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Building a Green Economy: Good Jobs Restoring Communities

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Center for American Progress

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Center for American Progress



Building a Green Economy

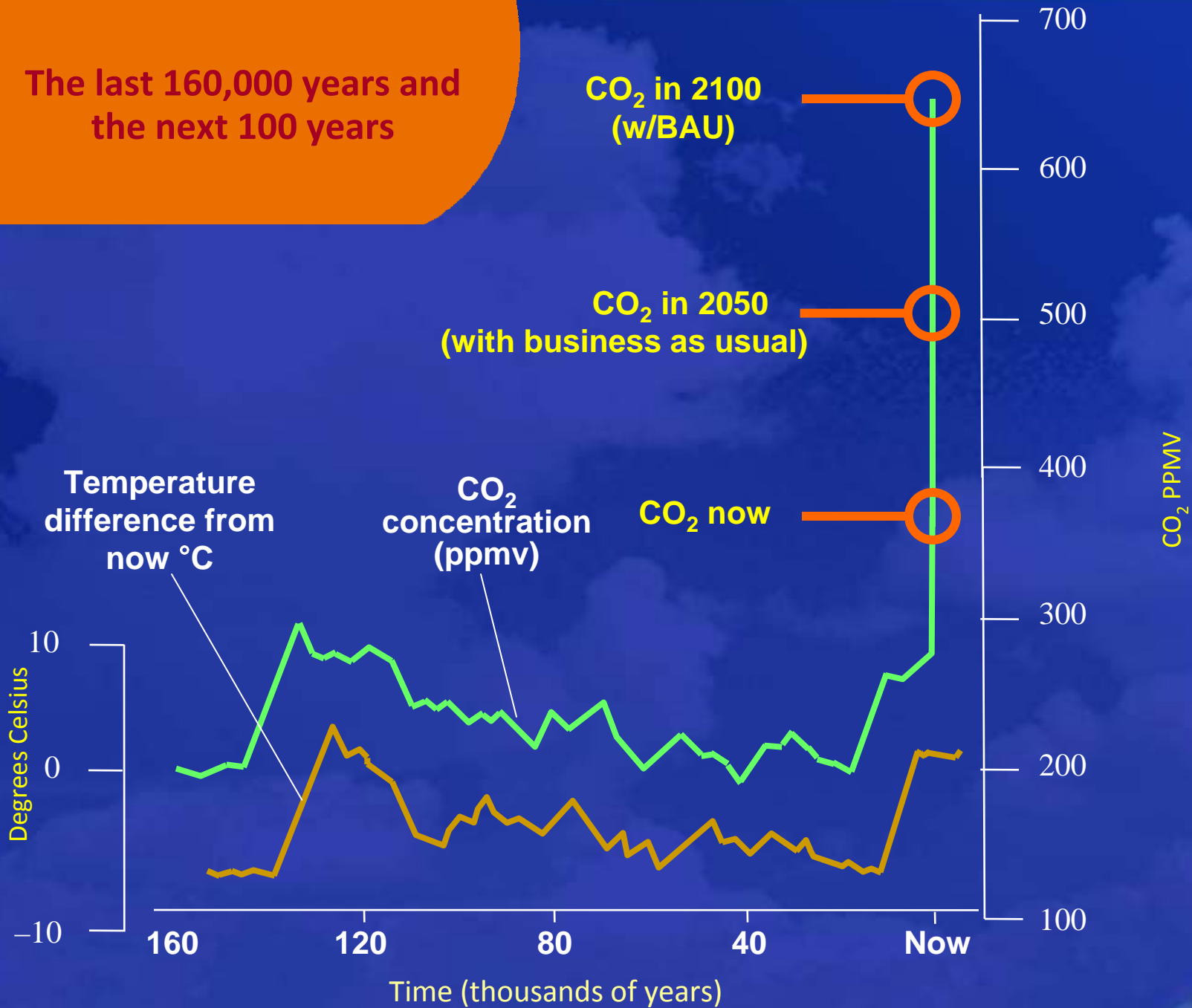
Good Jobs Restoring Communities

Bracken Hendricks, Senior Fellow CAP
Springfield, MA. November 22, 2008
Clean Energy Connections

www.americanprogress.org

Progressive Ideas for a Strong, Just, and Free America

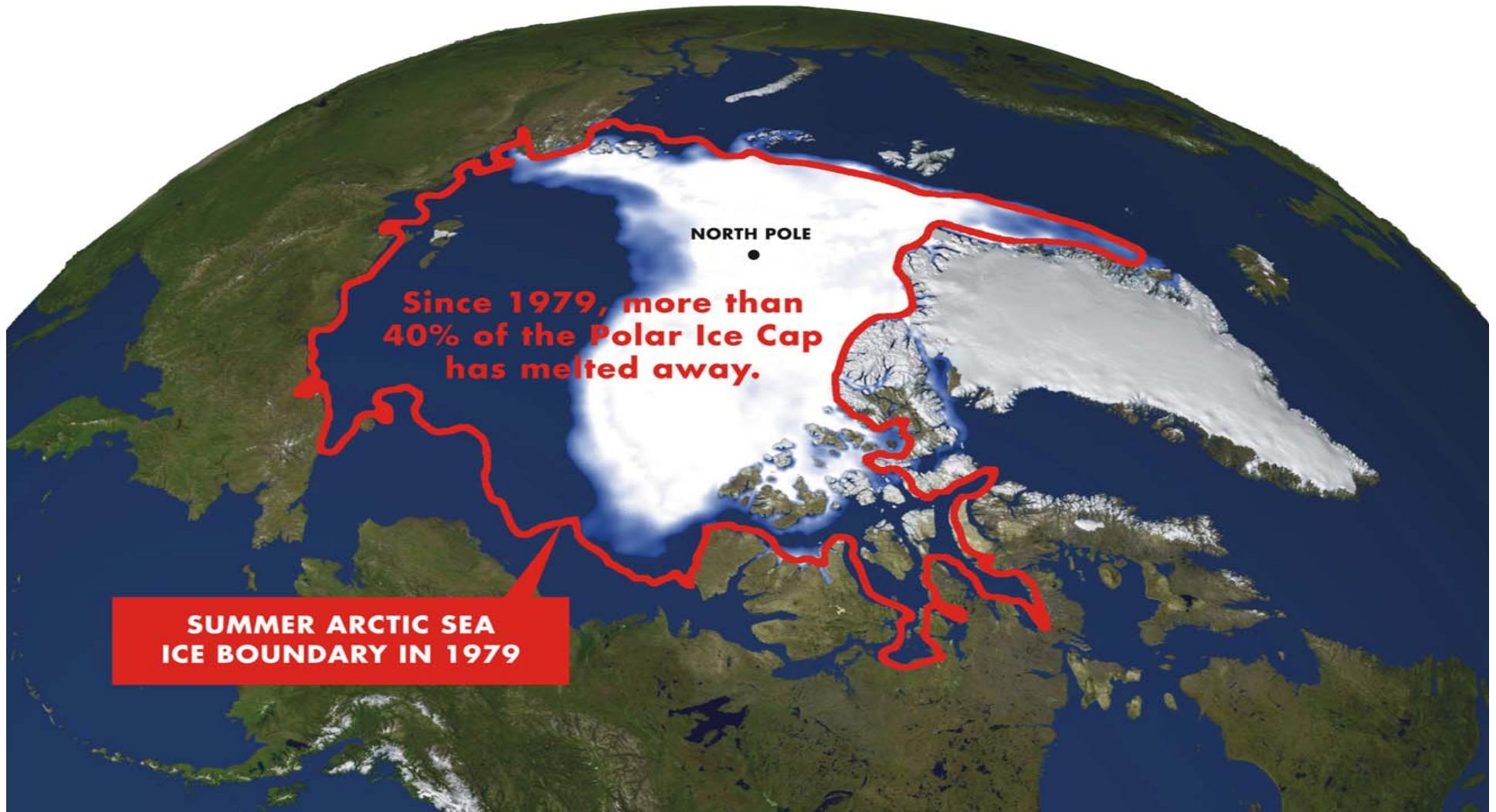
The last 160,000 years and the next 100 years





Scale, Scope & Speed

Recognizing the Severity of the Climate Threat





Center for American Progress



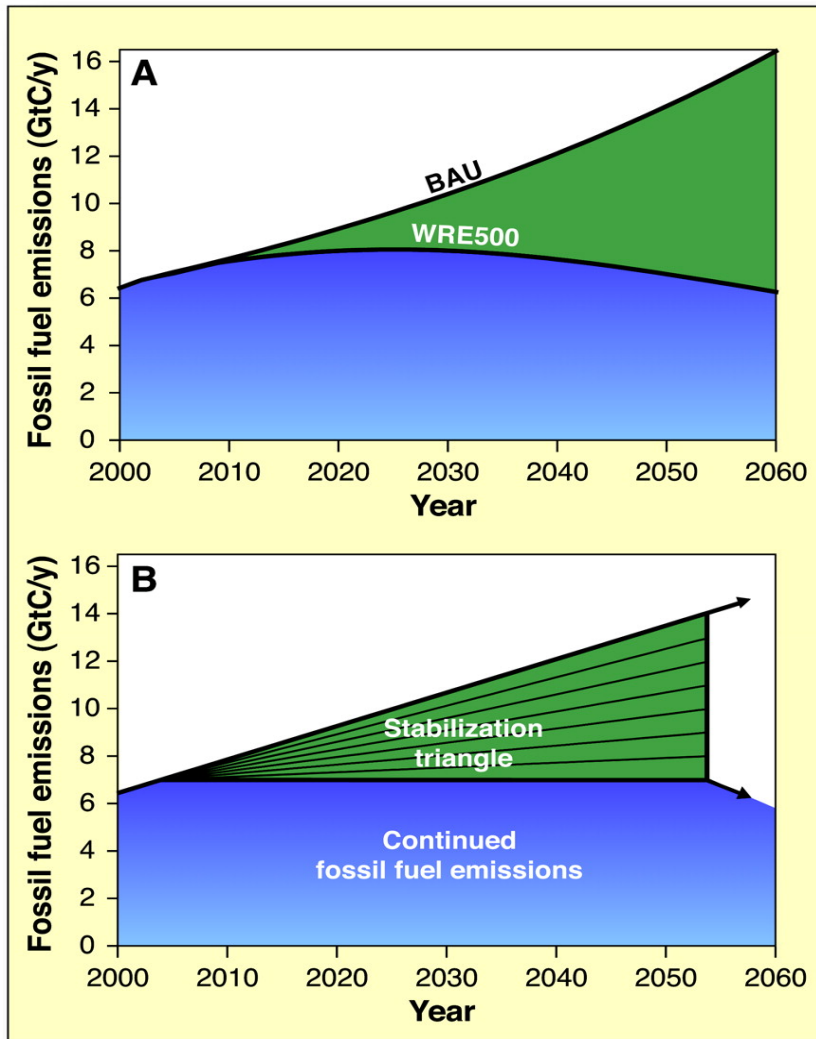
Scale, Scope & Speed

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



Solving Global Warming Means Investment

Regional Infrastructure is key

We need to rebuild the fabric of our communities on modern principles that allow for conservation and clean energy

