

NFRC at 20:

The Past As Precedent

(A Look Back, A Look Ahead)

R. Christopher Mathis

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Objectives

- Share some of my memories and perspectives about NFRC's early days
- Look at some of the trends and patterns that shaped NFRC then
- Compare those patterns and trends to things we see today
- Peek into the future as I see it
- Challenge us for tomorrow

Who Is This Guy?

- Building Scientist
- Owens-Corning Research Center – 1982
- NAHB Research Center – 1985
- Architectural Testing – 1988
- NFRC/D&R – 1990
- Own Business – 1995

Lots of stories... for another day...

The Past as Precedent – the 70s

1970

1980



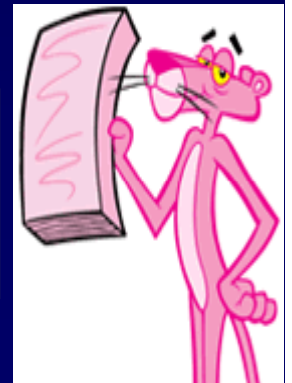
Arab Oil
Embargo
1973

ASHRAE
1975

FTC R-value
Rule 1978

Pattern Begins:

- (1) Crisis
- (2) Code
- (3) Regulation



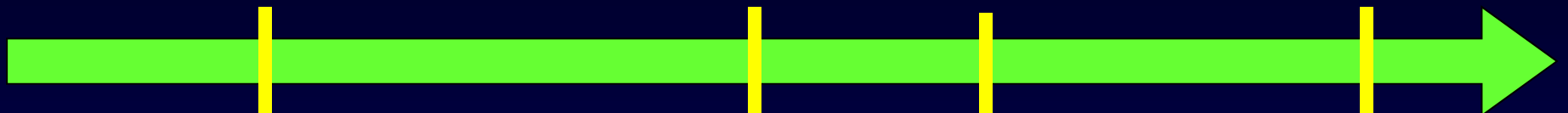
The R-Value Rule Started a Trend

- Need for:
 - Comparative Ratings
 - Better Test Methods
 - Rating Certification and Labeling
 - Independent Third Party QA
- Reliable Ratings for Energy Code Compliance, Utility Programs and Consumer Protection

The Past as Precedent – the 80s

1980

1990



Product Energy
Certification and
Labeling

NAECA Act
1985

Washington State
Energy Code

California Title
24 Update

Pattern Continues:

- (1) Crisis
- (2) Code
- (3) Regulation

New Energy Ratings and Standards

EPA Fuel Economy Estimates

CITY MPG
20
Expected range for most drivers: **16 to 24** mpg

HIGHWAY MPG
26
Expected range for most drivers: **21 to 31** mpg

Your actual mileage can vary significantly depending on how you drive and maintain your vehicle and other factors.

Placeholder for Guzzler Tax Information

Estimated Annual Fuel Cost
\$1435
(based on 15,000 miles at \$2.20 per gallon)

For comparison shopping, the range of fuel economy for all **Sport Utility Vehicles** is **15 to 30** MPG city and **20 to 40** MPG highway.

For more information see the FREE Fuel Economy Guide available at dealers or online at www.fueleconomy.gov.

Automotive

Seers, Roebeck and Co.
Model(s) 6302* *, 7302* *, 6303* *,
7303* *, 6306* *, 7306* *

Refrigerator-Freezer
Capacity: 19.9 Cubic Feet
Type of Defrost: Automatic

ENERGYGUIDE

Estimates on the scale are based on a 1992 national average electric rate of 9.25¢ per kilowatt hour. Only models with 18.5 to 20.4 cubic feet are compared in the scale.

Model with lowest energy cost: \$57
\$59
Model with highest energy cost: \$106

▼ THIS MODEL

Corrected yearly energy cost

Your cost will vary depending on your local energy rate and how you use the product. This energy cost is based on U.S. Government standard costs.

How much will this model cost you to run yearly?

	Yearly cost	
	Estimate using local energy rates	
Cost per kilowatt hour	2¢	\$14
	4¢	\$29
	6¢	\$43
	8¢	\$57
	10¢	\$72
	12¢	\$86

Ask your salesperson or local utility for the energy rate (cost per kilowatt hour) in your area.

