JUST TRANSITION AND THE ENERGY SECTOR

2022 roundup

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INTRODUCTION

The International Trade Union Confederation (ITUC) represents more than 200 million organized workers globally; LO Norway represents almost half on the Norwegian workforce, including oil and energy sector workers; and IndustriALL Global Union represents most of the world's organized energy sector and industrial workers, with 50 million members in 140 countries. Together, we launched the Just Transition and the Energy Sector initiative this year, to support our members in the energy sector as they work to get a Just Transition during this very turbulent time.

All our members feel the consequences of climate change. Many already feel the consequences of an unjust energy transition in the form of job losses, new jobs that are not good jobs, and anxiety about the future. But everyone will feel worse consequences of climate change if climate action is delayed; while our members face the loss of high quality, organized jobs in the energy sector if we don't make the energy transition a Just Transition.

Two years ago, at the height of COVID lockdowns, hundreds of thousands of workers in the oil and gas sector lost their jobs. Now, our members in the energy sector are back at work, but skyrocketing energy prices and price gouging overwhelm poor and working-class households and threaten jobs in energy intensive industry. Though some countries are returning to fossil fuels including more coal, we know this is short-term. In the long term we will have to rely on green energy.

This transition is already happening, but in most countries, it is happening without us. Trade unions must be part of it. This is our challenge and our responsibility. The jobs of tomorrow should be as secure, good and well paid as today's jobs, or even better. To get a Just Transition with good jobs, we must take the initiative and be at the center of shaping solutions. These initiatives are not going to come from employers or the government.

After years of work Norwegian unions achieved commitments to Just Transition, including a tripartite social dialogue body on the issue. At the LO Norway Congress this year, unions discussed and passed unanimously a resolution on industries, business, and production that addresses our climate responsibility and the hard choices that we will have to make.

Though the European energy crisis has changed the context for oil producing countries in the short term, we know very well that there is a need to phase out fossil fuels. We know also that this will affect many jobs both in and related to the petroleum sector. We expect governments and the energy companies to continue their work to ensure investments and production of renewable energy, so that there will be many good jobs for workers in and on the way to a climate friendly future.

Supporting our members to ensure a Just Transition is the objective for this joint initiative between ITUC, LO Norway, and IndustriALL. The initiative has two parts:

1. The first action as laid out in this report, looks at technologies and country examples to get the facts on jobs. Unions and experts have met to share information on jobs, skills, markets, investments, and emissions for technologies such as hydrogen, CCS, offshore wind and other renewables, alternative fuels, and energy services.

2. The second action is exploring the potential for a new, tripartite process anchored in the UN and focused on Just Transition in the energy sector, starting with oil and gas. The initiative would help get and enforce global decent jobs and Just Transition agreements between oil and gas companies and trade unions. If successful, global unions plan to expand to include other energy companies.

THE TECHOLOGY WORKSHOPS

The **technology workshops** provided a table for unions around the world to exchange information, examples, and strategies for good jobs and Just Transition in the energy sector.

According to the International Energy Agency (IEA), the energy sector employs about 65 million people worldwide in fuel supply (coal, oil, gas), the power sector (grids, transmission, generators), and end uses (equipment, buildings, vehicles). Energy sector employment represents 2% of the global formal workforce.

Keeping today's good jobs in energy while decarbonizing is an essential part of Just Transition and should be a goal of energy policy going forward.

Using this lens of keeping and creating good jobs, the workshops explored key technologies for the long-term decarbonisation of energy intensive industries and sectors.

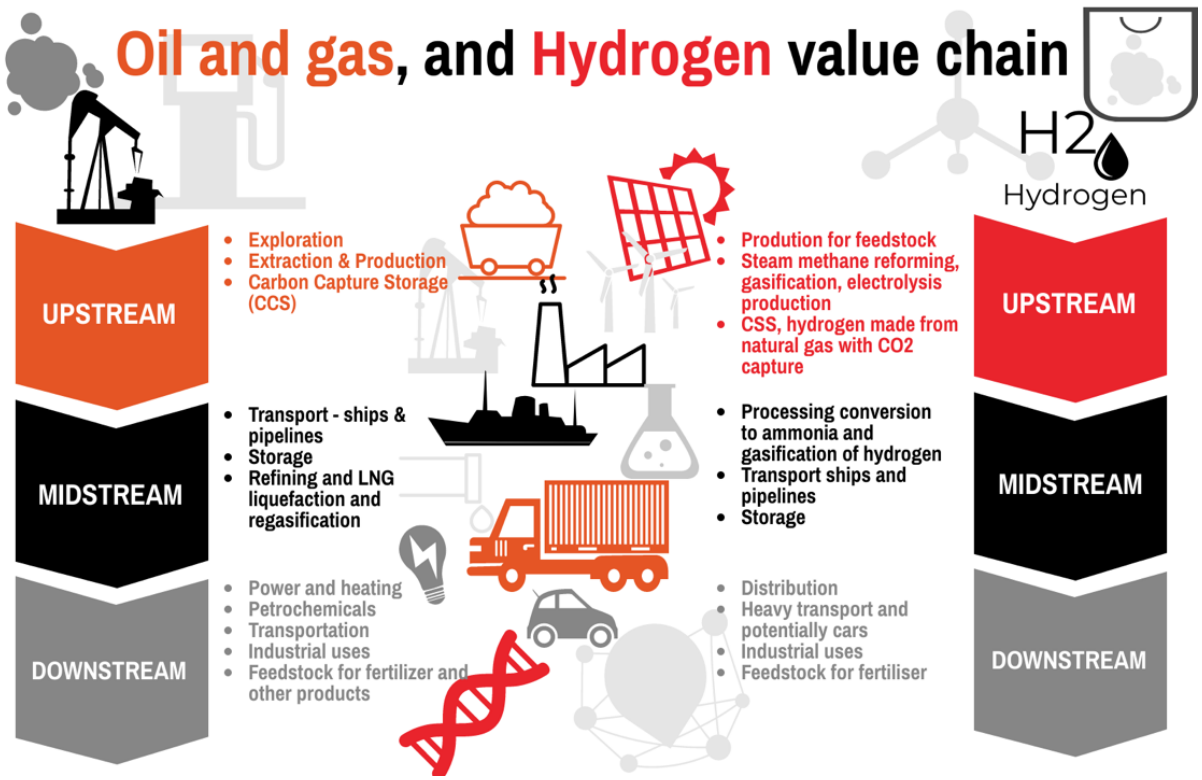
To get a better view of where jobs are and where they could be, the Just Transition and the Energy Sector technology workshops looked at the value chains of oil and gas, in comparison to of the value chains of:

- Hydrogen;
- Onshore & Offshore wind;
- Battery and Solar and Photovoltaic; and
- Carbon Capture Storage (CCS).

Breaking down the **value chains** of these technologies from production, processing, distribution, and end use (upstream, midstream, downstream) provides a clearer view of where the jobs are, and where there is a future for workers in clean energy technologies.

The workshops focused on the following questions:

1. How many new jobs are/will be created and when?
2. Which existing jobs will change?
3. Will the new jobs be additional or replace existing hobs?
4. What kinds of jobs are we talking about? Are they good jobs?
5. What new skills will be needed in these jobs?
6. What about health and safety?



