

# Decarbonisation and Labour Markets

Climate policies and green subsidies  
change the labour market and the skill  
composition of the workforce



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## Key Messages

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- The effect of subsidizing green employment may be estimated from US experience: green subsidies are more effective in regions with the appropriate green skills.
- The European Green Deal should make significant provision for retraining, taking account of the nature of workers' existing skills, and the distribution of green industries across EU countries.
- Increases in energy prices may have large effects on employment in individual firms, but less effect for the economy as a whole.
- Increases in energy prices tend to favour employees with technical skills rather than manual workers.



## Background and Context

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The debate on the labour market effects of climate policies has been always highly polarized, with advocates on both sides ignoring or exaggerating the effects. Advocates of carbon pricing and a green recovery tend to stress the creation of high-paying “green jobs”, while critics point to the job losses in energy-intensive industries exposed to international competition. The existing literature finds that the net effect of climate policies on employment is small, especially when general equilibrium and offsetting effects are considered. However, job losses are concentrated in polluting industries, raising concerns about the political acceptability of climate policies in regions highly dependent on those industries.<sup>1</sup>

The polarized debate reflects the fact that unilateral climate policies have two distinct effects on jobs: destruction of jobs in brown industries and creation of jobs in green sectors. The two effects are linked to each other at the macro-level through labor reallocation from brown industries (chemicals, metals, refineries, etc.) to green industries (construction, engineering and architectural services, manufacturing of machineries). Such a reallocation process may require, among the other things, workforce reskilling. The need for reskilling is further reinforced by the fact that climate policies trigger technological and organizational changes inside the firm that complement certain competences (e.g., technical) and substitute others (e.g., manual). It is therefore essential to assess which types of workers and skills will be mostly affected by the creative destruction induced by climate policies.<sup>2</sup>



## Increases in energy prices may have large effects on employment in individual firms, but less effect for the economy as a whole.

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The effect of stringent climate policy on employment was explored by studying the impact of the large historical increases of energy prices, a better proxy of a stringent climate policy than the EU-Emission Trading Scheme, on French manufacturing establishments<sup>3</sup> and 15 manufacturing sectors in different EU countries [4]. Both studies permitted the estimation of both short- and long-term effects (2000-2015 for the French study and 1995-2011 for the EU study). At the establishment-level, the large historical increase in energy prices (+56%) reduced manufacturing employment by approximately 5.5% in the long-run, especially in large establishments that are trade-exposed and energy-intensive. However, at a sectoral level of aggregation and for all EU countries the long-term effect of energy prices was often statistically insignificant, ranging between -1% and -1.5%.



In European manufacturing sectors, the long-term increase in energy prices increases the share of technicians by approximately 13%, and decreases the share of manual workers by approximately 6%



## Increases in energy prices tend to favour employees with technical skills rather than manual workers.

The opposite pattern is observed for the skill-biasedness of the effect. No long-term effect of energy price is found for different types of workers at French establishments. Conversely, skill-biasedness effects become important at the sectoral level for Europe. In the latter case, as shown in Figure 1, the long-term change in energy prices accounted for between 9.2% and 17.5% of the increase in the share of technicians, and 4.2% and 8.0% of the decrease in manual workers. This result is consistent with a bias of environmental policies towards technical and engineering skills

found by [2] for the US. Establishment-level effects are larger because they do not account for labour reallocation across establishments, while the macro-level analysis captures the fact that jobs are created in new establishments and destroyed in establishments that shut down. Skill-biased effects appear to emerge mostly as the result of a cross-establishment reallocation rather than of a within-establishment effect. Put differently, establishments with a larger share of technicians and a small share of manual workers are “selected” by the market in response to an increase in policy stringency.

### Percentage of the long-term increase (decrease manual) in occupational shares explained by the increase in energy prices

