Claiming Savings from Codes and Standards Activities – Learning From California and Arizona

NEEP Workshop
September 28, 2010
Presented by Allen Lee

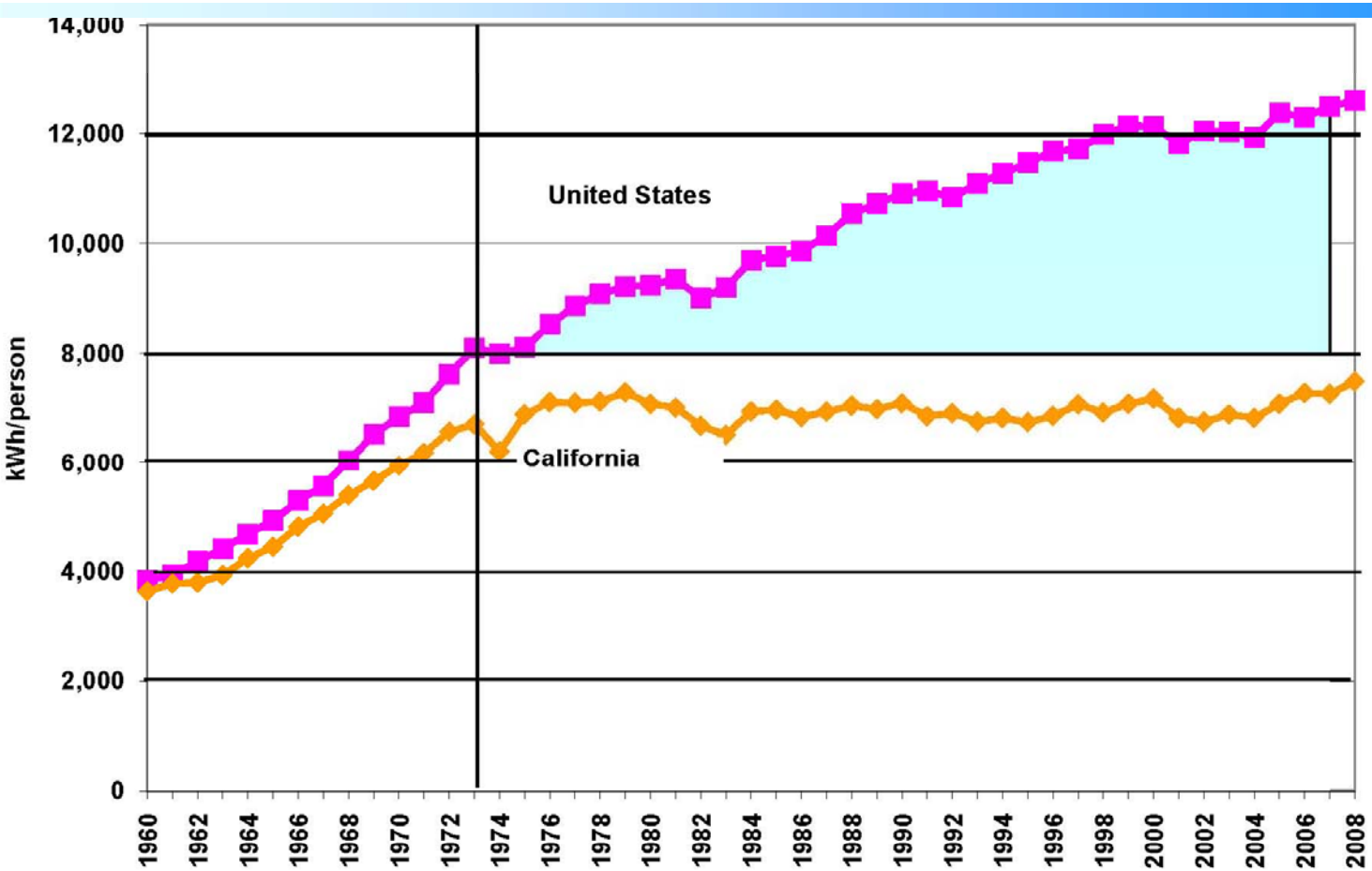
Overview

- Introduction to codes and standards
- Advantages/drawbacks of codes and standards (C&S)
- C&S processes
- C&S and Program Administrators
- Attribution to C&S efforts
- The California story
  - Evaluating savings and attribution in California
- Arizona approach
- Northwest snapshot
- What's been learned?

