

# **Providing Affordable Energy in a Carbon Constrained Environment**

**Mark Cooper,  
Director of Research  
Consumer Federation of America**

*“Providing Affordable Utility Services in Turbulent Times” 29<sup>th</sup> Annual Bonbright  
Center Electric and Natural Gas Conference, October 8, 2009.*

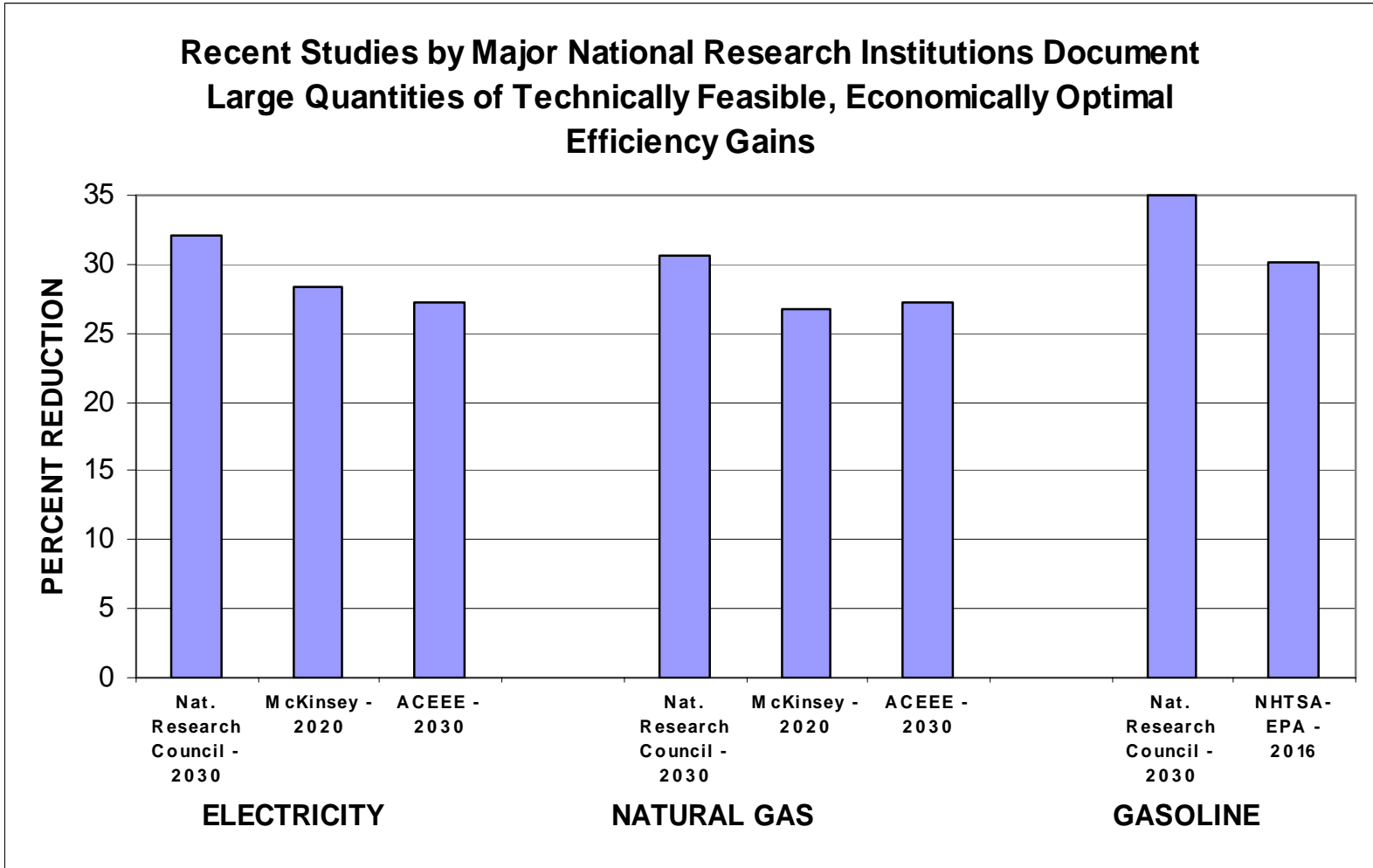
*“The Cost of Climate Policy,” Carbon Market Insights America’s 2009,  
November 3, 2009*

In real estate its  
Location! Location! Location!

