

Technical Position Paper #10
Recommendations for Improving
Building Energy Modeling in California



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Overview

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- Summarizes the modeling charrette held at PEC in May
 - Overview and background
 - Current modeling landscape
 - Improving the California modeling ecosystem
- Identifies issues, concerns, and recommendations raised during the charrette
- LADWP presented case study of grid-level building modeling
 - Conducted in partnership with SCG
 - Modeling performed by NREL

Improvements for the CA Building Energy Modeling Ecosystem

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Seamless Integration

Seamless integration of models, prototypes, rulesets, and processes must be successful.

Create Single Library of Prototypes

Publicly available and transparent
Clear designation of “ownership”
Clear designation of update protocols & responsibilities

Develop Interoperable Rulesets

Aligning common elements across rulesets can reduce use-case specific rules by 80%

Minimize Redundancies

Eliminate duplicate expenditures and efforts

Develop Roadmap

Short, mid, and long-term goals
Clear designation of responsibilities to execute strategies

Desired Future State

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Coordinate w/ National Entities

Coordination at the national level will ensure a stable future state for modeling & cement California leadership in national modeling arena. (Example: ICC)

Standardize Outputs

Standardizing output will lead to easier navigation & will promote model and output sharing across use cases.

Include Uncertainties

Providing uncertainties as part of the output will increase understanding of the model precision and supports transparency.

Expand Tools for Any Use Case

Establishing criteria and allowing any qualified tool to be used will promote software evolution in the private sector.

Future Opportunities

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ZNE / Decarbonization

ZNE and Decarbonation are underlying policy objectives in CA

Ensuring that modeling can incorporate ZNE and decarbonization will ensure BEM aligns with current policy objectives.

Non-Energy Benefits

Non-energy data outputs from building modeling can support NEB estimates.

Examples include power-based carbon reduction, health benefits (through air change and temperature profile management), etc.

Persistent Models

Maintaining a building model throughout the its lifetime could save resources and support long-term policy initiatives.

Examples include:

- Title 24 new building model
- Building continuous commissioning & calibration
- Future energy efficiency/renewable energy retrofit on building
- Title 24 building remodel

