



The Just Transition in America's Zero-Carbon Action Plan  
November 10, 2020

# Industrial Policy, Employment and Just Transition: *Highlights*

Robert Pollin, University of Massachusetts Amherst

Ellen Scully-Russ, George Washington University

Jeannette Wicks-Lim, University of Massachusetts Amherst

Highlights of Chapter 3 of America's Zero Carbon Action Plan

November 10, 2020

# How Are Job Creation Estimates Generated?

- **Basic Tool: Input/Output Tables**

- Tables available for countries, regions, states
- Tables are based on enterprise surveys
  - U.S. tables have 546 activity categories
- Can generate employment/output ratios for any activity
  - E.g. Jobs created through \$1 million in spending

- **Three channels for job creation**

- ***Direct jobs***—jobs within an activity itself, such as retrofitting a building or assembling an electric vehicle
- ***Indirect jobs***—jobs within the supply chain for direct activities, such as producing and delivering windows for a building retrofit or an electric vehicle
- ***Induced jobs***—“Multiplier effects” when newly-employed people spend their increased income



# Three Sources of Differences in Job Creation

- ***Labor intensity***—Spending on employing workers relative to spending on equipment, buildings, land and energy
- ***Compensation***—How much any given worker is paid in wages and benefits
- ***Domestic content***—For measuring job creation within a given country, what percentage of activity takes place within the country as opposed to purchasing imports.
- ***Nothing about “green jobs” per se***





# Challenges in Generating Estimates

- **Defining what we mean by “clean energy”**
  - Must define it within the framework of the input/output model
- **Incorporating change in production methods over time**
  - Need to make an assumption about improvements in labor productivity
- **Taking account of job quality**
  - Are jobs being created “good jobs”?
  - Is the workforce well-trained for these jobs?
  - Do underrepresented groups have equal access to the jobs?
    - Women and people of color are underrepresented in clean energy activities in U.S.

**Table 3.5**  
**Average Annual Net Job Creation through Combined Energy Supply and Energy Demand Expenditure Program, 2020 – 2050**

	Number of Direct and Indirect Jobs Created		Number of Direct, Indirect and Induced Jobs Created	
	Jobs Created at Existing Domestic Content Levels	Jobs Created at 100% Domestic Content	Jobs Created at Existing Domestic Content Levels	Jobs Created at 100% Domestic Content
<b>1) \$388.7 Billion in Net Average Annual Energy Supply Investments</b>	1.8 million	2.1 million	3.2 million	3.5 million
<b>2) \$162.6 Billion in Net Average Annual Energy Demand Expenditures</b>	529,801	632,331	978,919	1.1 million
<b>3) \$551.3 Billion in Net Average Annual Combined Expenditures</b>	<b>2.3 million</b>	<b>2.7 million</b>	<b>4.2 million</b>	<b>4.6 million</b>
<b>4) Total Net Job Creation as Share of Projected 2035 Labor Force</b> (projection is 175 million U.S. workforce in 2035)	<b>1.3%</b>	<b>1.5%</b>	<b>2.4%</b>	<b>2.6%</b>

**Job Creation  
through  
Energy Supply  
and Energy  
Demand  
Expenditures:**  
*Annual  
averages for  
2020 - 2050*

**Table 3.15** Attrition by Retirement and Job Displacement for Fossil Fuel Sector Workers in U.S., 2021-2030

	All Fossil Fuels	Coal Mining and Related Ancillary Industries	Oil and Gas Extraction and Related Ancillary Industries
1) Total workforce as of 2018	2,530,459	151,693	2,378,766
2) Job losses over 10-year transition, 2021-2030	304,977	151,693	153,284
3) Average annual job loss over 10-year production decline (= row 2/10)	30,498	15,169	15,328
4) Number of workers reaching 65 over 2021-2030 (=row 1 x % of workers 54 and over in 2019)	422,436* (16.7% of all workers)	38,530 (25.4% of all workers)	383,906* (23.8% of all workers)
5) Number of workers per year reaching 65 during 10-year transition period (=row 4/10)	42,244	3,853	38,391
6) Number of workers per year retiring voluntarily (80% of 65+ workers)	33,795	3,082	30,713
7) Number of workers requiring re-employment (= row 3 – row 6)	12,087	12,087	0

