

Adaptation and the world of work: framing the discussion

Discussion paper in view of ETUC workshop 4 & 5 July 2019

This document is part of the ETUC European project on adaptation to climate change. The three main objectives of this project, which builds upon several projects dedicated to climate change policies that the ETUC has performed in the past, and which outcome will be based on the results of 2 questionnaires sent to national and sectoral European trade unions as well as on 5 thematic workshops¹, are: (1) to inform European trade unions about the consequences of climate change on the world of work; (2) to prepare trade unions to play an active role in the design and implementation of the national strategies for adaptation; (3) to develop a tool kit for trade unions to bring adaptation on the agenda of industrial relations.

Climate change is increasingly recognized as a major threat to the stability and prosperity of society. No matter what the climate change mitigation efforts are, unavoidable climate impacts (floods, droughts, heat waves, variations in precipitation levels, scarcity of natural resources, decline of biodiversity, etc.) will take place together with the economic, social and environmental costs coming along. The changes observed in climate are already having wide-ranging impacts on ecosystems, economic sectors, human health and well-being in Europe. The average temperature for the European land area for the last decade (2002- 2011) is 1.3°C above the preindustrial average, which makes the increase over Europe faster than the global average.

According to the European Environmental Agency (EEA), the total reported economic losses caused by weather and other climate-related extremes in Europe amounted to over EUR 436 billion for the period 1980-2016². Climate change is expected to continue for decades, because of the delayed effect of past emissions. Even if all greenhouse-gas emissions were to stop today, we would still see major changes in the climate. Achieving the 2015 Paris Agreement goal of limiting the rise of global mean temperature below 1,5°C above pre-industrial levels would reduce the most serious risks of climate change. Yet, although international pledges help in reducing emissions, they are for the moment insufficient to ensure a “likely” chance of limiting global warming to that extent.

From an economic point of view, climate change is expected to seriously affect the European economy, bringing with it negative but also positive effects over national and regional economies. On the demand side, several economic sectors are highly vulnerable because of their dependence on regular climate conditions. Sectoral production shifts – in agriculture and tourism for instance – are expected. On the other hand, major investments in adaptation could offer employment and income opportunities in activities such as resilient buildings and infrastructure or water management.

As a consequence, climate change and adaptation measures are expected to have a wide range of effects over employment and working conditions. These effects include job

¹ The 5 selected themes are: adaptation and the world of work, sectors and regions at risk, working conditions and health and safety, emergency services, role of public authorities. For more information, please see: <https://www.etuc.org/sites/default/files/page/file/2019-03/2018-04%20call%20for%20tender%20-%20COMS%20expert%20.pdf>

² EEA Report No 15/2017, “Climate change adaptation and disaster risk reduction in Europe” (2017), updated in 2018