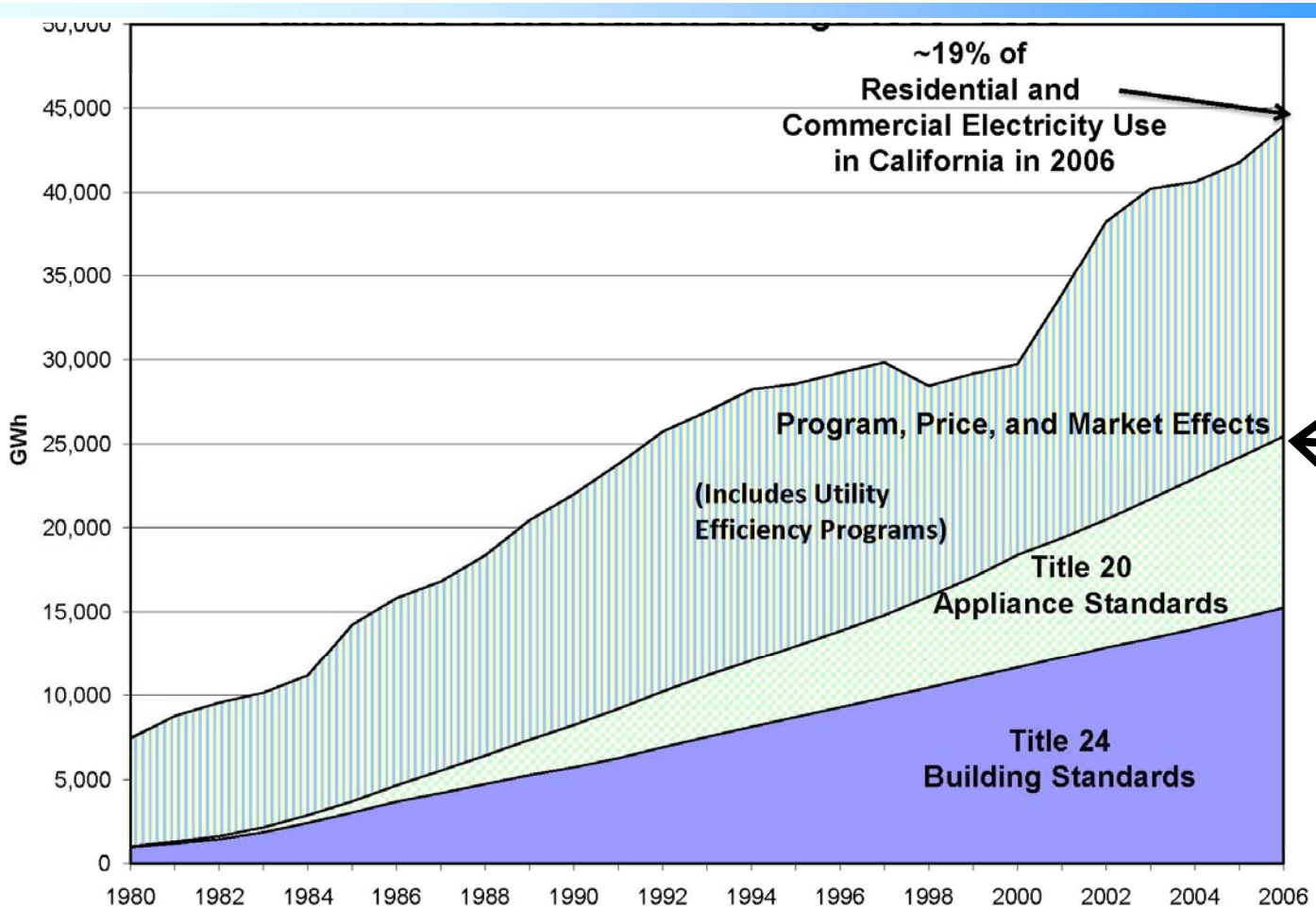
Energy-efficiency Codes & Standards (C&S)

