

Center for American Progress



# Jobs in a Green Economy

*Rebuilding for a Low Carbon Future*

Bracken Hendricks, Senior Fellow  
Baltimore MD (07/21/09)  
Governor's Workforce Investment Board

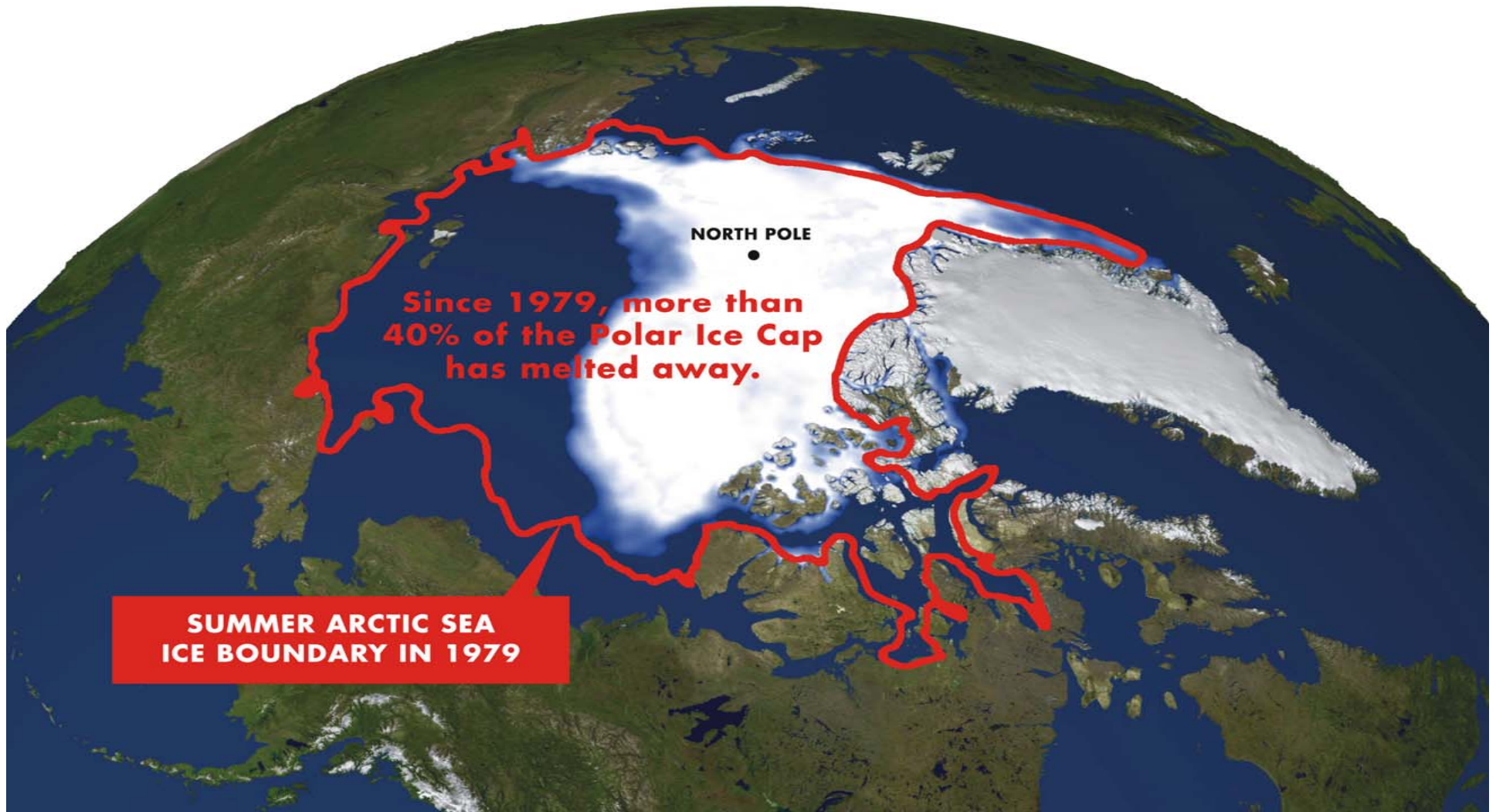
[www.americanprogress.org](http://www.americanprogress.org)

*Progressive Ideas for a Strong, Just, and Free America*



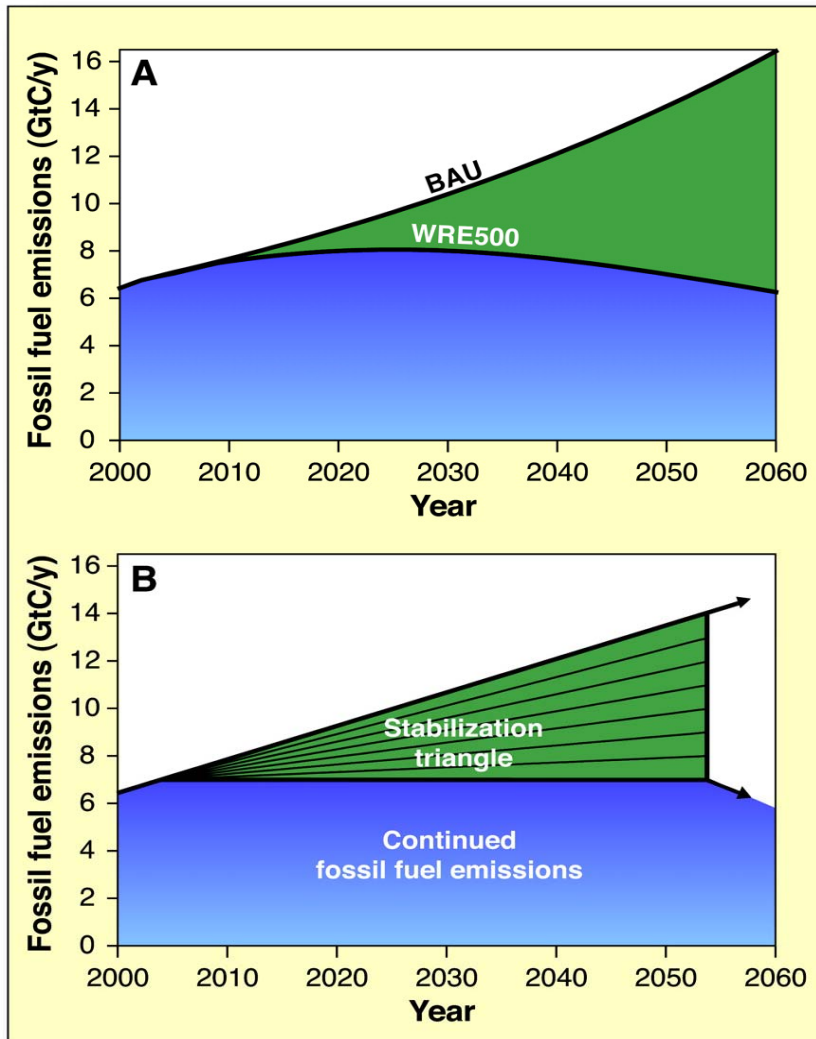
# Scale, Scope & Speed

*Recognizing the Severity of the Climate Threat*



# Reducing Carbon Emissions

*What will it take to get the job done?*



## *The Princeton Wedges*

1 Wedge = 1b tons carbon in 10 yrs.

- Cut VMT from 10k to 5k miles/year for 2billion cars
- Double fuel economy for 2b cars
- Geologic carbon storage (CCS)  
3,500 times Sleipner
- No tropical deforestation
- Conservation tillage on all crop land
  
