Discussion Forum

The job quality side of climate change

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Climate change is having a profound and transformative impact on the way we live and work. These impacts are direct, through the great shifts in temperatures and weather patterns which are being growingly felt across the globe, and indirect, through the measures and policies that are being deployed in order to tackle it. The Council recommendation on ensuring a fair transition towards climate neutrality confirm the endorsement of EU Member States towards "*the imperatives of a just transition of the workforce and the creation of decent work and job quality*", which have been established in the United Nation's Sustainable Development Goals and the Paris Agreement. This idea motivated Eurofound in a recent report, "the Job quality side of climate change" to investigate how climate change impacts job quality through a literature review, the consultation of its European network of correspondents and some statistical analysis of the European Working Conditions Telephone Survey of 2021.

The article will first set the scene by describing job quality, and its main components, depicting the relationship between Green House Gas emissions (GHG) and the employment levels by sector of economic activity. The latter can suggest priorities for decarbonisation. Changes in jobs =also occur as result of greening which is the process through which occupations adapt the content of their tasks to climate change with a significant impact on changes in the work performed and job quality in these occupations. It will then explore how job quality is expected to change due to climate change risks, and as a result of the greening of tasks and occupations. It will finally consider climate change as a possible driver to reinventing work, by changing the work processes involved in the current extraction, production, distribution and consumption systems which would also impact on the job quality of workers.

Setting the scene

In order to evaluate the impact of climate change on job quality, it is important to introduce job quality is, employment and greenhouse emissions to assess the contributions of economic activities to emissions and the greening of tasks, the transformation of occupations due to greening.

Job quality

For more than a decade, Eurofound has been working with its tripartite stakeholders and the research community on the measurement, definition and operationalisation of job quality (Eurofound 2012, 2017, 2022).

The rationale for measuring job quality and capturing job quality dimensions, at the level of the job is that this is the level of the contract between an employee and its employer. There is a legitimacy of public authorities to intervene in case of externalities.

Job quality is made of these characteristics of work and employment that have a proven causal relationship, positive or negative, with health and well-being as evidenced by high quality epidemiologic studies (for example Niedhammer et Al. 2022, Costa et al, 2010).

Positive and Negative refers to the fact that workers while carrying their job, are exposed to "job demands" and "job resources". Job demands are job attributes that require an effort and increase a worker's risk of poorer health and well-being. Job resources are attributes that support workers, doing so in three ways: by reducing job demands and their physiological and psychological costs; by helping workers achieve their work goals; and by fostering personal growth. This conceptualisation is in line with the job demands–resources model proposed by Bakker and Demerouti (2008).

Job quality is multidimensional: one way of organising all these characteristics of work and employment is to consider different dimensions or domains. Eurofound has been organising its monitoring of job quality around 7 indices: earnings, prospects, working time quality, skill use and discretion, social environment, physical environment and work intensity (Eurofound, 2012 and 2017).

