

# Savings to Code Subcommittee: Preview of Expected Deliverable



**CALIFORNIA**  
TECHNICAL FORUM

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# Executive Summary – Deliverable



2

- Background
  - Stringent Codes & Standards and code baseline default were limiting reach of ratepayer-funded programs
    - ✦ Issue slated for discussion in 2017, Rolling Portfolio Phase III
  - Opportunity came sooner than expected: AB 802 mandates code baseline for all applicable measures by Fall 2016
- Process
- “Interim Deliverables”
  - Categorization of To Code opportunity types
  - Annotated bibliography of existing literature and other resources
- **Key Findings:**
  - **“Repair Indefinitely” measures are a high To Code opportunity**
    - ✦ Two examples ready for workpaper development
  - **Further data requirements for individual projects would create necessary barriers**
- **Key Question:**
  - Should the Cal TF consider developing/reviewing “to code” measure in 2016?

## Savings To Code Subcommittee

- Armen Saiyan, TF
- Doug Mahone, TF
- Martin Vu, TF
- Mary Matteson Bryan, TF
- Spencer Lipp, TF
- Christopher Rogers, TF
- Tom Eckhart, TF
- Sherry Hu, TF
- Nicholas Dirr, AEA
- Kevin Messner, AHAM
- Marc Costa, Energy Coalition

