



CALIFORNIA ENERGY COMMISSION

2013 Building Energy Efficiency Standards Staff Workshop

Martha Brook

High Performance Buildings and Standards
Development Office

California Energy Commission

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Workshop Agenda

Proposed changes to ACM Manuals, Software, Certification Tests & Performance Budgets

GENERAL

- Plans for Compliance Software development

RESIDENTIAL

- ACM Manual reorganization
- California Simulation Engine
- Proposed requirement to use CEC Compliance Engine

NONRESIDENTIAL

- ACM Manual reorganization
- Proposed changes to compliance software certification testing
- Proposed changes to Reference Method
- Proposed changes to performance budgets



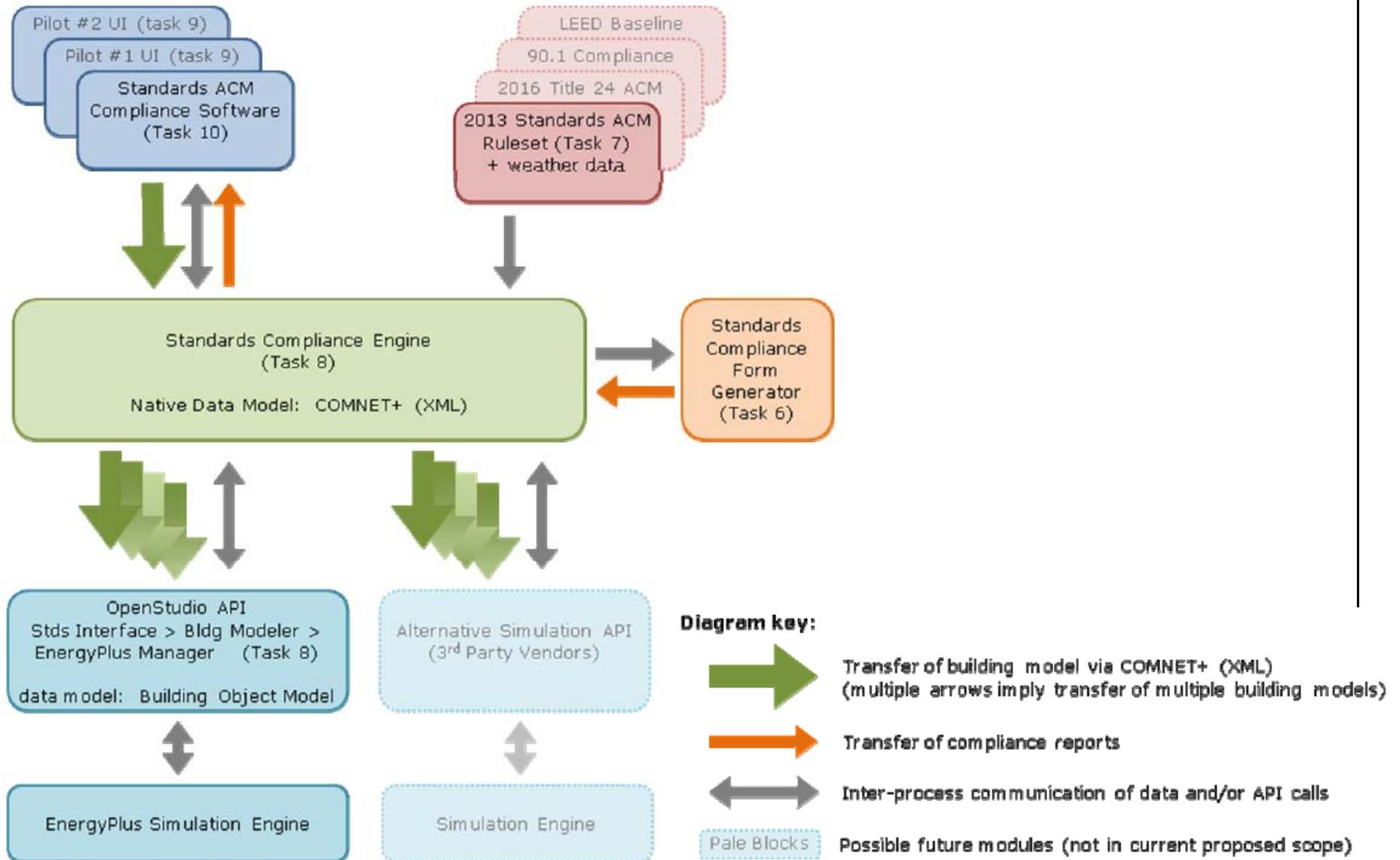
Plans for ACM Software Development

GENERAL

- Open source software platform – CEC will copyright software developed with public funding
- Use of Program Advisory Committees to facilitate collaboration, set QA standards, establish open source licensing
- Software efforts include:
 - Standards data model
 - Performance Standards rule sets
 - Rules processing software
 - Compliance forms generation
 - California Simulation Engine enhancements (Residential)
 - Compliance Engines
 - Compliance Software (= Compliance Engine + user interface)