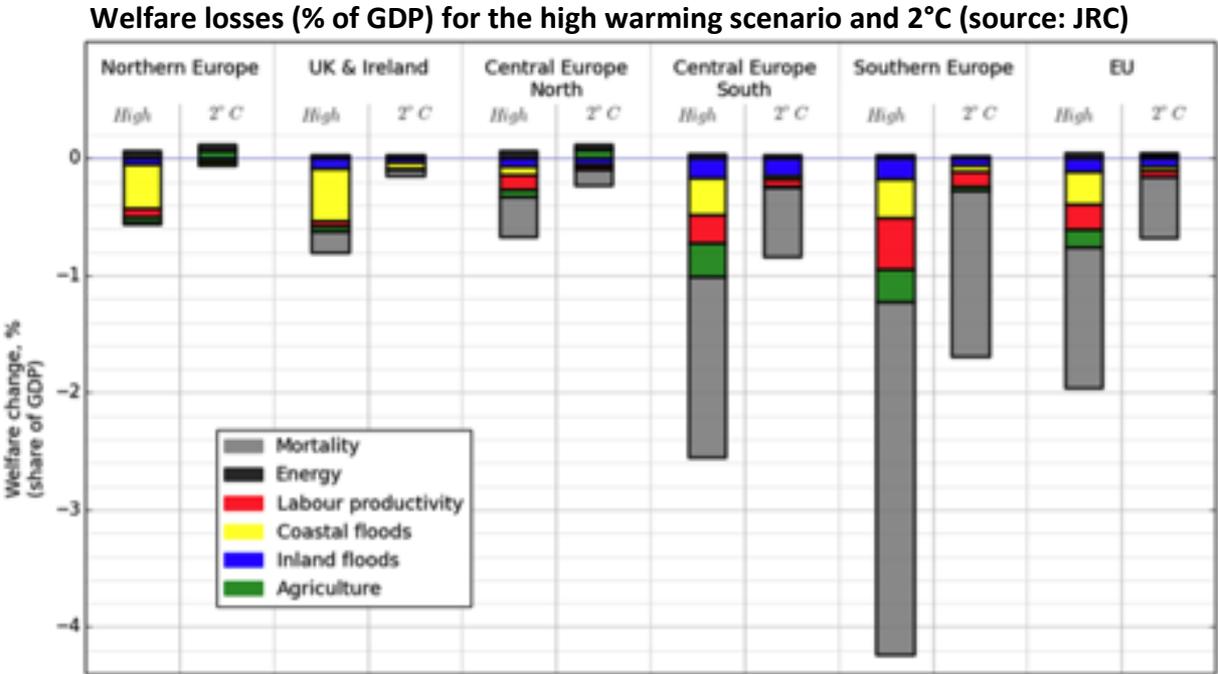
destructions, job creations, impacts over competences and skills needs as well as concerns over health and safety at work. As in the case of climate mitigation and the development of the green economy, trade union action is therefore needed in order to ensure an adequate protection of workers and the adoption of coherent adaptation policies that take into account the impacts of climate change over the world of work.

1. The economic impacts of climate change over the EU economy

Climate change is a complex phenomenon with multiple implications. Its' effects over the EU economy are therefore difficult to assess. As a consequence, none of the various reports available on this issue (for example through Climate Adapt³, the EU platform on adaptation) provides an exhaustive overview of all the costs associated to CC.

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 whole. Due to climate change alone, annual damage to Europe's critical infrastructure could for example 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. The average annual cost of flood damage alone across the European Union (EU) could rise from €4.5 billion to €23 billion by 2050.

The latest EU Joint Research Centre (JRC) PESETA III report⁴, commissioned by the Commission and published in 2018, evaluates the total EU overall welfare loss under a high warming scenario at around 1.9% of GDP (€240 bln) per year at the end of the century.



According to the JRC, the main losses are associated to heat-related mortality, the remaining being, in order of importance, coastal flooding, labor productivity, agriculture and river flooding. The report also

³ <https://climate-adapt.eea.europa.eu/>
⁴ 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>

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 increased by further 20%. On the contrary, small welfare gain thanks to lower energy consumption.

Vulnerability is of course country-specific and derived from particular physical, social and economic features. Each Member State will experience different effects and impacts of climate change. The JRC report points out a clear geographical north-south divide: countries in Southern Europe, and especially the Mediterranean area, will be more affected by global warming than those in the north. These countries appear to be more vulnerable to CC, especially with regards to its effects over heat-related human mortality, water resources, habitat loss, energy demand for cooling and forest fires.

This said it has however also to be mentioned that, beyond modelling and projections, no European country is protected from the consequences of climate change. Coastal and mountain areas are particularly at risk. It is 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 size across the EU could face the risk of inundation due to higher sea levels and extreme weather events⁵.

2. Sectors particularly at risk

Although the whole European economy is concerned, some economic sectors are considered to be particularly at risk. This is especially the case of sectors which are heavily dependent on natural resources (but not only). Difficulties (or positive development) in these sectors will have spill-over effects over the whole economy.

- Climate variability is projected to have a substantial effect on **agriculture** both in terms of crop yields and the location where different crops can be grown. In Northern countries, CC can lead to an extension of the crop season as well as to an expansion of suitable areas for crop cultivation, higher yields and the introduction of new crop varieties thanks to warmer climate conditions. On the contrary, CC may have severe effects over southern regions because of higher temperatures, water shortage and extreme weather events. Drier conditions and rising temperatures will affect livestock activities in different ways, including implications for animal health and welfare.
- Negative effects are expected over **forestry** and **fisheries**. Increased temperatures, droughts and storms will increase the risk of forest fires, especially in southern Europe, where the ecosystems are already degraded. Forest growth is projected to decrease in southern countries and to increase in northern Europe. Forests' biodiversity is expected to change across Europe, with changing tree species and increasing threats for specialized plant communities. In the fisheries sector, global warming can lead to a displacement of fish stocks, regional declines in some species or, on the contrary, to an increase of populations which can create environmental stress (reduced oxygen concentration and ocean acidification, etc.).
- Economic consequences for **touristic regions** can also be substantial. The suitability of southern Europe for tourism is projected to decline markedly during the key summer months but improve in other seasons. Central Europe is projected to increase its tourism appeal throughout the year. Extreme weather events (storms, hurricanes) may also have negative

