Implementation of SB 350

California Public Utilities Commission

Energy Division

December 2, 2015

Purpose and Scope of Workshop

- Initiate a conversation with Commissioners regarding implementation of SB 350 with a focus on integrated planning requirement
- Today's focus:
  - Defining integrated resource planning IRP
  - Comparing current planning process to IRP
  - Discussing options for implementing IRP

Workshop Agenda

- Safety Presentation (1:30 PM)
- Commissioner Opening Comments (1:40 PM)
- Overview of SB 350 Statutory Requirements (2:00 PM)
- Current Planning Process vs. Integrated Resource Planning (2:30 PM)
- Possible Work Plan for Transitioning to IRP (3:00 PM)
- Public Comment (3:30 PM)
- Closing Remarks (4:20 PM)

COMMISSIONER OPENING REMARKS

OVERVIEW OF SB 350 STATUTORY REQUIREMENTS

SB 350: CPUC Statutory Requirements

- Encourages **widespread Transportation Electrification**
- Requires **doubling of Energy Efficiency savings** from electricity and natural gas end-uses by 2030
- Increase **Renewable Requirements** from 33% by 2020 to **50% by 2030**
- Requires **resource optimization** and an **Integrated Resource Planning (IRP) process**
- Expresses intent for **regional expansion of the CAISO**
- Consider **disadvantaged communities** in CPUC decision-making process

SB 350: Transportation Electrification

- Specifies **transportation electrification is necessary to reduce economy wide GHGs**
- Transportation electrification efforts will target charging infrastructure availability, underserved communities, new technologies for customers, and vehicle grid-integration
- Directs CPUC to order the IOUs to propose programs and investments
- Requires CPUC review data triennially on electric transportation adoption rates
- Defines “Transportation electrification” to include:
  - Use of electricity in vehicles, vessels, trains, boats, & other equipment
  - Enable charging and propulsion infrastructure investments

SB 350: Energy Efficiency

- SB 350 establishes the goal of **doubling the end-use energy efficiency savings** from electricity through energy efficiency and conservation
- SB 350 identifies a number of **new energy efficiency sources** that can count towards the goal
- CPUC must at a minimum authorize the following IOU programs:
  - Existing conditions baseline
  - Behavioral, Retrocommissioning, and Operational programs
  - Market Transformation programs
  - Pay-for-Performance programs
- Some SB 350 work will occur in parallel with deadline-driven AB 802 work

AB 802 “Existing Condition” Baseline Requirement

- Generally, utility EE programs are to be credited for savings resulting from bringing existing buildings up to code
- Savings are to be estimated taking into consideration changes in metered usage (‘normalized’ for non-EE factors)
- Phased implementation: “high opportunity programs” can begin on 1/1/2016, with full implementation by 9/1/2016
- CPUC will consider how to implement this mandate to maximize ratepayer benefits, e.g., not funding upgrades that are currently happening without program funding

SB 350: Renewables Portfolio Standard

- SB 350 specifies that all load-serving entities **must procure at least 50 percent of their resources from eligible renewable energy resources by 2030**
- SB 350 requires the CPUC make RPS program rule changes, such as:
  - Increase minimum RPS procurement quantity requirements and add RPS procurement compliance periods
  - Add consideration of the State's GHG limits and system reliability to least-cost, best-fit methodology
  - Establish procurement expenditure limits that prevent disproportionate rate impacts
  - Adopt a penalty schedule for RPS non-compliance
- Statute does require an annual renewable procurement plan but encourages CPUC to integrate into "general procurement plan process."

SB 350: Integrated Resource Planning (IRP)

- Commencing in 2017, CPUC shall adopt a process for each load-serving entity to file an Integrated Resource Plan (IRP) that:
  - Meets the GHG emissions reduction targets established by ARB
  - Procures at least 50% eligible renewable energy resources by 2030
  - Serves customers at just and reasonable rates
  - Minimizes impacts on ratepayers' bills
  - Ensures system and local reliability
  - Strengthens the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities
  - Enhances distribution systems and demand-side energy management
- The CPUC shall both adopt a process for each load serving entity to file an IRP (per 454.52) and shall optimize resource portfolios (per 454.51)

SB 350: Disadvantaged Communities

- SB 350 requires the CPUC to consider disadvantaged communities in its decision-making processes
- CPUC must establish an advisory group of representatives from disadvantaged communities
  - Purpose: to provide advice on clean energy and pollution reduction programs and determine whether they will benefit disadvantaged communities
- CEC and ARB are required to conduct studies on the how to increase access to EE and transportation programs in disadvantaged communities

CURRENT PROCUREMENT PLANNING PROCESS VS. IRP PROCESS

Overview of Current Resource Programs

(EE, DR, CSI/NEM, SGIP, RPS, EV, Storage, etc.)