Hydrogen and its value chain

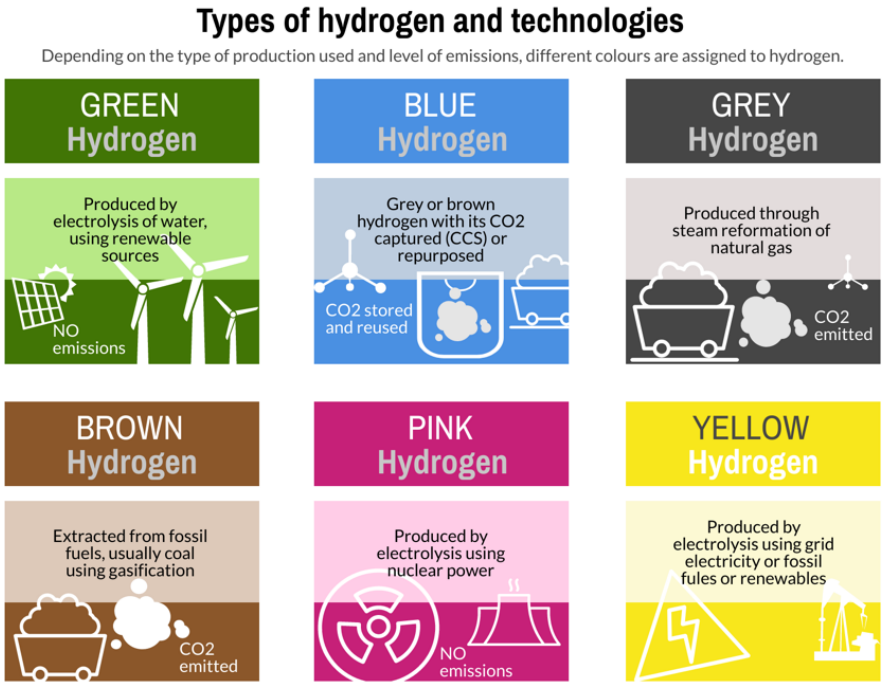
Hydrogen can provide opportunities such as increased value creation, new jobs, and significant emission cuts. It will play an important role in decarbonizing heavy industry and potentially transport as well as backing up the power sector. Jobs in the value chain of oil and gas have high skills transfer to jobs in the production, transport, and use of hydrogen.

However, hydrogen alone will not achieve full decarbonization, or provide enough jobs to replace today's good jobs in the oil and gas sector. And, though there are early-stage plans in many countries to export hydrogen, technology for transporting hydrogen by ship is not yet commercially viable.

The technology

Hydrogen can be produced from diverse, domestic resources, including fossil fuels, biomass, and water electrolysis (with electricity). The environmental impact and energy efficiency of hydrogen depends on how it is produced.

Green hydrogen is produced by using clean energy from renewable energy sources, such as solar or wind power, through a process called electrolysis. But 95% of the world's current production of hydrogen is produced from fossil fuels, mainly natural gas. It is expected that carbon capture and storage (CCS) and advances in CCS technology will cut emissions significantly from the production of hydrogen with fossil fuels.



The most common form of hydrogen is ***grey hydrogen****, produced from natural gas in a process (steam reforming) that produces 10 kg of CO2 for every kilogram of hydrogen. If the resulting CO2 emissions are captured and stored (CCS), it is called* ***blue hydrogen*** *which is expected to be less polluting, emitting between 1 and 3 kg of CO2 per kilogram. It doesn't store all of the resulting CO2 but technology is getting better at storing almost all of the emissions (93% CCS).*

Another way to produce hydrogen is by splitting water through electrolysis using renewable energy. This yields what is called ***green hydrogen****, and oxygen. Hydrogen can also be made from biomass; called* ***moss hydrogen****.*

Hydrogen is an energy carrier not an energy source. Its cost of production depends in large part on the cost of the energy feedstock used to produce it and, if CCS is deployed, on the cost of CCS as well. Hydrogen produced from fossil fuels without CCS is cheapest but does not deliver emissions reductions. Hydrogen produced from natural gas with CCS is projected to be less expensive than green hydrogen from renewables, with significantly lower emissions than grey hydrogen without CCS, but is not yet at commercial scale. Hydrogen produced by electrolysis from renewable energy is currently most expensive and has lowest emissions.

Despite the cost of green hydrogen, there is nonetheless increasing demand for it as a low emissions source of backup power for electricity deliveries from renewables as well as replacing fossil fuels in sectors that may be hard to electrify, such as heavy transport, the steel industry, and boat and air traffic.

Experts project that blue hydrogen may be necessary to meet demand in a transition period, while green hydrogen grows to commercial scale and costs come down. For example, according to the hydrogen road map in Europe, hydrogen could provide up to 24% of total energy demand in in the EU by 2050. The EU prioritizes green hydrogen but understands that they must explore blue hydrogen to develop infrastructure and demand.

Today, the energy debate in Europe is marked by the war in Ukraine. Russian gas has accounted for a significant share of EU gas imports. In addition to importing liquid natural gas from other countries, and more natural gas from Norway, EU countries are also keenly interested in using hydrogen as a substitute for natural gas in industrial and other sectors.

What do unions have to say about Hydrogen…

In **Germany**, there has been a long ongoing discussion around hydrogen technology driven by science, the oil lobby, and industrial consumers. The German government produced a hydrogen strategy in 2020 with an aim to create strong hydrogen-focused energy partnerships around the world. The debate is dominated by technical details, with **absolutely no worker perspective.**

What is the workers' perspective?

German union federation DGB went through a 10-month process to produce their own literature on the subject, engaging trade unionists, works council members, and value chain experts on industry, mobility, and energy. They carried out interviews with 20 different experts and produced the workers' position paper: *Trade union demands for the hydrogen economy – towards a H2 ready workforce*.

The main points for an H2 ready workforce are:

- Securing jobs in industry, creating new jobs in renewables
- Need for qualification in all sectors
- Technological support programs that include research relevant to employment and society
- Workforce and society acceptable of hydrogen
- Strong co-determination rights for climate and environment

Germany imports most of its oil and gas and has few jobs in oil and gas extraction. But many high-quality industrial jobs in Germany depend on gas, such as jobs in steel, chemicals, and the automotive sector. To keep these energy intensive jobs, the German government and trade unions want to be sure they move quickly on hydrogen as a replacement for natural gas. hydrogen. If they are too late to the hydrogen discussion and development of the technology, they would risk jobs leaving the country.

For hydrogen technology in Germany, a lot of new infrastructure must be built, there is gas infrastructure that needs to be repurposed for hydrogen, and technical issues that must be solved like the transportation question. Due to hydrogen's very small molecules and volatility, it is not easy to transport hydrogen by ship; existing gas infrastructure needs to be retooled. Industry will have to commercialize and build hydrogen infrastructure.

Repsol, the Spanish oil and gas company, is leading a major project in **Spain** to repurpose their five refineries into five hubs for hydrogen supply with distribution, output for small consumers especially for maritime transport, aviation, and heavy goods transport. The aim here is to put forward a green hydrogen project in Spain.

Spain's oil industry has about 30,000 workers. If you include the distribution workers there are about 100 000 workers in total. We don't know how many workers would work in hydrogen distribution. Where the hubs are being created in the petrochemical sector is where you are seeing real quality jobs in hydrogen. Hydrogen production outside these complexes are jobs with less pay, fewer rights less negotiating power and this worries unions the most.

Japan has established a *Green Growth Strategy* to achieve carbon neutrality by 2050. In the strategic framework to achieve Japan's carbon neutral goal, 11 out of 14 growth sectors are linked to hydrogen.

Japan's delivery of its hydrogen strategy has slowed down with recent developments such as the pandemic and the war in Ukraine. But one of the main targets has been to make hydrogen affordable, and to expand the hydrogen network in Japan. To achieve grid parity, hydrogen costs need to be lower than the price of natural gas.

Japan and **Australia** launched a new brown coal-to-hydrogen project. It will use brown coal in Australia to produce liquefied H2, which will then be shipped to Japan. The project will produce the hydrogen at

two facilities located in Victoria. The partnership is called the Hydrogen Energy Supply Chain. It was formed through a consortium of companies in Australia and Japan. It is a pilot project currently estimated to have a value of AU$500 million. The purpose of this partnership is to form a complete and solid supply chain for H2.

Brazil has the potential to become a global leader in green hydrogen production, but the country has slowed down under the Bolsonaro regime. The country has abundant wind and solar energy potential, and geographic advantages to export hydrogen to Europe and North America, plus a significant domestic industry.