⁵ Ibid p.9

impacts so as reductions in snow cover which will affect the winter sports industry in many regions.

- **Transport:** the projected increase in frequency and intensity of extreme weather can enhance negative impacts on the transport infrastructure, causing injuries and damages as well as economic losses. In 2012, the research “Weather project” has for instance concluded that from 2010 to 2050, due to weather extremes, rail transport will experience a substantial increase in all cost categories (i.e. comprising direct costs to the transport sector and indirect costs to its users and to other sectors)⁶.
- The impact of climate change is particularly pertinent to the **construction industry**. Buildings can be damaged or rendered unfit for use by any changing climatic condition or extreme weather event: rising of sea level, floods, occurrences of extreme low or high temperatures. **Urban-planning, investment in resilient infrastructure and housing** will play a crucial role regarding disaster prevention.
- **Public services** will also be impacted. As underlined by a recent EPSU study⁷, central and local government, social services, education, healthcare, public transport, disaster management, and emergency services (e.g. firefighters) will be put under pressure⁸. The case of emergency services is of particular importance. Climate change is expected to have severe impacts over human health and mortality. At the same time, these services (especially the medical sector) are facing personnel shortages in most of EU countries following the recent crisis-related budget cuts.
- Major utilities, such as **energy** (e.g. increased electricity demand for air-conditioning) and **water** providers (e.g. water scarcity), will also be affected. CC is expected to reduce demand for heating in northern and north-western Europe and to strongly increase energy demand for cooling in southern Europe, which may further exacerbate peaks in electricity supply in the summer. Further increases in temperature and droughts may limit the availability of cooling water for thermal power generation in summer but also for other activities which are heavily water dependent (agriculture for example).
- The probability of most types of extreme event is expected to change significantly, what can in turn affect the **banking and insurance sectors** (higher insure premiums, high vulnerability of low-income populations, new risks and financial products).
- Last but not least, multiple indirect impacts are also expected. These can for example relate to the **manufacturing sector and the industry**, due for instance to a lower availability of raw-materials, water-scarcity, price hikes, disruption in logistic supply chains or lower labor productivity (e.g. for outdoor workers).

⁶ <http://www.weather-project.eu/weather/index.php>

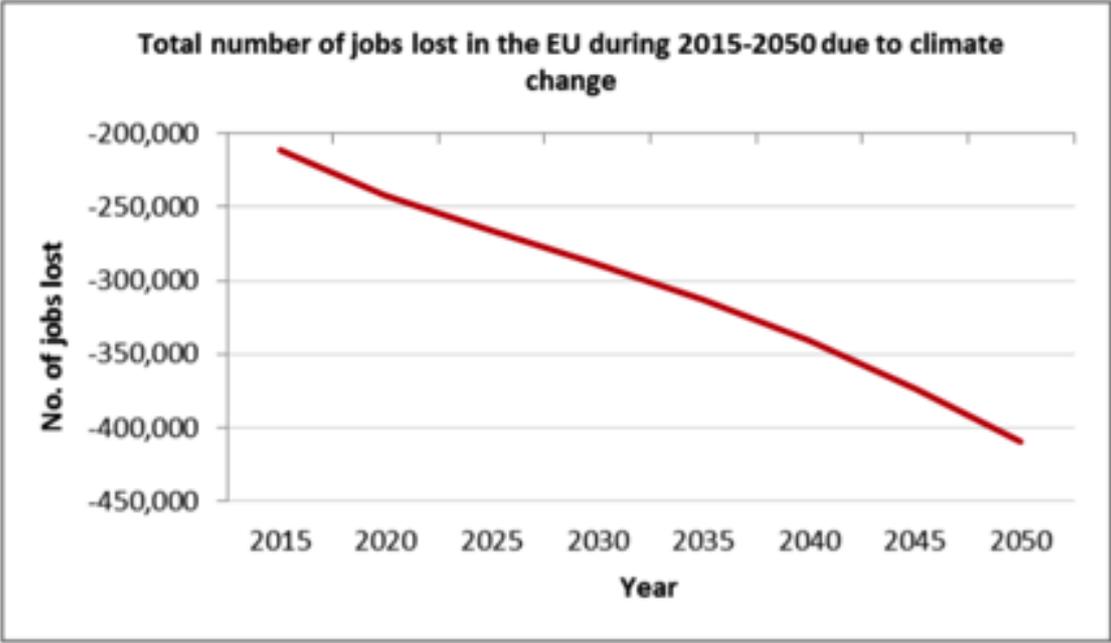
⁷ <https://www.epsu.org/article/epsu-feature-adaptation-climate-change>