- Green building is exploding nationwide
- Rapid renewables industry growth
- Energy efficiency is the low hanging fruit, cost effective and clean
- Look at green as a sector of the economy
- Green is a new lens for economic function

Question:

How do we realize this opportunity on the ground?



We are under investing in infrastructure

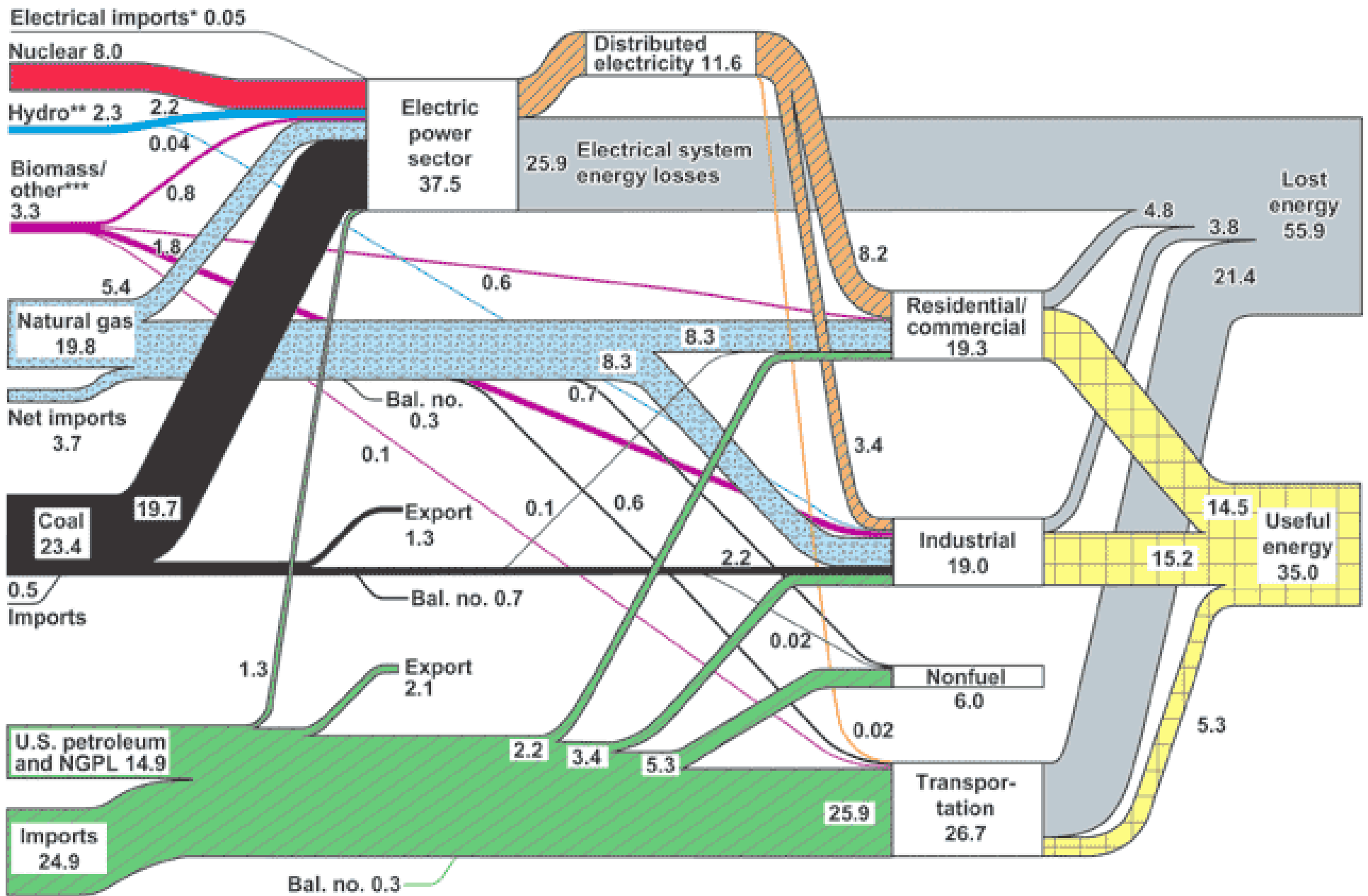
& Drawing down the capital of our communities

ACSE: 1.6 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.



Source: Production and end-use data from Energy Information Administration, *Annual Energy Review 2001*