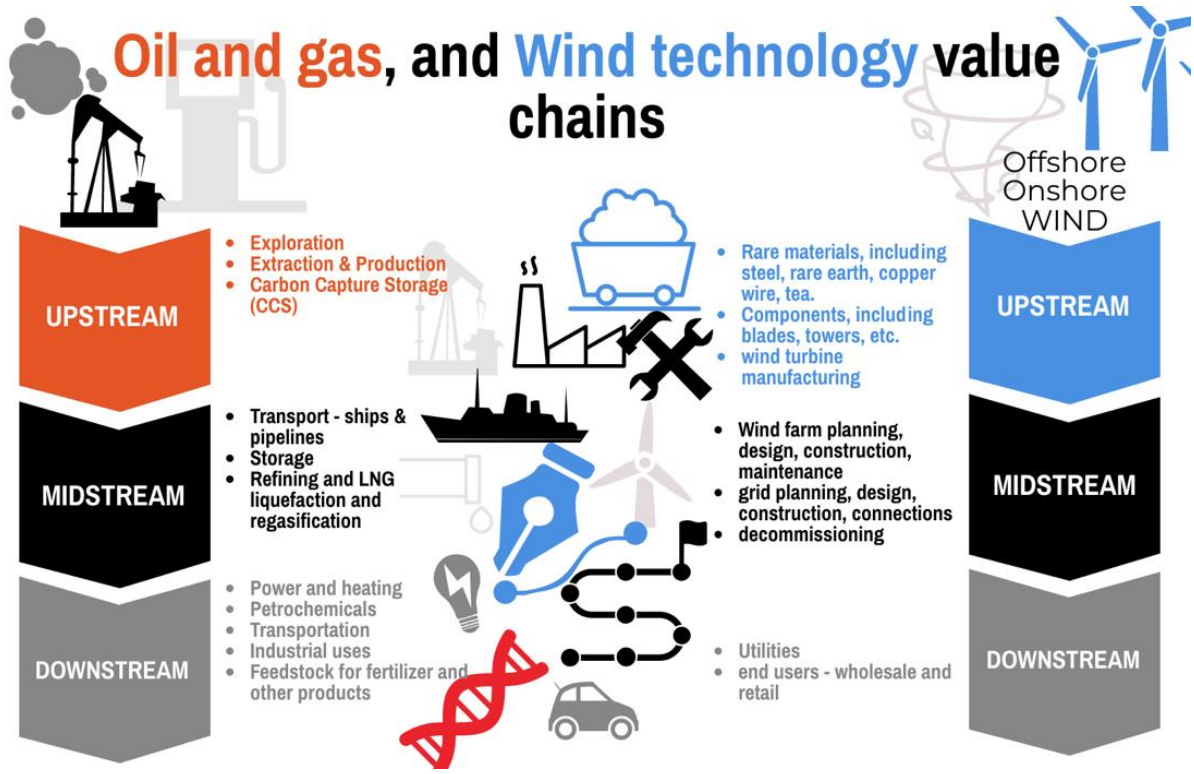
Brazil was a pioneer in hydrogen technologies between 2002-2005 with the national hydrogen plan. It was also an important player in climate protection. With interest in investment in cleaner technologies unions in Brazil are optimistic that the trend will change, though a lot depends on the forthcoming election.

In the USA, California has a goal to reduce greenhouse gases 40% from 1990 levels by 2030, eight years away. By 2045 the plan is to be completely carbon neutral.

The Infrastructure Investment and Jobs Act provides federal funding for up to four hydrogen hubs.

Unions representing workers in the energy industry are not deniers. Workers need to be on the proactive forefront. Unions in California are committed to achieving the state's climate goals. They see a future in hydrogen for today's skilled workers in the energy sector and are spearheading a coalition to secure federal funding for a green hydrogen hub in Southern California.

Workers in refineries all over the US are concerned, unions are working closely with the AFL-CIO on Hydrogen. There is national opportunity and challenges around Hydrogen. Unions representing workers in the hard to decarbonize sectors in the US are keen to see how the technology develops and how labour can be involved from the start.



The technology

Wind produces electricity by using the kinetic energy created by air in motion. This is transformed into electrical energy using wind turbines or wind energy conversion systems. Wind first hits a turbine's blades, causing them to rotate and turn the turbine connected to them.

Wind technology is not new and has been growing steadily since the 1990s, with accelerating rates of installations in the last decade.

Both offshore and onshore wind power play a central role in the transition to a carbon-free electricity system. Onshore and offshore wind turbines use essentially the same technology to generate electricity. Where the two differ is in their location, size, scale and how the electricity they generate is transferred.

Onshore wind technology is cost effective with quick installation, low maintenance and the potential to create a lot of good jobs in construction and maintenance. On the other hand, onshore wind strengths can vary giving variable generation capacity, it presents wildlife, noise and aesthetics concerns, and not all locations are suitable for wind turbines.

Offshore wind technology is more efficient due to stronger, steadier winds offshore winds. It has less potential for environmental impact than onshore wind and there is more space to build wind farms offshore. On the other hand, it requires major investment and with higher wind speeds, strong seas and accessibility issues, offshore wind farms are more challenging to maintain.

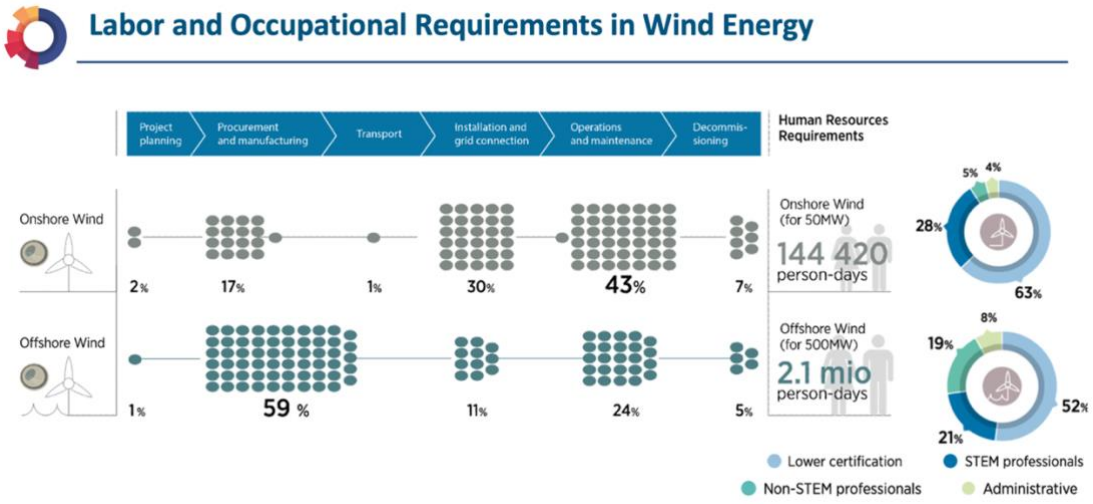
Wind energy employment, what influences jobs and quality?

The wind sector employs approximately 1.3 million workers globally and ranks amongst the top five renewable technologies in terms of workforce.

Gender balance is quite poor in the sector, mainly due to access to education, hiring practices, discriminatory workplace policies and a lack of flexibility. Yet gender equality is a key principle of Just

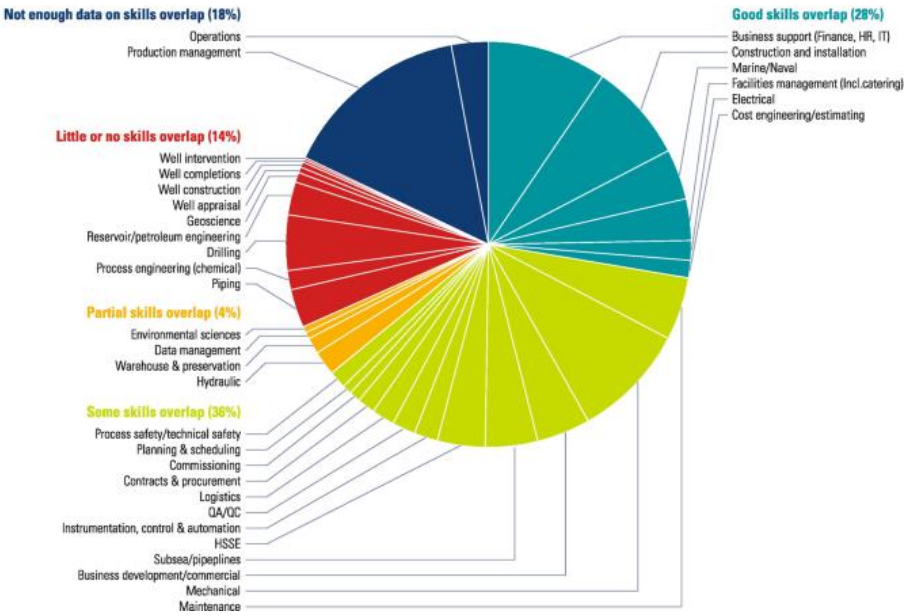
Transition. Strategies and programs addressing the effects of climate change must include the participation, experiences, and voices of women.

