

Green Growth and Sustainable Development: The U.S. Case

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Simple Points on Energy for U.S. Economy

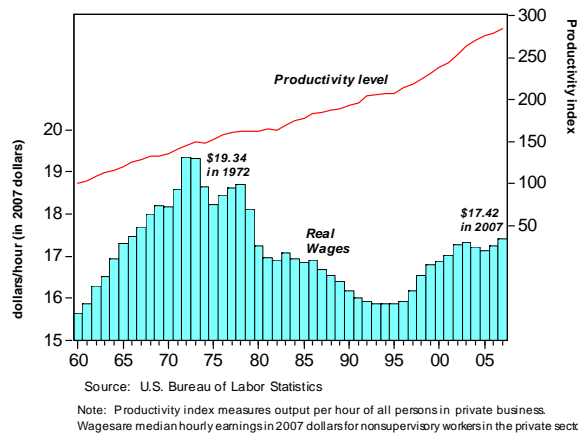
- **Realities of Global Warming**
 - Non-trivial possibilities of catastrophic consequences
 - Simple logic of insurance policies
 - How much are you willing to pay for insurance?
- **Ongoing dependence on foreign oil**
 - Destabilizing politically
 - Major source of structural trade deficit

Simple Points on Macroeconomy/Jobs

- **Short-term Economic/Employment Crisis**
 - 9.8% official unemployment as of 9/09
 - 17.0% including discouraged and underemployed
 - 15.1 million unemployed as of 9/09
 - 7.8 million jobs lost since 11/07
- **Long-term Employment Problem**
 - Wage stagnation for non-supervisory workers

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Figure 2.2
Average Real Wages and Productivity Level
in the United States, 1960 - 2007



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Simple Conclusions for U.S. Policy

- **Need to Take Action on:**
 - Global Warming and Energy Independence
 - Short-Term Job Crisis and Long-Run Employment Vulnerabilities
- **Possibilities for Convergences?**

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Parallels with Growth/Equity/Employment Programs for Developing Countries

- **Channeling Public and Private Investment for:**
 - Expanding decent employment opportunities
 - Raising productivity
 - Deepening markets
- **My own recent work with UNDP on this:**
 - “Employment Targeted” Economic Programs for Kenya/South Africa

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**RELATIVE EMPLOYMENT CREATION:
ACTIVITY X VS. ACTIVITY Y
\$1 Million in Expenditures**

	ACTIVITY X	ACTIVITY Y
Labor Intensity of Production	30% spending on labor = \$300,000	60% spending on labor = \$600,000
Domestic Content	80% = \$240,000 U.S. wage bill	90% = \$540,000 U.S. wage bill
Average Compensation	\$60,000	\$50,000
TOTAL EMPLOYMENT	4 JOBS (= \$240,000 wage bill/ \$60,000 wage)	10.8 JOBS (= \$540,000 U.S. wage bill/ \$50,000 wage)

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**RELATIVE EMPLOYMENT:
"FOSSIL FUELS" VS. "CLEAN ENERGY"
\$1 Million in Expenditures
Hypothetical Case Based on Representative Figures**

	"Fossil Fuels"	"Clean Energy"
Labor Intensity of Production	30% spending on labor = \$300,000	60% spending on labor = \$600,000
Domestic Content	80% = \$240,000 U.S. wage bill	90% = \$540,000 U.S. wage bill
Average Compensation	\$60,000	\$50,000
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Sources of Employment Creation

- **Job-Generating Clean-Energy Investments only**
- **Three factors in job creation**
 - Direct Jobs
 - Indirect Jobs
 - Induced Jobs
- **Nothing about:**
 - “Green Jobs”
 - Public vs. private sources of investment funds
- **Model includes only:**
 - Spending money
 - Differences in: labor intensity, domestic content, compensation
 - Job Creation and Inter-Sectoral Linkages Emerge

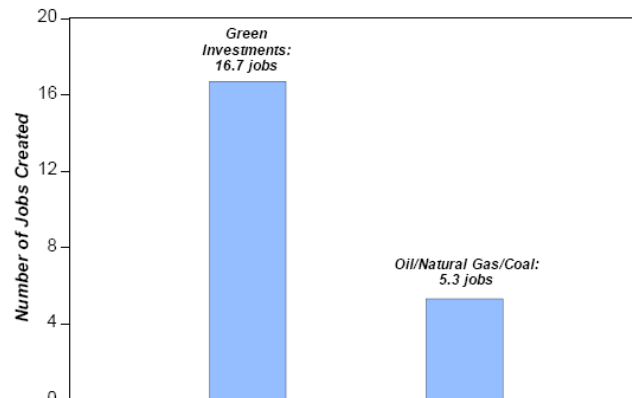
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U.S. Green Investment Program

- **Energy Efficiency Measures**
 - Building retrofits—40%
 - Public transportation and freight rail—20%
 - “Smart grid” electrical systems—10%
- **Renewable Energy Measures**
 - Wind power—10%
 - Solar power—10%
 - Non-food biomass—10%

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**Figure 1. Job Creation through \$1 Million in Spending:
Green Investments vs. Fossil Fuels**



Source: Input-Output Tables of U.S. Commerce Department
Note: Employment estimates include direct, indirect, and induced jobs.