- Terminology
  - Codes for buildings (usually)
  - Standards for equipment/appliances
- Linked to market transformation (MT) strategy of 1990's
  - MT seeks to change market so efficient products and services are norm and need no incentives
  - This is exactly what C&S do
- Benefits
  - Mandatory
  - Universal
  - No/low cost to some market actors

Per Capita Electricity Use Trends



California's C&S Savings Contribution



60% of Total

Advantages/Drawbacks of C&S

- Codes (have potential to) affect entire market and minimize "lost opportunities"
- Scale effects decrease costs of energy efficiency
- Relative to DSM programs…
  - Ongoing incentives are not required
  - Effects are persistent
- Drawbacks
  - Require authority and enforcer
  - Raise the "baseline"

Typical Codes Process

- Development—national level, typically
  - ASHRAE for nonresidential
  - International Code Council (ICC) for residential (IECC)
- Adoption—state or local level
  - With some exceptions (e.g., California) most jurisdictions adopt national model codes
  - Legislative or administrative process
  - Requires sound technical and cost data, feasibility, compliance/enforcement approach
- Implementation—local level
  - Involves compliance and enforcement
  - But usually given lower priority than life/safety codes

Typical Standards Process

- Development and adoption—federal or state level
  - Federal: Legislation or U.S. Department of Energy (DOE)
  - Basis often established by efficiency programs: Program Administrators, ENERGY STAR
- Implementation—federal or state level
  - Self-certification
  - Enforcement mostly reactive
    - Feds can test and force ceasing distribution
    - California has similar process

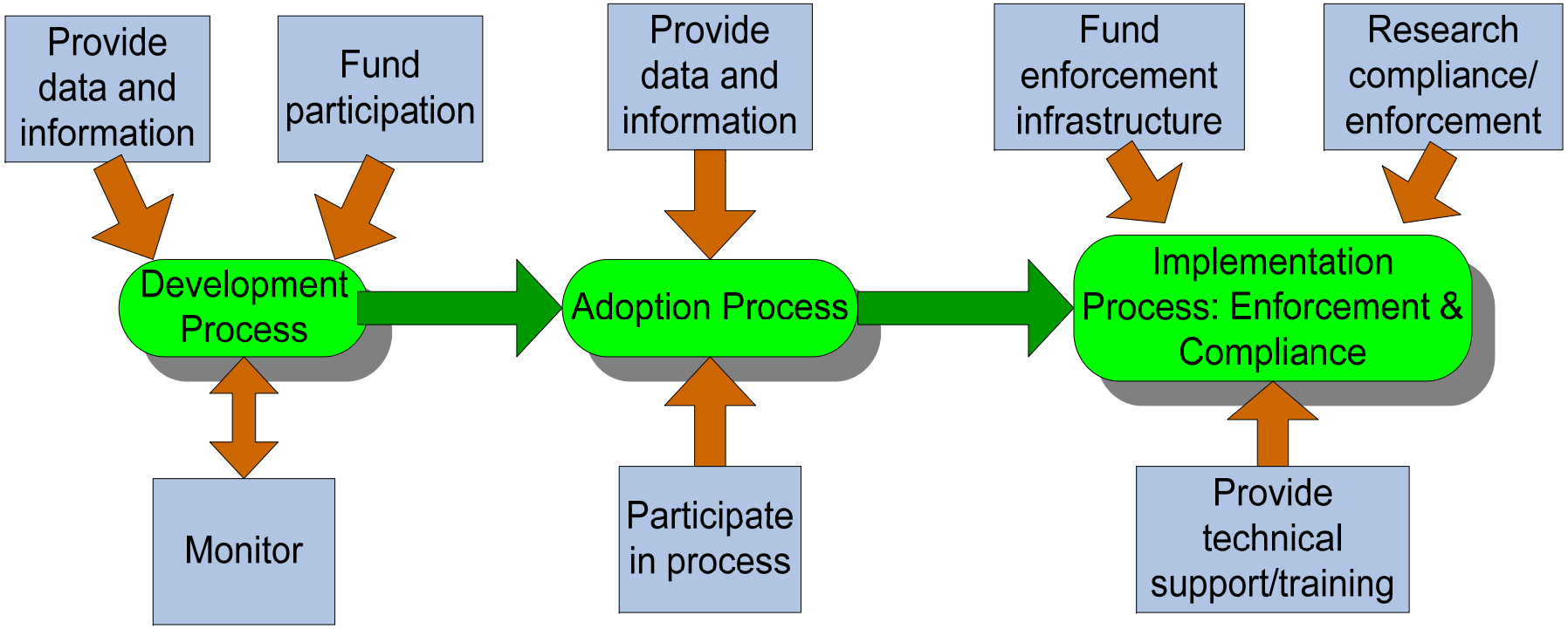
Multistate Appliance Standards Collaborative

