



# U.S. power sector labor pathways to achieve net-zero emission by mid-century: an application of the GCAMUSAJobs package

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# Outline

- **The Need for GCAMUSAJobs:** Why this tool
- **Overview of GCAMUSAJobs:** Key features and functionality.
- **Insights from GCAMUSAJobs:** What we can learn from an application.

# Motivations

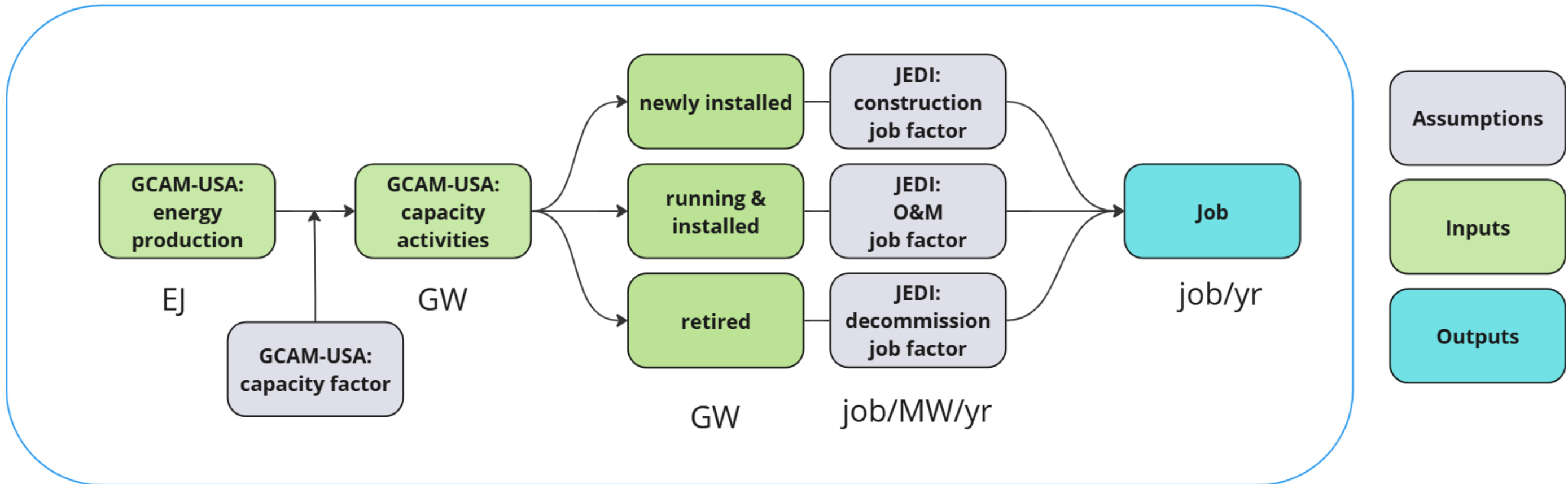
- Transitioning to a low-carbon power system introduces heterogeneous impacts on employment across regions and sectors (Xie et al. 2023; Mayfield et al. 2023; Hanson 2023; Raimi 2021).
- Integrating energy and employment modeling is crucial to assess and address the impacts of decarbonization on employment.

# GCAMUSAJobs: method

- U.S. state-level power generation pathways: the Global Change Analysis Model with U.S. state-level resolution (GCAM-USA).
- Employment factor: the Jobs and Economic Development Impact (JEDI) model.
- Focus on direct employment for power generation: fixed and variable O&M jobs, on-site construction jobs, construction-related jobs, and decommission jobs.
  - Jobs for resource extraction and biomass production are not included.