- Legislature or CPUC set Procurement Goals
  - Some current program goals do not get to the deep cuts needed for 2030 goals
- Goals/targets vary by individual proceeding, which inhibits optimal resource planning, e.g.:
  - EE optimizes all "cost-effective"
  - DR optimizes maximum DR participation
  - LTPP optimizes reliability
  - RPS maximizes kWhs
- Each resource proceeding has its own cost effectiveness methodology to ensure either:
  - Least cost best-fit procurement to an established target (e.g. RPS)
  - Procured resources meet a minimum cost effectiveness threshold (e.g. EE and DR)

Overview of Current Long-Term Procurement Planning (LTPP) Process

- Focuses on ensuring reliability- system, local, and flexible capacity
- Planning process collects information about cost and GHG emissions of future electric supply scenarios
- Authorizes new capacity after considering whether existing and already planned additions can meet reliability needs
- Does not:
  - Perform optimization to determine what combinations of resources are best at meeting residual need
  - Consider GHG emission targets as a binding constraint
- Provides for a competitive procurement process to identify least cost resources to meet reliability needs

Components of Integrated Resource Planning (IRP)

- Standard IRP definition - planning process that considers the costs and benefits of both demand and supply side resources when developing the least total cost mix of utility resource options
- California Focus – IRP will look at both supply side and demand side resources as a means of focusing on GHG emissions and reliability of the utility's portfolio.
- IRP – Fundamental Steps:
  - Develop load forecast for planning horizon (e.g., 10 or 20 years)
  - Determine portfolios of existing/future resources (supply and demand-side) for meeting system need
  - Determine GHG metrics
  - Evaluate cost and risk of candidate resource portfolios: utilize common cost-effectiveness metric
  - Minimize total costs
  - Create a flexible plan that allows for uncertainty and permits adjustment in response to changed circumstances
- Successful IRP process should include both meaningful stakeholder process and oversight from engaged commission

Options for Imposing IRP

- There are several ways that IRP could be implemented to reduce emissions and ensure reliability at lowest cost:
  - **CPUC-centric IRP**
    - CPUC develops the methodology and administers the IRP process
    - IRP process would set specific goals/targets for each individual resource programs
  - **IOU-centric IRP**
    - CPUC establishes reliability needs and GHG targets for each LSE, but LSEs develop the IRP methodology and administer the IRP process
    - Resource optimization decisions/strategies would be left to LSEs through something like an RFO with CPUC review and approval.
  - **Hybrid IRP approach**

IRP Implementation Issues

- Need for new analytical tools and methodologies
  - Common cost effectiveness methodology
  - Modeling of cost-effective grid integration solutions (e.g., pump storage and demand response)
- How do different planning approaches facilitate significant market transformation and infrastructure investments needed?
- How will IRP address planning uncertainty?
  - Technology (innovation, uptake)
  - Resource interdependencies (solar PV and storage)
  - Load forecasting (e.g., EV adoption and customer DG)
- How does the expansion of DG and CCAs impact the administration of IRP?

POSSIBLE WORK PLAN FOR TRANSITIONING TO IRP

Proceedings Potentially Informed by IRP

Proceeding	Description
R.11-03-012	Greenhouse Gas Proceeding for Electric Utilities
R.11-09-011	Distribution level interconnection rules and regulations
R.12-11-005	California Solar Initiative and Distributed Generation
R.13-09-011	Demand Response and Advanced Metering
R.13-11-005	Energy Efficiency
R.13-11-007	Alternative-Fueled Vehicle Programs
R.13-12-010	Long Term Procurement Plan
R.14-02-001	Joint Reliability Plan
R.14-08-013	Distribution Resources Plans
R.14-10-003	Integrated Distributed Energy Resources
R.14-10-010	Resource Adequacy Requirements
R.13-12-011	Water-Energy Nexus Programs
A.14-11-007	Energy Savings Assistance Program and CARE Budgets
A.15-02-001	Low Income Programs and Budgets
R.15-02-020	Further Development of Renewables Portfolio Standard Program
R.15-03-011	Energy Storage

