved training sessions, both transnational and national, with the objective of providing tailored information and training to promote awareness of ongoing challenges and specific European and national initiatives on the issues.

Finally, the project focused on the development of policy guidelines for European social partners involved in cross-industry and sectoral European social dialogue, to support them in the just transition of the heavy-transport sector. Throughout the project's activities, including preliminary research, workshops, and training sessions, specific issues and ideas were shared and collected, aimed at formulating comprehensive policy recommendations for the European and national institution as well as for social partners at the national, local and company level, to promote a green and just transition.

This report has been compiled with the objective of gathering and updating the work conducted over the two years of the project. The first section focuses on gathering the most important results from the research activity concerning EU policies and initiatives in the field of ecological transition, with a focus on the challenge of hydrogen, and EU social dialogue developments, also collecting and updating the most recent initiatives, regulations, and directives relevant to the issues considered. The second section is dedicated to selecting and sharing some of the results from the activity research concerning the mapping exercise on relevant national initiative and experiences. The third section delves into the outcomes of the national and international training sessions, summarising the results of the questionnaires distributed following the training, with the aim of sharing proposals and recommendations concerning the development of training programmes for union delegates in the specific field of the project. Finally, the fourth section

highlights and summarises the final output of the project, namely the policy recommendations.

This report serves as a comprehensive review of the informational assets generated by the project, incorporating updates on significant regulatory developments that emerged over the two years, such as the Corporate Sustainability Due Diligence Directive, and providing a selection of targeted examples to reflect the detailed analyses and training conducted.

2. Exploring EU Policies: ecological transition and social dialogue in the heavy transport sector

Climate change represents the most significant crisis that our planet is facing today. In this sense, it is imperative to develop a new sustainable economic model. Various policies have been implemented at both international and national levels to address this emergency: the concept of a green transition is central to these efforts, which encompasses a broad range of strategies aimed at transforming economies to be more environmentally sustainable. This transition involves shifting from fossil fuels to renewable energy sources, enhancing energy efficiency, reducing greenhouse gas emissions, and promoting sustainable practices across all sectors.

The goal is not only to mitigate the impacts of climate change but also to create resilient economies that can thrive in a low-carbon future. Through coordinated policies and initiatives, such as regulations, directives, green transition funds, governments and organisations worldwide are working to accelerate this shift, ensuring that economic growth is aligned with environmental sustainability and social equity.

The TIR-H Project has primarily focused on reconstructing EU policies and initiatives related to the ecological transition, with a specific emphasis on the challenge of hydrogen. Additionally, it has examined the developments in EU social dialogue within this field through rigorous research activities. The Report on EU Initiatives, Policy Recommendations, and Mapping of EU Social Dialogue Developments – Deliverable 2.1 is available on the project website.

2.1. International and EU policies for green and just transition

The first of many international initiatives regarding ecological transition is the Paris Agreement, which deals with mitigating climate change and adapting to its effects, aiming also to limit global warming.

Title: Paris Agreement
Level: Worldwide level
Year: 2015

The Paris Agreement, adopted in 2015 by 195 countries, is the first legally binding agreement on climate change. Its primary objective is to strengthen the global response to the threat of climate change within the context of sustainable development and poverty eradication efforts.
According to Article 2, the agreement aims at keeping the global temperature rise below 2°C above pre-industrial levels and striving to limit the increase to 1.5°C. It also seeks to enhance adaptive capacity to climate change, reduce greenhouse gas emissions, and direct financial resources toward low-emission development. The agreement provides that countries must prepare and implement national action plans, reporting progress to other signatories and the public: in particular, from 2023, a global review every five years will assess achievements and set new targets. The agreement also provides practical and financial support to developing countries to help them adapt to climate change.

The Paris Agreement lays out a clear path toward low-carbon economies, but it is clear how this transition presents significant challenges in technology, energy, economy, finance, and society.

To specify the green transition goals for the European territory, nearly four years later than the Paris Agreement, in December 2019, the EU launched the Green Deal, primarily aiming to reduce emissions by at least 55% by 2030 compared to 1990 levels, with the ultimate goal of eliminating emissions by 2050.

Title: Green New Deal
Level: European level
Year: 2019

The Green Deal is an ambitious and comprehensive plan initiated in 2019 by the European Commission to transform the European Union into a climate-neutral continent by 2050. It encompasses a wide range of policy measures aimed at reducing greenhouse gas emissions, promoting sustainable growth, and fostering innovation in clean technologies across various sectors of the economy. In particular, it addresses the urgent need to tackle climate change and environmental degradation, aiming for clean air and water, healthy soil and biodiversity, energy-efficient buildings, affordable and healthy food, public transport, clean energy, technological innovation, product durability, and future-proof jobs.
The EU Green Deal includes an investment plan to mobilise at least €1 trillion over the following decade, create a framework for sustainable investments, and support public administrations and project promoters in creating sustainable projects. It is clear how this green transition will significantly impact economic markets, employment, professions, and skills, affecting both current and future labour market participants, and therefore

how effective management of the transition is crucial for either increasing or decreasing employment levels.

Some years later, in February 2023, the European Commission presented also the Green Deal Industrial Plan aimed at boosting the competitiveness of Europe's net-zero industry and expediting the transition to climate neutrality. This plan had the objective to create a supportive environment for scaling up the EU's manufacturing capacity for net-zero technologies and products essential for meeting Europe's ambitious climate goals.

Title: Green Deal Industrial Plan
Level: European level
Year: 2023

In February 2023, the European Commission published the blueprint for the industrial transformation necessary to support the objectives of the Green Deal, entitled A Green Deal Industrial Plan for the Net-Zero Age. Building on previous initiatives, the Green Deal Industrial Plan leverages the strengths of the EU Single Market and complements ongoing efforts under the European Green Deal and REPowerEU. It is structured around four pillars: a predictable and simplified regulatory environment, accelerated access to finance, enhancement of skills, and open trade for resilient supply chains.
The plan's first pillar focuses on simplifying the regulatory framework, proposing a Net-Zero Industry Act for quick deployment of net-zero industrial capacity, along with the Critical Raw Materials Act to secure vital materials and electricity market reforms to benefit consumers. The second pillar aims at hastening investment and financing for clean tech production, leveraging public financing and private investment, with potential structural support through a European Sovereignty Fund.
The third pillar prioritises skill development for quality green jobs, proposing Net-Zero Industry Academies and facilitating labour market access for skilled third-country nationals. The fourth pillar emphasises global cooperation and open trade to ensure resilient supply chains, proposing the development of Free Trade Agreements, a Critical Raw Materials Club, and Clean Tech/Net-Zero Industrial Partnerships.
As part of this Plan's objectives, the Commission will also protect the Single Market from unfair trade practices and foreign subsidies that may distort competition in the clean tech sector.

In addition to all these policies concerning the ecological transition in the narrow sense, it seems useful to mention the two new directives on due diligence and corporate sustainability reporting that have contributed, over the past year, to establishing an effective European framework for the transition that encompasses not only environmental objectives but also social ones.

In particular, these directives underscore the European Union's commitment to fostering sustainable business practices and ensuring corporate accountability across a broad spectrum of environmental and social issues. By requiring companies

to conduct due diligence to identify and address adverse impacts throughout their supply chains, and to report on their sustainability performance, these directives aim at promoting greater transparency, accountability, and responsibility in business operations.

This comprehensive approach reflects the EU's recognition of the interconnectedness of environmental and social sustainability in achieving long-term economic resilience and societal well-being.

Title: Corporate sustainability reporting directive
Level: European level
Year: 2023

On 5 January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force, modernising and strengthening the rules concerning the social and environmental information that companies have to report.
This directive builds upon existing reporting frameworks and aims at standardising and strengthening sustainability reporting requirements for companies operating within the EU. It mandates that large companies, listed companies, and companies disclose information on their environmental, social, and governance (ESG) performance in their annual reports.
In particular, the CSRD will apply:

- From January 1, 2024, to companies with more than 500 employees, which were already subject to the NFRD;
- From January 1, 2025, to companies not subject to the NFRD but with more than 250 employees and/or a turnover exceeding 40 million euros and/or total assets amounting to 20 million euros;
- Other listed companies by 2027;
- Listed SMEs by 2028.

Companies whose securities are listed on a regulated market in the EU will also be subject to the CSRD, regardless of whether the issuer is based in the EU or in a non-EU country. This includes small and medium-sized enterprises (SMEs) listed on the stock exchange, with the sole exception of certain listed micro-enterprises.
The CSRD seeks to provide stakeholders with consistent, comparable, and reliable information to assess companies' sustainability impacts and performance. By promoting transparency and accountability, the directive aims at driving corporate sustainability practices, support sustainable investment decisions and contribute to the EU's broader sustainability objectives.

