

Economic Assessment for SB350

David Roland-Holst
Berkeley Economic Advising and Research
dwrh@berkeley.edu

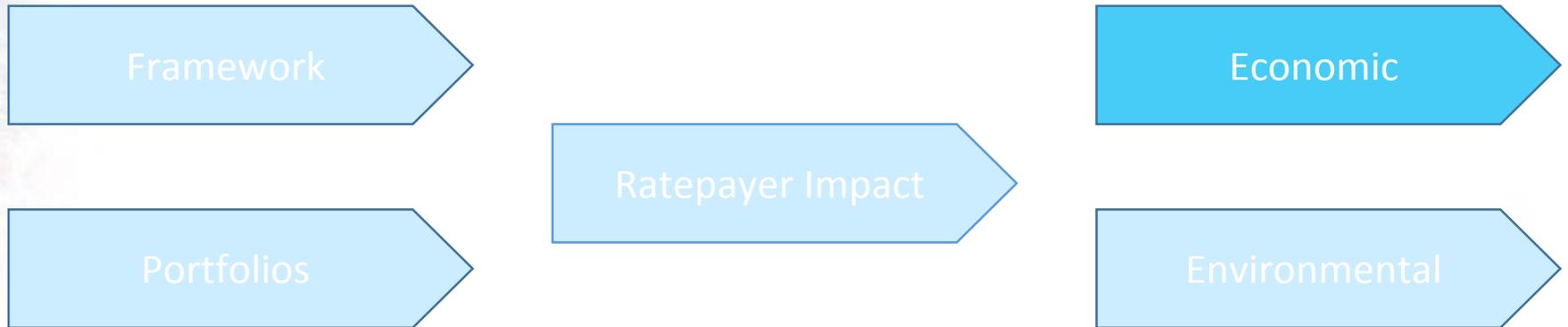
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BEAR
Berkeley Economic Advising and Research, LLC
1442A Walnut Street, Suite 108
Berkeley, CA 94705
www.bearecon.com

SB350 Study Process

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Economic Assessment - Contents

- Topics to be Covered
 - Overview of income and job dynamics
 - Model Structure and Inputs
 - Assessment Outputs
- Stakeholder Inputs
 - Data sources and perspectives
 - Subjects and issues of emphasis
 - Assumptions
- Objective – to promote evidence-based policy dialog



Income and Job Dynamics

Three main pathways in the SB350/CAISO scenarios:

1. Infrastructure investment
2. Power capacity investment
3. Income/expenditure effects of net costs (e.g. ratepayer savings) of regional market