**Job  
Displacements  
for Fossil Fuel-  
Based Workers,  
2021 – 2030**

**Table 3.16** Attrition by Retirement and Job Displacement for Fossil Fuel Sector Workers in U.S., 2031-2050

	Oil and Gas Extraction and Related Ancillary Industries*
1) Total workforce as of 2030	2,225,482
2) Job losses over 20-year transition, 2031-2050	1,595,110
3) Average annual job loss over 20-year production decline (= row 2/20)	79,756
4) Number of workers reaching 65 over 2031-2050 (=row 1 x % of workers between 34 and 55 years in 2019)**	1,138,707 (45% of all workers)
5) Number of workers per year reaching 65 during 20-year transition period (=row 4/20)	56,935
6) Number of workers per year retiring voluntarily	45,548 (80% of 65+ workers)
7) Number of workers requiring re-employment (= row 3 – row 6)	34,207

**Job  
Displacements  
for Fossil Fuel-  
Based Workers,  
2031 – 2050**

**Table 3.18** Total and Annual Average Costs for Just Transition Support for Displaced Fossil Fuel-Based Workers

**A. Years: 2021-2030**

Year	Income support <i>(3 years of support for 12,087 coal workers/year)</i>	Retraining support <i>(2 years of support for 12,087 coal workers/year)</i>	Relocation support <i>(1 year of support for 12,087 coal workers/year)</i>	Total <i>(= Cols. 1+2+3)</i>
Total Costs	\$11.9 billion	\$1.5 billion	\$4.5 billion	\$17.9 billion
Average Annual Costs	\$991.1 million <i>(12 years of support)</i>	\$131.9 million <i>(11 years of support)</i>	\$453.3 million <i>(10 years of support)</i>	\$1.5 billion <i>(12 years of support)</i>

**B. Time Period: 2031-2052**

Year	Income support <i>(3 years of support for 34,207 oil and gas workers/year)</i>	Retraining support <i>(2 years of support for 34,207 oil and gas /year)</i>	Relocation support <i>(1 year of support for 34,207 oil and gas/year)</i>	Total <i>(= Cols. 1+2+3)</i>
Total Costs	\$49.1 billion	\$8.2 billion	25.7 billion	\$82.9 billion
Average Annual Costs	\$2.2 billion <i>(22 years of support)</i>	\$0.4 billion <i>(21 years of support)</i>	\$1.3 billion <i>(20 years of support)</i>	\$3.8 billion <i>(22 years of support)</i>

Just Transition  
Support for  
Displaced  
Workers:  
Average Annual  
Costs

**Table 3.19** U.S. Coal Employment in States with 3,000 or More Employees, 2019

	Coal Employment	Total State Employment	Coal as share of total Employment (%)
West Virginia	14,136	553,604	2.6%
Kentucky	6,849	1,606,009	0.4%
Pennsylvania	5,568	5,248,989	0.1%
Wyoming	5,294	211,524	2.5%
Alabama	3,133	1,622,325	0.2%

**Community  
Impacts and  
Just  
Transition:  
Coal**

**Table 3.20** U.S. Oil and Gas Extraction Employment in States with 15,000 or more Employees. 2019

	Oil and Gas		Oil and Gas
	Extraction Employment	Total State Employment	Share of Total Employment (%)
Texas	234,022	10,691,618	2.2%
Oklahoma	45,587	1,295,884	3.5%
Louisiana	33,563	1,611,229	2.1%
Colorado	24,070	2,308,090	1.0%
New Mexico	21,799	657,218	3.3%
North Dakota	19,311	351,482	5.4%
Pennsylvania	17,546	5,248,989	0.3%

**Community  
Impacts and  
Just  
Transition:  
Oil & Gas**



**Table 3.8** Indicators of Job Quality in Primary Energy Demand Spending Areas: Direct Jobs Only

	1. Vehicles	2. HVAC	3. Refrigeration
Average total compensation	\$82,600	\$72,500	\$69,600
Health Insurance coverage, percentage	73.8%	57.7%	48.3%
Retirement Plans, percentage	49.2%	39.3%	32.7%
Union membership, percentage	13.2%	9.9%	11.7%

**Job Quality  
Issues in  
Clean Energy:  
*Energy  
Demand***



**Table 3.9** Educational Credentials and Race/Gender Composition of Workers Primary Energy Demand Spending Areas: Direct Jobs Only

	1. Vehicles	2. HVAC	3. Refrigeration
Share with high school degree or less	43.1%	48.6%	53.3%
Share with some college or Associate degree	29.4%	29.2%	27.6%
Share with Bachelor's degree or higher	27.4%	22.2%	19.0%
Racial and Gender Composition of Workforce			
Percent People and communities of color	35.4%	33.2%	36.5%
Percent Female	25.7%	17.3%	13.8%