- Current members and sponsors: California, Connecticut, Massachusetts, New York, Oregon, Rhode Island, and Washington
  - Additional sponsors include ACEEE and Pacific Gas and Electric Company (PG&E)
  - Several have adopted California or similar standards
- Other states have their own standards
  - Maryland
  - Vermont
  - New Hampshire
  - District of Columbia
  - Arizona

Program Administrators (PA)

- Who are they?
  - Investor-owned (IOUs) and public utilities
  - Energy service organizations
  - Regional consortia: e.g., NEEP, NEEA
- Why should PAs support C&S process? Compared to DSM programs codes . . .
  - Increase efficiency of non-participants
  - Do not impose administration costs on program administrators
  - Have much better payback: <0.5% California utilities' DSM expenditures on C&S accounted for about 10% of net savings

Potential PA Roles in C&S Process



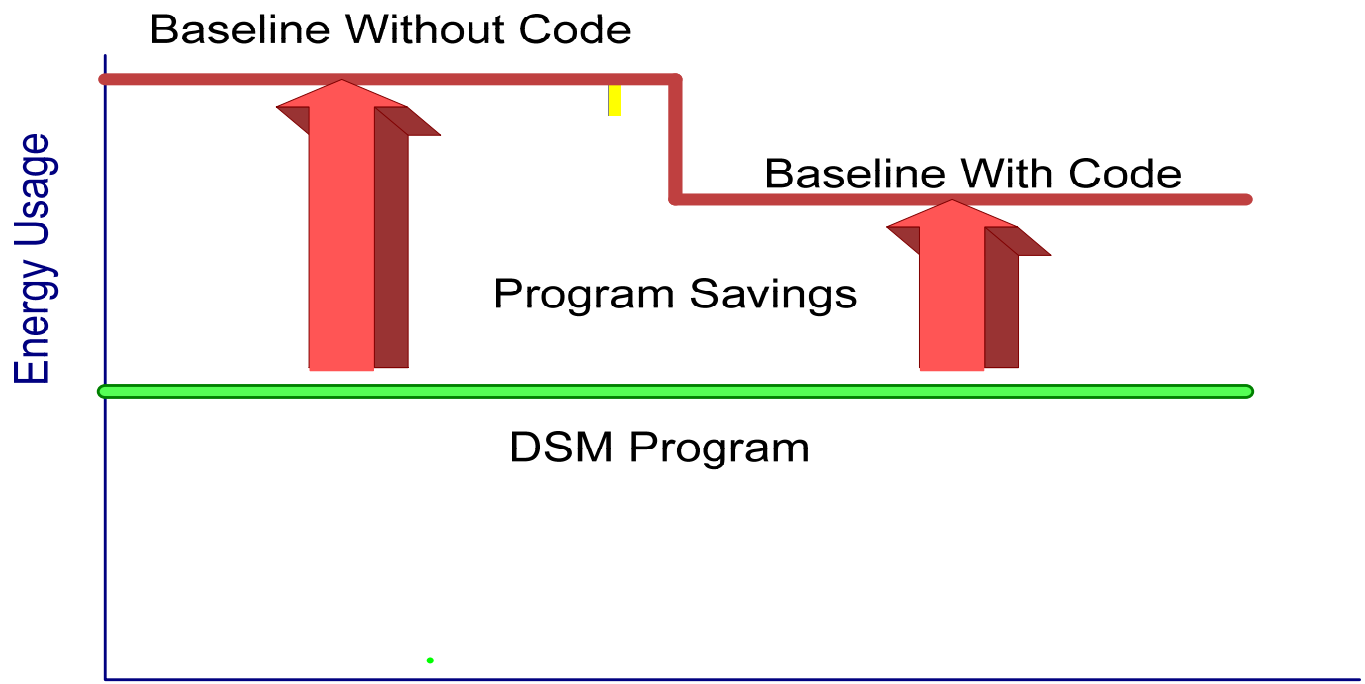
What Program Administrators Offer

- Data—energy use, savings, costs
- Technically competent staff/contractors
- Staff/contractors experienced in advanced building techniques and systems
- Demonstrations and incentivized programs

- Added credibility—viewed as objective "third-parties"
- Multi-jurisdiction coverage and experience
- *Overall impact is to provide balance in the codes and standards adoption process*

But….

- C&S increase efficiency, but decrease DSM program savings potential



Treatment of PA Code Activities

- Equitable treatment needed for PA expenditures on code efforts
  - Cost recovery
  - Incentives
  - Lost revenue

- Evaluation of savings is more complex
  - What's the baseline?
  - What's the compliance rate?
  - How much credit does PA get?

The Credit Question: Attribution

- For adoption of C&S, to what extent can adoption be ***attributed*** to a PA's C&S Program?
- Program net savings = (Attribution %) X (net energy savings)
- Attribution can be credited based on efforts such as:
  - Development of compliance methods and special analytic techniques
  - Development of technical and cost information and C&S language
  - Demonstrating feasibility

Three Models

- Driven by how credit for savings from C&S interacts with savings goals and forecasts
  - Prove it and claim it—California
  - Support achievement of C&S savings, and get part of credit —Arizona (with other 2/3 of savings documented for resource planning)
  - Project what will be there and work together to make it real—Northwest

In the Beginning: California C&S

- California Energy Commission (CEC) charged with developing efficiency standards
  - Law passed 1974—response to oil shortage
  - Title 20 appliance standards
  - Title 24 building standards (codes)
- CEC moved aggressively
  - Public process
  - Cost effectiveness

Origins of California IOU C&S Program

- Utilities began involvement in mid-1990s
  - Market transformation era
  - First Codes and Standards Enhancement (CASE) reports in 1998
  - Began by PG&E as information-only program
  - California PUC expanded effort to coordinated, statewide C&S Program
- First influence on 2001 Title 24

First Major Impacts 2006-08

- Supported 2005 Title 24 and 2006 Title 20 upgrades
  - IOUs conduct research, advocate, and propose
    - 12 Title 24 standards
    - 27 Title 20 standards
  - C&S part of cyclical process with acquisition programs
- Program led to questions
  - How much energy do C&S save?
  - How much is due to C&S Program?
  - How should C&S Program be treated in assessing savings goal and earnings?

Some Answers and Fallout

- Gross savings 20% or more of 2006-08 savings goals
- Attribution to C&S Program was unmeasured, but possibly large
- This posed problems:
  - Recognition that C&S savings reduce utility program savings
  - Measurement and regulatory/financial treatment undefined
- California PUC (CPUC) initiated process to credit C&S Program for *verified* savings