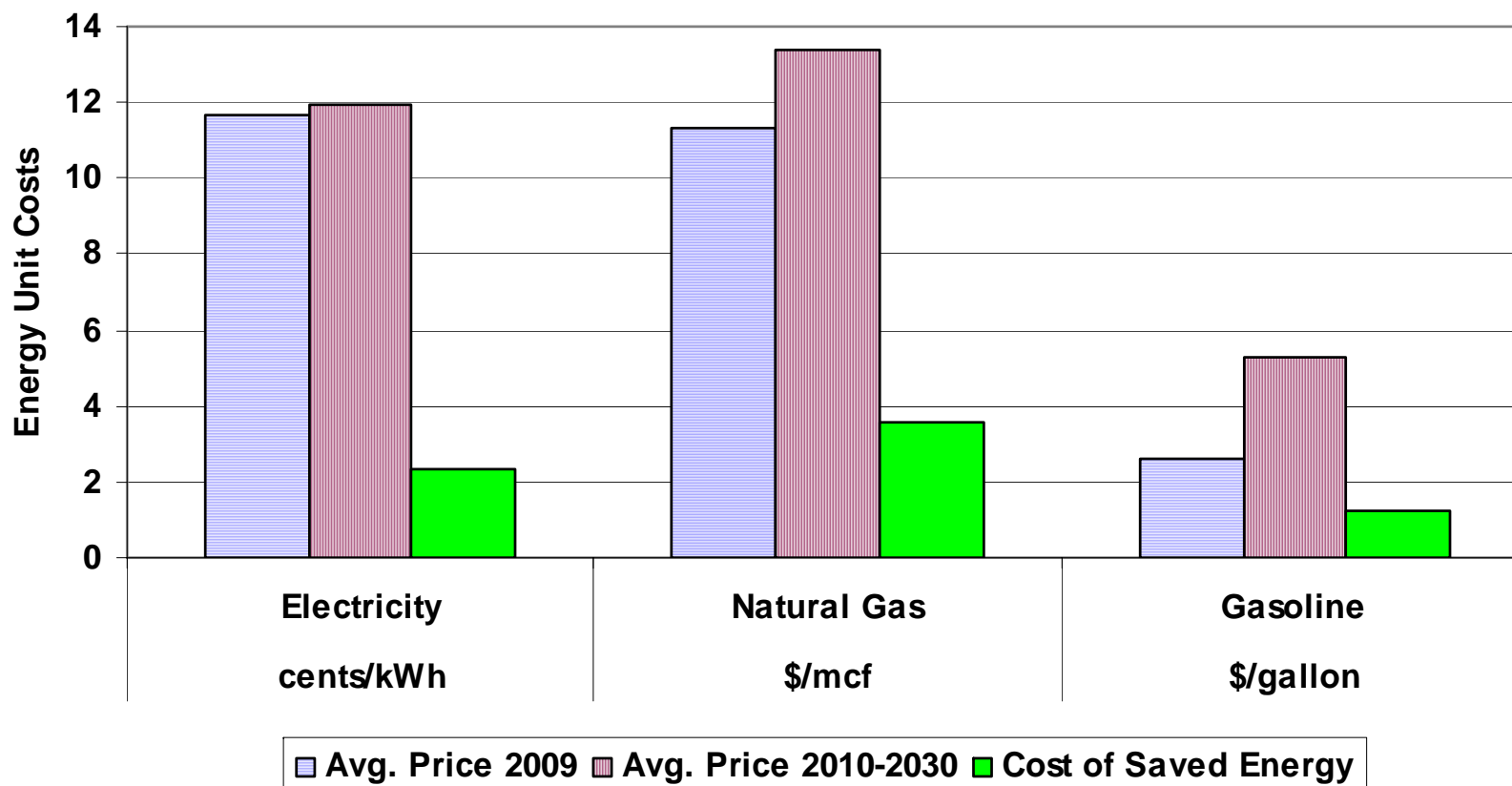
In energy/climate policy its  
Efficiency! Efficiency! Efficiency!

