



A GUIDE FOR TRADE UNIONS

Adaptation to Climate Change and the world of work



Adaptation to Climate Change and the world of work

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Foreword

Scientific recommendations from the Intergovernmental Panel on Climate Change (IPCC) are clear. If we want to keep global warming below 1,5 to 2°C and avoid irreversible and disastrous consequences for our societies, we need to achieve climate neutrality by 2050 at the latest. Reducing greenhouse gas emissions is therefore a top priority for the trade union movement and the ETUC is committed to continue its work to ensure a just transition to a green economy through mitigation measures.

But while we are working on proposals and regulations to reduce carbon emissions, climate change consequences are getting real. We see that the past five years have been the warmest in the modern record, and that 18 of the 19 warmest years have occurred since 2000. These increases in temperature are accompanied by extreme weather events such as floods, droughts and wildfires that are getting more intense and more frequent over time. There is no doubt anymore that consequences of climate change are here and that these changes will affect workers more and more.

For these reasons, it is crucial that trade unions become involved in the adaptation to climate change. In the near future, additional measures will indeed be needed to protect workers health and safety and our policy makers will need to anticipate the changes ahead in order to protect employment in the sectors most at risk. It is clear that trade unions will have an important role to play in making our societies more resilient, be it by developing new collective agreements or by providing recommendations for relevant policy measures.

At each step of this process, it will be essential to respect the principle of just transition¹. For the European trade union movement, just transition means (1) the presence of solidarity mechanisms to support most vulnerable and affected sectors and regions, (2) adequate social protection and training programmes to ensure workers' resilience to the changes (3) the development of local economies and the diversification of activities, (4) rigorous socio-economic impact assessments and detailed long-term strategies to anticipate the changes, (5) an effective social dialogue and a strong participation of workers at all stages of the process, (6) the availability of sufficient financial means through a fair redistribution.

This guide has several objectives: first of all, it provides a clear definition of the concept of adaptation to climate change. Second, it aims to give the reader a clear idea of how climate change consequences will affect the different European regions and sectors. Third, it aims to explain what effects climate change will have on health and safety of workers. Finally, it details a set of recommendations and looks at existing practices to allow trade unions to take action on adaptation at the various levels.

I wish you a good reading and am looking forward to continue working with you and your organisations on this important topic.

In solidarity,
Ludovic Voet
ETUC **Confederal Secretary**

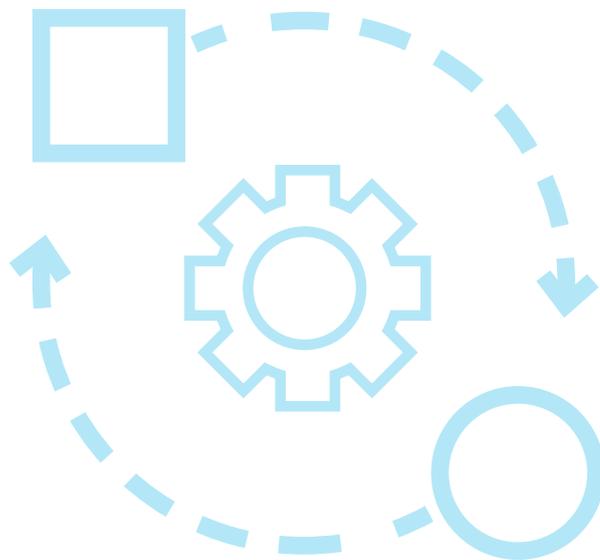
¹ Guidelines for a just transition towards environmentally sustainable economies and societies for all, 2015, https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_432859.pdf

What is adaptation to climate change?

Climate change adaptation means “anticipating the adverse effects of climate change and taking appropriate action to prevent or minimize the damage they can cause or taking advantage of opportunities that may arise”². The primary objective of adaptation is to reduce climate vulnerability of specific regions, economic sectors or populations. It has been shown that well planned, early adaptation action saves money and lives later. Adaptation measures can, for example, consist of investments in infrastructure to protect against natural disasters, the development of resource efficiency management systems, the strengthening of social protection systems or the adoption of adequate prevention measures (e.g. Investments in fire-fighting equipment).

Climate adaptation differs from climate change mitigation which aims to decrease the amount of emissions released into the atmosphere and reduce the current concentration of carbon dioxide (CO₂) by enhancing sinks (e.g. expanding forests to remove greater amounts of CO₂ from the atmosphere). Examples of mitigation measures are: increased use of renewable energy, application of new technologies such as electric cars or changes in practices or behaviors (driving less or changing one’s diet)³.

Mitigation deals with the causes of climate change; adaptation deals with the impacts of climate change.



² https://ec.europa.eu/clima/policies/adaptation_en

³ <https://unfccc.int/topics/mitigation/the-big-picture/introduction-to-mitigation>

Using scarce water resources more efficiently



Developing drought-tolerant crops



Households and businesses buying flood insurance



Choosing tree species and forestry practices less vulnerable to storms and fires



Investment in emergency & rescue services and other critical public services (training, recruitment, equipment)



CLIMATE CHANGE ADAPTATION

Anticipating the adverse effects of climate change and taking appropriate action to prevent or minimize the damage they can cause or taking advantage of opportunities that may arise

Investment in training and equipment in order to protect workers from the adverse effects of climate change and adapt their skills to the changing economic environment



Investment in infrastructure to protect against natural disasters, building flood defenses and raising the levels of dykes



Adapting building regulations to future climate conditions and extreme weather events



Strengthening social protection systems and adopting adequate prevention measures



Reducing energy demand by increasing energy efficiency



Phasing out coal power stations and developing renewable energy sources (wind energy, solar, etc.)



Decreasing industrial CO₂ emissions by developing new production technologies

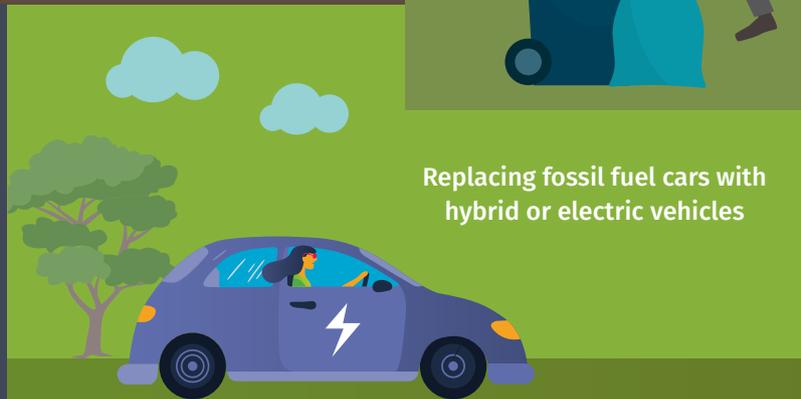


CLIMATE CHANGE MITIGATION

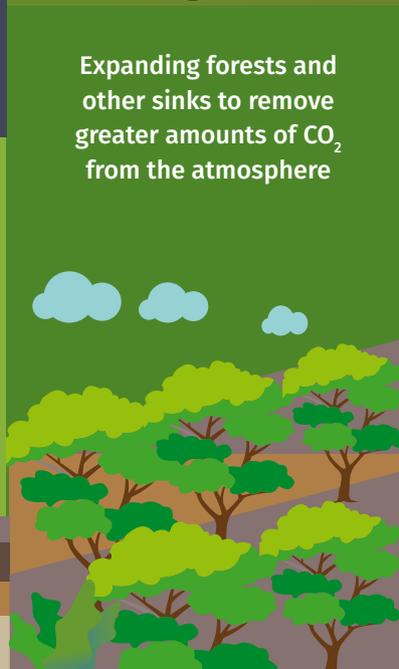


Decreasing the amount of emissions released

Replacing fossil fuel cars with hybrid or electric vehicles



Expanding forests and other sinks to remove greater amounts of CO₂ from the atmosphere



Increasing carbon sequestration in agricultural soils



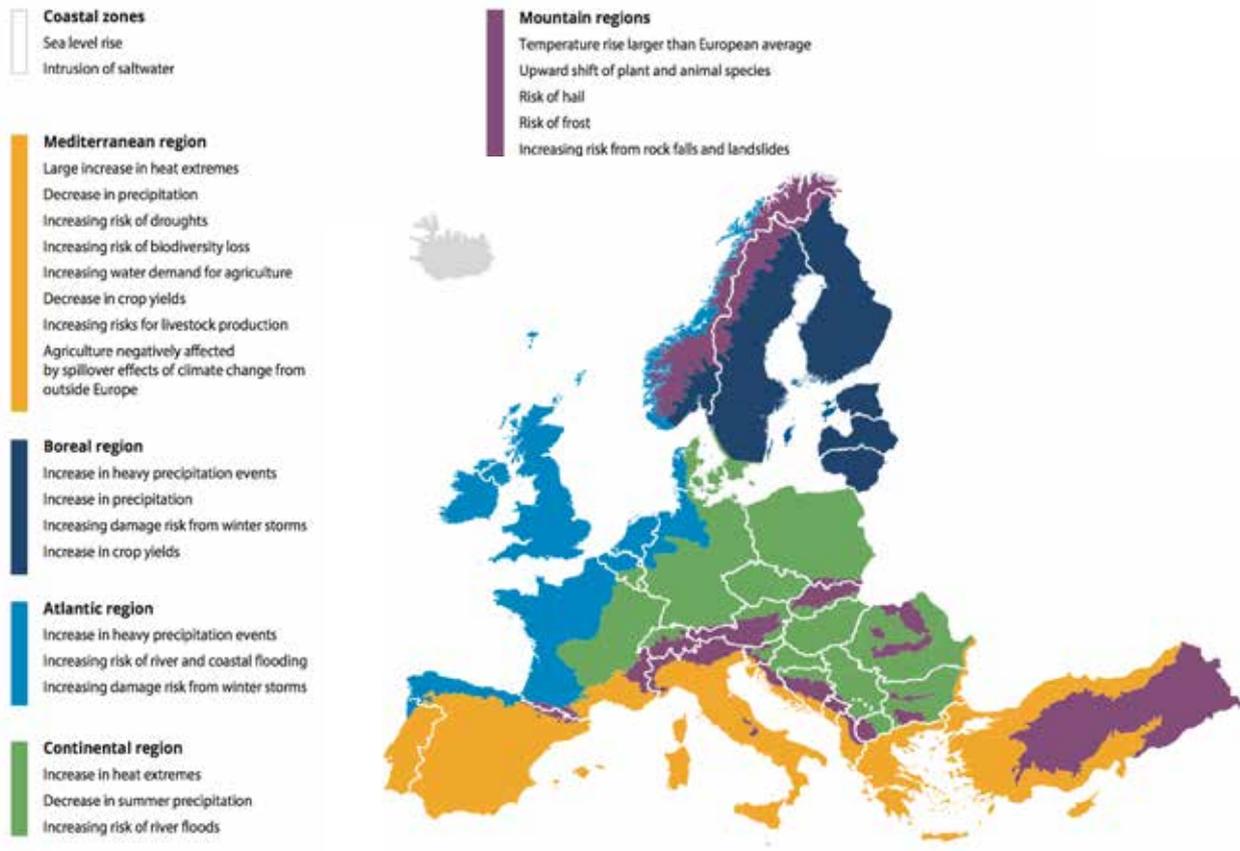
Switching to new modes of public transport and carpooling



Climate change impacts in Europe: Not a uniform situation

In the years to come, climate change should lead to additional increases in average temperatures, changes in precipitation levels as well as a large increase in the number of extreme weather events. Vulnerability is of course country-specific, and each Member State will experience different effects of climate change (Fig. 1). Countries in Southern Europe, and especially the Mediterranean area, will be more affected than those in the north. This said, and as demonstrated by the recent forest fires in Sweden, no European country is protected from the consequences of climate change.

Fig. 1 - Main climate change impacts in Europe by biogeographical region⁴



Source: Adapted from EEA (2017b)

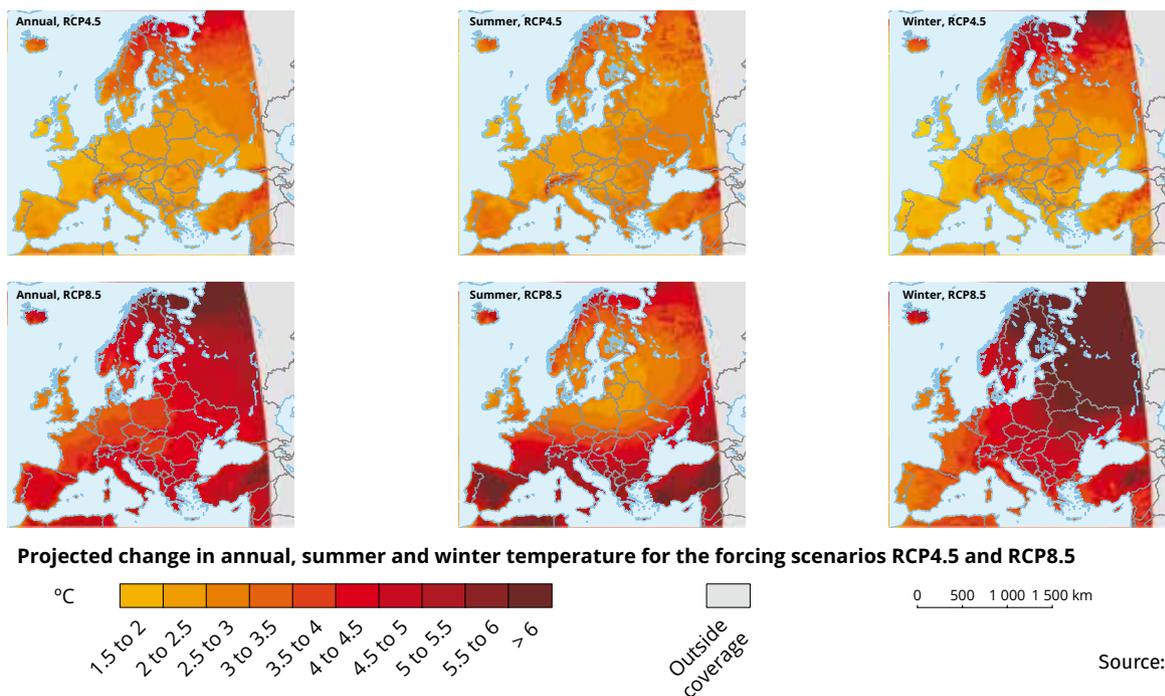
⁴ <https://www.eea.europa.eu/publications/cc-adaptation-agriculture>

2.1 Increased temperatures

The latest climate projections for Europe have confirmed that Europe is warming faster than the global average. According to EURO-CORDEX⁵, the continent is expected to experience more than 2°C of warming, even if the Paris Agreement targets are met. In the case of high warming scenarios, this increase could reach 4°C. However, in terms of temperatures, the consequences largely differ across European countries, showing important seasonal differences as well (Fig. 2). South-eastern and southern Europe are projected to be hotspot regions, having the highest

numbers of severely affected sectors and domains. At the same time, Northern and Central Europe should experience milder winters than in the past but limited average temperature rises in summer. These trends are exacerbated under higher warming scenarios. European cities are also exposed. Because of the Urban Heat Island effect (UHI)⁶, those tend to be hotter than their surrounding suburban and rural areas, and urban climates differ from rural ones. Global warming will intensify the UHI effects.

Fig. 2 - Projected changes in annual (left), summer (middle) and winter (right) near-surface air temperature (°C) in the period 2071-2100, compared with the baseline period 1971-2000 under a moderate (RCP 4.5) and a high warming scenario (RCP 8.5)



Source: EEA

⁵ EURO-CORDEX is the European branch of the international CORDEX initiative, which is a program sponsored by the World Climate Research Program (WRC) to organize an internationally coordinated framework to produce improved regional climate change projections for all land regions world-wide: <https://euro-cordex.net/>

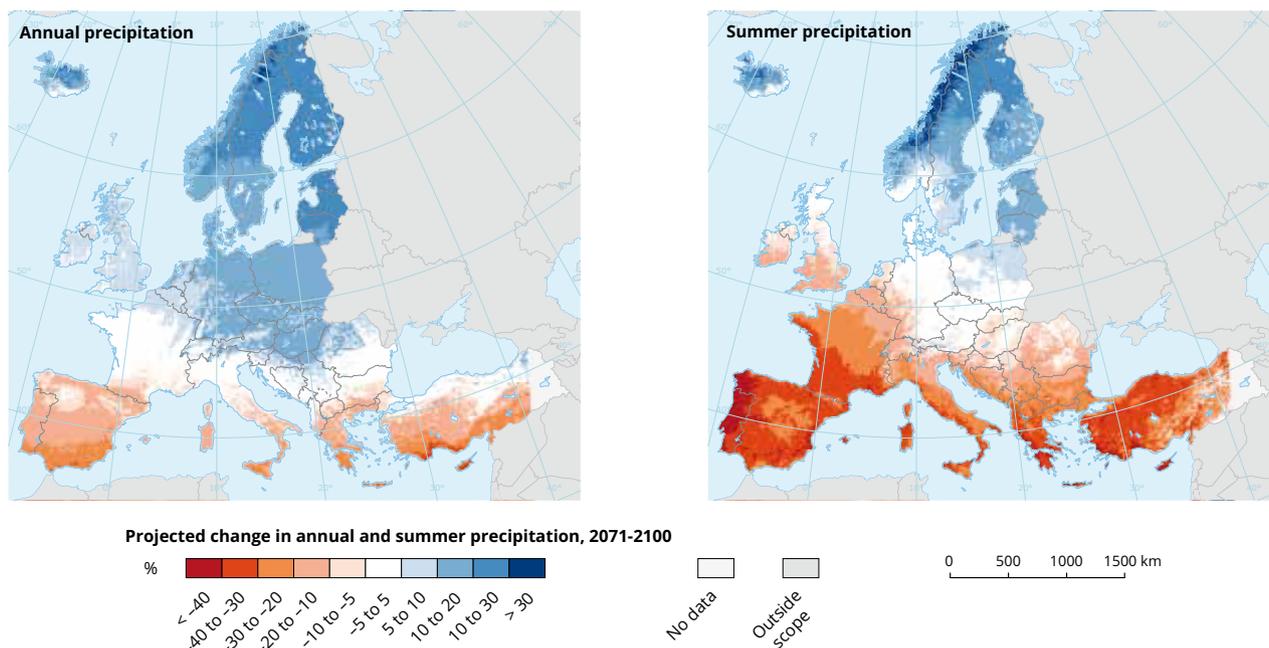
⁶ An urban heat island occurs when a city experiences much warmer temperatures than nearby rural areas. The difference in temperature between urban and less-developed rural areas has to do with how well the surfaces in each environment absorb and hold heat.