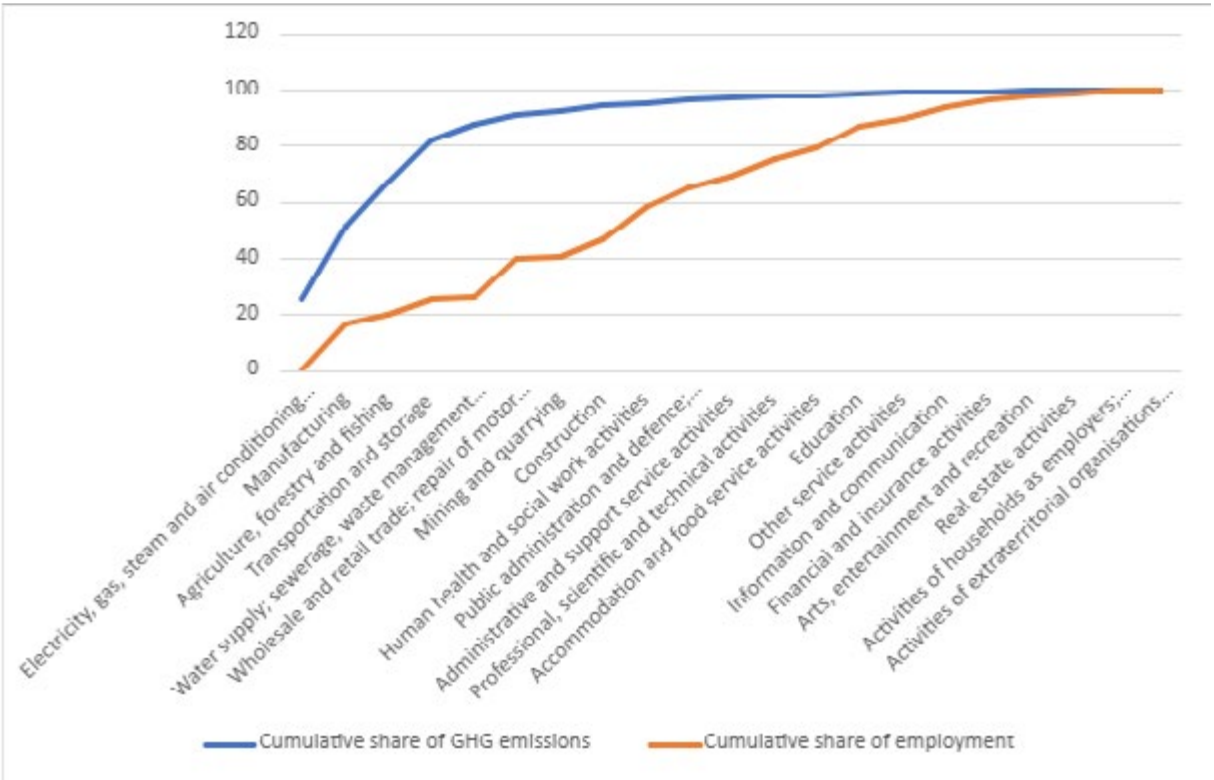
It is the combination of negative and positive attributes that determines how good a job is. For instance, if a worker experiences very intense work, having the autonomy to decide how to do it may reduce the adverse impact on them. By capturing job quality at individual level, these compensating and interacting effects can be measured most effectively. A job is described as 'strained' when the number of demands exceeds the number of resources and 'resourced' when the number of resources exceeds the number of demands. Workers in strained jobs are at risk of poorer health and well-being, not only in the short term but also in the medium and long term.

Employment and greenhouse emissions

The European Green Deal launched by the European Commission in 2020, reflects the European Union's commitment to make the region climate neutral by 2050. In order to achieve such goal, the "Fit for 55" set of legislation has been adopted with a view to reduce net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

Eurostat Statistics for the European Green Deal clearly show that the volume of emissions of greenhouse gases (GHG) per employed person has been declining in the EU, at least, since 2010. This results, on the one hand, from decreasing GHG emissions and, on the other hand, from increasing employment in the EU. In 2020, there were 13.6 tonnes of GHG emissions by every employed person in the EU, the lowest value on record and 4.4 tonnes less than in 2010 (Eurostat, 2022). However, despite this positive and auspicious outlook, not all sectors of activity produce the same amount of GHG emissions nor employ similar shares of people.

Figure 1 – Cumulative GHG emissions and employment by economic sector of activity. EU27, 2022 (%)



Note: the blue line shows the cumulative share of total GHG emission by sector from the left to the right; the orange line shows the cumulative share of employment.
Source: Eurostat, European Union Labour Force Survey, employed population over 15 years old (lfsa_egan2) and air emissions accounts, greenhouse gases (env_ac_ainah_r2).

The figure ranks broad economic activity sectors by their share of total GHG emissions in 2022, from the sector with most GHG emissions on the left, to the least emitting sector on the right-hand-side. The graph shows that the sector with the largest share of GHG emissions in 2022 – electricity, gas, steam and air conditioning – accounts for 26% of emissions but less than 1% of the total employment in the EU. Overall, the largest emitters of GHGs in the EU account for a relatively small proportion of the total employment in the region: the sectors to the left of (and including) water supply and waste management produce 88% of the EU's total GHG emissions but employ only 27% of the EU workforce. If this criterion is used to assess the size of workers likely impacted by climate policies, it is not necessarily very large. An

important use of this figure is to identify main industries to restructure as we aim to decarbonize.