- Cut emissions 1/4 for ALL buildings & appliances
- Install 50 times current global wind capacity while replacing coal
- Install 700 times current solar power



# **We are under investing in infrastructure** *& Drawing down the capital of our communities*

***ASCE: 2.2 Trillion Dollars in unmet needs (D- grade)***

**Green Strategies can drive smart reinvestment**

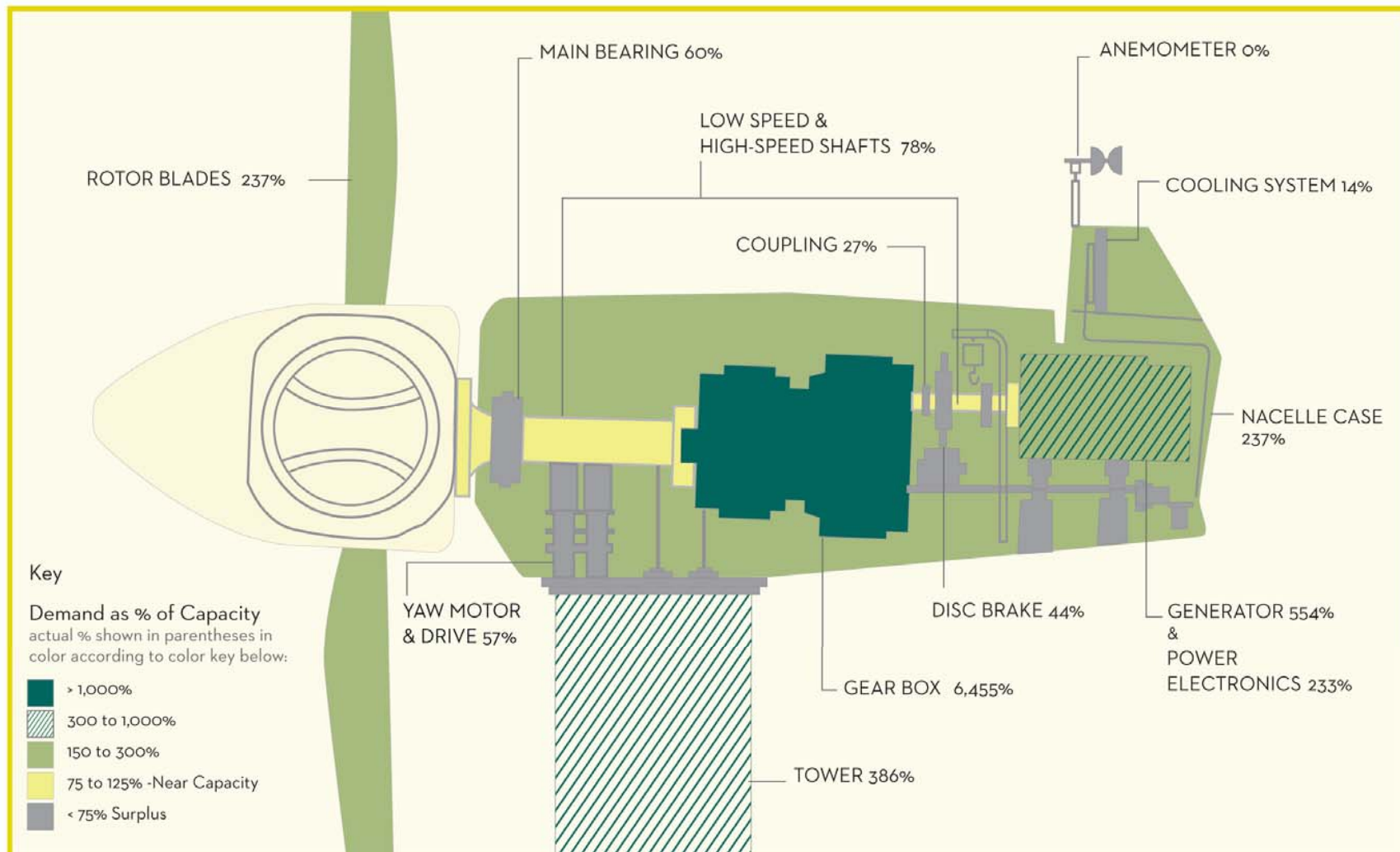
- **Transit**
- **Rail**
- **Fuels**
- **Storm water**
- **Public buildings**
- **Smart grid**
- **Energy efficiency at scale**

**These core public investments enable new markets, business growth, global competitiveness, and provide alternatives to mounting environmental crisis.**



