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Employment Transition and Economic Impacts of Net Zero US State Power Systems

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MOTIVATION

The United States' return to the Paris Agreement and the introduction of the American Jobs Plan emphasized the employment opportunities of investing in **clean energy** and **resilient infrastructure**. Reports have shown the overall job creation potential of national net zero transition pathways, with varying employment outlooks across different states. Several questions remain:

- How does the composition of the **future workforce** compare to today? Will different skills and education be required?
- What are our skill gaps from a low carbon workforce? How can workers transition across industries and skillsets?
- For states vulnerable to job losses, what **alternative pathways** can they adopt to continue to decarbonize?

POLICY LANDSCAPE

Renewable Investment Tax Credit (ITC)

• Offshore wind (30%), solar PV (26%), small wind (26%), geothermal (10%) Clean Coal Tax Credits (Energy Policy Act of 2005)

- <u>Section 48A</u>: 30% investment credit on advanced coal and IGCC Section 45Q: CO_2 sequestration credit (\$50/ton for geological storage,
- \$35/ton for enhanced oil recovery) with **new amendments** including: • Carbon Capture Utilization and Storage Act - \$120/ton for DAC
- End Polluter Welfare Act terminate 48A and 45Q **Decarbonization Scenarios**

	Scenario	C target	Technology	Optimization	Tax Credit
	NetZero	2050	All	Min TSC	No
	45Q	2050	All	Min TSC	45Q

ECONOMIC STRUCTURE

Agriculture, forestry and fishing Mining and quarrying Manufacture of food, beverages and tobacco Manufacture of textiles, wearing apparel and leather Manufacture of wood and paper products and printing Manufacture of coke, refined petroleum and chemicals Manufacture of pharmaceutical products Manufacture of rubber, plastic and non-metallic minerals Manufacture of basic and fabricated metal products Manufacture of computer, electronic and optical products Manufacture of electrical equipment Manufacture of machinery and equipment Manufacture of transport equipment Other manufacturing, repair and installation Electricity, gas, steam and air-conditioning supply Water supply; sewerage and waste management Construction Wholesale and retail trade; repair of motor vehicles Transportation and storage Accommodation and food service activities Information and communication Financial and insurance activities Real estate activities Professional, scientific and technical activities Administrative and support service activities Public administration and defence Education Human health and social work activities Arts, entertainment and recreation Other service activities Activities of households



CAPEX Capture unit JEDI model **Direct Impact** $Jobs_{c,i} =$ ESO model • Bioenergy Nuclear • BECCS

2020 workforce

Gross Value Added from Output

Data disaggregated from Bureau of Economic Analysis 2019



MODEL FRAMEWORK: ESO-JEDI







- decarbonization in Wyoming,
- Texas and California? • How much transition would be required for the current workforce in a decarbonized 2050?
- How effective is the tax credit across the states?



PRELIMINARY CONCLUSION

- less nuclear and more CCS early
- late terms when no 45Q tax credit is imposed

The 45Q tax credit encourages decarbonization pathways with

CCS would only be used for removal the residual emissions in the

Under a continued 45Q tax credit, the current power sector

workforce could align themselves differently across states:

• WY: Some mining workers would transition to construction

• TX: Opportunities spread out across sectors

CA: More opportunities in the utilities sector