2.2 Changes in precipitation levels

Projected changes of daily precipitation in winter and summer present a similar trend. Winter precipitation is projected to increase over most of Central and Northern Europe. In summer, a general reduction in precipitation

is projected for all regions except Scandinavia and Eastern Europe. The southern regions of several Mediterranean countries see declines in precipitation in both seasons (Fig.3).

Fig. 3 - Projected changes in annual (left) and summer (right) precipitation (%) in the period 2071-2100 compared to the baseline period 1971-2000 under a high warming scenario



Source: EEA

2.3 Extreme weather events

Another consequence of global warming is that extreme climatic events, such as heat and cold waves, river and coastal floods, droughts and windstorms, are likely to become much more frequent. High overall temperatures, the increased number of extremely hot days, wind variability and low humidity will also lead to an increase in the number

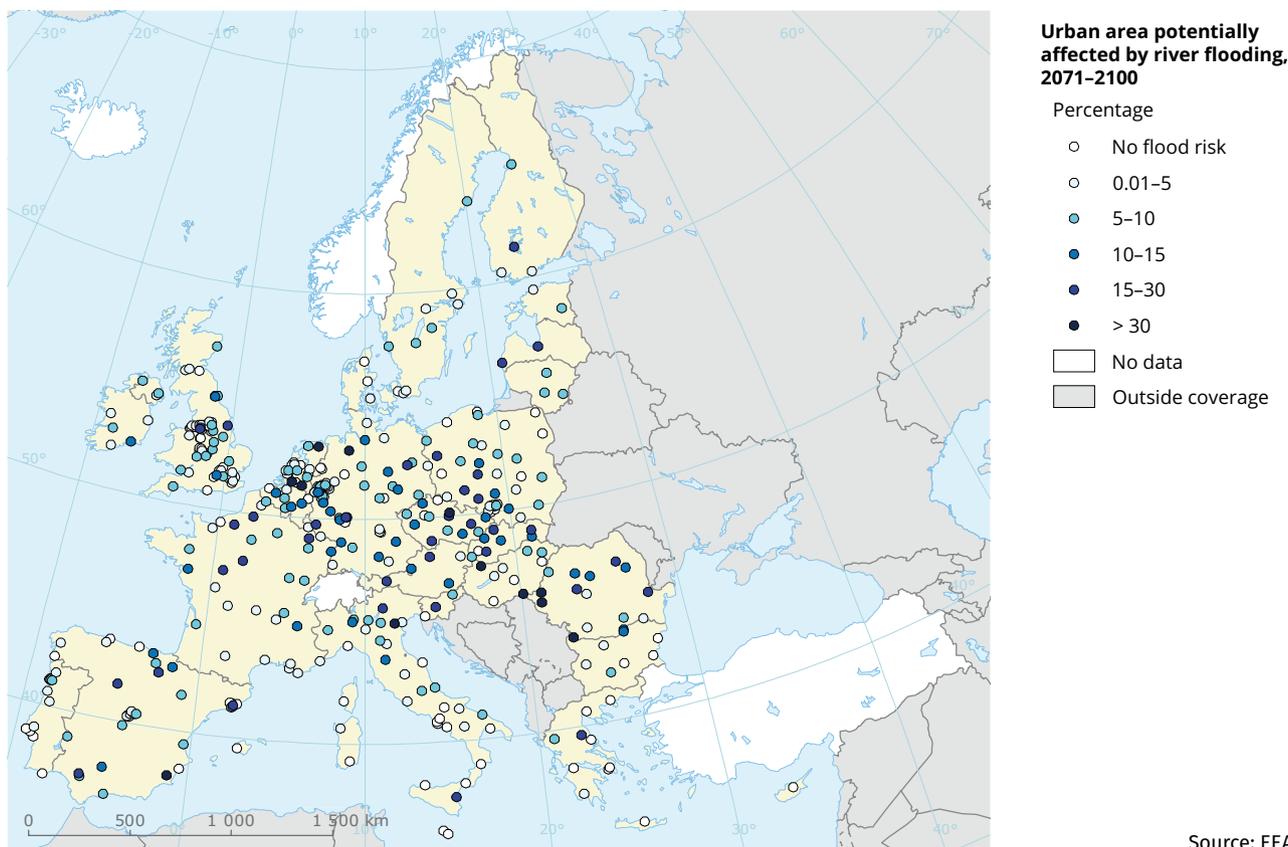
of fires, in particular forest fires and wild fires (grass and heathland fires, straw or stubble burning, etc.). At present, the most damaging climate hazards in Europe are mostly river floods (44%) and windstorms (27%). The situation is, however, expected to change in the years to come, with the proportions of drought and heatwaves greatly rising, to ac-

count for nearly 90% of climate hazard damage by the end of the century.

This increased frequency of natural disasters will affect all regions, even though, here again, certain regions are more exposed to certain types of natural hazards than others. Drought will primarily occur in southern countries. Similarly, river and coastal floods will remain the most critical hazard in regions that already regularly experience these kinds of events, such as Central and Eastern Europe. The increase in fire risk will be particularly important around the Mediterranean Basin, but not limited to it. The three most exposed countries are Spain, Portugal and Turkey.

According to the European Commission, the southern regions of Europe will bear the greatest cost of the consequences of climate change. However, the fires raging in Sweden last summer show that despite models and projections, no European country is immune. Coastal and mountain areas are particularly at risk. The JRC PESETA III research project has, for example, estimated that, by the end of the century, under a high warming scenario, about 200 airports (especially in the North Sea region) and 850 seaports of different sizes across the EU could face the risk of inundation due to higher sea levels and extreme weather events.

Fig. 4 - Urban areas at risk of river flooding, 2071 – 2100⁷



Source: EEA

⁷ <https://www.eea.europa.eu/data-and-maps/figures/share-of-the-citys-urban-1>

Climate change and associated extreme weather events are expected to seriously affect the European economy. In terms of employment, not adapting to global warming may lead to the permanent destruction of several hundreds of jobs. Many of these job losses will be linked to the reduction of labour productivity⁸. According to the ILO, the projected temperature increases will make heat stress more common, reducing the total number of work-hours in the G20 countries by 1.9 per cent by 2030. On the other hand, adaptation measures can lead to significant employment gains. Evidence suggests that in Europe at least 500 000 additional jobs will be directly or indirectly created by 2050 as a result of the increase in adaptation-related activities⁹.

3.1 Overall economic impacts

In 2012, the European Commission (EC) has estimated that the economic, environmental and social costs of not adapting to climate change could range from EUR 100 billion a year in 2020 to EUR 250 billion a year in 2050 for the EU as a whole¹⁰. Due to climate change alone, annual damage to Europe's critical infrastructure could, for instance, increase ten-fold by the end of the century, under business-as-usual scenarios, from the current EUR 3.4 billion to EUR 34 billion (Fig. 5)¹¹. The average annual cost of flood damage alone across the European Union (EU) could rise from EUR 4.5 billion to EUR 23 billion by 2050¹².

The latest EU Joint Research Centre (JRC) PESETA III report¹³, commissioned by the European Commission and published

in 2018, evaluates the total EU overall welfare loss under a high warming scenario at around 1.9% of GDP (EUR 240 billion) per year at the end of the century. According to the JRC, the main losses are associated with heat-related mortality, the remaining being, in order of importance, coastal flooding, decrease in labour productivity, agriculture and river floods. The report also points out that, through a transboundary effect (changes in trade flows due to climate impacts occurring in third countries), welfare losses in the EU could be enlarged by further 20%. On the other hand, small welfare gains could be achieved thanks to lower energy consumption.

⁸ According to the ILO, the increasing frequency and intensity of various environment-related hazards caused or exacerbated by human activity have already reduced labour productivity. Between 2000 and 2015, 23 million working-life years were lost annually at the global level as a result of such hazards.

⁹ ILO, The employment impact of climate change adaptation. Input Document for the G20 Climate Sustainability Working Group International Labour Office – Geneva, 2018

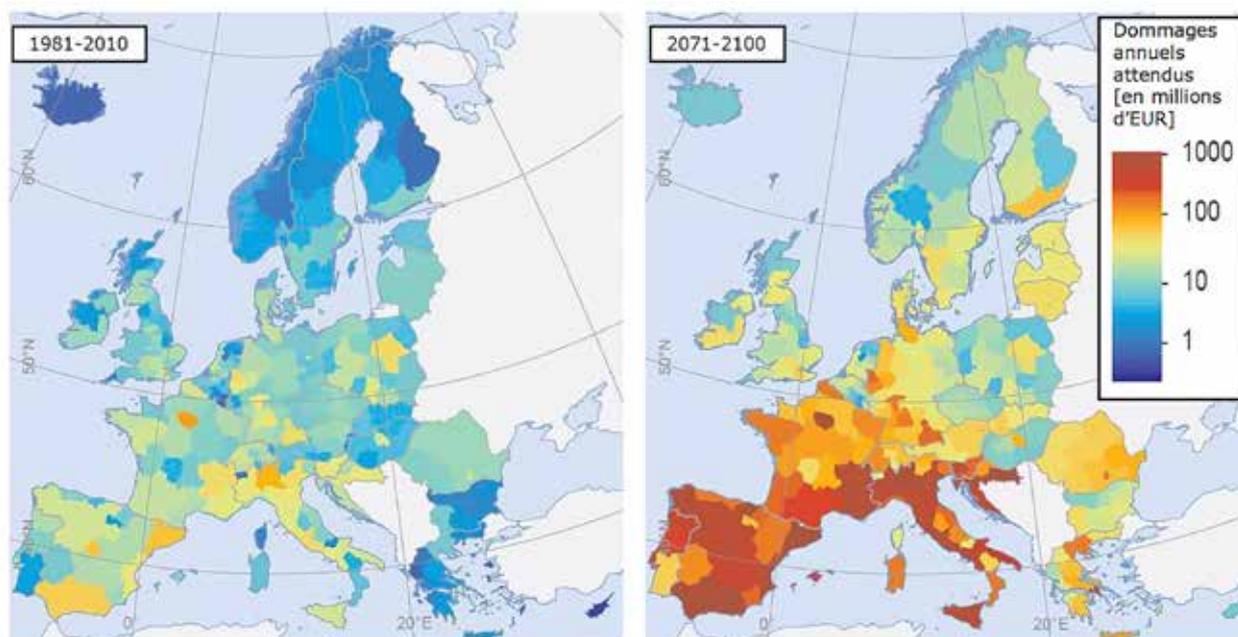
¹⁰ European Commission (2013), "An EU strategy on adaptation to climate change", COM (2013) 216 final, 16 April 2013– Geneva, 2018

¹¹ Forzieri et coll. (2018), «Escalating impacts of climate extremes on critical infrastructures in Europe», *Global Environmental Change*, vol. 48, pp 97–107, available at: <https://www.sciencedirect.com/science/article/pii/S0959378017304077>

¹² European Commission (2018), Report to the European Parliament and the Council on the implementation of the EU Strategy on adaptation to climate change, COM/2018/738 final, 12 November 2018

¹³ Ciscar J.C., Feyen L., Ibarreta D., Soria A. (2018), Climate impacts in Europe, Final report of the JRC PESETA III project, <https://ec.europa.eu/jrc/en/news/climate-change-human-and-economic-outlook-europeans>

Fig. 5 - Expected annual damages (EAD) of overall natural hazards linked to climate change on critical infrastructure in Europe¹⁴



Source: Global Environmental Change

3.2 Potential impacts of climate change on EU employment

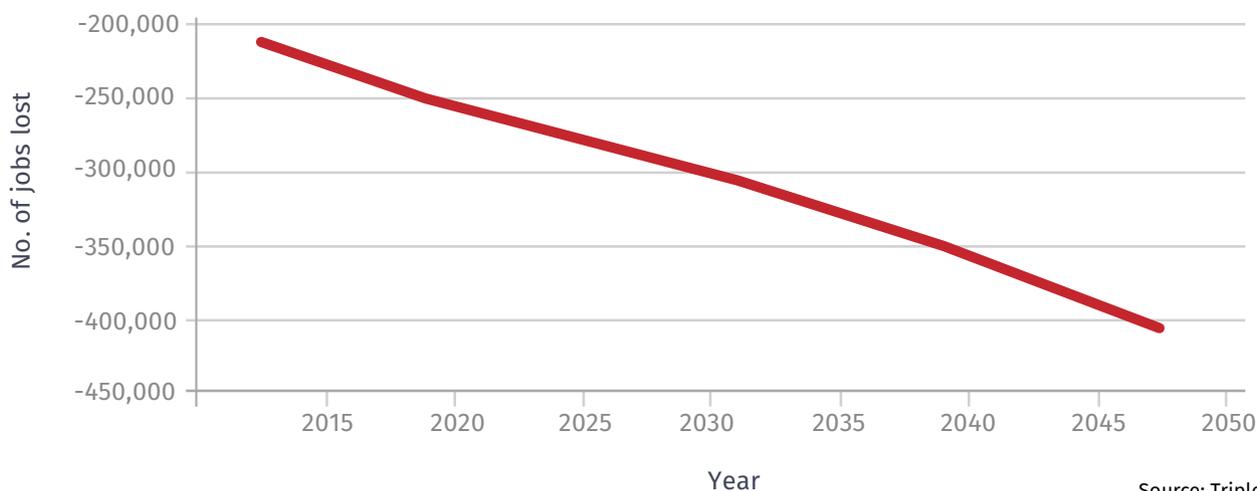
Few studies and research have for the moment been undertaken in relation to the impacts of climate change on employment in the EU. In 2014, Triple E Consulting estimated 240 000 potential job losses by 2020 and 410 000 by 2050 if no adaptation measures are taken¹⁵. These job losses (Fig. 6) are associated with the negative consequences of cli-

mate change on the most impacted economic sectors and their spill-over effects on the whole economy. They are also linked to an overall decrease in labour productivity due to the increase of natural hazards such as heat-waves or droughts.

¹⁴ This analysis focuses on seven climate hazards, namely heat and cold waves, river and coastal floods, droughts, wildfires, and windstorms. 'Critical infrastructures' refers to the array of physical assets, functions, and systems that are vital to ensuring the European Union's health, wealth, and security. According to this definition, they include existing transport systems, renewable and non-renewable energy generation plants, industry, water supply networks, education and health infrastructures.

¹⁵ Triple E consulting (2014), Assessing the implications of climate change adaptation on employment in the EU, available at: <https://climate-adapt.eea.europa.eu/metadata/publications/assessing-the-implications-of-climate-change-adaptation-on-employment-in-the-eu-1>

Fig. 6 - Total number of jobs lost in the EU during 2015 – 2050 due to climate change



Source: Triple E

Triple E estimates that the highest job losses should occur in Bulgaria, Croatia, Cyprus, Estonia, Greece, Latvia, Lithuania and Romania. This is explained by the fact that these countries have a large agricultural sector and most of them also have a well-developed touristic sector. Belgium, Ireland, France and Luxemburg have much lower negative climate change effects and hence a lower number of lost jobs compared to the rest of Europe. In Scandinavia and Great Britain, a positive effect of climate change on employment is expected due to warmer seasons, especially in sectors such as agriculture, forestry and tourism.