Title: Corporate sustainability due diligence directive
Level: European level
Year: 2024

The Corporate Sustainability Due Diligence Directive is aimed at enhancing corporate accountability and sustainability practices within the European Union. This directive

seeks to ensure that businesses operating within the EU uphold environmental, social, and governance (ESG) standards throughout their supply chains.
It places a strong emphasis on due diligence measures, requiring companies to identify, prevent, and mitigate adverse impacts on human rights, the environment, and other areas. By promoting transparency and responsible business conduct, this directive aims at fostering sustainable and ethical practices among corporations, contributing to the EU's broader sustainability goals.
The directive will apply depending on the size of the companies following this timeline:

- 3 years from the entry into force of the directive for companies with more than 5,000 employees and €1,500 million turnover;
- 4 years from the entry into force for companies with more than 3,000 employees and €900 million turnover;
- 5 years from the entry into force of the directive for companies with more than 1,000 employees and €450 million turnover;

and to all their activities ranging from the upstream production of goods or the provision of services, to the downstream distribution, transport, or storage of products.
The directive requires companies to ensure that human rights and environmental obligations are respected along their chain of activities. If a violation of these obligations is identified, companies will have to take the appropriate measures to prevent, mitigate, bring to an end or minimise the adverse impacts arising from their own operations, those of their subsidiaries and those of their business partners in their chain of activities. Companies can be held liable for the damage caused and will have to provide full compensation.
Following the Council's approval on May 24, 2024, of the European Parliament's position, the legislative act has been adopted. After being signed by the President of the European Parliament and the President of the Council, the directive will be published in the Official Journal of the European Union and will enter into force on the twentieth day following its publication. Member states will have two years to implement the regulations and administrative procedures to comply with this legal text.

2.2. Supporting green transition: the green transition funds

With the pressing need to address environmental challenges such as global warming and biodiversity loss, it is clear how green transition funds play a crucial role in financing the transition to a low-carbon and resilient future. Green transition funds are financial instruments designed to support the shift towards a sustainable, low-carbon economy. These funds aim at mobilising public and private investment in projects and technologies that reduce greenhouse gas emissions, promoting renewable energy, enhancing energy efficiency, and fostering sustainable development.

Therefore, by providing financial support for initiatives that mitigate climate change, improve environmental health, and drive economic growth, green transition funds play a crucial role in achieving global and regional climate targets, such as those outlined in the Paris Agreement and the European Green Deal. These funds also help to ensure that the transition to a green economy is inclusive and equitable,

supporting regions, industries, and workers most affected by the shift away from fossil fuels.

Below is a comprehensive list of the primary green transition funds and their respective allocations. Each fund is characterised by its unique objectives and allocation criteria, tailored to prioritise key areas in the transition towards a low-carbon economy. By their examination, it is possible to gain valuable insight into the varied strategies and investments fuelling the global transition towards environmental sustainability and resilience.

Title: Just Transition Fund
Level: European level
Year: 2020

To support regions struggling with the transition to climate neutrality due to their dependence on fossil fuels, in January 2020 the European Commission established the Just Transition Fund. This fund aims at ensuring that climate neutrality is achieved equitably, under the principle "Leave no one behind." The fund supports economic diversification and modernisation, professional retraining, and employment inclusion in regions heavily impacted by the transition. Member States must submit local plans for a just transition to access this support.
The fund's scope includes sustainable investments in SMEs, research and innovation, renewable energy, energy efficiency and sustainable local mobility. It is important to highlight that the success of the Just Transition Fund relies on the participation and engagement of the public and all stakeholders, including local economic and social partners, trade unions, civil society organisations, and environmental NGOs.

Title: Fit for 55 plan
Level: European level
Year: 2021

The financial package of the EU's climate policy also includes the Fit for 55 plan, promoted by the European Commission in 2021, aiming to achieve the necessary transformation across the economy, society, and industry, thereby creating new opportunities for innovation, investment, and employment.
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 balance between pricing, targets, standards, and support measures.

Title: Invest-EU programme
Level: European level
Year: 2021

Alongside the other funds, in 2021 the European Parliament approved the Invest-EU programme, with the aim of mobilising € 400 billion to be invested across the Union between 2021 and 2027. The new programme 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, nonoptimal situations and investment care in specific sectors.
The project aims, particularly, to achieve the following objectives: sustainable infrastructures (about 38%); research, innovation and digitisation (about 25%); investments in SMEs (about 26%); social investments and skills (for the remaining 11%).
Eligible beneficiaries can be private entities, public sector entities, mixed and non-profit organisations. Also, within the scope of application of the programme several investments are granted to address the social, economic and environmental challenges arising from the transition process in the four main themes of the programme. Among the various investments, it is imperative to recognise the pivotal role of those allocated to the energy sector, as well as to critical and sustainable transportation infrastructures.

2.3. Fostering the green transition: the EU hydrogen strategies

Already in 2015, the European Commission highlights the critical role of developing and deploying climate technologies for achieving climate change goals, creating green jobs, and fostering sustainable economic growth.

The EU's transition to a zero-carbon economy necessitates a swift and fair shift that balances sustainability and health, protects production, reduces energy poverty, ensures supply security, and broadens accessibility, including economic accessibility. The Commission emphasises, in particular, that research funding, market measures, educational programmes, and emission pricing policies are essential for a broad range of technologies, including those for weather resilience, climate services, water management, energy production, industrial processes, transport, agriculture, and reducing deforestation[1].

In this context, hydrogen, and particularly renewable hydrogen, holds an untapped potential as a clean energy source. In support of this, several studies indicate that achieving sectoral emission reductions will require a mix of innovative technologies such as electrification, hydrogen use, biomass, alternative materials, energy efficiency, recycling, and carbon capture and storage (CCS)[2].

[1] 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.
[2] 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.

Hydrogen's potential as an energy source lies in its ability to emit no greenhouse gases, produce other fuels, convert existing infrastructure, and offer high energy density for long-distance transport and heavy goods. Also, hydrogen can be used across various sectors, including industrial processes, transport, heating, and energy storage, playing a crucial role in integrating the energy system. In addition, it is also clear that investment in hydrogen can drive sustainable growth and job creation.

Despite its current modest role in the global and EU energy mix, primarily produced from fossil fuels, hydrogen has significant potential to support the EU's carbon neutrality goals by 2050. Renewable hydrogen, produced through water electrolysis using wind and solar energy, is particularly promising due to its near-zero greenhouse gas emissions.

In this respect, numerous EU countries, alongside existing gas suppliers, are actively formulating strategies to produce renewable hydrogen for export to the EU. This initiative aligns with the European Commission's ambitious objectives to substantially increase the proportion of hydrogen in Europe's energy composition by 2050. Such efforts are primarily motivated by the considerable economic advantages associated with harnessing hydrogen's potential.

It is clear that, for achieving green and just transition objectives, hydrogen production must scale up and decarbonise. Also, effective hydrogen market regulation is needed to support the strategy, including common market rules, demand-side policies, low-carbon standards, and certification criteria. International cooperation is similarly vital for establishing technical standards, regulations, and definitions. In addition, it is important to recall the need to promote specialised skills and vocational training systems, equal opportunities in the hydrogen sector, and dedicated training programmes to support workers, engineers, and technicians. This is essential to ensure that the green transition, including the adoption of new and alternative technologies, is also equitable and just.

For these reasons, in 2020, the European Union promotes its Hydrogen strategy. Not only it stresses the importance of hydrogen 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 (highlighting how it 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 and, most importantly, it does not emit CO_2 and almost no air pollution when used); it also, highlights 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».

Title: Hydrogen Strategy for a Climate-Neutral Europe
Level: European level
Year: 2020

In July 2020, the EU adopted the Hydrogen Strategy for a Climate-Neutral Europe, which outlines policies for hydrogen production and use. It suggests policy action points in four areas: investment support; support production and demand; creating a hydrogen market and infrastructure; research and international cooperation.
The strategy is further specified in 20 key actions, divided in each action point.
First action point: "An investment agenda for the EU":

- Through the European Clean Hydrogen Alliance, develop an investment agenda to stimulate the roll out of production and use of hydrogen, and build a concrete pipeline of projects.
- Support strategic investments in clean hydrogen in the context of the Commission's recovery plan, in particular through the Strategic European Investment Window of InvestEU.

Second action point: "Boosting demand for and scaling up production":

- Propose measures to facilitate the use of hydrogen and its derivatives in the transport sector in the Commission's upcoming Sustainable and Smart Mobility Strategy, and in related policy initiatives.
- 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 based on their full life-cycle greenhouse gas performance.
- 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.

Third action point: "Designing and enabling a supportive framework":

- Start the planning of hydrogen infrastructure, including in the Trans-European Networks for Energy and Transport and the Ten-Year Network Development Plans taking also into account the planning of a network of fuelling stations.
- Accelerate 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.
- Design enabling market rules to the deployment of hydrogen, including removing barriers for efficient hydrogen infrastructure development, and ensure access to liquid markets for hydrogen producers and customers and the integrity of the internal gas market through the upcoming legislative reviews (e.g., review of the gas legislation for competitive decarbonised gas markets).
- Launch a 100 MW electrolyser and a Green Airports and Ports call for proposals as part of the European Green Deal call under Horizon 2020.

- Establish the proposed Clean Hydrogen Partnership, focusing on renewable hydrogen production, storage, transport, distribution and key components for priority end-uses of clean hydrogen at a competitive price.
- Steer the development of key pilot projects that support hydrogen value chains, in coordination with the SET Plan.
- Facilitate the demonstration of innovative hydrogen-based technologies through the launch of calls for proposals under the ETS Innovation Fund.
- Launch a call for pilot action on interregional innovation under cohesion policy on Hydrogen Technologies in carbon-intensive regions.

Fourth action point: "The international dimension":

- Strengthen EU leadership in international fora for technical standards, regulations and definitions on hydrogen.
- Develop the hydrogen mission within the next mandate of Mission Innovation (MI2).
- Promote cooperation with Southern and Eastern Neighbourhood partners and Energy Community countries, notably Ukraine, on renewable electricity and hydrogen.
- Set out a cooperation process on renewable hydrogen with the African Union in the framework of the Africa-Europe Green Energy Initiative.
- Develop a benchmark for euro-denominated transactions.

