Cost-Effectiveness Approach & Tools in California

CALIFORNIA
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Background; C/E Test (TRC)
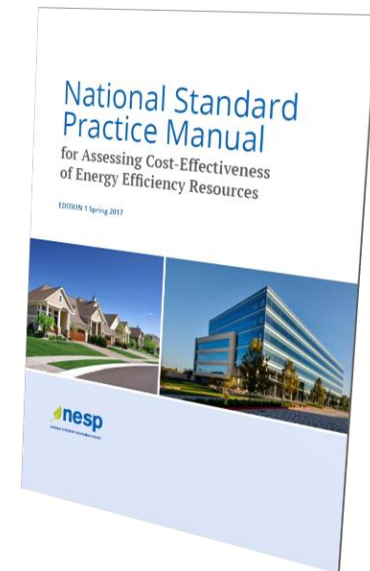
❑ CA C-E tests are based on the California Standard Practice Manual (October 2001), modified by D.06-06-043 and D.07-09-043

❑ Nationally developed C/E guidance (Spring 2017)

❑ CA test not aligned with national TRC test or TRC calculations in any other jurisdiction in one key respect

   ✖ CA includes Incentives for free riders as program costs in TRC

   ✖ Result: **Reduces CA TRC**

Background: C/E Test Tools (IOU/POU)

- E3 built parallel tools for both IOUs and POUs in late 2000's

  ❑ Excel-based

- In 2017, the IOU tool was migrated to SQL Server-based system

  ❑ Relational database, code can be inspected

- In 2018, the POU tool was migrated to Energy Platforms

  ❑ Database, proprietary code, not yet available for inspection

IOU and POU Tool Comparison

- IOU CET was compared with E3 POU calculator
  - ❑ Energy Platforms code was not available for inspection
  - ❑ Key difference from E3 POU calculator and EP tool is the incorporation of **hourly load shape data for energy savings and CO$_2$ impacts**
  - ❑ Many issues with IOU CET tool
    - ✗ Certain values (GHG) not correctly calculating (underreports GHG); CPUC fixing
    - ✗ No documentation/administrator manual/schema
    - ✗ Quality of code
    - ✗ Stability of code – questionable, sometimes referred to as "spaghetti code"
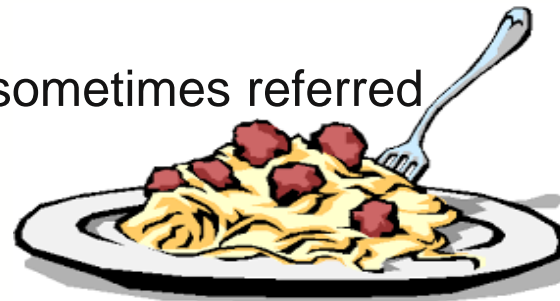
Tool Comparison – Avoided Costs and Rates

IOU

- Avoided Costs – taken from Avoided Cost Calculator maintained by E3
  - GHG monetized in avoided costs
- Includes avoided T&D costs
- Customer Rates – Simplified rates in tool (single $/kWh); given complexity of tariff design, probably of little use

POU

- Avoided Costs – Uses IOU values, also allows entry of POU-specified costs
- Avoided T&D costs optional
- Customer Rates – Allows for entry of simplified rates (single $/kWh) if desired. May be of little practical use

Tool Comparison – CO_2

IOU

- CO_2 measurement and monetization
  - Hourly CO_2 values from Avoided Cost Calculator are pre-processed into quarterly and annual $ values
  - CO2 monetization is handled by avoided cost calculator
    - Issues: Statewide GHG, No hourly load shapes what else?

