



2030 Target Scoping Plan Update - Economic Reviewers

January 15, 2016



Workshop Outline

- ▣ Introduction and Welcome
- ▣ 2030 Target Scoping Plan Overview
- ▣ Economic Reviewers Overview
- ▣ Proposed Scoping Plan Analysis
- ▣ Introduction to Pathways
- ▣ Introduction to REMI
- ▣ Proposed Reference Scenarios & Modeling
- ▣ Next Steps

2030 Target Scoping Plan Requirements

- ▣ Engagement with State Agencies
 - ▣ Engagement with Legislature
 - ▣ Coordination with other plans (i.e. 111(d), Cap & Trade, SIP, Freight Strategy, etc.)
 - ▣ Economic Reviewers
 - ▣ Environmental Justice Advisory Committee Engagement
- Public Health Analysis
 - Environmental Analysis (CEQA)
 - Public Process: Workshops (Sacramento and regional)
 - Draft Report / Final Report (targeted measures and estimated emission reductions)

Guiding Principles

- Reduce Greenhouse Gas Emissions to 40% Below 1990 Levels by 2030 (Executive Order B-30-15)
- Create jobs and support a robust workforce
- Save water
- Support Disadvantaged Communities
- Make California more resilient
- Transform to a clean energy economy
- Give consumers clean energy choices

Advisory Groups

- ▣ Economic Reviewers
 - ▣ Provide input on tools and modeling assumptions to evaluate economic impact of Scoping Plan
- ▣ Environmental Justice Advisory Committee
 - ▣ September 25, 2015: Board re-convened EJAC for 2030 Target Scoping Plan and approved new members

Economic Reviewers for the 2030 Target Scoping Plan

Economic Reviewers

- ▣ Objective
- ▣ Structure
- ▣ Scope and Deliverables
- ▣ Timeline
- ▣ Engagement
- ▣ Questions and Comments



Objective

- ▣ Review the economic analysis of the 2030 Target Scoping Plan, including:
 - ▣ Analytical methods and tools
 - ▣ Assumptions and inputs of the California PATHWAYS model and REMI PI+
 - ▣ Modeling of a carbon price
 - ▣ Macroeconomic feedback
 - ▣ Handling of uncertainty

Structure

- ▣ Core of 5 academic economists and energy modelers with expertise in:
 - ▣ California climate and air pollution policy
 - ▣ Energy markets and modeling
 - ▣ Transportation and fuels
 - ▣ Power systems and energy efficiency
- ▣ Input may be sought for expertise in other areas
 - ▣ Natural and working lands



Economic Reviewers

- ▣ Jim Bushnell – UC Davis
- ▣ Max Auffhammer – UC Berkeley
- ▣ Duncan Callaway – UC Berkeley
- ▣ Meredith Fowlie – UC Berkeley
- ▣ Christopher Knittel - MIT



Jim Bushnell

- ▣ UC Davis
 - ▣ Professor, Department of Economics
- ▣ Research Associate, National Bureau of Economic Research (NBER)
- ▣ Member, Market Surveillance Committee of the California Independent System Operator (CAISO)
- ▣ Former member of Economic Analysis and Allocation Committee (EAAC), Market Simulation Group (MSG), Emissions Market Assessment Committee (EMAC), and the California Power Exchange



Max Auffhammer

- ▣ UC Berkeley
 - ▣ Associate Dean, Division of Social Sciences
 - ▣ George M. Pardee Jr. Family Chair in International Sustainable Development
 - ▣ Professor, Agricultural and Resource Economics and International and Area Studies
- ▣ Research Associate, NBER
- ▣ Fellow, CESifo
- ▣ Member, Expert Panel on the Social Cost of Carbon, National Academies of Science
- ▣ Member, Energy Statistics Advisory Committee to DOE/EIA



Duncan Callaway

- UC Berkeley
 - Assistant Professor, Energy and Resources Group
 - Affiliated Faculty, Department of Mechanical Engineering
- Faculty Scientist, Environmental Energy Technologies Division Lawrence Berkeley National Laboratory
- Member, Technical Committee on Smart Grids, IEEE Control Systems Society
- Co-Chair, Working Group on Dynamic Performance of Cyber-Physical Energy Systems, IEEE Power and Energy Society



Meredith Fowlie

- ▣ UC Berkeley
 - ▣ Class of 1935 Endowed Chair in Energy
 - ▣ Associate Professor, Agricultural and Resource Economics
 - ▣ Affiliated Faculty, Energy and Resources Group
- ▣ Research Associate, NBER
- ▣ Affiliate, Abdul Latif Jameel Poverty Action Lab (J-PAL)
- ▣ Affiliate, Center for Global Action (CEGA)



Christopher Knittel

- Massachusetts Institute of Technology
 - William Barton Rogers Professor of Energy Economics, Sloan School of Management
 - Director, Center for Energy and Environmental Policy Research
- Faculty Co-Director, The E2e Project
- Associate Scholar, Harvard Environmental Economics Program
- Research Associate, NBER
- Former member, EAAC



Structure

- ▣ Public process
 - ▣ Participate in public workshops and meetings
 - ▣ Post reference or source materials
 - ▣ Discuss findings in public
 - ▣ View public comments posted on ARB website

- ▣ Coordination with ARB and E3
 - ▣ Review model input and assumptions
 - ▣ Comment on translation of data between models
 - ▣ Identify data gaps

Scope

- ▣ Reference Scenario
- ▣ Scoping Plan measures
- ▣ Assumptions and inputs of PATHWAYS and REMI PI+
- ▣ Translation of costs and savings between models
- ▣ Carbon prices and monetized costs and savings
- ▣ Model results and interpretation
- ▣ Review of existing work, no new research



Deliverables

- ▣ Review of the economic analysis of the 2030 Target Scoping Plan
- ▣ Public presentation of findings
- ▣ May release public white papers on specific issues

Process for Engagement

- ▣ ARB is the point of contact for the Economic Reviewers
- ▣ Reviewers can receive, but are not obligated to respond to public comment
- ▣ Public workshops and meetings will be noticed
- ▣ Reviewer findings posted to ARB website

Questions and Comments

Contact

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