In addition, in July 2021, the Commission adopted a set of proposals for renewable and natural gases and for hydrogen to align the EU's climate, energy, transport, and taxation policies with the goal of reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels.

This package supports the demand and production of renewable and low-carbon gases, including hydrogen; it proposes harmonised rules on gas quality, allowing up to 5% hydrogen blending, and ensuring access to LNG terminals and gas storage for these gases. Also, increased transparency and better utilisation of capacities at LNG terminals and storage facilities are promoted.

Title: Proposal for a Regulation of the European Parliament and of the Council on the internal markets for renewable and natural gases and for hydrogen (recast)
Level: European level
Year: 2021

The revision of the Gas Directive 2009/73/EC and Gas Regulation (EC) No 715/2009, published in December 2021 and known also as the Hydrogen and Gas Markets Decarbonisation Package, aims at decarbonising gas consumption and introduces policies to support the creation of optimal and dedicated infrastructure and efficient markets. It seeks to remove barriers to decarbonisation and facilitate a cost-effective transition.
To develop a cost-effective, cross-border hydrogen infrastructure and competitive market, the proposed revision establishes EU-wide rules for the hydrogen market and infrastructure. It removes obstacles to development and establishes conditions for

repurposing natural gas infrastructure for hydrogen use, leading to cost savings and promoting decarbonisation.
The proposal also introduces a European Network of Network Operators for Hydrogen to manage the EU hydrogen market and facilitate cross-border hydrogen trade and supply. Additionally, it includes a system for terminology and certification of low-carbon hydrogen and fuels, complementing the revised Renewable Energy Directive's rules for renewable hydrogen.

The proposal, adopted as provisional agreement in December 2023, provides rules to facilitate the uptake of renewable and low carbon gases, including hydrogen, while ensuring security of supply and affordability of energy for all citizens in the EU.

A few months earlier, in October 2023, the European Parliament and the Council of the European Union adopted also a comprehensive legal framework to advance clean energy development across all sectors, thereby enhancing the EU economy and cooperation among member states. This framework includes the revised Renewable Energy Directive (EU) 2018/2001, which was updated in 2023 to expedite the EU's clean energy transition.

The original Renewable Energy Directive (2018/2001/EU), which came into effect in December 2018 as part of the Clean Energy for All Europeans package, was designed to uphold the EU's leadership in renewable energy and to aid in meeting emissions reduction commitments under the Paris Agreement. It set a binding renewable energy target for the EU of at least 32% by 2030, with the possibility of an upward revision by 2023, building on the previous target of 20% for 2020. The directive introduced measures to support the achievement of this target, particularly in the slower-progress sectors of heating, cooling, and transport. Additionally, it included provisions to empower citizens to participate in renewable energy development through renewable energy communities and self-consumption, and it established improved criteria for bioenergy sustainability.

Building on the directives from 2009 and 2018, the revised directive proposed in 2023 introduces robust measures to fully leverage the potential for renewable energy development, which is essential for achieving the EU's climate neutrality goal by 2050 and for strengthening Europe's energy security. The amending Directive (EU) 2023/2413, which took effect on 20 November 2023, requires Member states to transpose most of its provisions into national law within 18 months, with an earlier deadline of July 2024 for certain permitting provisions for renewables.

Title: Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652
Level: European level
Year: 2023

The Directive (EU) 2023/2413, adopted by the European Parliament and the Council on 18 October 2023, made major amendments to Directive (EU) 2018/2001. This significant legislative action underscores the evolving commitment of the European Union towards enhancing environmental sustainability and fostering green transitions. Among its essential contents, the Directive addresses critical aspects such as renewable energy targets, carbon reduction goals, and the promotion of clean energy technologies.
The revised directive of 2023, in particular, sets a new target to double the current share of renewable energy sources and establishes a strong policy framework to promote electrification across various sectors. This includes increased sector-specific targets for renewables in heating, cooling, transport, industry, buildings, and district heating/cooling, along with a framework to support electric vehicles and smart recharging.
To further promote the adoption of renewables in transport and heating/cooling, the directive incorporates key concepts from the energy system integration and hydrogen strategies introduced in 2020. These strategies together aim at creating an energy-efficient, circular, and renewable energy system that supports renewables-based electrification and the use of renewable fuels, including hydrogen, in sectors where electrification is not yet viable. For these hard-to-electrify sectors, the directive sets new binding targets for renewable fuels of non-biological origin.

Therefore, recognising the significant barrier posed by permitting procedures to the deployment of renewables, the directive simplifies and accelerates the processes for renewable energy projects, including through shorter approval periods and the creation of "Renewables acceleration areas", as well as for the necessary infrastructure projects.

In June 2024, just a few months later, the European Commission further advanced its support for the development of the European hydrogen market by promoting a pilot mechanism. This new initiative, established under the recently adopted decarbonised gases and hydrogen package, aims at accelerating investments by providing a clearer understanding of market conditions for both off-takers and suppliers, and by facilitating their interactions.

In particular, the hydrogen pilot mechanism has the aim of gathering, processing, and providing access to information on the demand and supply of renewable and low-carbon hydrogen, as well as its derivatives, enabling European off-takers to connect with suppliers both within Europe and abroad.

Title: Pilot mechanism to support the market development of hydrogen
Level: European level
Year: 2024

The European Commission at the beginning of June 2024 announced the launch of a pilot mechanism for the development of the hydrogen market, with the aim at enhancing the scale of EU hydrogen production and market development by increasing transparency in supply and demand and facilitating connections between buyers and suppliers. The pilot mechanism will operate under the auspices of the European Hydrogen Bank and will be in place for 5 years.
The mechanism may encompass renewable and low-carbon hydrogen, as well as their derivatives, and will enable EU buyers to connect with hydrogen suppliers from outside Europe. In May 2024, the Commission initiated a procurement process to develop this platform; by the end of 2024, the procurement contract will be signed, and by mid-2025, the pilot mechanism platform will be launched.

2.4. EU climate neutrality strategy in the transport sector

Within the framework of ecological transition goals, the transport sector stands out as a crucial area of focus. The transport sector is responsible for approximately a quarter of the EU's greenhouse gas emissions, with road transport being the largest contributor at 71.3%, followed by aviation, maritime transport, rail transport, and inland waterway transport. These emissions stem from both direct and indirect sources, primarily the energy production required for travel, therefore action in this sector is critical[3]. Currently, also, almost 94% of transport energy needs in the EU are met by oil, making the sector highly dependent on imports.

In this sense, it is clear how the EU prioritises making transport sustainable for all regions, including the most remote areas. In particular, by 2026, the European Commission aims at extending emissions trading to road transport, pricing pollution, encouraging the use of cleaner fuels, and reinvesting in clean technologies[4].

For many years the EU has been focusing on decarbonizing the sector: for example, the 2011 White Paper on Transport urgently called for significant reductions in greenhouse gas emissions to limit global warming below 2°C, specifically targeting a 60% reduction in emissions from the transport sector compared to 1990 levels.

In this context, hydrogen, as highlighted in the European Hydrogen Strategy, could offer solutions for the hardest-to-decarbonise parts of the transport system, also supplementing electrification and other low-carbon fuels. In particular, the Global

[3] 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.
[4] European Commission, Priorities 2019-2024, Delivering the European Green Deal, *§ Make transport sustainable for all*.

Hydrogen Review 2022[5] underscores hydrogen's role in supporting decarbonisation and reducing fossil fuel dependency, especially in sectors like heavy industry and long-distance transport. Hydrogen, also, could complement electrification, particularly in sectors where batteries are not feasible, such as aviation, long-haul road transport, maritime transport, and railways.

Despite the technological and economic challenges, hydrogen technology is progressively increasing in the transport sector, with fuel cell electric vehicles growing from 33,000 in 2020 to over 51,000 in 2021.

However, significant barriers related to storage, infrastructure, and costs must be addressed before green hydrogen can become a central energy source in the transport sector. Additionally, technological challenges concerning weight and hydrogen storage require solutions, particularly in the maritime and aviation sectors.

Furthermore, it is imperative to integrate the green transition with a just transition within the sector. In this sense, the automotive sector, which employs over 16 million workers in Europe, must proactively anticipate and manage the impending changes, that include potential job losses, new job creation, and shifts within the workforce. A Just Transition framework, supported by robust social dialogue, is essential to address these challenges effectively. This framework should prioritise skills development and training programmes to equip workers with the necessary competencies to adapt to the evolving demands of the green economy. By doing so, it ensures that the transition is not only environmentally sustainable but also socially equitable, minimising adverse impacts on workers and communities.

In this context, again, the Fit for 55 Plan represents a cornerstone of the European Union's ambitious agenda to combat climate change and achieve carbon neutrality by 2050, also promoting the respect for human rights and social development and focusing, among others, on the transport sector. Announced in July 2021, this comprehensive legislative package aims at reducing the EU's greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The plan encompasses a wide array of measures across various sectors, including energy, transport, industry, and agriculture, to ensure a cohesive and integrated approach to achieving the emissions reduction target.

By revising existing legislation and introducing new policies, the Fit for 55 Plan seeks to drive forward the EU's green and just transition, fostering innovation, enhancing energy efficiency, and promoting the adoption of renewable energy sources, while also protecting workers, communities and vulnerable groups in the transition processes. This initiative underscores the EU's commitment to leading global efforts in addressing climate change, while also ensuring economic growth, competitiveness, and social equity.

[5] IEA, Global Hydrogen Review 2022, September 2022.