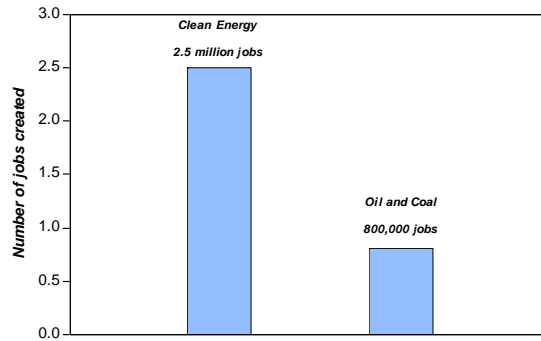
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Overall Clean Energy Investment Transition

- **Three Factors in Transition**
 - Investments in efficiency
 - Investments to lower costs of renewables
 - Regulations to raise prices/restrict burning of fossil fuels
- **Main Forces Behind Transition**
 - February 2009 Economic Stimulus Program
 - Waxman-Markey Regulatory Program
 - Independent Technological Developments and Market Deepening
 - Induced Innovation/Self-sustaining growth
- **Can Develop ~\$150 Annual Investment Level in U.S.**

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Job Creation through \$150 Billion Clean Energy Investment Program



Source: Input-Output Tables of U.S. Department of Commerce

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Impact of Green Employment Expansion on U.S. Labor Market Trend

A) Overall Employment Expansion through \$150 Billion Shift from Fossil Fuels to Clean Energy

1) Job Creation through \$150 billion spending on Clean Energy	2.5 million jobs
2) Job Creation through \$150 billion spending on Fossil Fuels	795,000 jobs
3) Net Job Creation through shift to clean energy (row 1 - 2)	1.7 million jobs

Source: U.S. Bureau of Labor Statistics and TMDI AN

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B) Impact of Clean Energy Job Expansion on 2008 U.S. Labor Market

1) Overall Labor Force	154.3 million
2) Total Employed before Clean Energy Investments	145.4 million
3) Total Unemployed before Clean Energy Investments	8.9 million
4) Unemployment Rate before Clean Energy Investments (= rows 3/1)	5.8% (=8.9 million/154.3 million)
5) Impact on Total Employment of Shift from Fossil Fuels to Clean Energy	Employment rises by 1.7 million jobs: 1.2% increase to 147.1million
6) Impact on Unemployment Rate of Shift from Fossil Fuels to Clean Energy (= rows (3 - 5)/1)	Unemployment falls from 5.8% to 4.7% (=7.2 million/154.3 million)

Source: U.S. Bureau of Labor Statistics and IMPLAN.

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Additional Employment Effects

- **Range of jobs**
 - Spread of occupations
 - Geographic equity
 - Construction, manufacturing, transportation
- **Opportunities for job ladders**

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Luddism, Protectionism, and Poverty Wages?

- **Green Investments through low productivity?**
 - Close parallels with labor-intensive investment strategies for developing countries
- **High Domestic Content through Green Investments**
 - Without trade protection
 - Can expand trading opportunities
- **Jobs at all wage and credential levels**

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Table 3.
Breakdown of Job Creation through Clean-Energy Investments versus Fossil Fuels by Formal Credential Levels

(based on \$1 million of spending)

	1) Clean Energy	2) Fossil Fuels	3) Difference in Job Creation (= column 1 – 2)
Total job creation	16.7	5.3	11.4
High-credentialed jobs -- BA or above -- \$24.50 average wage	3.9 (23.3% of clean energy jobs)	1.5 (28.3% of fossil fuel jobs)	2.4
Mid-credentialed jobs -- Some college but not BA -- \$14.60 average wage	4.8 (28.7% of clean energy jobs)	1.6 (30.2% of fossil fuel jobs)	3.2
Low-credentialed jobs -- High school degree or less -- \$12.00 average wage	8.0 (47.9% of clean energy jobs)	2.2 (41.5% of fossil fuel jobs)	5.8
Note: Low-credentialed jobs with decent earnings potential -- \$15.00 average wage	4.8 (28.7% of clean energy jobs)	0.7 (13.2% of fossil fuel jobs)	4.1

Note: Average wage is the median wage for all workers across all industries within each of the credential categories listed above.
 Source: 2008 Current Population Survey, IMPLAN.

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How to Pay for Clean-Energy Investment Program?

- **Short-term:**
 - Deficit Spending
- **Long Term:**
 - Carbon Tax or Cap-and-Trade Auction Revenues?
 - Military Budget?
 - Mobilize Private Credit Markets?
 - \$2.2 trillion in private lending in 2007
 - Incentives for private lenders
 - \$60 billion in private loan guarantees in stimulus

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Green Investments As Transformative Economic Agenda

- **Fights Global Warming**
- **Significant source of net employment creation**
 - Can operate as both short- and long-run program
- **Is Affordable**
 - Easily meets standards of *affordable insurance*
- **Can Help Stabilize Financial Markets**
- **Analysis comparable for other countries**

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