

# CA Potential Studies and Goals: Background and Perspectives

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> Knowledge to Shape Your Future



# But first, a quote...

- “Prediction is very difficult, especially about the future.”
  - > Niels Bohr



- CA potential studies and application to goals
- Goal setting processes
- Potential studies and goals
  - > Connections and gaps
- Perspectives

# Context and Orientation of Studies



- 2002-2003 IOU/EF (*Secret Surplus*) studies
  - > Utility resource planning perspective
  
- 2006 and 2007 CA IOU potential studies
  - > IOU resource planning perspective
    - What is *probable* rather than what is best case
  
- Both studies used past to inform adoption forecasts
  - > No assumed change in consumer and business behavior
  
- Neither study sought to ID *optimal* level of savings
  - > Nor societal/IOU policies needed to get max

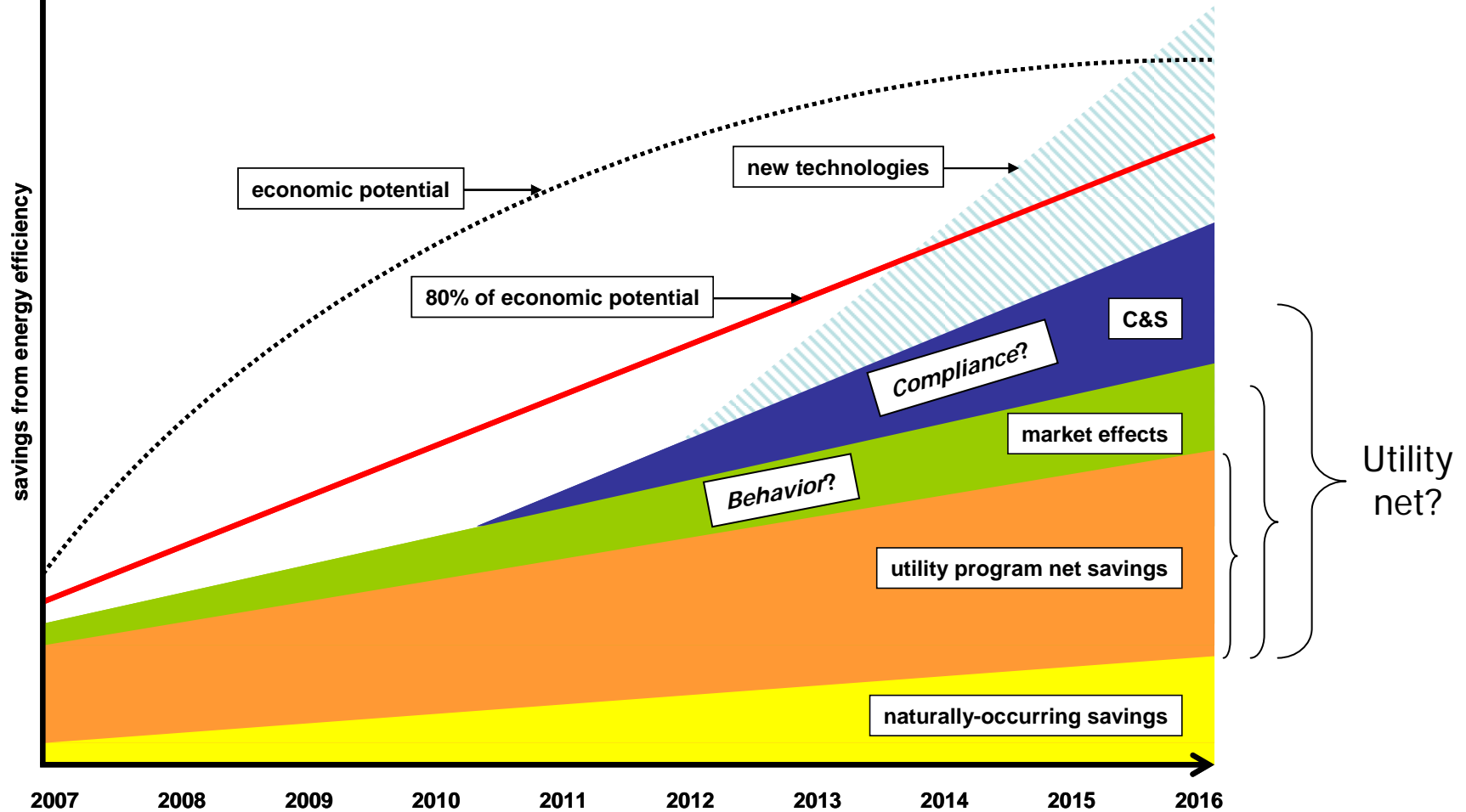
# Development of CA EE Savings Goals



- CPUC 2004-2013 CA IOU goals
  - > *Secret Surplus* study an input
  - > Goals from CEC/CPUC Joint Staff analysis
    - Considered historic trends, state goals, emerging tech
  - > ~85% of *Secret Surplus* max achievable
  