Title: Fit for 55 plan
Level: European level
Year: 2021

On July 14, 2021, the European Commission presented a comprehensive package of proposals titled Fit for 55 to align existing climate and energy legislation, with the new objective of reducing net greenhouse gas emissions (emissions after subtracting removals) by at least 55% by 2030, compared to 1990 levels, with the aim of achieving climate neutrality by 2050.
The Fit for 55 package involves a revision of mechanisms that have long governed the reduction of greenhouse gas emissions and form the backbone of European climate policy, adapting them to the new and more ambitious climate targets. Specifically, the Fit for 55 plan strengthens eight existing pieces of legislation and introduces five new initiatives across a range of policy areas and economic sectors, including climate, energy and fuels, transport, buildings, and land use and forestry.
Regarding the transport sector, the Fit for 55 package includes proposals to promote cleaner vehicles and fuels. In particular, it provides for a revised CO_2 emission standards for new cars and vans with the aim of reducing greenhouse gas emissions, providing a realistic path toward zero-emission mobility. Key priority areas for decarbonising transport include enhancing the system through digital technologies and smart pricing, accelerating the adoption of low-emission alternative energies such as advanced biofuels, electricity, and hydrogen, and transitioning to zero-emission vehicles. It is also acknowledged that cities and local authorities, as well as social parties, play a crucial role in implementing these strategies.

Also, to support the full development of hydrogen strategies and technologies in the transport sector, the EU implemented regulations 2023/1185/EU and 2023/1184/EU on July 10, 2023. These regulations define conditions for qualifying hydrogen as a non-biological renewable fuel source and integrate the Renewable Energy Directive 2018/2001/EU, establishing criteria for considering hydrogen and hydrogen-based fuels as non-biological renewable fuels. In particular, producers must demonstrate compliance with additivity rules, ensuring renewable hydrogen is produced when and where sufficient local renewable energy is available (temporal and geographical correlation). Additionally, a methodology for calculating greenhouse gas emissions of non-biological renewable fuels throughout their lifecycle is provided.

These initiatives align with the RepowerEU policy and the Fit for 55'proposal, aiming to produce 10 million tons of non-biological renewable fuels.

Implementing the Fit for 55 package, the European Commission's also promoted in February 2023 the proposal on new CO_2 emissions targets for new heavy-duty vehicles from 2030 onwards and the Greening Freight package, discussed in July 2023, aim at enhancing freight transportation efficiency and sustainability.

Title: Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2019/1242 as regards strengthening the CO_2 emission performance standards for new heavy-duty vehicles and integrating reporting obligations, and repealing Regulation (EU) 2018/956
Level: European Level
Year: 2023

In February 2023, the European Commission put forward a proposal to establish new CO_2 emissions targets for new heavy-duty vehicles (HDVs), effective from 2030 onwards. This initiative is part of the broader European Green Deal strategy, aiming to significantly reduce greenhouse gas emissions and achieve climate neutrality by 2050.
The proposal sets ambitious targets to lower the carbon footprint of HDVs, which are a substantial source of transportation-related emissions in the EU. By incentivising the development and adoption of low and zero-emission technologies in the heavy-duty transport sector, the initiative seeks to enhance the environmental sustainability of freight transport, improve air quality, and promote innovation within the automotive industry.
Additionally, the proposal emphasises the need for a supportive infrastructure, such as charging and refuelling stations, to facilitate the transition to greener vehicles. This regulatory push is expected to drive significant investments in clean technologies and contribute to the EU's overarching climate objectives while maintaining competitiveness and ensuring a just transition for the workforce involved.

Title: Greening Freight package
Level: European level
Year: 2023

The Greening Freight package, discussed by the European Commission in July 2023 and then adopted in terms of common position (general approach) by the Council, aims at enhancing the sustainability and efficiency of freight transportation within the EU. The draft regulation sets out a common regulatory framework, based on an ISO standard, for greenhouse gas emissions accounting of transport services across the entire multimodal transport chain, thus creating a level playing field between modes, segments, and the EU's national networks.
The draft regulation is designed to support companies that calculate and report greenhouse gas emissions of their transport operations on a voluntary or contractual basis, or when required by other specific measures taken by industry and public authorities.
This comprehensive initiative includes also measures to improve rail infrastructure management, provide stronger incentives for the adoption of low-emission lorries, and offer better information on the greenhouse gas emissions associated with freight transport, contributing significantly to reducing transport emissions by 2050 in line with the European Green Deal objectives. By addressing these key areas, the package seeks to reduce the environmental impact of freight operations, support the transition to a low-carbon economy, and contribute to the broader objectives of the European Green Deal.

2.5. Social dialogue for the ecological transition

Addressing climate change and environmental degradation represents one of the most significant global challenges. Consequently, how the transition towards a more environmentally sustainable labour market will have diverse impacts on individuals, communities, and businesses.

Primarily, this transition will lead to the creation of new job opportunities, fostering professions and occupations in sectors that may not yet exist. It is evident that the transition may also result in the reduction or elimination of certain professions, particularly those within industries characterised by high levels of pollution, such as coal and gas extraction. Therefore, discussing the transition also entails discussing skills: a reconfiguration of competences requirements across various occupational domains within the economy is essential to safeguard workers during the transition while ensuring productivity, competitiveness, and economic growth.

Effectively addressing these challenges requires a comprehensive reassessment and modernisation of educational curricula and training programmes to align with the evolving demands of the labour market. Given the diverse nature of these transitions across regions and territories, a locally tailored approach becomes crucial. For example, looking at local dynamics, it should be highlighted that approximately 18% of employees within the OECD are engaged in roles encompassing a substantial portion of green tasks, directly contributing to environmental sustainability or the mitigation of greenhouse gas emissions. However, the prevalence of these "green-task" occupations shows considerable variation across regions, with rates ranging from 7% to over 35%.

Certain areas, particularly numerous capital regions, stand out as pioneers in the green transition, characterised by a pronounced and escalating prevalence of green jobs coupled with a minimal incidence of "polluting" jobs vulnerable to obsolescence. Conversely, in other territories, there exists a conspicuous overlap between substantial proportions of both polluting and green-task positions, presenting opportunities for workforce transitions.

In this context, it is crucial to highlight the necessity for local-based strategies that integrate local economic development initiatives and business support programmes with national or European-level green transition policies. Moreover, there should be a specific emphasis on enhancing support mechanisms for small and medium-sized enterprises[6].

Also, expanding beyond the broader perspective, empirical data indicates not only that green and high-polluting employment opportunities are consistently distributed unevenly within countries and territories, but also that there is a substantial gender disparity: men significantly outnumber women in green job positions, and individuals

[6] OECD, Job creation and Local Economic Development 2023: Bridging the Great Green Divide, 2023.

with higher levels of education are more likely to secure green jobs compared to those with middle or lower education[7].

In this regard, if the climate emergency stands as the foremost policy imperative, necessitating a fundamental restructuring of our economic framework, it is equally apparent that a central role is played by social partners and social dialogue. Alongside European and national policies, they can ensure ecological transition while simultaneously ensuring that *it leaves no one behind*.

According to the ILO, addressing environmental challenges requires joint efforts rather than separate or consecutive actions. Social dialogue is essential for creating a strong social consensus on sustainability goals and pathways and, in this sense, it should be an integral part of the institutional framework for policymaking and implementation at all levels, involving adequate, informed, and ongoing consultation with all relevant stakeholders[8].

Social dialogue in the green transition allows for the inclusion of numerous interests in assessing environmental issues and sustainable development. It promotes a better understanding of different interests and needs, increasing the chance of adopting collective agreements and implementing concrete actions. While its most evident contributions are linked to social development, such as employment protection and training, social dialogue also strengthens economic development by fostering collaboration, improving productivity and economic growth, and stimulating innovation.

In this sense, trade unions and cooperative industrial relations play a central role in supporting sustainability transitions. Effective social dialogue at the national/sectoral level is crucial in supporting adaptation activities at each step, involving stakeholders from all levels and sectors, including public and private sectors, civil society, and other relevant organisations.

Also at the site level, it is important to foster effective social dialogue. Numerous examples demonstrate its centrality in sharing transition processes, creating decent jobs, reskilling workers, and ensuring a social floor for those affected by renovations. Therefore, it is clear how the role of employers' associations and trade unions in managing the green and just transition is particularly significant at the site level, where local factors influence the methods and degree of implementation of climate neutrality goals. For enterprises, social dialogue involves agreeing on concrete, time-bound, and enterprise-wide plans for emissions reductions while creating decent jobs, reskilling and retaining workers, and investing in communities.

In this sense, the European Union emphasises the need for meaningful and effective social dialogue at all levels (European, national, sectoral, regional, and workplace)

[7] OECD, OECD Economics Department Working Papers, 2024, spec. p. 10.
[8] ILO, Social Dialogue and the Sustainable Development Goals: An Essential Synergy for Human-Centred Development and Recovery, 2023.

to realise the European Social Model and enhance the competitiveness of the European productive system[9].

Social Dialogue – ILO

«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»[10].

Policies supporting social dialogue are included in the European Pillar of Social Rights (EPSR) and the Employment Policy Guidelines.

EPSR Principle 8 stresses the importance of consulting social partners on economic, employment, and social policies, encouraging them to negotiate and conclude collective agreements relevant to their interests.

EPSR Principle 8

«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»[11].

Also, the European employment strategy provides a framework for EU countries to share information, discuss and coordinate their employment policies. Within this framework, the employment guidelines establish shared priorities and objectives for employment policies. Specifically, guideline number 7 advocates for social dialogue as a pivotal instrument in crafting equitable employment policies.