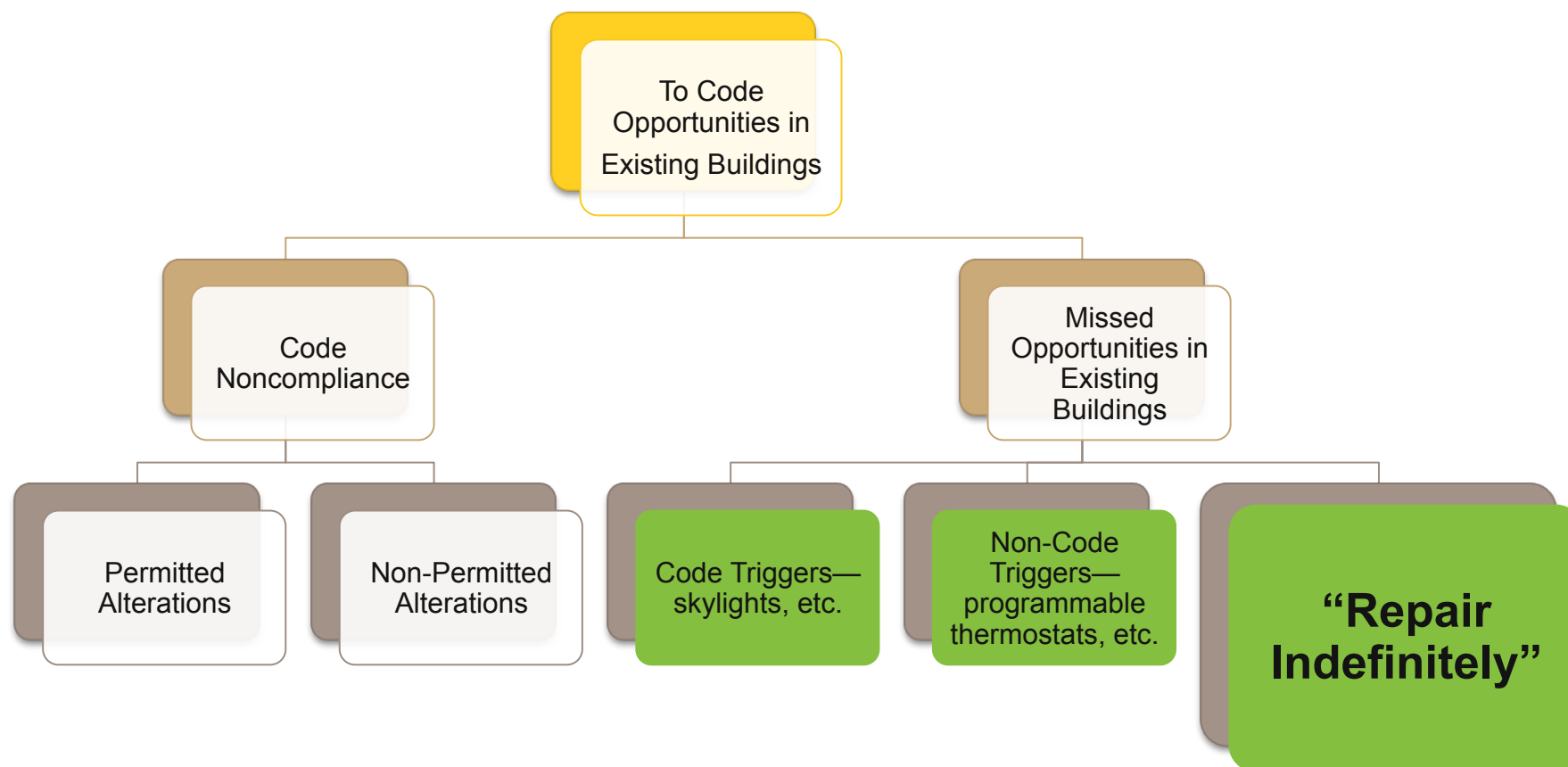


## Objectives

- Characterize key below code opportunities being missed
- Quantify possible savings from key opportunities, such that:
  - ❑ PAs can begin capturing savings “stranded by code”
  - ❑ Minimize ratepayer expenditures on free rider activities
  - ❑ Saving claims are not “double counted”

# Opportunity Categorization

4



# What is a Repair Indefinitely (RI) Measure?

5

## Key Criteria

- Failure mode is not catastrophic
  - Kept in service indefinitely through repairs and part replacements
- History of rebuild/repair rather than replace
- Far less expensive to rebuild/repair than to replace

## Examples

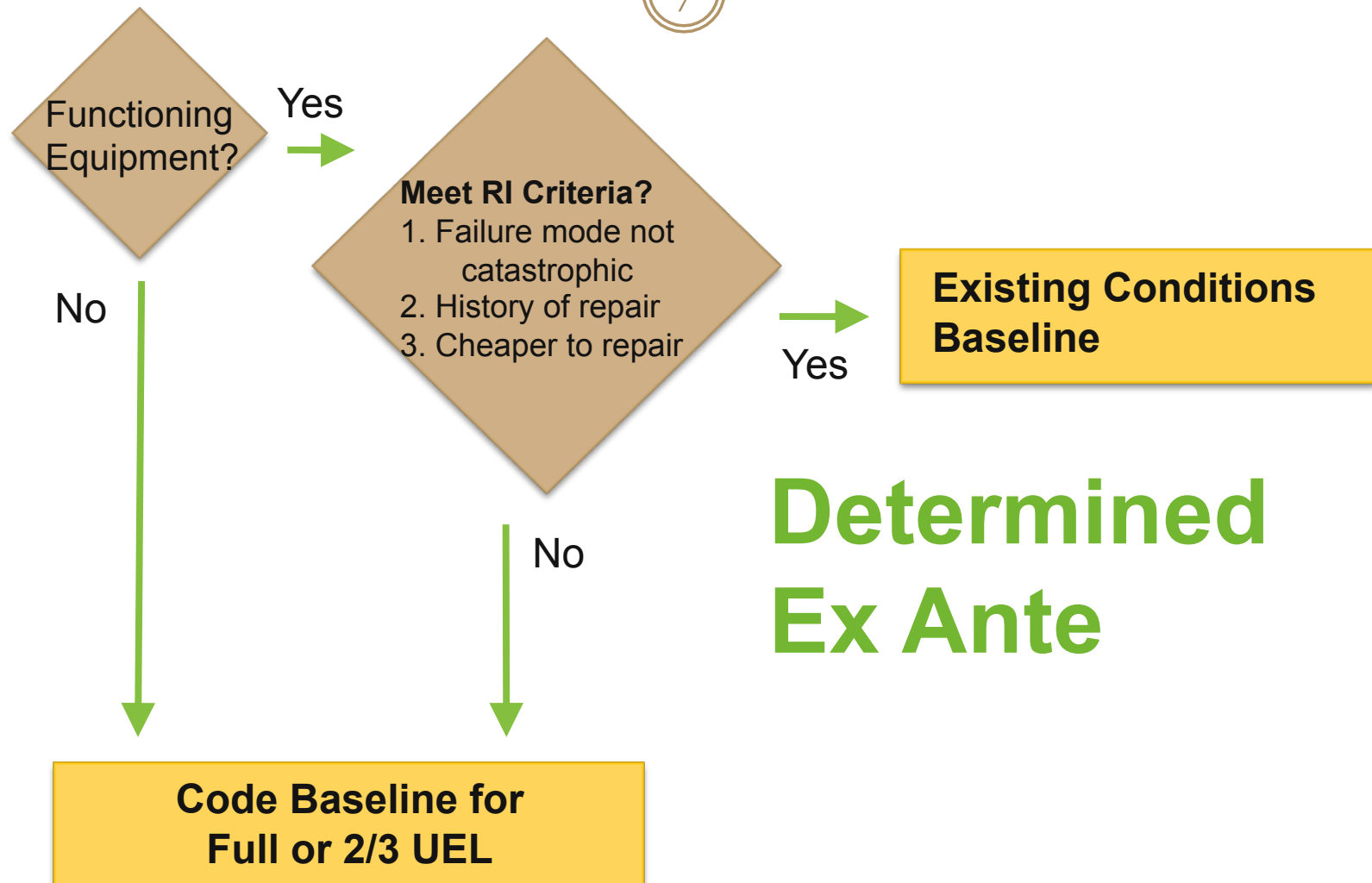
- Large electric motors
  - Often rewound
- Large pumps and fans
  - Difficult to replace, easier to repair
- Windows
  - Often last the lifetime of the building