**Mark Cooper:**

I label these



## The Cost of Saved Energy is Far Below Current and Projected Residential Energy Costs



Capturing the full measure of efficiency at these  
costs and quantities,

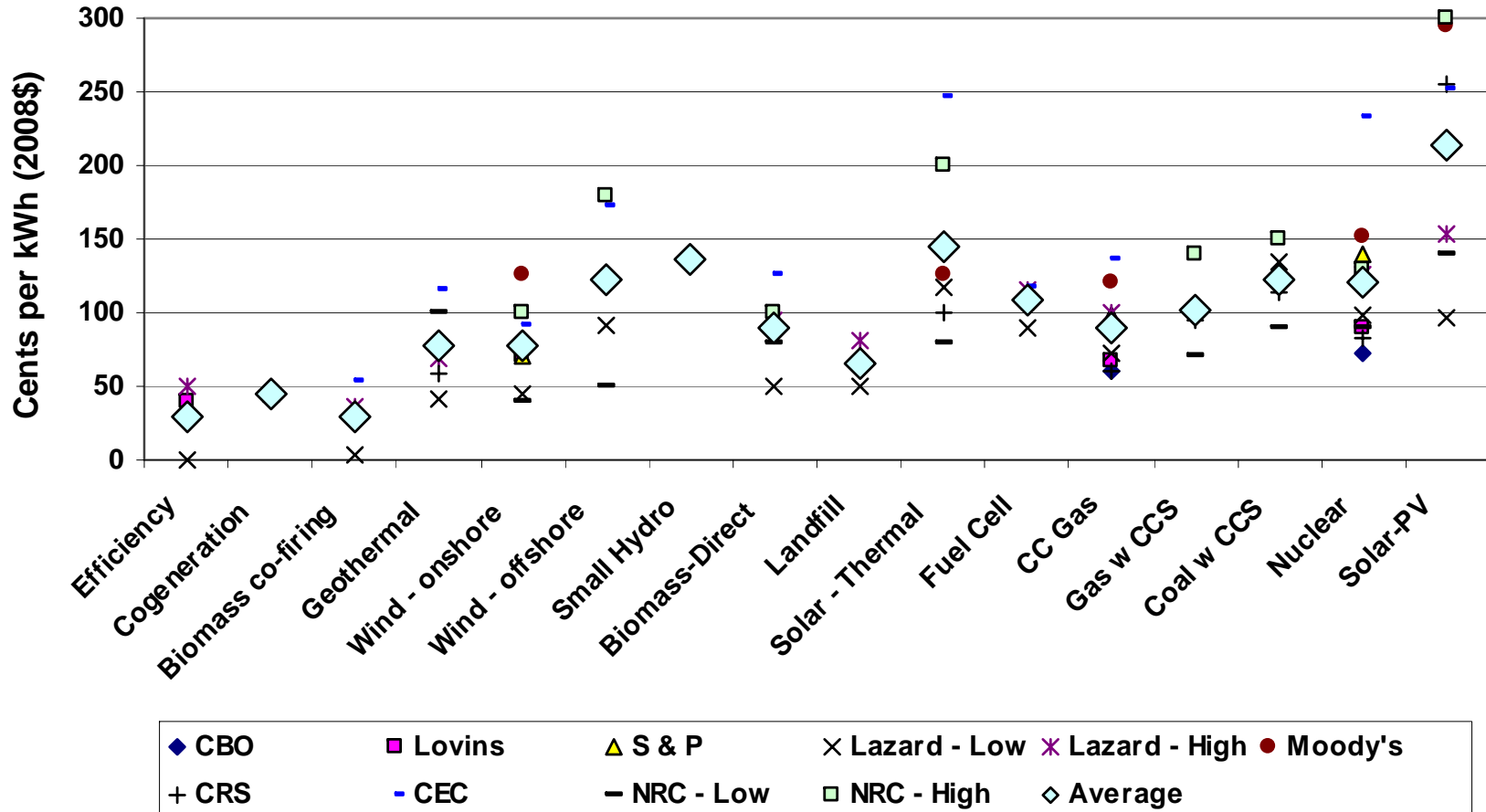
produces well over \$1,000,000,000,000  
in net present value cost savings

provides 2/3 of the HR2454 target reduction in CO2  
emissions for 2030

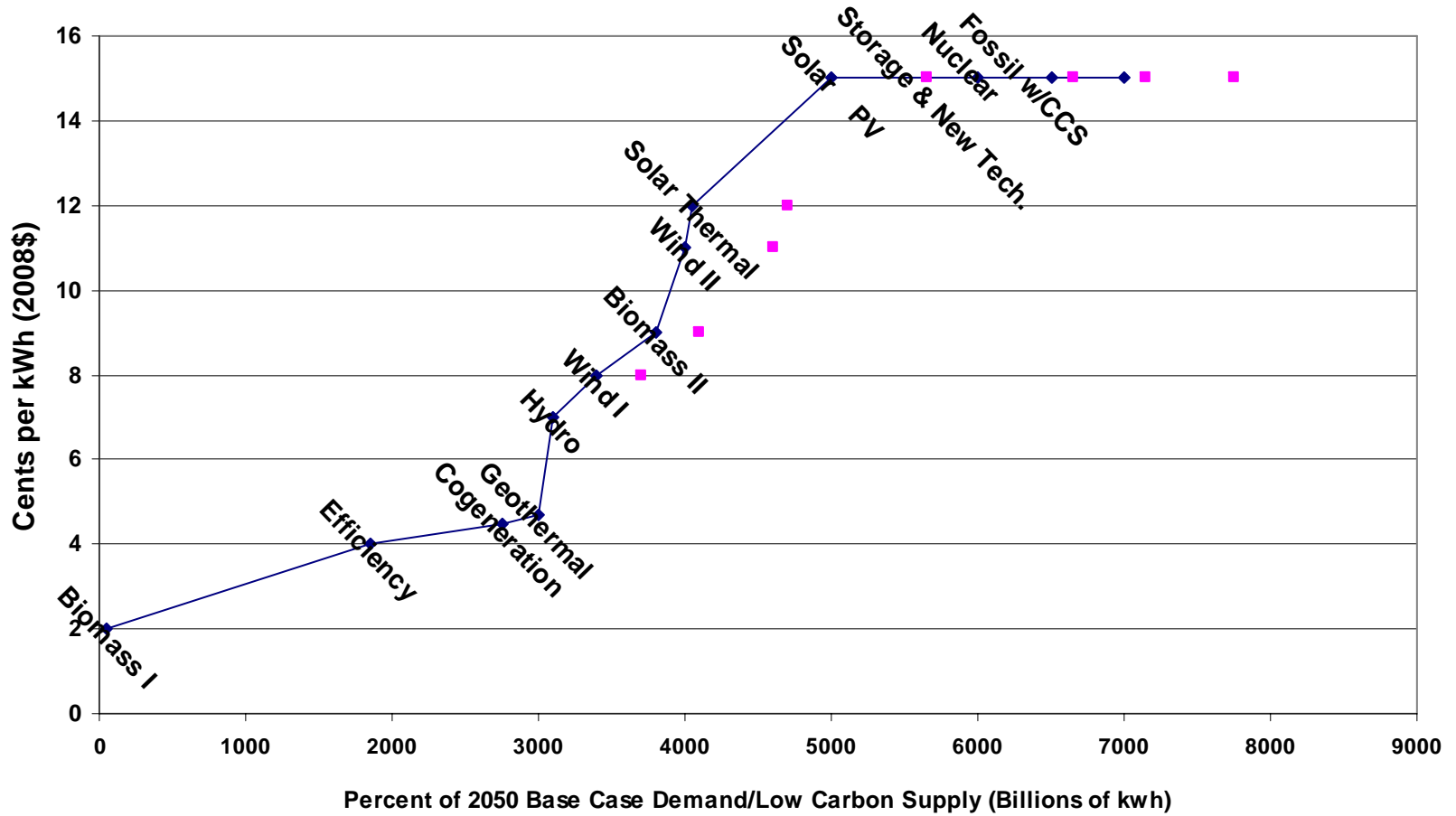
Efficiency is a win-win for consumers and the  
environment