Estimating Impacts

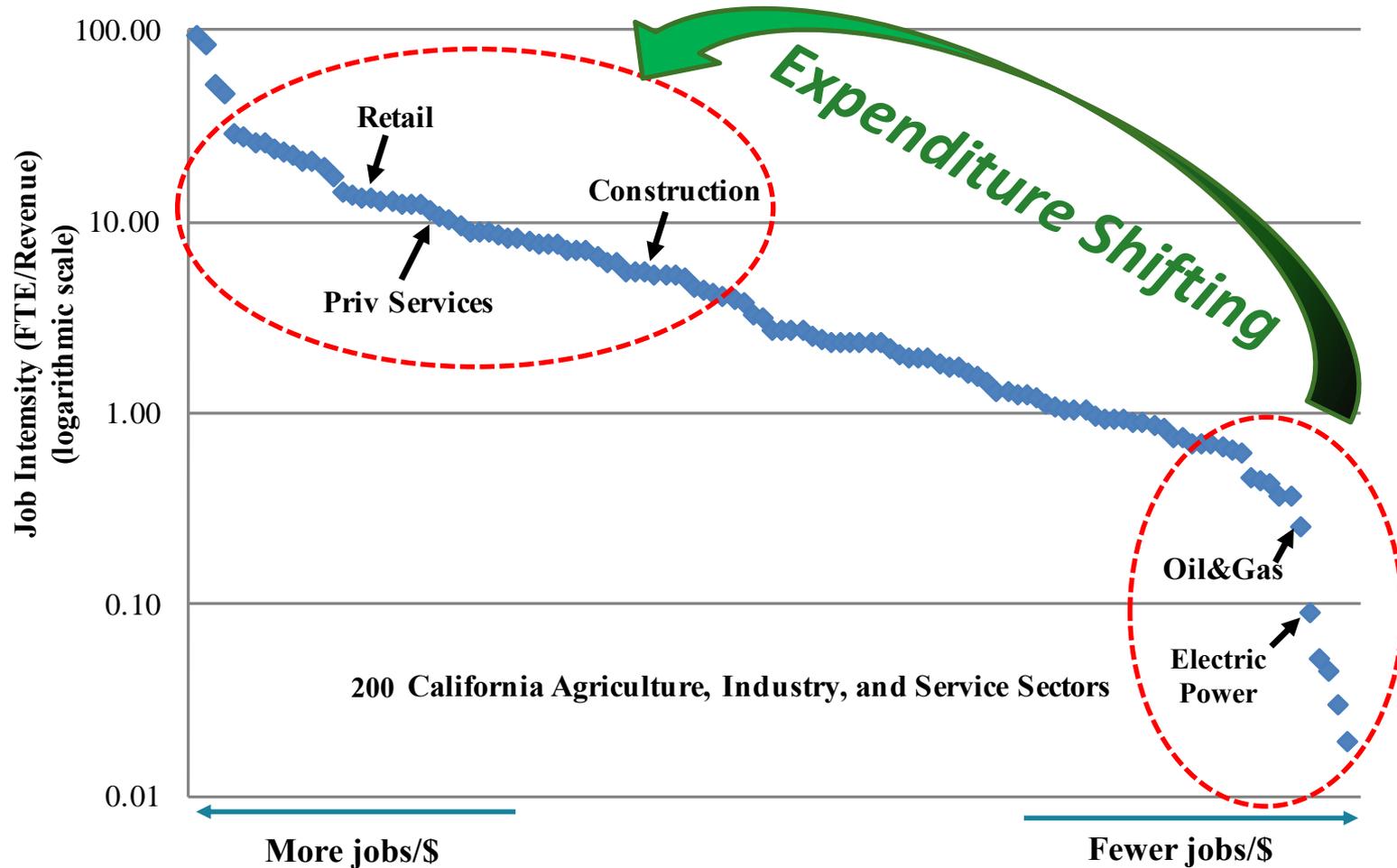
- Direct Effects: Increased economic activity in response to direct spending (investment or consumption).
- Indirect effects: Economic activity in enterprises linked by supply chains to directly affected sectors (e.g., suppliers of input components and raw materials).
- Induced effects: Demand from rising household income (e.g. spending by employees of directly and indirectly affected firms).



A Few Economic Principles

1. Infrastructure investment can create short-term employment.
2. Capacity investment can create short and long term jobs, depending on import content.
3. Expenditure Shifting: Demand funded by energy savings is long term, creates more jobs, more kinds of jobs, and is more likely to be for California goods and services.
4. More affordable energy is pro-poor: Lower income households spend a larger percent of their income on energy services.