⁸ Galgoczi B. (2017), Public services and adaptation to climate change, EPSU, available at: <https://www.epsu.org/article/epsu-feature-adaptation-climate-change>

3. Potential employment impacts of climate change over EU employment

Very few information is available on climate change impacts over employment in the EU. During the course of our research, only 1 report (Triple E Consulting 2014) has been identified as giving a comprehensive overview of the issue⁹.

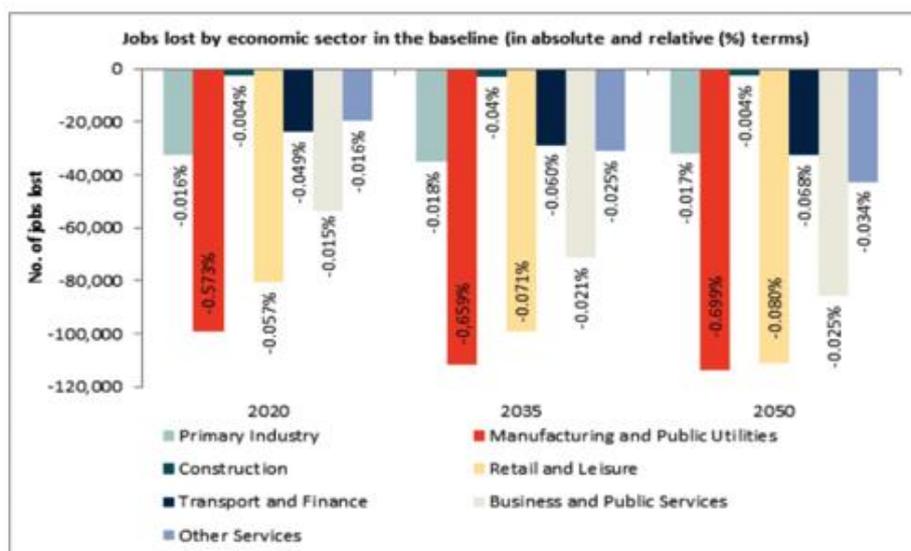
According to the authors, the impacts of climate change on employment in EU sectors is estimated at 240 thousand and 410 thousand job losses by 2020 and 2050 respectively, in case no adaptation measures are taken. These job losses (Figure 2) are associated to the negative consequences of CC over the most impacted economic sectors and their spill-over effects over the whole economy. They are also linked to an overall decrease in labor productivity due to the increase of natural hazards such as heat-waves or droughts.



The Triple E report estimates that the highest job losses should occur in in Bulgaria, Croatia, Cyprus, Estonia, Greece, Latvia, Lithuania and Romania. This is explained by the fact that these countries have a large agricultural sector as well as, in a majority of them, a well-developed touristic sector. On the contrary, 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. Scandinavian countries and Great Britain have positive climate change effects on a number of their economic sectors including agriculture, forestry and tourism.

Regarding the sectoral dispatching of job losses due to climate change, 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) and business and public services (up to 90 000 jobs lost). These results may be surprising as these sectors are not all identified as the sectors suffering the most from CC.

⁹ 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>



This situation is caused by the important spill-over effects of CC on these sectors, via down-stream inter-sectoral linkages. The negative effect of climate change on manufacturing and utilities, for example, is due to an expected loss of labor productivity and the indirect effects from other economic sectors such as 'Primary Industry' and 'Retail and Leisure'. The manufacturing industry is heavily dependent on primary industry but is much labor intensive, what explains the important differences in terms of job losses. 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 sector of the economy.