New installations drive jobs in the wind sector, primarily jobs in construction, manufacturing, and project design. But long-term employment is determined by the installations that are in place and that create jobs in operations and maintenance. Since wind technology is not that new and many installations are reaching the end of their lives, there are also potential jobs in dismantling and recycling old wind turbines.



Source : IRENA

Skills Overlaps between Offshore O&G and Wind



Source : Source: GWEC, Global Wind Report 2022 https://gwec.net/global-wind-report-2022/

Restrictive spatial planning and other polices make wind technology difficult to bring into some countries. The lengthy process for securing permits for new wind farms has a major influence on the technology developing further and, in many countries, there is a need for strategic industrial policy.

What do unions have to say about onshore & offshore wind?

In the UK, the focus has been on lowering costs, in particular labour costs. Component production is outsourced and some of the offshore vessel crews use cheap labour from abroad. Capital expenditures are what drive jobs in the supply chain and construction. A recent study showed that only 29% of capital expenditures on UK offshore wind projects are spent within the UK. If you include development cost and maintenance and operations, that rises to 48%.

In comparison, Denmark, a much smaller country, has a much more complete domestic supply chain and is home to major turbine manufacturers like Vestas. Danish companies have an estimated 40 per cent of the European offshore market, primarily in operations and maintenance, but also installations. The number of jobs that Danish companies can create in and outside of Denmark is significant.

The Danish model has a highly unionized workforce that have managed to secure quality jobs in the wind sector, demonstrating that unions are crucial in ensuring that the new jobs are good jobs.

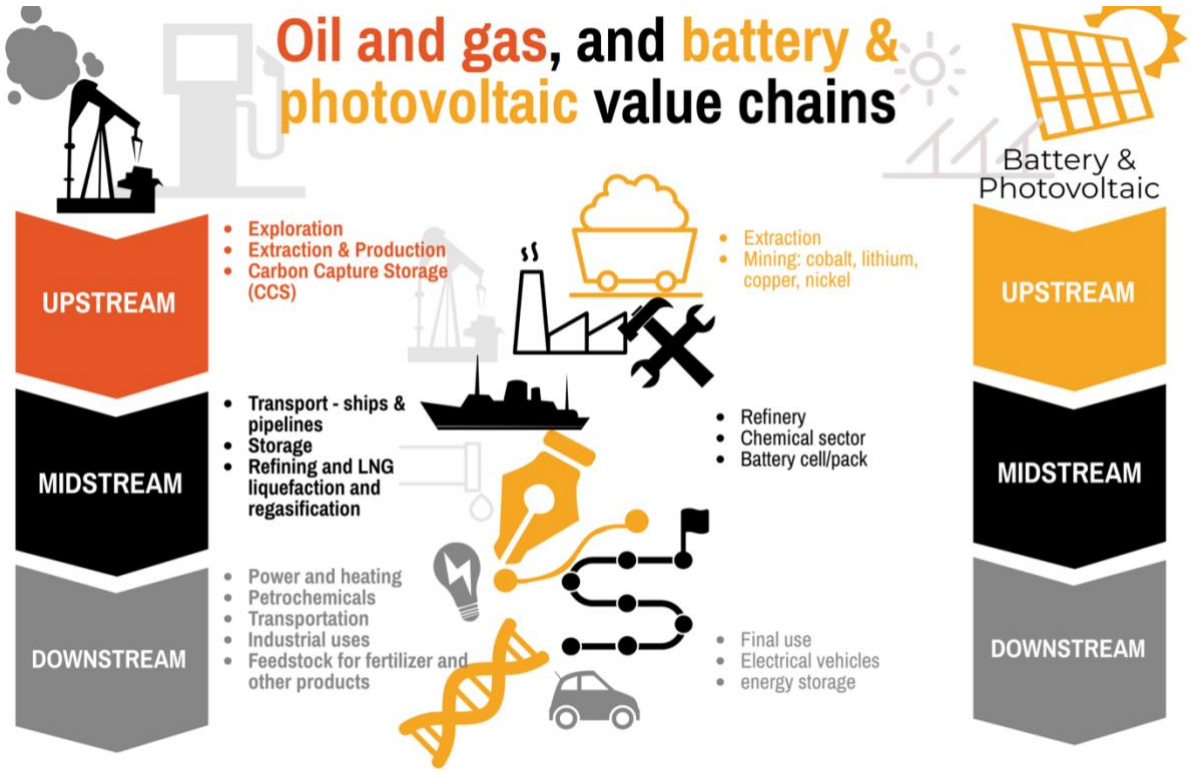
The industry's equipment manufacturing footprint is a big factor affecting where jobs are created. It determines a country's abilities to establish a strong local domestic supply chain and the ability to implement and to upgrade and update power grids to feed wind electricity into the grid.

In Norway, eleven offshore floating wind installations will be developed with employers, governments, and unions. These will be the first floating wind facilities powering offshore oil and gas installations. As oil and gas production emissions represent a quarter of Norway's CO2 emissions, it was important for Norway to electrify these platforms.

In Spain, UGT and CCOO have put together a manifesto in view of the potential for wind technology in the country. They have involved companies in the sector, ports and shipyards in the value chain, universities, and research institutions. The manifesto is an attempt to be ready in view of the emerging wind technology. Unions want to be prepared and make sure that workers and communities will be part of the discussion.

South Africa relies heavily on oil, gas, and coal for energy, but there is a rush for clean energy. There is potential to develop wind powered energy and to organize workers in this new sector.

Wind technology has been piloted in South Africa and studies show conflicting results. But there is hope that this technology will create many jobs, especially if there is local manufacturing. Unions are clear on having public and worker ownership, including through worker cooperatives.



The technology

Solar photovoltaic

Energy can be harnessed directly from the sun, even in cloudy weather. Solar energy is used worldwide and is increasingly popular for generating electricity or heating and desalinating water. Solar power is generated in two main ways:

- Photovoltaic panels are installed for the conversion of thermal energy into electricity,
- Solar panels convert solar radiation into heat

Average annual solar generation growth of 25% in the period 2022-2030 is needed to follow the Net Zero Emissions by 2050 Scenario. This corresponds to a more than threefold increase in annual capacity deployment until 2030, requiring much greater policy ambition and more effort from both public and private stakeholders, especially in the areas of grid integration and the mitigation of policy, regulation, and financing challenges. This is particularly the case in emerging and developing countries.

Solar PV combines two advantages: Module manufacturing can be done in large plants, which allows for economies of scale, and it is also a very modular technology and can be deployed in very small quantities at a time. This allows for a wide range of applications. Systems can be very small, from personal electronics or off-grid applications, up to utility-scale power generation facilities.

Battery storage and EV

A battery is a device which stores chemical energy and converts it to electrical energy. Battery technology is widespread for individual consumers and in scaled operations, whether that is using smart- phone, automotive vehicles, or even large-scale data centres.

A typical electric car requires six times the mineral inputs of a conventional car and an offshore wind plant requires thirteen times more mineral resources than a similarly sized gas-fired plant. Electricity

networks need a huge amount of copper and aluminium, with copper being a cornerstone for all electricity-related technologies.

Critical minerals such as copper, lithium, nickel, cobalt, and rare earth elements are essential components in many of today's rapidly growing clean energy technologies – from wind turbines and electricity networks to electric vehicles. Demand for these critical minerals will grow quickly as clean energy transitions gather pace.

Solar, batteries, and jobs: International Energy Agency (IEA) World Energy Employment Report

With formal energy sector jobs representing 2% of the global workforce, clean energy is fueling employment growth. Based on the investment pipeline there is potential for significant growth. Today, the bulk of people working on new energies are employed in the construction phase. These jobs are temporary. Once the facilities are built there will be additional jobs created in operations and maintenance, but this part of the value chain is less labor intensive than construction and creates fewer jobs.

