

Energy Efficiency Investments as an Employment Generator

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Unified Program for Environment and Employment

- **Fighting Climate Change and Expanding Decent Employment as Distinct Goals**
 - Tinbergen critique: can't kill two birds with one stone
 - Inevitable trade-offs or possibilities for complementarities?
 - Pathways out of poverty?

Spending Creates Employment, but How Much?

- **Net Employment Benefits for Given Spending Level Dependent on Three Variables**
 - Labor Intensity
 - Domestic Content
 - Compensation
- **No Particular Connection with Green Agenda**

**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)

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

	“Fossil Fuels”	“Clean Energy”
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Energy Efficiency as Step One

- **Clean Energy Transformation should begin with energy efficiency, then move to renewables**
 - With Efficiency:
 - Technologies are known
 - Risks are low
 - With Renewables:
 - Need to invest in R&D, Commercialization to move down cost curve

Energy Efficiency Investments vs. Fossil Fuels

TABLE 4
Employment Impacts of alternative energy sources

Job creation per \$1 million in output

Energy source	Direct job creation per \$1 million in output (# of jobs)	Indirect job creation per \$1 million in output (# of jobs)	Direct and indirect job creation per \$1 million in output (# of jobs)	Direct and indirect job creation relative to oil (% difference)
Fossil fuels				
Oil and natural gas	0.8	2.9	3.7	-
Coal	1.9	3.0	4.9	+32.4%
Energy efficiency				
Building retrofits	7.0	4.9	11.9	+221.6%
Mass transit/freight rail (90% MT, 10% FR)	11.0	4.9	15.9	+329.7%
Smart grid	4.3	4.6	8.9	+140.5%

Why Not All Energy Efficiency Investments as Job Generators?

- **First-order vs. Second-order effects**
 - Substituting Efficient vs. Inefficient:
 - Autos, appliances, new construction
 - No first order effect; second-order effect will be positive
- **First-order effect: apples vs. oranges**
 - Constructing new infrastructure vs. maintaining and incrementally improving existing one

Job Creation through Low Productivity?

- **Productivity of what?**
 - Producing goods and bads in conventional productivity measure
 - Reducing carbon intensity of output through efficiency highly “productive” activity
- **Job Creation**
 - Labor as cost vs. labor as life-opportunity
 - Abundance of jobs across all sectors and qualification levels through energy efficiency
 - “Pathways out of poverty” not mere slogan

Did Green Recovery Fail as Job Creator?

Table 3.

Regression Results with U.S. Energy Department Grants from ARRA Stimulus Program

	2009Q2-3	2009Q4	2010Q1
Coefficient	0.73 (0.091)	0.97 (0.03)	0.96 (0.016)
T-Statistic	8.01	31.6	59.5
R ²	0.13	0.61	0.76
Number of Individual Grant Observations	106	527	1,094

Source: PERI Research for U.S. Energy Department

Increasing Job Creation by Increasing Spending on Efficiency

- **Why Aren't More \$50 bills on sidewalk getting picked up?**
 - Recession
 - Systems of intermediation/risk-sharing underdeveloped
 - Hassle factors
- **ARRA had good financial incentives but inadequate attention to public/private linkages**
 - Important area for ongoing research and policy design