4. The need for adequate adaptation policies

Climate change adaptation can be defined as the process of adjustment of a society or a natural system to the evolution of weather conditions caused by global warming, aiming at lowering the risks caused by these evolutions and exploiting their potential beneficial opportunities. The primary objective of adaptation measures is of course to reduce climate vulnerability of specific regions, economic sectors or populations.

These measures can for example consist in investment in infrastructure to protect against natural disasters (urban and coastal planning, defenses against sea-level rise, improving the quality of road surfaces to withstand hotter temperatures, etc.), development of resource efficiency management systems (energy, materials, circular economy), behavioral shifts, (individuals using less water, increased use of air-conditioning, farmers planting different crops and more households and businesses buying flood insurance) or strengthening social protection systems and adopting of adequate prevention measures (e.g. Investments in firefighting equipment), etc. Adaptation policies help reduce the costs associated to climate change. According to the Commission, every euro spent on flood protection could save €6 in damage costs.

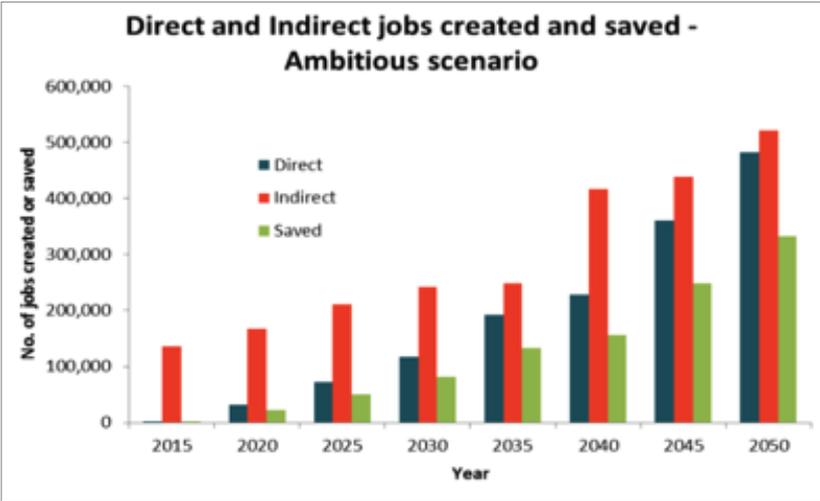
In April 2013, the European Commission adopted the EU adaptation strategy¹⁰¹¹, which is based on 3 main objectives: promoting action by Member States, better informed decision making and promoting adaptation in key vulnerable sectors. Since then, the commission monitors the adoption of national

¹⁰ <https://climate-adapt.eea.europa.eu/eu-adaptation-policy/strategy>

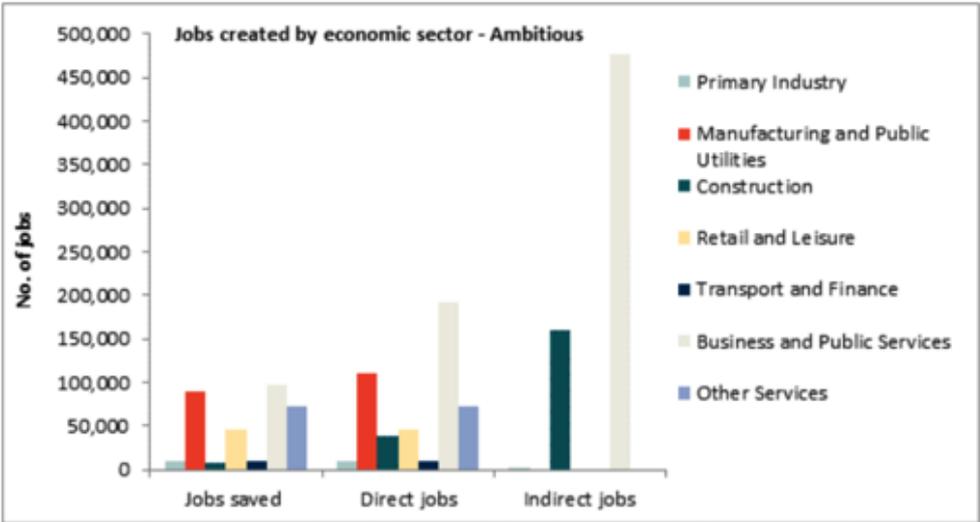
¹¹ A review process has been launched in 2018 as adaptation is now more urgent than forecast in the EU's 2013 adaptation strategy

adaptation strategies (NAS) by EU Member States: 25 out of 28 of them had adopted NASs by early 2018^{12,13}.

