EFFECTS OF EXTENDING AND EXPANDING ENERGY-EFFICIENCY TAX DEDUCTION FOR COMMERCIAL BUILDINGS
Agenda

☐ Overview of 179D tax provision
☐ Energy efficiency and economic growth
☐ Policy/modeling context
☐ About REMI
☐ Overview of key results
☐ Lunch
☐ Walk through simulations
Overview

- Congress has sought to promote energy efficiency through financial incentives – why?
  - Energy independence – less reliance on foreign fuel
  - Insulate from fluctuations of energy markets
  - Efficiency gains via lower utility bills
- Incentives can encourage the private sector to find best practices for conserving energy
- Incentive programs can help the economy through tax benefits and energy savings
Incentivizing Energy Efficiency

- Section 179D Energy-Efficiency Commercial Buildings Tax Deduction
  - Deduction to provide incentive for companies to design and build energy-efficient structures
    - Program created through the Energy Policy Act of 2005
    - The provision has never been made permanent
    - Expired and reinstated multiple times over the years
- $38 billion per year in commercial lighting costs
Deduction rules

- Deduction of up to $1.80 per square foot available to owners of new or existing buildings who install:
  - (1) interior lighting; (2) building envelope; or (3) heating, cooling, ventilation, or hot water systems
  - Must reduce the building’s total energy and power cost by a certain percentage compared to minimum professional standards (ASHRAE standards)

- What about tax-exempt building owners?
  - Allocate to architect/engineer/contractor responsible for design
  - Savings must be calculated using qualified software
  - Qualified 179D certifiers must verify
Mechanisms

- Extending the program could yield economic benefits
  - Higher investment in services and materials
  - Lower energy use over time
  - Upfront investment; high labor use
  - Energy employs fewer workers

- Economic analysis does not capture all of the non-economic benefits – environment, energy independence, grid maintenance, etc.
Buildings Share of U.S. Primary Energy Consumption, 1980-2010

U.S. Primary Energy Consumption

- Residential Buildings
- Commercial Buildings
- Industry
- Transportation

what does REMI say? sm
Commercial Sector Energy Consumption, 1980-2010

What does REMI say? sm
Commercial Building Energy Usage

2010 Commercial Energy End-Use by Fuel Type

- Lighting: 0.5%
- Space Heating: 5.8%
- Space Cooling: 8.6%
- Ventilation: 11.8%
- Refrigeration: 15.6%
- Water Heating: 18.5%
- Electronics: 20.0%
- Computers: 20.0%
- Cooking: 26.3%
- Other: 6.3%

what does REMI say? sm
Tax reform key to Trump and Ryan agendas
Deductions across the board are potentially on the table for revision/expiration
New administration is willing to “invest” in the form of tax expenditures
Compelling jobs and economic growth argument are critical to making this case
179D relationship to private sector
Scope of Analysis

- REMI evaluates the economic impact of three separate scenarios:
  - Extension of Current Law
  - Extend and Expand
  - Strengthen and Modernize
Data/Assumptions

- Energy Tax Savers, Inc. – 179D certifiers
  - $3.12 of private investment per $1 of tax incentive
  - $0.08 of energy efficiency savings per $1 of tax incentive
- Project costs
  - Labor costs: 30%
  - Materials costs: 70%
- Project types
  - HVAC: 75%
  - Lighting: 25%
About

- Research
- Forecasting
- Consistency

Software
- Dynamic
- Customized
- Integrated

Data

Services
- Consulting
- Training
- Support

what does REMI say? sm
Framework

what does REMI say? sm
Regions

- How REMI defines model regions:
  - A county or...
  - A collection of counties
    - e.g. an MSA or a state
    - Can cross state borders
  - Multiple regions
    - No requirement for contiguousness
  - Customized by needs
Methodologies

Input-Output (IO) Tabulation
- Industry-to-industry transactions and social accounting matrices
- Supply chains, regional purchase concepts, and multipliers

Computable General Equilibrium (CGE)
- Long-term effects after markets “clear” back to an equilibrium
- Dynamic adjustments to population, fuel mixtures, market shares, etc.