Important: Removal of this label before consumer purchase is a violation of Federal law (42 U.S.C. 6202)

©1993

Appliances

The 1980s gave us (more) new means of product energy comparison...

NFRC Has Many “Beginnings”

1980

1990



NFRC's Beginnings...

- NAHB
- ASHRAE
- LBL
- BTECC
- Utility Programs
- FTC

- ASTM
- WA, CA, OR

...and many interesting people...

Key Events in the 80s...

- 1986 NAHB Show
- ASHRAE TC 4.5 Meetings
- LBL Research and Modeling Tools
- Bonneville Power, Washington and John Hogan
- “Let the private sector respond...”
- California
- BTECC

NAHB 1985-1987

- 1986 NAHB Show
 - Energy Committee members asked:
 - *“We can compare appliance and insulation energy performance. Why can’t we compare windows?”*
 - Developed a window certification and labeling program based on the insulation labeling and certification program already underway at the Research Center
 - Oh the things I didn’t know...

ASHRAE

- TC 4.5 Fenestration responsible for Handbook chapter
 - Growing number of glazing options, coatings and frame types
 - Weaknesses in DOE2 models
 - Desire to better predict window contributions to loads
 - Funded Research in US and Canada
 - Formed Labeling subcommittee
 - Co-chairs: Von Klompenberg (Pella) and Mathis

LBL

- Home of the DOE2 model
- Also Primary Windows Research Lab
 - Focusing on predicting window performance
- Research papers by Arasteh, Selkowitz, Klems and others on modeling and MOWITT measurements
 - Understanding of window performance variables began to take predictive shape
 - First with glazing systems modeling
- Published WINDOWS 3.1 in 1988

BTECC

- BTECC (Building Thermal Envelope Coordinating Council)
 - Formed a Fenestration Research Coordinating Committee
 - Help review and prioritize DOE research support related to fenestration
 - Chaired by Herb Yudenfriend

Bonneville Power

- Utility programs seeking “Super Good Cents” desiring to include windows in the incentive programs
- Needed U-factors for simple building modeling used
- First major emphasis on “doing better than the minimum code requirements”
- Window industry wanted in

Washington Energy Code

- 1986 - Required testing of fenestration for overall assembly U-factor performance
 - Thermal breaks in some aluminum frames
 - Sometimes also in the sash, sometimes not
 - Low-e coatings are starting to appear on the market
- City of Seattle compiles database of tested windows
- Hogan starts playing with WINDOWS program

Hogan ASHRAE Papers

- ***“A Summary of Tested Glazing U-Values and the Case for an Industry-Wide Testing Program”, 1988 Transactions v.94 pt. 2, 1317-1324;***
- ***“An Evaluation of the Representativeness of Glazing Product U-Values in the ASHRAE Handbook - 1989 Fundamentals”, 1990 Transactions v.96 pt. 1, paper AT-90-7-2, 884-895.***

Federal Trade Commission

- Technical papers by Hogan drew attention of federal investigators regarding truth in labeling
 - Existing laboratory accreditation and testing programs for thermal performance brought into question
 - Some thermal tests suggested that these windows were so good the frames had to be giving off heat...

FTC Fallout

- Labs shut down
- Industry testing program discredited
- Lawsuits
- Window industry scrambling to show code compliance
- Window industry needed mechanism to qualify for utility programs

Federal Government

- Threat of federal action
 - FTC and DOE
 - “If the private sector won’t do it, feds will...”
- Reagan era mantra:
 - “Let the private sector respond...”
 - Window industry decided better to do it collaboratively within the private sector rather than have a federal program

Needs Emerged

- Better test methods needed
 - ASTM activities began to improve and modify hot box methods to address window industry needs
- Better calculation tools needed
 - LBL and Enermodal led modeling efforts
- Reliable product certification and labeling needed
 - Who's the Third Party?
 - Fox guarding the hen house?

California

- Working on the next version of Title 24 in 1988-89
- Wanted to develop its own rating and labeling system

ASHRAE Efforts Coalesced

June 1989

- “In a bar in Vancouver, across from the depot, a small group of conspirators converged...”
 - Some of the names will sound familiar...
 - Divided up tasks, agreed to meet again in 6 months with tasks complete
 - Structure, tax status, incorporation docs, management, funding, etc.

Some of the Early Names...