*Net fossil-fuel electrical imports

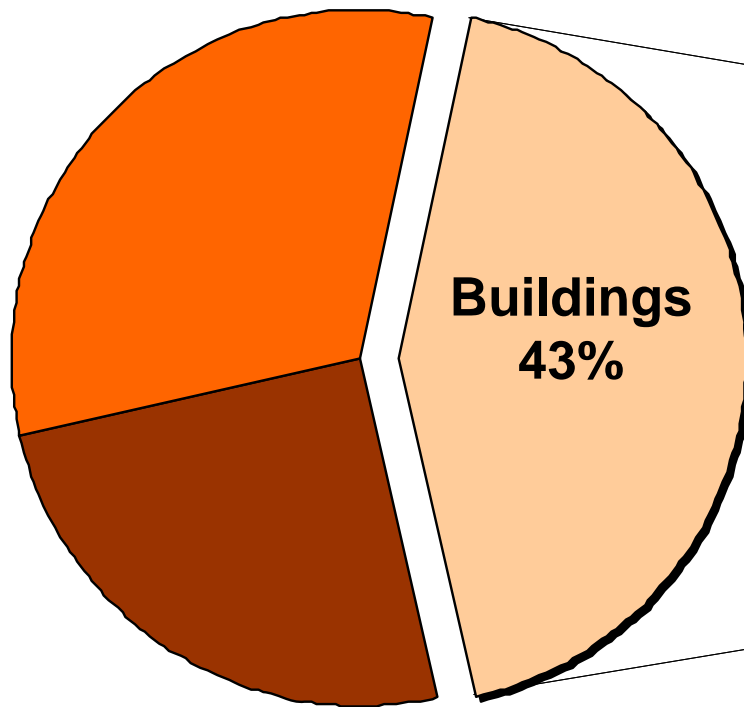
**Includes 0.2 quads of imported hydro

***Biomass/other includes wood, waste, alcohol, geothermal, solar, and wind.

August 2003
 Lawrence Livermore
 National Laboratory
<http://eed.llnl.gov/flow>

Building Contribution to CO₂ Emissions

Transportation
32%



Industry 25%

Residential
21%

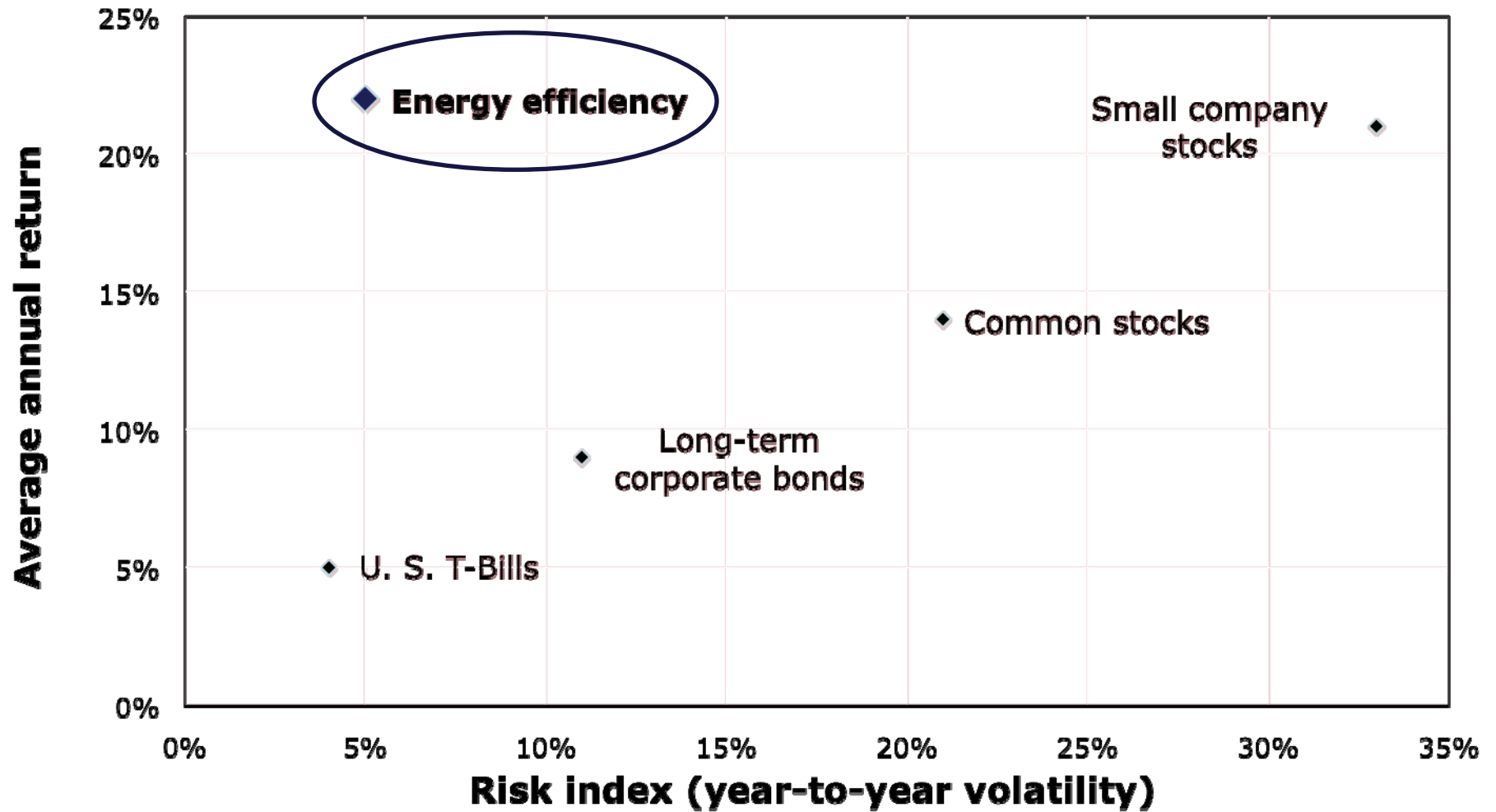
Commercial
17%

Industrial
5%

Source: Pew Center on Global Climate Change



Efficiency: Good Returns on Investment



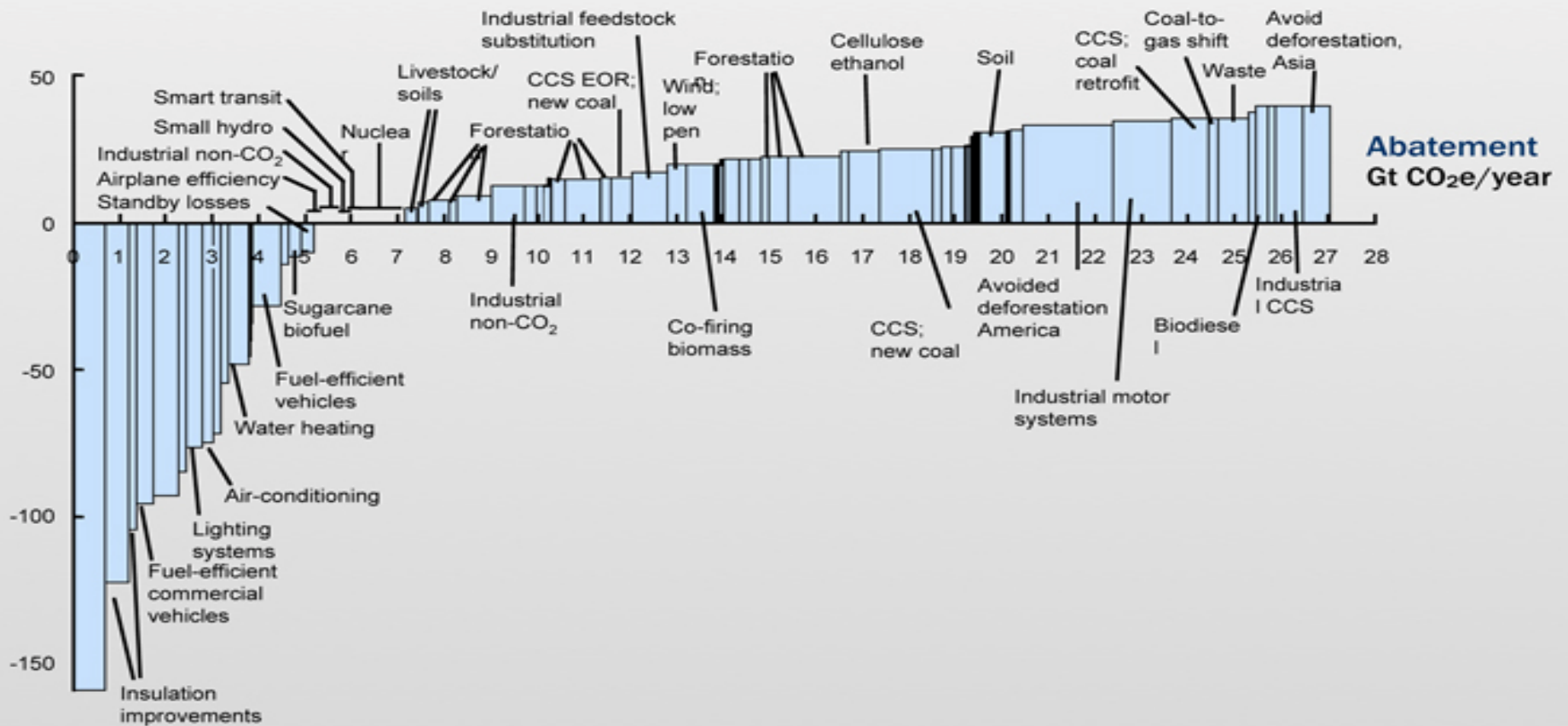
Source: ACEEE