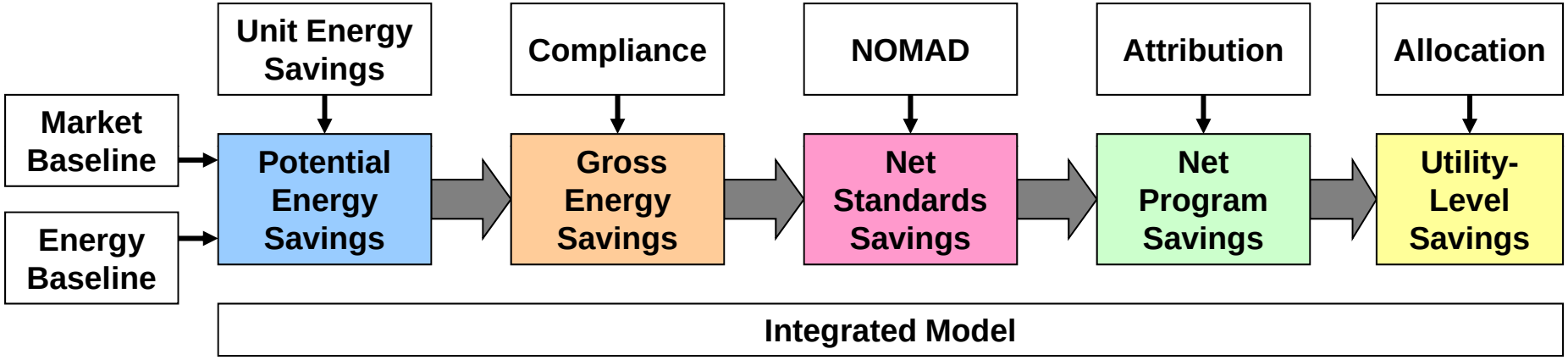
CPUC Regulatory Treatment

- C&S program evaluation protocol developed
  - Built upon other California protocols
  - Protocol required to estimate verified savings
- Utilities received credit toward 2006-08 savings goals
  - From pre-2006 advocacy activities
  - 50% of *verified* savings credited toward savings goals

Current California Situation

- CPUC and IOUs acknowledge the lag between C&S program activities and energy savings
- In next round, utilities will receive 100% credit for *verified* savings toward goal, but no earnings
- Issues remaining:
  - Treatment of compliance enhancement
  - Credit for stretch codes
  - Credit for federal impacts