- Jim Krahn
- Mike Koenig
- Marlo Van Klompenberg
- Nehemiah Israel Stone
- Gary Curtis
- John Hogan
- Steve Selkowitz
- Sam Taylor
- Lou Masonick
- Jim Benney
- Herb Yudenfriend
- Dariush Arasteh
- Chris Mathis

NFRC Formed

- December 1989
 - Non-profit
 - Consumer protection and education
 - 12-member Board
 - 5 from industry
 - 3 from window, 2 from glass/other
 - 7 from other interested parties
 - (architects, builders, remodelers, utilities, state government, consumer interests)
 - “Fair, Accurate and Credible” was born

Key Patterns Echoed

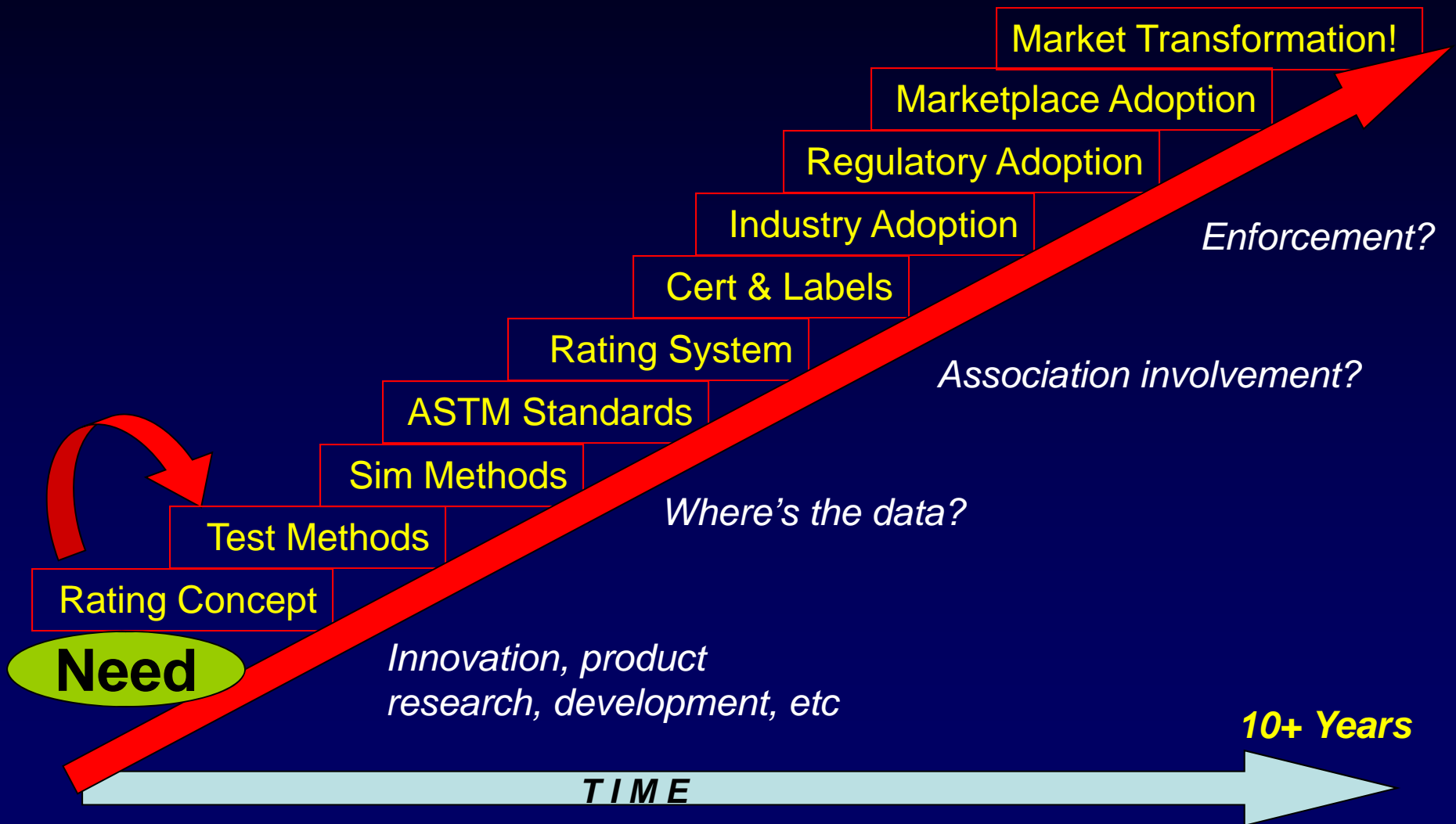
- Testing Standards
- Calculation Standards
- Product Ratings
- Rating Certification
- Labeling
- Adoption into Codes
- Used by Utility Programs
- Consumer Protection, Awareness and Use
- Market Transformation



A
Problem
Emerges

Change...

