

Do Renewables Create Local Jobs?

The opposition of local communities has become one of the main bottlenecks for deploying renewable energy investments. Why do residents oppose those investments, despite the expectation that renewable energies will bring socio-economic benefits, including new jobs? In recent research, Natalia Fabra, together with Bank of Spain researchers Eduardo Gutiérrez, Aitor Lacuesta, and Roberto Ramos provide an answer to this seeming paradox. Exploiting the variation in the timing and size of the renewable investment projects across more than 2,000 Spanish municipalities from 2006 to 2020, they find that new jobs are not always created in the municipalities where the investments occur. This finding has important implications for public policy.

 Natalia Fabra

A technological revolution has driven the costs of investing in renewable energies to record lows. For instance, over the last decade, **the cost of investing in solar photovoltaics and onshore wind has fallen by 88% and 68%, respectively** (IRENA, 2022). Together with the need to reduce fossil fuel consumption for environmental and security reasons, these cost reductions have fostered a massive roll-out of renewable energy investments around the globe. However, **a new, unexpected obstacle has emerged: the opposition of the local communities where the investments are located.** Residents oppose the new projects because of their widespread fear of negative impacts on land conservation, biodiversity, and some economic activities such as agriculture or tourism. But what about the local benefits

triggered by these investments? It is widely recognized that renewable energies bring about socio-economic benefits. Indeed, the post-pandemic recovery plans rely on green investments as a lever for economic growth and employment. If those benefits are present but local residents do not perceive them as such, does it mean that **the local benefits are not enough to compensate for the costs?**

Natalia Fabra and researchers from the Bank of Spain, Eduardo Gutierrez, Aitor Lacuesta, and Roberto Ramos, have analyzed this issue, **using employment and unemployment impacts as proxies for the local economic benefits of renewable investments.** They exploit variation in the timing and size of the investment projects across more than 2,000 Spanish



municipalities during a 14-year period (2006-2020) that witnessed two major investment waves. Their work is one of the first applications of the recent work by Dube et al. (2022). They propose a new estimator for staggered Differences-in-Differences analysis that extends the local projections approach (Jordá, 2005) with clean controls.

The analysis uses very detailed data on individual renewable projects, including their location, technology, and start-up date. These data are combined with employment and unemployment data at the municipality level: whereas employment data capture the number of jobs by local firms, unemployment data reflect the number of local residents without a job. The combination of these data sources provides a complete picture of the local labor market effects.

Their research delivers some key findings. First, **there are big differences in the job multipliers across renewable technol-**

ogies. Whereas investment in solar photovoltaics has sizeable multipliers, investment in wind triggers no statistically or economically significant local job creation. This finding aligns with IRENA's (2021) assessment: "The integration of local

content and local employment remains a challenge, particularly in wind energy". Indeed, in the case of wind, investments are front-loaded and not necessarily local as high-skilled workers are required to carry out the projects, which they often do from elsewhere. Solar investments require less specialized skills, allowing the project developers to hire workers locally. Furthermore, the construction of solar farms, which has a strong local component, bears a higher weight in the project's total cost. Consistently with this, the authors also find that the labor market effects of solar investments concentrate primarily during the construction phase and become very mild during the maintenance phase.

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Figure 1: Local employment effects of solar and wind investments