Regarding the sectoral impact, the report concludes that the highest number of job losses will occur in manufacturing and public utilities, retail and leisure (around 100 000 job losses for both sectors by 2050), business services (IT, legal services, facility management, etc.¹⁶) and public services (up to 90 000 jobs lost for both). These results

may seem surprising as these sectors are not all identified as suffering the most from climate change. This is due to the fact that “the negative effects of climate change on the primary industries will lead to strong negative spillover-effects on other sectors via down-stream inter-sectoral linkages ; for example, negative impacts of climate change on the forestry sector lead to relatively small number of directly lost jobs due to low labour intensity of the forestry sector. However, the reduction in production of wood has wider economic effects on in particular wood products manufacture sector, publishing and media sector, pulp and paper producing sector as well as reprocessing of wood products sector”¹⁷. Similarly, the retail and leisure industry will be impacted because of its strong links with the touristic sector. The transport sector may also suffer important job losses because of its up-stream and down-stream links with other sectors of the economy.

¹⁶ https://ec.europa.eu/growth/single-market/services/business-services_en

¹⁷ Triple E consulting (2014), Assessing the implications of climate change adaptation on employment in the EU, available at: <https://climate-adapt.eea.europa.eu/metadata/publications/assessing-the-implications-of-climate-change-adaptation-on-employment-in-the-eu-1>

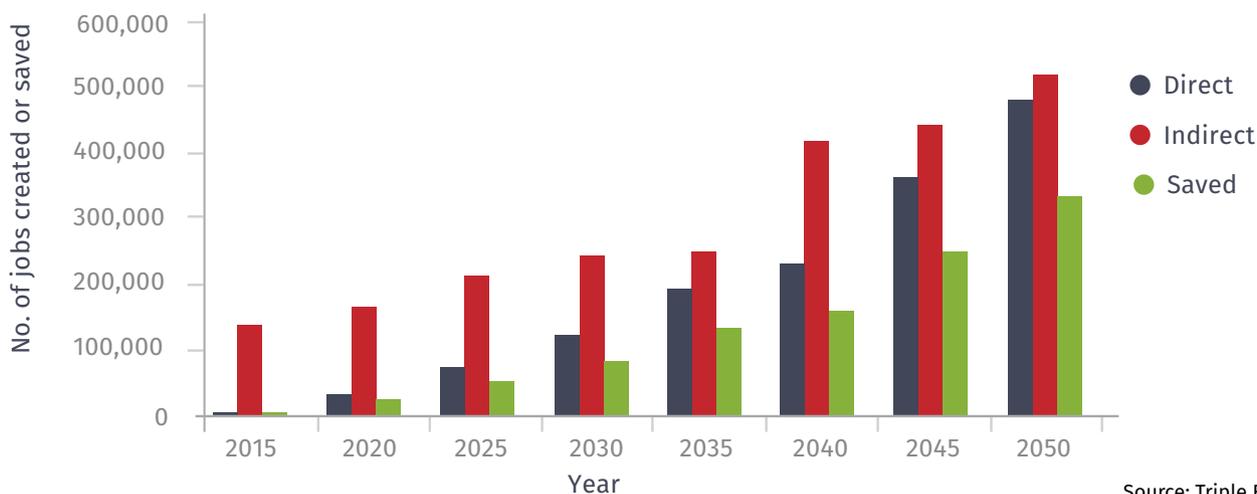
3.3 The benefits of adaptation policies

Adaptation policies reduce the climate vulnerability of specific regions, economic sectors and populations. These policies can also help take advantage of beneficial opportunities that may arise from the changing meteorological conditions. The benefits of adaptation policies clearly outweigh their costs. Between 1980 and 2011, floods in Europe killed more than 2 500 people, affected more than 5.5 million and caused direct economic losses of more than EUR 90 billion. The minimum cost of not adapting to climate change is estimated at EUR 100 billion a year in 2020 and EUR 250 billion in 2050 for the whole EU¹⁸.

Adaptation has positive effects on the economy but also on employment. Indeed, it contributes to preserving existing jobs by maintaining the viability and resilience of existing businesses. Furthermore, many adaptation measures will require substantial investments which can, in turn, stim-

ulate a demand for labour. These investments can also stimulate the demand for new types of goods and services and thus create new market opportunities and increase innovation. The Triple E study has assessed the impact of the implementation of the adaptation measures at EU and national level on employment, in both a reference (average annual spending on adaptation measures for EU countries equivalent to 0.5% of GDP) and an ambitious scenario (1% of GDP). According to the study, such implementation could lead to the creation of 500 000 (reference scenario) to one million direct and indirect jobs (ambitious scenario) by 2050. Adaptation measures could also help to preserve from 136 000 to 300 000 jobs during the same period. In both scenarios, it is estimated that most jobs would be created in the business and public services sector and the construction sector.

Fig. 7 - Direct and indirect jobs created and saved – Ambitious scenario



Source: Triple E

¹⁸ https://ec.europa.eu/commission/presscorner/detail/en/IP_13_329

Consequences of climate change on workers' health and working conditions

Climate change has already had and will continue to have detrimental effects on human health, safety at work and on working conditions. Immediate action must be taken in order to avoid these negative and dangerous impacts as much as possible and to protect workers inside and outside their workplaces.

4.1 Impact of climate change on human health

Climate change can have severe impacts on our health. Its impact on our health is often described as either primary, secondary or tertiary, depending on the causal pathway through which it occurs¹⁹.

Primary effects



are related to direct exposure to excessive heat or the physical hazards of extreme weather (like physical injuries during storms or floods).

- ▶ In very hot conditions the body's blood temperature rises. Heat-induced occupational illnesses and injuries occur in situations in which the total heat load exceeds the capacities of the body to maintain normal bodily functions without excessive strain.
- ▶ Acute health effects of exposure to heat stress include heat exhaustion, heat rash (prickly heat), heat fatigue and heat syncope/fainting. If one's body temperature rises above 39°C, there is a risk of heat stroke or collapse.
- ▶ Exposure to heat can also lead to complications of many chronic diseases, including chronic obstructive pulmonary disease, coronary artery disease, diabetes mellitus, and chronic kidney disease.
- ▶ High temperatures and humidity are also said to affect the body's physiological responses to environmental toxicants. As for example, warm wet skin promotes the absorption of chemicals.

¹⁹ S. Sweeney, J. Treat (2019), Nurses' Unions, Climate Change and Health: A Global Agenda for Action, available at: <http://unionsforenergydemocracy.org/tued-bulletin-90/>

Secondary effects



are those resulting from disruptions of surrounding ecosystems, which, in turn, can lead to a modification of biological risks, such as the development of infectious, immuno-allergic and toxic diseases.

- ▶ Climate change is, for instance, broadening the range of disease vectors (such as ticks and mosquitoes) and favoring the development of pathogens outside of areas usually recognized as contaminated.
- ▶ It is also said to increase pollen production and pollen seasons, thus leading to increases in allergic disorders among workers and others.

Tertiary effects



are those resulting from the disruption of social, political, and economic systems, producing dislocation or even violence.

Additional health impacts



Furthermore, there are also additional health impacts that are not necessarily the result of climate change, but that are closely associated with the physical and chemical processes of our fossil fuel-driven economy. These include greater health risks from higher air pollution levels (from burning of fossil fuels in many cases) as well as increased exposure to UV radiation as a result of the depletion of the ozone layer.

Although it is very difficult to assess how many climate-related deaths have already occurred, the health impact of global warming is already visible in Europe. The 2003 heat wave is said to have killed 70 000 across the EU and 20 000 in France alone. This trend should continue in the future. According to the 2019 report of The Lancet Countdown on health and climate change²⁰, unless warming is slowed down urgently and appropriate action is taken, about 350

million Europeans could be annually exposed to adverse climatic extremes by the end of the century (compared to 25 million in the early years of the 2000s). Under a 3°C scenario, the lethality of weather-related disasters in Europe could be multiplied by 50, from an average of 3 000 annual deaths between the years 1981 and 2010, up to 152 000 deaths at the end of the century.

²⁰ [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)32596-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)32596-6/fulltext)

4.2 The impact on working conditions

These risks will of course also impact working conditions. Ordinarily people work best at a temperature between 16°C and 24°C, depending on the kind of work being done. In addition to the above-mentioned health effects, higher temperatures decrease worker productivity and increase the risk of fatigue, which can lead to a potential “decline in vigilance”. This, in turn, can result in increasing the frequency of several types of work accidents, such as: risks of tripping, bumping or other disruption of movement, falling from height; risks related to falling objects, mechanical handling, road risks on mission; risks related to the internal circulation of vehicles, handling chemicals or dealing with electricity, etc. These risks can be increased by external or work-related factors: high humidity, low air convection, wearing protective clothing impeding the evaporation of sweat, etc. Inadequate organisation of work may also aggravate the situation: maintaining working hours during

the hottest hours of the day, inadequate break conditions, working with hot surfaces, etc.

Heat stress or extreme weather events will primarily affect outdoor workers and especially those whose activity is physically demanding. Agriculture and construction are sectors considered particularly at risk. Several categories of workers who work indoors may also be impacted, especially those who work in warm spaces that are not air-conditioned. Experience shows that even office workers can be impacted if the building is lacking in proper isolation or a cooling/ventilation system. Possible preventive measures include changing working hours, in-work organisation, investment in proper equipment and access to water. It's important to note, however, that some of these measures may introduce new hazards.



Climate change is already impacting workers and their working conditions in a wide variety of sectors

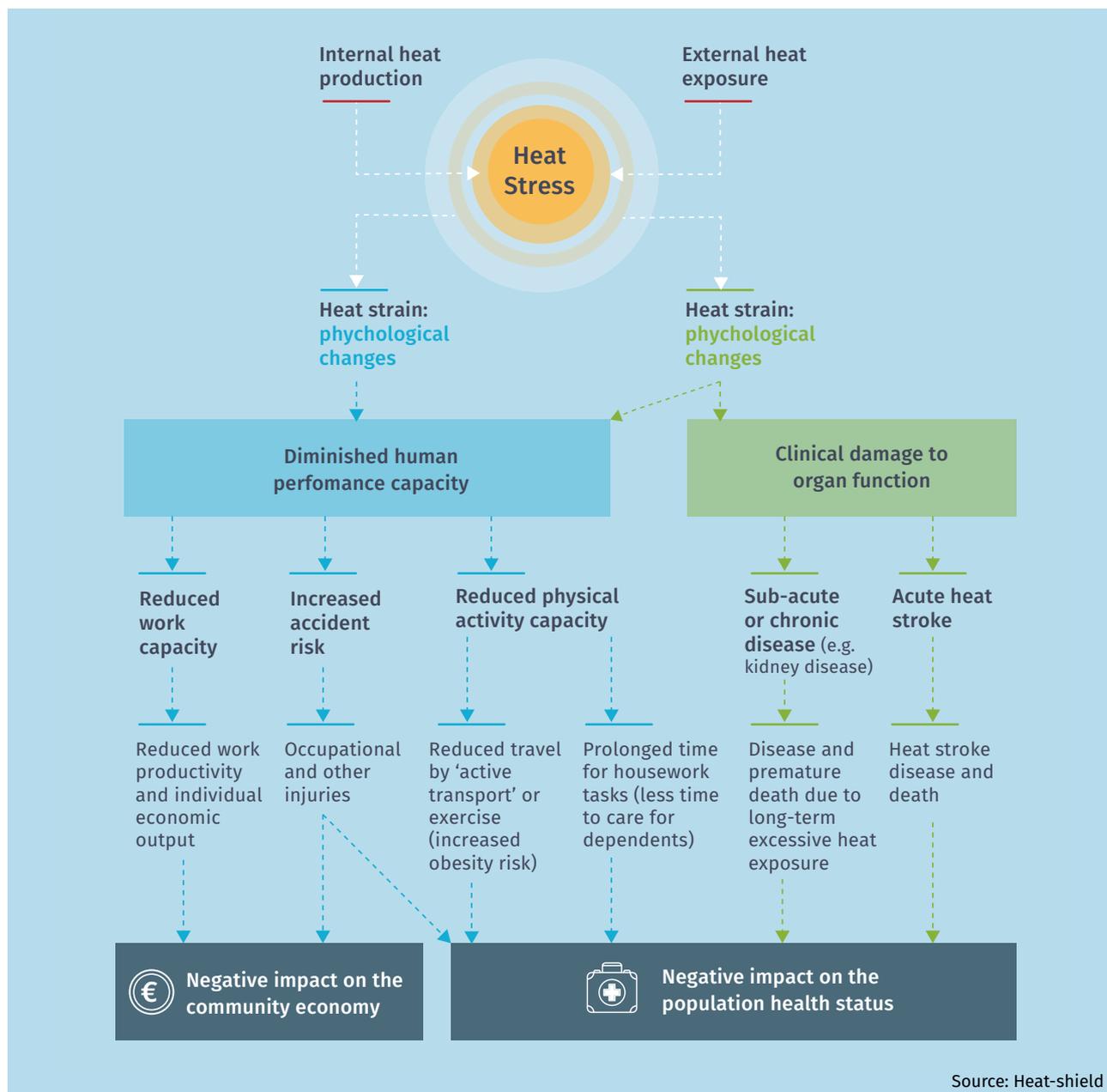
“We can take the example of those who work in high temperatures on construction sites at road works stretching the asphalt, the masons when they isolate a roof, when they make a concrete casting, or mount a scaffolding. Among the sectors exposed to heat stress, in addition to agriculture, there is also transport. Here, the risk factors, more than the organisation of work, are linked to the obsolescence of cars and brakes. Buses and metro often lack air conditioning even with the windows locked. The working conditions of drivers are heavily affected, as are those of travelers who move in these temperatures. Furthermore, conducting a train while enduring heat stress puts the safety of passengers at risk: the thresholds for attention and concentration of drivers in these conditions are put to the test”.



ITALY

Extract from Italian trade unions' (CGIL, CISL, UIL) answer to the ETUC questionnaire.

Fig. 8 - Framework of causal pathways for direct heat effects on working people²¹



²¹ Source: Heat-shield

Climate change and other forms of environmental degradation have already caused net negative impacts on jobs and work productivity, and these impacts are expected to become more pronounced in the coming decades. Although the whole European economy is concerned, some economic sectors are considered to be particularly at risk. This is especially an issue in sectors which are heavily dependent on natural resources, such as **agriculture** and **forestry**, but not limited to them. Rising sea levels, ocean acidification and changing ocean temperatures will limit biodiversity and alter the distribution and productivity of

fisheries. Natural disasters will likely disrupt sectors such as **energy and water providers, construction, transport and tourism**, destroy critical infrastructure and take lives, putting additional pressure on **emergency and rescue services, the health care sector** and other **public services**. The probability of most types of extreme events is expected to change significantly, which can in turn affect **banking and insurance** companies. Last but not least, the **manufacturing sector** and the **industry** are also exposed, mainly through spill-over effects coming from the most affected sectors.







Agriculture

Agricultural land accounts for 40% of total EU land. Agriculture and food-related industries and services provide over 44 million jobs in the EU, and 22 million people are directly employed in the sector itself, which accounts for 9.2% of total EU employment.

! The sector is highly sensitive to climate²²



Long-term weather trends, in terms of rainfall and temperature, have an impact on the productivity and spatial distribution of crops. The sector is also particularly sensitive to the occurrence of droughts, floods, heat waves, frosts and other extreme events.



Climate change has already been recognized as one of the factors contributing to recent stagnation in wheat yields in parts of Europe. The variability of crop yields has also greatly increased over the last decades mainly as a consequence of extreme climatic events. This trend should continue and even increase in the future, leading to high volatility of prices.



Dryer conditions and rising temperatures are also expected to affect livestock activities in different ways, including implications for animal health and welfare and impacts on grassland productivity.

! Studies indicate strong regional divergences in the spatial distribution of climate impacts²³



In Northern areas climate change may create opportunities for agriculture through the introduction of new crop varieties, higher yields and the expansion of suitable areas for crop cultivation, due to the expected increase in the duration of the thermal growing season, decreasing cold spells and extended periods without frost. Northern areas can also expect negative impacts such as increase in the number of pest infestations and diseases, nutrient leaching, and reduced soil organic matter. The projected increase in rainfall in Northern Europe may pose challenges for grazing livestock and harvesting grass, owing to the accessibility of land and the declining soil fertility due to soil compaction.