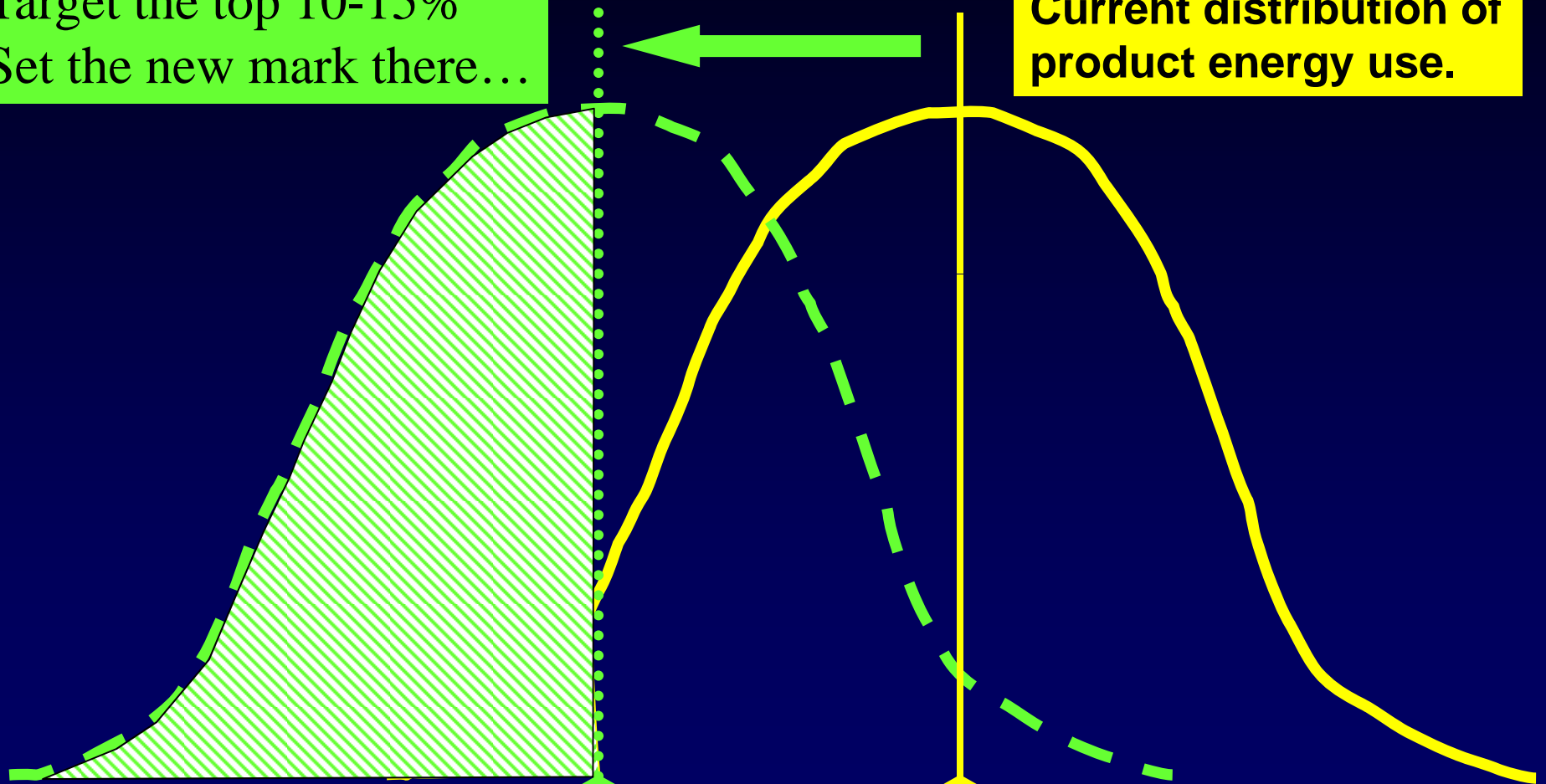
Market Transformation Takes Time



Shift the Mean...