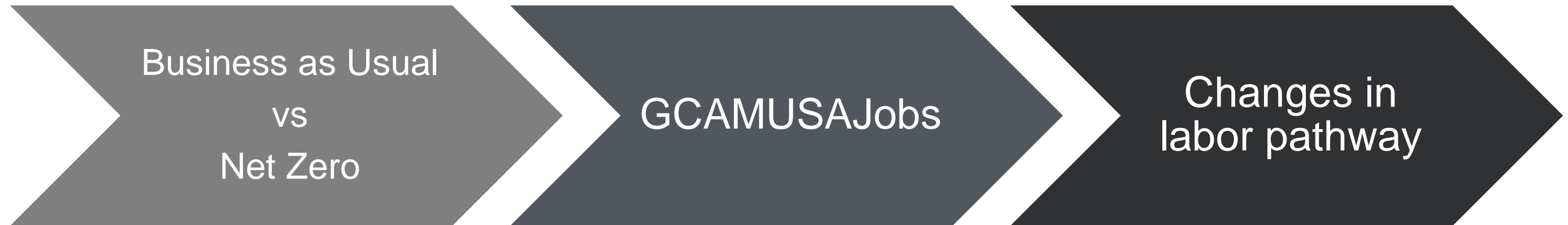
# GCAMUSAJobs: overview

R package



Package vignette

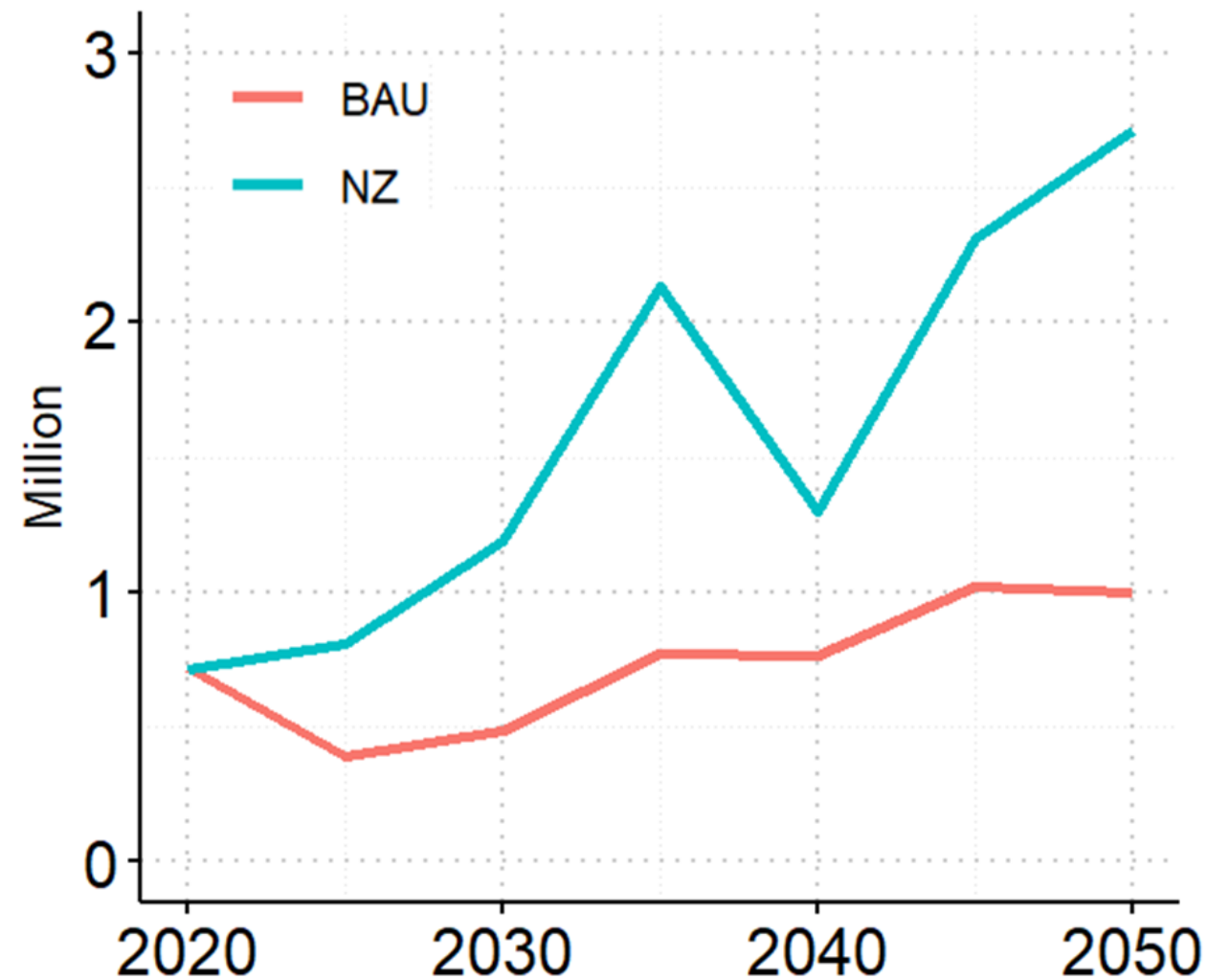
# GCAMUSAJobs: application



Ou, Y., Zhang, Y., Waldhoff, S., & Iyer, G. (2024). GCAM-USA Scenarios for GODEEEP (v3.0.2) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.10642507>