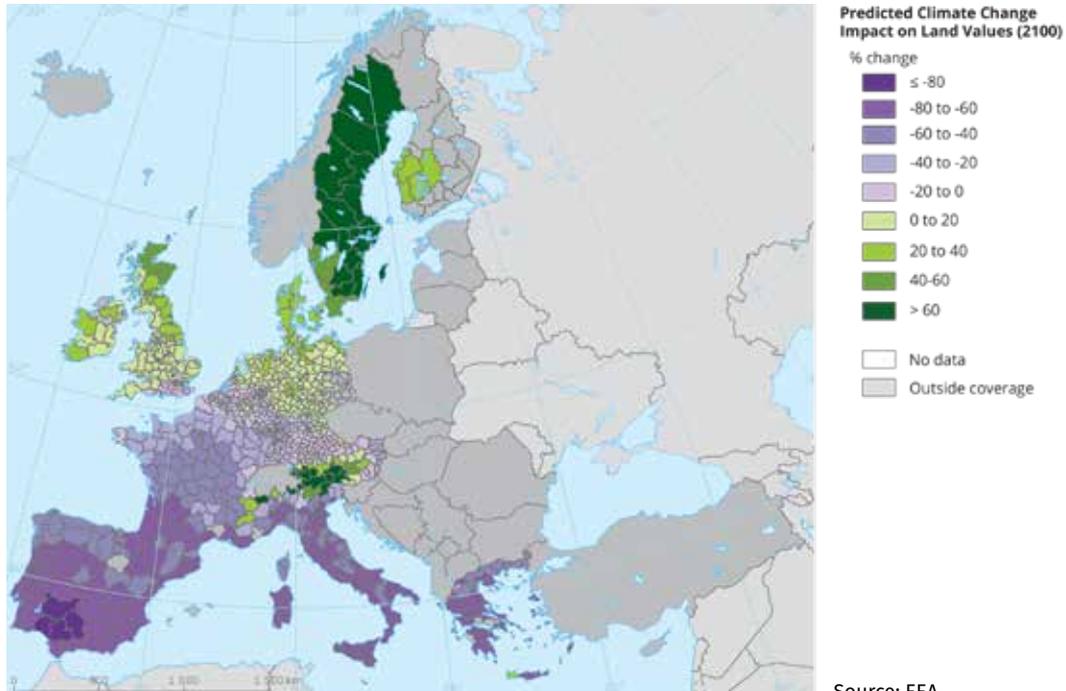


In Southern areas the disadvantages are likely to be predominant. The overall expected reduction in precipitation might lead to water scarcity. Combined with extreme heat events, this may negatively affect crop productivity, lead to higher yield variability and, in the long term, drive a change in the range of current cropping possibilities.

²² EEA (2019), Climate change adaptation in the agriculture sector in Europe, available at: <https://www.eea.europa.eu/publications/cc-adaptation-agriculture>

²³ European Commission Joint Research Center (2018), Climate impacts in Europe, Final report of the JRC PESETA III project, available at: <https://ec.europa.eu/jrc/en/news/climate-change-human-and-economic-outlook-europeans>

Fig. 9 - Percentage change in farmland values projected for the period 2071-2100 compared to 1961-1990



Source: EEA

Workers from the sector are particularly exposed. Many of them work outside and therefore may suffer from heat stress, dryness, UV radiation or biological hazards (new viruses, bacteria or pathogens). Numerous examples of workers obliged to work at night during the summer period

have already been identified. Extreme weather events, through the damages they cause, may also lead to permanent job reduction, especially in small rural communities where economic activity is based on traditional production.



LITHUANIA

“Agricultural workers often have to stick to a strict schedule (due to the seasonality of crops’ growth) and sometimes cannot delay the performance of their tasks, even if the temperature becomes unbearable. This situation can lead to very high risks for workers’ health, for example during the spray of chemicals which necessitates wearing special protective suits“.

Extract from Lithuanian trade union LPSK’s answer to the ETUC questionnaire.

Forestry

In the EU-28 about 548 870 persons worked in the forestry and logging sector in 2017²⁴. The sector accounts for 0.23% of total EU employment. In the European fisheries and aquaculture sector, over 181 000 people are directly employed²⁵. According to Europêche, EU's blue economy represents 5.4 million jobs in total and generates almost EUR 500 billion a year²⁶.

Forests and the way they are managed are particularly sensitive to climate change because the long lifespan of trees does not allow for a rapid adaptation to environmental changes.



! The sector might be impacted in different ways



The main impact of climate change on European forests is of course linked to forest fires. Studies on this issue project an increase in frequency and extent, especially in Southern Europe. Fires currently affect more than half a million hectares of forest each year, with estimated economic damages of EUR 1.5 billion annually. According to the JRC PESETA III report²⁷, areas burned in Europe could increase by 200% by the 2080s due to climate change. Spain, Portugal, Greece, Italy and Mediterranean France are particularly at risk.



Storm damage (blowdowns) may increase in severity and frequency with increased storminess, impacting the productivity of the forest industry and the price of wood.



Changes in the patterns of infection by forest pests (insects, pathogens and other pests) are expected under a changing climate as a result of warmer temperatures, changes in precipitation, increased drought frequency and higher carbon dioxide concentrations.



Forest growth is projected to decrease in southern countries and to increase in Northern Europe. Forest biodiversity is also expected to transform across Europe, with changing tree species and increasing threats for specialized plant communities. On the other hand, biomass productivity is expected to increase in Central and Northern Europe.

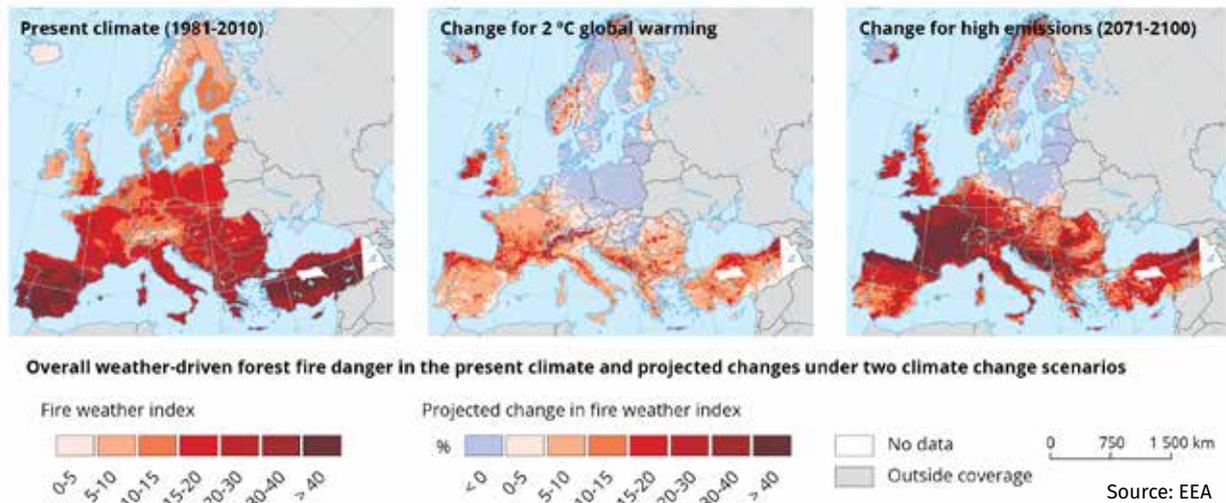
²⁴ The largest workforce was recorded in Poland, with 52 700 persons, in Germany (48 000), Romania (47 800), Sweden (41 000) and Italy (39 800). Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Forests,_forestry_and_logging#Forests_and_other_wooded_land

²⁵ Source: Eurostat

²⁶ <http://europeche.chil.me/about-us>

²⁷ ibid

Fig. 10 - Overall weather-driven forest fire dangers in the present and projected changes under two climate change scenarios



Fisheries

In the fisheries sector, global warming can lead to a displacement of fish stocks, regional declines in some species, but also to an increase of population of some which can create environmental stress (reduced oxygen concentration and ocean acidification, etc.).



Climate impacts sustainability of fisheries and aquaculture, the livelihoods of the communities that depend on fisheries, and the ability of oceans to capture and store carbon.



The effect of sea level rise means that coastal fishing communities are in the front line of climate change, while changing rainfall patterns and water use impacts inland (freshwater) fisheries and aquaculture.

The situation is critical as the sector is already confronted with several other challenges such as sustainability, protecting the marine environment and a decline in the number of vessels.

Travel and tourism



With EUR 782 billion of turnover in 2018, travel and tourism are major sectors of the European economy. According to Eurostat, economic activities related to tourism employ over 13 million people in the European Union, accounting for 9% of people employed in the total non-financial business economy. The impact of climate change on tourism is a highly sensitive issue. Indeed, for some countries, especially in Southern Europe, the sector represents a lion's share of GDP and youth employment. In Greece for instance, tourism represents nearly one in four people employed (23.9%)²⁹. The sector is furthermore characterized by low wages as well as low levels of social dialogue and collective bargaining.

! Many tourism activities are directly related to climate and will likely be impacted by climate disruptions



Due to higher temperatures, the suitability of southern Europe for tourism is projected to decline during the key summer months but improve in other seasons³⁰. Countries from this region will be more and more in competition with regions with a milder climate, such as Central Europe and Scandinavia. Heat waves and high temperatures can also have a negative impact on urban tourist centers, as well as extreme weather events on sunny destinations.



Sea level rise and erosion threaten tourism infrastructures, such as holiday resorts in coastal areas. Water scarcity could become an issue in some tourist destinations, so much that their economic viability could be threatened. In general, climate change is very likely to exacerbate conflicts with other users over resources, principally water and land.



Nautical tourism on the seaside, lakes and rivers could be impacted by surface water scarcity and health problems related to rising temperatures (such as the development of cyanobacteria making the waters unfit for swimming).



Cultural and nature-based heritage sites are also increasingly threatened by climate change³¹.

²⁹ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_industries_-_employment&oldid=475662

³⁰ For a graphical overview, see for instance fig. 2 on projected changes in near-surface air temperature and fig. 3 on projected changes in precipitation levels.

³¹ European Commission (2013), Commission staff working document - Impact Assessment - Part 2 -Accompanying the document « An EU Strategy on adaptation to climate change», SWD (2013) 132 final, 16 April 2013



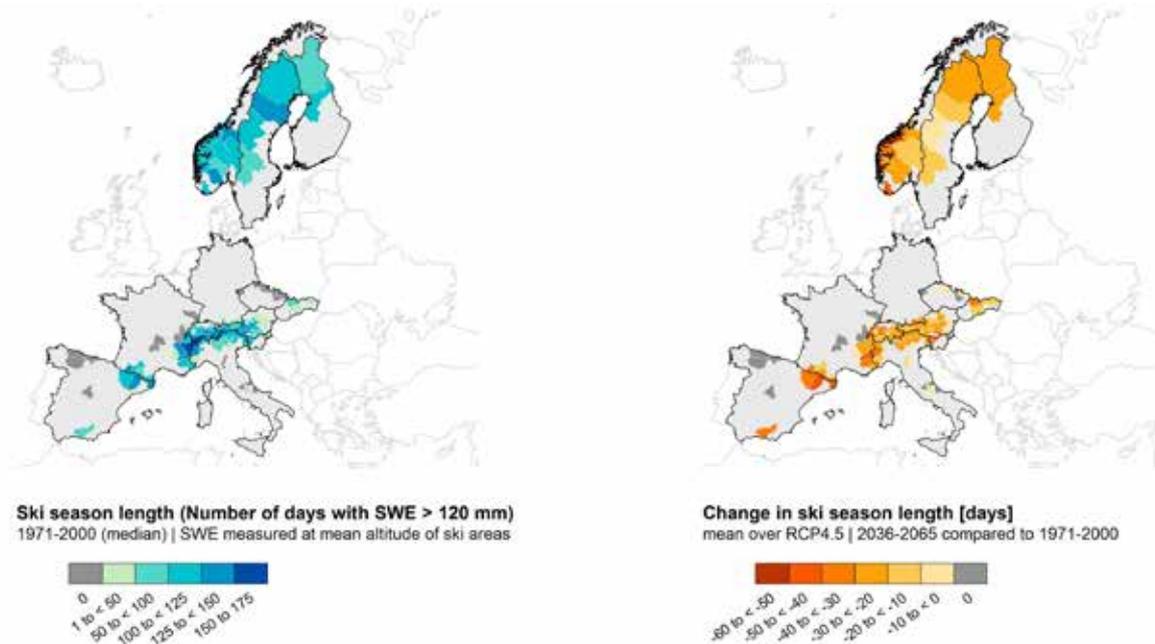
The change in snow conditions will affect winter tourism. Not only will the snow cover be thinner in the future, but also the ski season will be shortened (Fig. 11).

- There is already a redistribution effect from little resorts at medium altitude to higher resorts, like glacier resorts. The adverse effect on employment of such redistribution demand could be worsened by the fact that ski resorts are principally located in rural areas where alternative employment is scarce. In France and Switzerland, many banks have already declared they would not finance investments in ski resorts located below a certain altitude.
- According to a study on the impact of global warming on winter tourism demand in Europe, under 2°C warming, the weather-induced risk of losses in winter overnight stays related to skiing tourism in Europe amounts to up to 10.1 million nights per winter season³².



On the other hand, public awareness about climate change may trigger higher demand for eco-tourism, with its corresponding positive effect in terms of employment in the branch.

Fig. 11 - Globally reaching +2°C in 2036 – 2065 (RCP4.5) decreases the European ski season length (based on natural snow conditions) on average by 19 days³³



³² <https://www.sciencedirect.com/science/article/pii/S2405880715300297#f0010>

³³ Ibid.

Transport

In 2017, the transportation and storage services sector employed 10.1 million persons and recorded a value added of EUR 479 billion, which represented 8.1% of those working in the non-financial business economy and 7.7% of the wealth generated³⁴. The risks of climate change for the transport sector primarily arise from extreme events, such as flooding, heat waves, droughts and storms, especially where these exceed the design range. Some beneficial effects can also occur, through, for example, reduced snow falls for most European regions improving traffic conditions.



Extreme weather events can cause accidents and damages to infrastructure, especially in the case of road and freight transport, which in turn can beget important economic losses.



Wider indirect impacts are also expected, through travel time extension or disruptions affecting the supply of goods and services, which can be significant for major events. In 2014, the PESETA II study considered impacts on the road and rail network in Europe, estimating the total damages to transport infrastructure due to extreme precipitation at EUR 930 million/year by the end of the century under a high warming scenario (around a 50% increase from the current baseline damage of EUR 629 million/year) and EUR 770 million/year under a 2°C scenario³⁵.



Droughts can severely disrupt inland navigation services by reducing water levels to the point where navigation is impossible, or to a point where water vessels have to carry a reduced load. The situation will, however, vary from region to region. Thanks to forecasted higher precipitation levels, fewer low flow events are, for example, expected on the Rhine and the Danube, allowing the inland waterways network to function with less disruptions.



Airports and seaports may also be vulnerable. As already mentioned, the JRC PESETA III report has for instance estimated that, by the end of the century, under a high warming scenario, about 200 airports (especially in the North Sea region) and 850 seaports of different sizes across the EU could face the risk of inundation due to higher sea levels and extreme weather events (Fig. 12)³⁶.

³⁴ https://ec.europa.eu/eurostat/statistics-explained/index.php/Transportation_and_storage_statistics_-_NACE_Rev._2

³⁵ <https://ec.europa.eu/jrc/en/peseta-ii>

³⁶ European Commission Joint Research Center [2018], loc. Cit.

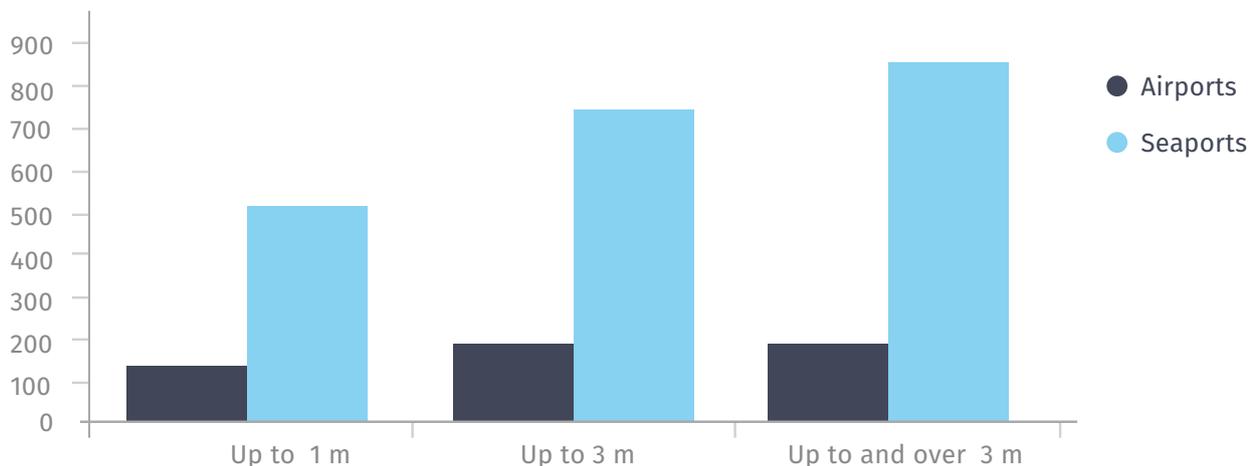


Extreme weather conditions have a direct impact on the conditions in which bus, coach and truck drivers live and work

“In many EU Member States, buses, coaches and trucks are not provided with air conditioning, which impacts the driver’s well-being and their capacity to manage complex situations entailed by traffic conditions, being in charge of passengers or tourists, etc. Additionally, spending the daily rest and even week-end rest in vehicles is a common practice, particularly in road freight transport. Thousands of truck drivers live and work for months in their trucks. Extreme weather conditions have a direct impact on the quality of their rest and quality of life. Although trucks may be provided with air-conditioning installations, keeping it on for long periods when the vehicle is stationary would lead to higher fuel consumption and drivers are often penalised when using too much fuel. For bus and coach drivers, particularly those working on domestic, short-haul trips, one of the main issues is the long waiting time in between two journeys, which is spent by the driver either in the vehicle or at the company base, depot, terminals etc. which are rarely heated or equipped with air-conditioning installations. Investing in adequate resting and waiting areas will certainly contribute to increasing the attractiveness of the sector”.