Climate change and the greening of tasks

One possible perspective to investigate the impact of climate change on job quality is through the greening of work tasks and occupations. According to Dierdoff et al. "the greening of occupations refers to the extent to which green economy activities and technologies increase the demand for existing occupations, shape the work and worker requirements needed for occupational performance, or generate unique work and worker requirements."

By using this perspective, we can assert that the green transition is likely to impact occupations in three possible ways. It will lead to the development of new occupations, some of which do not even exist yet (for example, green policy planners, renewable energy engineers). In many cases, it will transform existing occupations, requiring different and new skills to be learned and developed (for example, construction managers, electrical engineering technicians, meteorologists). Finally, some existing occupations are needed to 'make and build' the transition (for example, crop and vegetable growers, carpenters, fitters, welders, insulation workers, electrical engineers), leading to increased demand for these occupations, but without significant transformation of their skill sets. Other occupations will be less impacted or not impacted at all by the green transition; tasks will not change per se although job content may be informed by the transition (for example, occupations in the education or health sectors).

According to EWCTS 2021 data, more than 50% of the workers employed in agriculture, mining, water supply and sewerage waste management, construction, transportation, electricity and gas supply, manufacturing, and extraterritorial organisations and bodies are in occupations which are likely to be impacted by greening.

Why should job quality be an essential ingredient of conversation on the adaptation of companies and work to climate change?

Let's now turn to examining what current evidence tells us about the association between job quality and climate change. First, we will examine the issue of climate change risks and their impact on job quality, then estimate the job quality of jobs according to greening, turn to those sectors that are at the intersection of different climate change influences and illustrate with two examples.

Climate change risks at work, an increase in exposure in risks which can also impact on other dimensions of job quality

Environmental degradation is associated with changes in the working environment, including exposure to heat and air pollution, ultraviolet (UV) radiation, increase in the frequency and intensity of extreme weather events, and communicable vector-borne diseases and expanded vector habitats. It is also associated with changes that impact on natural resources in the work environment (Schulte and Chun, 2009; Adam-Poupart et al, 2013; Schulte et al, 2016).

Climate change also leads to an increase in psychosocial risks, for example linked to fear of employment loss and increased insecurity. Job insecurity can arise as a result of climate degradation, when the yields of agricultural products decline; as a result of adaptation policies, when there is pressure to close certain industries (such as coal mining); or as a result of mitigation policies, as new skills are needed to work in the same industry.
Emerging occupations and industries also come with specific occupational risks and job quality profiles: in some cases, "known" risks are combined in new industries and work situations in novel ways; in other cases, new or unknown risks may emerge.

Working outside and working in the emergency services increase exposure to climate change risks. The exposure of workers in these occupations and work situations will be higher than that of the general population as their job is to face these situations. Certain industries and occupations, such as agriculture, construction, energy, municipal services, tourism and healthcare, are more impacted by climate change and climate policies than others. Some groups of workers are more exposed than others, such as men, migrant workers and low-wage workers.

While exposure to some climate change risks such as heat, UV radiation is highest for workers in certain specific occupations and work situations, exposure to extreme weather events will impact on all workers concentrated in the area; it can also impact on companies and industries whose value chain production depends on companies located in the area where the extreme weather events occurred.

Research has found that workers in occupations vulnerable to heat have poorer job quality and working conditions due to rising heat levels (Schulte, P. A. and Chun, H. (2009)). Heat exposure makes performing work activities more strenuous and difficult: it increases physical discomfort, reduces manual dexterity and affects cognitive performance, visual motor capacities, short-term memory and vigilance It alters workers' emotional state (leading to irritability or anger) and can aggravate tensions within an organisation or with the public, and it is therefore ultimately likely to increase psychosocial risks at work (Anses, 2018).

Practices on adaptation to regular and strong exposure to climate risks can lead to different answers that have different impact on job quality:

There are different ways that a climate change risk can impact job quality. for example,

> In order to prevent work under extreme hot temperatures, companies may decide to adapt the timing of work; as a result exposure to high temperatures will decrease but work in the evenings, or in the morning (times where the temperature is less hot) will increase, resulting in an increase in a working time job demand. This is also likely to impact more negatively women who remain more engaged in caring work particularly of children and might have to decide between caring for their children or going to work at these early and late time of the day where social services may not be available.
>
> Another example found in the report shows how a technical solution to address work in high temperature may lead to positive benefits in overall job quality. The Dutch association of construction and infrastructure companies, advises its members to invest in on-site facilities, alternative construction methods and changing employee behaviour (Bouwend Nederland, 2022). Investing in on-site facilities may include providing good shelter, such as a construction tent. These can provide more workable days, which makes meeting work schedules more feasible. Choosing new construction methods can also make the construction process less dependent on weather conditions and less hazardous, for example, modular construction.