**Job Quality  
Issues in  
Clean Energy,  
Cont.**

**Table 3.12** Characteristics of Workers Employed in Fossil Fuel-Based Sectors in U.S. 2021-2030

	<b>Fossil Fuel-Based industries</b>
Average total compensation	\$109,400
Health insurance coverage	75.4%
Retirement benefits	48.6%
Union membership coverage	8.8%
<b>Educational credentials</b>	
Share with high school degree or less	40.0%
Share with some college or Associate degree	27.2%
Share with Bachelor's degree or higher	32.8%
<b>Racial and gender composition of workforce</b>	
Percent People and communities of color	29.2%
Percent Female workers	16.1%

## Job Quality for Fossil Fuel Sector Workers

**Table 3.22** Summary Figures: All Firms Reporting Hiring Difficulties in Energy Efficiency, Solar Electricity and Wind Electricity Sectors

	Energy Efficiency	Solar Electricity	Wind Electricity
Construction	84%	85%	86%
Professional/business services	82%	73%	81%
Manufacturing	72%	78%	79%
Wholesale trade, distribution, transport	72%	77%	85%
Utilities	---	79%	83%
Other services	76%	62%	73%

**Hiring  
Difficulties  
for Clean  
Energy Firms**

# Workforce Development Education and Training Programs

Ellen Scully-Russ, EdD

Associate Professor, Human and Organizational Learning

The George Washington University

# Obama Green Policy & Politics

## 2009

- G20 Governments invest \$2.6 trillion to stimulate global economy
- \$400 billion in clean technologies
- \$110 billion in ARRA for green economy
- \$1 billion for education & training
- \$500 million for Energy Training Partnerships

## 2016

- Solyndra
- DoL IG on ETP:
  - The program's goal was to train 124,893 people and put 79,854 in jobs. But 17 months later, 52,762 were trained and 8,035, or roughly 1 in 10, had jobs.
- Google: *Obama Green Jobs "Failure" ... "Slow to Sprout"*

# Contextual Challenges

- The Green Economy not brought to scale
- Underestimated consumer demand (weatherization)
- The Great Recession hit green sectors of established industries hard (housing, manufacturing)
- Clean energy
  - Conversion projects require significant # of skilled trades workers, but these are short term jobs
  - Many green jobs require large measure of education and skills which government programs do not support (i.e. RD/Service high barriers to entry)
- Uncertainty in the broader regulatory environment (tax incentives, cap and trade)

# The Training Challenge

- ETP: Training is out ahead of jobs
- Disjointed education and training system
- Policy press for short-term training; need for long term education
- Ineffective workforce planning methods

# Lessons Learned

## ***Leverage public investments in the green economy to:***

- Move green employers to adopt a work system based on high quality jobs and skill standards
- Enhance new workforce and certificate programs, both for the green economy specifically and more generally

***Build from the ground up:*** responsive and effective economic and workforce strategies and programs in the green sector emerge from within local relationships and conditions.



# **Tools for achieving equitable access to high quality employment with the Zero Carbon Action Plan**

## Current Employment Status by Gender and Race

Unemployment Rate	Oct. 2019	Oct. 2020	Increase
White Men	2.9%	5.8%	+2.9%
White Women	2.9%	5.6%	+2.7%
Black Men	5.1%	11.5%	+6.4%
Black Women	4.9%	9.2%	+4.3%

Labor Force Participation Rate	Oct. 2019	Oct. 2020	Decrease
White Men	71.7%	70.5%	-1.2%
White Women	58.3%	56.5%	-1.8%
Black Men	68.0%	65.4%	-2.6%
Black Women	62.6%	60.1%	-2.5%

Source: Workers 20 years and older. U.S. Labor Department, Employment Situation Summary – October 2020, Economic News Release

# Tools for achieving high quality jobs:

- Labor Unions and Labor Standards
  - The case of utility-scale solar installations in Arizona and California

# Tools for achieving equitable access:

- Affirmative Action Policies
  - Executive Order 11246

# Upcoming Webinars (Eastern Time)



## **Policy & Implementation**

November 12  
1:00 – 2:00 pm



## **Materials**

November 17  
1:00 – 2:00 pm



## **Industry**

November 18  
3:00 – 4:00 pm



## **Food & Land-Use**

November 24  
3:00 – 4:00 pm