Negative Cost Solutions = Profit

THE COST CURVE PROVIDES A “MAP” OF ABATEMENT OPPORTUNITIES

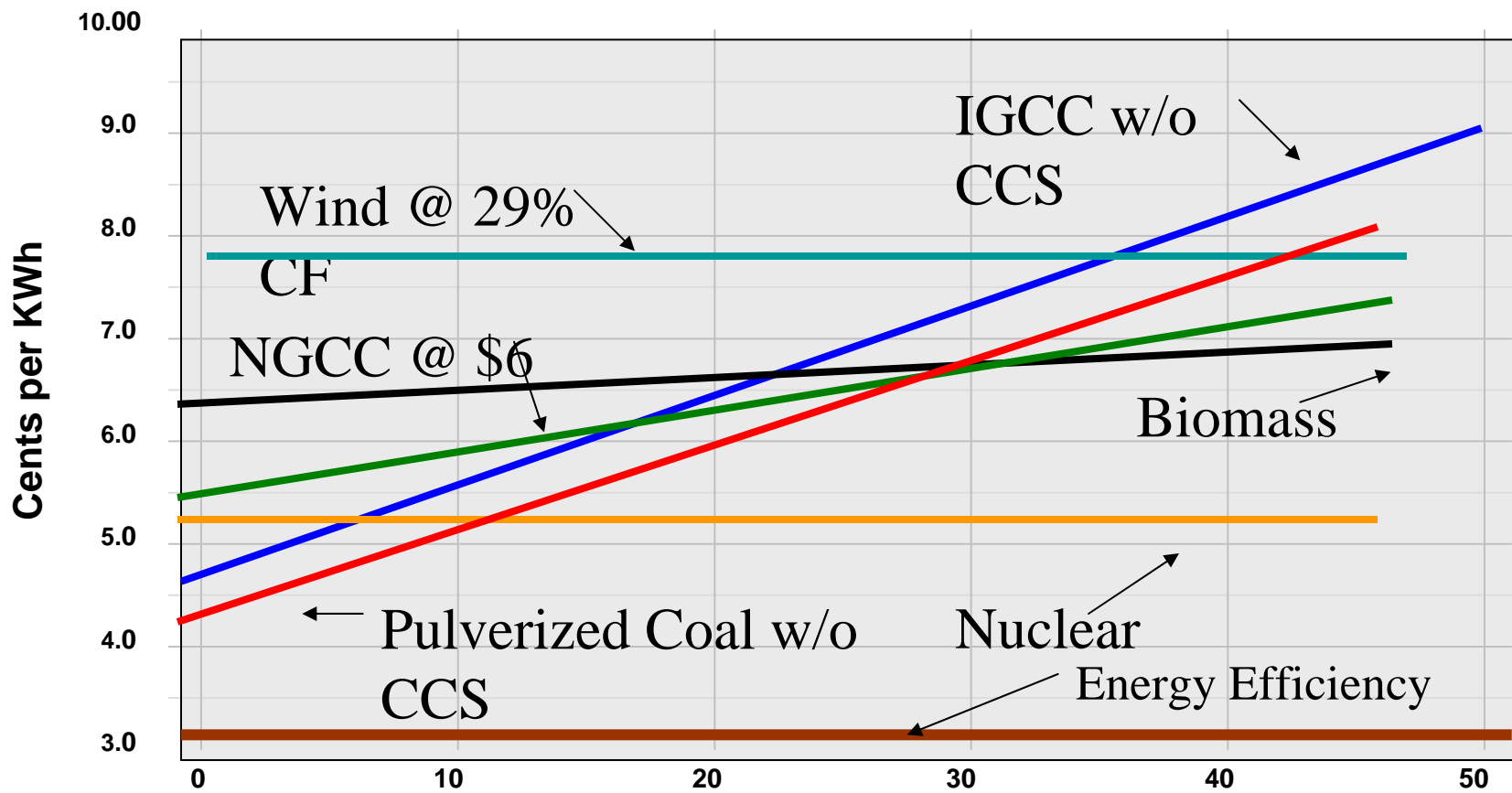
Cost of abatement, 2030, €/tCO₂e*



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



Efficiency is Cheap and Getting Cheaper

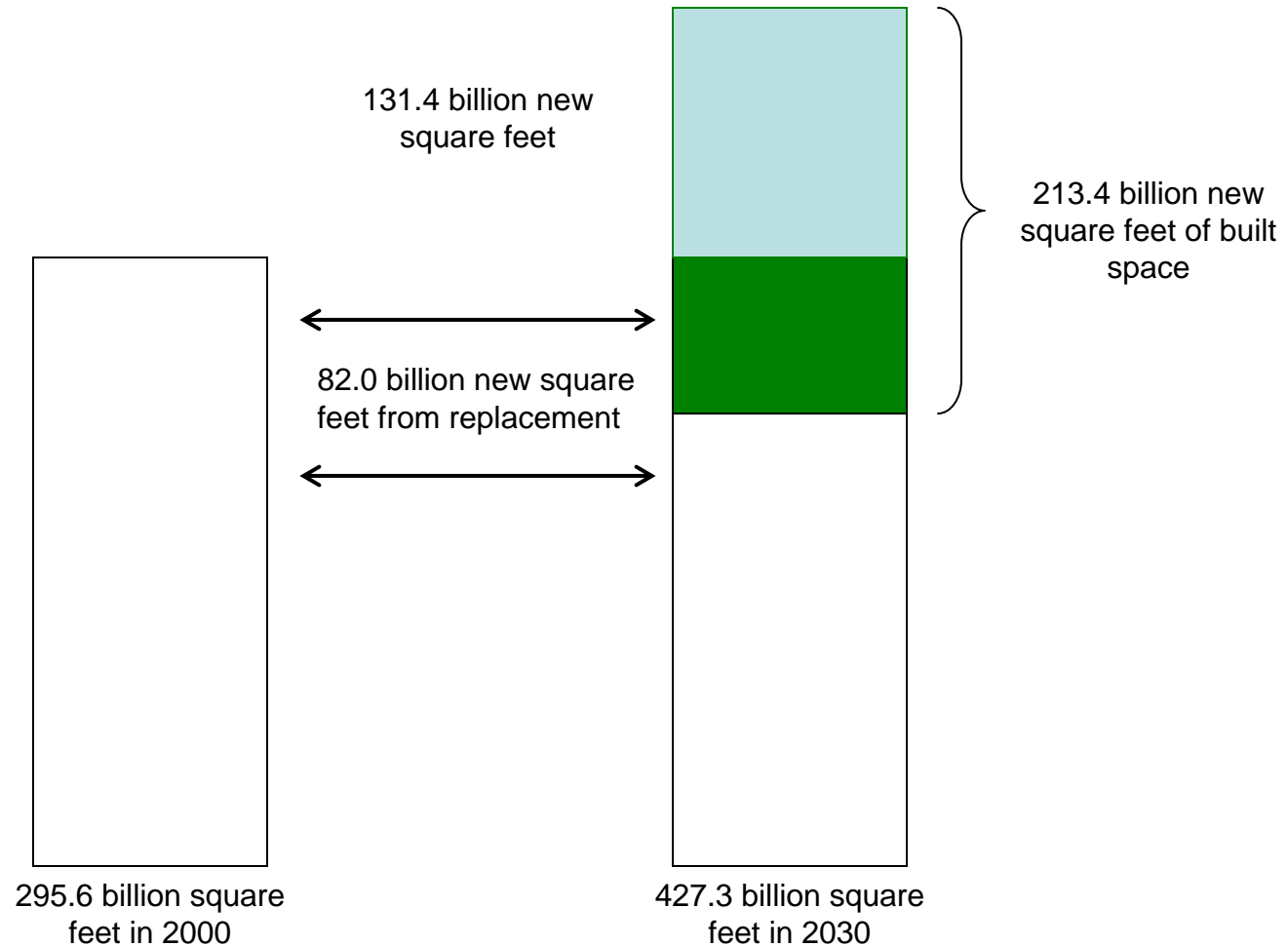


Price of carbon per ton

Source: ACEEE



Rebuilding America – The Opportunity

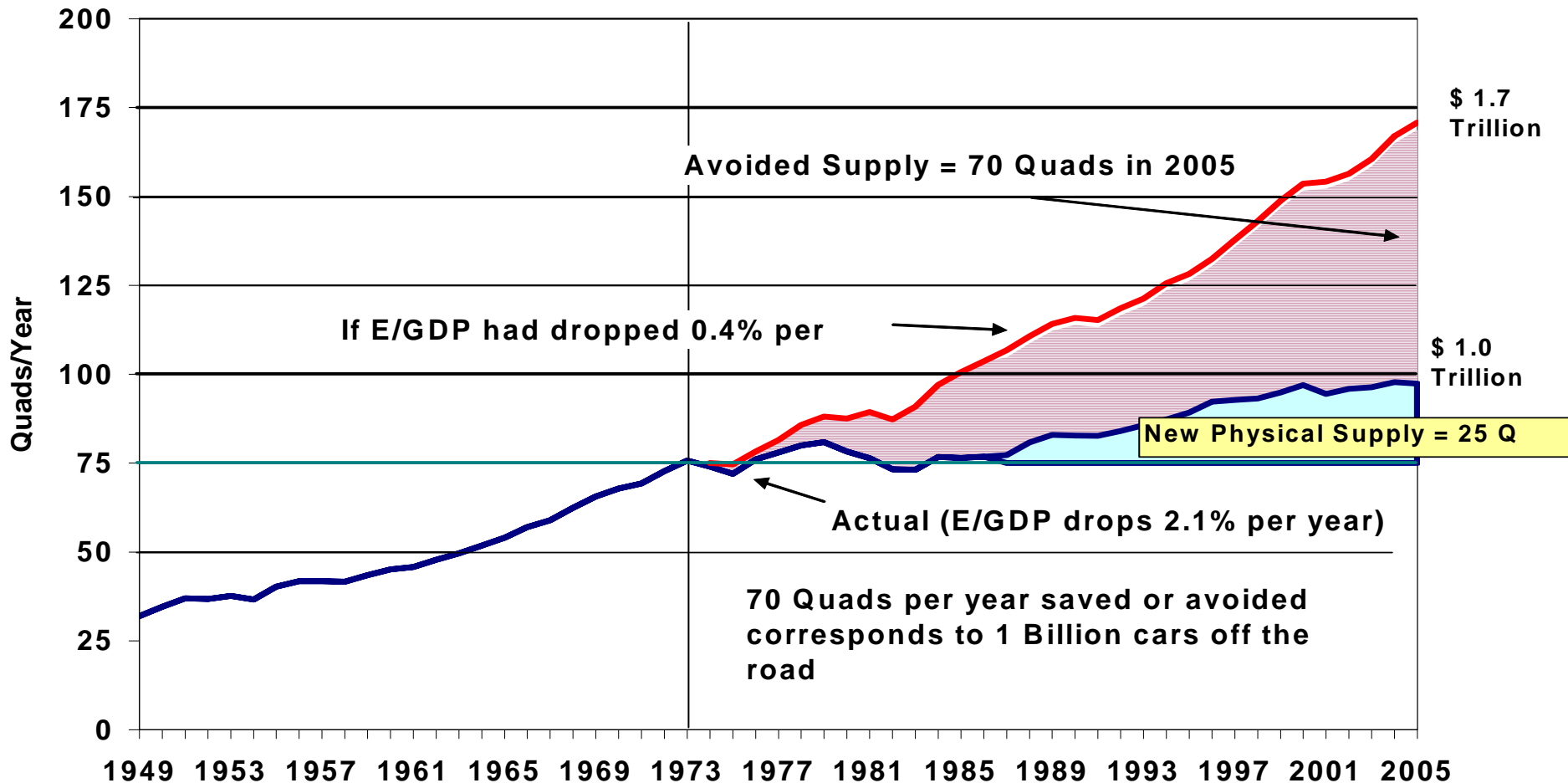


Source: Nelson, "Toward a new Metropolis"



Energy Efficiency is the "First Fuel"

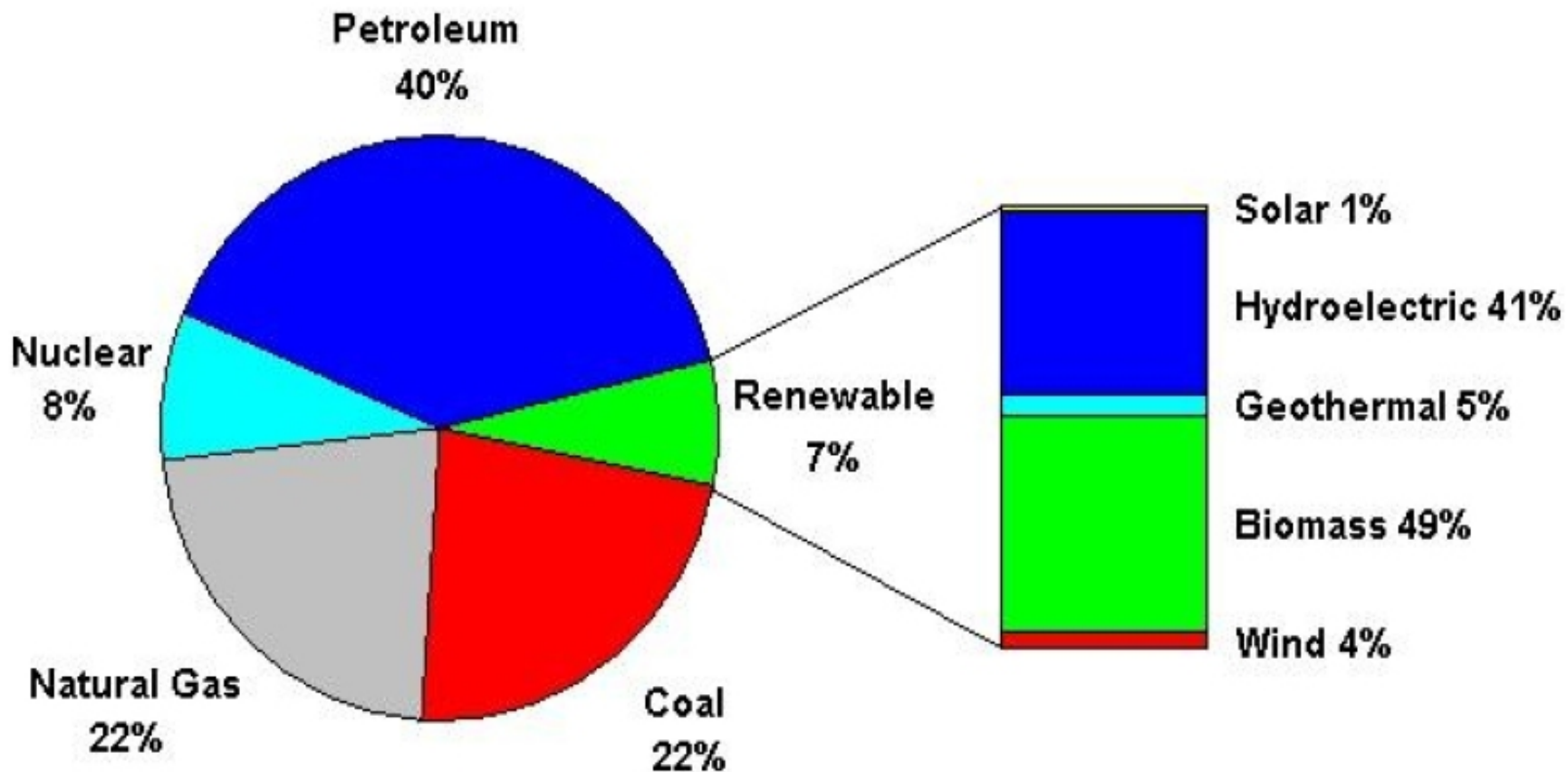
Energy Consumption in the United States 1949 - 2005