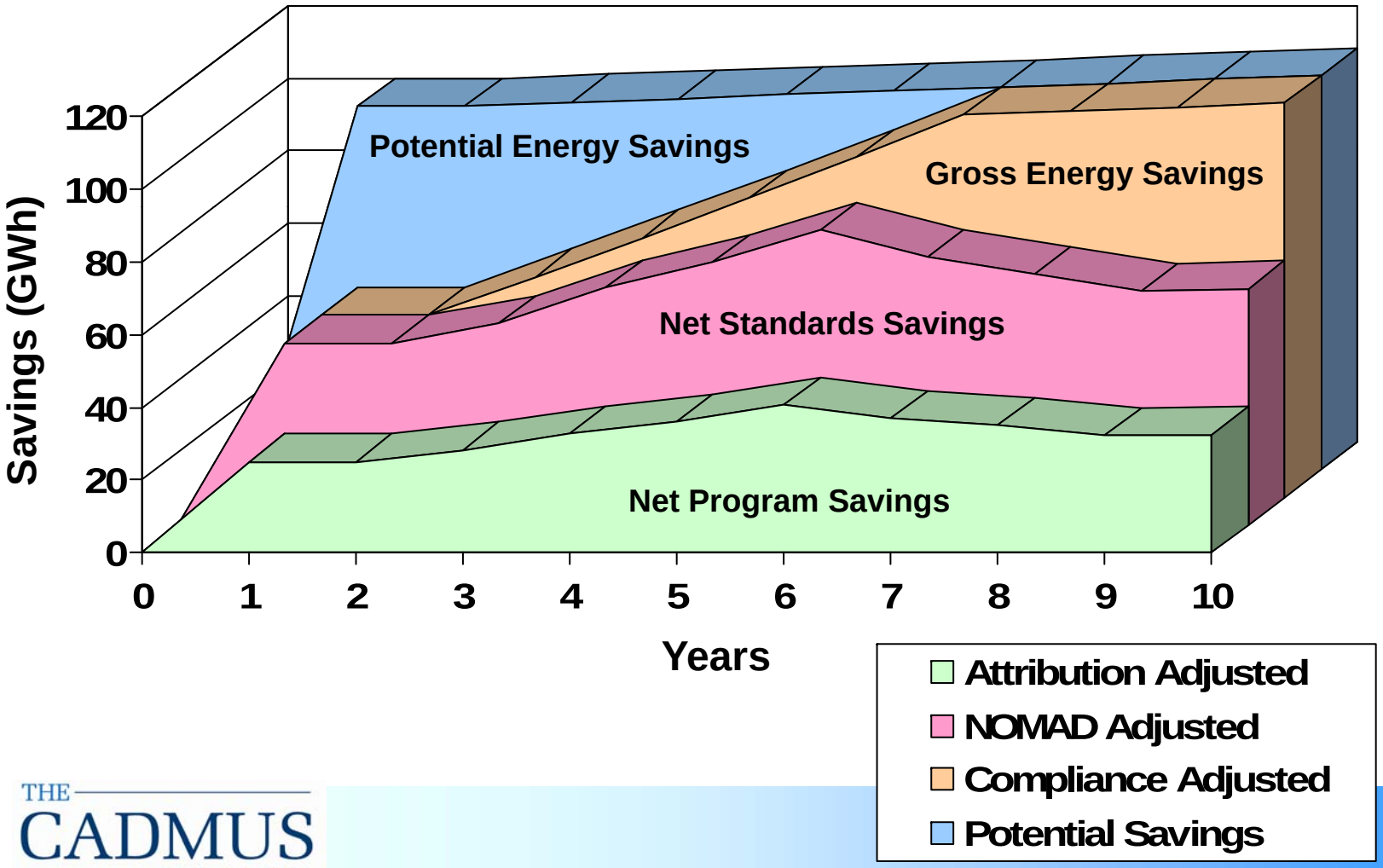
CA Impact Evaluation Protocol



Savings Adjustments

- Compliance→gross savings
  - Buildings: site visits, scoring, modeling
  - Appliances: vendor site visits, surveys
- NOMAD (Naturally Occurring Market Adoption)→net savings
  - On-line visualization tool
  - Expert feedback
- Attribution→Program savings
  - Expert survey
  - Third-party assessment

Savings Quantification



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Attribution Process

- Identified and estimated factors required for adoption
  - Compliance method; technical/ economic information; feasibility demonstration
  - Survey knowledgeable experts and quantify factor weight
- Document development/adoption
- Assign score to program effort
  - Third-party assessment
  - Weighted sum of scores=attribution
  - Overall attribution ranged from 55% to 94% for C&S actively supported

Final Savings Credit

- Combined adjustments reduced initial potential savings estimate (24% of goal) about 50%
- CPUC applied 50% factor
- Final adjusted savings ~6% of portfolio savings goals

Arizona Approach Background

- Regulators concerned about growth and new building load
- Established Electric and Gas Rules with Energy Efficiency Standards (EES)
  - Electric: 22% savings by 2020 (20% energy savings)
  - Gas: 6% savings by 2020 (very little heating load in AZ)
- Effort to include C&S credit toward EES target
  - Decided to take different path than California
    - Encourage utility efforts, with greater certainty of credit
    - Concerns re: evaluation required, contentious disputes, costs
  - Goals explicit, but flexible to implement

Arizona Approach

