Ireland’s Sustainable Energy Investment Model (SEIM)

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Introduction to the Sustainable Energy Investment Model (SEIM)

- SEIM based on popular American model REMI (Regional Economic Models, Inc.)

- Net Employment and Macroeconomic impact of Ireland’s 2020 NREAP/NEEAP Targets.

- Presentation outline:
  - SEIM Methodology/Structure
  - SEAI Inputs and Outputs
  - Interface
  - Limitations and Benefits
  - Some Results
Methodology

Input Output

Econometrics

Computable General Equilibrium

New Economic Geography

Border, Midland and Western

Southern and Eastern
Model Calibration

NREAP/NEEAP Capacity
Capital Investment
RES-E Sales Revenue/O&M
Displacement of Fossil Fuel
Solid Biomass Demand
Electricity Price Scenarios/Cost to Exchequer

Irish Economy
20 Industries (CSO, I-O 2009)
Baseline growth to 2020 (ESRI forecast)
Baseline RES-E Capacity

What effect would Policy X have?
Change in policy variables associated with Policy X
The REMI Model
Baseline values for all policy variables

Alternative Forecast
Control Forecast
Compare Forecasts
• **Model Blocks and Linkages:** A change in one input will create a reactionary change in all other endogenous areas of the economy

  - E.g. Capital investment in onshore wind:
    - Demand increases, primarily in construction
    - Generates employment
    - Employment stimulates higher disposable income and consumption
    - In price block, employment feeds into a change in employment opportunities, compensation, production costs, and prices
Model Interface - Inputs

Onshore Wind Custom Industry – Capital Investment

- Manufacturing: 70%
- Electricity Supply Services: 12%
- Construction: 3%
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- Finance: 10%
- Professional Services: 2%
Model Interface - Outputs
Limitations

- Fixed intermediate input proportions
- No monetary or fuel price block
- Estimated regional industrial activity
- Some US parameters
- Global economy exogenous
- Relatively complex model with large data requirements and some training required for interpretation
Benefits

• Combines benefits of multiple methodologies
• Forecasting, industrial disaggregation, inter-regional analysis
• Substitution effects
• Dynamic incomes, prices, and costs subject to scarce resources
• Wide range of outputs and policy analysis options
• Clear breakdown of direct, indirect and induced net employment by sector
Initial Outputs: Onshore Wind, Net Employment per MW 2020

Wind and Transmission Grid
3.73 per MW

Direct 2.11
Indirect 0.65
Induced 0.4
Investment Demand 0.67

Electricity Supply 0.4
Construction 1.7
Initial Outputs: 5% Biomass RES-E 2020 (imported solid biomass, with 2% electricity price increase)

Biomass RES-E Net Employment by Sector, SE Region

- All Other
- Wholesale/Retail Trade
- Agriculture/Forestry
- Professional Services
- Manufacturing
- Electricity Supply
- Construction

Bar chart showing employment changes in various sectors due to Biomass RES-E.
Initial Outputs: 12% RES-H 2020 (imported solid biomass)

RES-H, Net Employment by Sector, SE Region

- All Other
- Wholesale/Retail Trade
- Agriculture/Forestry
- Professional Services
- Manufacturing
- Electricity Supply
- Construction
Lessons and Future Analysis

• Lessons:
  - Collaboration with stakeholders important
  - Considerable background analysis required for ‘custom industries’ and calculation of inputs into the model

• Forthcoming and Future Analysis:
  - Reports specific to Onshore Wind, Biomass/Renewable Heat and Energy Efficiency Targets
  - Post 2020
  - Utilise price outputs from energy models
Thank you.
Any questions?

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