Extract from the European Transport Federation’s answer to the ETUC questionnaire

Fig. 12 - Number of airports and seaports at risk by the end of the century to different levels of coastal flood, under a high warming scenario³⁷



Source: European Commission Joint Research Center

³⁷ Source: European Commission Joint Research Center



Infrastructure and construction

In 2018, the construction sector in Europe employed 15 339 000 persons and accounted for 6.2% of total employment and 9% of the EU's GDP³⁸. The impacts of climate change are particularly pertinent to infrastructure and buildings given their long-life span and their high initial cost, as well as their essential role in the functioning of our societies and economies.



Buildings and infrastructure can be vulnerable to climate change because of their design (low resistance to storms) or location (e.g. in flood-prone areas, landslides, avalanches). They can be damaged or rendered unfit for use by any changing climatic condition or extreme weather event: rising of sea levels, extreme precipitation and floods, occurrences of extreme low or high temperatures, heavy snowfalls or strong winds.



Flooding is, after earthquakes, one of the costliest kinds of disasters and this is mainly due to floods in built-up areas³⁹. Many European cities have been built along a river and these rivers will respond to extreme rainfall or snowmelt events with extreme discharges, threatening the cities with floods. This can have dramatic consequences for people and the economy as it impacts the local economic tissue, industry, retail, SMEs, etc.



There is also a growing problem with overheating of the built environment being exposed to rising temperatures and extreme heat, which is not only an issue for the construction material but also affects the occupants' comfort and health.

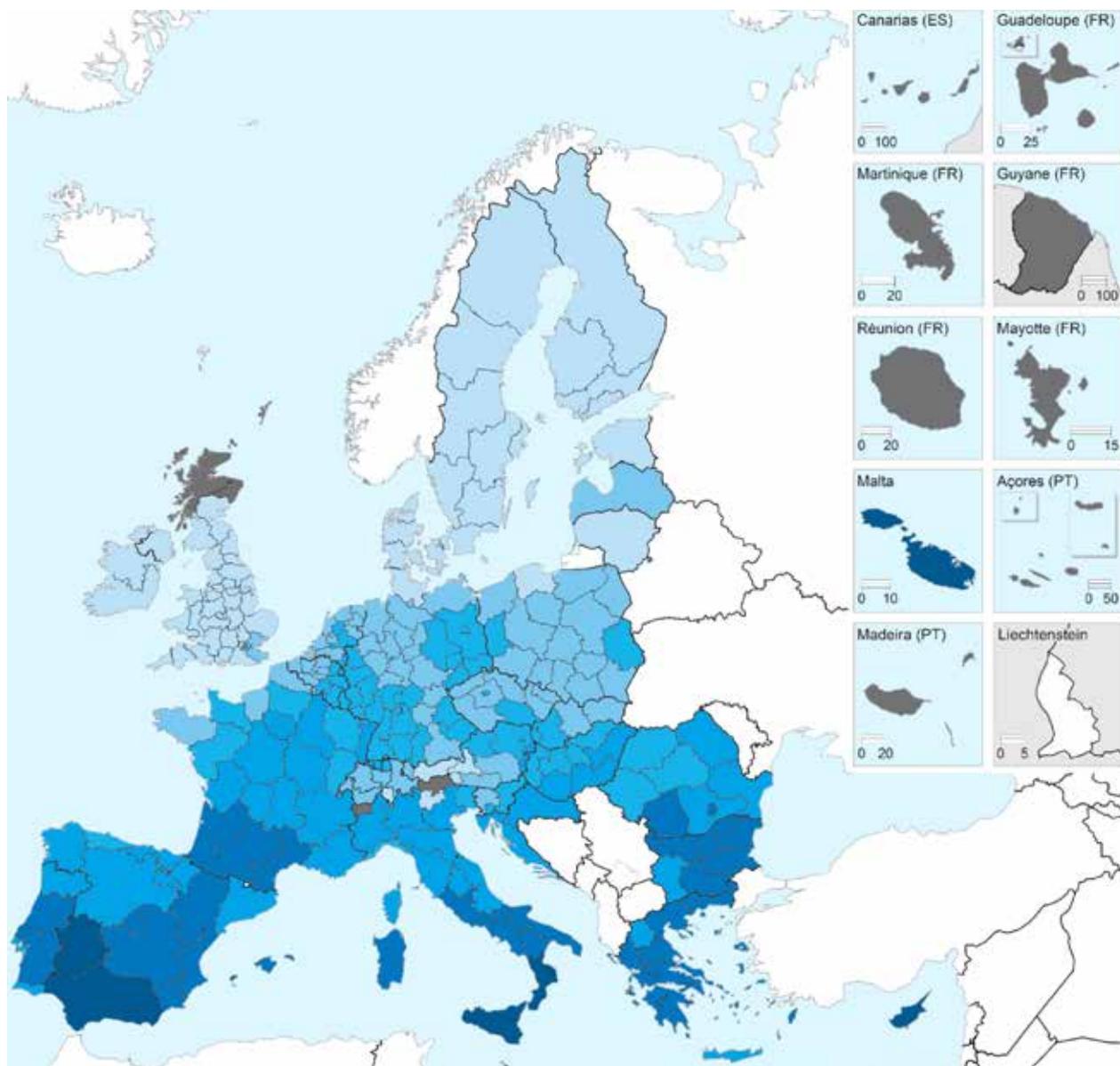


In coastal areas, coastal protection (e.g. sea walls, barriers) may require increasing maintenance costs and higher frequency of readjustments.

³⁸ Source: Eurostat

³⁹ Source: WHO Regional Office for Europe

Fig. 13 - Vulnerability map – construction sector – Loss of added value due to temperature in Europe⁴⁰



Source: Flouris & al.

⁴⁰ Flouris & al. (2018). Report on vulnerability maps for health and productivity impact across Europe. HEAT-SHIELD Project Technical Report 5. Downloaded from: <https://www.heat-shield.eu/technical-reports>. Access date: May 10, 2020. Brussels, Belgium.

 **The higher temperatures projected with climate change pose serious risk to workers' health and safety.**



Many of them work outside and therefore may suffer from heat stress, dryness, dizziness or even heat stroke or collapse if the body temperature rises above 39°C.



Even at less extreme temperatures, heat leads to a loss of concentration and increased tiredness, which means that workers are more likely to put themselves and others at risk. High temperatures mean there is an increase in the likelihood of accidents due to reduced concentration, slippery, sweaty palms as well as an increased discomfort of some personal protective gear, resulting in reduced protection through inappropriate usage or non-usage⁴¹.



The sector might also suffer from a loss of productivity, especially in Southern Europe where the highest rise in temperatures are expected. Many studies have shown that labour productivity starts to decline above a temperature threshold of around 25°C⁴².

The construction sector is one of the sectors that could benefit the most from adaptation policies. Urban-planning, investment in resilient infrastructure and housing will play a crucial role regarding disaster prevention. Investing in skills will be necessary in a sector where 97% of companies employ less than 20 people⁴³. At present, the

sector is experiencing a skill shortage. There is a lack of technicians, namely electricians and machine operators, as well as other occupations, such as roofers, carpenters and stonemasons, often due to unattractive working conditions resulting in forced mobility and emigration.

⁴¹ <https://www.etuc.org/en/document/etuc-resolution-need-eu-action-protect-workers-high-temperatures>

⁴² Triple E Consulting loc. cit p.

⁴³ <https://www.euractiv.com/section/social-europe-jobs/infographic/the-construction-sector-in-europe-and-its-smes-facts-and-figures/>





Emergency and other public services

Public services, which currently accounts for 16% of employment in the EU⁴⁴, will also be impacted. As underlined by a recent EPSU study⁴⁵, in case of extreme-weather events, central and local government, social services, education, public transport, and disaster management units will be put under pressure⁴⁶. The most severe impacts are, however, expected for emergency and rescue services as well as for the health care sector, which will be at the forefront of the fight against negative consequences of climate change.

FIRE AND RESCUE SERVICES



The danger of forest fires driven by weather is expected to increase (see fig. 10), which will of course have detrimental effects on fire and rescue services, leading to greater workload, a deterioration of the firefighter's working-conditions and increased risks for their safety.



The main concerns include firefighters suffering heat stress, injuries due to uneven terrain, smoke inhalation and flying firebrands. Furthermore, large wildfires or heath fires can temporarily drain the fire cover of a large area, resulting in increased response times for primary fires and rescues.



Fire crews will be tired from the increase of incidents, sickness and injury levels may rise due to fatigue and equipment will be under more strain due to more frequent usage⁴⁷.



Climate change is going to lead to variations in precipitation levels, increasing the risk of droughts and water-scarcity, which can affect brigades' training and demonstrative capabilities. Water companies can reduce the pressure in their mains supplies to minimize leakage, so firefighters may have to relay water across longer distances from alternative water sources.

⁴⁴ https://ec.europa.eu/eurostat/cache/digpub/european_economy/bloc-4d.html?lang=en

⁴⁵ <https://www.epsu.org/article/epsu-feature-adaptation-climate-change>

⁴⁶ Galgoczi B. (2017), Public services and adaptation to climate change, EPSU, available at: <https://www.epsu.org/article/epsu-feature-adaptation-climate-change>

⁴⁷ Fire Brigade Union (FBU, 2010), Climate change – key issues for the fire and rescue service, available at: <https://www.fbu.org.uk/publication/climate-change-key-issues-fire-and-rescue-service>

The potential problems linked with the changing weather conditions require the adoption of appropriate responses, such as additional recruitments and investment into equipment (specialist firefighting appliances, water bowsers, portable dams, planes and helicopters assisting with the rapid extinguishing of wild fires). Prevention measures, such as updated fire risk plans and regular and appropriate training, will also have to be enforced.

Climate change will also lead to an increase in the number of floods, droughts, storms and heat waves, which, in turn, will impact firefighters working conditions, health and safety⁴⁸. Under a high warming scenario, flood risk could more than triple by the end of the century (see fig. 14).

The changing weather conditions are linked with potential problems



Emergency and rescue services play three main roles during flooding: (1) emergency response and rescue, (2) damage mitigation and (3) making flooded areas safe before residents are permitted to return home.



Extreme weather events pose a variety of health and safety hazards to rescue workers, such as injuries from slips and falls, being struck by airborne objects, inadequate sleep and nutrition due to long and uninterrupted work shifts, physical exhaustion, mental stress, and vehicular crashes.



Other potential health and safety hazards associated with flooding are: the exposure to toxic substances or contaminated flood waters (with chemical waste, oil, diesel, pesticides, fertilizers, etc.), asbestos and other hazardous dusts, mold, biological agents, flood debris, electrical hazards, drownings and blood-borne pathogen infections.

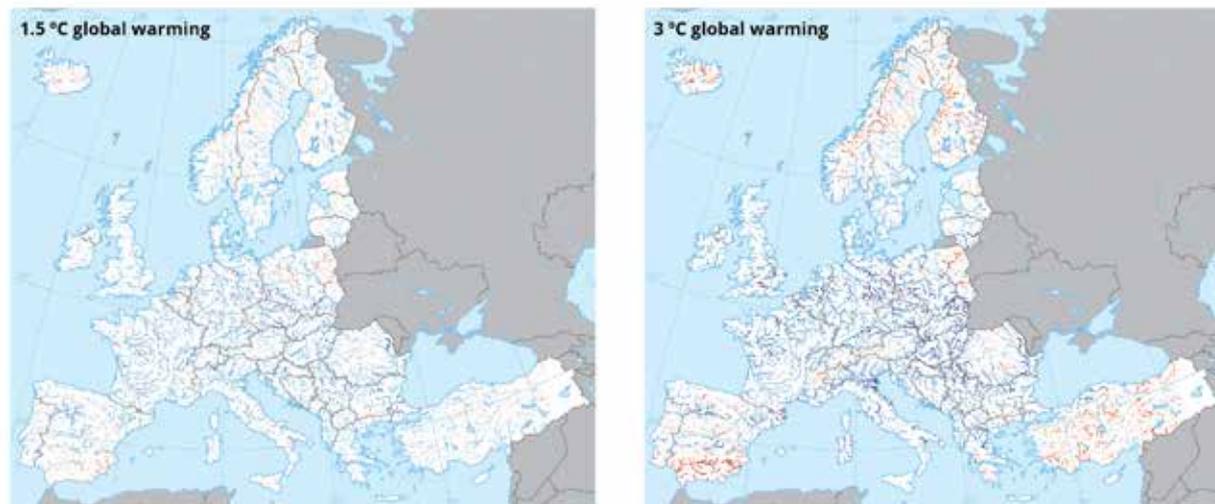


Climatic events may also be a source of important stress for workers, with possible negative implications at work (burn-out, increased workplace violence, etc.) and in their private life (depression, post-traumatic stress disorders linked to activities during cleanup operations).

As in the case of fires, fire and rescue services may have to consider adapting their capabilities to allow for a greater flood rescue response capability.

⁴⁸ See for example: FBU, Inundated: The lessons of recent flooding for the fire and rescue service, available at: <https://www.fbu.org.uk/publication/inundated-lessons-recent-flooding-fire-and-rescue-service>

Fig. 14 - Projected change in maximum 100-year daily river discharge for two global warming levels (1,5°c and 3°c)⁴⁹



Projected change in maximum 100-year daily river discharge for two global warming levels

Source: EEA



“The work of the Fire Brigades is very conditioned by climate change that affects the extreme phenomena occurring in the Italian territory, traditionally very fragile. In particular, the increase in temperatures and droughts in the summer period leading to more widespread and intense fires; the strong, violent and concentrated rains and snowfalls in the winter period; and natural disasters such as landslides. These can only be addressed with a significant increase in the overall number of firefighters, which should be expected to rise from the current 35 000 (about 30 000 operational) to around 50 000; precisely because the working conditions and the safety of firefighters’ operators will inevitably tend to get worse if their number is not soon increased”.

Extract from the Italian CGIL fire brigade trade union’s answer to the ETUC questionnaire

⁴⁹ <https://www.eea.europa.eu/data-and-maps/indicators/river-floods-3/assessment>

HEALTHCARE SECTOR



Europe's 18.6 million health and care workers represent 8.5% of the total workforce. The number of workers in this sector continues to grow, with an increase of 13% between 2008 and 2016. This growth has led to the net creation of 2.1 million jobs, which represents the largest absolute increase of all economic sectors during this period, with a particular increase in the number of medical doctors⁵⁰.



Despite this, the EU healthcare sector can be considered in crisis and is being challenged from different directions. The sector is confronted not only with climate change but also with other megatrends such as the migration crisis and the increasing life-expectancy. The ageing population, for instance, raises the need for more care and for the development of new primary care models and better integrated care. This poses a serious challenge due to the raising number of patients and the rise in associated costs.



In the meantime, EU healthcare systems are confronted with budgetary constraints. According to Eurostat's most recent available data, healthcare expenditures have slightly risen in almost all EU Member States during the period 2011 – 2016. This rise appears, however, to be insufficient to meet the growing demand. The available hospital data for the period 2011 – 2016 shows that the number of hospital beds has decreased dramatically and length of stay has shortened in 10 out of 13 EU countries.



Eurostat data also shows major differences between EU countries, with healthcare expenditure per capita ranging from more than EUR 4 000 in countries such as Luxembourg, Sweden and Denmark to around EUR 500 in Bulgaria and Romania. Within many Member States, moreover, accessibility is further affected by an uneven geographical distribution of health professionals, with shortages in rural, isolated areas and deprived urban areas.

Climate change is a significant threat to the health of Europeans. As climate continues to change, the risks to human health will continue to grow, impacting millions of people and therefore putting additional pressure on healthcare and medical services, which are already facing budget cuts

and personnel shortages in most EU countries. The recent COVID 19 crisis has shown us how much the healthcare sector has been underfinanced in the recent years, lacking workforce, beds, equipment and diagnostic tools at the height of the pandemic.

⁵⁰ https://ec.europa.eu/eurostat/statistics-explained/index.php/Healthcare_expenditure_statistics

Lately, several protests have taken place in different EU Member States in order to denounce the insufficient level of public funding, which results in low-wages, under-staffing, increased workload and decreased working conditions.

! Public funding issues



A 2017 Deloitte study on the state of the healthcare sector has pointed out growing concerns over nurses and doctors' workload in the EU, as well as its detrimental effect on their physical and mental health⁵¹.



All these elements are causing severe personnel shortages. The World Health Organisation (WHO) predicts a health professional shortfall of up to two million (or 15% of the workforce) across the EU by 2020.



Several Eastern European countries, such as Latvia, Lithuania, Poland, Romania, the Slovak Republic, Croatia, Bulgaria and Hungary, face major challenges in retaining health professionals due to low wages and inadequate public financing.



