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THIS PRESENTATION WAS SHARED BY

William Prindle

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FOR THE SESSION:

“Policy Framework for Energy Efficiency in Buildings (Codes and Standards)”

DURING ANGAN 2019

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Market Transformation Tales: Policy Implementation in the Buildings Sector

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ANGAN Conference
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Overview

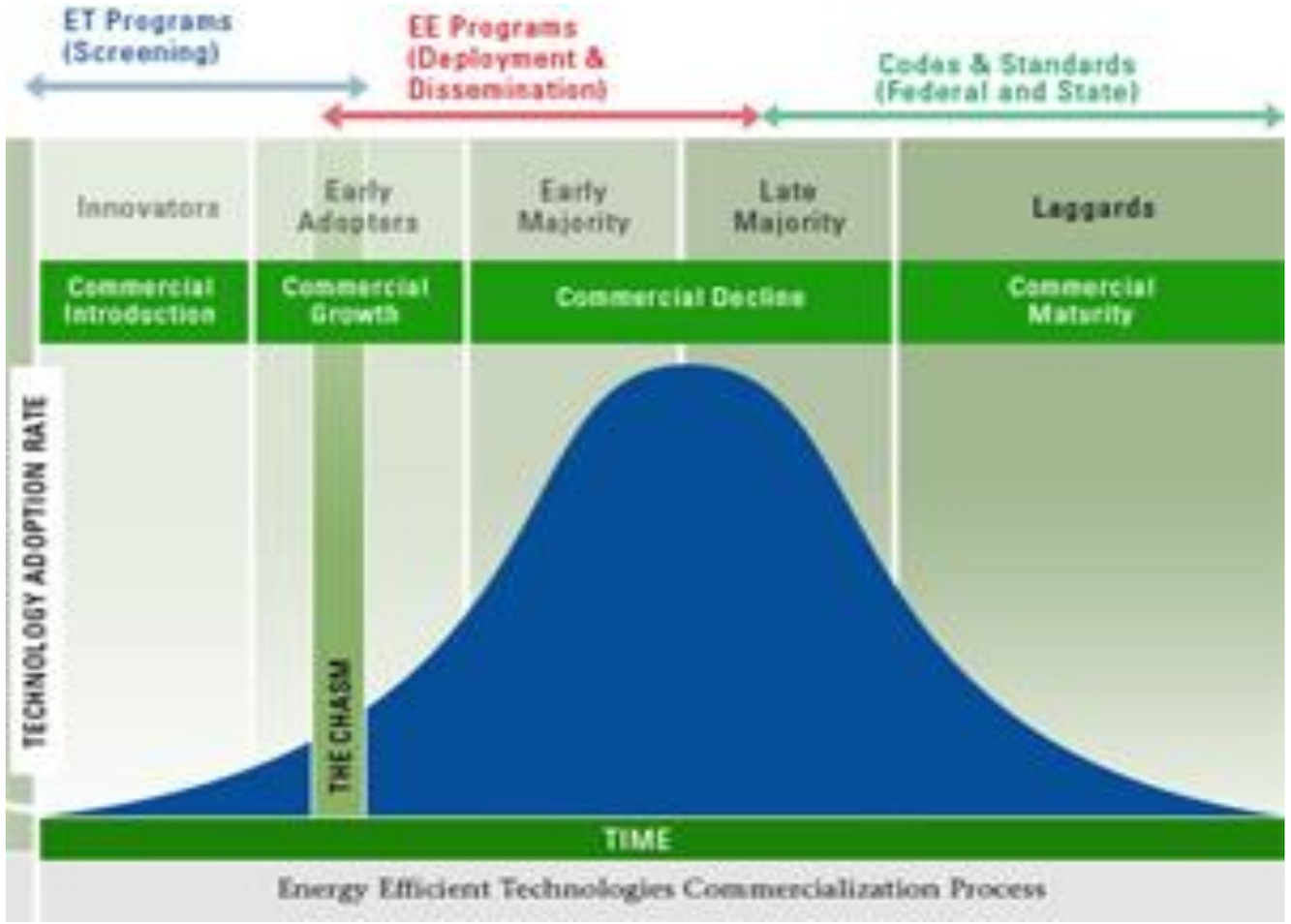
- The challenges to market transformation in the buildings sector
- A market transformation framework for overcoming challenges
- Three U.S. market transformation stories: refrigerators, residential building codes, and residential windows.