How Energy Savings Create Jobs

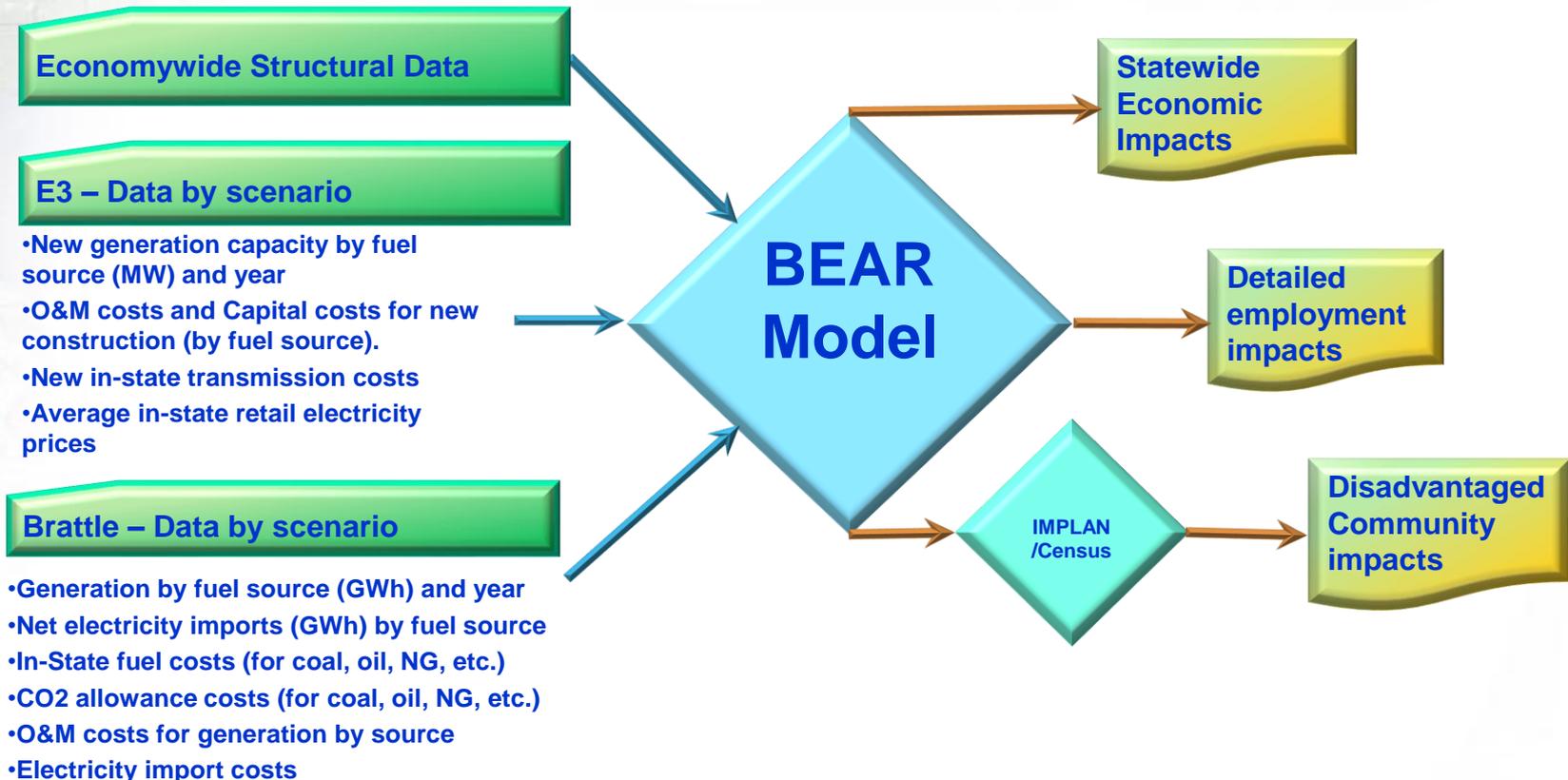




Forecasting Model: General Features

- A state economy model
 - California's economic structure is unique
 - Our stakeholders need clear information on the adjustment process
 - National and regional assessments can mask extensive interstate and regional spillovers and trade-offs
- A dynamic general equilibrium model
 - Traces pathways of growth and job creation
 - Captures detailed interactions and linkages across markets and between institutions
 - Captures extensive direct, indirect, and induced impacts
 - Evaluates policies ex ante, identifying benefits and adjustment needs to facilitate dialog and implementation