# A Quick Look at the Electricity Sector Supply-side Cost and Availability

## Levelized Cost of Low Carbon Electricity Options

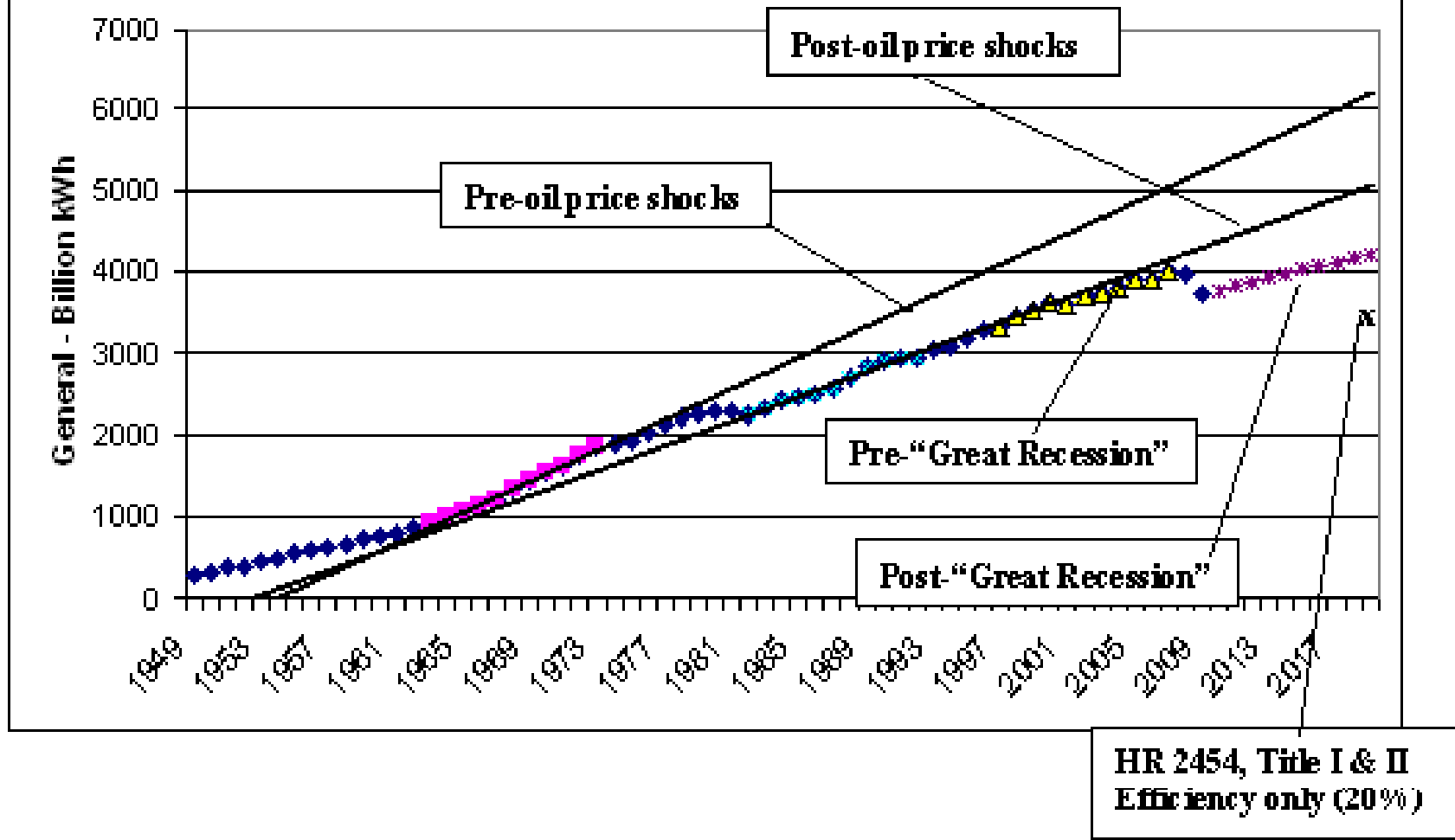


# Electricity Supply Curve in a Carbon Constrained Environment

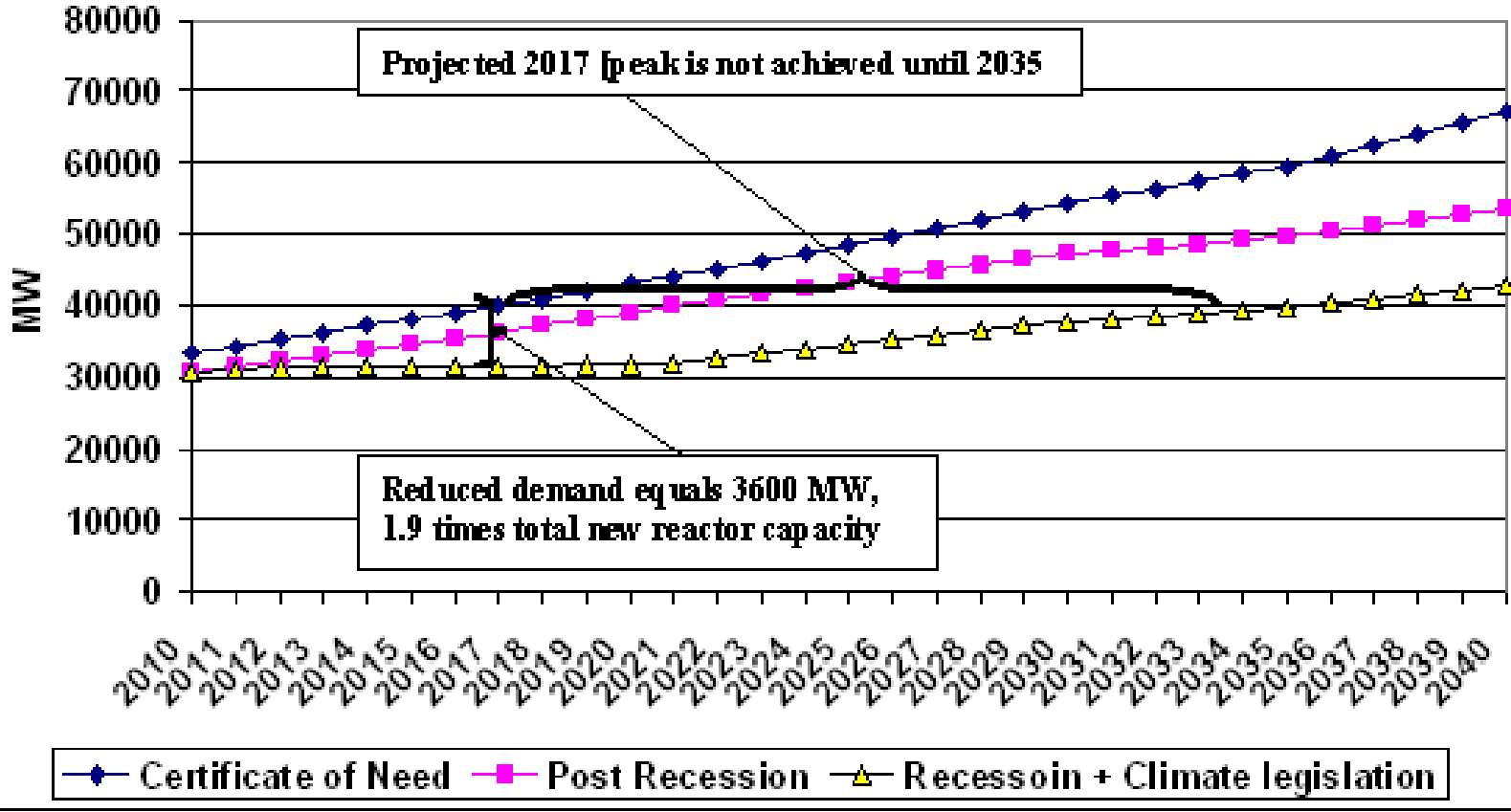


Demand

## External Shocks and Shifts in the Level and Growth of Demand

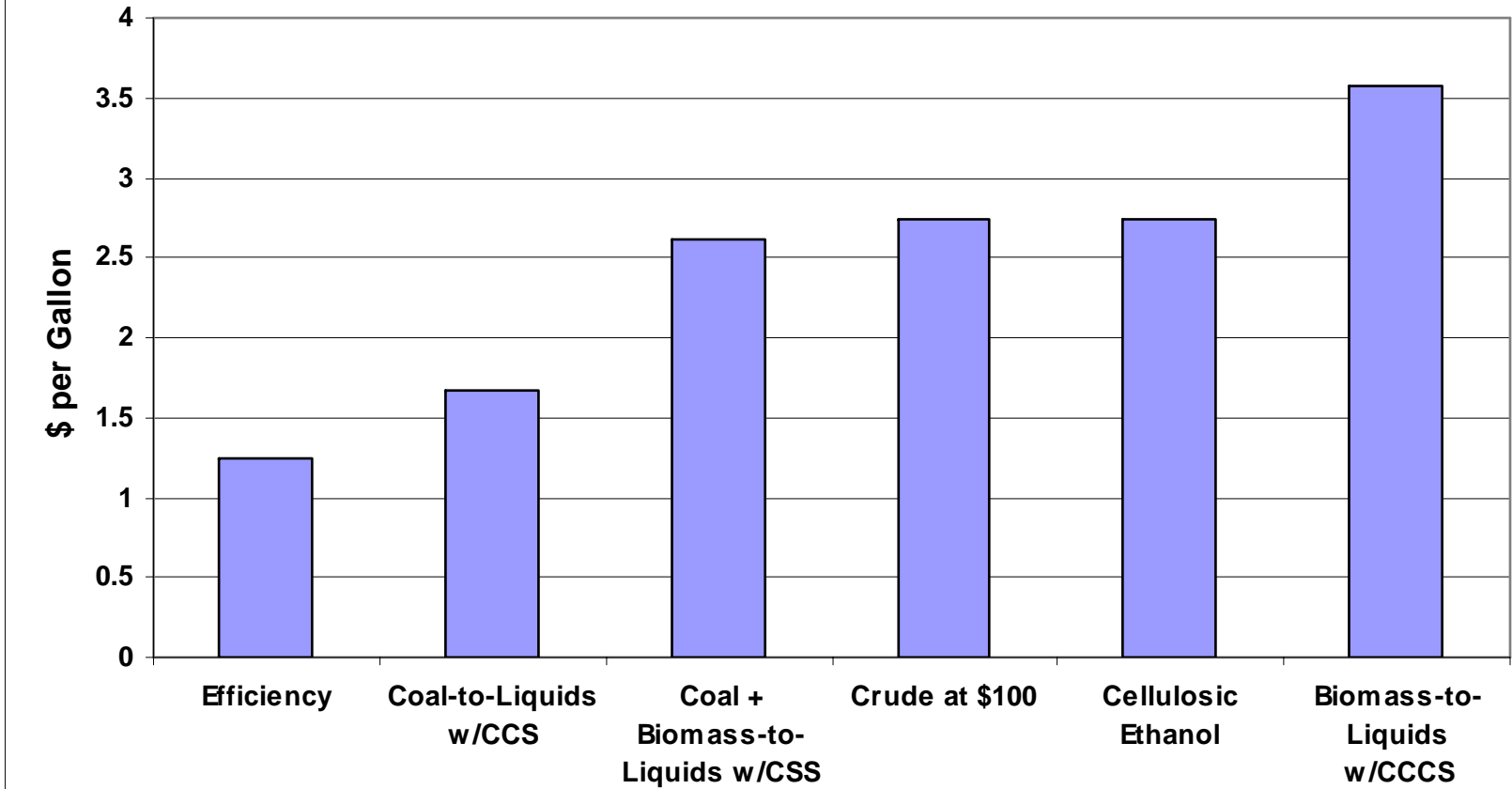


### Projections of Peak Summer Load: Florida Power and Light & Progress Energy Florida

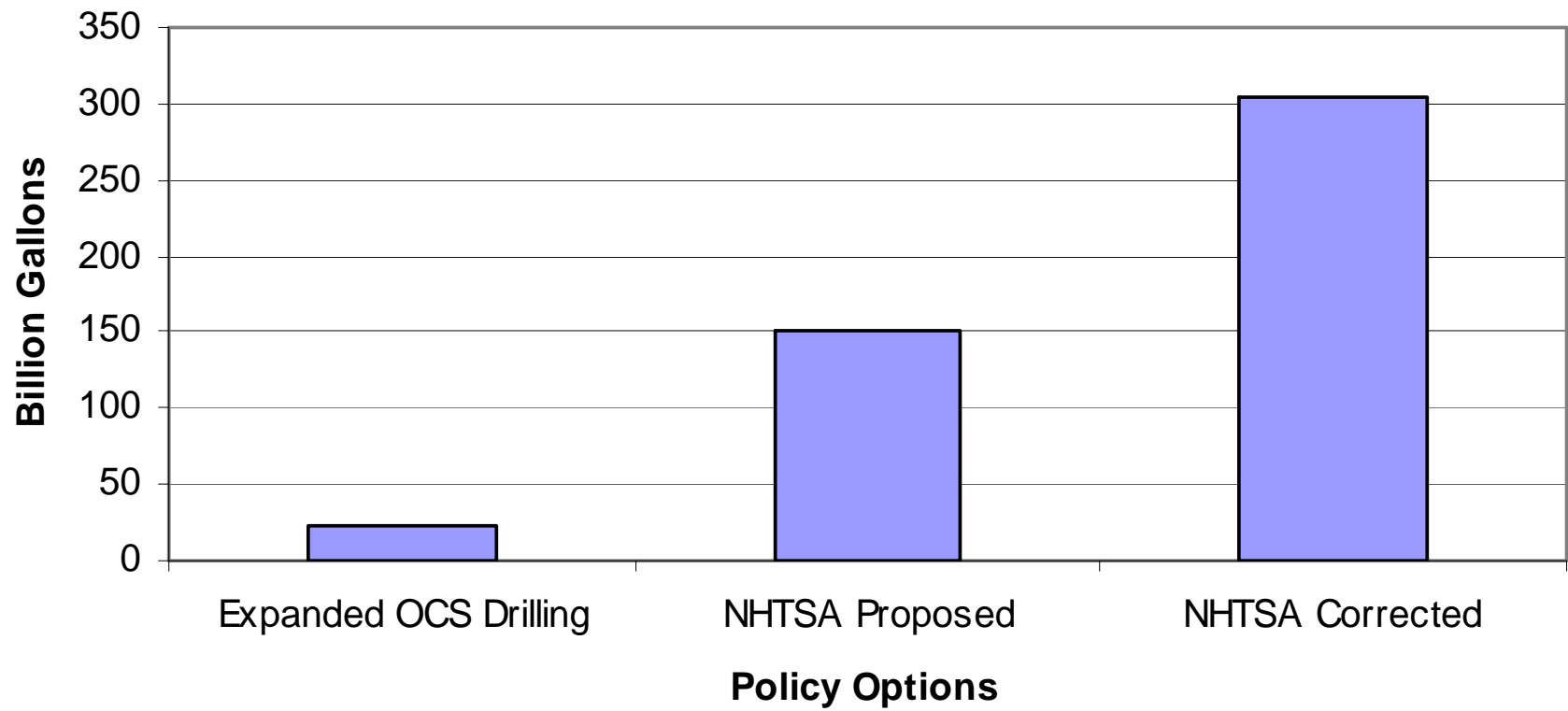


# A Quick Look at Gasoline Supply-side Cost and Availability

### Cost of Alternatives for Meeting Gasoline Demand



**Contribution to Solving the Oil Supply and Import Problem:  
2011 - 2030**



# Policy Conclusion:

Even if climate change did not require large reductions in greenhouse gas emissions, the need for energy in the next two decades should be met with investments in energy efficiency

In a capitalist economy, when something is plentiful, inexpensive and important, it should be widely used.