These examples show the importance of bringing in the job quality perspective and its multiple dimensions while adapting job situations to climate change to assess if and how this transformation can be supportive (or not) of job quality. The "bad news of increase exposure to risks in work due to climate" change could at least be partially offset by practices which integrate job quality in their design and assessment.

Climate change and the greening of tasks: job quality a key element to support the successful implementation of the green transition

The greening of tasks will impact job quality as a "process" and as a "result". The process of greening calls for significant deliberations on what changes are needed as well as on the provision of a significant volume of training to workers in order to support their adaptation and ability to perform in their new roles. This would constitute a higher risk for those workers in "enhanced green occupations." Furthermore, the reorganisation of occupations is likely to lead to changes in the way work is structured with further implications for job quality. The quality of the change process (from anticipation to planning) will influence the job quality of workers as their work requirements change (Westgaard, R. H., & Winkel, J. (2011). Two essential dimensions to consider are the quality of collective and individual employee involvement in the design and implementation of the restructuring and reorganisations plans, the scope and content of supportive actions in particular in relation to access to training. Special consideration needs to be given to the conditions of access to training as part of the job or not. When this is not the case, workers for example with high care duties are at risk of

being excluded due to lack of time. Additional consideration also needs to be given to workers in self-employed jobs calling for different policy mechanisms to support change in the desirable direction.

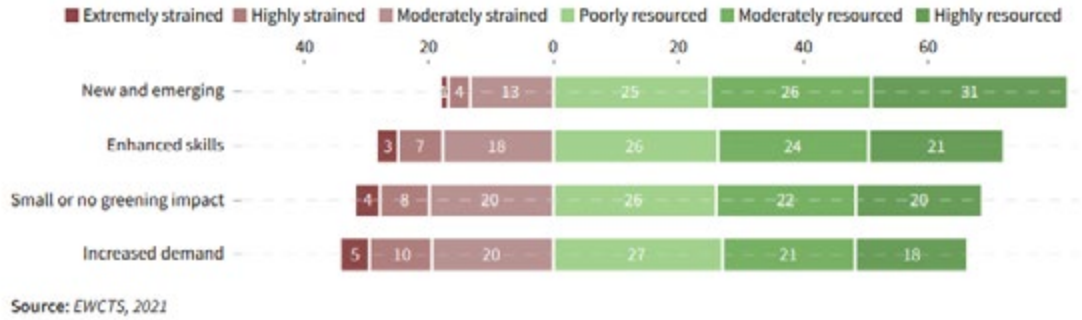
Greening also matters for job quality as the different groups of greening occupations have different job quality profiles with different specific job quality concerns.
When the current job quality in these occupations is estimated, the results show contrasting profiles amongst occupations.

Workers in increased demand occupations currently report higher than average exposure to job strain, which puts job holders at increased risk for their health and wellbeing. Workers in this group report higher exposure to job demands, in particular physical risks (such as handling or being in contact with infectious materials) and physical demands (such as, working in tiring or painful positions and doing repetitive movements), dependence (for the self-employed), intimidation and discrimination and job insecurity while at the same time they report weaker access to job resources, including task discretion and autonomy, organisational participation and workplace voice, intrinsic rewards (such as receiving recognition for their work, social support (by colleagues and managers) and opportunities for self-realisation.

As our societies embark on the process of decarbonisation, it is important to monitor if and how the jobs involved will be of good quality. What should we do if we want a green transition based on jobs and work environments of good quality? We should develop a preventive approach aimed at decreasing exposure to job demands and supporting access to more and better job resources, and closely monitor this approach throughout the transition.

This highlights the importance of supporting job quality to support the implementation of the green transition. Previous work of the European Commission (ESDE 23) have shown that most occupations experiencing persistent labour shortages had poorer job quality. This is a concern that we would need to anticipate. In this context, increased demand occupations are at most risk from a job quality perspective and deserve policy attention to improve working conditions in these jobs.