- Utilities can count up to 1/3 of savings from building energy codes or standards*
  - Savings based on EM&V study
  - Support of state C&S adoption or implementation, and federal efforts can count
  - Utilities must document efforts to support C&S
- Utility credit for efforts (attribution) based on stipulated 1/3 factor (not determined by EM&V)
  - Must document efforts to show "skin in the game"

*Credit for savings from standards is only available to gas utilities

Arizona C&S Process

- C&S program may be element of program or separate program as part of DSM energy-efficiency (EE) portfolio
- Utility administrators propose specific efforts in their EE implementation plans
- Details to be determined
  - How much “skin in game” is required to get 1/3 credit
  - How savings will count toward performance incentive

Northwest Snapshot

- Regional body—Northwest Power & Conservation Council—develops Power Plan that includes expected, cost-effective C&S in load forecast
- NW Energy Efficiency Alliance conducts regional/national activities to promote C&S
  - Selects C&S targets
  - Focuses efforts strategically
- Forecast gets readjusted as C&S advance
  - Oregon adopted requirement to upgrade code 10-15% every three years

Lessons Learned

- C&S program savings can be significant and cost effective
- Evaluation requires unique approach and can be complex
  - Document and start evaluating early
  - New challenges include compliance enhancement and reach codes

More Lessons Learned

- Regulatory processes need to adapt and rewards and credit approach must be linked to…
  - Reward/incentive mechanisms
  - C&S assumptions in conservation goal setting
- There is…
  - Much to leverage from others
  - Power in numbers