# Green Jobs & Manufacturing Opportunity

## WIND TURBINE COMPONENTS: SUPPLY CHAIN BOTTLENECKS





# Clean Energy is Economic Development

## EE&RE FIRMS IN OHIO (Examples of Selected Firms)

Company	Sector	Location	Company	Sector	Location
Advanced Hydro Solutions	RE	Fairlawn	North Coast Wind & Power	RE	Port Clinton
American Ag Fuels	RE	Defiance	Novar Controls Corp.	EE	Cleveland
AMTEK Solid State Controls	EE	Columbus	O'Brock Windmill Distributors	RE	North Benton
CybetUtility	RE	Cleveland	Ohio Windmill Mfg. Co.	RE	Berlin Center
Dovetail Solar & Wind	RE	Glouster	Owens Corning	EE	Toledo
Energy Technologies, Inc.	EE	Mansfield	Renewable Lubricants, Inc.	RE	Hartville
EXTOL of Ohio	EE	Norwalk	Repower Solutions	EE	Cleveland
Eye Lighting International	EE	Mentor	Schward Electrical	RE	Dayton
Energy Technologies, Inc.	EE	Mansfield	SCI Engineered Materials	RE	Columbus
Essential Research, Inc.	EE&RE	Cleveland	Solar Creations	RE	Perrysville
First Solar	RE	Perrysburg	Special Materials Research	EE	Strongsville
Forry, Inc.	EE	Chagrin Falls	SSOE Systems, Inc.	EE	Toledo
Gardiner Trane	EE	Solon	Staco Energy Products	EE	Dayton
James Leffel & Company	RE	Springfield	SunLight Energy Systems	RE	North Lawrence
Jatro Diesel	RE	Mason	Sunpower, Inc.	RE&EE	Athens
Joe Mescan Windmill	RE	Columbia Station	Technology Bus. Development	RE	North Ridgeville
Liquid Resources of Ohio	RE	Medina	Teron Lighting, Inc.	EE	Fairfield
M&B's Battery Company	RE&EE	Harrison	The Enterprise Corp.	EE	Twinsburg
Malcolm Pirnie	EE	Akron	Third Sun Solar & Wind Power	RE	Athens
Michael Byrne Mfg. Co.	EE	Mansfield	Universal Electric Power	RE	Akron
Mariner Energy Systems	EE	Brunswick	Vanner, Inc.	EE	Hilliard
Midwest Mechanical Power	RE&EE	Plain City	Venture Lighting	EE	Solon
National Electric Coil	EE	Columbus			

Source: Management Information Services, Inc. and Green Energy Ohio, 2007.



# **"Green Recovery" Report (CAP/PERI)**

## ***Findings***

### **\$100 Billion Investment over 2 years**

#### **6 Efficiency & Renewables Strategies**

- **Building Retrofits, Transit & Rail, Smart Grid**
- **Wind, Solar, Advanced Biofuels**

### **2 Million Jobs**

- **4 times more jobs than Oil investment**
- **3 times more good jobs over \$16/hr.**
- **300,000 more jobs than Consumption Stimulus**
- **800,000 jobs in construction & manufacturing**

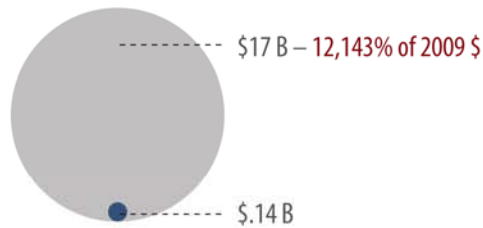
***Clean Energy = More Jobs + Better Jobs***



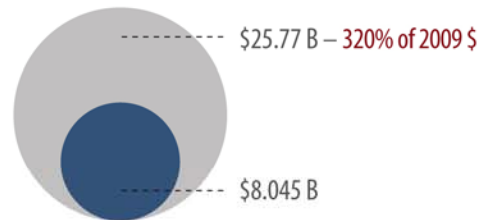
# Energy investments in the American Recovery and Reinvestment Act compared to FY2009 appropriations

● FY2009 appropriations\*    ● Conference agreement, American Recovery and Reinvestment Act

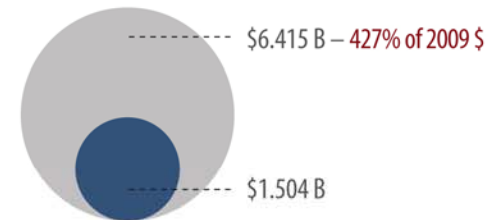
Investment in smart grid and transmission



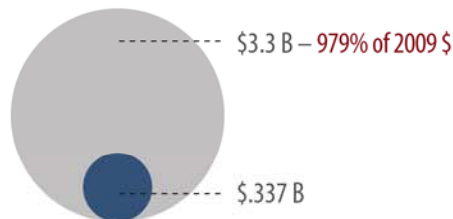
Investment in building and appliance efficiency



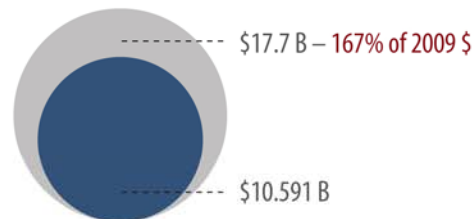
Investment in renewable and alternative energy



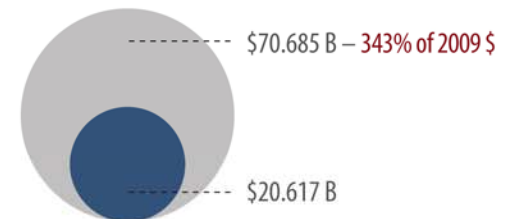
Investment in clean vehicles



Investment in transit



Total energy investments



\*FY2009 appropriations under Continuing Resolution.