Key Recommendation One:

# **Adopt Repair Indefinitely as a DEEMED Measure Type**

# Proposed Rule Set for “Deeming” RI Measures

7



**Determined  
Ex Ante**

Key Recommendation Two:

**Only Require a Level of Rigor that  
Can be Met by AVAILABLE Data**

As long as there is enough confidence in the  
data/results



# RI Characterization One: Steam and Hot Water Boilers

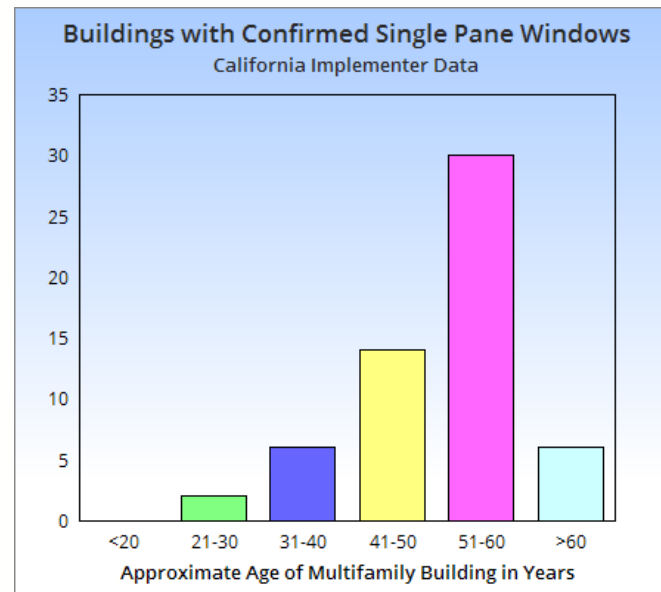


9

- Existing sample of 177 boilers replaced by a Federal program in San Francisco
  - Exact age of replaced equipment is very costly and virtually impossible to determine
    - ✦ Cal TF staff used combination of primary document review and exercise of professional judgment (via program manager and experts)
  - **Determined that 138 of the boilers replaced had been maintained in service decades past their DEER EULs**
    - ✦ **Only 6 determined as replacements upon equipment burn out**
- San Francisco Environment reported 164,465 Therms per year for the entire project – 1,000 average Therms per year per project
  - Savings distribution heavily skewed to greater savings per project

## RI Characterization Two: Multifamily Windows

- Sample of 58 multifamily buildings retrofitted in BayREN territory
  - Building age proxy for age of replaced single pane, aluminum frame windows:



- Modeled savings: 2.9 Therms or 38.1 kWh per window

# Conclusion

11

- There are significant To Code opportunities being missed by today's EE programs
  - ❑ **Repair Indefinitely opportunities are a “low hanging fruit” in the To Code tree**
    - ✦ **Perfect for for the High Opportunity list required by AB 802**
- Repair Indefinitely measures should be deemed for ex ante savings estimates
  - ❑ Multifamily boilers and windows have already been characterized by the subcommittee
- Only the level of rigor achievable by available data should be required for deeming RI measures

## Appendix: AB 802 Language



12

- “Authorize electrical corporations or gas corporations to provide financial incentives, rebates, technical assistance, and support to their customers to increase the energy efficiency of existing buildings based on all estimated energy savings.”
- High Opportunity measures starting January 1<sup>st</sup>, 2016
- All other applicable measures September 16<sup>th</sup>, 2016

## Appendix: Measure for Further Study – Commercial Rooftop HVAC



13

- Sample of over 50,000 commercial units maintained by EE implementers statewide
- Potential savings averaged across building types and climate zones: 174 kWh per ton of handling capacity
- Found 14,127 of the units were in operation past 15-year DEER EUL – 2,403 were 25 years or older
  - ❑ Distribution of equipment age not enough for subcommittee to recommend deeming as RI
  - ❑ Further data analysis needed to establish more accurate equipment lifetime