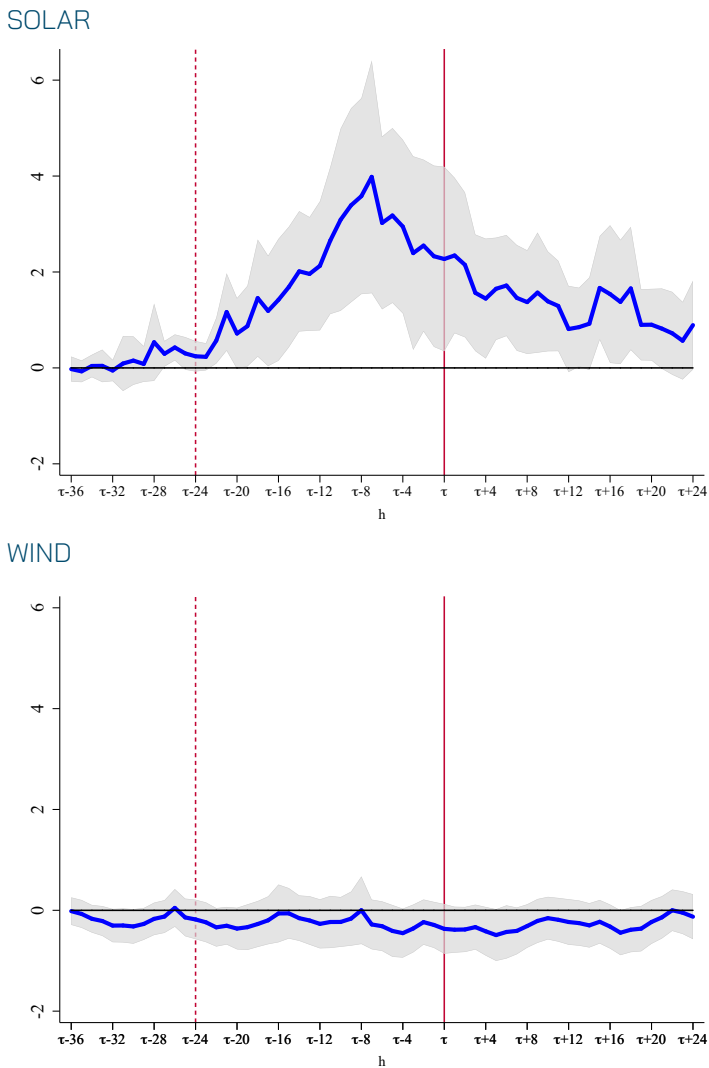


Figure 1 illustrates the employment effects across technologies and periods. The x-axis reflects the number of months before or after the start-up date (when the plant must be ready to produce electricity), marked by a red line. The y-axis shows the value of the job multipliers per MW invested (a similar pattern is found per million euros invested). The start of construction is unobserved, but it can be inferred from the date when the multipliers become positive. In the case of solar investments, multipliers become positive approximately 20 months before the start-up date, which is consistent with the expected duration of the projects. The multipliers after the start-up date go



down but do not fully vanish, reflecting the weaker labor needs during the maintenance phase. In the case of wind, the multipliers are not different from zero, both during the construction and maintenance phases.

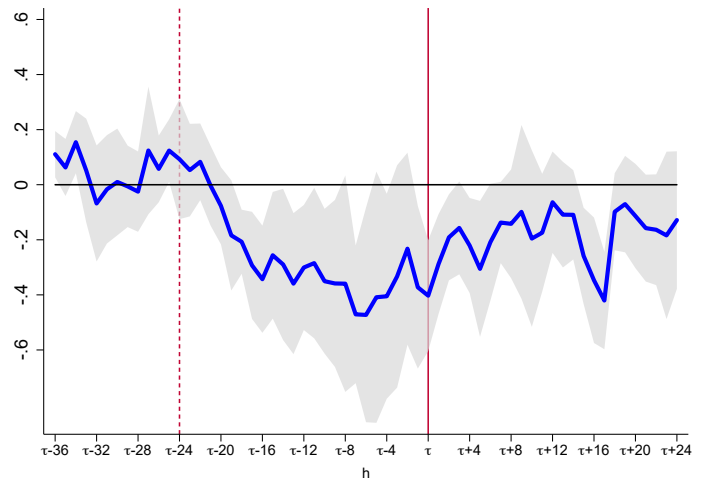
As can be seen in Figure 2, the effects on employment tend to be larger than those on unemployment, suggesting that local firms tend to hire workers living in other municipalities or counties. Again, this is consistent with **difficulties in finding skilled workers in the rural municipalities where the projects are often located**. It also reflects that the labor market effects are mostly confined to sectors directly linked to the construction or maintenance of the plants. Interestingly, in the case of solar, after the start-up date, there is a slight surge in unemployment of previously employed workers in the construction sector, even relative to the pre-construction period. This finding is consistent with the project attracting new residents to work on the plant's construction, who become unemployed once it ends.

The authors also explore the spatial effects of the investments, i.e., whether

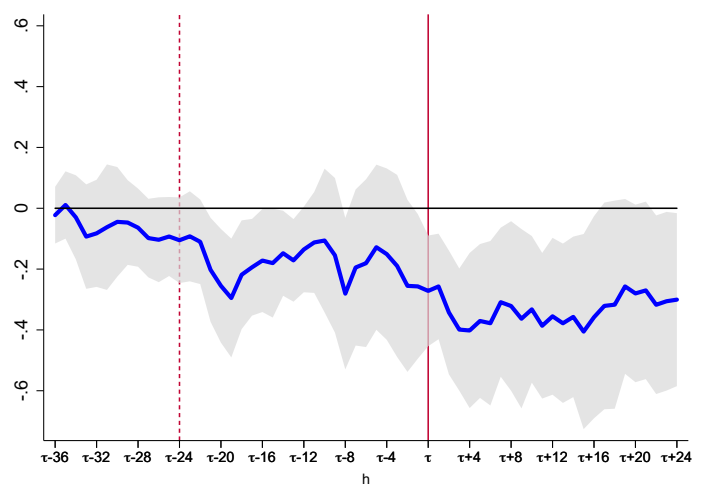


Figure 2: Local unemployment effects of solar and wind investments

SOLAR



WIND



the construction of the plants leads to job creation in nearby municipalities. For solar projects, **spatial spillovers lead to greater employment in urban areas and less unemployment in rural ones**. These results are consistent with the idea that employers tend to locate in larger municipalities (so that the spatial effects on employment appear in urban areas). In comparison, residents of smaller cities benefit from increased job opportunities when a new plant opens nearby (so that the spatial effects on unemployment show up in rural areas).

The relatively small magnitude of the local effects, particularly in wind investments, does not mean that renewable investments do not create jobs on a broader scale. Indeed, it is plausible that a significant fraction of the employment benefits accrue away from the municipalities where the investments occur. However, since the opposition of the local communities may become a bottleneck for the broader deployment of renewable energies, **it is fair and efficient to distribute the gains from the renewable investments with the**

hosting municipalities. Promoting local energy communities so residents have stakes in the new projects, reducing the electricity price for local residents, increasing the local taxes paid by renewable investors, and prioritizing grid access to those projects that promise greater local benefits...These and other options should be considered before it becomes too late. The energy transition cannot wait much longer •

Further reading

"Do Renewables Create Local Jobs?" Fabra, N., E. Gutiérrez, A. Lacuesta, and R. Ramos. EEL Working Paper 114.