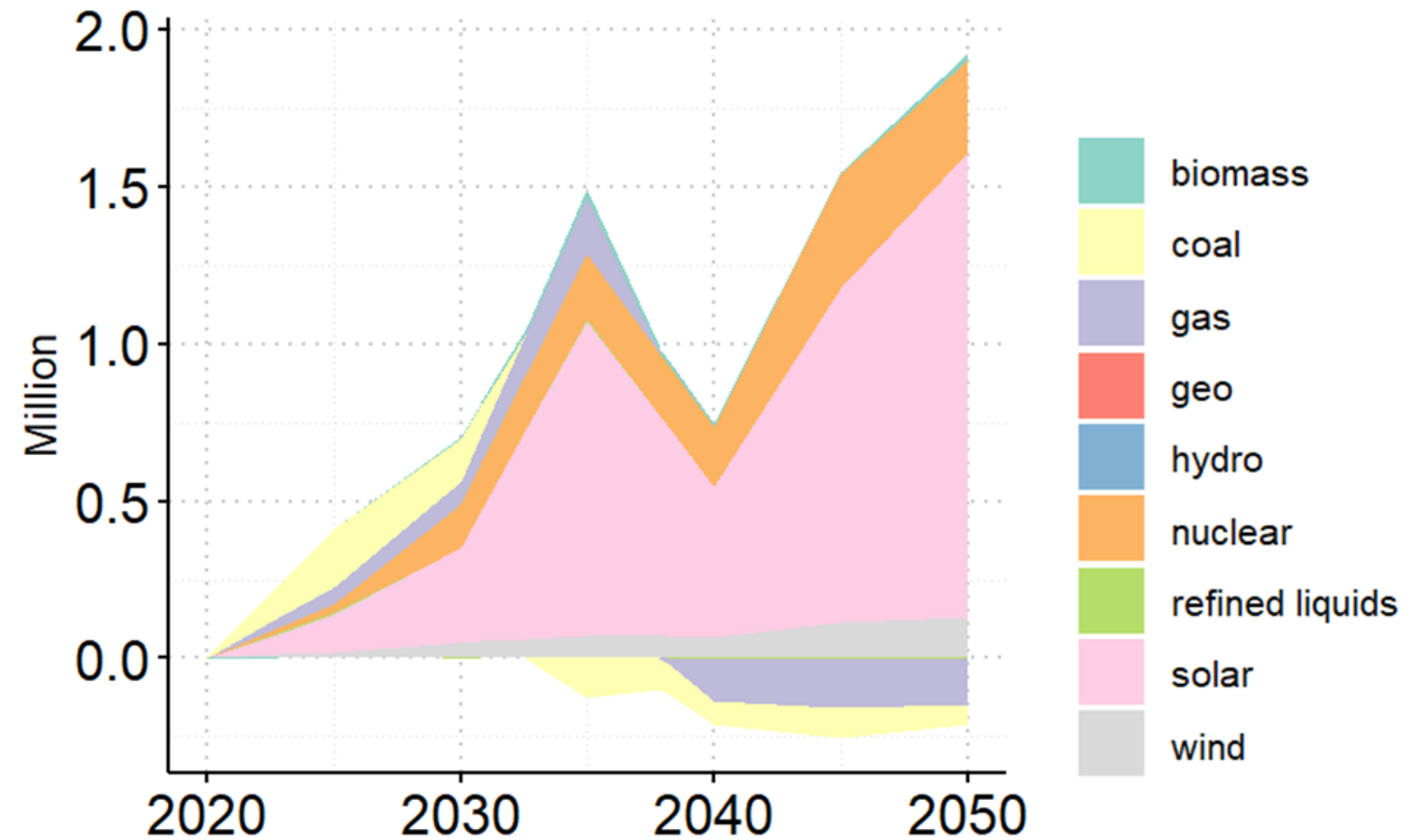
- Cumulatively, direct employment of the power sector under the NZ scenario is projected to be **2.36 times** that in the BAU from 2025 to 2050.