Sources of U.S. Energy Use

Total = 99.861 Quadrillion Btu

Total = 6.922 Quadrillion Btu





PERI Report:

The Benefits of a Green Recovery

The CAP – PERI Model

Investment in 6 Efficiency & Renewables Strategies

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

\$100 Billion over 2 years

Direct Spending, Tax Incentives & Loan Guarantees

Spurs Private Investment & Growth



PERI Report:

The Benefits of a Green Recovery

The Findings

Clean Energy = More Jobs + Better Jobs

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**
- **Unemployment rate down 5.7% to 4.4%**

Clear policies and pathways to investment

Obvious jobs and community benefits

Rebuilds industry and skills for long term

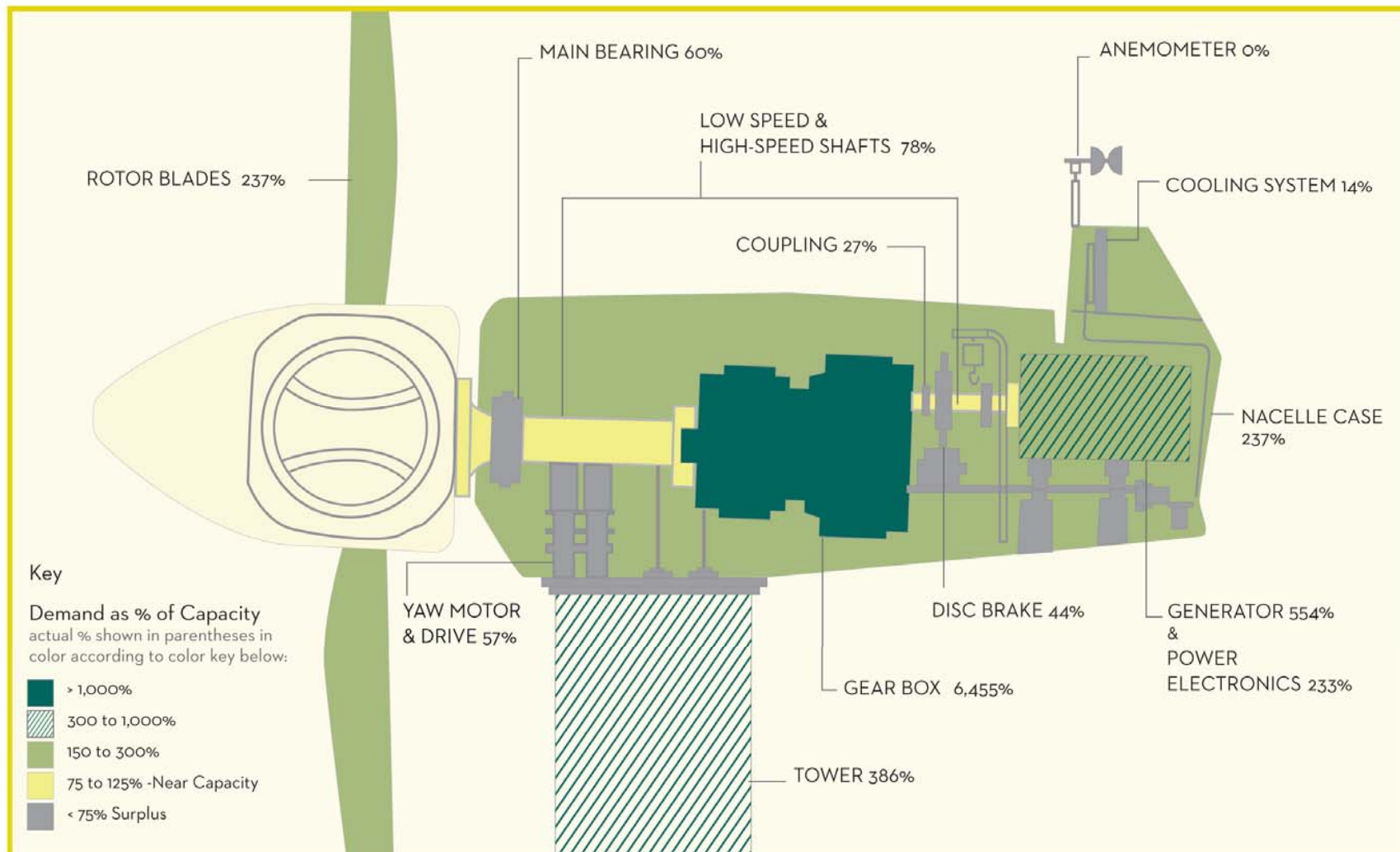
Meets pressing needs while spurring growth

Career ladders & pathways out of poverty



Green Jobs & Manufacturing Opportunity

WIND TURBINE COMPONENTS: SUPPLY CHAIN BOTTLENECKS





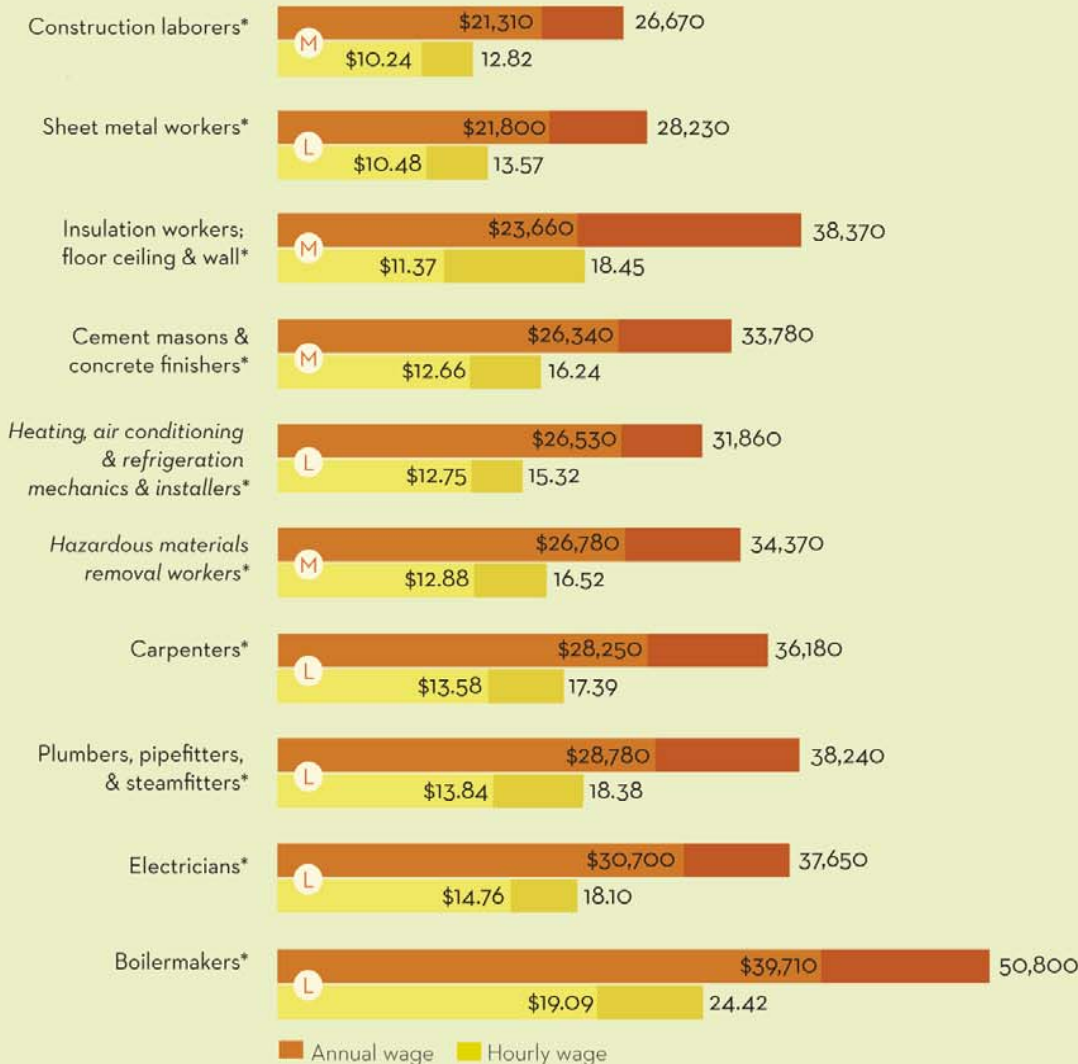
Kinds of Green Jobs: Efficiency & Renewables

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.