Market Transformation Challenges

- **Size and diversity of building stock**
  - 100+ million buildings and growing
  - Widely diverse building types and ownership structures
  - Multiple markets—new construction, equipment replacement, optional retrofit
- **Small scale of energy end use decisions**
  - Millions of decisions by diverse parties on varying timeframes
  - Creates an endemic transaction-cost problem
- **The split incentive/principal-agent problem**
  - Especially affects new construction and rental markets

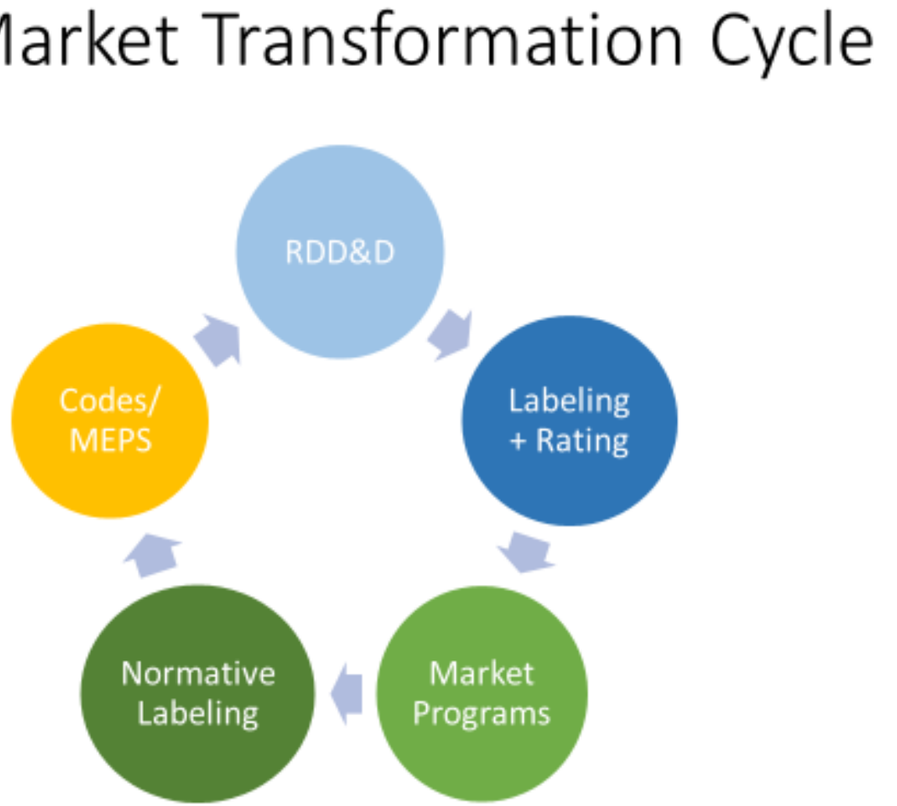
Market Transformation Framework: Linear or Cyclical?

A linear process model



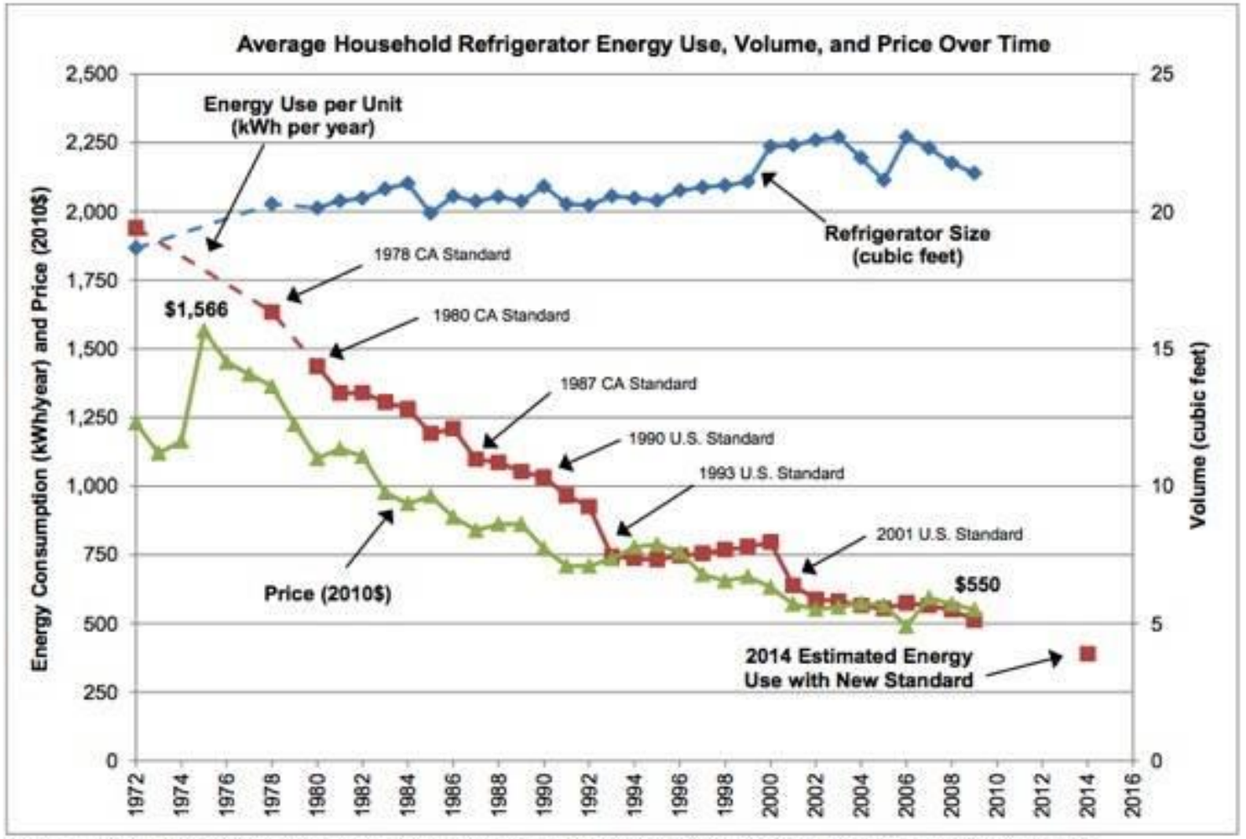
Market Transformation as Cyclical Process