Target the top 10-15%
Set the new mark there...

Current distribution of
product energy use.



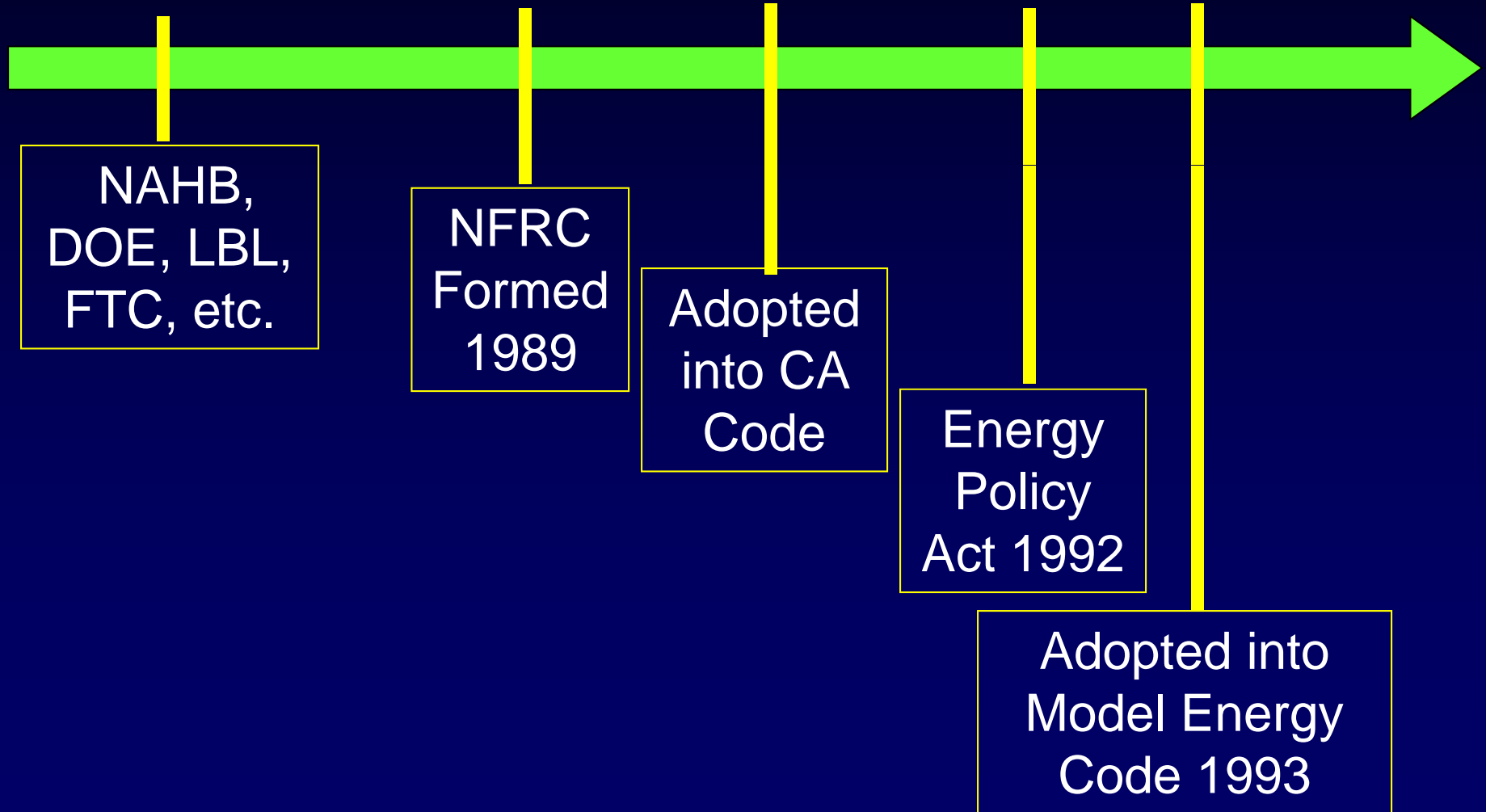
Desired improvement in
average energy use

Current average
energy use

Early NFRC Milestones

1985

1995



Many Milestones

- California Title 24 developments
 - 1990-1992
- First Logo and Label Design 1990-1991
- First Certified Products Directory 1991
- Energy Policy Act of 1992
- First labeled products 1993
- Many more...