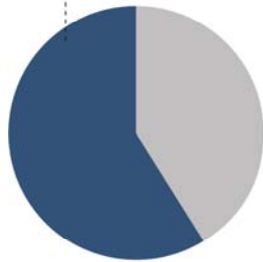


# Total International Stimulus Funds (Early 2009)

● Green Funds ● Total Funds

European Union

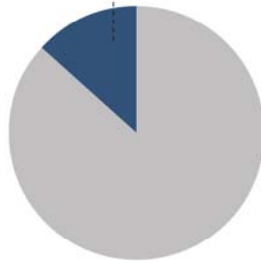
\$22.8 B 58.7% green



\$38.8 B Total

Germany

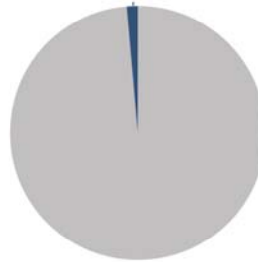
\$13.8 B 13.2% green



\$104.8 B Total

Italy

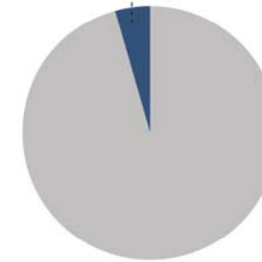
\$1.3 B 1.3% green



\$103.5 B Total

Other EU states

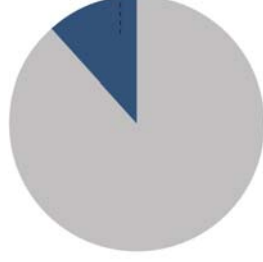
\$16.2 B 4.18% green



\$386.9 B Total

United States

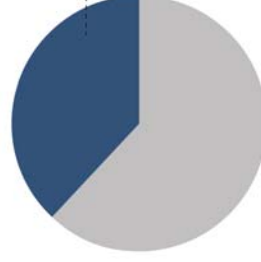
\$112.3 B 11.6% green



\$972.1 B Total

China

\$221.3 B 37.8% green



\$586.1 B Total

Japan

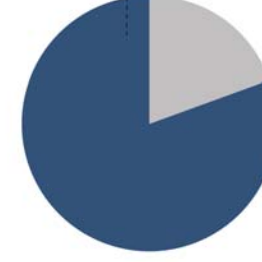
\$12.4 B 2.6% green



\$485.9 B Total

South Korea

\$30.7 B 80.5% green



\$38.0 B Total



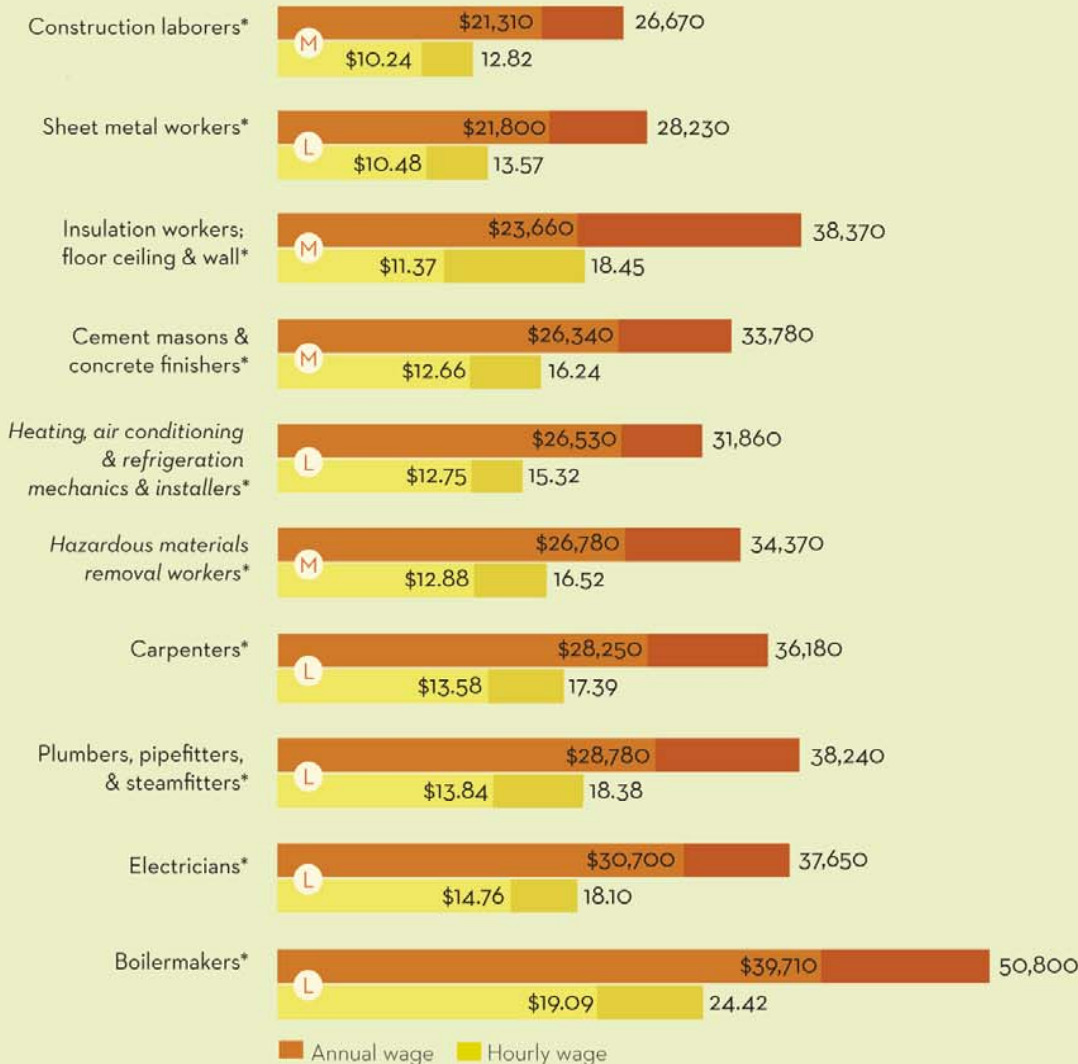
# Kinds of Green Jobs: Efficiency & Renewables

## GREEN INVESTMENTS AND JOBS

STRATEGIES FOR GREEN ECONOMIC INVESTMENT	REPRESENTATIVE JOBS
Building Retrofitting	Electricians, Heating/Air Conditioning Installers, Carpenters, Construction Equipment Operators, Roofers, Insulation Workers, Carpenter Helpers, Industrial Truck Drivers, Construction Managers, Building Inspectors
Mass Transit/Freight Rail	Civil Engineers, Rail Track Layers, Electricians, Welders, Metal Fabricators, Engine Assemblers, Bus Drivers, Dispatchers, Locomotive Engineers, Railroad Conductors
Smart Grid	Computer Software Engineers, Electrical Engineers, Electrical Equipment Assemblers, Electrical Equipment Technicians, Machinists, Team Assemblers, Construction Laborers, Operating Engineers, Electrical Power Line Installers and Repairers
Wind Power	Environmental Engineers, Iron and Steel Workers, Millwrights, Sheet Metal Workers, Machinists, Electrical Equipment Assemblers, Construction Equipment Operators, Industrial Truck Drivers, Industrial Production Managers, First-Line Production Supervisors
Solar Power	Electrical Engineers, Electricians, Industrial Machinery Mechanics, Welders, Metal Fabricators, Electrical Equipment Assemblers, Construction Equipment Operators, Installation Helpers, Laborers, Construction Managers
Advanced Biofuels	Chemical Engineers, Chemists, Chemical Equipment Operators, Chemical Technicians, Mixing and Blending Machine Operators, Agricultural Workers, Industrial Truck Drivers, Farm Product Purchasers, Agricultural and Forestry Supervisors, Agricultural Inspectors



# Green Jobs are Diverse with Good Wages



## NOTES

This chart depicts national wage data for selected middle-skill occupations in the residential building construction industry.

■ The 25th percentile describes wages at the lower end of the labor market.

■ Median wage marks the center of the wage distribution in a given occupation.

*Italics* indicate that BLS projects faster than average growth for this occupation across all industries over the next decade.

\* In-Demand occupation per DOL, regardless of overall occupational growth levels, because the work is central to a high-growth industry, like energy or construction.

Regional wage ranges and more precise occupational projections by industry can be run on a state-by-state basis.