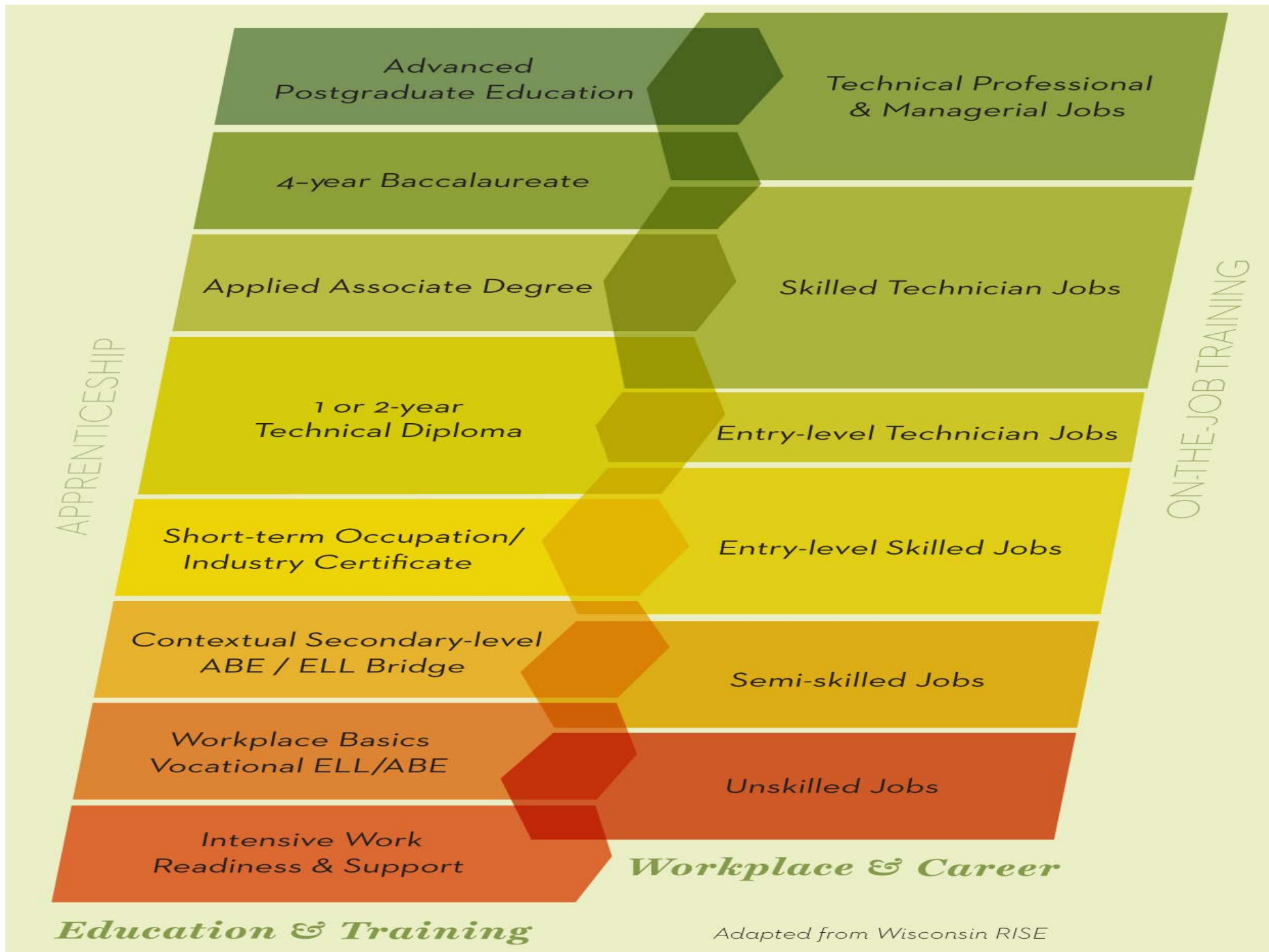
Regional wage ranges and more precise occupational projections by industry can be run on a state-by-state basis.

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.

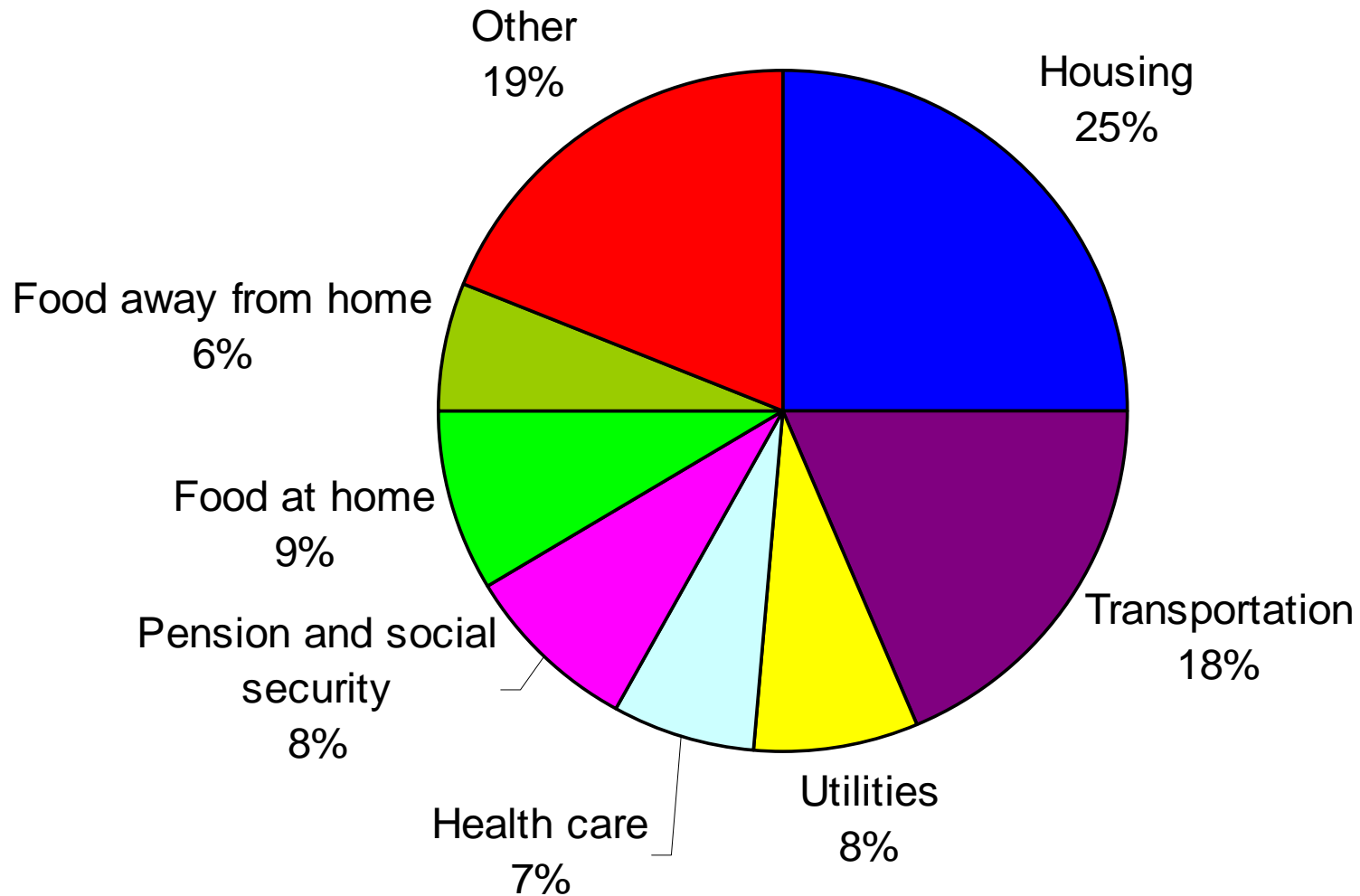
(L) **Long-term on-the-job training:** Requires more than one year of on-the-job training, or combined work experience and classroom instruction, and may include apprenticeships of up to five years.