Organizational and Procedural Implications of IRP

Organizational	Procedural
May need to adjust roles and responsibilities in energy division to better focus on IRP and not silos	Identify which proceedings need to be eliminated, redefined, or consolidated
Need additional staff with appropriate skill set – key focus may be on modeling	Will IRP be implemented in the long-term planning proceeding (LTPP)? If not, what is role of LTPP?
Cross-sectoral coordination (e.g. transportation sector) with other agencies. Note - need to determine at what level this coordination should occur and make sure that information is shared within the CPUC.	What structure/processes will be needed to manage cross-proceeding coordination? Note - Some proceedings may need to modify programmatic goal setting or oversight based on IRP results.

IRP Implementation Work Categories

- Analytical efforts:
  - Common cost-effectiveness analysis
  - Changes to modelling efforts to move towards IRP to support achievement of deep carbon reductions
  - Incorporation of GHG targets in optimization efforts
    - This will need to be cross agency and include ARB and CEC
- Procedural efforts:
  - Develop a work plan to coordinate work across proceedings
  - Determine procedural venue for core work for initial IRP implementation (at least in the short term)
  - Coordinate with other state agencies (ARB, CEC) and CAISO
- Organizational efforts:
  - Align staffing resources with procedural and analytical priorities

Some IRP Foundational Work Underway

- Some ongoing CPUC work will inform IRP implementation:
  - Cost-effectiveness methodology
    - Common cost-effectiveness framework in Integrated Distributed Energy Resources proceeding
  - All-source procurement (supply & demand-side resources)
    - All-source procurement authorization from 2012 LTPP for local areas in SCE service territory
  - Least Cost-Best Fit (LCBF)
    - RPS LCBF reform & RPS Calculator refinements
  - Grid integration work and potential solutions
    - Integration adder modelling & analysis
    - Energy Division white paper: Beyond 33% Renewables: Grid Integration Policy for a Low-Carbon Future