With 8.4 practicing nurses and 3.6 practicing doctors per 1000 people, the EU has an average nurse to physician ratio of about 2.5. But, this ratio varies from 1.1 in Bulgaria to 4.6 nurses per doctor in Denmark and Finland. In some countries, advanced practice nurses now assume certain tasks that were traditionally assigned to doctors.



Last but not least, the sector also faces skills mismatches and is confronted with an aging workforce. The share of people above 50 years working in the sector increased from 27.6% to 34.1% between 2008 and 2016, which is a faster pace than observed across all sectors on average (24.0% to 29.6%)⁵².

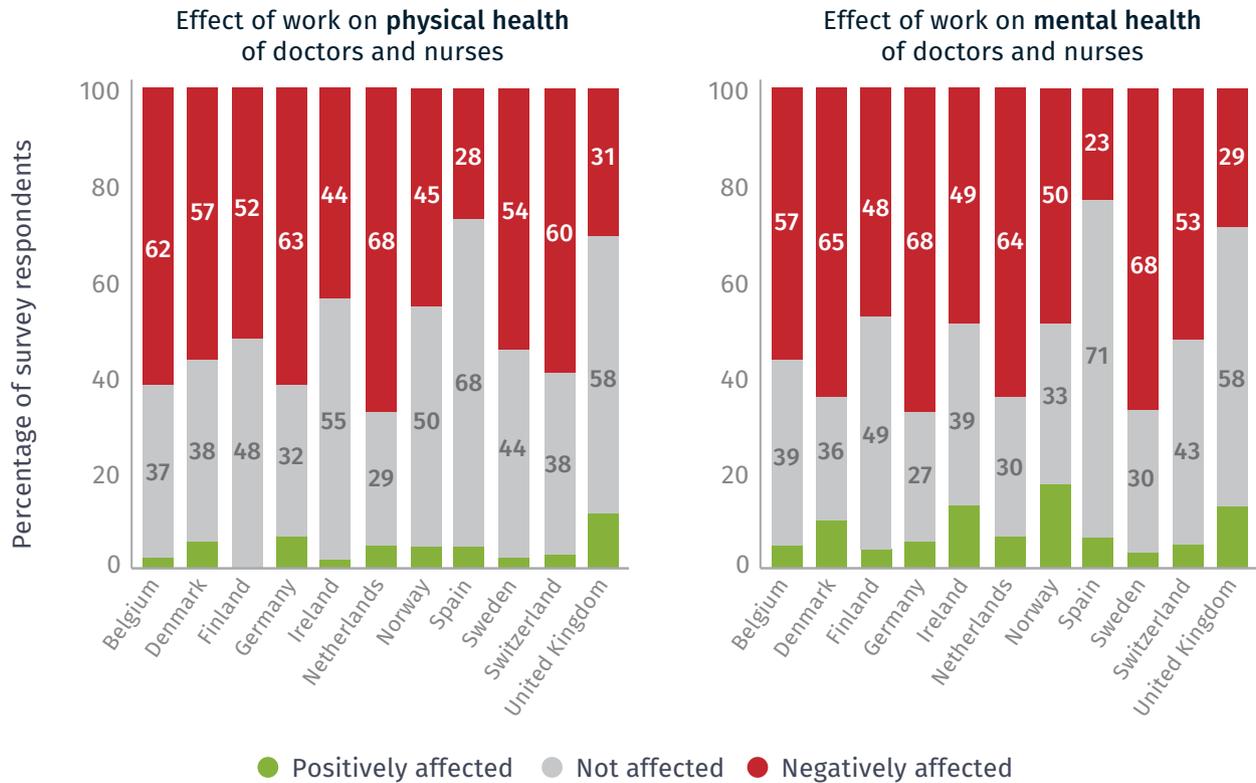
Climate change related impacts over human health will seriously impact the EU medical and health services, adding extra workload to a sector already understaffed and, in many Member States, underfinanced. Health is however a universal human right. Public financing must be secured in

order to guarantee proper levels of workforce (nurses, doctors, administration, rescue services, etc.), investment and training. This is the only way to ensure acceptable working conditions for workers.

⁵¹ Deloitte (2017), Time to care - Securing a future for the hospital workforce in Europe, available at: <https://www2.deloitte.com/uk/en/pages/life-sciences-and-healthcare/articles/time-to-care.html>

⁵² https://ec.europa.eu/health/state/companion_report_en

Fig. 15 - Perceptions of hospital doctors and nurses of the effect of work on their physical and mental well-being



Source: Deloitte



Utilities

Climate change is expected to seriously affect European utilities, such as energy and water providers or waste management units. These sectors represent a total employment of 4.7 million jobs across the EU and account for almost 2% of the European workforce. Access to energy, water and sanitation are human rights that must be guaranteed in order to ensure an adequate standard of living for all European citizens. In that view, adequate levels of investment - at present in danger due to rampant privatization of public utilities - must be ensured to counteract the negative effects of climate change on the sector.

! All energy sources will be affected



Components of the energy system are affected by climate change via long-term changes in climate parameters, variability and extreme weather events. Negative impacts of climate change are already identified in wind, solar, nuclear and thermal power stations but also in hydropower and bioenergy resources.



On the demand side, increasing temperatures reduce energy demand in cooler climates, resulting in decreased energy costs for households, but decreased revenue for utilities. Extreme temperatures can have severe consequences if they cause spikes in demand that cause brownouts or blackouts, or if extended power outages occur during periods of extreme heat. Increasing energy costs associated with extended warm seasons can have negative impacts on economically marginalized populations who may lack the ability to pay for heating or cooling resources during winter and summer months.



On the supply side, impacts include changes to the averages and variability of wind, solar and hydropower resources; the availability of crops for bioenergy feedstocks; costs and availability of fossil fuels due to melting sea ice and permafrost; the efficiency of PV panels, thermo-electric power plants and transmission lines due to rising temperatures; technology downtime due to changes in the frequency and intensity of extreme weather events.



Further increases in temperature and droughts may also limit the availability of cooling water for power generation but also for other activities which are heavily water dependent (agriculture for example). Nuclear power plants for instance need large quantities of water to cool and cooling them causes river temperatures to rise. They are therefore likely to exert additional pressure on rivers with decreasing flows.

! Water management will play a key role in the following:



Water scarcity is not only an issue for the energy sector. A fierce competition for scarce water resources is forecasted between households, industry, power producers, agriculture, and nature.

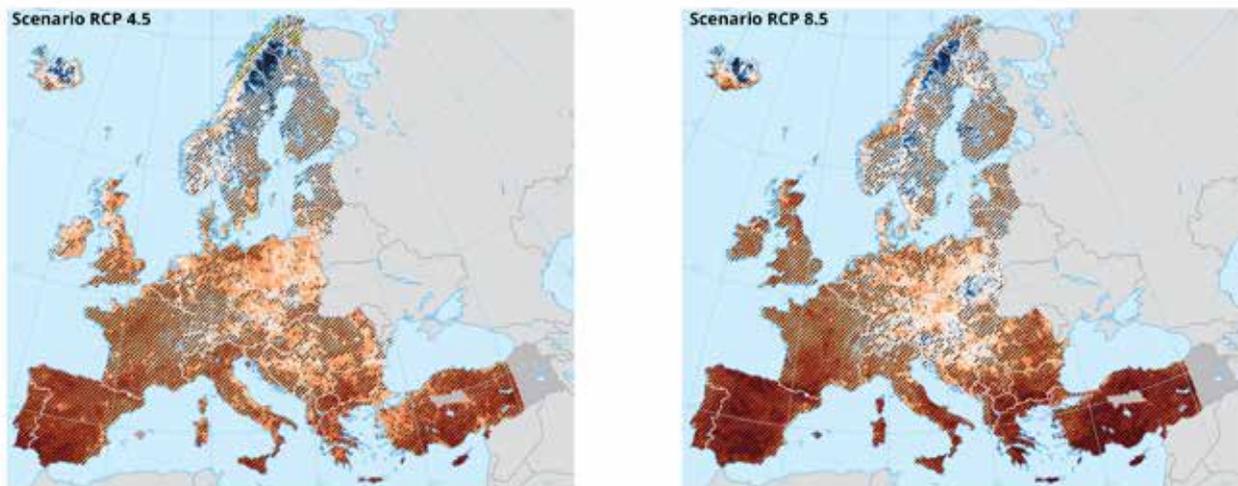


The expected water scarcity is mainly driven by changes in water withdrawals and the percentage of area under severe water stress is expected to increase in all regions by 2050, with major changes in particular in eastern, western, and southern Europe;



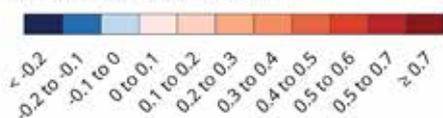
In particular, the projected increases in water abstraction and water use will exacerbate minimum low flows in many parts of the Mediterranean region, leading to increased probabilities of water deficits when maximum water demand overlaps with minimum or low availability⁵³.

Fig. 16 - Projected change in meteorological drought frequency between the present (1981-2010) and the mid-21st century (2041-2070) in Europe, under a medium (RCP 4.5) and a high (RCP 8.5) emissions scenario⁵⁴



Projected change in meteorological drought frequency between 1981-2010 and 2041-2070 under two climate scenarios

Number of events per 10 years



At least two-third of the simulations used agree on the sign of change

No data

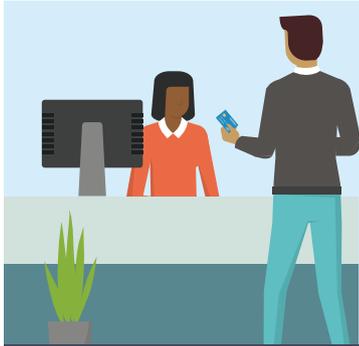
Outside scope

0 500 1 000 1 500 km

Source: EEA

⁵³ <https://www.ecologic.eu/3586>

⁵⁴ <https://www.eea.europa.eu/data-and-maps/indicators/river-flow-drought-3/assessment>



Banking and insurance

In 2018, the financial sector employed 5.8 million people in the EU and accounted for almost 2.5% of the total EU workforce. Climate change constitutes a major challenge, causing both threats and opportunities that will significantly affect the economy and financial institutions, depending on which carbon emission scenario eventually unfolds.



For the banking sector, the first risk factor concerns physical risks caused by climate and weather-related events, such as droughts and rise of sea levels. Banks need to consider the risks that such events create for their credit exposures and their asset portfolio. Potential consequences are large financial losses due to damage to property, land and infrastructure. This could lead to the impairment of asset values and borrowers' creditworthiness. Losses can arise from both direct damage but also from the effects that potentially higher maintenance costs, disruption and lower labour productivity could have on profitability and hence default risk.



Insurance companies can be affected through a rise in insurance premiums. Total insurance losses for weather-related events reached 0.1% of GDP in 2018, with total economic losses approximately double that amount. As a result of global warming, insurance and economic losses caused by climate-related events are likely to start trending upwards as a share of GDP. Insurance and reinsurance companies need to continue to ensure that reserves are adequate to cover expected losses⁵⁵.



Insurance costs are expected to increase. Climate change is very likely to increase uncertainty in risk assessment and thus affect the functioning of the insurance market. Insurers may have to withdraw from some activities where the risk is evaluated as being too high with changed climatic conditions and consider some risks as being uninsurable over the medium and long term. In addition, new losses will emerge from life and health branches due to injuries and mortalities. Similarly, insurance services linked to transport activities could be affected.



In the longer term, particularly in most vulnerable sectors or areas, climate change could indirectly increase social disparities as insurance premiums become unaffordable for a fringe of the population.

⁵⁵ Source: European Central Bank

Although financial institutions seem to be aware of potential climate-related risks, they have, so far, made relatively little progress in quantifying and integrating them into their risk management. This may be related to the fact that, traditionally, insurance companies consider time horizons of months to years, rather than decades, which, in turn, is related to the fact that insurers can fairly easily adapt their tariffs according to new insights with respect to weather extremes.

Climate change is however not just a risk. New financial products, such as green loans, should continue to develop. Since banks hold and manage important assets, climate

change may highly influence their long-term investments. Insurers could benefit from opportunities due to climate change, by being able to offer new risk management products, and could actually experience an increase in the demand for insurance itself, with its potentially positive impact on employment in the sector. Furthermore, by shifting the horizon away from the short term and contributing to a more sustainable economic trajectory, the financial sector can become a powerful force acting in our collective best interest. It has to be kept in mind that the financial sector will be pivotal in mobilising the necessary financial resources for climate adaptation.

Industry



Currently, there are 36.7 million people employed in the European industrial and manufacturing sectors, which equates to almost 16% of the total EU workforce⁵⁶. Although not usually mentioned among the sectors particularly at risks, industry and manufacturing will also be affected by climate change, either directly or through spill-over effects from the most affected sectors.



According to the Triple E study on the economic impacts of climate change, manufacturing and public utilities are the sectors which are going to lose the highest number of jobs if no adaptation measures are implemented. This situation is due to the negative impacts of climate change on certain sectors' demand, but also to a higher loss of productivity in comparison with other sectors (Fig. 17)⁵⁷.



Climate change will affect workers' health and safety, especially those who work indoor or in hot environments. In practice, the most often quoted places where such danger can occur are places like greenhouses, bakeries, manufacturing plants, warehouses or foundries.



The industry may suffer from price hikes (for example, for agricultural products or energy), due to disruptions in logistic supply chains or rarefaction of certain commodities.



In case of water-scarcity, companies will be competing for access to water with other sectors, such as tourism, agriculture or power plants. In the same way, energy supply can be reduced in case of extreme climate weather event or risk of blackout, forcing companies to adapt their energy consumption.

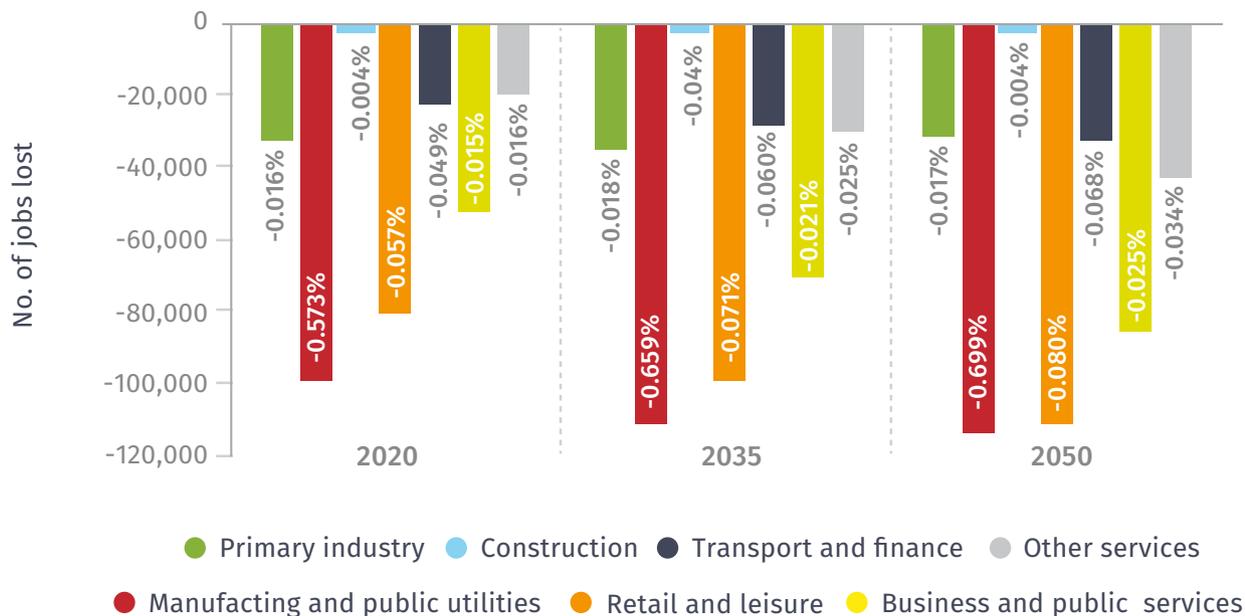


Finally, industry and manufacturing can also be directly impacted, through extreme-weather events or sea-level rise, forcing them to permanently or temporarily stop their production, relocate or renovate their facilities.

⁵⁶ Source: Eurostat

⁵⁷ Triple E consulting (2014), Assessing the implications of climate change adaptation on employment in the EU, available at: <https://climate-adapt.eea.europa.eu/metadata/publications/assessing-the-implications-of-climate-change-adaptation-on-employment-in-the-eu-1>

Fig. 17 – Number of jobs lost (in absolute and relative (%) terms for seven aggregated economic sectors, for 2020, 2035 and 2050 in the baseline (source Triple E)



Source: Triple E

The adoption of adaptation strategies and policies is crucial as these strategies and policies play a key role in avoiding or diminishing the negative effects climate change may have on human health, safety and on the economic environment and employment. The benefits of adaptation policies clearly outweigh their costs. According to the European Commission, every euro spent on flood protection for instance could save six in damage costs.

