

Title 24 Energy Code Compliance Improvement from the Ground Up

*Learning from and modifying existing processes
to achieve better building performance*

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BAY Regional
AREA Energy
Network

Permit Opportunity Resource Program (PROP)

Purpose

- To learn about energy code enforcement barriers and challenges
- To identify successful enforcement strategies
- To gather data about the impact of discrepancies on building performance

2014 PROP Activities

15 Building Departments visited: 1-2 days at each

- Interview CBO, plans examiners, building inspectors, counter staff
- Observe internal permitting processes
- Collect data to learn
 - How they classify permits that trigger energy code
 - Volume of activity by energy code permit scenario
 - What energy code-related permits are
 - Issued at the counter
 - Plan reviewed

2014 PROP Activities

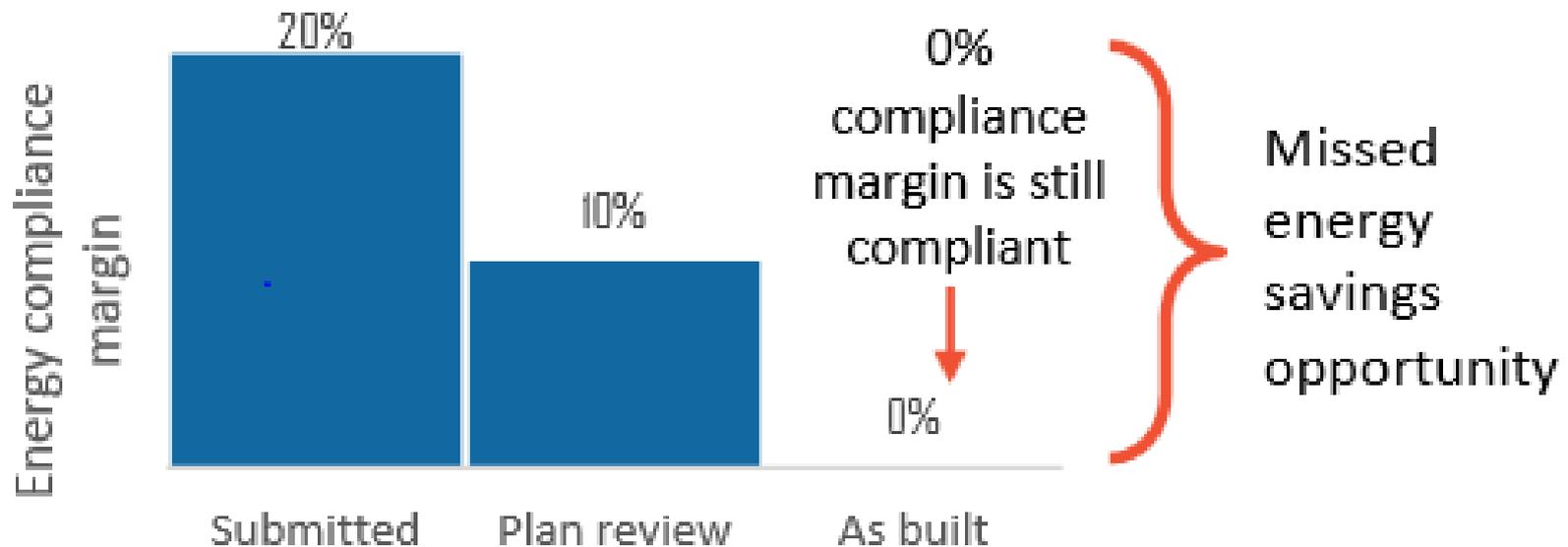
Reviewed 2-3 projects selected by jurisdiction

- Criteria included convenient project, problematic projects or typical projects
- Reviewed each project for energy code compliance discrepancies at several stages:
 - As submitted by permit applicant
 - After plan review
 - As constructed in the field

Findings

- Error or Discrepancy-free compliance is rare for all building types when all three stages of permitting are considered
- Errors and discrepancies do not always knock the project off the code minimum cliff
 - This uncertainty has a role in undermining code compliance and enforcement
 - This is also an opportunity for improving building performance

How 'compliant' errors impact efficiency



Findings

Local government and building department staff are influential in:

- Enforcing minimum code compliance
- Encouraging best practice building design and construction
- Motivating contractors to comply with codes
 - Most contractors, and other market actors want to do the right thing

Findings

Discrepancy 'Themes'

- Incomplete, inaccurate or conflicting energy information on plans/compliance documentation
- Installed measures that perform worse than what was specified at permitting stage
- Energy code documentation missing in the field
- Inaccurate energy documentation on plans

Examples

Figure 4. BayREN PROP Analysis Project Characteristics

Characteristic	Frequency
Building type	
Residential	30
Nonresidential	19
Title 24 climate zone	
2	10
3	10
4	6
12	23
Project type	
Addition/alteration	20
Tenant improvement (TI)	7
New construction	22
Compliance method	
Prescriptive	21
Performance	28

Figure 5. Error-Free Energy Code Documentation at All Stages of BayREN's Review

Type	Error-Free Projects ⁶	Total projects	% Error-Free
Additions/alterations	2	27	7%
New construction	6	22	27%
Residential	4	30	13%
Nonresidential	4	19	21%
Total	8	49	16%

Figure 6. Error-Free Energy code Documentation at Each Stage of BayREN's Review

Stage	% Error-Free
Original submission	71%
Plan check	49%
Field inspection	57%

Figure 7. Relative Building Performance Post-Construction by Project Type

Type	Post-construction projects performing worse than predicted by submitted documents	Total projects	% projects performing worse than predicted
Additions/alterations	18	27	67%
New construction	7	22	32%
Residential	17	30	57%
Nonresidential	8	19	42%
Total	25	49	51%

Conclusion: How do we improve building performance in our communities?

- Code is a floor -- not a ceiling, or target
- Encourage standardization and automation
- Code development, implementation should be user-driven
 - What do building departments care about?
 - What do planners, building owners and operators and the community care about?
 - What do architects, designers, builders, contractors, engineers, energy consultants care about?

Questions?

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www.bayren.org/codes/prop-final-report