Asia is home to energy's largest and fastest growing clean energy workforce. Due to lower wages, less mechanized processes, and rapidly expanding infrastructure, Asia holds a significant portion of the clean energy value chains like critical minerals, solar wind batteries. China alone represents about 30% of the formal energy employment globally.

Overall, the energy transition will result in net gains in jobs. However, losses will be acute in certain regions and sectors. Significant investment is needed to ensure a good transition, while rapid employment growth also has risks: Difficulties getting enough skilled workers, growing skills gaps, and an insufficient focus on decent work.

Today's energy sector has a large share of highly skilled workers. This makes it harder for new clean energy sectors to attract a talented workforce base.

Workers in fossil fuel extraction are highly skilled and many of these skills transfer well to clean energy jobs. In oil and gas, workers who today are working in skilled construction can transfer to other skilled construction jobs in clean energy. Similarly, there is likely to be high skills transfer in the manufacturing leg of the oil and gas value chain. Workers in extraction, refining, distribution, and transport of natural gas have skills that transfer well to hydrogen and to CCS value chains. Finally offshore oil and gas workers are likely to have skills that transfer well to offshore wind and offshore grids.

Just transition in the energy sector – mapping impacts for workers

Critical minerals are spoken about as the new oil of this generation. Green transition will require intensive and extensive exploitation of critical minerals. Quantitively electric vehicles will require more critical minerals. Graphite and nickel are major exports from Russia and there is an issue with that supply.

There is pressure to extract the critical minerals needed for the green transition and thus a need to look closely at mining policy and how it should be changed. The green transition is creating pressure on countries to exploit their minerals.

Workforces across the world face different challenges and there are significant gaps on industrial capabilities between transition pathways of different countries (Eg Japan Korea China – EV producers vs Brazil hybrid cars vs Germany /China wind turbines). We must look at different sectors and countries and their policies and priorities because needs are different. It is a messy and complex picture there is not a *one size fits all* when dealing with a just transition.

What does the supply chain look like?

China is the new player because it has significant control over clean energy minerals. Plus, China continues to increase its presence in the rest of the supply chain, from raw materials to processed

materials, components, and assembly. With significant deficits in labor and human rights for some Chinese workers, this has an impact on the type of workforce that is taking part in this transition.

In terms of the geographical spread, very different countries than those who produce oil and gas are predicted to be major players. Minerals are spread differently geographically and the current distribution of mining countries in the supply chain will change dramatically because of mining investments. e.g., Brazil has some of these minerals but aren't investing in their extraction.

It is important to remember that there is not one single type if battery technology. There is fierce competition for battery technology because of its wide use, more are trying to secure their access to the batteries. Battery companies are scrambling to get access to critical minerals so there are different bottlenecks in the supply chain. Because of the fear that this will run out there is a lot of research on alternatives like swapping lithium with other minerals.

There is more diversity in the battery supply chain because there is not one single type of battery. Asian countries dominate when it comes to battery production. Within the EU there is a big push to achieve battery self-production. Europe is looking into more mining within the EU. The geopolitical context has a huge impact on this.

Important changes in the supply chain in the past 12 months

1. Rapid escalation of **mining as a strategic sector** and
2. USA **Inflation Reduction Act (IRA)** blocking imports from Chinese led supply chain… if a US led supply chain for clean energy by inviting South Korea and other firms to develop processing technologies and refining plants
3. **African countries** are becoming framed as **strategic partners** due to immense mineral wealth.

What do unions have to say about solar photovoltaic and battery technologies?

Workers in the well-organized **automotive sector** have been working to ensure that battery plants are owned by automobile factories, because they are well organized with quality longstanding CBAs. However, there are only few examples of this. Battery production needs large facilities and requires significant investment, workers today are seeing it being outsourced by auto makers.

In **Brasil** INEEP reported that while there has been an increase in prices and demand in the solar photovoltaic sector since 2021, creating about 151,000 jobs, 43% of those jobs are outside of Brazil, and the jobs are concentrated in construction and characterized by precarious working conditions and low wages in Brasil.

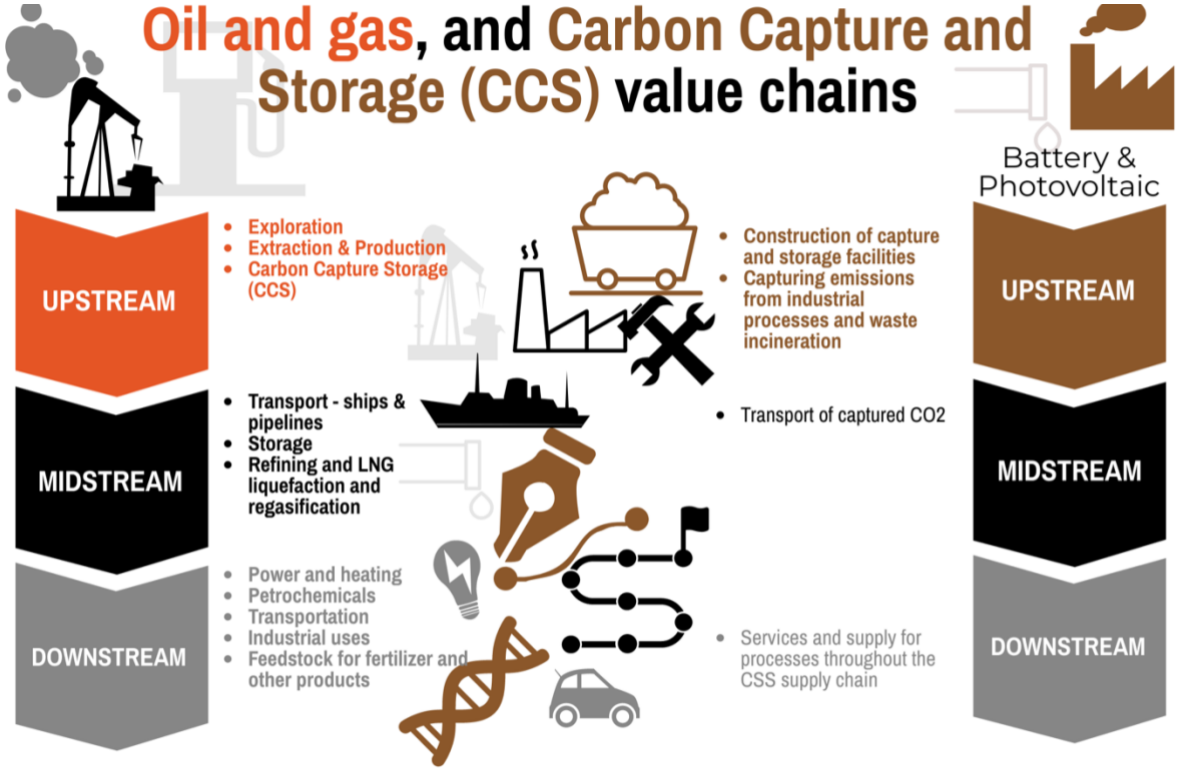
There is strong potential in Brazil for the expansion of the sector but the delay in projects, lack of tax incentives and shortage of equipment has makes growth difficult. Energy transition in Brazil is at a critical moment. Presidential election results will have a considerable impact on the country's direction for just transition.

In **Chile,** mining is the backbone of the economy, yet the industry creates few jobs. The country is a major producer of critical minerals, where 14 per cent of the workforce is unionized and only 8 per cent have access to collective bargaining.

Chile's social and environmental challenges makes it difficult for workers to progress. Unions continue to work hard for more social dialogue, especially around just transition.

In **Colombia**, the mining industry has seen difficult times in the country. Glencore for example, took advantage of the previous government's softer regulation, using the pandemic and just transition as an excuse to close plants and dismiss workers.

Workers want to move towards clean energy, and hope that the government will ensure a just transition for workers. With the newly elected government unions believe that they can make progress on a just transition, not only in the energy sector but in other sectors as well, like agriculture.