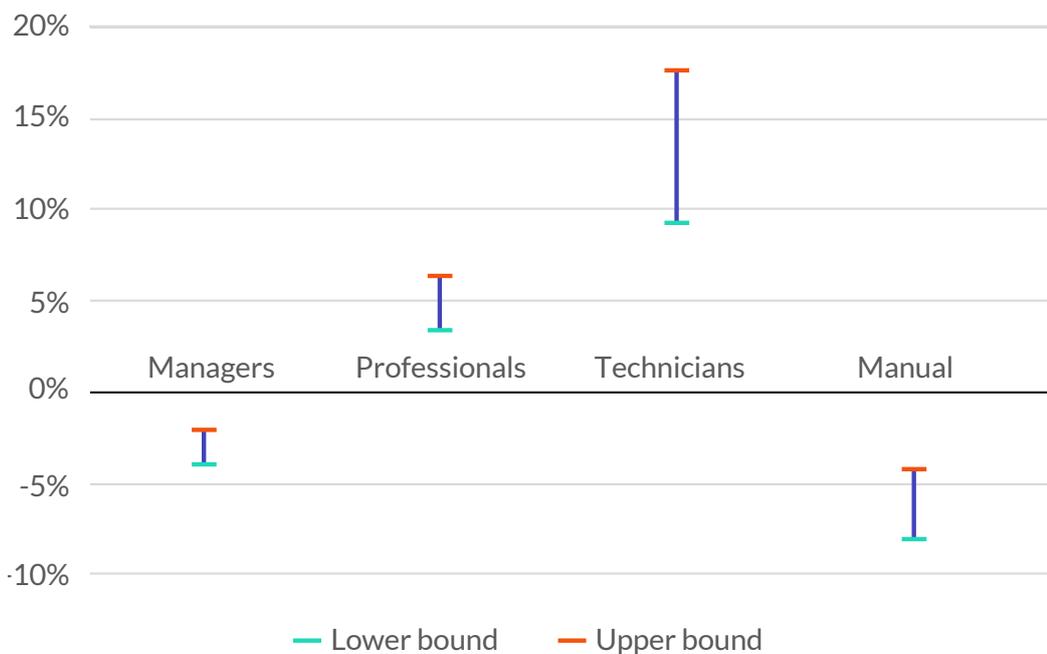


Figure 1: Effect of energy prices on employment for different groups of workers. source Marin and Vona (2019)

**The effect of subsidizing green employment may be estimated from US experience: green subsidies are more effective in regions with the appropriate green skills.**

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The American Recovery and Reinvestment Act (ARRA), enacted by Obama in 2009, was the largest green stimulus package ever implemented, with 19% devoted to projects such as building retrofits and weatherization, investments in public transport and clean vehicles, and Environmental Protection Agency (EPA) spending to clean up brownfield sites. The availability of the data at the commuting-zone level permitted the estimate of a green fiscal push in local labour markets, controlling for pre-existing employment trends and other characteristics affecting the allocation of green ARRA spending. This showed that a green fiscal push is significantly more effective in regions with a larger pool of green skills, and emerge especially in the long-run. The number of jobs created per \$ 1million is twice as large in US regions at the top quartile of the green skills distribution compared to the average effect<sup>5</sup>. This study also found that green spending benefits manual workers in the construction and waste management sectors. However, manual labor wages did not increase reflecting the fact that the green stimulus was too small to offset the long-term deterioration of the bargaining power of manual workers.

**The European Green Deal should make significant provision for retraining, taking account of the nature of workers' existing skills, and the distribution of green industries across EU countries.**

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These results can be used to guide the design of the green Covid-19 recovery packages, including the European Green Deal. First, retraining investments, especially for technical skills, should be a crucial part of these packages. Not only do they mitigate the distributional effects of climate policies, but they also enhance the job creation effect of the whole package. Second, retraining costs from brown to green jobs may be low because the two types of workers have similar sets of skills, but retraining workers for the green economy will be significantly costlier for workers displaced by automation and the Covid-19 crisis because the skill distances are much larger in these cases<sup>6</sup>. Third, given that green investment is most effective in countries and local areas that already have green industries, the cross-country distributional effect of a EU green deal are likely to be remarkably in favour of richer countries (e.g. Denmark, Germany, Austria and Sweden)<sup>7</sup>, which already have the required green competences and skills to expand green production successfully, while other countries are more specialized in traditional industries. To offset these distributional effects, countries lagging behind may need to receive a larger share of EU infrastructural investments, both material and immaterial.



## Further Information

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For further information, please consult the following publications:

- Vona, F., 2019. 'Job Losses and the Political Acceptability of Climate Policies: why the "job-killing" argument is so persistent and how to overturn it,' *Climate Policy* 19(4), 524-32 (editor's choice).
- Vona, F., Marin, G., Consoli, D., Popp, D., 2018. 'Environmental Regulation and Green Skills: an empirical exploration,' *Journal of the Association of Environmental and Resource Economists* 5(4): 713–753.
- Marin, G., Vona, F., 2021. 'The Impact of Energy Prices on Socioeconomic and Environmental Performance: Evidence from French Manufacturing Establishments, 1997-2014,' *European Economic Review* 135.
- Marin, G. and Vona, F., 2019. 'Climate Policies and Skill-Biased Employment Dynamics: evidence from EU countries,' *Journal of Environmental Economics and Management* 98, 102253.
- Popp, D., Vona, F., Marin, G., Chen, Z., 2020. 'The Employment Impact of Green Fiscal Push: Evidence from the American Recovery Act,' NBER working paper 27321.
- Chen, Z., Marin, G., Popp, D., Vona, F., 2020. 'Green stimulus in a post-pandemic recovery: the role of skills for a resilient recovery,' *Environmental and Resource Economics* 76, 901–911.
- Bontandini, F. and Vona, F. 2020. 'Anatomy of Green Specialization: evidence from EU production data, 1995-2015,' OFCE working paper 21/2020.



**This Policy Brief was written by:**

Francesco Vona,  
[francesco.vona@sciencespo.fr](mailto:francesco.vona@sciencespo.fr),  
OFCE Sciences-Po



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