Economic Assessment Framework



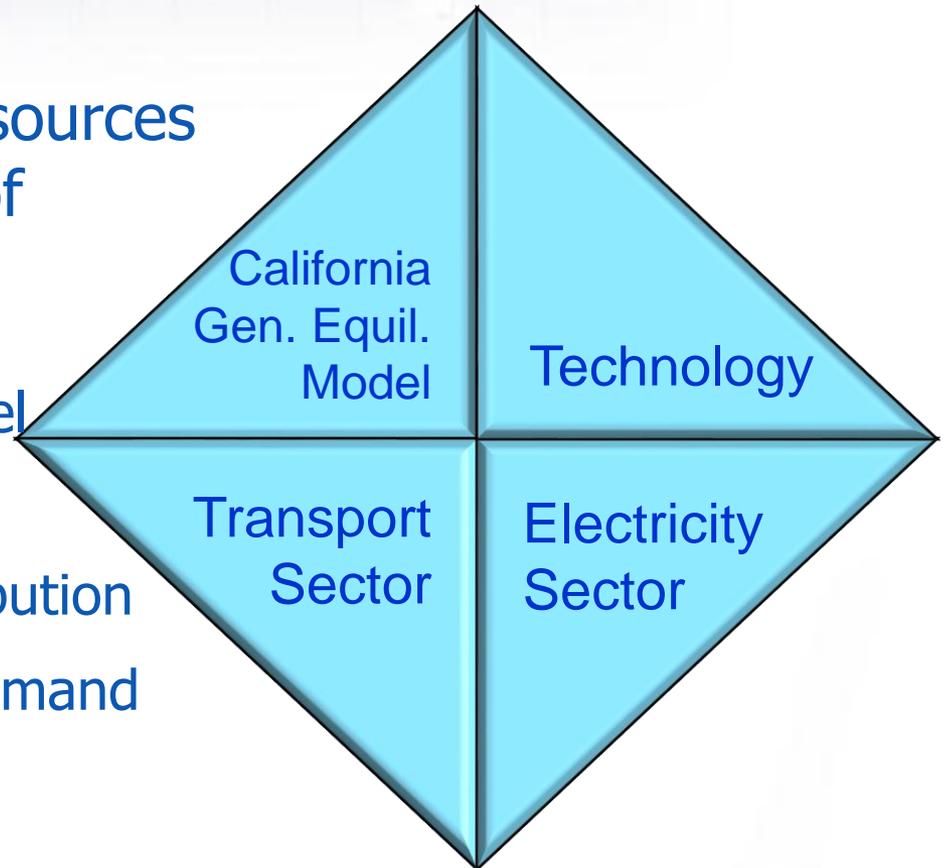
How we Forecast

The Berkeley Energy and Resources (BEAR) model is comprised of four modules.

1. Core General Equilibrium model
2. Technology module
3. Electricity generation/distribution
4. Transportation services/demand

Time frames:

1. Policy Horizon, 2016-2030
2. Strategic Horizon, 2016-2050





Economic Data for California, 2013

- 200 production activities
- 200 commodities (includes trade and transport margins)
- 24 factors of production
 - 22 labor categories
 - Capital
 - Land
- 10 Household income groups
- Enterprises
- Federal Government (7 fiscal accounts)
- State Government (27 fiscal accounts)
- Local Government (11 fiscal accounts)
- Consolidated capital account
- External Trade Accounts
 - Rest of United States
 - Rest of the World