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



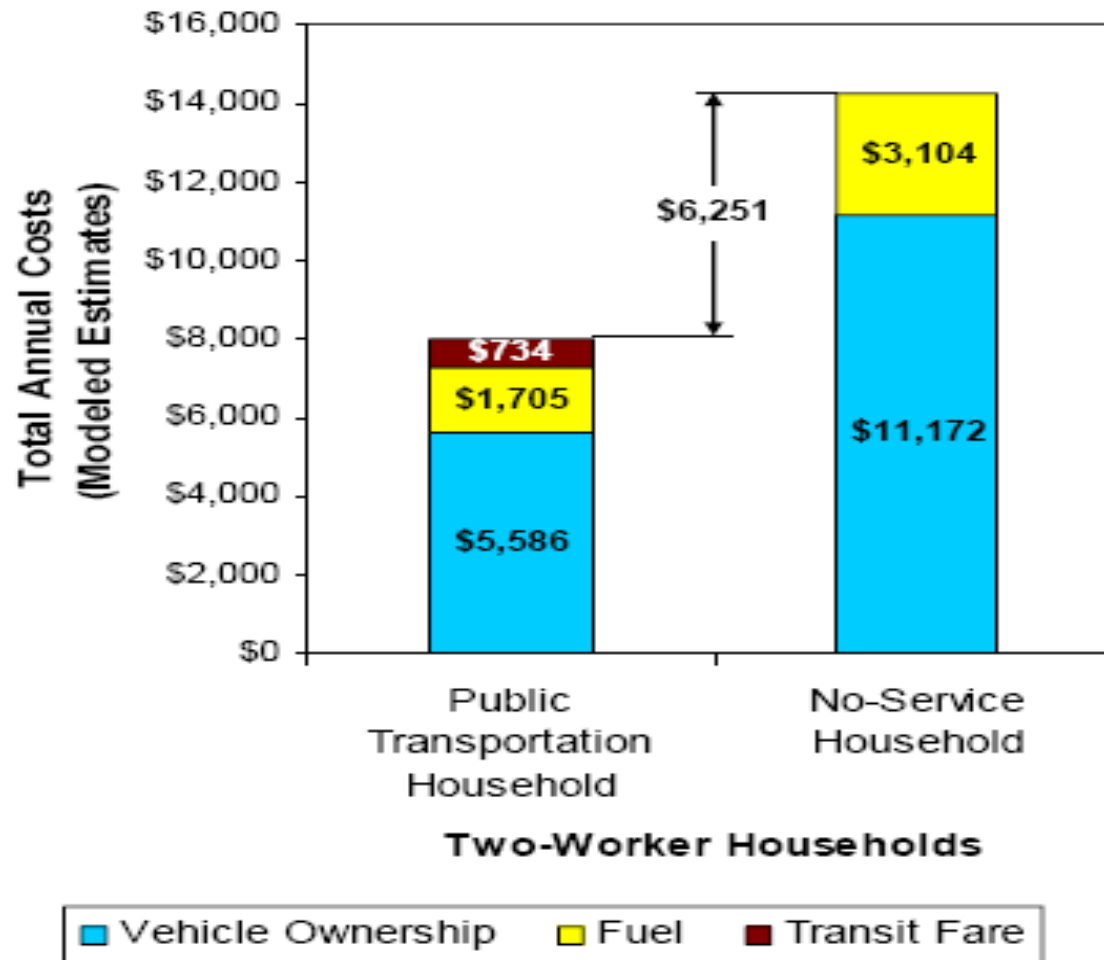


Working Family Consumption Budget





Income Gains from One Less Car

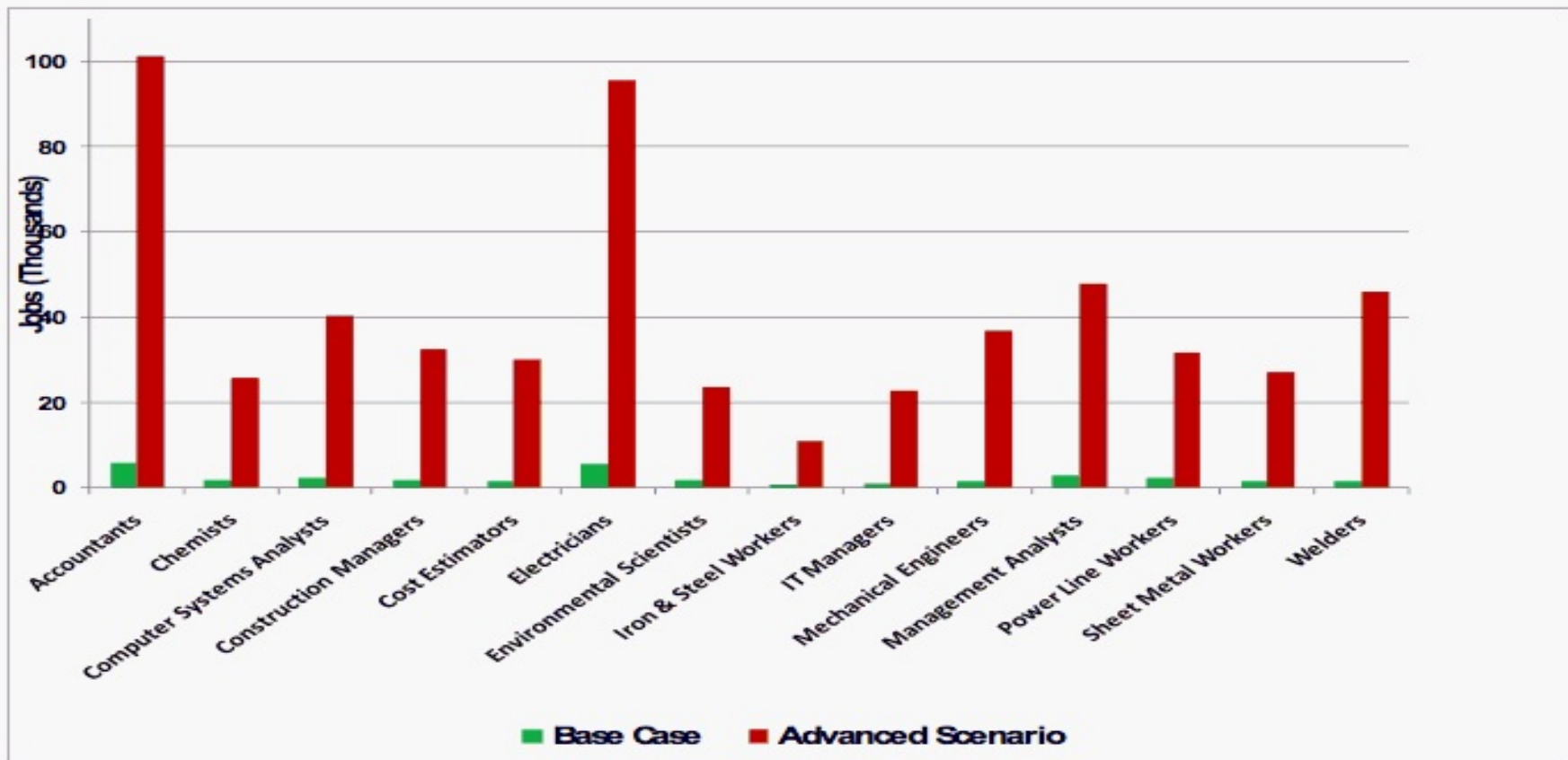


Source: ICF International, *Public Transportation and Petroleum Savings in the U.S.: Reducing Dependence on Oil*, 2007.



Potential RE Jobs in Familiar Occupations

U.S. JOBS CREATED BY RE IN 2030 (TOTAL JOBS CREATED -- SELECTED OCCUPATIONS)





Clean Energy is Economic Development

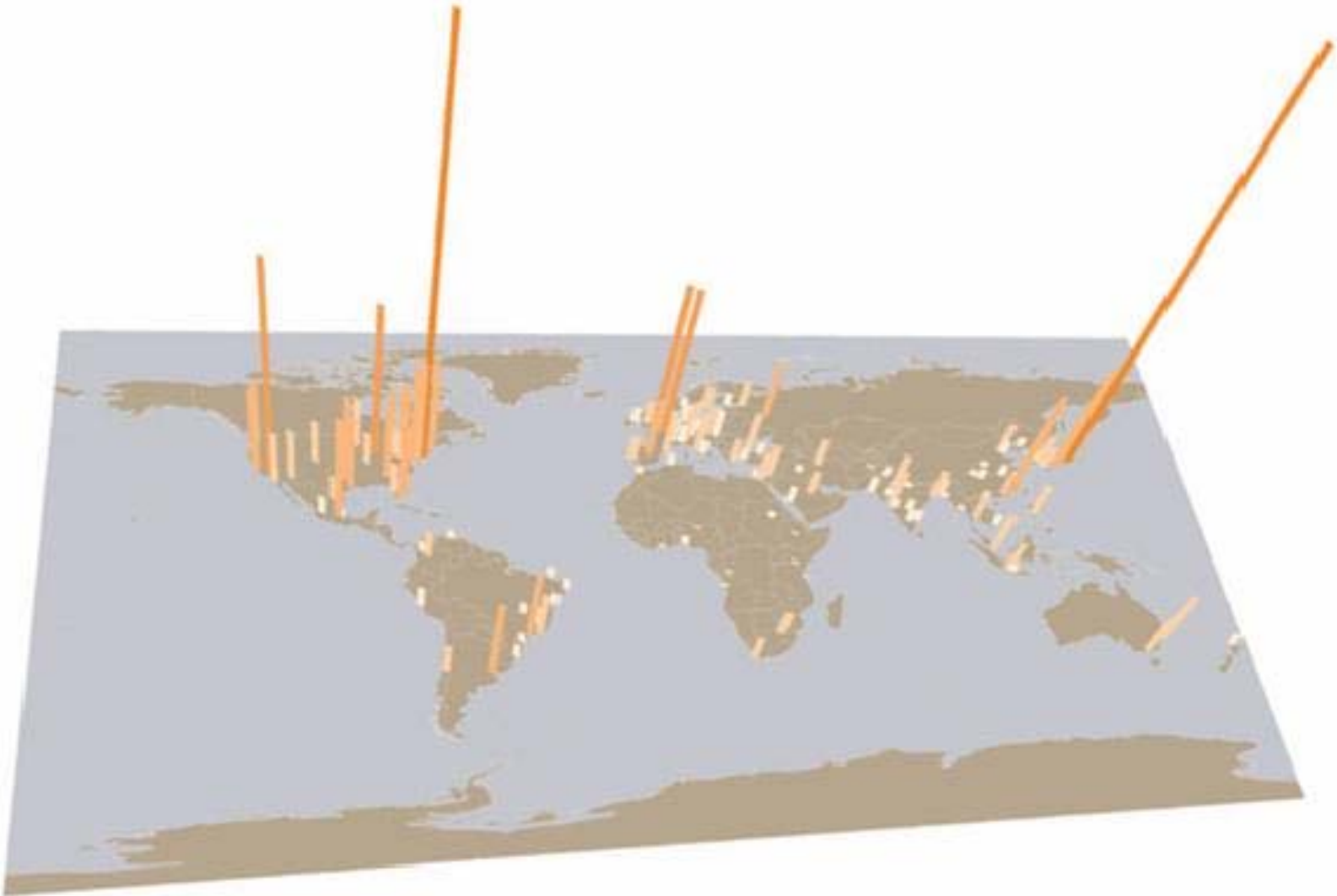
EE&RE FIRMS IN OHIO (Examples of Selected Firms)

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.