EPAct 1992

- Federal Threat Codified
 - “Either NFRC does it or FTC and DOE will.”

1989 to 2009 and Beyond

- What have we learned in 20 years?
- How will these lessons shape our next 20?
 - Or our next 2?

Some of the Lessons

- Truth in Labeling Matters
 - The federal charge is just as relevant today as it was in 1992
- NFRC's role as consumer protector even more important today
 - Thousands more products and variations
 - Energy prices growing at increasing rates
- Windows Matter!
 - And doors and skylights and...

More Lessons

- Energy modeling tools more sophisticated than ever
 - More and more A&E firms have easy to use modeling tools
 - “Garbage In = Garbage Out” rule still applies
- Does the product we made yesterday perform to the level on the label?
- How sure are we?

Major Lessons

- “Fair, Accurate and Credible” is more than a sound bite
 - How many decimal places matter?
 - What size? Which configuration?
 - Heating? Cooling? Light transmission? Leakage?
- Are we protecting the consumer?
 - “Your actual mileage may vary...”

Chris's Crystal Ball

- The Future As I See It
 - Trends shaping us all
- Key Messages
 - Averages versus Actual
 - What if I test one?
- Consumer Protection
 - More Important Than Ever

The Energy MEGATREND

- Energy supply questions
- Rising energy prices
- Concern about peak power demands
- Carbon implications
- National Security implications?



Energy and Power Trends

- Electricity demands for buildings rising
- Existing buildings being prioritized
- Peak power becoming even more important
- Utilities as players
- Global concerns
 - Energy, Power, Carbon, Water, Pollution
- Not business as usual
 - How responsive will we be to these needs?

Regulatory Trends

- Energy codes an even higher priority
 - We're going to start measuring things more and more
- Shifting landscape focusing on
 - Delivered Performance
 - Sustainability/Green
 - Energy and Peak loads
 - Water Supply/Drought

Industry Trends

- Windows/Fenestration STILL Remain the Weakest Energy Link in Buildings
- Industry is (generally) Slow to Market and Slow to Change
- New Leaders Will Be Defined By
 - Responsive, Flexible, Reliable, Innovative

Financial Trends

- Life Cycle Perspectives
 - Will we finance building envelope decisions differently than HVAC or lighting decisions?
 - Will real estate investment value and portfolio valuations be based increasingly on measured energy performance?
 - How will window investments be valued by the building industry? For how long?

Weak Spots I See

- Consumer Protection Concerns
 - “X +/- 10%” does not protect the consumer
 - Especially when windows can account for >30% of their heating or cooling bills?
 - Is it: 0.30? 0.33? 0.36?
 - Values should be “X or better”
 - If tax credits or utility programs ask for a 0.30 window it had better be 0.30 or better!

More Weak Spots I See

- Gas Fill Levels
 - 100%? 90%? 50%?
 - What levels would we find if we tested production units?
 - What is the “conservative, consumer protection” position?

More Weak Spots

- Gas Retention
 - If IG seal durability is the critical component of energy performance longevity, then we'd better get that one right from the start.
 - IG Certification was the first step
 - How much gas is really in there in a year? In Two years?
 - Shouldn't we assume "worst case" gas fills unless we have statistical quality assurance?

