Cal TF Modeling Charrette: Overview of Plan for Comment

CALIFORNIA
TECHNICAL FORUM

ANNETTE BEITEL

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Agenda

- Business Plan Goal re: Modeling
- Issue and Challenge
- Current State
- Desired Future State
- Process

Business Plan Goal

Develop High-Level Proposed Approach for Achieving Statewide Consistent Approach To Building Simulation Modeling in California.

NOTE: "Consistent" is not intended to mean "the same" or "identical" modeling approach.

Issue & Challenge

- Case Study:
  - UC Merced 2020 Project
    - 5 different models for different purposes required for each building
      - CBECC compliance
      - LEED compliance
      - Title 24 minus 20%
      - Savings by Design
      - Contractually set energy targets

Example courtesy of Steve Kromer

Issue & Challenge

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- Can key stakeholders agree on a consistent approach to building simulation modeling used for various purposes in California to:
  - Reduce cost, inefficiency & uncertainty around modeling & ***modeling results***
- What questions do we need to answer to develop a framework?
- How do we determine acceptable equivalency of results if approach uses different simulation engines, prototypes or models?
  - Results may not be identical
- Can we keep it simple?

Current State

- Use Cases:
  - What model(s) are used for each use case?
  - What simulation engine(s) are used for each use case?
  - What building prototypes are used with each use case?
  - What other inputs are used with each use case?
  - Data source and form for each use case?

- Metrics:
  - What metrics should be used to evaluate models?
  - Can the metrics be “general” across all use cases, or should they be tailored to the use case?

Current State: Use Cases

- Examples:
  - CEC:
    - Code development
    - Code compliance
    - Demand forecast
    - Urban footprint – Calculates water, energy, emissions reductions for different scenarios
    - CEUS
  - CPUC:
    - Deemed
    - Custom
    - Project analysis (e.g. Savings by Design)
    - EM&V – Potential studies?

Current State: Use Cases

- Other:
  - Forecasting load impacts
  - Large-scale regional models to identify where interventions will be most cost-effective (LA project)
  - Benchmarking
  - Local ordinances
  - Greenhouse gas targets

- Potential Future Uses
  - What else could models do or be used for?

What use cases are we missing?

Current State: Building Prototypes

- DEER Building Prototypes
- CEC Building Prototypes (Reference Models)
- DOE Building Prototypes
- Newly created “Urban Footprint” Prototypes
- Custom Prototypes

Any missing building prototypes?

Data Standards/Sources

- Standards:
  - Cal TF's eTRM Data Specification
  - CPUC Custom Data Rules
  - DOE's BEDES – Building Energy Data Exchange Specification
  - CEC's SDD (Standards Data Dictionary)

- Sources for Calibrating & Populating Model Inputs:
  - RASS, CEUS
  - AMI, Tax Assessor, Proprietary databases . . . .

Data Standards

Taxonomies

- CalTF Data Specification
- CPUC Data Specification
- Standards Data Dictionary (SDD)
- BEDES

Schemas/Tools

- eTRM
- CEDARS, DEER, READI
- CBECC
- BuildingSync
- HPXML
- HES XML

Current State: Metrics To Consider

- Policy:
  - Consistency with state policy objectives
- Functionality:
  - Transparency & documentation
  - Reproducibility
- Technical Rigor & Breadth:
  - Does simulation model meet industry standards?
  - Has model been validated?
  - What are model's capabilities? (e.g. ET, solar, batteries, etc.)

Current State: Metrics to Consider

- User Experience:
  - Ease of user interface(s)
  - Learning curve
- Cost:
  - Cost to use model & interfaces
- Administrative:
  - Funding for updates, bug fixes & new features?
- Model Pros & Cons

Desired Future State

- Single model or multiple approved models?
- Approved building prototypes that can be used with multiple models
  - Availability of building prototypes should not drive which model(s) may be used
- Transparent, well-documented & reproducible
- Clear guidelines on how each model can be used/relied on
- Good user experience, effective, on-going & low-cost training
- No or minimal costs to users

What else?

Process: Next Steps

- When:
  - Kick-Off: May 24th Charette, PEC (or Sac?)
- Who (leads): Cal TF Staff, Steve Kromer
- Who (Invitees): Open to All
  - Cal TF members
  - IOUs/POUs
  - CEC/CPUC
  - CABEC
  - CEDMC
  - IBPSA
  - Labs – NREL, PNNL
  - Davis
  - Others?

Process: Next Steps

- Deliverable:
  - Agenda & Outline of Issues (pre-Charette)
  - Draft TPP (produced by Cal TF Staff)
  - Refined in Cal TF Subcommittee (open to all)
  - Draft II – Presented at Cal TF meeting
  - Final by Q4
    - We will not seek to “come to consensus”
    - Goal is to provide background, frame issues, identify areas of consensus & identify major non-consensus items