There are a lot of emissions in European heavy industry, such as petrochemicals, iron and steel, and non-metal minerals, and – outside of green steel - few commercially viable ways to reduce these emissions. CCS is therefore an important solution for these hard to abate emissions. There is a lot of opportunity to develop CCS technology and Norway is one of the leading countries in the world investing in it.

The technology

Capturing CO2 from industrial processes and storing it safely can substantially cut emissions. The IPCC, the UNFCCC and the IEA underline that carbon capture and storage, CCS, is necessary to reach climate goals.

Carbon capture with permanent storage (CCS) or usage of the captured CO2 (CCU) are tools for reducing emissions, and both are needed to combat climate change. While CCU is an integral part of the long-term vision, CCS is necessary on the way to reach large-scale reduction of CO2 emissions as quickly as possible.

Waste-to-energy with carbon capture and storage is a solution that provides sustainable end-treatment for unrecyclable waste, it removes CO2 from the atmosphere and produces local heat and electricity. But the right framework and conditions are needed to roll out the technology.

Is there a market for CCS?

As mentioned above, there are a lot of emissions in European industries. CO2 capture represents the largest market in the CCS value chain. It is important that we get the opportunities for emission cuts and transition jobs known. Unions must make sure that the workers are organized. Know-how gives international potential. A full-scale project could contribute qualified technology, solutions and experience that would be beneficial on a global scale.

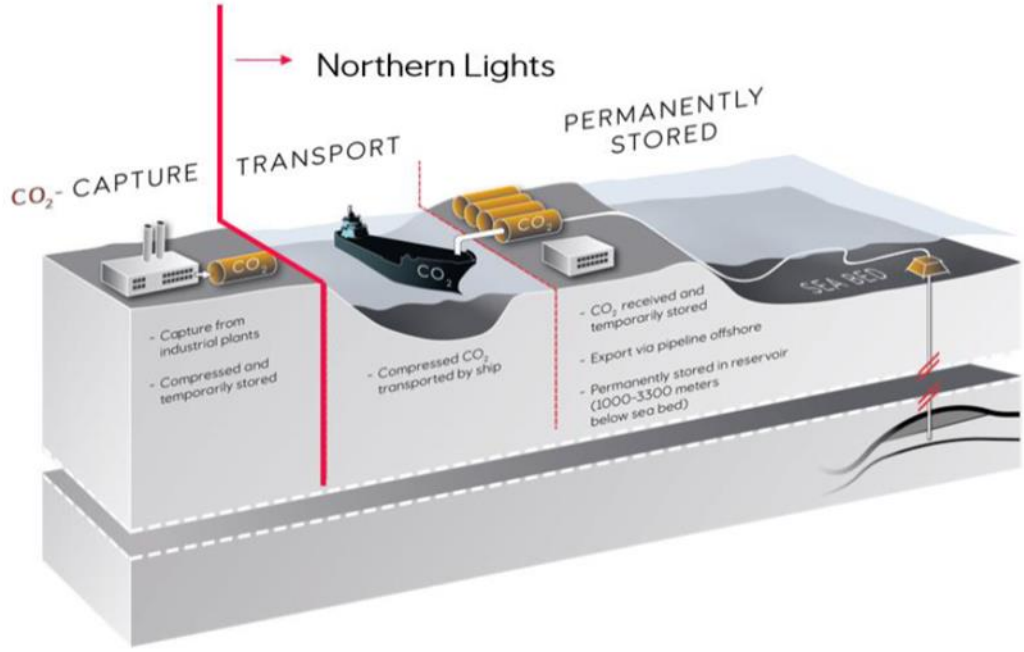
Longship - Norway's largest climate project ever - creating a new industry for Europe.

From 1996 Norway has been working on CCS capture and storage and put in place incentives. Waste is one of the world's largest climate challenges. It isn't possible to achieve climate goals without considering waste-to-energy options

The Longship program is the Norwegian Government's carbon capture and storage project. It will be the first ever cross-border, open-source CO2 transport and storage infrastructure network and offers companies across Europe the opportunity to store their CO2 safely and permanently underground deep under the North Sea. Phase one of the project will be completed in mid-2024 with a capacity of up to 1.5 million tons of CO2 per year.

Longship includes capturing CO2 from industrial sources in the Oslo-fjord region (cement and waste-to-energy) and shipping liquid CO2 from these industrial capture sites to an onshore terminal on the Norwegian west coast. From there, the liquefied CO2 will be transported by pipeline to an offshore storage location subsea in the North Sea, for permanent storage.

Longship and Northern Lights full scale CCS project



The Longship project reflects the Norwegian government's ambition to develop a full-scale CCS value chain in Norway by 2024, demonstrating the potential of this decarbonization approach to Europe and the world.

The government issued feasibility studies on capture, transport, and storage solutions in 2016. Combined, these studies showed the feasibility of putting together the pieces of the value chain and realising a full-scale CCS project.

What do unions have to say about Carbon Capture and Storage?

In Norway trade unions have been working together with employers' organizations to look at just transition through CCS. Several reports have been commissioned about the job creation and the opportunities in CCS, and how to create a business plan for the CCS value chain.

The findings of one of the reports show that numbers are high when it comes to job creation in CCS, both in capture and in transportation and in strengthening existing jobs. The ripple effects could strengthen 160k to 200k jobs and contribute to creating 70k new jobs in 2050. There is a need for investment and government support and focus on extending full-scale projects.

There were several questions on the actual usage of the captured CO2. Experts explained that it was important to evaluate not only the storage of the CO2 captured but also the usage. And the usage needs to be explored but would potentially be used for the manufacturing of goods such as plastics and building equipment.

Another concern especially coming from the global south and considering the large investments needed to enable the infrastructure for CCS large scale projects was how does this appeal to smaller economies that are large emitters. In Africa where solar power is in abundance CCS becomes less appealing due to the significant investment needed.

Fossil fuel in the Middle East and North African (MENA) region is important due to the dependance. It provides lots of jobs and revenues.

In Iraq more than 90 % of the country's budget comes from oil and gas, at the same time MENA region is the most impacted by climate change from drought to water storages and heat waves, damages to ecosystems etc.

There have been some initiatives in the region to reduce emissions of CO2. This includes shifts to renewable energies and investment in CCS. Solar power also of huge potential in the region. Th e reason CCS is so attractive for the gulf states is because it would enable them to continue exporting their hydrocarbon.

CCS is especially interesting for the unions in the region because it would help to not shut down the industry but clean it up as a first step.

At present, Qatar, Saudi and emirates is home to three major CCS facilities, which together account for around 10% of global CO2 captured each year, at 3.7 million tons a year.

In the USA under the infrastructure bill there is also money to establish CCS hubs in the USA. There is a cluster of states industrial actors and unions including the USW in the Ohio valley, where they are looking at CCS initiatives.

There is a lot of money available for a lot of projects, most refinery employers (Chevron EXXON…) are doing a lot of projects. USW are looking at how they can influence that they use some of these resources to deal with the refinery plants.

There are a few projects in Exxon in the Gulf of Mexico which will require a lot more funding but even with the money that the government is providing the investment needed is still significant. Unions are not seeing enough efforts to save jobs.

THE COUNTRY WORKSHOPS

The **country workshops** focused on the status of Just Transition in the energy sector in particular countries.

Unions globally shared examples on just transition focusing on:

- Government plans to transition
- Government investment in energy transition
- Status of social dialogue
- Models or studies on the effects on jobs
- What can we do collectively?

A global snapshot

Progress and challenges: what workers are doing to ensure a Just transition

Australia has had a poor record on Just Transition in the past years, with a government of climate deniers and a powerful fossil fuel lobby. Despite this, renewable energy has grown and is in a position where it could provide 80% of electricity generation by 2030if there is enough investment.

The new Labour government is now likely to agree to union demands for the creation of a national Just Transition Authority. The longer-term role of natural gas in the energy transition is still being shaped.

There is cause for optimism with the new government. Australian unions are doing a lot to make sure that they are part of this process and are pushing government to focus on investment and a Just Transition for workers.

In Norway, the petroleum industry has been one of the most important industries for the past 50 years. It accounts for 22% of the state income and employs over 220,000 workers.

Norwegean trade unions support the Paris Agreement and understand that jobs might shift sooner rather than later.