[9] European Economic and Social Committee, Social dialogue within the green transition (Exploratory opinion requested by the Czech Presidency), September 2022.
[10] 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.
[11] 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.

Guideline 7 of the EU Employment guidelines
«Enhancing the functioning of labour markets and the effectiveness of social dialogue»[12].

Also, recent opinions from the European Economic and Social Committee (EESC) highlight the importance of social dialogue in the transition process[13]. Given the diverse social and industrial relations models across Member States, there is no one-size-fits-all solution: each situation must be evaluated to ensure well-functioning social dialogue.

In addition, the 2023 EU Council recommendation on strengthening social dialogue, social dialogue, including collective bargaining recognises social dialogue itself as a crucial and beneficial tool for a well-functioning social market economy, driving economic and social resilience, competitiveness, stability, and sustainable and inclusive growth and development. The recommendation also highlights that social dialogue plays an important role in shaping the future of work, taking into account particular trends in globalisation, technology, demography, and climate change, recognizing how Member States with robust frameworks for social dialogue and extensive collective bargaining coverage tend to have more competitive and resilient economies.

Title: Council Recommendation of 12 June 2023 on strengthening social dialogue in the European Union **Level:** European level **Year:** 2023
The Recommendation of the Council of June 2023 aims at strengthening social dialogue in the EU. In particular, the Council recommends that EU Member States, among other things, ensure a favourable environment for bipartite and tripartite social dialogue, including collective bargaining, in both the public and private sectors at all levels. The Recommendation highlights the need to respect the fundamental rights of freedom of association and collective bargaining; promote strong and independent trade unions and employers' organisations to foster meaningful social dialogue; include measures to strengthen the capacities of trade unions and employers' organisations; ensure access

[12] 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.

[13] 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.

to relevant information necessary for participation in social dialogue; promote the participation of all parties in social dialogue; keep pace with the digital age and promote collective bargaining in the new world of work, ensuring a fair and just transition to climate neutrality; and provide adequate institutional support to stimulate meaningful social dialogue.
Furthermore, the Council highlights that Member States should systematically, meaningfully, and timely involve social partners in the development and implementation of employment and social policies, and where applicable, economic and other public policies, which is necessary for participation in social dialogue and collective bargaining.

Recently, European institutions and social partners further confirmed the centrality of social dialogue with a declaration on the future of the European Pillar of Social Rights. La Hulpe Declaration of 2024 builds upon its 2007 predecessor, reaffirming the European Economic and Social Committee's (EESC) commitment to sustainable development and social justice in the face of escalating climate challenges. The declaration thus sets a renewed agenda for collective action, aiming to foster resilience, inclusivity, and sustainability across Europe.

Title: La Hulpe Declaration on the Future of Social Europe
Level: European level
Year: 2024

The 2024 La Hulpe Declaration on the Future of Social Europe, adopted by the European Parliament, the European Commission, the European Economic and Social Committee together with some social partners, emphasises the urgent need for a just transition to a low-carbon economy, highlighting the pivotal role of social dialogue in this transformation. In particular, it recalls «the importance of the freedom of assembly and association, and workers' and their representatives' right to information and consultation within their workplace and the right to collective bargaining and action».
The Declaration stresses on the centrality of the just and not only green transition; in this sense, it highlights the need to involve communities and territories recognising «the role of civil society, in particular regarding policies contributing to the fight against social and economic exclusion and inequalities, and regarding policies affecting underrepresented and vulnerable groups», and also valuing its function in our democracies and stressing «the importance of safeguarding civic spaces to address the needs of these groups and ensure the efficient implementation of policies targeting them».
In this regard, it calls for enhanced collaboration between governments, businesses, and social partners to develop comprehensive policies that seamlessly integrate environmental sustainability with economic growth and social equity. Recognising the multifaceted impacts of climate change, the declaration advocates also for robust support systems to manage the restructuring of industries, ensuring that workers are provided with adequate training and opportunities to transition into green jobs. Furthermore, it underscores the importance of innovation and the adoption of clean

technologies to drive the decarbonisation of key sectors, particularly transport and energy.

3. Relevant initiatives and experiences of social dialogue on the green and just transition

Despite numerous initiatives at various levels, significant challenges persist. In this context, social dialogue and collective bargaining assume a central role in mitigating regional disparities and addressing specific challenges, albeit with still limited involvement from social partners. Their primary role is to mitigate adverse employment effects resulting from sectoral transformations, with contributions from tripartite bodies and cross-sectoral social dialogue on equitable outcomes.

The TIRH Project has thus been engaged in drafting a report that highlights some exemplary practices at both national and company levels in the field of ecological transition, with a focus on the role of hydrogen, observed in France, Hungary, Italy, and Turkey. These examples encompass specific initiatives, corporate objectives, and instances of social dialogue pertaining to sustainability and carbon emissions reduction within the heavy freight and passenger transport sector. The report also aims at underscoring the increasing relevance of hydrogen technologies in supporting the green transition of heavy freight and passenger transport.

These practices were collected in collaboration with TIR-H Project partners, originating from three Member States and one candidate country (Turkey). Specifically, the good practices and initiatives were collected from the following organisations: FIM Cisl Torino e Canavese (Italy), Federation Des Travailleurs De La Metallurgie CGT (France), Vasas Szakszervezeti Szovetseg (Hungary), and Turk Metal Sendikasi (Turkey). Additionally, the FIM- Cisl, in quality of Associated Organisation contributed to the collection of the practices and supported its regional federation (FIM-Cisl Torino e Canavese, Coordinator of the Project). The data collected includes: 7 national case studies, three of which concern ecological transition programmes, while four specify their focus on new hydrogen technologies; 4 multistakeholder initiatives, one of which is dedicated to the utilisation and centrality of hydrogen in transition processes, one focused on hydrogen use in the transport sector, and two dedicated to exploring the ecological transition in the transportation sector.

Finally, 18 company-level initiatives were gathered, covering the use and promotion of new hydrogen technologies (2), the ecological transition in the automotive and heavy transport sectors (4), and the utilisation of new hydrogen technologies in the transportation sector.

The good practices are categorised by initiatives taken at the national level, with a distinction between government and multistakeholder initiatives, as well as

company-level initiatives. Following, an example of best practices for each level included in the report is presented, while a comprehensive overview can be found in the report itself.

The Report on relevant policies, initiatives, and experiences in the field of ecological transition with a focus on the role of hydrogen in France, Hungary, Italy, and Turkey – Deliverable D2.2 is available in the project website.

3.1. National level initiatives

3.1.1. Governmental initiatives

Country: France
Parties involved: French government – Ministry for Energy Transition, Ministry Delegate for Industry
Title: France Hydrogen Strategy
In September 2020, the French government, in particular the Minister for Energy Transition, Minister Delegate for Industry, presented its national strategy for the development of decarbonised hydrogen, focusing on applications where hydrogen is key for deep decarbonisation, including refineries and the chemical industry as well as steel production, and the mobility sector. Key stages for the initiative include the support for research and development (R&D) to advance the efficiency of hydrogen technologies across various applications; the assistance for business start-ups and industrialisation, leveraging both European partnerships for large-scale projects and national initiatives; the deployment support through the establishment of assistance mechanisms. Priorities for intervention encompass decarbonising the industrial sector through the development of a robust electrolysis sector in France; the advancing the utilisation of decarbonised hydrogen for heavy-duty mobility purposes and the promotion of the research, innovation, and skills development to foster the adoption of future hydrogen applications.
Source: https://www.tresor.economie.gouv.fr/Articles/4a1ac560-a021-4358-a466-f5430928a1db/files/7d2fd0e2-8a3d-4ce8-bbb3-94cbd5b9c3d1

Country: Hungary
Parties involved: Ministry for Innovation and Technology

Title: Hungary's National Hydrogen Strategy 2018-2022

The Hungary's National Hydrogen Strategy 2018-2022 is a national policy promoted in May 2021 by the Ministry for Innovation and Technology.
The Plan contributes to the achievement of decarbonisation goals and presents an opportunity for Hungary to actively participate in the European hydrogen sector, by paving the way for the establishment of a hydrogen economy.
In the short and medium term, the strategy recognises the need for a rapid reduction in emissions and the creation of a viable hydrogen market, therefore requiring the production of low-carbon hydrogen. In the long term, the strategy primarily focuses on green hydrogen, which is produced using renewable resources like solar energy; the plan also acknowledges the potential for hydrogen production based on carbon-free energy from sources such as nuclear power or the existing energy network.
The policy focuses on four priorities. Firstly, it aims at producing large volumes of low-carbon and decentralised carbon-free hydrogen. Secondly, it focuses on the decarbonisation of industrial consumption, partly using hydrogen. Thirdly, it emphasises green transport initiatives. Lastly, it aims at supporting the infrastructure for electricity and natural gas.
Looking at the specific predictions of the strategy regarding the potential use of hydrogen in the heavy-duty transportation sector for goods and people, it is important to emphasise how this strategy is designed to reduce emissions by promoting the use of hydrogen, also predicting a significant increase in hydrogen demand by 2050. The policy aims at developing and promoting a refuelling network for hydrogen vehicles. Additionally, it TIR-H Transporting Industrial Relations towards Hydrogen 10 supports the decarbonisation of heavy-duty traffic through the implementation of hydrogen propulsion technologies, including projects like Green Truck and Green Bus.