Why is there an “efficiency gap?”

Market failures, imperfections,  
barriers, and obstacles

## **STRUCTURAL FLAWS**

### **Endemic**

- Agency
- Owner Transfer
  - Limited payback
  - Lack of premium
- Capital
  - Illiquidity
- Asymmetric Information . Adverse selection

### **Sector Specific**

- Bundling: Multi-attribute
  - Gold Plating
  - Inseparability
- Regulation
  - Price Distortion Average-cost pricing
  - Other Distortions
- Chain of Barriers
  - Disaggregated, fragmented Mkt.
- Availability
  - Lack
  - Emergency replacement
- Quality
  - Improper installation, lack of enforcement
  - Improper use and maintenance
- Imperfect Competition
  - Market Power

## **TRANSACTION COSTS**

- Sunk costs
- Life time
- Risk & Uncertainty
- Imperfect Info.
  - Availability
  - Search Cost
  - Accuracy

## **BEHAVIORAL FACTORS**

### **Motivation**

- Custom
- Values & Commitment
- Social group & status

### **Perception**

- Prospect
- Framing
- Loss Avoidance
- Status Quo
- Salience
- Awareness
- Attention
- Low priority

### **Calculation**

- Bounded rationality
- Ability to process info
- Limited understanding
- Heuristic Decision Making
- Rules of thumb
- Information

### **Discounting**

- Low Probability Events
- Long-Term
- Small Outcomes

## **SOCIETAL FAILURES**

### **Externalities: Mis-pricing**

- Environmental
- Energy Security

### **Public Goods**

- Basic research

### **Information**

- Learning by doing
- Learning-by-using

There are proven policy solutions:

**Restructure Financial Incentives**

Reform Underwriting, Appraisal, Insurance, Taxation

Provide public funds for research, development &  
deployment (retrofit)

Adopt climate policy (put a price on carbon)

**Reform Market Practices**

Renewable Energy Standards

Energy Efficiency Resource Standards

Building Codes for Energy Efficiency

Appliance Efficiency Standards

Construction Standards

Training and Certification of Labor

**Information & Educate Market Participants**

Labeling with Auditing and Verification

Education

Best practice sharing

## MAPPING SOLUTIONS ONTO PROBLEMS

### CAUSES OF MARKET FAILURE

### POLICY RESPONSES

#### STRUCTURAL FLAWS

##### Endemic

Agency, Owner Transfer  
Capital Illiquidity

Reform Market Practices  
Public Funds

##### Sector Specific

Bundling  
Price Distortion  
Other distortion  
Quality

Labeling & Education  
Climate Policy  
Retrofit Requirements n GSE  
Construction Standards & Enforcement  
Training & Certification

#### TRANSACTION COSTS

Sunk Costs, Risk

Efficiency Codes and Standards  
Public Funds

Imperfect Information

Labeling and Education

#### BEHAVIORAL FACTORS

Motivation,  
Perception  
Calculation

Efficiency Codes and Standards  
Labeling  
Education

#### SOCIETAL FAILURES

Externalities:

Public Goods  
Information

Climate Policy  
Efficiency Codes and Standards  
R&D expenditures  
Best Practice Sharing

The Major Supply-side Alternatives not only cost more, but they face just as many risks and obstacles.