Detailed Occupational Analysis

The BEAR Model tracks employment by sector (200) and by 9, 22, or 95 occupations

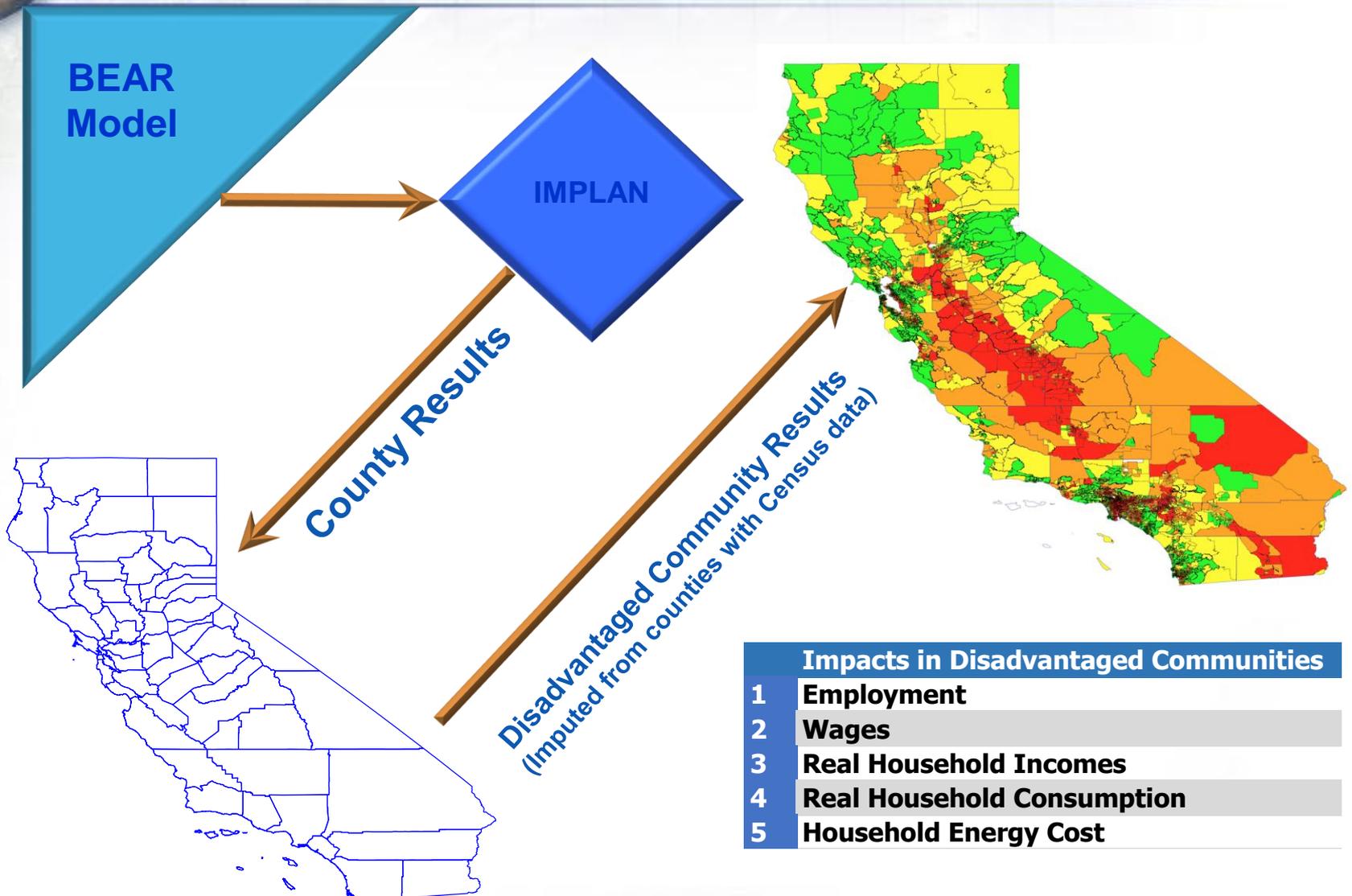
1. **Management occupations**
2. **Business and financial operations occupations**
3. **Computer and mathematical science occupations**
4. **Architecture and engineering occupations**
5. **Life, physical, and social science occupations**
6. **Community and social services occupations**
7. **Legal occupations**
8. **Education, training, and library occupations**
9. **Arts, design, entertainment, sports, and media occupations**
10. **Healthcare practitioners and technical occupations**
11. **Healthcare support occupations**
12. **Protective service occupations**
13. **Food preparation and serving related occupations**
14. **Building and grounds cleaning and maintenance occupations**
15. **Personal care and service occupations**
16. **Sales and related occupations**
17. **Office and administrative support occupations**
18. **Farming, fishing, and forestry occupations**
19. **Construction and extraction occupations**
20. **Installation, maintenance, and repair occupations**
21. **Production occupations**
22. **Transportation and material moving occupations**