Figure 4: Job quality index, by greening occupational group, EU27 (%)



Source: *EWCTS, 2021*

Sectors under multiple climate change influences: an opportunity to improve job quality

By combining the various influences described in the first section of this article such as increase exposure to climate change risks in some sectors the proportion of GHG, the proportion of greening occupations in these sectors, one can identify sectors likely to experience the highest level of change.

These sectors are at the heart of the transformations linked to climate change.
We illustrate our point with two sectors, agriculture and energy.

Agriculture

This sector is responsible for about one fifth of all emissions.
It plays an essential role in satisfying the basic human need for food. It also contributes to ecosystem health. This is a sector characterised by more than half of the workers being self-employed. Self-employed workers have a different access to lifelong learning and to different labour standard rights and protections. Also, close to a fifth of workers are over 56-years-old and about two thirds of workers are male.

Agricultural workers are highly exposed to climate change hazards including financial insecurity as yields become less predictable and farmers may need to adapt their practices to the new environmental conditions. The quality of adaptation practices and the risks associated with maladaptive practices need to be considered. Maladaptive practices, such as the increased usage of chemical pesticides due to declining yields, could increase exposure to dangerous substances and impact the quality of the food produced.

According to the EWCTS 2021, about 80% of agricultural workers are working in occupations likely to be impacted by greening: 71% work in increased demand occupations; 7% in enhanced skills and 2% in new and emerging occupations.

In terms of job quality, agriculture is a sector in which the share of workers in strained jobs is larger than the EU average and most other sectors. According to the data of the European Working Conditions Telephone Survey 2021, overall, 40% of workers in agriculture, forestry and fisheries are in strained jobs, in which job demands surpass job resources. Workers in agriculture tend to be more exposed to physical risks, physical demands, unsocial work schedules and perceived job insecurity than the EU average. At the same time, in terms of job resources, workers in agriculture tend to present better than average opportunities for self-realisation but worse than average in terms of social support, task discretion and autonomy, and training and learning opportunities. From a working life perspective, while a comparatively large share of workers reports a high level of engagement, many report difficulty in making ends meet (51%), having their health and safety at risk because of work (46%), while more than half report physical and/or emotional exhaustion (53%) (Eurofound, 2024).

Energy

Although renewable and clean energy is meeting a growing share of Europe's energy needs, in 2022, the energy production sector (including the electricity, gas and steam supply) still accounted for 26% of the EU's total GHG emissions.
Like agriculture, energy is both part of the 'problem' and the solution for climate change as we depend on energy for most of our activities and production while quality of life depends on a reliable supply of energy at an affordable price. Many jobs are at risk in the fossil fuel industry, leading to the need to cater for and retrain workers involved.

In the case of extreme weather events and when the energy supply is down, industry, transport, services, cooking, heating, lighting, payment systems and access to the internet will all be negatively affected. Higher temperatures, humidity and dust deposits on insulators also increase the risk of systems failure.

According to the EWCTS, close to two thirds of the workforce in the energy sector are currently employed in occupations likely impacted by greening: 20% belong to new and emerging occupations, 23% to enhanced skills ones and 21% to increased demand.
Renewable and clean energy such as wind energy generation and solar energy generation come with specific combinations of old occupational risks but also new, less known risks. Furthermore, the production and supply of renewable energy sources are decentralised, and, as a result of that, new, smaller companies may enter the sector without always having the necessary work safety culture set-up.

In terms of job quality, according to the EWCTS, the energy sector fares better than the EU average, with 'only' 24% of its workers in strained jobs. In fact, the sector performs better than the EU average in all job demand dimensions, and especially in terms of physical risks and physical demands. The sector also fares relatively well in most job resource dimensions, only falling behind the EU average in terms of opportunities for self-realisation.

All these facts suggest the high relevance of job quality in supporting the transition of the agriculture and energy sectors. At the same time, it indicates different priorities for setting the appropriate job quality agenda in the different sectors.