Typical education and training path:

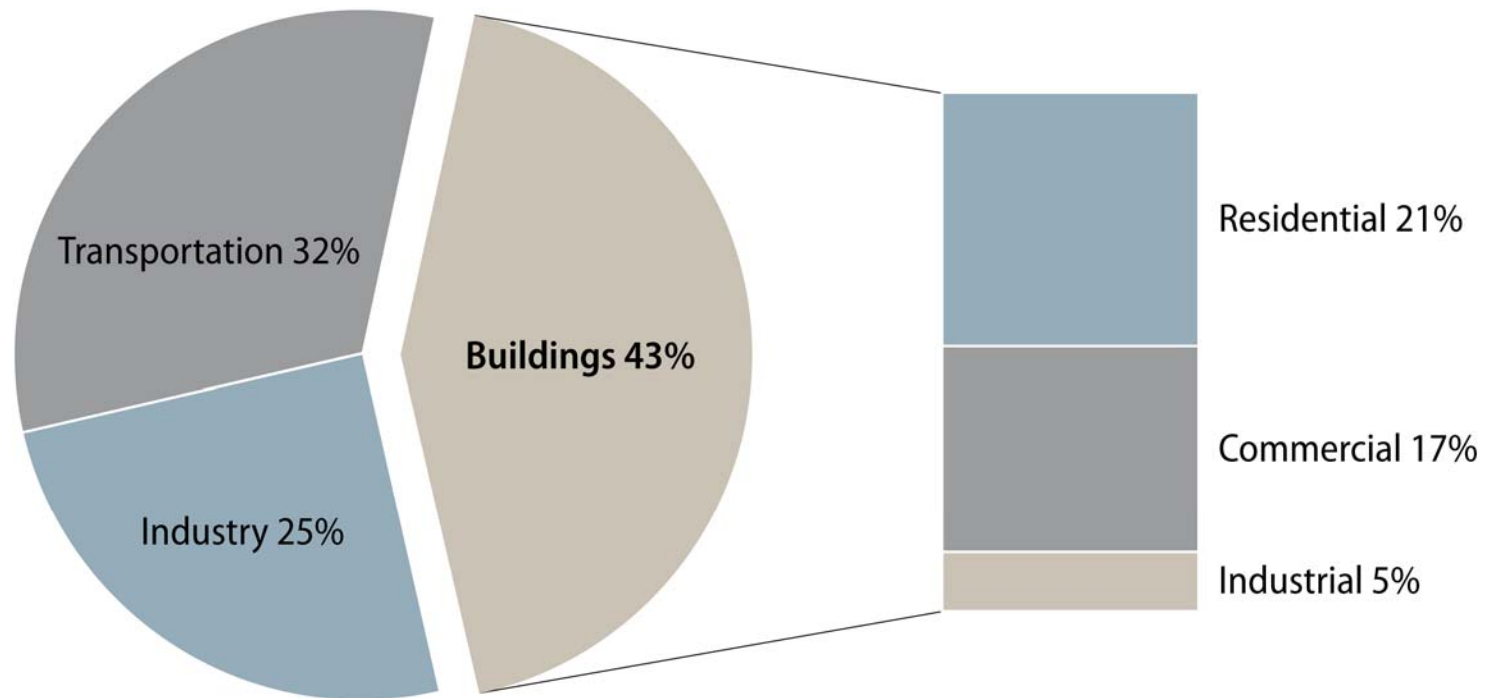
(M) **Moderate-term on-the-job training:** Requires from one to twelve months of training, which typically occurs at the workplace.

(L) **Long-term on-the-job training:** Requires more than one year of on-the-job training, or combined work experience and classroom instruction, and may include apprenticeships of up to five years.

These are general indicators; there may be other pathways into the occupation, as well as additional educational, training or licensing requirements.



# Building Contribution to CO<sub>2</sub> Emissions

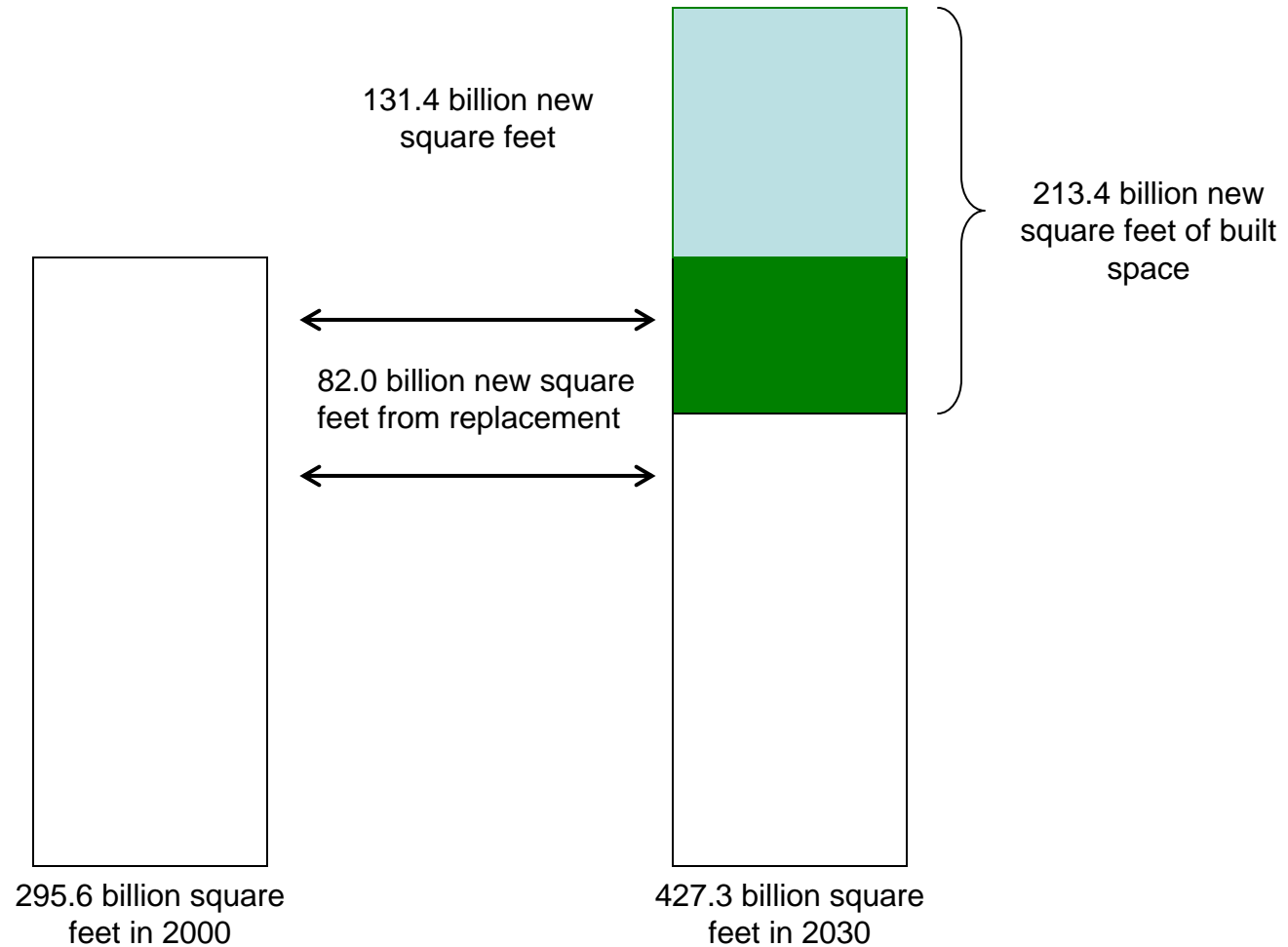


Source: Pew Center on Global Climate Change.