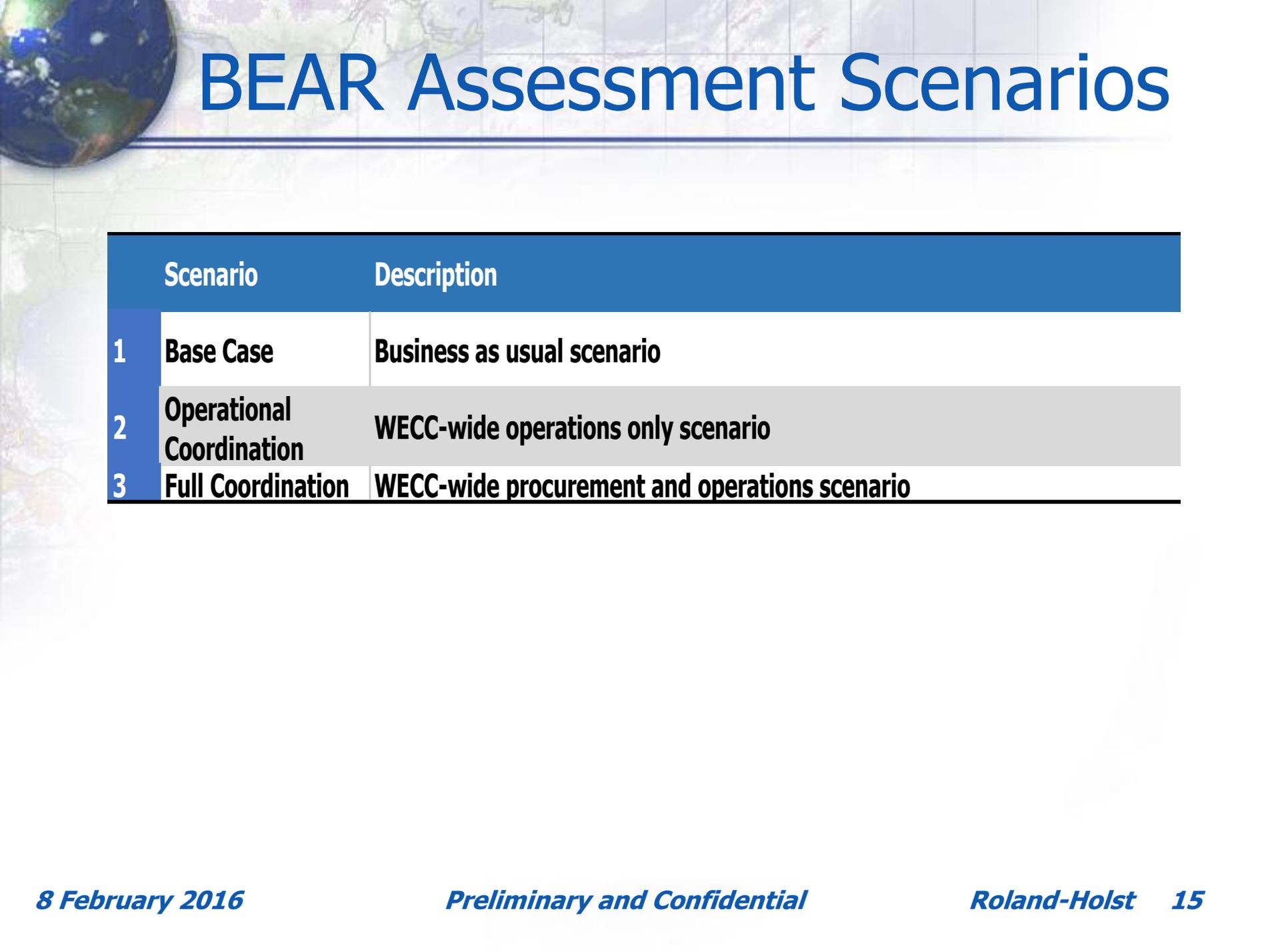


BEAR Macroeconomic Impacts

| Category | Output |
|----------------------------|---|
| Employment | Aggregate |
| | Sector |
| | Households by Income Decile |
| | Labor category (skilled, unskilled) |
| Gross state product | Aggregate |
| | Sector |
| Personal income | Household ratepayer by income decile |
| | Labor category |
| Enterprise Income | Firm ratepayers by sector |
| State tax revenue | Aggregate |

Detailed Livelihoods Impacts





BEAR Assessment Scenarios

| | Scenario | Description |
|----------|---------------------------------|--|
| 1 | Base Case | Business as usual scenario |
| 2 | Operational Coordination | WECC-wide operations only scenario |
| 3 | Full Coordination | WECC-wide procurement and operations scenario |



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- Objective – to promote evidence-based energy policy dialog
- Overview of income and job dynamics
- Economic Model, Data, and Scenarios
- Stakeholder Inputs
 - Data sources and perspectives
 - Subjects and issues of emphasis
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Discussion