Preliminary Ideas for 2016 IRP Work Plan

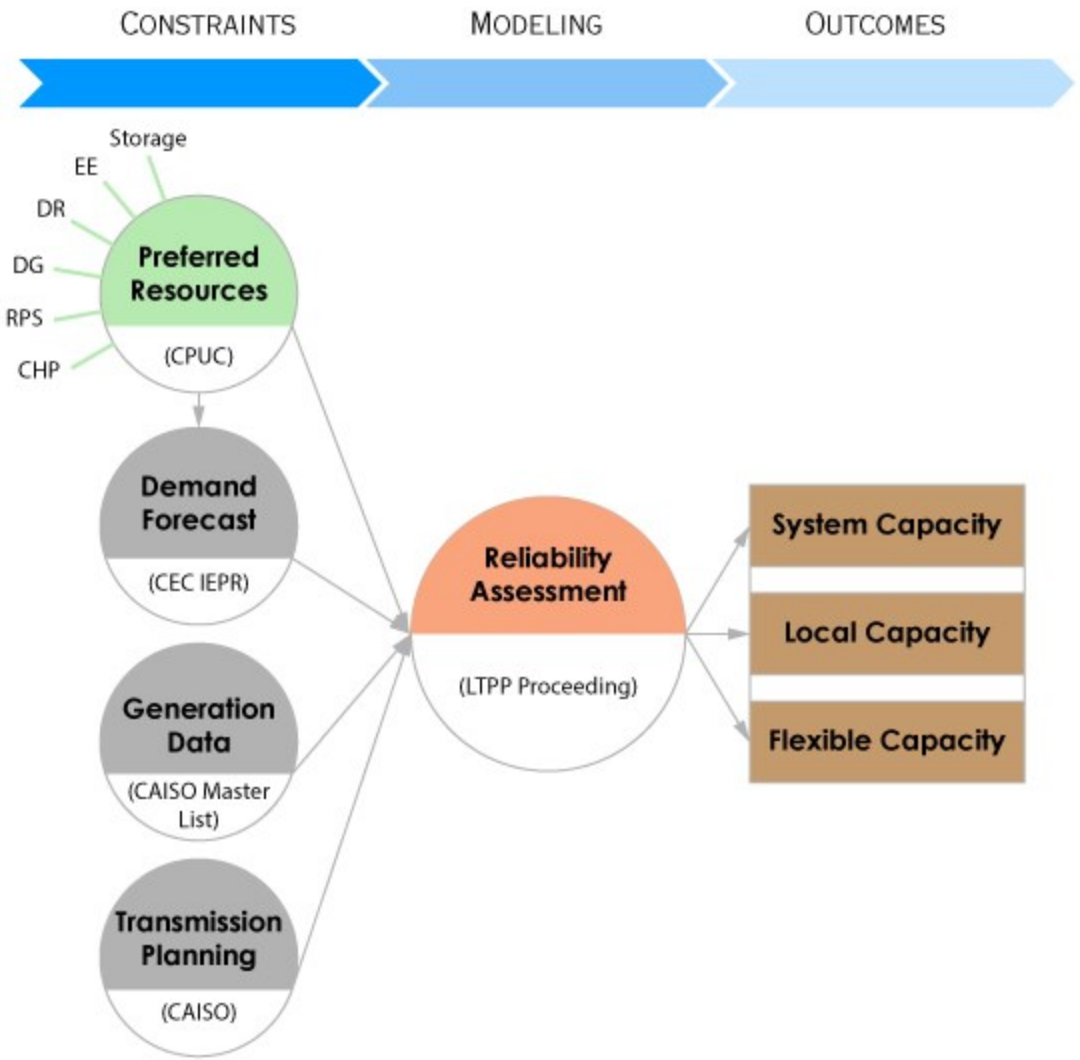
all dates are estimates

- **Dec 2015**: Staff can seek post-workshop comments from stakeholders on IRP-related issues raised in workshop
- **Q1 2016:** Scope IRP implementation into LTPP proceeding
- **Q1 2016:** Staff drafts IRP implementation work plan
- **Q1 2016:** Continue refinement on modeling to move toward common assumptions needed for IRP
  - Improve models to test system reliability, especially as it relates to flexibility
  - Develop optimization methodologies to get agreement on a process and the required models
- **Q4 2016:** Develop common cost-effectiveness framework
- **2017**: CPUC adopts a process that each LSE files an IRP