- CEC AB2021 EE Goals – Statewide IOU & POU
  
- CPUC EE goal setting
  - > 09-11 and other CPUC decisions
  - > CPUC Goals Study
  
- CPUC Big-Bold EE Initiatives

# The Many Faces of Potential

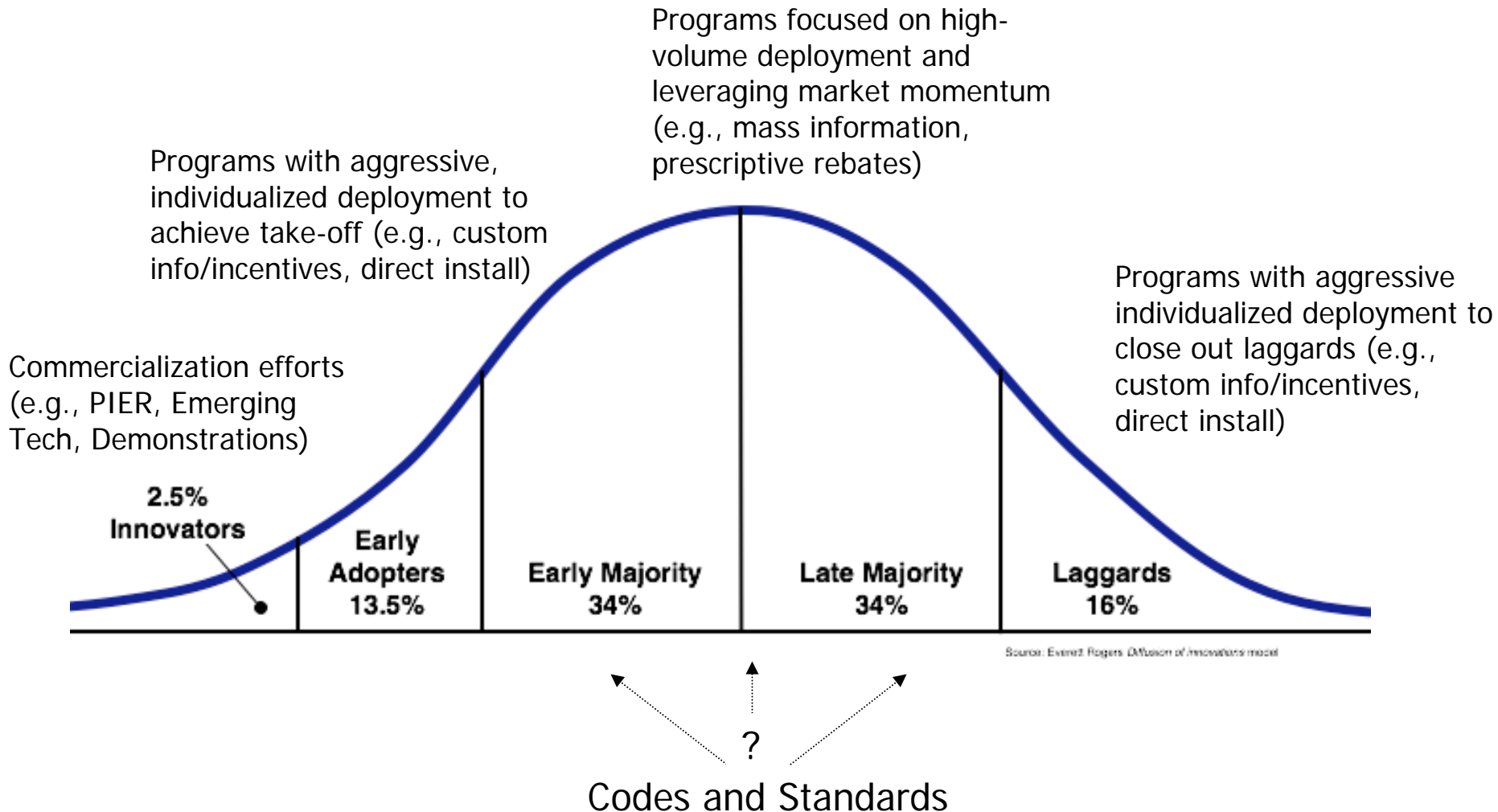
Technical and economic potential are highly theoretical constructs  
Program/achievable potential estimates are designed to incorporate real-world adoption results based on customer behavior and other measure market barriers



# Technology Diffusion & Program Life-Cycle



*How to model this over time?.....*



# What are the Goals of the *Goal*?

- Maximize cost-effective (C-E) societal energy savings?
- Maximize C-E societal savings *as quickly as possible*?
- Maximize C-E savings from *utility* programs?
- Maximize savings *as cost-effectively* as possible?
- Set benchmark for utility performance incentives?
- Produce high reliability for procurement?
- Contribute maximum possible to GHG reduction goal?