See more on offshore onshore wind in Norway

See more on Carbon Capture and Storage in Norway

Indonesia's government will host the G20 this year. The country has a net zero roadmap with a phase out of coal fired power by 2060. However, unions are concerned that there is no clear plan on how to reach these targets or what they mean for the 1.2 million workers in coal mining. Unions want tripartite social dialogue to shape this plan and for social dialogue to include discussions on the future of the oil and natural gas industries.

Unions need more certainty for the transition to green jobs and the impact on workers. They are focusing on training and upskilling to be able to prepare workers. Including just transition language in CBAs and educating on climate change impact is key.

In Iraq transition plans and investment have come to a halt due to instability in the country, while government remains hostile to union collaboration. There is so much opportunity for renewable energy in Iraq, yet there is flaring of gas all over the country. Climate change and global warming are universal problems, and there is a need for global pressure on the Iraqi government.

Unions must look at the global picture to see where multinational companies are investing and where there are opportunities for solidarity with Iraqi energy workers. For example, the German company Siemens has signed an agreement with the Iraqi government to produce hydrogen in the country. IndustriALL has a Global Framework Agreement with Siemens that can provide unions with leverage to demand workers' participation in the transition process.

Japan has an ambitious roadmap to tackle climate change. Cooperation between unions and the government is strong. With tight electricity supply and high natural gas prices, the government and unions see roles for solar power and nuclear energy. To maintain security of supply, the Japanese government also is looking for natural gas suppliers.

Japan's roadmap to tackle the challenge of climate change is bold and ambitious. It is marked by three key milestones.

- Firstly, Japan's commitment under the United Nations Climate Change Convention to reduce greenhouse gas (GHG) emissions by 26% from 2013 levels by 2030.
- The second milestone is to promote the development of innovative technologies by 2050 that enable Japan to contribute to the reduction in accumulated atmospheric CO2 globally to "Beyond Zero".
- The third and most ambitious milestone unveiled by Prime Minister Suga Yoshihide on October 26, 2020, calls for Japan to achieve net zero GHG emissions by 2050. This bold pledge sets Japan on a course to become Carbon Neutral in 30 years.

Japan's approach is based on three key principles

1. Promote Innovation & Technology as the agents of change in tackling the challenges of global warming.
2. Promote Green Finance to support the development of innovation and new technologies.
3. Support greater International Cooperation for business-led adoption of innovative green technologies.

To achieve carbon neutrality by 2050, systemic socioeconomic changes are needed, such as lifestyle changes in clothing, food, housing, and transportation. Efforts are already underway in Japan to make renewable energy and electric vehicles mainstream.

More on Japan and hydrogen

New Zealand is the first country to announce a phaseout of offshore oil and gas drilling with an inclusive Just Transition plan for workers and communities. Further, there is support from unions both on the phaseout of offshore oil and gas and on plans to achieve net-zero emissions by 2050.

The government has included unions in the discussion around this transition. Government has consulted with unions when it comes to the implementation of their plan.

Workers get a say in the planning of the industries and a skills transition, there is also close work with communities in this just transition process.

Unions are optimistic, the have the right framework and there are many positive developments, but they are still learning. The transition process is not perfect. The current government is taking real steps but if there is a change of government unions are concerned about what it might mean for the process.

In Nigeria, trade unions are part of a tripartite social dialogue process on delivering the country's commitments to the UN climate goals, but more needs to be done to make the process meaningful and effective.

Despite the energy transition plan with many renewable energy jobs, the government still invests heavily in oil and gas exploration. Oil and gas exports account for 65% of Nigeria's national revenue. While oil jobs are below 5 per cent of direct employment, they are the best quality jobs available.

Unions will not support a transition without conditions. The transition must be placed side by side with the removal of subsidies in the oil and gas industry. It is the major source of income in Nigeria so there is a lot of impact on workers and communities.

As a precondition to supporting an energy transition, energy workers argued for social protection, staff training and skills upgrade.

In South Africa COSATU and its affiliated unions have developed a Just Transition Blueprint for Workers for the coal-energy value chain, agriculture, and transport. The Blueprint provides policy, collective bargaining, and other tools for unions to ensure that workers can drive the agenda of a radical transformation of the economy. South Africa's energy mix going forward is under discussion after recent announcements by the government. There will be more renewables, and potentially a greater role for natural gas.

COSATU's top 5 demands for a just transition:

- Employment creating and sustainable policy
- A universal basic income grant
- Reskilling and upskilling
- Land redistribution
- End austerity for a climate just macroeconomic framework

Spain's Just Transition strategy for the energy sector is part of a larger decarbonization effort for the whole economy. Social dialogue is a big part of this process and unions are closely involved. Union confederations CCOO and UGT reported a complex yet positive start to the process, which started with a coal phaseout and a rapid build-up of renewable energy and last year expanded to include a ban on new oil and gas drilling.

As both academic and trade union sources note, just transition efforts for Spain's coal industry will be mainly reactive, addressing the fallout of previous mine closures and the future of coal communities, rather than proactively transitioning a significant active workforce. Mining towns are already struggling due to the industry's gradual decline, with depopulation rates as high as 40%. Because of their rural nature and lack of a diversely skilled workforce, these areas struggle to attract new enterprises. Strong local coalitions have emerged to slow or stop mine closures, including workers, unions, municipal governments and businesses indirectly supported by the coal industry, and they have hindered successive plans to close coal mines over past decades. Job losses are of particular concern for Spain, because even before the COVID-19 pandemic, its unemployment rate was double the EU average.

See more on hydrogen in Spain

In December 2020 Denmark, before Europe's current energy crisis, the Danish government passed a binding law for climate neutrality by 2050. The law includes phasing out oil and gas extraction with Just Transition measures and cancelling the current licensing round for gas extraction.

Danish unions have welcomed the government's ambitious goals with one exception: the cancellation of the last round of licensing, which would not impact climate goals, but which would have a negative impact on workers.

At the North Sea Summit in 2022 in Denmark, leaders from Germany, Belgium, the Netherlands announced a common aim of a fourfold increase of offshore wind capacity by 2030, and tenfold by 2050.

This much investment in renewable energy requires significant investment in training and reskilling. The social partners in Denmark have created an offshore academy where trade unions and companies make sure that the skills of workers match the skills needed in the new industry.

See more on offshore onshore wind in Denmark

In Germany unions have been heavily involved in and supportive of the country's plan to phase out coal. However, with the current crisis and the country's dependance on oil and gas imported from Russia, there are challenges to phase-out coal according to the original timeline.

See more on hydrogen in Germany

In the USA, the Inflation Reduction Act (IRA) under the Biden Administration aims to create clean energy jobs, drive public and private investment in renewable energy, revitalize the manufacturing sector, and lower health care costs. The act is projected to create just under 1.5 million jobs in the construction and manufacturing sectors.

This is the first time in the US that unions have ever had anything that looks like industrial policy, much less one that is climate and energy oriented. These developments are positive. There are still concerns around the transition itself. For example, increases in clean energy will over time bring reductions in the use of coal and oil, and internal combustion vehicles. But when it comes to workers in these industies there are no provisions for them in the IRA. The act has its limitations and unions will continue to fight for those workers.

See more on hydrogen in the USA

The Netherlands' national center FNV supports government climate policies but insists on the creation of funds to support transitioning workers from the coal sector. FNV is working on influencing Dutch pension funds to divest from fossil industries and instead invest in more sustainable industries. Together with the government and businesses, unions are working on a responsible business conduct platform for the renewable energy sector.

In Brazil, the Bolsonaro government has been terrible for the environment and for workers. They cancelled investments in renewables by Brazil's state-owned oil and gas company Petrobras, depriving the state of a key tool to drive Just Transition. Privatization and increased use of contract workers at Petrobras have resulted in job losses, as well as making jobs worse. But unions have high hopes for a potential Lula government.

More on solar and photovoltaic in Brazil

In Canada unions have fought for a national Just Transition law for several years. The legislation is expected late 2022 or early 2023. The main lesson learned from Canada's Just Transition Task Force on phasing out coal is that unions must have more than an advisory role in Just Transition processes. Unions need to be at the table making decisions and that is the demand of the Canadian Labour Congress and its affiliates.