Source:
https://cdn.kormany.hu/uploads/document/a/a2/a2b/a2b2b7ed5179b17694659b8f050ba9648e75a0bf.pdf

Country: Italy

Parties involved: Italian government – Ministry for economic development

Title: National Hydrogen Strategy: preliminary guidelines – Strategia Nazionale Idrogeno: Linee Guida Preliminari

As a complement to the strategy outlined in the National Integrated Plan for Energy and Climate, the Italian government published in the same year the National Hydrogen Strategy Preliminary Guidelines. These guidelines emphasise the role of hydrogen in the national decarbonisation pathway, in line with the National Integrated Plan for Energy and Climate, the broader environmental agenda of the European Union, and the recently published EU Hydrogen Strategy within the Long-Term Strategy for complete decarbonisation by 2050.

In the long term, the plan highlights how hydrogen can support decarbonisation efforts along with other low-carbon technologies, particularly in "hard-to-abate" sectors such as high-energy-intensive industrial processes or aviation.
In the short term, until 2030, hydrogen will play a central role in selected applications such as chemistry, mobility, and oil refining, enabling the development of a national hydrogen ecosystem necessary to fully harness the long-term potential of hydrogen. Among the key objectives of hydrogen utilisation, the government emphasises its application in the transportation sector, particularly in heavy-duty vehicles like long-haul trucks, railways, and industry. Additionally, hydrogen will be used in segments where it is already employed as a feedstock, such as the chemical sector and oil refining.

Source:
https://www.mimit.gov.it/images/stories/documenti/Strategia_Nazionale_Idrogeno_Linee_guida_preliminari_nov20.pdf

Country: Turkey

Parties involved: Türkiye Ministry of Energy and Natural Sources

Title: Türkiye Hydrogen Technologies Strategy and Roadmap

The Ministry of Energy and Natural Resources (MENR) of Turkey is actively engaged in developing Turkey's hydrogen roadmap.
The preliminary roadmap outlines a strategic plan divided into four distinct time periods for the country's hydrogen development: the first one, for the 2021-2025 period, focuses on initiating pilot projects, including innovation and demonstration initiatives. It also involves the completion of testing for domestic appliances and the establishment of a regulatory framework. The second period, 2025-2030, emphasises the development of the renewable and low carbon gas market. Furthermore, industry incentives are increased to promote the production of hydrogen-ready appliances. Additionally, regulations are formulated for the transportation, storage, distribution, and consumption of hydrogen. The third period, 2030-2040, involves the gradual integration of up to 20 percent regional hydrogen blending. It also entails scaling up hydrogen production and establishing dedicated hydrogen pipelines to connect industrial clusters with storage and production facilities. The fourth and last period, 2040-2050, envisions the widespread utilisation of hydrogen in the industrial sector and residential buildings. Distribution lines are expected to be fully compatible with hydrogen, marking a significant shift. Moreover, this phase involves the commencement of hydrogen export and the establishment of adequate hydrogen production and storage capacity. The MENR is committed to driving the development and implementation of Turkey's hydrogen roadmap, aiming to position the country as a key player in the hydrogen economy while fostering sustainable growth and reducing carbon emissions.

Source:
https://ticaret.gov.tr/data/60f1200013b876eb28421b23/MUTABAKAT%20YE%C5%9E%C4%B0L.pdf

3.1.2. Multistakeholder initiative

Country: Hungary
Parties involved: Hungarian Hydrogen Technology Association (involving employers, NGOs, regional municipalities, governmental organisations, universities)
Title: Green Truck Programme, 2021-2022
The Green Truck Programme, promoted by the Hungarian Hydrogen Technology Association, is part of the project for the greening of transport connected to Hungary's National Hydrogen Strategy. The concept of the Green Truck Programme is based on the opportunities presented by both hydrogen technologies and LNG to make the traffic of heavy-duty vehicles greener on the TEN-T corridors that cross Hungary. Within this project, the objective is to simultaneously examine the economic incentives for purchasing and operating LNG- and hydrogen-fuelled heavy-duty vehicles (road tolling system, excise taxes) and to promote new and modern technological/infrastructural conditions. The aim is to establish a supply chain based on domestically available bio-LNG and hydrogen.
Source: https://cdn.kormany.hu/uploads/document/a/a2/a2b/a2b2b7ed5179b17694659b8f050ba9648e75a0bf.pdf https://hh2.hu/index.php/projects/

3.2. Company level initiatives

Country: France
Parties involved: Air Liquide, IVECO
Title: Air Liquide and IVECO for the development of hydrogen heavy-duty mobility in Europe
In 2021, Air Liquide, a world leader in gases, technologies and services for Industry and Health, and IVECO, the commercial vehicles brand of CNH Industrial, have signed a Memorandum of Understanding to develop hydrogen for mobility in Europe. The partnership will contribute to materialising clean mobility by leveraging the two companies' complementary competencies, in particular Air Liquide's unique expertise across the entire hydrogen value chain, from production and storage to distribution, and IVECO's legacy as a provider of advanced, clean sustainable transport solutions. Both partners will dedicate means and resources to study the roll-out of heavy-duty fuel-cell electric long-haul trucks coupled with the deployment of a network of renewable

or low-carbon hydrogen refuelling stations along the main trans-European transport corridors. In parallel, both companies will jointly promote initiatives to encourage hydrogen mobility by involving all stakeholders along the entire value-chain.

Source:
https://it.airliquide.com/statics/2021-12/Air%20Liquide%20e%20IVECO%20collaborano%20per%20accelerare%20lo%20sviluppo%20della%20mobilit%C3%A0%20pesante%20a%20idrogeno%20in%20Europa.pdf?VersionId=viTigBN_DfAciVnadAoA0dxanAjxE0_O

Country: Hungary

Parties involved: A Waberer's

Title: Waberer's Ambitious Green Logistic Concept: Pioneering Hydrogen Technology in Hungarian Transportation

In 2021, Waberer's, the Hungarian transportation company, developed an extensive Green Logistic Concept, a declaration aimed at expanding combined transportation and adopting hydrogen technology in Hungary. The key elements of Waberer's Green Logistic Concept are: ensuring widespread charging infrastructure, considering fast charging time and range while accounting for payload mass, offering a full range of vehicles powered by hydrogen engines for road transportation, providing accessible maintenance and financing solutions, maintaining competitive lifetime costs and vehicle acquisition prices, and offering secondary market or manufacturer buyback guarantees. In the absence of these conditions or until they are achieved, the company refers to s EU or government support to offset the additional costs of traditional diesel vehicles by internalising positive social externalities. It also emphasises the importance of customer support for the adoption of the technology. Furthermore, the guidelines involve the implementation of various local projects. For example, in Győr, Waberer's proposes establishing a cross-dock facility to cater to the distribution needs of the entire region using their hydrogen-powered truck fleet. They also suggest utilising the Győr railway terminal for hydrogen-powered last-mile intermodal deliveries and introducing hydrogen buses in Győr's public transportation system. In Debrecen, Waberer's is committed to implementing hydrogen technology in BMW factories, contingent upon the availability of charging infrastructure. As for Budapest, the proposal is to serve the city via a carbon-neutral hydrogen truck fleet using a ring road and conducting targeted deliveries once a day.

Source:
https://zerocarbonhub.hu/wp-content/uploads/2021/11/Zold_kamion_Waberers.pdf

Country: Italy

Parties involved: AFV Beltrame Group

Title: Beltrame Group's Sustainable Transition Strategy: Embracing Sustainability Across the Steel Industry Value Chain

The Beltrame Group, a company operating in the steel industry with a focus on construction, shipbuilding, and earthmoving machinery, has recently embraced a sustainable transition strategy. In fact, recognising the multifaceted nature of sustainability across the value chain, the company is dedicated to integrating sustainability into its operations. In pursuit of this goal, Beltrame has formulated a strategy based on 5 pillars, which represent the key areas of focus. The first pillar pertains to electrical Consumption, aiming to reduce the use of electricity (including natural gas and electrical energy) and increase the share of renewable energy in the energy supply. The second pillar focuses on water, seeking to decrease water consumption in production processes. The third pillar addresses waste, aiming to recycle and appropriately manage waste and by-products generated during production, with landfill disposal as a last resort. The fourth pillar is dedicated to CO_2 emissions, encompassing a decarbonisation plan to minimizse the carbon footprint in alignment with the objectives of the European Green Deal. The fifth pillar revolves around safety, aiming to mitigate the risk of workplace incidents. Of particular significance is the pillar concerning the reduction of CO_2 emissions. The plan sets a target of achieving a 40% reduction in CO_2 emissions by 2030 compared to 2015 levels, accompanied by an investment plan of 300 million euros by 2030. The decarbonisation plan encompasses the development of 45 projects organised into four areas: improving and modernising facilities, enhancing operational and maintenance practices, procuring green energy through Power Purchase Agreements (PPAs) and constructing renewable energy production facilities, and promoting the utilisation of hydrogen (blended with methane) in rolling mill furnaces. The company has also established guidelines for creating an integrated systemic process. To facilitate this integration, the Beltrame Group has defined its sustainability policy, which focuses on two key aspects: the sustainability of production processes and the enhancement of relationships with internal and external stakeholders.