In April 2013, the European Commission adopted the EU adaptation strategy⁵⁸, which is based on three main objectives: promoting action by Member States, better informed decision making and promoting adaptation in key vulnerable sectors. Since then, the commission has been monitoring the adoption of national adaptation strategies (NAS) by EU Member States: 25 out of 28 of them have adopted NASs by early 2020^{59 60}. Despite this, the vast majority does not deal with employment-related issues, nor with the potential risks faced by workers. More generally, they do not deal sufficiently with broad social and economic consequences climate change may have. In this context, trade union action is needed in order to secure workers' inter-

ests, ensure an adequate protection for all, as well as the adoption of coherent adaptation policies that consider the impacts of climate change on the world of work.

The present chapter presents and details the measures and different actions that can be taken by trade unions at EU level (Section A), national level (section B), at regional and local levels (section C), sectoral level (section D) and company level (section E). The last two sections provide recommendations for all levels, respectively on the creation of partnerships and alliances (section F) and the need for trade unions to raise awareness among their affiliates (section G).

6.1 European level

In 2019, the European Commission carried out a review process of its adaptation strategy. Several gaps have been identified throughout it⁶¹. At first, progress in the adoption of national adaptation strategies has been slower than expected. Better downscaling of adaptation knowledge might be required, notably on socio-economic impacts and pos-

sible responses. Regarding infrastructure, major projects are now required to be climate-proof. Further work on preparedness and standards is ongoing, but might not deliver results before 2020. There is also some margin to improve implementation and monitoring. The strategies developed so far lack concrete socio-economic impact assessments of

⁵⁸ <https://climate-adapt.eea.europa.eu/eu-adaptation-policy/strategy>

⁵⁹ Strategies are being developed in the remaining three Member States (Latvia, Bulgaria and Croatia) but have not yet been adopted.

⁶⁰ The recently adopted European regulation on the governance of the Energy Union and Climate Action (11 December 2018) make it compulsory for Member States to integrate within their integrated national climate-energy plans a chapter about climate change adaptation (plan and measures) as well as to consult the social partners on these issues.

⁶¹ <https://www.eea.europa.eu/policy-documents/evaluation-of-the-eu-adaptation>

⁶² <https://www.epsu.org/article/epsu-feature-adaptation-climate-change>

climate change consequences on the working world, both in terms of employment and working conditions. These strategies should include meaningful indicators to monitor the socio-economic impacts of adaptation strategies and to assess the value of the prevention and management of risks linked to climate change. Furthermore, and as underlined by the EPSU study “Public services and adaptation to

climate change”⁶², the different strategies are characterized by an “absence of stable and systematic public financing, at both national and municipal levels”. Finally, there is also a lack, at EU level, of any legal instrument that would protect the workers’ health in relation to the risks raised by climate change.

AT THE EUROPEAN LEVEL TRADE UNIONS MUST:

▶ Call upon the European Commission to strictly monitor the development and implementation of national adaptation strategies, with regards, in particular, to the assessment of climate change’s socio-economic impact and make sure trade unions are involved.

▶ Call upon the European institutions to introduce legislative instruments that recognize the increased risk faced by workers and provide frameworks for protecting them. Weather conditions do not respect national borders therefore European action is required.

▶ Call upon the European Institutions to establish social protection mechanisms at European level to support Member States in case of emergencies.

▶ Call upon the European Institutions and Member States to provide sufficient funding for adaptation through a rise of the amounts dedicated to adaptation by the different European Structural and Investment funds (ESI) and harmonize taxation regimes across Member States in order to prevent tax fraud, tax avoidance and ensure a fair redistribution of resources in order to allow public authorities to finance adaptation measures.

▶ Call upon European employer’s organisations to establish a strong and stable social dialogue on the implications climate change may have on the health and safety of workers in order to issue guidance for companies on how they should act to protect their workers.

▶ Take action to protect workers from the negative effects of climate change, including exposure to high temperatures.



The ETUC is already acting at EU level to promote action to Protect Workers from High Temperatures⁶³

At its executive committee meeting held on December 18th 2018, the ETUC adopted a resolution on the Need for EU Action to Protect Workers from High Temperatures. The text points out different detrimental effects increased heat may have on workers and details the ETUC commitments with regards to solving these problems:

- To work, through the ETUC Health and Safety committee, to identify a series of actions to promote the issue of safe and healthy working temperatures. This will include developing guidance to be issued to its affiliates which will address different work environments and temperatures.
- To raise the issue of unsafe working temperatures with both the European Agency for Safety and Health at Work (EU-OSHA) and the Advisory Committee on Health and Safety at Work (ACHS) with an aim to raise the profile of this risk.
- To launch a day of action in June 2019, timed to coincide with the June ETUC Executive Committee, which will generate publicity for the demands.
- To call upon the European Commission to introduce a legislative instrument that recognizes this increased risk and provides a framework for protecting workers.
- To demand that European employers' organisations take this issue seriously by issuing guidance to their affiliates on how they can protect their workers from unsafe temperatures for work both indoors and outdoors. The ETUC is ready to work with the employers in developing this.
- Pursuing these objectives throughout the course of the next European Commission and Parliament mandate.

⁶³ <https://www.etuc.org/en/document/etuc-resolution-need-eu-action-protect-workers-high-temperatures>

6.2 National level

The participation of trade unions to the definition of national adaptation strategies is crucial in order to ensure a just transition. The European Commission has published guidelines on developing adaptation strategies⁶⁴, in which it foresees active involvement of all relevant stakeholders, including interest groups, scientists, private sector, NGOs and the general public. This involvement includes “access to information, consultation on specific issues of concern and participatory engagement throughout the whole process”. According to the Commission, with only two excep-

tions, all Member States have a dedicated process in place to facilitate stakeholder involvement⁶⁵. In reality, trade union involvement widely vary between Member States and is still not as intense and effective as it could be, and probably much weaker than in the case of mitigation. Furthermore, there is, at present, no predefined institutional framework that would govern this participation and trade union involvement often depends of the national culture of social dialogue.

AT THE NATIONAL LEVEL THE TRADE UNIONS MUST:

▶ Promote the adoption of coherent and effective national adaptation strategies that help anticipate and tackle the adverse effects of climate change, including its socio-economic impact and the impact on workers.

▶ Call upon governments to develop precise roadmaps for trade unions and other stakeholder involvement in the design, implementation and monitoring of national adaptation strategies.

▶ Call upon governments to introduce legislative instruments that recognize the increased risk faced by workers and protect them from the adverse effects of climate change.

▶ Call upon governments to ensure stable and systematic public financing for adaption measures as well as for public services, including those which will be the most impacted and/or at the front line (public utilities, administration, emergency and rescue services, healthcare, etc.).

▶ Call upon governments to strengthen social protection systems to guarantee that most vulnerable people are protected against consequences of extreme weather events due to climate change (e.g. temporary unemployment, direct subsidies to workers and companies, recovery plans...).

▶ In order to be able to finance adaptation policies, call upon governments to update fiscal policies to fight tax fraud and tax avoidance. Make sure that fiscal measures are progressive and that they redistribute added value in a fair way.

⁶⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013DC0216>

⁶⁵ https://ec.europa.eu/clima/policies/adaptation/what_en#tab-0-1



During the course of our study, several examples of active and successful trade union involvement have been identified



BELGIUM

In **Belgium**, trade unions have been consulted during the elaboration process of the National Adaptation Plan (2017-2020), among others through their participation to the Federal Council for Sustainable Development (FRDO-CFDD), a body which advises the Belgian federal government on sustainable development policies. In its opinion from 13/2/2017, relating to the project of the national adaptation plan, the Council underlines, at the request of the trade unions, that “a comprehensive analysis of the socio-economic impact of climate change would be desirable to identify the sectors, firms and categories of workers that will be the most affected and how to anticipate this”⁶⁶. The opinion also stresses the different elements missing in the draft, i.e. “the impact of climate change on workers (especially on their health), and other sensitive groups in our society (children, pensioners, vulnerable people) and more generally the necessity to maintain an effective health system for all”⁶⁷.



FRANCE

In **France** in 2011, the first national adaptation plan (PNACC) was elaborated in consultation with a wide range of organisations (NGOs, administrations, private actors and trade unions) organized in thematic working groups. In 2014, an evaluation concluded that there is a need to strengthen the national adaptation strategy. This mission was entrusted to the General Council for the Environment and Sustainable Development (CGEDD) in June 2015. Its final report was then submitted for opinion to the National Council for Ecological Transition (CNTE), a forum for dialogue on ecological transition and sustainable development, chaired by the minister in charge of ecology, which brings together NGOs, social partners, experts, regional authorities and parliamentarians.

⁶⁶ <https://www.frdo-cfdd.be/fr/publications/advices/avis-sur-le-projet-de-plan-national-dadaptation-2016-2020-pour-la-belgique>

⁶⁷ Source: FGTB

6.3 Regional and local levels

The participation of trade unions in the defining of adaptation strategies is crucial at national level but also at the regional and local levels. Multiple regions in Europe are heavily dependent on sectors which are going to be severely impacted by climate change (agriculture, tourism, forestry, fisheries, infrastructure, etc.). These impacts include risks for health and safety at work, permanent or temporary business closures, unwanted relocation of businesses and the displacement of workers and potential job losses. Certain regions (for example low altitude

ski resorts) may face as big structural changes as the one expected for coal regions.

Cities will also be affected. Around three quarters of Europe's population lives in urban areas (EEA) and expert projections suggest that up to 80% of adaptation costs will emerge in cities. Across the EU, around 40% of cities with more than 150 000 inhabitants are estimated to have adopted adaptation plans^{68 69}.

TO AVOID OR MINIMIZE THE NEGATIVE EFFECTS ON WORKERS, TRADE UNIONS MUST:

▶ Call upon regional and local public authorities and employer' organisations to work together with trade unions to map and assess the negative impact climate change may have on the regional economic environment and workers (health, working conditions, job losses, need for new qualifications).

▶ Promote the adoption of long-term economic diversification strategies and policies that will allow for a requalification and relocation of workers in growth sectors and include social protection measures for the ones that may be left behind in the most affected regions.

▶ Call upon regional public authorities to set up dialogue on the establishment of regional and local adaptation strategies. Ensure trade union involvement in their elaboration, implementation and monitoring in order to secure the workers' interests;

⁶⁸ https://ec.europa.eu/eurostat/statistics-explained/index.php/Urban_Europe_-_statistics_on_cities,_towns_and_suburbs_-_executive_summary

⁶⁹ <https://climate-adapt.eea.europa.eu/knowledge/tools/urban-adaptation>



Across Europe, several trade union organisations are already involved in the definition of regional or local adaptation strategies



SPAIN

In **Catalonia**, **Life Clinomics** was a three-year project (June 2016 - June 2019) led by the Barcelona Provincial Council and partially funded by the European Union (60%). The project aimed to increase climate change resilience of selected territories and economies within the Province of Barcelona. Proposed actions are in line with the Spanish climate change strategy. The project involved local administrations and people working in the agriculture, silviculture, fishery and/or tourism sectors. The main objective was to build the resilience of Mediterranean local authorities through interventions in the counties of Montseny, Alt Penedès and Terres del Ebro within the Province of Barcelona. The specific objectives of the project were to draft climate change adaptation action plans and strategies, giving local authorities tools that allow them to affordably launch climate change adaptation processes, develop climate change adaptation planning models, attract investments into the adaptation measures, improve the competitiveness of farming, forestry, fishing and tourism businesses as well as create new jobs and raise awareness among citizens, stakeholders and local authorities. CCOO Catalunya and UGT Catalunya were members of the project.



FRANCE

Paris green urban development plan (ECECLI): In 2007, the French region of Ile-de-France started the planning of the construction of a new transportation network for greater Paris. The project, known as “The Grand Paris Project”, was accompanied by an ambitious green urban development plan. In total, investments in transport infrastructures, buildings and rehabilitation works have been evaluated at EUR 26 billion. During the process, trade unions (CFDT, CGT) and employer organisations, supported by the expert team Syndex – Fondaterra, played an important role in the development of an employment and skills needs forecasting and management tool (GPEC) called ECECLI, which integrates the 2019 and 2030 policies as well as the measures of the Ile de France region dedicated to climate change mitigation and adaptation (SRCAE Regional scheme climate, air, energy). The vulnerability and adaptation components were devoted to the needs for new jobs and competences in relation to investments in water management (small and large water cycle), biodiversity, energy, transports, waste and landscapes (development plans for revegetation, natural and landscaped areas and the fight against urban heat islands).



SPAIN

In **Spain**, **ISTAS** carried out the **Saludapt** project, which aimed to contribute to the development of territorial plans and strategies for adaptation and protection of health in the face of climate change. In this framework, the institute elaborated a wide range of proposals aiming at improving the protection of workers' health. The final document targets public authorities as well as social partners and companies. Among other proposals, ISTAS proposes to improve the notification of professional contingencies related to high temperatures (by including them in occupational accidents categories) and to urge companies to adequately assess occupational hazards due to thermal stress.

6.4 Sectoral level

As mentioned above, climate change will have a range of impacts on businesses and several sectors will be severely affected. These impacts include risks for health and safety

as well as potential job losses. Climate change may also offer new business opportunities for products and services that would help people adapt.

TO AVOID OR MINIMIZE THE NEGATIVE EFFECTS ON WORKERS, TRADE UNIONS MUST:

▶ Call upon public authorities and employers to initiate dialogue aiming at mapping and assessing the risks and opportunities linked to climate change at sectoral level, in terms of employment, skills and competences needed but also in terms of health and safety risks.

▶ Call upon employer organisations to foster collective bargaining and negotiate sectoral collective agreements aiming at protecting workers and adapting the way they work (health and safety rules, prevention measures, additional protective equipment, etc.).

▶ On that basis, call upon public authorities and employers to draw up, in cooperation with trade unions, coherent and effective sectoral adaptation strategies, e.g. to develop specific skills and competences, to prevent health and safety risks, to ensure employment in the future

▶ Inform workers about the risks for their health linked to global warming as well as its potential consequences to their sector and on their working conditions. Develop informative leaflets or tool guides including best practices and necessary protection measures.



SPAIN

In Spain again, the ISTAS institute⁷⁰ initiated, in September 2019, a project called “Climate change and the world of work” (**Cambio climático y mundo laboral**)⁷¹, the objective of which is to promote the role of workers as agents of change in the definition of adaptation strategies within a range of sectors particularly vulnerable to climate change (forestry, chemical-paper, health, tourism, construction and water). The specific goals of this project, which has the support of the Ministry for Ecological Transition, are: (1) to analyse the perceptions and behaviours of workers and their representatives in the face of climate change, as well as their levels of awareness, (2) Promote the development of sectoral adaptation proposals and strategies, (3) Facilitate exchanges and debates between workers and their representatives but also with all other players (public administration, employer organisations) involved in the design of climate change adaptation policies within the covered sectors, (4) Disseminate project results and promote the development of environmental competencies by workers and trade unions.



UK

In 2010 the **UK Fire Brigade Union (FBU)** published “Climate Change: Key issues for the Fire and Rescue Service”⁷², setting out the risk of climate change for the firefighter sector. The report pointed out that climate change will increase the risk of grassland and forest fires; increase the risk of floods, including floods from surface water, rivers and the sea; affect the supply and availability of water and may give rise to more extreme weather events. The FBU stated that these hazards will have implications for the working conditions of firefighters. Climate change will require significant changes to appliances, equipment available to firefighters, training; pumping capability and water use and increased call center capacity. It will also require a greater awareness of the health implications for firefighters. Following this, the FBU published several other reports, including reports on flooding, indicating the extra work done by firefighters and the need for long-term funding in a context of important job cuts^{73 74}.

⁷⁰ ISTAS (Labour, Environment and Health Trade Union Institute) is an autonomous technical union foundation promoted by Comisiones Obreras (CCOO) with the general objective of promoting social progress activities for the improvement of working conditions, the protection of environment and the promotion of the health of workers. More information at: <https://istas.net/istas/que-es-istas>

⁷¹ <https://istas.net/noticias/istas-inicia-el-proyecto-cambio-climatico-y-mundo-laboral>

⁷² FBU, Climate Change: Key issues for the Fire and Rescue Service (2010), available at: <https://www.fbu.org.uk/publication/climate-change-key-issues-fire-and-rescue-service>

⁷³ <https://www.fbu.org.uk/publication/inundated-lessons-recent-flooding-fire-and-rescue-service>

⁷⁴ <https://www.fbu.org.uk/publication/december-2015-floods-report>



In 2018, the **construction sector federations of French trade unions CFTD and CFTC** negotiated and concluded an **agreement** in the Limousin region with the regional employers' Federation of Public Works (FRTP-EFPW) **on workers' rights regarding health, safety and working conditions in hot weather and heat waves**. The agreement includes a set of preventive measures to be implemented on work sites when outside temperature reaches 30°C. These measures include:

- the possibility of getting unemployment compensation for work interruption in case of hot weather;
- the obligation for employers to monitor weather forecasts, adapt workload, working conditions and working hours in case of heat waves;
- the provision of adapted work clothes and of a suitable room for the reception of workers in the event of climatic conditions likely to affect their health.