How important are tradeoffs among:

- Cost-effectiveness?
- Attribution?
- Reliability?
- Rate vs. bill impacts?
- Magnitude?
- Timing?

# Factors Affecting Estimates of C-E Potential & Load



## ■ Savings Higher/Load Lower

- > More rapid availability of new EE measures
- > Synergies of whole-building/systems approaches
- > Increased market transformation
- > More effective marketing
- > Changes in behavior that lead to increased EE adoption
  - Willingness to accept less than fully equivalent service
  - Concern over GHG
- > “Big/Bold” strategies

## ■ Savings Lower/Load Higher

- > Slower adoption and acceptance of key measures
- > Lower potential in less studied segments (e.g., Ag & TCU)
- > Increased energy service demands
  - Illumination levels, home size, plug loads, etc.

## ■ Savings Higher/Load Higher

- > Low C&S compliance

## ■ Savings Lower/Load Lower

- > Higher current EE saturation
- > Higher naturally occurring

- Societal goals - inclusive of utility and non-utility efforts
- Utility incentive-based goals - aggressive *but probable*
  - > Leave some room to exceed
- Utility goals - reflect realistic mix of portfolio strategies
- Utility goals - encourage long-term savings

- Measure/track *all* EE savings against frozen efficiency baselines
  - > Already significant market-based EE...which will grow
- Ensure policies align interests of utilities - society
- Connect load growth and efficiency opportunities
- Begin addressing behavioral change
  - > ...and better code compliance
- Increase collaborative research

# Backup Slides...



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# Potential Studies/Models: Strengths and Weaknesses



- Strengths:
  - > Use of saturation data
  - > Use of stock accounting
  - > Organizational frameworks for managing data
  - > Calibration to program and market accomplishments
  - > Tracking of savings over time
  - > Framing estimates of technical and economic potential
  - > Ability to efficiently handle multiple scenarios
  - > Works well with “widgets”
- Weaknesses:
  - > Lack of empirical data
  - > Lack of quality data
  - > Challenges associated with:
    - Discrete and static measure lists
    - Measure interactions
    - Systems/practices
    - Effect of economic vs. non-economic factors
    - Program and naturally-occurring adoption
    - Market effects
    - “Out-of-sample” initiatives
  - > Data intensiveness often leads to false perceptions of precision
  - > Provision of point estimates, limited presentation of uncertainty

- Numerous and significant uncertainties pervade studies
- Some can be reduced through better baseline and evaluation research
- Some are inherent to forecasting and irreducible
- If data and assumptions are relatively unbiased, small random errors will often cancel one another
- Need to differentiate empirical inputs from assumptions and judgments
- Need to broaden input on assumptions and judgments
- Increase use of scenario and risk analyses

# A Few Needs for Potential Studies



- Improve baseline end use and saturation data
- Improve data on marketing/information effectiveness
- Improve data on adoption (revealed preference)
- Improve tracking of program accomplishments and overall efficiency market share
- Improve analysis of integrated design and practices
- Improve characterization of uncertainty and increase use of scenario analysis
- Increase transparency and understanding of empirical versus judgment-based inputs
- Develop simpler tools to support policy-making and input from key decision makers
- Conduct multi-client baseline & potential research

# Breakdown of Recent CA Studies



- 2000-2001: PG&E/SCE/SDG&E commercial and residential sectors (KEMA-XENERGY)
- 2001-2002: CEC and Energy Foundation leverage IOU work in *Secret Surplus* Study (Rufo/Coito/KEMA-XENERGY)
- 2006 Itron update study for IOUs; KEMA industrial
- 2007 Itron update study for IOUs; KEMA support
- 2007 CPUC Goals Study (Itron)
- 2006-2007 CEC (PIER) Long-term EE Scenarios (LBNL/Itron)
- Muni studies: LADWP (2005-2006), SMUD (2006-2007), TID (2007), RMI CA multi-munis (2007)