Climate change influences on production processes and final products and services

This global and sectoral perspective should also be completed by evoking the actions of companies and organisations and their employees. There are many ways companies and organisations can engage. Companies and organisations may change their practices as they engage in "green workplace behaviours", which are 'scalable actions and behaviours that employees engage in that are linked with and contribute to or detract from environmental

sustainability' (Ones and Dilchert, 2012). They are diverse in their nature; examples of green behaviours contributing to environmental sustainability are shown in Table 5 (Francoeur et al, 2021).

Table 5: Categories of green workplace behaviours

Category	Behaviours
Conserving	Recycling, reusing, reducing use, repurposing
Avoiding harm	Preventing and reducing pollution, monitoring environmental impact, strengthening ecosystems
Transforming	Choosing responsible alternatives, changing how work is done, creating sustainable products and services, embracing innovation for sustainability
Influencing others	Educating and training for sustainability; encouraging and supporting others
Taking initiative	Initiating programmes and policies, lobbying and activism, putting environmental interests first

Source: *Francoeur et al, 2021*

Little evidence is available yet on the extent to which companies and organisations engage in such practices. First results from a Finnish survey (Moilanen and Toika 2023) suggest that most employees in Finland do not perceive the organisations in which they work as sustainable, and actions to hasten the transition to sustainability are scarce. Training on sustainability is not yet common and neither are collaborative climate actions.

These behaviours are likely to impact on job quality when they become part of the job tasks. For example, the introduction of such behaviours can be under the direct influence of employees or not. This suggests the more changes will happen in companies and other organisations in the next years, which would likely impact on the job quality of workers.

Conclusion

There are multiple ways by which climate change will impact job quality, directly and indirectly. Climate change will profoundly impact labour markets, as well as working conditions and job quality. However, current research evidence remains patchy and the implications, particularly for working conditions and job quality, are less researched and less well understood than is the case for other megatrends such as digitalisation and population ageing.

More research is needed, including concrete adaptation practices including maladaptive practices. The evaluation of practices should assess how the different dimensions of job quality are impacted, identify and measure the trade-offs between job quality dimensions as well as their impact on workers' wellbeing and the performance of companies and other organisations. This would support the dissemination of good practice.

The fact that those occupations that are likely to be impacted by greening of the economy through an increase in demand, which represent an important share of the whole workforce, have poor job quality calls for strong action towards the improvement of working conditions and job quality. Overall, the impact of climate change and the green transition in terms of job quality will be probably mixed – with the creation of both new and probably better-quality jobs and of increased demand jobs with inferior job quality. In addition, the other occupations likely impacted by the greening of the economy (new and emergent occupations, or requiring some re-skilling), may have a job quality similar or better than average but can still benefit from improvements in some dimensions. So it will be extremely important to monitor if and how the jobs involved will be of good quality.

This short overview of the influence of climate change, and the policies addressing it, on job quality identifies the strong benefits of bringing job quality into the conversations about climate change at work and in companies and other organisations. Such conversations are likely to be different according the various sectoral perspectives. Altogether, this pushes for a wider job quality improvement agenda that covers not only exposure to physical and psychosocial risks, but also other aspects such as the conditions of learning at the workplace, applying one's own knowledge and skills, or access to job resources.

As climate change will lead to changes in the work performed, the processes used, and the exposure to job demands and job resources available, there are many benefits in shaping policies and practices to changing climate change by mainstreaming job quality and integrating job quality concerns.

A better understanding of the implications of climate change on job quality calls for the development of new methodological and conceptual tools, or at least improvement of existing ones. It is important that working conditions surveys, for example, cover specific issues related to the impact of climate change and the extent to which workplaces address the challenges posed by climate change and measures put in place to address it. Companies cases studies and workers interviews can support the development of new indicators.

Numerous bottom up initiatives address these issues : how can we collect and analyses these practices to increase the speed of collective learning ? Let's advance in this journey to prepare a future that we want in our changed climate environment by having job quality at the top of our agenda. It is not a matter of just measuring how many jobs will be destroyed or created with the green deal. It is a matter of ensuring that all stakeholders are involved in the design, implementation and monitoring of the necessary change, from tasks at individual level, to work processes at the workplace, to infrastructure and supportive social policy at societal level. This means that in order to ensure a just transition, workers, their representative organisations, their families, and their communities are, more than heard, duly involved in the whole process. The Stakes are extremely high, time is short and collective intelligence and cooperation are key resources to advance.

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