The cyclical model includes RD&D and other elements



MT Story 1: U.S. Refrigerators

ASAP | APPLIANCE STANDARDS AWARENESS PROJECT



Sources: Association of Home Appliance Manufacturers (AHAM) for energy consumption and volume; U.S. Census Bureau for price

Notes: a. Data includes standard-size and compact refrigerators.
b. Energy consumption and volume reflect the DOE test procedure published in 2010.
c. Volume is adjusted volume, which is equal to the fresh food volume + 1.76 * freezer volume.
d. Prices represent the manufacturer selling price (e.g. excluding retailer markups) and reflect products manufactured in the U.S.

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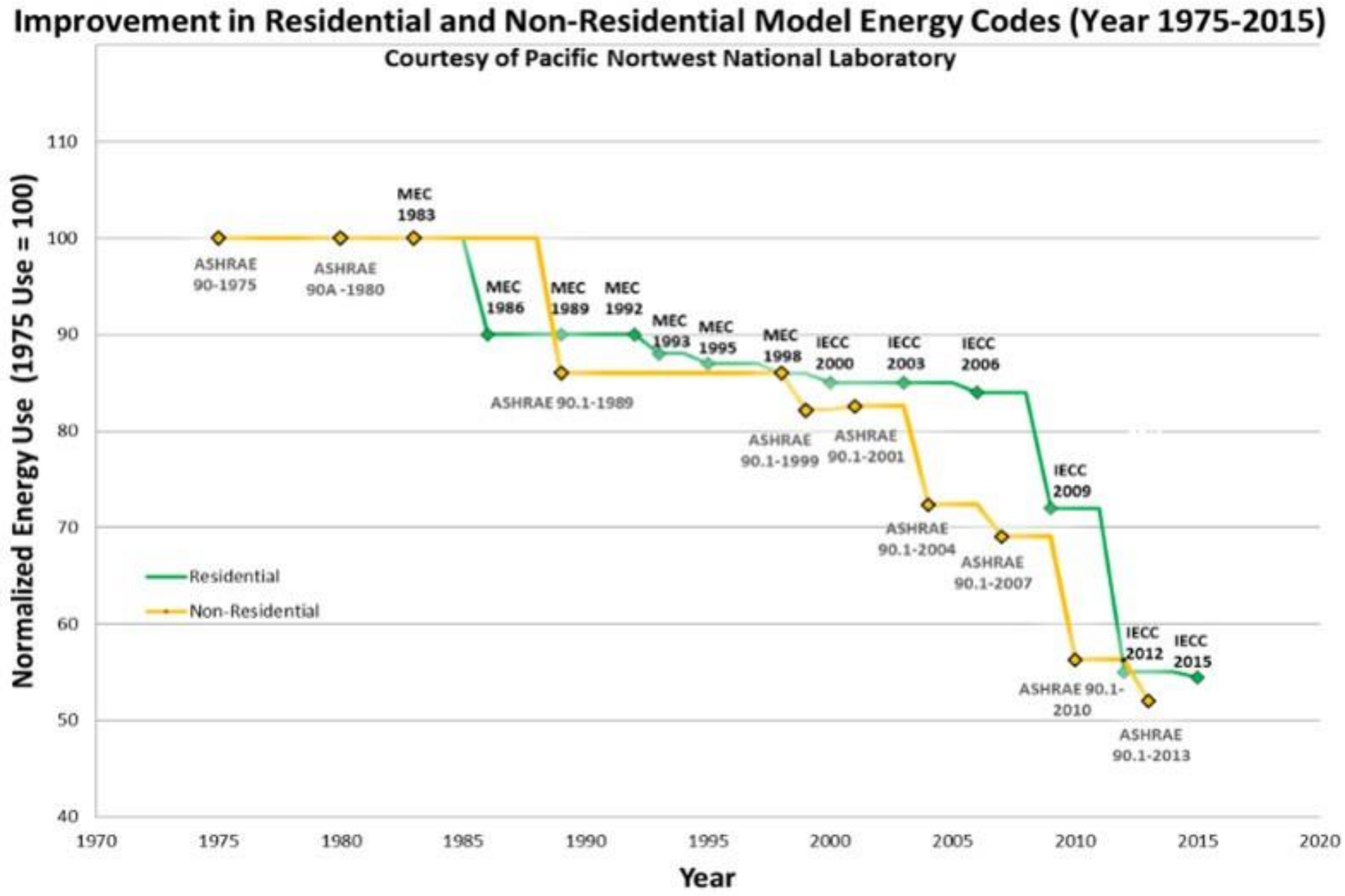
The Refrigerator Story