Roadmap

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Mid Term

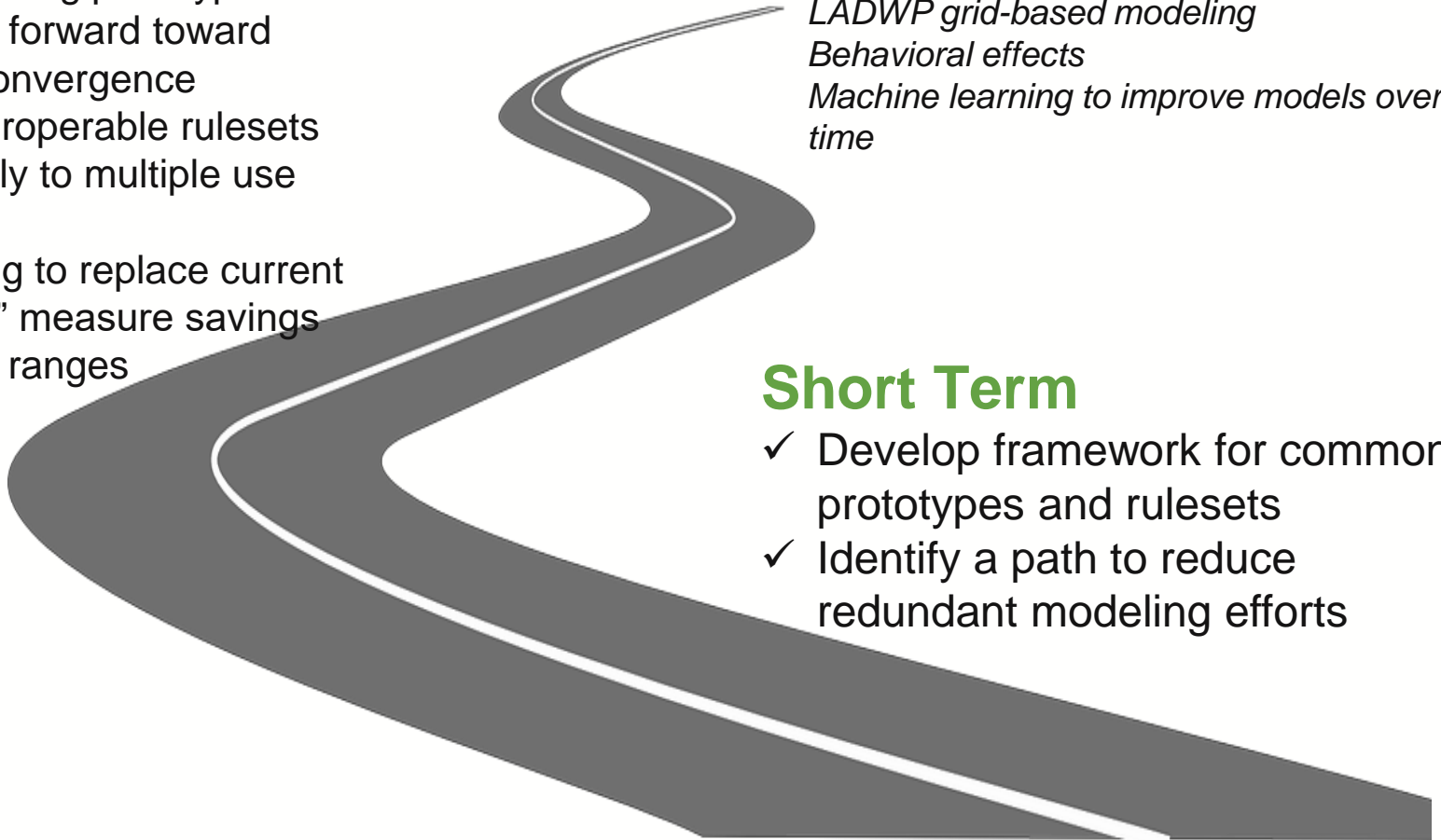
- ✓ Establish a single reference library of building prototypes
- ✓ Identify path forward toward regulatory convergence
- ✓ Develop interoperable rulesets that can apply to multiple use cases
- ✓ Use modeling to replace current “single point” measure savings with savings ranges

Long Term

- ✓ Explore dynamic model development
 - LADWP grid-based modeling*
 - Behavioral effects*
 - Machine learning to improve models over time*

Short Term

- ✓ Develop framework for common prototypes and rulesets
- ✓ Identify a path to reduce redundant modeling efforts



CalBEM Feedback

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- TPP 10 was presented to one of the working groups at CalBEM on November 14.
 - In addition to national entities, coordination with regional entities should be used.
 - Language regarding open-source software in the TPP should be modified, as practitioners note that proprietary software often is more flexible for designers than existing open-source applications.
 - The practitioners in the audience felt that some low-ranking issues in the “Desired Future State” category should receive greater priority.
 - ✦ Have industry-accepted level of detail definitions
 - ✦ Tools are interoperable

CalBEM Feedback

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- The structure of CalBEM 2019 was different from prior symposia
 - Three working groups were established
 - Problems and opportunities were discussed within each group
 - Action items were agreed upon, with commitments from participants to move issues forward
- Some items identified in TPP 10 were independently raised at CalBEM, with action items and participants identified to move those items forward.
 - Ruleset alignment
 - Prototype development
 - Engagement with national entities
- CalTF Staff to meet with SCE in Q1 2020 to align work efforts and ensure success in tackling issues raised both at CalBEM and in Charrette

Next Steps

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Provide your
feedback.



Form Cal TF
Subcommittee in
Q1 2020.

- Refine recommendations
- Develop Prototype Framework and high-level Ruleset Framework
- Coordinate with SCE

Questions?