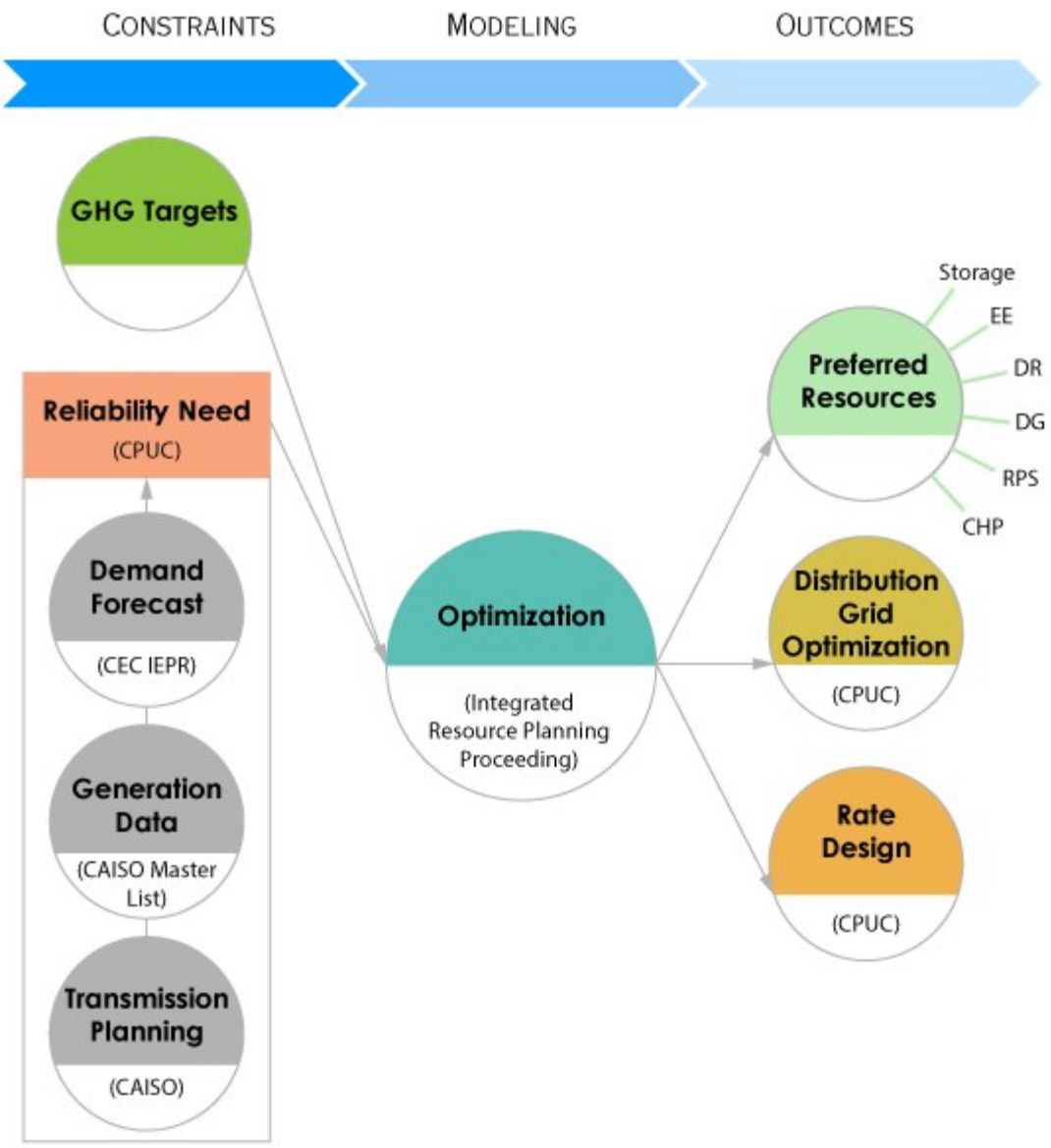
PUBLIC COMMENT AND CLOSING REMARKS

BACKUP SLIDES

Relation Between LTPP & Resource Programs



IRP – Conceptual Diagram



Comparison of LTPP vs. IRP

Planning Attribute	LTPP	IRP (conceptual)
10 yr >= Planning Horizon	√	√
Reliability (system, local, flexible) Constraint	√	√
Social & Enviro Considerations	√	√
GHG Emissions	Consider during planning process	Act as a binding constraint when picking optimal portfolio
Cost of Entire Portfolio	Consider during planning process	Select optimal portfolio using common cost-effectiveness
Cost of Procurement	Procurement Costs attained through Market Response (e.g. RFOs)	Procurement Costs attained through Market Response (e.g. RFOs)

- IRP could solve for lowest net cost, assuming GHG target and reliability are constraints
- IRP "plans" are only **indicative** – market responses (e.g. RFOs, response to program offerings) determine actual ratepayer costs

Grid Integration Solutions

Demand Side (Responsive Load)	Supply Side (Responsive Supply)
Storage - customer-side	Storage - supply-side
Demand Response - enhancements to DR	Demand Response (bidding into CAISO markets)
Distributed generation incentives (NEM, SGIP)	Distributed Renewables (Change curtailment provisions in distributed gen RPS contracts, change in CAISO market to bid in distributed resources)
Distribution grid technologies (Smart-Inverters and Micro-grids)	Transmission grid technologies and markets (EIM, exports, regionalization, targeted TX expansion)
	Renewable Procurement Changes (Change Least Cost/Best Fit, integration adder considerations)
Customer Rates (TOU and Dynamic Rate Design)	Wholesale Rates and Market Products (Day-Ahead market changes to reduce self-scheduling)
Load Forecasting (More accurate and granular load shapes through IEPR)	Load Forecasting (Improved day-ahead forecasting of renewables and load)
Transportation Sector (Plug-in Electric Vehicles as responsive load)	Transportation Sector (EVs or charging stations as storage supply)