Adaptation has positive effects over the economy and employment. First of all, adaptation contributes to preserving existing jobs through maintaining viability and resilience of existing businesses. Furthermore, many adaptation measures will require substantial investments which can stimulate demand for labor. 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 impacts over employment of the implementation of adaptation measures at EU and national level, 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 1 mln direct and indirect jobs (ambitious scenario) by 2050. Adaptation measures could also help to preserve from 136 000 to 300 000 jobs on 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.



¹² Strategies are being developed in the remaining three Member States (Latvia, Bulgaria and Croatia) but have not yet been adopted.

¹³ 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.

5. Impact on skills' needs and health and safety at work

Climate change and adaptation policies are expected to have strong implications on the labor market and will therefore raise the need to adapt worker's skills and competencies. Adaptation also means adapting working conditions in order to guarantee health and safety at work.

Skills

Climate change and adaptation policies will have various impacts on the job market. Of course, these impacts will vary significantly among the different sectors and regions concerned:

- Climate change may lead to the disappearance of certain activities, thus raising the need for a requalification of workers, the setup of adequate social protection measures and the development of new economic activities to tackle potential unemployment.
- Similarly to green jobs, workers will have to adapt their existing competences to new demands. This will require additional training to familiarize workers with new adaptation-related concepts and practices, the adaptation of educational and vocational programs and the development of life-long learning programs. Up-skilling may require significant investment in skills in some sectors due to the scale of up-skilling required.
- Last but not least, climate change adaptation can lead to the development of completely new economic activities and therefore the need for entirely new skill profiles.

A report published by Oxfam in 2010 showed that adaptation related jobs will require all skills type and levels¹⁴. This ranges from farmworkers to civil engineers, planners, construction workers and environmental managers. The more recent Triple E report has concluded that investments into climate change adaptation will mainly increase the need for workers with average or higher education levels. Average education people are for example office clerks and protective service workers. The increasing number of high skilled workers can be explained by the fact that a large share of CCA investments is spend on consultancy, engineering and R&D related services where people with highest level of education are working.

Health and safety

Climate change is expected major impacts over human health¹⁵ and therefore also over health and safety at work.

All types of natural hazards (heat or cold waves, increased rainfalls, storms, etc.) can impact workers and this in many different ways ((e.g. extreme temperatures or intense natural hazards keeping people from performing their jobs or reaching their workplace). This situation leads to the obligation of implementing measures aiming at securing the workplace, such as adapting working conditions, investing in adapted means and equipment (e.g. air conditioning) and training workers in relation to the risks they may face.

According to the ILO¹⁶, the increasing frequency and intensity of various environment-related hazards caused or exacerbated by human activity have already reduced labor productivity. Between 2000 and

¹⁴ Oxfam (2010) "A fresh look at the green economy: Jobs that build resilience to climate change", available at: <http://www.oxfamamerica.org/static/media/files/a-fresh-look-at-the-green-economy.pdf>

¹⁵ Recently, the World Health Organization (WHO) that 150 000 deaths worldwide were caused by climate change in 2000. The organization forecasts this number will increase and reach 250 000 deaths per year worldwide by 2040.

¹⁶ ILO (2018), The employment impact of climate change adaptation. Input Document for the G20 Climate Sustainability Working Group, available at : https://www.ilo.org/global/topics/green-jobs/WCMS_645572/lang--en/index.htm

2015, 23 million working-life years were lost annually at the global level as a result of such hazards. 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.