# Rebuilding America – The Opportunity



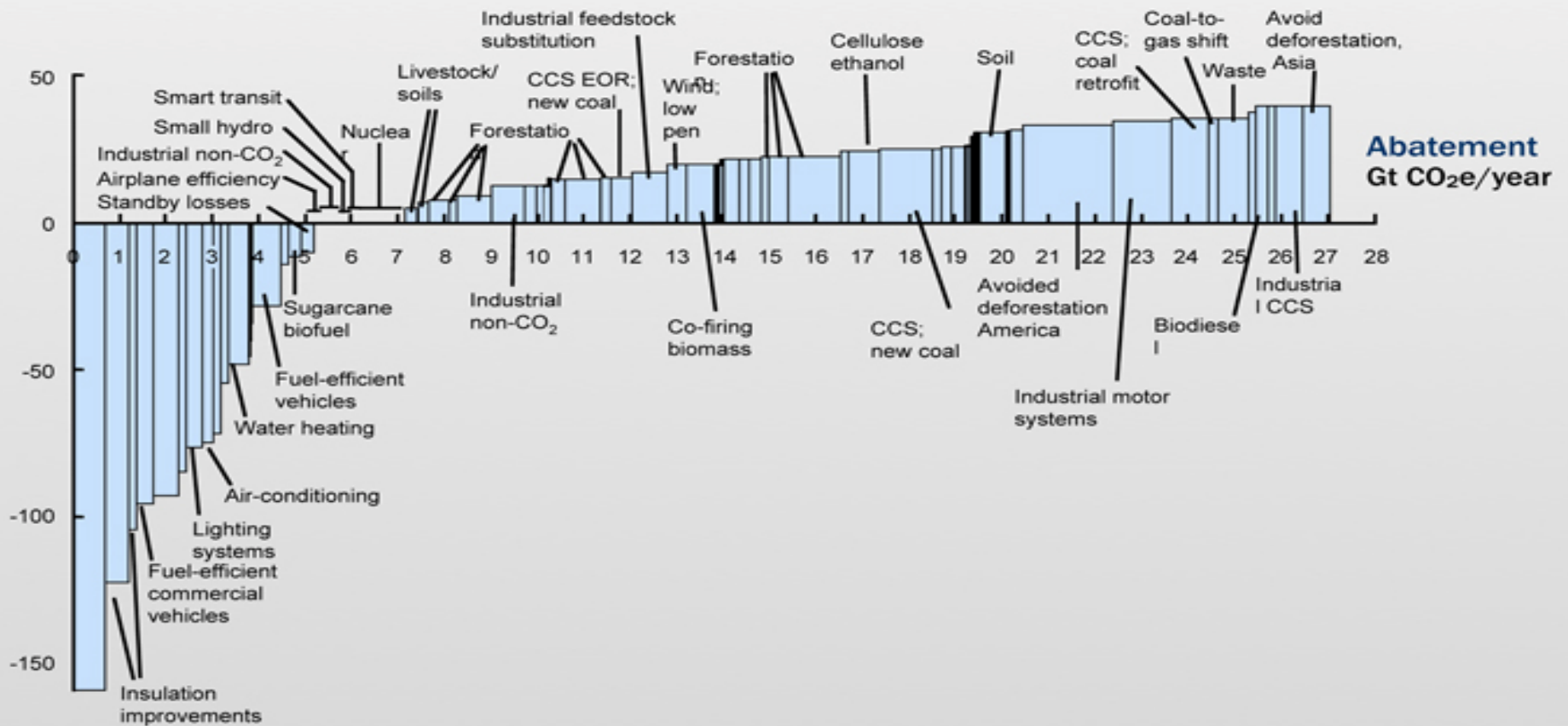
Source: Nelson, "Toward a new Metropolis"



# Negative Cost Solutions = Profit

## THE COST CURVE PROVIDES A “MAP” OF ABATEMENT OPPORTUNITIES

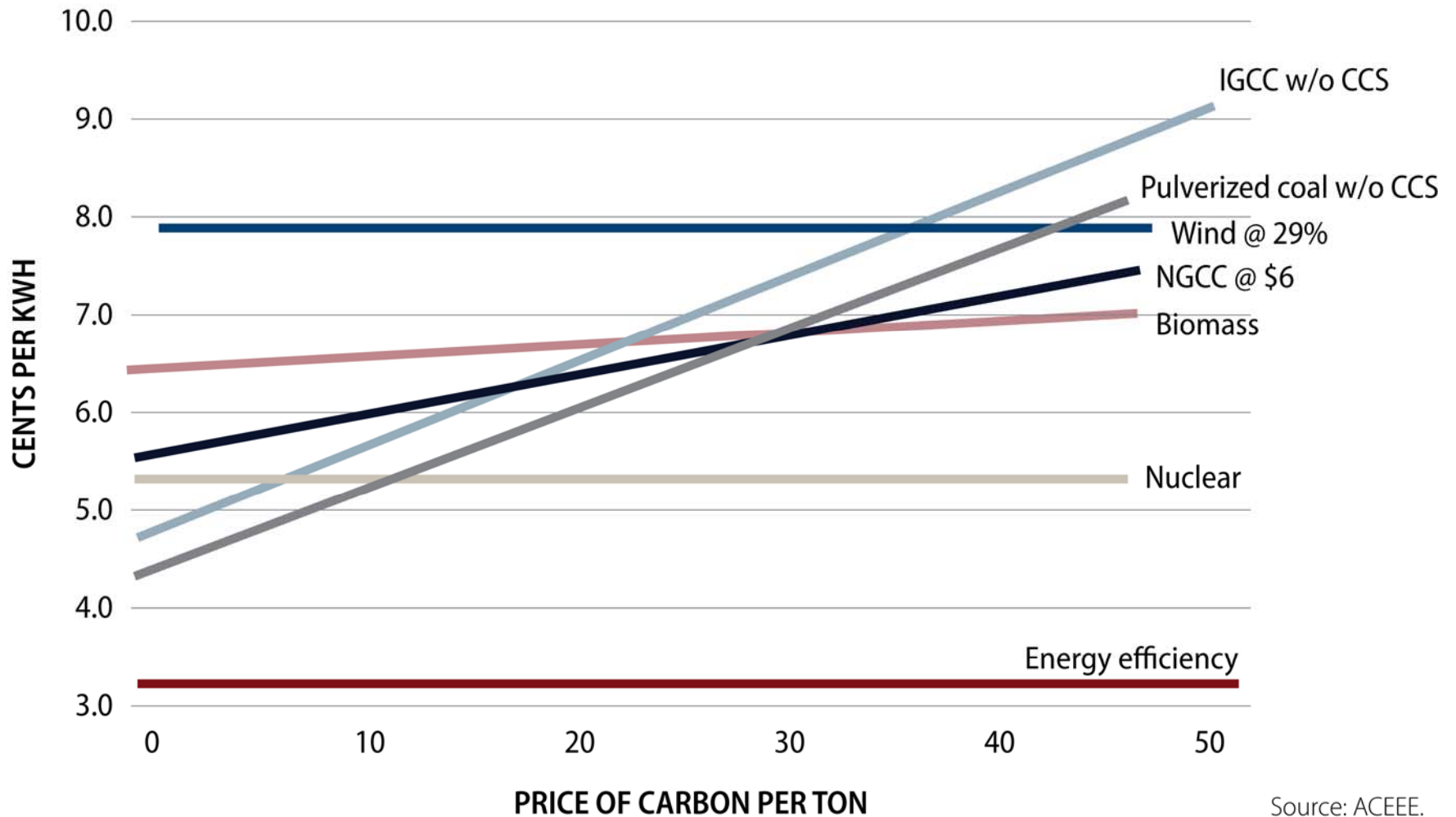
Cost of abatement, 2030, €/tCO<sub>2</sub>e\*