**Risks Affecting Large Scale, Low Carbon Central Station Technologies**

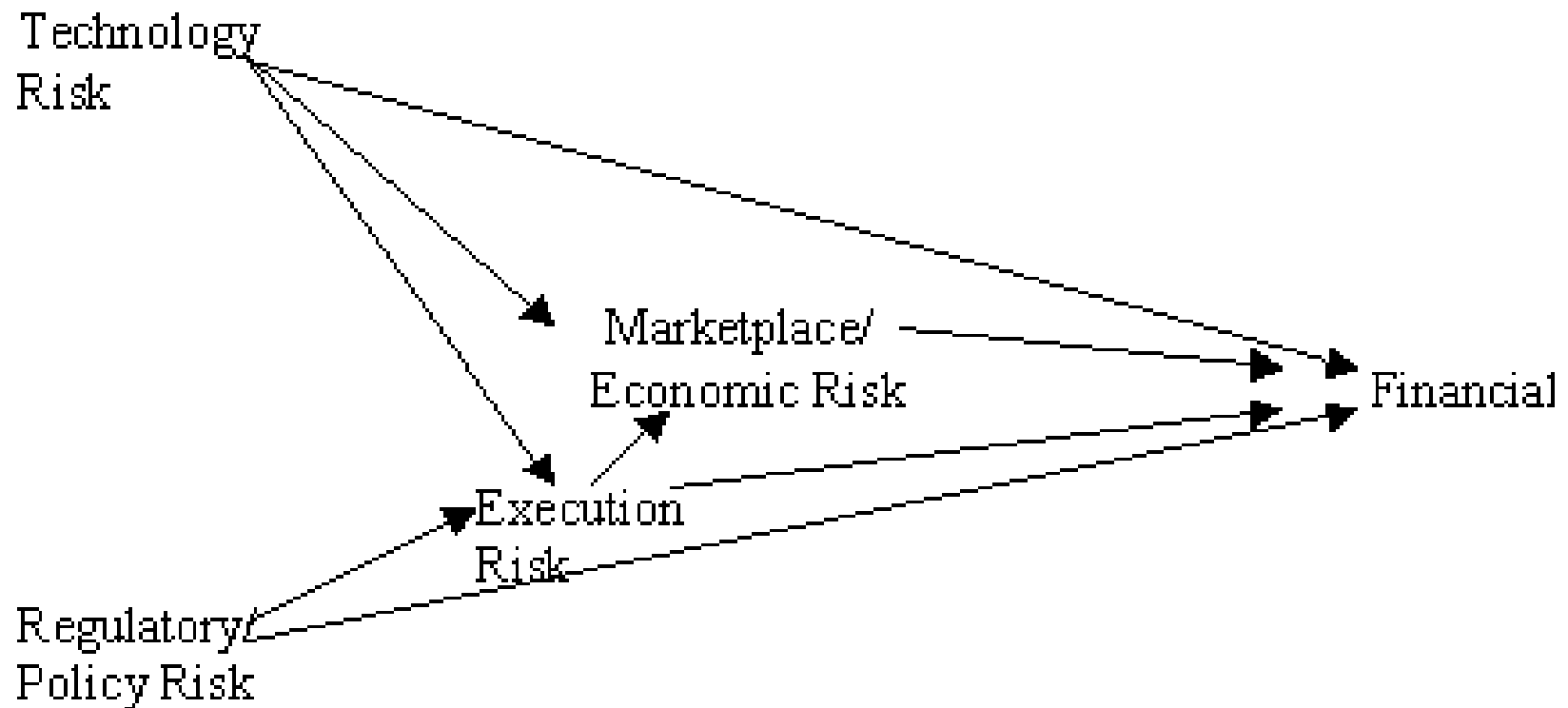


Exhibit IV-4: Major Risk Factor Affecting Low Carbon-Central Station Generation

TYPE OF RISK	SPECIFIC RISK	Nuclear	Carbon CCS
<b>Technology</b>	New Technology Risk	X	X
	Supply-side alternatives	X	X
<b>Regulatory/Policy</b>	Demand-side alternatives	X	X
	Regulatory Reviews	X	X
	Lack of experience, changing requirements	X	X
	Regulatory recovery of investment	X	X
	Shifting Policy Agenda	X	X
<b>Marketplace</b>	Nuclear operating exposure will increase	X	
	Commodity and labor cost escalation and volatility	X	X
	Uncertain demand growth	X	X
	Slowing due to recession	X	X
	Shifting due to excessive leverage, loss of wealth	X	X
	Uncertain fuel costs	X	X
	Rate shock reduces demand	X	X
<b>Execution</b>	Construction Risk	X	X
	Counterparty risk	X	X
	Lack of experience in construction	X	X
	Complexity	X	X
	Cost overruns and rework costs	X	X
	Long Period	X	
	EPC contract	X	
	Size and cost	X	X
<b>Financial</b>	General financial conditions	X	X
	Tight money and new liquidity requirements	X	X
	Utilities	X	X
	Existing debt and need to refinance	X	X
	Rising cost of debt	X	X
	Limited cash & equivalents declining due to recession	X	X
	Weak balance sheets	X	X
	Underfunded pension plans	X	X
	Project	X	
	High hurdle rate for risky projects	X	X
	Impact of large project	X	
	B37Debt load and service burden impact	X	
	Capital structure distortion	X	
Financial ratio deterioration	X		

Sensible policy would ensure that we capture the full potential of efficiency and low cost renewables in the short and mid-terms, buying a couple of decades to do the research necessary to meet long-term energy needs in a carbon constrained environment.

The candidates for the post 2030 world are:

- (1) more efficiency (including lifestyle changes)
- (2) another generation of renewables
- (3) energy storage
- (4) carbon capture
- (5) nuclear