The JRC PESETA III¹⁷ research also underlines the risks related to the higher temperatures over labor productivity. According to the report, under a high warming scenario and assuming no adaptation, daily average outdoor labor productivity could decline by 3.4% in the EU, with large variation across the EU: in Southern Europe a reduction up to 17% by the end of the century and in Northern Europe by up to 4%. The report focuses mainly on outdoor workers, which should be the most affected. Indoor workers can however also be impacted, as demonstrated by the strikes organized recently by bank workers and bus drivers in France and Belgium following the occurring of important heat waves. This can also be the case of public authorities' workers. This can be problematic, as public authorities are on the one hand expected to play an important role with regards to climate adaptation (definition of policies, implementation of adaptation measures, urban planning, etc.) and on the other hand are confronted to continuous cuts in public investment and spending.

6. Implications for trade unions

As shown in this report, climate change and adaptation policies may have important impacts over the world of work. Trade union action is needed in order to ensure the mitigation of their negative effects and the exploitation of the positive ones. Potential trade union actions could include:

- **Inform and raise awareness among trade unions** at all levels (European, national, sectoral, regional) about the potential consequences of climate change on employment, working conditions and health and safety at work. These impacts are not always known and understood. At the moment, only a very limited number of studies or research works have been made about these impacts.
- **Participate to the elaboration, implementation and monitoring of national and local adaptation strategies** (or the adaptation parts of national climate strategies) in order to ensure that climate change impacts over employment and workers are considered and a just transition pathway is ensured. At the moment, the vast majority of climate adaptation strategy does not deal with employment issues.
- **Promote the elaboration of regional adaptation strategies** aiming at increasing resilience and anticipating the consequences of climate change over the local economic tissue. The local / regional dimension is of key importance. Around three quarters of Europe's population lives in urban areas (EEA)¹⁸ and expert projections suggest that up to 80% of adaptation costs will emerge in cities¹⁹. Across the EU, around 40 % of cities with more than 150 000 inhabitants are estimated to have adopted adaptation plans. Climate impacts over the different European

¹⁷ Ciscar J.C., Feyen L., Ibarreta D., Soria A., loc. Cit.

¹⁸ EEA (2012) 'Urban adaptation to climate change in Europe' report No 12
<http://www.eea.europa.eu/publications/urban-adaptation-to-climatechange>

¹⁹ Galgoczi B., loc. cit.

cities can be identified, among others, through the recently launched Urban Adaptation Map Viewer²⁰, developed by Climate-ADAPT, the EU platform on adaptation²¹.

- **Promote the elaboration of European, national and regional sectoral strategies** aiming at dealing the consequences of climate for workers in the different sectors impacted. Such strategies should include at least impact assessments, evaluations of potential job destructions and creations, skills mismatches as well as an analysis of climate impacts over working conditions.
- **Promote the allocation of European and national funds for climate adaptation measures.** Under the European Regional Development Fund (ERDF) and Cohesion Fund (CF), a substantial amount of funding can be directly tracked to adaptation-related investments. In addition, the current common agriculture policy includes a number of measures relevant for adaptation as well as for mitigation spread across several priorities. The implication of TU organization in the management of these funds may have an important impact over the whole process and favor a just transition. Since 2013, article 5 of Regulation 1303/2013 containing common provisions on ESI Funds strengthen their role by involving them in all stages of the planning, implementation, monitoring and evaluation of projects financed by ESI funds.

	EU support	Climate-related	Of which		
			Direct mitigation	Direct adaptation	Supportive measures for both
ERDF and ETC ³⁰	196.7	37.9	30.8	3.4	3.6
		[19.3%]	[15.7%]	[1.7%]	[1.8%]
CF	63.4	17.6	13.4	3.0	1.3
		[27.8%]	[21.1%]	[4.7%]	[2.0%]
ESF ³¹ and Youth Employment Initiative	88.9	1.2	1.2	-	-
		[1.3%]	[1.3%]	-	-
EMFF ³²	5.7	1.0	1.0	-	-
		[18.2%]	[18.2%]		
EAFRD ³³	99.0	56.5	5.4	7.5	43.6
		[57.1%]	[5.5%]	[7.6%]	[44%]
Total	453.7	114.2	51.9	13.9	48.5
		[25.4%]	[11.4%]	[3.1%]	[10.8%]

Source: European Commission

²⁰<https://www.covenantofmayors.eu/news-and-events/news/1694-get-informed-about-european-cities-adaptation-needs-and-actions-through-the-urban-adaptation-map-viewer.html>

²¹ <https://climate-adapt.eea.europa.eu/>