My Concerns

- I'm not really concerned about where NFRC will be at 40. I am more concerned about where NFRC will be at 22.
 - Tough decisions need to be made now
 - NFRC needs to re-commit to its consumer protection mission
 - Industry needs to fully get behind this mission too, or risk continued loss of credibility in the efficiency and regulatory communities

Some Hopes

- Continued Improvement to Technical and Certification Procedures
 - Smarter, simpler
- Rating Procedures for More Products
 - Those we can't simulate
 - Plastics, Fritts, Triples, Quads, Switchables etc.
- Reduced Costs
- Increased Quality Assurance/Control

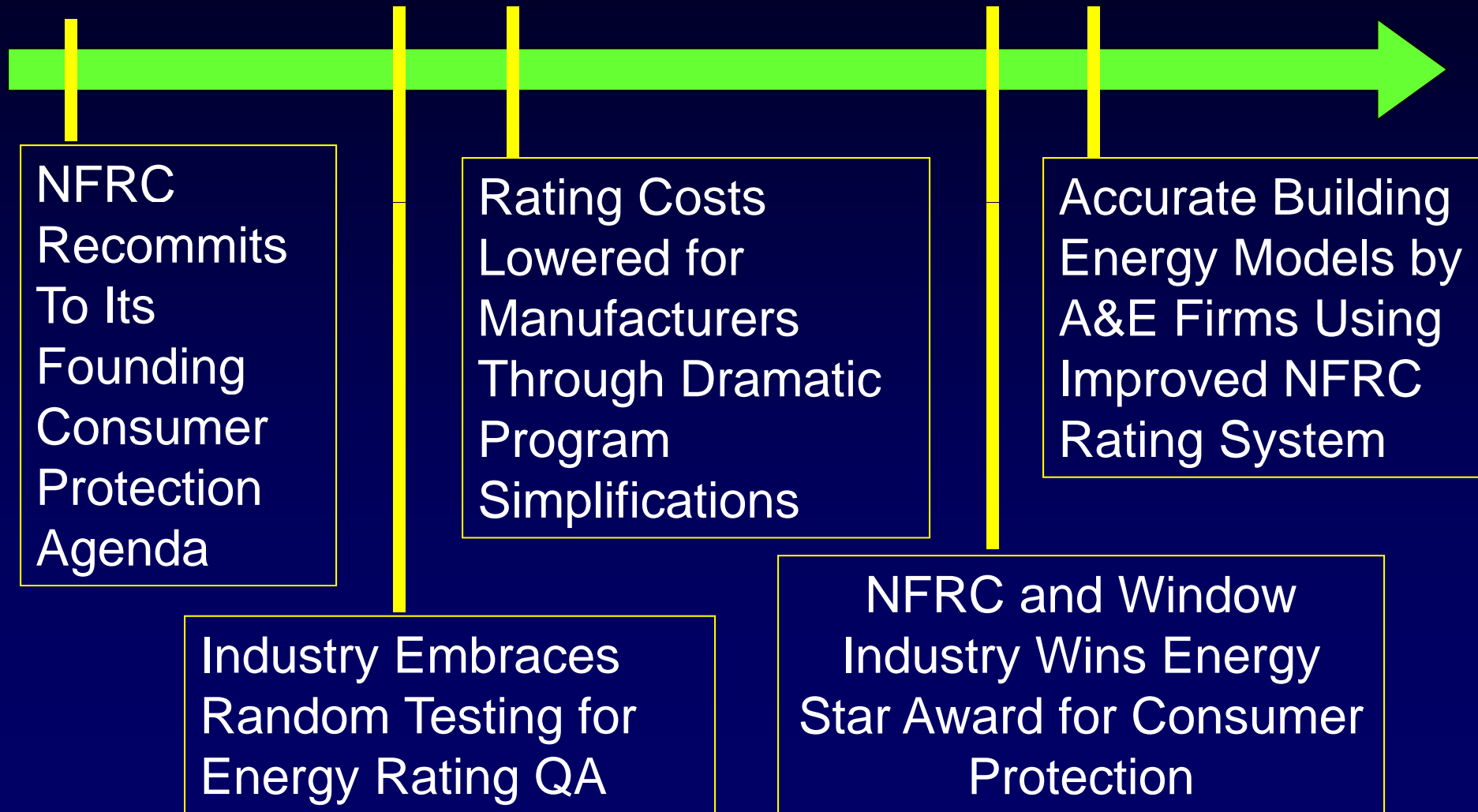
Chris's Crystal Ball

- Energy Performance of Products
 - Increasingly Important
 - Increasingly Scrutinized
- Fenestration Industry a KEY to:
 - Energy Security
 - Building Industry Recovery
 - Jobs
- Existing Buildings Will Get More Attention
- Utilities Will Get Involved (again)

Future Milestones - 2012?

2010

2012



Thank You!