\* Cubic feet of carbon equivalents.  
Source: McKinsey and Vattenfall analysis

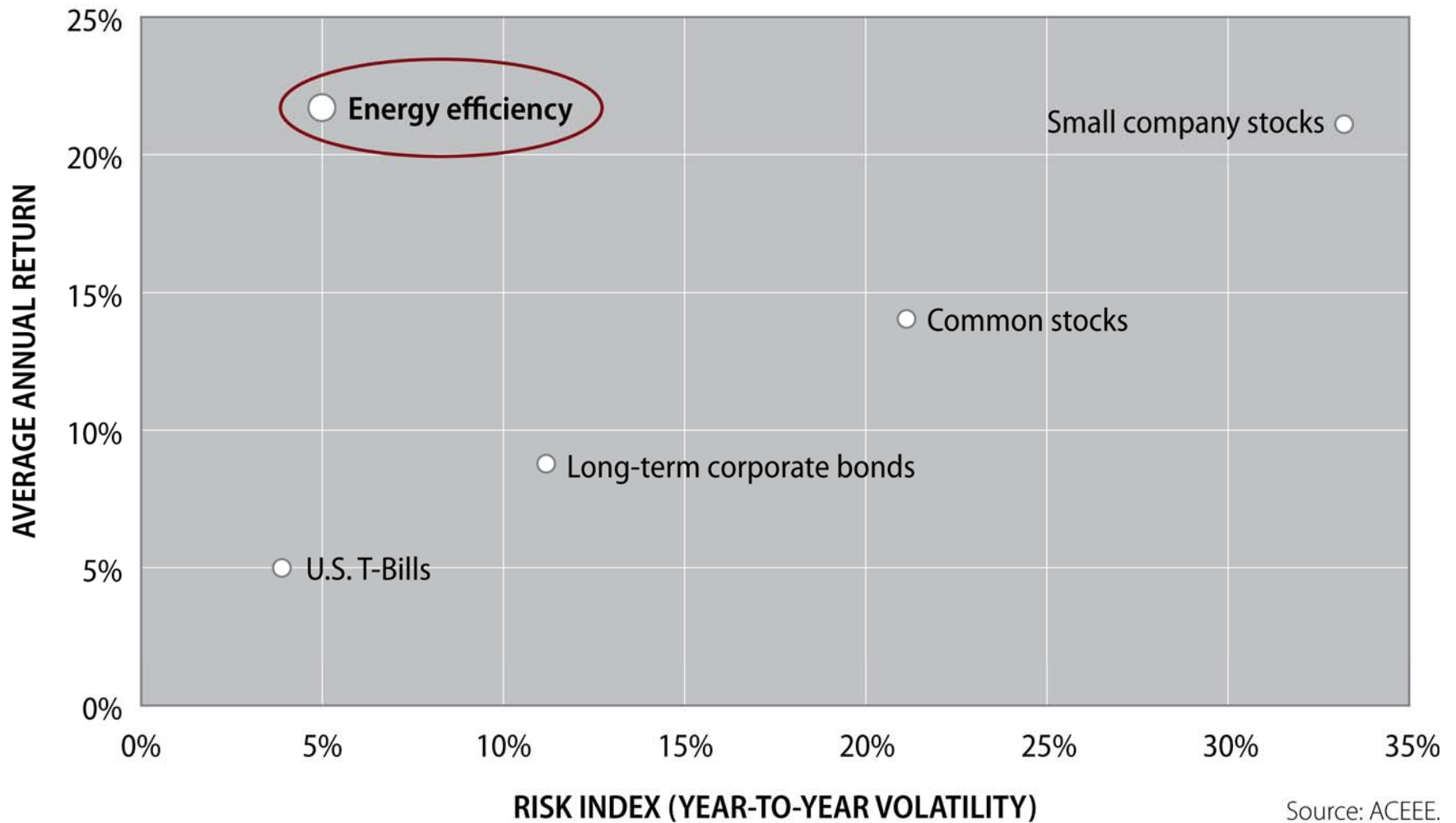


# Efficiency is Cheap and Getting Cheaper





# Efficiency: Good Returns on Investment

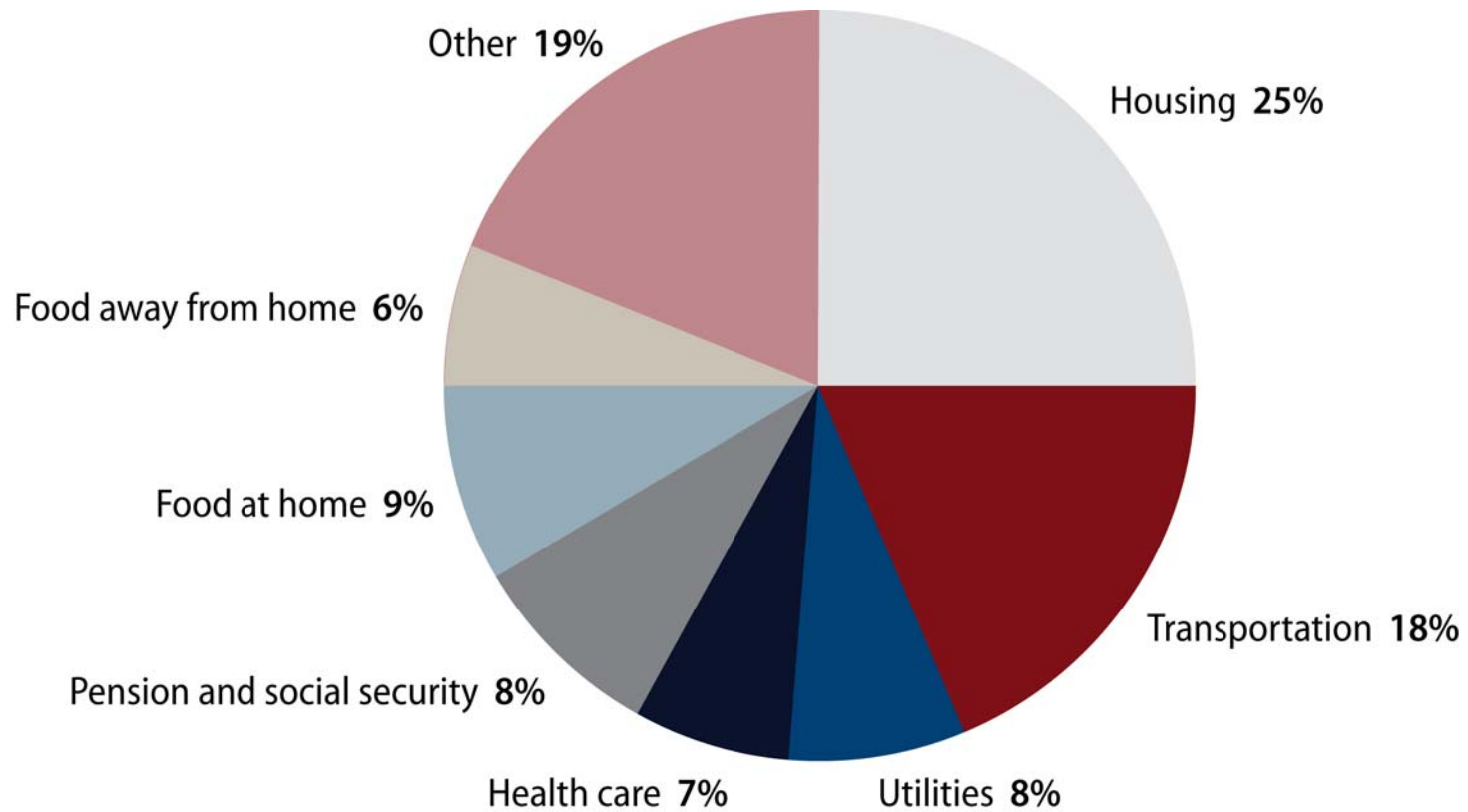


Source: ACEEE.



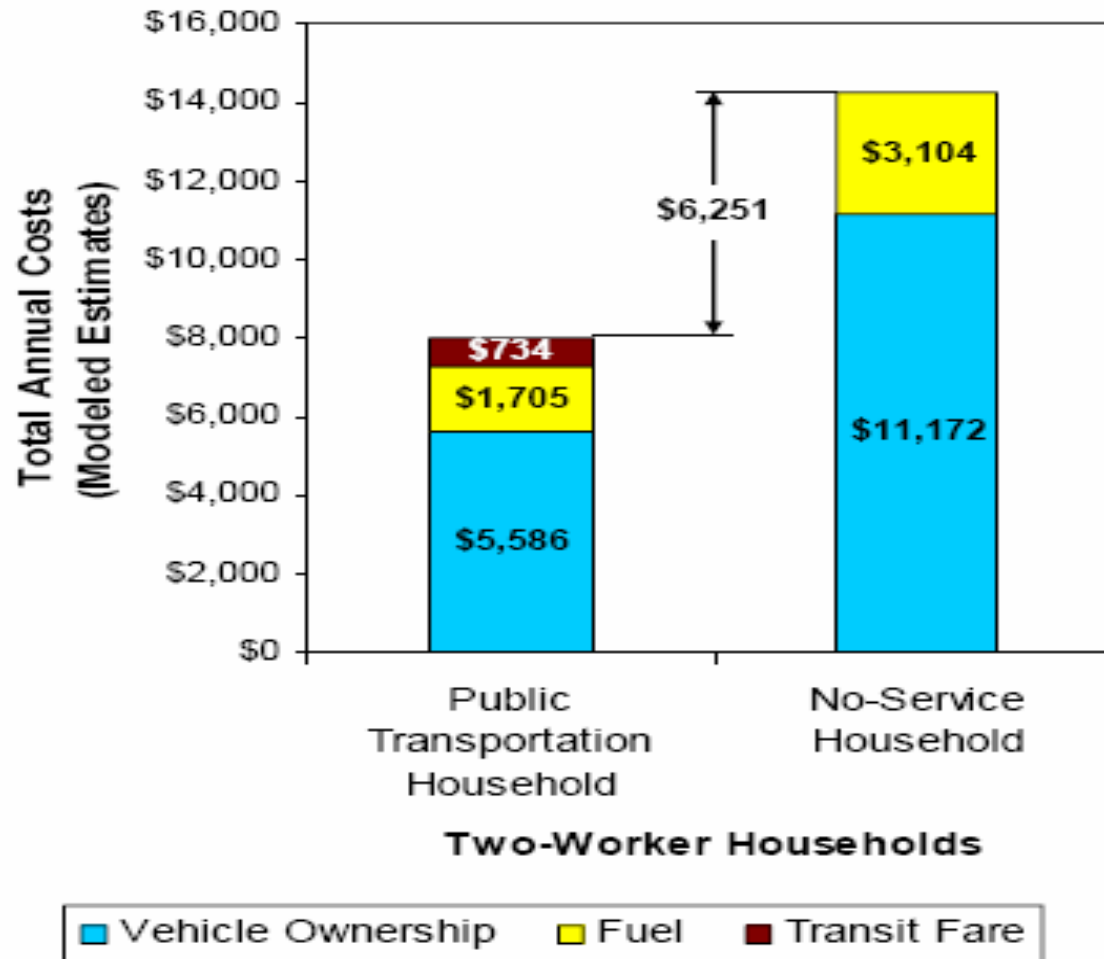


# Working Family Consumption Budget





# Income Gains from One Less Car



Source: ICF International, *Public Transportation and Petroleum Savings in the U.S.: Reducing Dependence on Oil*, 2007.







Jay Inslee and Bracken Hendricks  
Foreword by President Bill Clinton



# APOLLO'S FIRE

IGNITING AMERICA'S  
CLEAN ENERGY  
ECONOMY

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