In June 2019, the FNCB-CFTD issued a press release asking the government and employers to generalize this type of agreement in all French regions because the national legislation on this issue has a constraining effect on workers' rights and their representatives⁷⁵. Furthermore, since 2015, the FNCB-CFTD runs an information, awareness and training campaign for its members as well as a lobbying campaign called "the hidden face of the sun"⁷⁶.



In **Greece, Famelab**⁷⁷, which is part of Thessaly University, cooperates with HEAT-SHIELD, a Horizon 2020 funded program which aims to address the negative effects of increasing workplace temperatures on the working population. HEAT-SHIELD focuses on providing adaptation strategies for five major industries of the EU and its workers: manufacturing, construction, transportation, tourism, and agriculture. Together, these industries represent 40% of the EU's GDP and 50% of its workforce. The project focuses on health and productivity impacts and aims to provide evidence-based recommendations regarding personalized warning systems, work-rest ratios, clothing-based recommendations, mechanization, hydration and the identification of vulnerable populations.

⁷⁵ <https://www.cfdt-construction-bois.fr/presse/1016-alerte-canicule-salaries-du-btp-8-morts-en-2018-10-en-2017-cela-doit-cesser.html>

⁷⁶ https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwi69_WAzbnAhWHY1AKHWGbcCcUQFjAAegQIA-hAB&url=https%3A%2F%2Fwww.cfdt-construction-bois.fr%2Fimages%2Foutils%2Fcampagne_soleil_20130K.pdf&usq=AQvVaw1RxxHQ72Wr2kW4kgXuHNJ2

⁷⁷ <http://www.famelab.gr/heat-shield/>



In the **Netherlands**, climate change has an impact on working conditions, especially for people who work outside. {Recently}, the roofing sector claimed more protection for the workers to prevent skin cancer. They demanded special working clothes with UV-protection together with a special cap and sun cream distributed by the employer. “In the construction sector, FNV developed a Climate App as an organizing instrument. The App informs workers on risks related to climate. It informs the workers what they can do themselves in case of extreme heat and what the employer should do according to the collective labour agreement. In the public sector, FNV also developed a Climate App. This App also gives information about what has to be done according to the Working Conditions Law” (extract from Dutch trade union FNV’s answer to the ETUC questionnaire).

6.5 Collective bargaining at company level

Climate change will seriously impact workers in numerous sectors, those working outdoor but also those working in warm environments (like greenhouses, bakeries, manufacturing plants, warehouses, foundries or even office workers whose offices are not properly equipped with air-con-

ditioning. Workers and their representatives must use all the tools at their disposal at company level to help workers avoid the risks linked to increased ambient temperatures and other climate hazards.

IN THIS CONTEXT, TRADE UNIONS MUST:

- ▶ Call upon management to establish dialogue aiming at identifying the risks faced by workers, as well as the necessary investments.
- ▶ Call upon employers to negotiate and sign company collective agreements that adapt working conditions and health and safety procedures to reduce the risks incurred by workers. The signing of such agreements (or the inclusion of specific clauses into existing agreements) is for sure one of the most efficient ways to ensure the protection for workers.

- ▶ Use of trade unions and/or work councils’ information and consultation procedures, as well as Health and Safety Committees to collect information, carry out assessments and adapt company policies. These instances may also help workers exert influence over the company’s environmental footprint and strategy. Works council should also discuss the training needs to ensure adequate skills and competences of workers to adapt to climate change, it should also provide guidance on future investments to make sure that they can maintain jobs and are adapted to future consequences of climate change.



Trade unions can play an active role in the definition of a company's environmental strategies



BELGIUM

In **Belgium**, Hesbaya Frost & APLIGEER⁷⁸ is a company specializing in cultivating and deep-freezing vegetables, promoting the use of ecological and socially responsible methods. An extensive social dialogue is being carried out in relation to the company's environmental impact. According to the FGTB, active trade union membership in all of Hesbaya's different departments gives the trade union the strength to advise, alert or inform on the developments to be made. The sewage treatment plant manager is a worker union representative. Also member of the works council, he is a direct actor on environmental issues and in charge of the dialogue with Natagora⁷⁹, an environmental organisation. This cooperation has led to the establishment of a management plan of an Upper Geer basins, aimed at safeguarding the natural heritage around the reserve⁸⁰.

⁷⁸ <http://hesbayefrost.be/en/about-us/>

⁷⁹ <https://www.natagora.be/>

⁷⁹ Source: FGTB

6.6 Building partnerships

Collaboration is one of the keys to unlocking sustainability. No single organisation or sector has the knowledge or resources to “do it alone.” Leaders from all sectors of society agree that solving sustainability challenges such as climate change will require unparalleled cooperation. Creating broader alliances, involving other trade unions, employ-

ers, non-governmental organisations, civil society organisations, citizens’ movements and national and local public institutions, can strengthen the voice of workers, help pinpoint the effects of climate change, promote the adoption of adaptation policies and spread the trade unions’ perspective.



Examples of such partnerships:



BELGIUM

In **Belgium**, the **Climate Coalition** is a national nonprofit organisation which brings together around 70 Belgian civil society organisations (environmental NGOs, development cooperations, youth councils, citizens’ movements and trade unions including ABVV-FGTB, CSC, ACLVB-CGSLB) around climate justice⁸¹. The aims of the coalition are to lobby political decision-makers for the adoption of strong measures and to mobilise the largest possible audience around the idea of a fair and climate-friendly society. The organisation has been in existence since 2008 and has already been heard several times by resounding campaigns like “Sing for the climate”, “Train on Tour” and “Bankruptcy”⁸². The Climate Coalition is composed of a board of directors and a general assembly. It develops its campaigns through the work of thematic working groups.



SPAIN

In **Spain**, la **Alianza por el Clima**⁸³ is formed by more than 400 organisations that represent the environmental movement (Greenpeace, WWF and many more), trade unions (CCOO, UGT), development/cooperation, science and research institutes and consumer organisations. The Alliance promotes the transition towards a renewable, efficient, sustainable and fair energy model that guarantees universal access to energy, through the development of collective proposals and the organisation of activities aiming at raising awareness among citizens and different political groups of the need to implement measures against climate change.

⁸¹ <http://www.klimaatcoalitie.be/fr/climatecoalition>

⁸² <http://www.klimaatcoalitie.be/fr/acties>

⁸³ <http://alianza-clima.blogspot.com/>

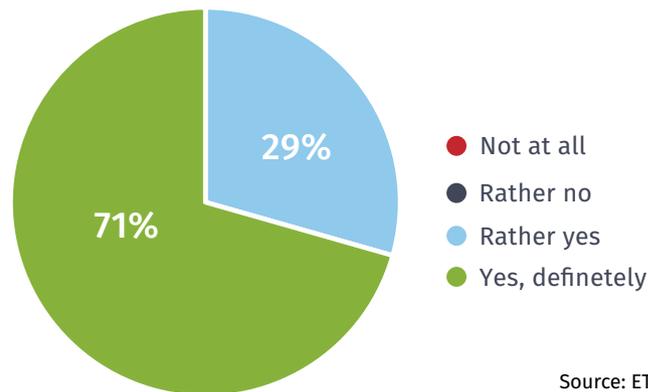
6.7 Raise awareness among trade unions

The result of the ETUC survey carried out in the framework of this project shows that national trade unions are clearly aware of the potential negative effects of climate change but also of its potential benefits. Of the respondents, 100% estimated that climate change, and especially extreme weather events (wildfires, droughts, storms, flooding) and heat waves, will have a significant impact on workers, in-

cluding negative effects on working conditions (88%). The main identified impacts relate to health and safety conditions. Potential negative impacts on the economy have been identified in all countries covered by the survey, which also confirmed a clear North/South divide, with South European countries (such as Greece, Italy or Spain) expected to be more severely impacted.

Fig. 18 - ETUC questionnaire

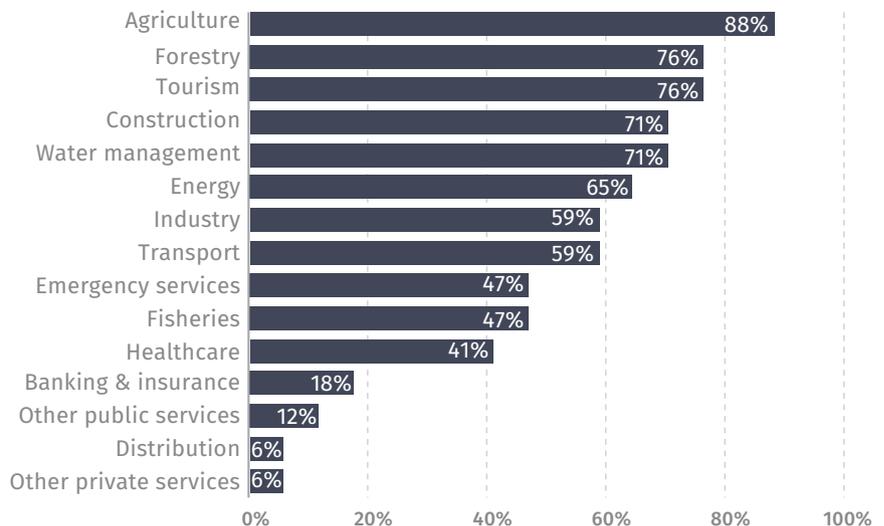
According to you, in your country, are climate evolutions / disruptions expected to have significant impacts on workers (employment, working conditions, safety, etc.)?



Source: ETUC questionnaire

Fig. 19 - ETUC questionnaire

According to you, which ones of the following economic sectors can be, in your country, potentially the most affected by climate change?



Source: ETUC questionnaire

Regarding the opportunities, 88% of respondents estimate that adaptation policies may lead to the development of new economic activities. These relate, for example, to the development of green and resilient infrastructures, the implementation of adaptation plans in urban areas, the development of circular economy and the adoption of mitigation measures (development of renewable energy sources, energy efficiency, etc.).

Despite this, there is a feeling that the concrete impacts of global warming upon workers (job destruction, impact on working conditions, health and safety, etc.) are not always known and understood, neither are the possible adaptation measures and the benefits resulting from them. In many cases, there is a confusion between adaptation and mitigation policies. Furthermore, some adaptation strategies involving trade unions have been identified.

TO RAISE AWARENESS, TRADE UNION MUST:

▶ Include the issue of adaptation in their union's strategy and raise awareness among their members at national, regional, sectoral and shop floor level. This can be done via several ways and actions, such as speeches by leaders, communication campaigns, conducting studies, the publication of position papers and information leaflets.

▶ Develop training programs for trade union members on these issues through new or existing training networks.

▶ Take initiative through leading or taking part in the EU funded awareness raising projects, organizing conferences or seminars.

▶ Develop original methods to raise awareness and help affiliates to organize, e.g. by developing apps or online tools that help workers to have a clear idea of the risks and to enable them to relay their concerns.



In September 2019, Trade unions for energy democracy (TUED)⁸⁴ and the American trade union National Nurses United⁸⁵ produced a major report titled, Nurses' Unions, Climate Change and Health: A Global Agenda for Action⁸⁶.

The report provides nurses and their unions with important information regarding climate-related health risks. After a brief overview of current policies on energy and emissions trends, the report highlights the “gap between ambition and action” and the need for different climate politics. It also takes up key issues raised by major recent reports that are relevant to understanding and addressing the health impacts of climate change. Finally, the report offers observations and suggestions for how healthcare workers and their union - and the labour movement more broadly - can and must take up the fight against the accelerating climate and health emergencies. Together, they must formulate a bold agenda for global action, one that places workers and communities at the center and that embraces the power of organized labour in fighting for the future. Although written for nurses' unions in particular, the report may be of interest to all climate, environmental, health and labour activists.



In Belgium, trade unions have created an integrated training network on environment and mobility issues.



BELGIUM

RISE is a trade union awareness raising network, created by the CSC and the FGTB. Its main mission is to support environmental action within companies. Its main objectives are to educate workers and their representatives about the environment, strengthen their capacity to intervene at company level (through consultation and negotiation bodies) and stimulate social dialogue on environment issues. The different working themes are, for example, waste, energy savings, climate adaptation and mitigation, eco-consumption, workers mobility or even environmental management of companies. The network proposes trainings, awareness raising and supporting measures for union teams.

⁸⁴ <http://unionsforenergydemocracy.org/about/about-the-initiative/>

⁸⁵ <https://www.nationalnursesunited.org/about>

⁸⁶ <http://unionsforenergydemocracy.org/wp-content/uploads/2019/09/Climate-Change-and-Health-GNU-2019.pdf>

WHAT CAN TRADE UNIONS DO?

European level

- ▶ Call upon the European institutions to strictly monitor the development and implementation of national adaptation strategies and make sure trade unions are involved.
- ▶ Call upon the European Institutions to provide sufficient funding for adaptation and the establishment of social protection mechanisms to support Member States in case of emergencies.
- ▶ Take action to protect workers' health and safety and call upon European employer organisations to establish a strong and stable social dialogue on this issue.

National level

- ▶ Promote the adoption of effective national adaptation strategies and make sure that trade unions and other stakeholders are involved.
- ▶ Call upon governments to introduce legislative instruments that recognize the risks faced by workers and to give them protection.
- ▶ Call upon governments to ensure public financing for adaption measures and public services and to strengthen social protection systems.

Regional/local level

- ▶ In cooperation with public authorities and employers, map and assess the negative impact climate change may have on the regional economic environment and workers.
- ▶ Call upon regional public authorities to set up regional and local adaptation strategies and ensure trade union involvement.
- ▶ In regions that will be the most affected, promote the adoption of long-term economic diversification strategies and of adequate social protection measures.

WHAT CAN TRADE UNIONS DO?

Sectoral level

- ▶ In cooperation with public authorities and employers, map and assess the risks and opportunities linked to climate change at sectoral level (employment, skills, health and safety). On that basis, draw up coherent and effective sectoral adaptation strategies.
- ▶ Call upon employer organisations to foster collective bargaining and negotiate sectoral collective agreements aiming at protecting workers.
- ▶ Inform workers about the risks for their health and the necessary protection measures.

Company level

- ▶ Establish dialogue with management aiming at identifying the risk faced by workers and informing them of it.
- ▶ Use trade unions and/or works council's information and consultation rights as well as Health and Safety Committees to collect information. Works council should also discuss the needs in terms of training to ensure adequate skills and competences of workers to adapt to climate change.
- ▶ Call upon employers to negotiate and sign company collective agreements that adapt working conditions and health and safety procedures.

All levels

- ▶ Raise awareness among trade unions at national, regional, sectoral and shop floor level (e.g. speeches by leaders, communication campaigns, conducting studies, information leaf-lets, etc.).
- ▶ Develop training programs as well as new original methods to help affiliates to organize (e.g. developing apps or online tools).
- ▶ Create coalitions or adequate working groups with other stakeholders to develop a common understanding of the challenges at stake and ensure that the workers' perspective is considered in the different narratives and positions.

Climate change is not questionable – it is happening now - and is clearly expected to bring in growing challenges in the near future and beyond. No matter what the climate change mitigation efforts are, unavoidable consequences (floods, droughts, heatwaves, variations in precipitation levels, scarcity of natural resources, decline of biodiversity, etc.) will be present along with the economic, social and environmental costs. Climate change will profoundly impact the world of work, starting with potentially detrimental impacts over human-health and working conditions, in particular for workers who work in hot environments. From an economic point of view, the European Commission has estimated that the economic, environmental and social costs of not adapting to climate change could range from EUR 100 billion a year in 2020 to EUR 250 billion a year in 2050 for the EU as a whole. In total, up to 410 000 jobs could be lost if adaptation measures are not taken.

Trade unions must include climate change adaptation in their strategies and raise awareness among their workers and members to prevent the potential risks. Even though unions have been very active on climate-related issues during recent years, the impact of climate change consequences on workers are, however, not always known and understood. Like for mitigation, to defend the fairest possible transition and bring the social dimension to the agenda of policy-makers dealing with adaptation, it is also fundamental for trade unions to be actively involved within the policy-making process. Coherent and effective adaptation strategies, that properly assess and tackle all the socio-economic impacts of climate change on the world of work, will ensure the sustainability of our jobs, health and safety at work, as well as the creation of decent and quality jobs while providing social protection measures for those who may be left behind. It is key to ensure a just transition for all and prevent the risk of a territorial and social breach, especially in regions and sectors that will be the most affected.



A two-stage project:

Stage 1

First, a questionnaire was sent to the ETUC affiliates in order to take stock of what had been done so far, in their respective countries, to involve social partners into the debate on adaptation. The aim was to get a sense of the maturity of the debate within the trade union movement and to also identify possible best practices and experiences that may be shared. At national trade union confederations level, 20 answers were received from 18 different countries and 31 answers were received from sectoral organisations (EBWW, ETF, EPSU, IndustriAll).

Stage 2

The second stage of the project consisted of a series of five workshops organized in different Member States. Each workshop focused on a specific theme (setting the scene, sectors and regions at risk, health and safety issues, emergency and rescue services, trade union strategies). Experts from trade union organisations and from relevant institutions presented their views on how to deal with the different impacts that climate change can have on workers and how trade unions can engage in designing and implementing adaptation strategies.

For each seminar, a background document was prepared by Syndex and discussed with participants as well as with local stakeholders.



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