The Distributional Consequences of the Clean Energy Transition

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Climate change is now understood to be the most critical challenge facing policymakers this century. In response to this challenge, many countries have committed to net zero emissions by 2050. How this will be achieved, and the consequences of such commitments, however, remains unclear.

To date, much of the focus has been on the efficacy and efficiency of these commitments. This focus, however, has led to other policy considerations, such as equity, receiving little attention. The policies being implemented will inevitably create winners and losers, not only between competing technologies, but also among ratepayers, taxpayers, firms, and workers. Leveraging newly linked administrative and survey data from the U.S. Census Bureau and IRS we aim to provide systematic descriptive and causal evidence on the distributional consequences of the Clean Energy Transition (as experienced to date) in the United States.

Specifically, our project seeks to answer the following questions:

- How are employment opportunities in new "green" industries distributed across the population?
- Who bears the cost of employment loss in declining "dirty" industries?
- Are workers in legacy sectors "stranded", or are they able to find alternative employment opportunities? How long does this take? How does this vary by age, race, and income?

Efforts to mitigate climate change may perpetuate pre-existing disparities. The distributional consequences of climate change and any corresponding policy response takes place against a background of growing inequality within the United States. Income and wealth inequality have grown substantially over the last few decades, driven primarily by an increasing share of income and wealth accruing to those at the top of the distribution (Piketty, Saez and Zucman, 2018; Smith, Zidar and Zwick, 2020). At

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the same time, income and wealth gaps between advantaged and disadvantaged groups have also remained stubbornly high (Wolff, 2018).

Economists have long argued that environmental policies are regressive (Parry et al., 2005; Fullerton, 2008; 2011; Bento, 2013). There is the potential for tension between these objectives, but a strong empirical evidence base has yet to be formed. Most salient is the burden on those already working in legacy energy sectors. How will they be affected by the clean transition? Economists have traditionally relied on general equilibrium models that assume full employment for tractability (Goulder et al., 1999; Fullerton and Metcalf, 2002). However, such approaches abstract from transitional dynamics, which may be important (Walker, 2013). Understanding who is affected and how long it takes for workers to find new employment opportunities is essential.

Our research team is fortunate to have access to tremendously rich individual-level and firm-level data from the U.S. Census Bureau and the Internal Revenue Service. Our work in this space creates an opportunity - that has not been possible until now - to refocus our attention from a place-based understanding of environmental and energy inequality to an individual-level understanding. Working under an approved internal Census Bureau project, we have linked: administrative tax data from forms W-2 and 1040 to demographic information from the Decennial Census and American Community Survey and residential histories and household characteristics from third party housing data vendors and other data sources, providing migration information over time. We additionally are able to link individual to their employers in the Longitudinal Business Database and the Census Business Register, providing information on firm characteristics such as the location of the firm/establishment, and the sector of employment. This allows us to follow a very large (millions), nationally representative sample of individuals across residences and employers, tracking their economic outcomes, alongside much richer demographic information on race, ethnicity, education, and family structure, which would not be possible using tax return data alone. Note that a similar, although less full featured linked employer-employee dataset can be constructed using the Longitudinal Employer-Household Dataset (LEHD), which is also accessible on internal Census Bureau projects. Combined with information about plant closures/openings and other related policies, our work will uncover new facts about the distribution of costs and benefits over time and space for different socioeconomic and demographic groups, shaping the way we think about and design regulations to reduce climate risk in an equitable and efficient way.

The main focus of our project will be to build a systematic understanding of employment dynamics in legacy industries. In addition, we intend to provide descriptive evidence of where clean and dirty jobs are concentrated, and the demographic and economic characteristics of the workers in clean and dirty industries. Focusing on clean industry as well as legacy industry is important because it will provide insights into who has access to energy transition opportunities. The justice implications of the energy transition are not solely based on the uneven distribution of costs. Understanding who has access to new employment opportunities and technologies is also important. Our work in this space will begin by documenting the distribution of employment in these sectors. We will also explore the employment effects associated with the closing of coal mines and power plants, tracking where workers go, what they do next, and how this varies by age and other characteristics. We will also look at the indirect effects of these events on those living and working in the surrounding community and understand the degree to which there are asymmetries in the economic spillovers between the closure of dirty plants and the opening of new plants in clean sectors.