## Direct employment for power generation: USA



- Under the net-zero scenario, employment **growth** mainly comes from **solar**, **nuclear**, and **wind** power generation.

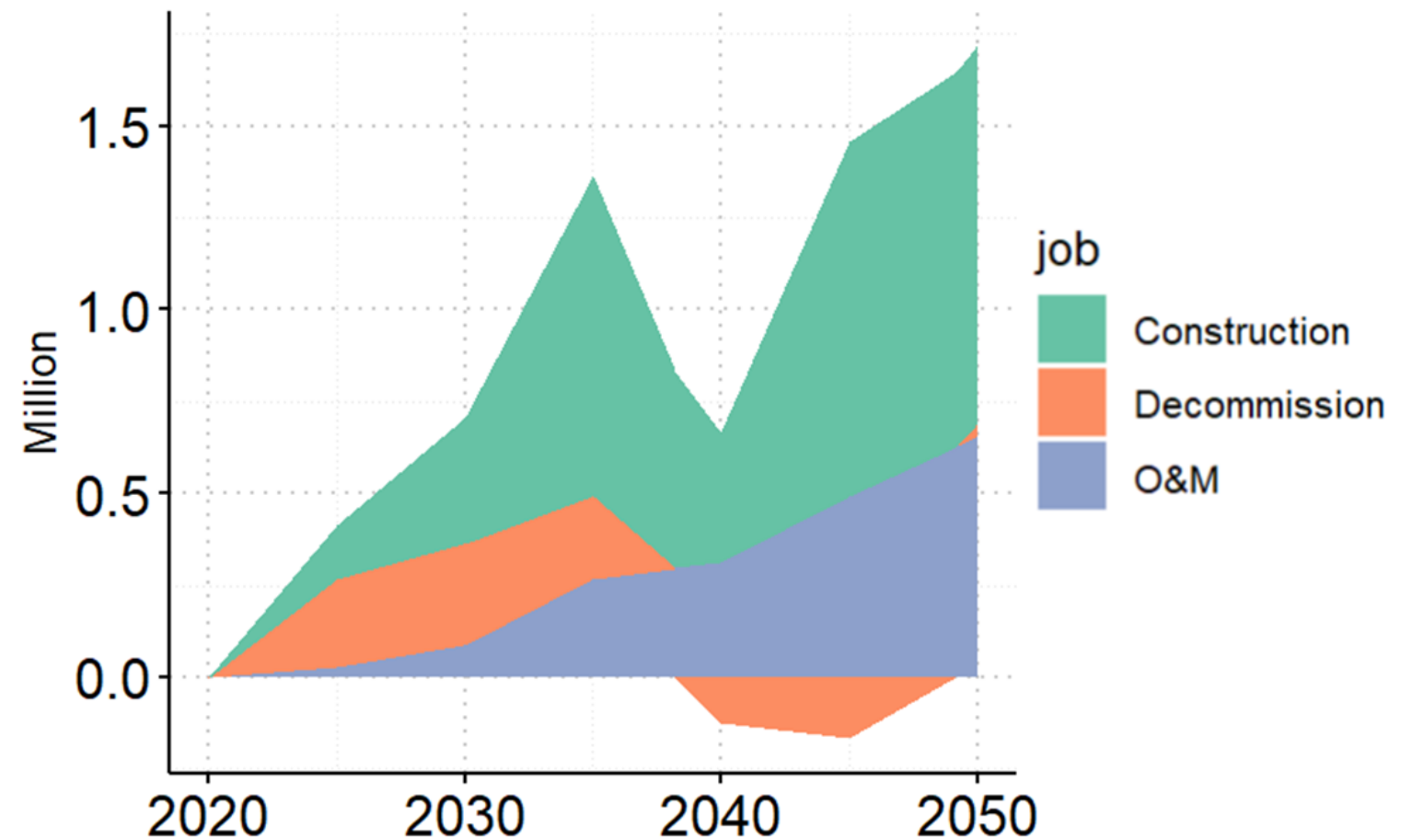
## Employment change (NZ - BAU) by power sector: USA





- Decarbonization in the power sector drives **steady growth** for **O&M jobs**, while the cyclical nature of **construction** and **decommission jobs** creates **volatility** in job growth.