Real action is needed so that workers and communities are part of the transition to ensure good paying jobs for their communities.

The missing link is having industrial and sectoral policies and training to provide the skills for the next generation of workers. This is a key role that both federal and provincial governments need to take on.

Conclusions and recommendations

Conclusions

Energy sector unions and national confederations are mobilized on the issue of good jobs and Just Transition. Our members have experienced changes to jobs and job losses as well as new clean energy jobs and organizing opportunities due to decarbonization. We are already in a transition but it is mostly not just.

Our members know the energy transition will continue and they want to be prepared for what's coming. Unions are keenly interested in information, examples, and exchanges with other unions, particularly focused on good jobs and social dialogue.

All projections show net gains in jobs in a transition to clean energy. However, no single clean energy technology or activity will involve as many jobs, and as many quality jobs, as workers have in today's oil and gas sector. Further, while today's jobs in oil and gas are often the best jobs in the economy, so far jobs in new clean energy companies are often lower quality than fossil fuel jobs and employers are often hostile to unions. The new jobs need to be good jobs. **That means unions need to step up our core business to organize workers in both existing and in new sectors.**

Though the global energy price crisis has increased employment in the oil and gas sector, unions understand this will not last. Further, there is agreement that high energy prices are bad for everyone in the working class and worst for poorer countries and households. High energy prices also threaten jobs in energy intensive industries.

Though many jobs in the oil and gas sector have high skills transfer to clean energy jobs, this is not universally true. The transition will require skilling and reskilling. Similarly, newer technologies such as hydrogen raise new health and safety issues that will require new HSE regulations and skills. Even older technologies such as solar panels require more attention to skills and HSE, as there is currently not enough focus on risks such as falls and high voltages.

Governments and companies are investing in and deploying different clean energy technologies at different speeds. This has implications for today's jobs and for when new jobs in clean energy will be created. To have the right demands for our members in different sectors, we need to understand which technologies will get adopted when and what the timing of technology adoption means for jobs across sectors. For example, in some countries the transition to electrification and potentially hydrogen in transport is happening quickly. This will reduce demand for oil, especially refined oil products. What this means for refinery workers is that CCS for refinery emissions may secure refinery jobs for a period but not indefinitely.

The energy transition will require more critical minerals as well as recycling and reuse of minerals that are already embedded in products. Jobs in mining can be good jobs but often are not. To secure more good jobs for workers in countries with big reserves of critical minerals, governments will need to demand a greater share of the value chain of these minerals. For example, processing of minerals and manufacturing could take place in the countries where the minerals are extracted.

As the energy transition accelerates, there is a risk that regions and communities that depend on jobs and revenues from oil and gas or other energy activities will be left behind. Governments need to plan for and lead a proper development process for these regions because otherwise they will just be the first link in the production chain.

For energy sector workers in most oil and gas producing countries, there is no social dialogue about Just Transition, climate targets, and the future. Some employers and governments have created their

own versions of “just transition” that do not involve workers and their representatives. Most have not involved unions in developing decarbonization plans or in plans for Just Transition. Our affiliates and members mostly do not have clarity about when the transition will happen or how, which existing jobs will change or disappear, what new jobs will be created, and what the pathway for workers will be to new jobs.

In today’s energy companies, most of the jobs – as much as 80% - are in the companies’ supply chain. There is a need for better tools to ensure that supply chain jobs are good jobs too. In countries with high union density, jobs in the supply chain can be good jobs, especially in manufacturing. In other countries, supply chain jobs tend to be worse quality. Multinational enterprises exert real control over their suppliers on issues such as prices, engineering specification, and technology development. They should also be able to ensure that suppliers provide decent jobs and comply with good labor standards.

In many countries, privatization of the energy sector and contractualization of jobs in both private and public sector energy companies have made jobs worse and social dialogue difficult if not impossible. Privatization and contractualization have not advanced decarbonization either. To the contrary, many of the companies involved are opening new extraction sites. Together these processes have sharply reduced opportunities for effective collective bargaining as well as intentional, state-driven industrial policy and decarbonization.

A few employers, especially those that are state owned, have strong social dialogue, agreements, and plans for Just Transition in their home countries. All, however, have weak or no requirements for Just Transition and social dialogue in other countries where they operate or in the supply chain. There is an urgent need for new agreements and/or legislation that will cover workers in the international operations and supply chains of multinational oil companies. There is also a need for new tools to support social dialogue and get employers to the table.

The United Nations and particularly UN Secretary General Gutierrez strongly support Just Transition. At the same time, they are concerned about the integrity of existing voluntary climate targets and initiatives, including those involving oil and gas companies. Trade unions are concerned too. We see many commitments to “just transition” related to the UN climate process, from governments, employers, and financial institutions, that do not include social dialogue, trade unions, or decent work. We welcome the report by the UN Secretary General’s High Level Expert Group on Net Zero Commitments by Non-State Actors, which recommends that non-state actors report on how their net zero commitments will support a Just Transition. We would go one step further and establish a process to scrutinize how these commitments comply with the ILO Guidelines on Just Transition.

For Global Just Transition Agreements to succeed, they will have to include strong accountability mechanisms. The International Labor Organization, as the UN’s only tripartite body, might be a natural home for such agreements, with convening by the UNSG. Due diligence and the UN Guiding Principles on Human Rights would be natural components of these agreements.

Energy should be regarded as a common good. Within this approach, the union’s job is to guarantee decent and good jobs in the entire supply chain.

Recommendations

*The list below is not in order of priority

1. The initiative should continue in 2023. Affiliates say that it provided an important space for exchanges across regions, national borders, sectors, and union formations.
2. In a next phase, the initiative could cover additional topics that affiliates highlighted. For example, there was strong interest in a workshop on nuclear power as well as a MENA region Just Transition workshop.
3. Whether as part of the initiative or separately, there is also interest in exploring the role of a public goods approach to the energy sector.
4. To keep good jobs and make sure new jobs are good too, trade unions need to step up our core business to organize workers in both existing and in new sectors.
5. Most workers in the energy sector work in the supply chain. Efforts to organize and get collective agreements should include these workers too.
6. Getting real social dialogue that can bring good jobs and collective agreements to energy sector workers involves organizing, political and campaigning pressure, and a strong and united movement. It will require sector unions, national confederations, and different levels of the union movement to work together.
7. Building union capacity through exchanges between unions in a company's home country and unions in countries where supply chains are is a practice that works in sectors as textile and can be used for the energy sector too.
8. Clean energy jobs are for everyone. A potential next phase of the initiative should include gender and racial justice issues to a greater extent and explore what the union movement can do to make sure more women, racialized, and young workers are involved.
9. Nonetheless, the initiative's focus should shift, from sharing information to supporting energy sector unions in getting social dialogue on good jobs and Just Transition. With a few exceptions, today's tools are not enough; new tools are needed.
10. Global Just Transition Agreements can be a useful tool to promote social dialogue. To be effective, though, they will need the full support of the unions that organize multinational energy companies at home; the engagement of the UN Secretary General; and a strong tripartite process through the ILO. These agreements should incorporate the UN's Guiding Principles on Business and Human Rights[1] and strong requirements for human rights due diligence and include workers in the supply chain.

[1] https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf

11. Creation of tripartite tables of social dialogue to discuss Just Transition between governments, employers and unions is necessary. They should work together to identify future needs for just transition and begin planning for just transition early, and before job losses occur, to ensure that new and good jobs are in place before existing jobs are phased out.

12. National and regional governments in countries with significant critical minerals reserves should take steps to retain more of the value chain and jobs relating to these minerals. This would include requirements to process minerals in the country of extraction and potentially also co-location of manufacturing.

13. Similarly, governments need to plan for and lead a proper development process for regions and communities that depend on jobs and revenues from oil and gas or other energy activities. Otherwise, these regions may be left behind as the energy transition accelerates.

14. Commitments made on climate and Just Transition under the Paris Agreement should be scrutinized to ensure that they are real and, in the case of Just Transition, compliant with the ILO Guidelines. Many countries and companies are using these commitments as greenwashing. Unions must demand that governments and employers deliver.