Source:
https://gruppobeltrame.com/sostenibilita-gruppo/

Country: Turkey

Parties involved: FORD Otosan/FORD Trucks

Title: Ford Otosan's Path to Sustainability: Advancing Renewable Energy and HydrogenPowered Mobility Solutions

Ford Otosan, the leading company of the Turkish automotive industry, announced its long-term sustainability goals. Firstly, Ford Otosan demonstrates its commitment to sustainability by sourcing all of the electricity utilised in its campuses from 100% renewable sources. This renewable energy approach contributes to reducing the environmental impact associated with the company's operations. In addition, in its pursuit of producing zero-emission vehicles, it has successfully developed a hydrogen-powered single-cylinder engine. This accomplishment aligns with Ford Otosan's long-term plan to exclusively produce zero-emission vehicles by 2040. Notably, Ford Otosan is the sole manufacturer of the E-Transit, a light and medium commercial electric vehicle, in Europe. Ford Otosan has also made significant progress in hydrogen-related research and development. The company has successfully produced the first hydrogen-powered internal combustion research engine in Turkey, furthering its contributions to sustainable mobility solutions and alternative propulsion systems.

Source:
https://www.fordotosan.com.tr/documents/2021_sustainability_report.pdf

4. The transnational and national training sessions

Following the completion of the two reports, namely the Report on EU Initiatives, Policy Recommendations, and Mapping of EU Social Dialogue Developments (D2.1), dated October 2022, and the Report on relevant policies, initiatives, and experiences in the field of ecological transition with a focus on the role of hydrogen in France, Hungary, Italy, and Turkey (D2.2), a transnational online training session was organised for workers and representatives from the four project countries. Additionally, four national training sessions were conducted in-person by each partner in their respective countries. The objective of these training sessions was to enhance participants' understanding of the ecological transition, particularly focusing on the role of hydrogen, as well as EU policies and initiatives related to this field. Moreover, the training aimed at providing workers and representatives with practical knowledge and skills on the most relevant EU and national initiatives on green transition to actively engage in social dialogue processes at both national and transnational levels.

Following the transnational training session, held online, and the national training sessions, organised in-person by the partners of the project, participants were provided with questionnaires. These questionnaires aimed at gathering feedback and assessing the alignment with training objectives and the actual results achieved.

The collected data were analysed and consolidated into two comprehensive reports: one focusing on the transnational training and the other on the national training sessions. Although these reports contain sensitive information, they can be made available upon request. All of the training materials are available on the

project website, and in particular: the materials of the *Transnational Training Session on EU Initiatives and Policy Recommendations and Mapping of EU Social Dialogue Developments on the Green and Just Transition of the Heavy Transport Sector (D3.1), December 2022*; the documents used for the *Transnational Training Session. Training material Package Part 1 (26-27 January 2023)*; and the materials used for the *National Training Sessions. Training material Package Part 2 (May 2023 – February 2024)*.

4.1. The transnational training session and questionnaires

Concerning the transnational training, questionnaires were drafted by ADAPT and administered in Italian, Hungarian and Turkish among participants thanks to the work of the BENs (COO included). The anonymous questionnaires were collected by COO and BENs staff and analysed by ADAPT.

In particular, the transnational training report details the participants, their feedback, and the outcomes of the competency assessments. This information offers valuable insights into the effectiveness of the training sessions and the diversity of the participants involved. It helps in understanding their backgrounds and the impact of the training on their professional development.

With regard to the participants, Hungary, Italy and Turkey participated in the training session while France was not present. In general, there were 60 participants in total, 51 men and 9 women, all from various companies and with different specialisations in the trade unions they represented, such as FIM-TORINO, VASAS, and TMS.

For Hungary, 16 participants took part, including 4 women and 12 men, from companies such as Continental, Daimler Mercedes, Yanfeng, and ZF. The group included heads of local trade unions, shop stewards, and trade union professionals working for VASAS in various roles like sectoral experts, education and training coordinators, international relations officers, regional office heads, and even the VASAS vice-president. The average age of the Hungarian participants was 40, with ages ranging between 25 and 55.

For Italy, there were 24 participants, with 2 women and 22 men. They represented companies like Leonardo, Thales Alenia Space, G.E. Avio, Faveley, Centro Ricerche Stellantis, FTP, Stellantis Carrozzerie, and Enti Centrali Stellantis. The Italian participants included trade unionists operating both at the site level and the local level, as well as a union secretary from FIM-TORINO. The average age in this group was 45.

Turkey had 20 participants, consisting of 3 women and 17 men. They were from companies including BOSCH, Mercedes-Benz, M.A.N, Ford, Renault, and Türk Metal. The Turkish participants were diverse in their roles, with shop stewards, a Branch Secretary, Branch Organisation Secretary, and Branch Education Secretary. Additionally, the group included International Relations Specialists and a Research and Training Specialist from TMS. The average age of the Turkish participants was 38.

The feedback questionnaire aimed at gathering input regarding the organisation of the training, the preparedness of the teaching staff, the subjects covered, and the participants' interest in those subjects.

In particular, the feedback questionnaires of the transnational training reflect a generally positive assessment of the transnational training and a predominantly favourable evaluation of the teaching staff. However, the main concern highlighted was the effectiveness and efficiency of remote training, with 5 out of 47 respondents rating it poorly. Additionally, the questionnaire indicated that participants had limited background knowledge of the topics covered during the training sessions. Despite these issues, nearly all respondents and participants in the transnational training expressed that they would recommend this type of course to a colleague.

Regarding the competencies questionnaire, it consisted of five questions focusing on various aspects of the EU's green transition and related policies addressed during the training. Participants were firstly asked to identify the first all-encompassing EU initiative on green transition from four options: the Paris Agreement, the Green Deal, the Just Transition Fund, and the Next Generation EU programme. Most participants correctly identified the Green Deal as the right answer. However, some selected the Paris Agreement or the Just Transition Fund. It is important to clarify that while the Paris Agreement is a binding international treaty on climate change, it is not exclusively European. Also, some participants answered: "The Just Transition Fund", which is a part of the broader Just Transition Mechanism, designed to support regions most affected by the shift towards climate neutrality.

The second question focused on the EU's strategy for promoting clean hydrogen. Participants were asked how hydrogen could be used according to the strategy, with options being: as a feedstock, as a fuel, as an energy carrier, or all of the above. The majority correctly chose "all of the above", recognising the diverse potential uses of hydrogen in decarbonising the economy. Some participants, however, only identified specific uses rather than the comprehensive role hydrogen can play.

The third question asked about the most important strategies for greening the transport sector. The provided options included: improving the transport system solely through electrification, enhancing digital technologies and encouraging a shift from fossil fuels to lower-emission transport models, focusing only on hydrogen as a new energy source, or improving local and public transportation. Nearly all respondents identified the correct strategy, which is to use multiple and complex approaches, highlighting the need for a multifaceted effort to green the transport sector.

Participants were then asked to identify the primary focus of the Corporate Sustainability Reporting Directive. This directive aims at modernising and strengthening the rules regarding the social and environmental information companies must report. The correct answer among the options was that the directive's main goal is modernising and strengthening the rules for social and environmental reporting by companies. Although all options were relevant to the directive's themes, the majority correctly identified the primary focus.

The last question addressed the EU's proposal for a directive on corporate sustainability due diligence. Participants had to choose from four options related to the directive's objectives: preventing human rights abuses, fostering environmental sustainability, both of these, or none of the above. The correct answer was that the directive aims at covering both human rights and environmental sustainability, encouraging companies to address these issues in their operations and supply chains.

Overall, the participants demonstrated a good understanding of the fundamental concepts and frameworks discussed during the training. However, they found the more technical and legal aspects to be challenging. The feedback indicates that while there is a solid grasp of the general topics, there is a need for further focus on the intricate details of policies and legal frameworks.

As previously mentioned, all the reports are sensitive, but they can be made available upon request.

4.2. The national training sessions and questionnaires

Following the transnational training, each BEN partner country conducted a national training session for workers' representatives from Italy, France, Turkey, and Hungary between May and November 2023. Specifically, these sessions were held on the following dates: the French National Training Session took place on May 24-25, 2023; the Italian session on October 10-11, 2023; the Hungarian session on September 19-20, 2023; and the Turkish session from October 30 to November 1, 2023.

The national training sessions saw significant engagement across the four partner countries. In France, over 200 individuals attended the two-day training course in May 2023. This high level of participation was facilitated by the fact that the training coincided with another initiative promoted by the French partners. In Hungary, the training was divided into two sessions on consecutive days. On September 19th, there were 27 participants, comprising 17 men and 10 women. The following day, on September 20th, there were 25 participants, with 14 men and 11 women. This balanced gender representation indicates a diverse and inclusive approach to training in Hungary. In Italy, nearly 26 trade union delegates participated in the training held in October 2023. Among these participants, 4 were women, showcasing the involvement of female trade unionists in the training programme. In Turkey, 26 trainees attended the session held from October 30th to November 1st, 2023. This group included 6 women, highlighting the participation of women in the Turkish training efforts.

Each of these sessions contributed to building competencies among workers' representatives, with varying levels of engagement and gender representation across the different countries. A report was compiled for each of these national training sessions, structured into two main sections. The first section focuses on

collecting and analysing feedback from the training sessions held in all four countries. The second section delves into the results of a questionnaire designed to evaluate the skills and knowledge acquired by participants throughout these sessions.

The feedback questionnaires from each national training session consistently reflect a positive overall impression of the training experiences. Unlike the challenges observed during the first transnational training session in January 2023, where concerns were raised regarding the efficiency and functionality of remote learning, such issues were not present in the national training sessions. This is attributed to the fact that all national trainings were conducted in person, eliminating any obstacles associated with remote class delivery. Furthermore, the feedback questionnaires revealed a notable lack of pre-existing knowledge among participants regarding the training topics before the commencement of the sessions. However, it is noteworthy that the majority of participants reported acquiring new skills and information on the subject matter during the course of the training.