POU

- CO2 measurement and monetization
  - CO2 values for five periods in tool.
  - CO2 monetization table exists, does not appear to be used in TRC calculation
    - May be embedded in avoided costs if IOU values used

IOU

- Load profiles are stored as five period values
  - Summer peak, off-peak, mid-peak
  - Winter peak, off-peak
- Load profile values developed outside CET

POU

- IOU load profiles supplied
- POUs can enter additional custom load profiles if desired

Tool Comparison – Cost Effectiveness

IOU

- TRC
  - Contains carbon adder, market effects (claims only)
- PAT
  - Contains carbon adder
- RIM
  - Contains carbon adder
  - Not reliable due to simplified rate data
- PCT
  - Not provided
- SCT
  - Not provided (yet)
    - Recent CPUC decision requests this as informational output, to inform future use

POU

- TRC
  - Same as IOU except no market effects adder
- PAT
  - Same as IOU, tool allows inclusion of water savings
- RIM
  - Same as IOU
- PCT
  - Not reliable due to simplified rate data
- SCT
  - Not provided in E3 tool

Tool Comparison – Discount Rates

IOU

- Discount rates are specific to utility (WACC)
  - PG&E: 7.66%
  - SCE: 7.65%
  - SCG: 7.38%
  - SDG&E: 7.36%
- Discount rates for Renewable Energy Networks based on applicable utility rate

POU

- Discount rates are specific to utility
  - User-enterable
  - Generally lower than IOU rates (so higher TRC)
    - POU's don't have equity component in discount rate
    - Often based on bond rates

Tool Comparison – Findings

- The underlying tools are fairly similar
  - This owes to them originating from the same basic E3 tool
  - The EP tool builds on the E3 capabilities by incorporating hourly data into its analyses
  - EP tool also provides more sophisticated data rendering
    - Graphs, charts, powerful presentment capabilities built-in
  - CET is designed as a high-volume cost-effectiveness calculator
    - Not designed as a data presentment tool or for analytics (no what-if scenario capability)

Discussion: Desired Future State?

- C/E Calculation Approach
  - ❑ Standardized across IOUs and POUs
  - ❑ Consistent with National TRC Approach
    - ✖ Incentives for free riders not treated as program costs
  - ❑ Hourly inputs
    - ✖ Load profiles and GHG emissions
    - ✖ GHG emissions – customizable to all utility specific values (LADWP)
  - ❑ All avoided cost elements valued
    - ✖ T&D can be included (or not)
  - ❑ Carbon reporting calculation consistent across state
    - ✖ GHG - for purposes of reporting pounds of carbon reduction
  - ❑ Include all "resources" in calculation
    - ✖ Treat water as "resource" in CA

Discussion: Desired Future State?

- Tool
  - Single Tool for IOUs/POUs
    - Spreadsheet and database version?
  - Development Approach
    - Features broadly socialized before development
    - Rigorous, frequent and socialized testing and acceptance during development (IOUs, POUs, CEC/CPUC Staff and Consultants) (Agile/Scrum method)
  - Documentation
    - Schema, User Manual, Administrator Manual
  - Platform and Code
    - PostgreSQL, not SQL Server
    - Software stack aligned with CEDARS and eTRM
    - Code available for inspection
    - Tool not proprietary, no ongoing license fee

Discussion: Desired Future State?

- Tool: Features
  - ❑ Appealing and intuitive user interface
  - ❑ Data visualization (Tableau . . .)
  - ❑ Data analysis
  - ❑ Large scale data processing
  - ❑ Feature toggling
    - ✖ TRC with and without free rider incentives treated as program cost, for example . . .
  - ❑ Hourly data
    - ✖ Load profiles and GHG profiles
  - ❑ Allowable customization
    - ✖ GHG values, Avoided costs, T&D in or out, discount rate
  - ❑ Direct link to eTRM and CEDARS to allow for rapid and easy data analysis at measure, program and portfolio analysis

Next Steps

- Cal TF Discussions
  - ❑ Q1 2020
  - ❑ Fold into Charette on Potential Study Recommendations
- Staff White Paper; Perhaps TPP
- Continued conversations with regulatory staff (CEC and CPUC) and PAC

Questions?