NONRESIDENTIAL Software Plan





Plans for ACM Software Development





RESIDENTIAL ACM Manual Reorganization

ACM Approval Manual

- Adopted by the CEC in the 2013 Standards rulemaking
- Explains the process requirements for certifying compliance software:
 - Application package
 - Required software capability
 - Optional capabilities
 - Software test processes & criteria for approval
 - Software vendor requirements



RESIDENTIAL ACM Manual Reorganization

ACM Reference Manual

- Approved by the CEC along with Residential Standards Compliance Manual
- Documents the performance standard rule set
 - Explains Standards data model terms
 - Explains each rule applied to the proposed building design
 - Explains how to compute the performance budget that the proposed building is compared to
- Documents the functional requirements of the ACM Software
 - Requirements of data from the user
 - Reporting requirements
- Explains details of compliance certification tests
- Includes or references CSE documentation



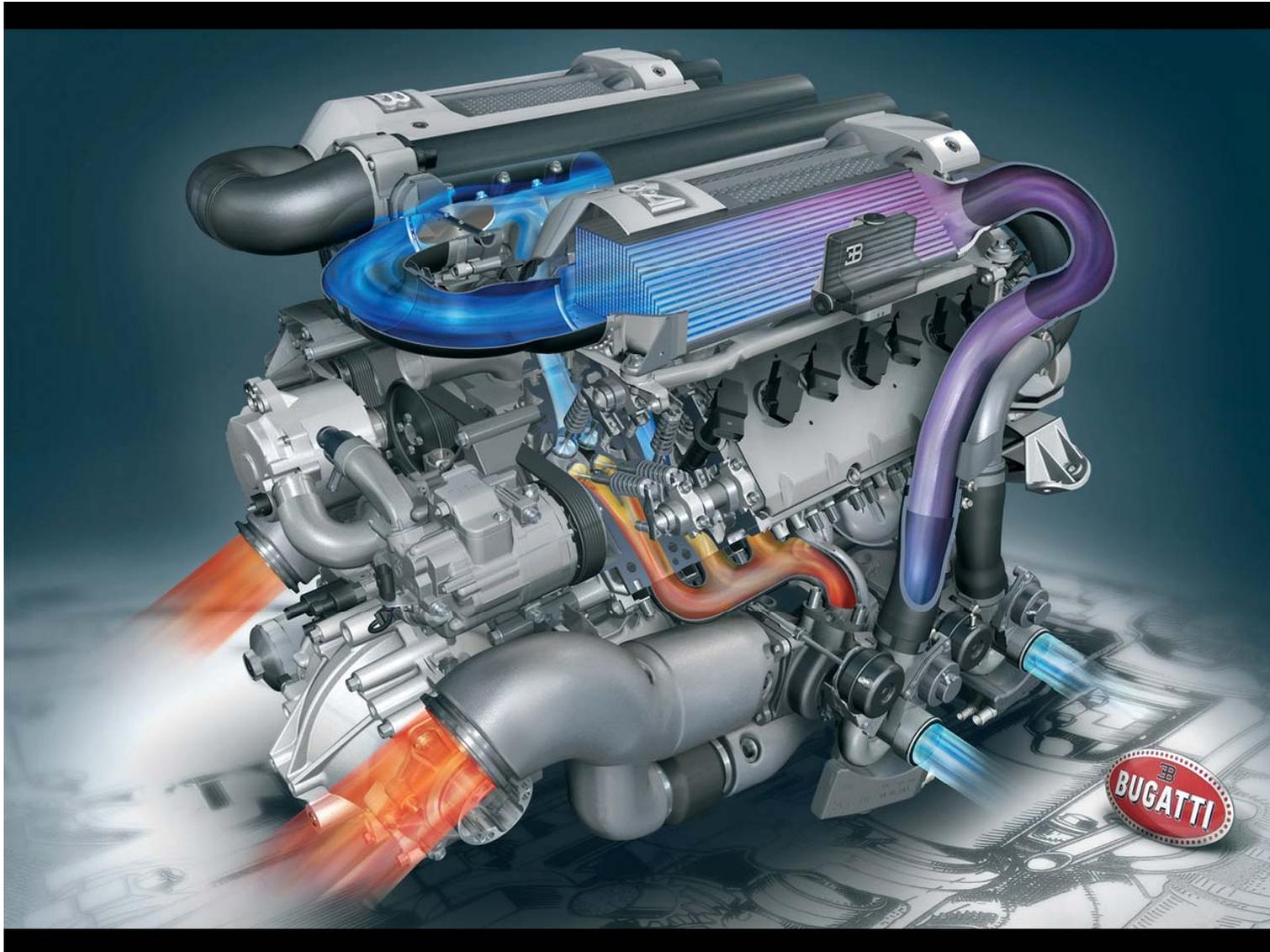
RESIDENTIAL ACM Manual Reorganization





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California Simulation Engine (CSE)





RESIDENTIAL – required use of CEC Compliance Engine

- CEC Compliance Engine will include:
 - CSE & Water Heating DLL
 - Residential rule set
 - Rules processing software
 - Forms generation
 - Data libraries
- Benefits:
 - Single interpretation & implementation of the performance standards
 - Streamlined process for third-party Compliance Software
- Potential issues:
 - Will need continued, collaborative support to update CSE for emerging technologies



RESIDENTIAL – required use of CEC Compliance Engine





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NONRESIDENTIAL ACM Manual Reorganization

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- Will document the performance standard rule set
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NONRESIDENTIAL ACM Manual Reorganization

ACM Reference Manual, cont.

- Will explain details of compliance certification tests
- Will summarize the modeling results contained in the Reference Method
- Current draft manual format adopted from COMNET
 - See next slide for COMNET summary
 - Provides a much needed “face lift” for the ACM reference material
 - Similar formatting between CEC’s ACM and COMNET will help user community:
 - ✓ find information quickly
 - ✓ make comparisons between the two approaches
 - Some ruleset CONTENT may also be adopted from COMNET (TBD)



NONRESIDENTIAL ACM Manual Reorganization

What is COMNET?

- **COM**mmercial Energy Services **NET**work is a new system assessing and rating the energy efficiency of commercial and multifamily buildings