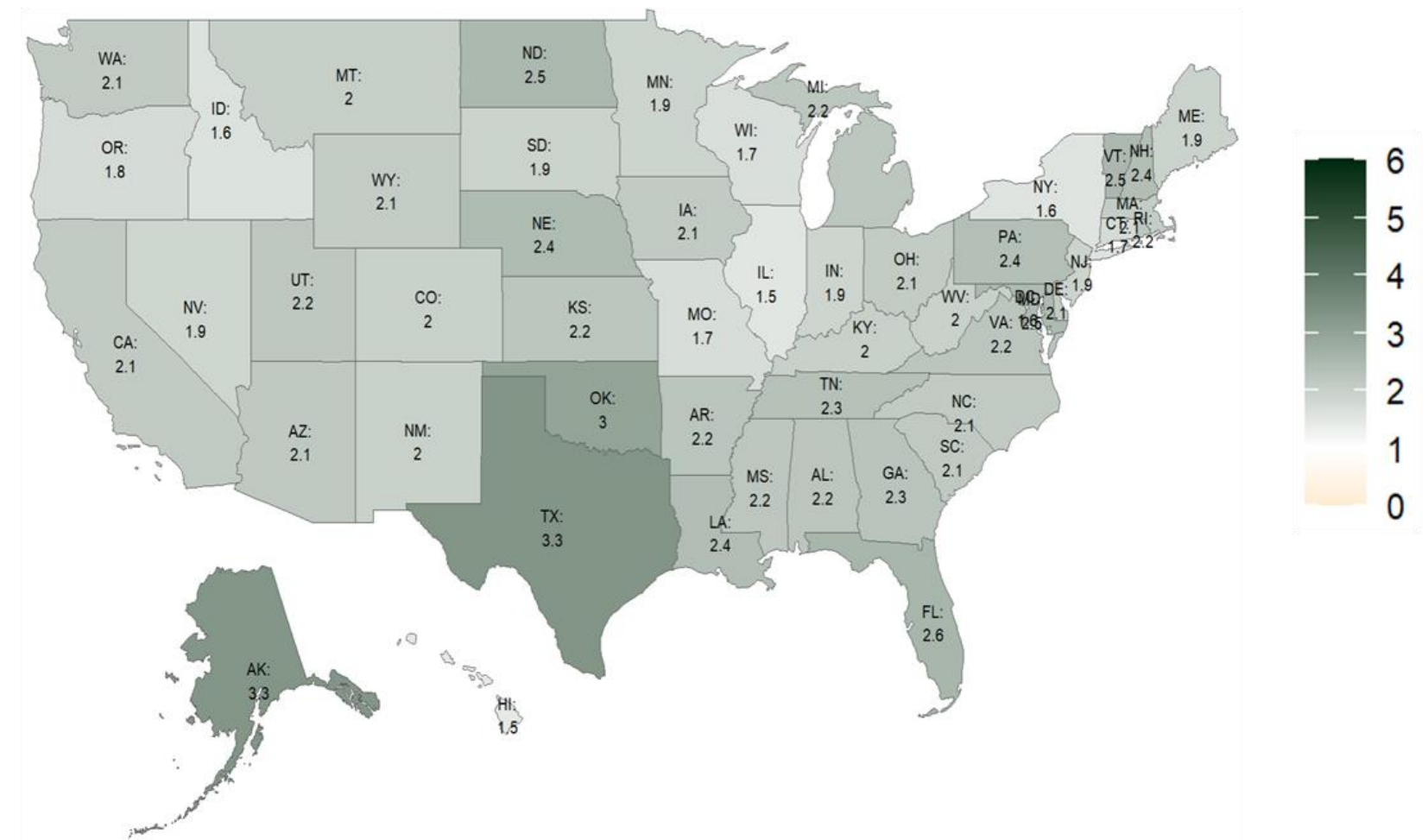
## Employment change (NZ - BAU) by occupation: USA



- Achieving Net Zero in the U.S. by mid-century **promotes** direct employment for power generation, especially in **Texas, Alaska, Oklahoma, and Florida.**

Direct employment power sector in NZ relative to BAU (BAU = 1):

Cumulative, from 2025 to 2050





scan  
for  
more



**GCAMUSAJobs**

<https://github.com/JGCRI/GCAMUSAJobs/tree/paper>



**AGU 2024: GC21M-0027**

Employment Implications  
under the U.S.  
Decarbonization

**Tuesday, 10 December 2024**

**08:30 - 12:20**

Hall B-C (Poster Hall)

# Thank You

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