The competency questionnaires, provided by Adapt to all stakeholders, were then tailored by each partner organisation to align with the specific content covered in their respective national training sessions. In particular, while Bulgaria and Italy utilised the questionnaire model provided by ADAPT, the French training employed open-ended questions, requiring participants to respond in brief paragraphs. These questions not only assessed the acquired knowledge of key policies related to the ecological transition but also explored best practices in the heavy transport metalworking sector and the union's role in managing the social and occupational aspects of the transition. Similarly, Turkey adapted the questions for its training participants to assess acquired competencies according to national needs. Indeed, it is noteworthy that certain questions used in previous training sessions conducted in EU member countries could not be directly applied in the Turkish training and required further specification to align with the specific national context under analysis.

It is worth emphasising that all competency questionnaires were administered in the language of the country where the training took place. This approach ensured that participants could respond to the questions directly, without relying on translation systems, thereby facilitating more accurate and nuanced feedback.

Overall, the national training sessions appear to have played a crucial role in enhancing participants' understanding and proficiency in the areas of ecological and just transition. The feedback indicates that these training initiatives effectively supported participants in acquiring new knowledge and reinforcing existing competencies related to the transition themes.

5. The policy recommendation document

At the conclusion of the Project, ADAPT, in collaboration with the other BEN members, developed a comprehensive set of policy recommendations for EU cross-sectoral and sectoral social dialogue. These recommendations were carefully crafted in close cooperation with the project coordinator and with the specific support of the partners, aiming to enhance the effectiveness of social dialogue across various sectors and ensure their practical applicability and impact.

The policy recommendations were initially developed in English and then translated into all EU languages to facilitate their circulation throughout the European territory. This approach supports the efforts of institutions and social partners towards a just transition by ensuring accessibility and comprehension across the EU member states. The policy recommendations translated in all the EU languages are available in the project website in the Material section.

Indeed, recognising the crucial role of effective social dialogue and initiatives in fostering innovation and achieving positive outcomes in economic markets and society, the policy recommendations highlight the imperative to strengthen social dialogue among EU Member States, industrial stakeholders, employers, trade unions, and worker representatives. This is especially vital in the manufacturing sector, including the production of heavy transport vehicles for goods and passengers, which holds significant importance in both the European and global economies. As evident from the European regulatory framework, this sector also plays a pivotal role in transitioning economies and countries towards sustainability.

In this sense, strengthening social dialogue can bridge the gap between companies operating within the EU and elsewhere, facilitating the attainment of universally shared objectives related to the green transition and equitable practices, as already promoted by the recent Corporate Sustainability Due Diligence Directive.

National social partners operating at both national and sectoral levels bear the responsibility for establishing the framework and guidelines for the green transition within the manufacturing sector. This involves ensuring a sustainable and equitable transformation while promoting industrial policies conducive to retaining and expanding manufacturing activities. Addressing employee training needs and adapting to evolving requirements, such as new roles, technologies, and occupational transitions, are essential components of this process. Also, collaboration with public and private institutions, as well as national and local authorities, is crucial for achieving green and equitable transition goals within the manufacturing sector, alongside the promotion of innovative and sustainable technologies.

Similarly at the corporate level, social partners play a pivotal role in overseeing and delivering onsite training initiatives for workers and their representatives. Their actions should be tailored to the specificities and needs of individual territories and companies, thereby promoting a transition that is not only green but also just.

The policy recommendations were then formulated taking into account the European level, national governments, national and sectoral social partners, as well as company-level social partners. For each of these entities, suggestions were developed to assist and incentivise institutions and social partners in promoting a just transition, considering both green objectives and the social protection necessary during transition processes. Among the various topics addressed, collective rights, organising, social dialogue, collective bargaining, and the promotion of regulations and initiatives in support of the green and just transition are highlighted.

5.1. Recommendations for the EU level

In this sense, it is recognised how the European Union needs to prioritise environmental responsibility across its operations, acknowledging and mitigating the adverse environmental impacts of its activities outside the EU. This involves fostering sustainable practices throughout its entire value chain, ensuring consistent health and safety standards across all states where EU companies operate.

In terms of energy policies and hydrogen use, the EU should also continue promoting hydrogen as a key component of its energy strategy, setting clear, achievable targets and regulations for its integration into the energy mix while addressing challenges related to production efficiency, infrastructure, and safety.

To achieve genuine sustainable development, the EU must also promote regulations that balance economic, environmental, and social pillars, ensuring comprehensive development that addresses economic growth, environmental conservation, and social well-being. Emphasising a just transition is crucial to ensure that sustainability efforts do not disproportionately affect certain communities or groups, with policies aimed at safeguarding vulnerable groups and fostering inclusivity.

In order to act for a just transition, and not just a green one, it is imperative to recognise the significance of collective rights in fostering collaboration and inclusivity within workplaces. In this sense, the European Union should safeguard the critical role of trade unions and firmly oppose any national legislation that undermines workers' fundamental rights.

Moreover, fostering social dialogue is essential for enhancing social cohesion, driving economic development, and promoting overall well-being. It is vital to establish a common understanding and effective communication among stakeholders, including strategies to facilitate cooperation across production sites. Transitioning from mere informational relationships to active consultation and collaboration with trade unions ensures participatory decision-making, incorporating diverse perspectives and interests into policies and strategies.

In this regard, the EU must also support the functioning of European Works Councils (EWCs) to ensure consistent processes of information dissemination and consultation across various countries.

Additionally, the EU should reject austerity measures to prioritise the well-being and livelihoods of workers and communities. Exploring alternative approaches that emphasise social welfare and economic stability is paramount.

5.2. Recommendations for Member States

Within each Member State, the pivotal role of public authorities in regulatory processes should be underscored, recognising their responsibility in shaping and enforcing policies. Moreover, Member States should acknowledge the necessity of tailoring energy regulations to their unique energy shares, reflecting diverse energy needs and consumption pattern, and considering hydrogen not as an ideological solution, but as one of the viable options to address energy challenges.

Meaningful dialogues with social partners, employers, and employees should be prioritised also at the national level to develop policies that consider the interests of all stakeholders.

In addition, addressing social challenges, Member States should advocate for enhanced job opportunities for vulnerable groups, including people with disabilities, and focus on transitioning policies to support the younger demographic entering the workforce. Financial support for training programmes is essential to guide and protect workers through transition processes, ensuring they acquire diverse skill sets necessary for future workforce demands.

Also, encouraging industrial policies that support transition sectors without excessive state intervention, Member States should promote active participation in social dialogue and collaboration among states, companies, enterprises, and unions. This shared approach aims at defining new employment opportunities, attracting investments, and fostering active dialogue and participation in transition processes, positioning stakeholders at the forefront of sustainable development.

5.3. Recommendations for social partners at the national/sectoral level

Policy recommendations extend beyond European and national-level institutions to include guidance for social partners at both national/sectorial and company levels.

Specifically, national social partners are encouraged to advocate for a cultural transformation within large corporations and small and medium-sized enterprises (SMEs), as well as among workers, fostering a mindset conducive to embracing change and adapting to new technologies and practices. This entails promoting the concept of lifelong learning and encouraging workers to view transitions as opportunities for growth and development.

Again, emphasising the necessity of constructive dialogue with governments, employers, and companies, including those resistant to or sceptical of the green transition, social partners at the national level should champion efforts to facilitate meaningful conversations aimed at bridging divides and fostering mutual understanding among stakeholders.

Social partners must also underscore their significance in addressing training, employment, and broader transition-related challenges. In this sense, national social partners are tasked with promoting comprehensive training programmes aimed at mitigating potential employment disruptions during transition periods. Additionally, they should design specialised training pathways for worker representatives, equipping them with the knowledge and skills necessary to actively engage in sectoral social dialogue and contribute to the construction of fair and just transition processes.

Efforts should be directed towards promoting also high-quality, inclusive lifelong learning opportunities that enable workers to innovate and apply their skills effectively, both within their current roles and in potential future employment scenarios. These training modules should address specific skill gaps and emphasise the development of transferable competencies, validated and certified at the European level. Rather than reactive measures, national social partners should focus on establishing proactive professional training pathways that enhance employability throughout individuals' careers.

Acknowledging the evolving nature of work, national social partners should also endorse research initiatives aimed at identifying future essential skills, encompassing both technical proficiencies such as digital literacy and soft skills like adaptability and communication.

5.4. Recommendations for social partners at the company level

To social partners at the company level, the emphasis lies again on nurturing robust social dialogue. This entails advocating for and implementing information and consultation rights, allowing unions and worker representatives to actively participate in decision-making processes that consider the interests of both parties.

Within multinational corporations, recognition of the pivotal role played by European Works Councils (EWCs) is essential in facilitating cohesive decision-making and communication. Collaboration and information exchange between the EWC and company representatives ensure alignment in multinational contexts.

Furthermore, addressing local and company-specific considerations is essential, particularly in regions facing potential job losses due to transitions. Companies must prioritise respect for human rights and ecological transition processes across their global value and supply chains, tailored to the specificities of each operating country while upholding human rights and ensuring a fair ecological transition.

Social partners also play a vital role in monitoring and enhancing employee satisfaction, crucial for fostering a positive work environment and organisational productivity. Supporting trade unions and workers' representatives is imperative to empower them in advocating for social and environmental protection measures. Moreover, advocating for comprehensive training programmes encompassing green and digital skills is essential. Additionally, initiatives for the training and retraining of workers' representatives are crucial, ensuring their active participation in decision-making processes and effective collaboration within the company.