- The commercial building sister to RESNET
- Standardizes the process of performing energy calculations by:
 - Accurately specifying the baseline building
 - Restricting schedules and other operation assumptions
 - Providing credit for reductions in non-regulated energy use
 - Establishes acceptance criteria for software based on ASHRAE 140
- Is developing a quality assurance program to:
 - Accredit software
 - Accredit raters/modelers
 - Accredit auditors (longer term)



NONRESIDENTIAL ACM Manual Reorganization





NONRESIDENTIAL ACM Software Certification Testing

1. Use of COMNET Tests (or equivalent)
 - COMNET details: www.comnet.org
 - ACM Software must pass ASHRAE Std 140 (BESTEST)
 - ACM Software must model U.S. DOE prototype buildings to demonstrate correct performance rule application
2. Comparison to Reference Method modeling results
 - ACM Software must model Reference Method building designs to demonstrate consistency with Reference Method modeling results



NONRESIDENTIAL ACM Reference Method

- Switch from single simulation engine reference to database of representative modeling results
- Proposed simulation engines for use in building reference database include:
 - EnergyPlus
 - DOE2.3 & DOE2.2R
 - Virtual Environment
- Benefits:
 - ACM Reference Method based on modeling tools used by design engineers
 - Enable ACM Software modeling of a greater number of innovative system designs & technologies



NONRESIDENTIAL ACM Certification Testing & Reference Method





NONRESIDENTIAL - Proposed change to performance budget calculations

- Apply the Prescriptive Standard to prototype buildings over a range of a few key bldg. parameters (e.g. climate zone, footprint, # floors, equipment power density)
- Develop a matrix of performance budgets including expected range
- Benefits:
 - Performance standards are explicitly stated (published in tables)
 - Greatly simplifies ACM rule set – rules only apply to proposed building design
 - Architects & designers can use published energy intensity targets to understand code compliance potential of early design decisions
- Potential issues:
 - Absolute rather than relative energy use calculations determine code compliance



NONRESIDENTIAL - Proposed change to performance budget calculations

Identifying key parameters for Office buildings: Summary of Findings





NONRESIDENTIAL - Proposed change to performance budget calculations





2013 Standards Update

Please send comments on today's workshop topics
by July 21, 2011 to:

Martha Brook
California Energy Commission
1516 Ninth Street, Mail Stop 37
Sacramento, CA 95814
916-654-4086
mbrook@energy.state.ca.us