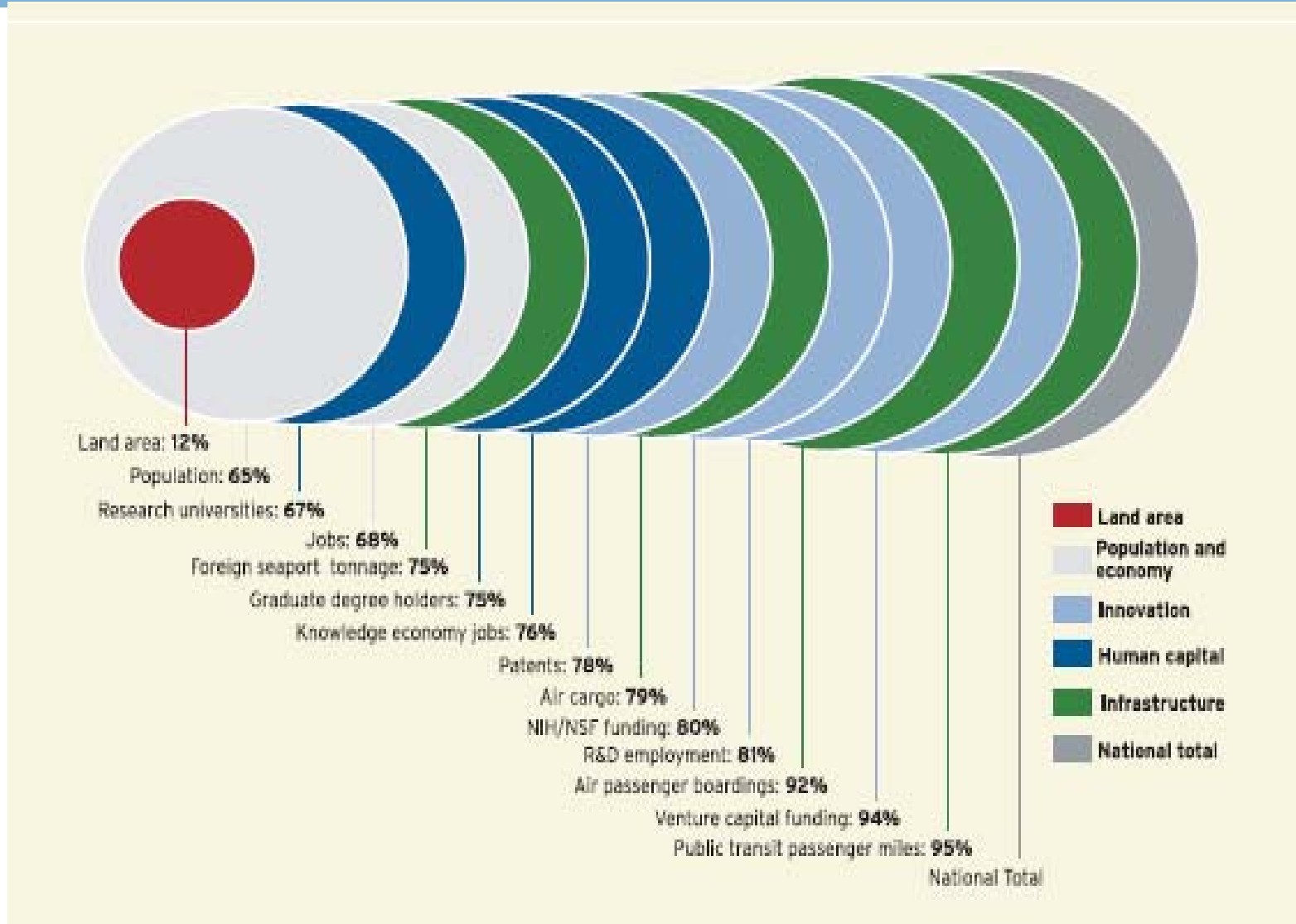


Cities: The World is Not Flat (Share of GWP, Top 130 Cities)





100 Top US Metro Areas = 75% of US GDP



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Green Jobs

Green Economic Development Means New Constituencies

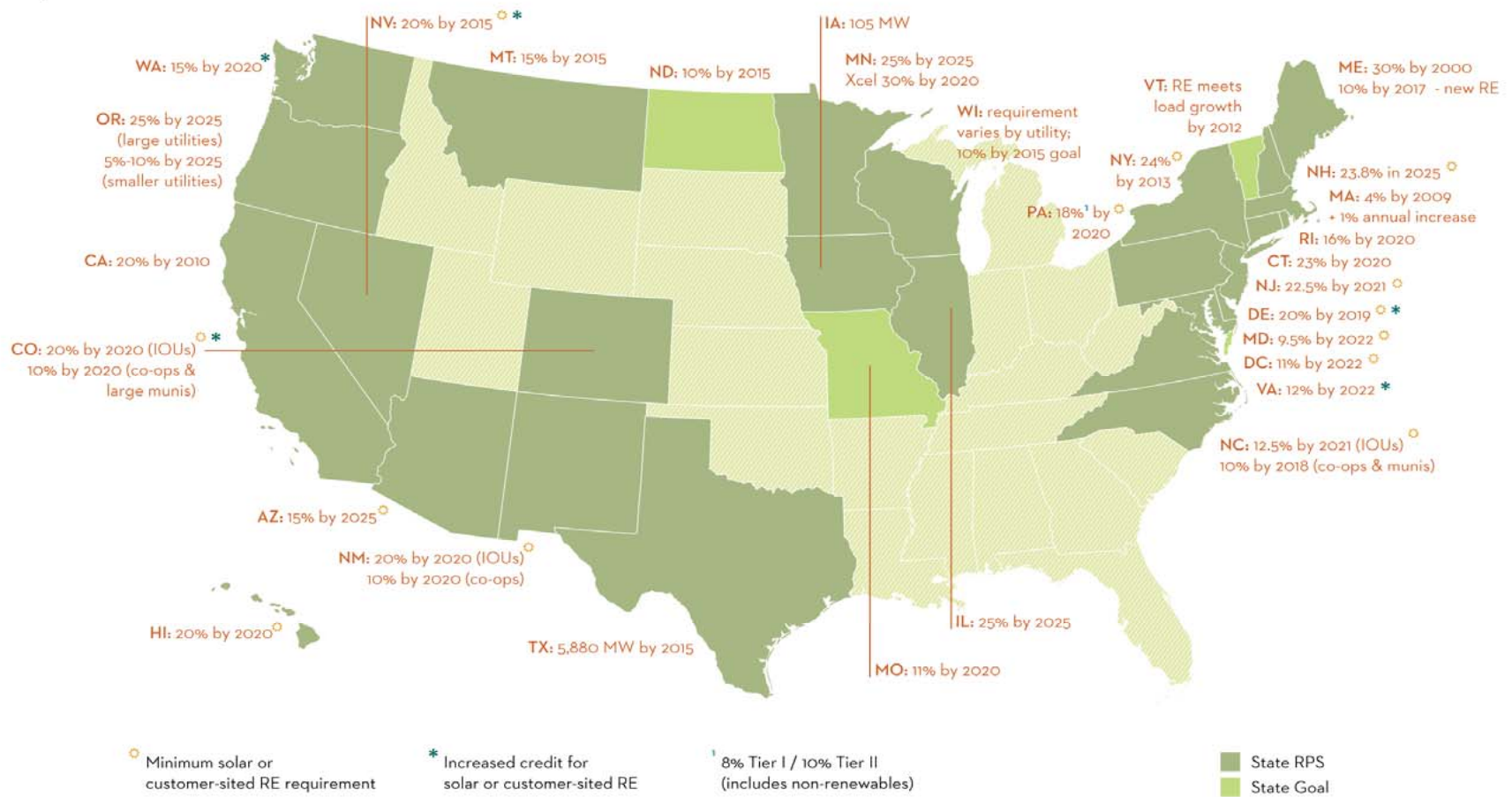




State Leadership

Policy creates markets and infrastructure

STATE RENEWABLE PORTFOLIO STANDARDS AS OF JANUARY 2008

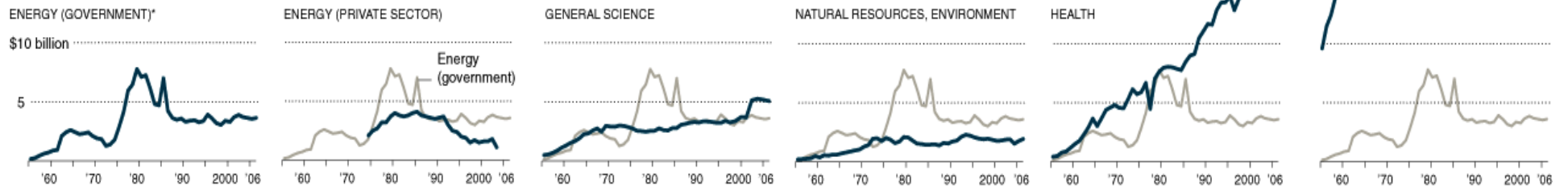




Declining Investment in Energy R.&D.

Spending for energy research and development peaked during the oil crisis and has since fallen while spending in most other sectors continues to grow.

Research and development spending by function, in 2006 dollars





PERI Report:

The Benefits of a Green Recovery

A model for Green Stimulus/Recovery

\$55 Billion in near term spending

- **Energy Efficiency & Conservation Block Grants**
- **Transit Starts: 74 projects, 23 states, \$30 billion**
- **Weatherization Assistance Program**
- **Green Schools & Affordable Housing**
- **Smart Grid and Clean Energy Infrastructure**
- **Workforce Investment: Green Jobs Act & MEP**

Near term growth package

Reduce cost of clean energy transition

Save consumers money

Build more efficient regional economies

Reduce price volatility and vulnerability













HOPE



PROGRESS

Jay Inslee and Bracken Hendricks
Foreword by President Bill Clinton



APOLLO'S FIRE

IGNITING AMERICA'S
CLEAN ENERGY
ECONOMY

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Conclusion:

A Smart Grid is a smart environmental strategy for Illinois

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Training Pipeline for a Skilled Workforce



Adpted from Washington Work Force Training and Education Coordinating Board



Pathways into Career Track Jobs

A visual representation of how different stakeholders can merge their expertise to create a Green Jobs Corps.