- 1970s: FTC Energy Guide labeling
- 1980s: DOE R&D on advanced compressors and other features
- Early 1990s: “Golden Carrot” competition
- Mid-1990s: Utility DSM promotion of efficient refrigerators
- Mid-1990s: ENERGY STAR refrigerator specification
- 1997: Negotiated DOE MEPS standard
- 2001: new DOE standard effective date
- 2001+: Further market transformation via ENERGY STAR specs, DOE standards, stakeholder collaborations

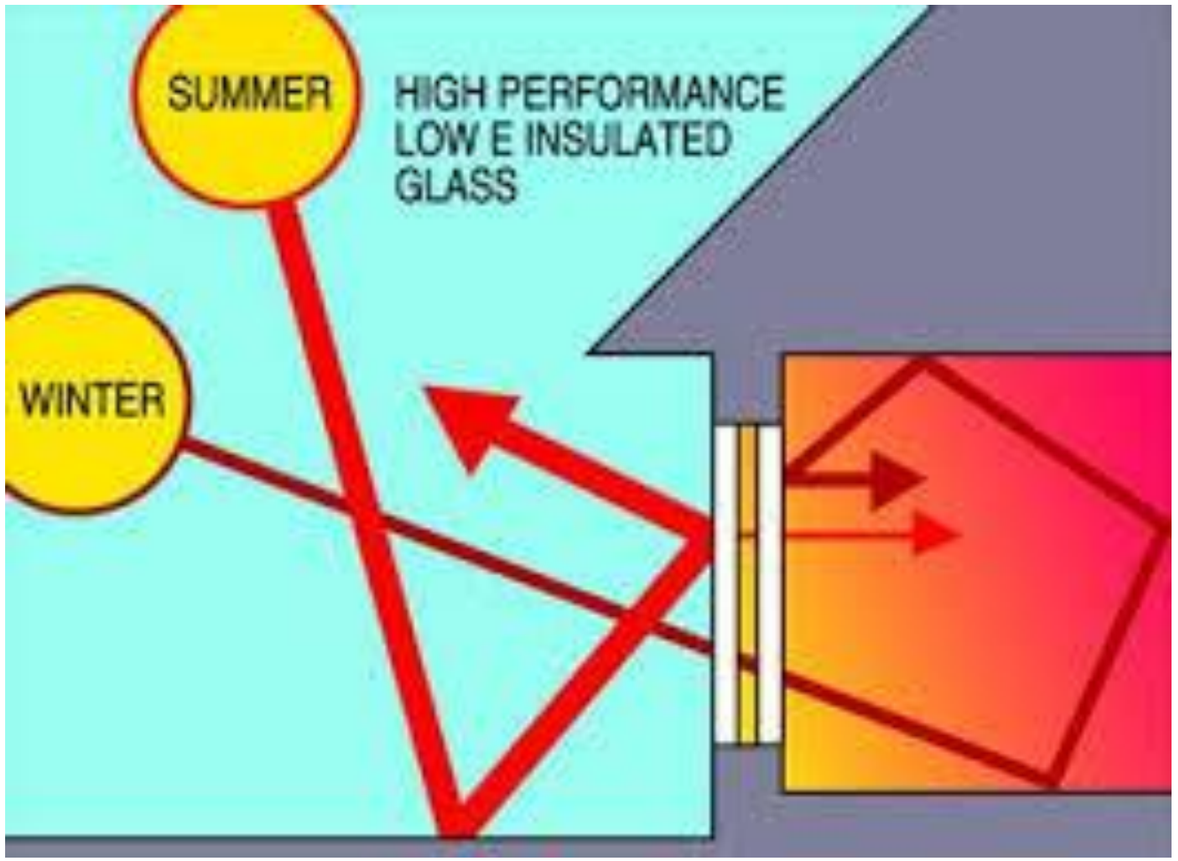
MT Story 2: U.S. Energy Codes

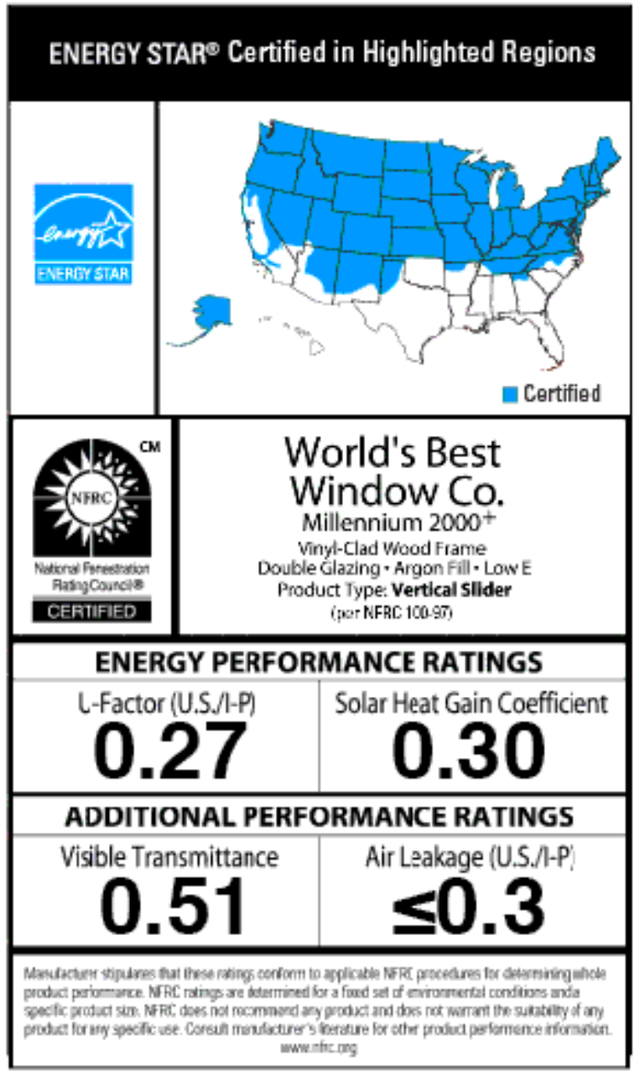


The U.S. Residential Energy Codes Story

- **1970s: National Building Energy Performance Standards (BEPS**
- **1980s: Congress repeals BEPS**
- **1980s: Model Energy Code (MEC); adoption by states is voluntary**
- **1992: Energy Policy Act of 1992 places mandates on states**
- **1994: Building Codes Assistance Project (BCAP) and DOE's codes technical assistance program launched**
- **1990s:**
  - most states "notify" MEC versions, MEC becomes IECC
  - ENERGY STAR Homes gains market share; utility programs offer incentives.
- **2000s:**
  - 2009 and 2012 IECC residential standards improve, adopting ENERGY STAR technologies.
  - RESNET drives voluntary HERS ratings.
  - 2015 IECC adds RESNET-based Energy Rating Index (ERI) compliance path.

MT Story 3: U.S. Residential Windows





The U.S. Residential Windows Story

- 1980s: DOE research on low-emissivity coatings
- 1990s: EPAct 1992 requires rating and labeling system,National Fenestration Rating Council (NFRC) is formed
- 1990s: NFRC test methods and labeling mandatory in Model Energy Code.
- Late 1990s: ENERGY STAR Windows program launched, also based on the NFRC rating and labeling scheme.
- 2000s: ENERGY STAR Windows criteria applied in IECC versions, matching code and voluntary standards in some states. U-factor and SHGC criteria continue to improve in subsequent code versions.

Key Lessons Learned

- Think long-term
- Think outside policy silos
- Leverage voluntary programs
- Cultivate market leaders

Contact information

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Thank you!