Econometrics
- Estimation of statistical parameters from historical data
- Strength of responses, elasticities, preferences, and “time lags”

New Economic Geography (NEG)
- Endogenous productivity adjustments from industry/labor clustering
- Full trade flows by industry and interregional competitiveness
## Client Types

### State and Local Governments
- Montana Department of Commerce (DOC)
- Southern California Association of Governments (SCAG)

Economic and demographic forecast for 56 counties
Impact of the $500 billion long-range transportation plan

### Federal Agencies
- Sandia National Laboratory (SNL)
- U.S. Army Corps of Engineers (USACE)

Integration of REMI with energy and financial models
Environmental impact of closing Chicago River freight locks

### International
- Alberta Enterprise and Advanced Education
- Korean Energy Economics Institute (KEEI)

Supply chain implications for oil and gas developments
Development and energy policy for the 10 provinces

### Consultants
- Booz Allen Hamilton
- Cambridge Systematics

Impacts of new technology on macroeconomic growth
Tolling options for Interstate-95 in North Carolina

### Academic Institutions
- Florida State University (FSU)
- University of Michigan

Contribution of university system to Florida’s economy
Budget planning and tax credit analysis for Lansing

### Non-Profits and Research Groups
- National Federation of Independent Business (NFIB)
- Third Way

Healthcare reform and tax credits for small businesses
State-by-state impact of the “fiscal cliff” and sequestration

**what does REMI say?**
Input Variables

- Energy efficiency – **production cost**
- Industry tax deductions – **production cost**
- Architect/designer deductions – **production cost**
- Equipment purchases – **detailed investment***
- Maintenance and repair – **industry sales**
- Reduced electricity generation – **utilities (output)**

* “Stock” concept, meaning there are future offsets that are accounted for
Results of this analysis show positive economic impacts over the first ten years in terms of job creation and economic expansion.

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>Extension of Current Law</th>
<th>Extend and Expand</th>
<th>Strengthen and Modernize</th>
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<tr>
<td>Jobs</td>
<td>40,749</td>
<td>39,388</td>
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<td>GDP (millions of 2016 dollars)</td>
<td>3,860</td>
<td>3,730</td>
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<tr>
<td>Personal Income (millions of 2016 dollars)</td>
<td>3,128</td>
<td>3,017</td>
<td>5,729</td>
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</table>
Extend Current Law

- Based on PATH Act of 2015
- $324 million JCT score over ten years for a two-year extension
Extend Current Law - Jobs

Job Gains - Extension of Current Law

what does REMI say?sm
Extension – Jobs by Industry

Industry Job Gains and Losses - Extension of Current Law - Average Ten Year Impact

- Utilities: -2%
- Construction: 20%
- Manufacturing: 9%
- Trade: 10%
- Professional Services: 6%
- Health Care, Social Assistance: 7%
- All Other Industries: 46%
Extension – Output & Income

Economic Measures - Extension of Current Law
(billions of dollars)

- Gross State Product
- Personal Income
- Output
Extend and Expand

- Extension of current law
- Extend to non-profit entities
- Extend to tribal governments
- Increase applicable energy efficiency standards
Extend and Expand - Jobs

Job Gains - Extension and Expansion

- Total
- Average

what does REMI say? sm
Extend and Expand – Jobs by Industry

Industry Job Gains and Losses - Extension and Expansion - Average Ten Year Impact

- Construction: 20%
- All Other Industries: 45%
- Manufacturing: 9%
- Trade: 10%
- Professional Services: 7%
- Health Care, Social Assistance: 7%
- Utilities: -2%

what does REMI say?sm
what does REMI say?

Extend & Expand – Output & Income

Economic Measures - Extension and Expansion
(billions of dollars)

- Gross State Product
- Personal Income
- Output

Average
Strengthen and Modernize

- Increase value of deduction
  - $1.80/square foot to $3.00/square foot
- Increase the applicable energy efficiency standards
- Adjustments to building eligibility
- 81% private, 19% government investment (per BEA)
Strengthen and Modernize - Jobs

Job Gains - Strengthen and Modernize

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<tr>
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</table>
Strengthen and Modernize – Jobs by Industry

Industry Job Gains and Losses - Strengthen and Modernize - Average Ten Year Impact

- Utilities: -2%
- Construction: 22%
- Manufacturing: 10%
- Trade: 12%
- Professional Services: 7%
- Health Care, Social Assistance: 8%
- All Other Industries: 39%
Strengthen and Modernize – Output & Income

Economic Measures - Strengthen and Modernize (billions of dollars)

- Gross State Product
- Personal Income
- Output

What does REMI say? sm
Conclusion

- Extending and expanding the Section 179D Energy-Efficiency Commercial Buildings Tax Deduction will create jobs and expand the nation’s economy.
- Extending the program leads to an average annual gain of 43,453 jobs, $4 billion in gross domestic product, and $2.9 billion in personal income over first five years.
- Strengthening and modernizing the existing program can yield even more substantial economic gains.