Electric Energy Price-Suppression Effects

Presentation on behalf of NRDC

Stakeholder Advisory Group Meeting
Chicago

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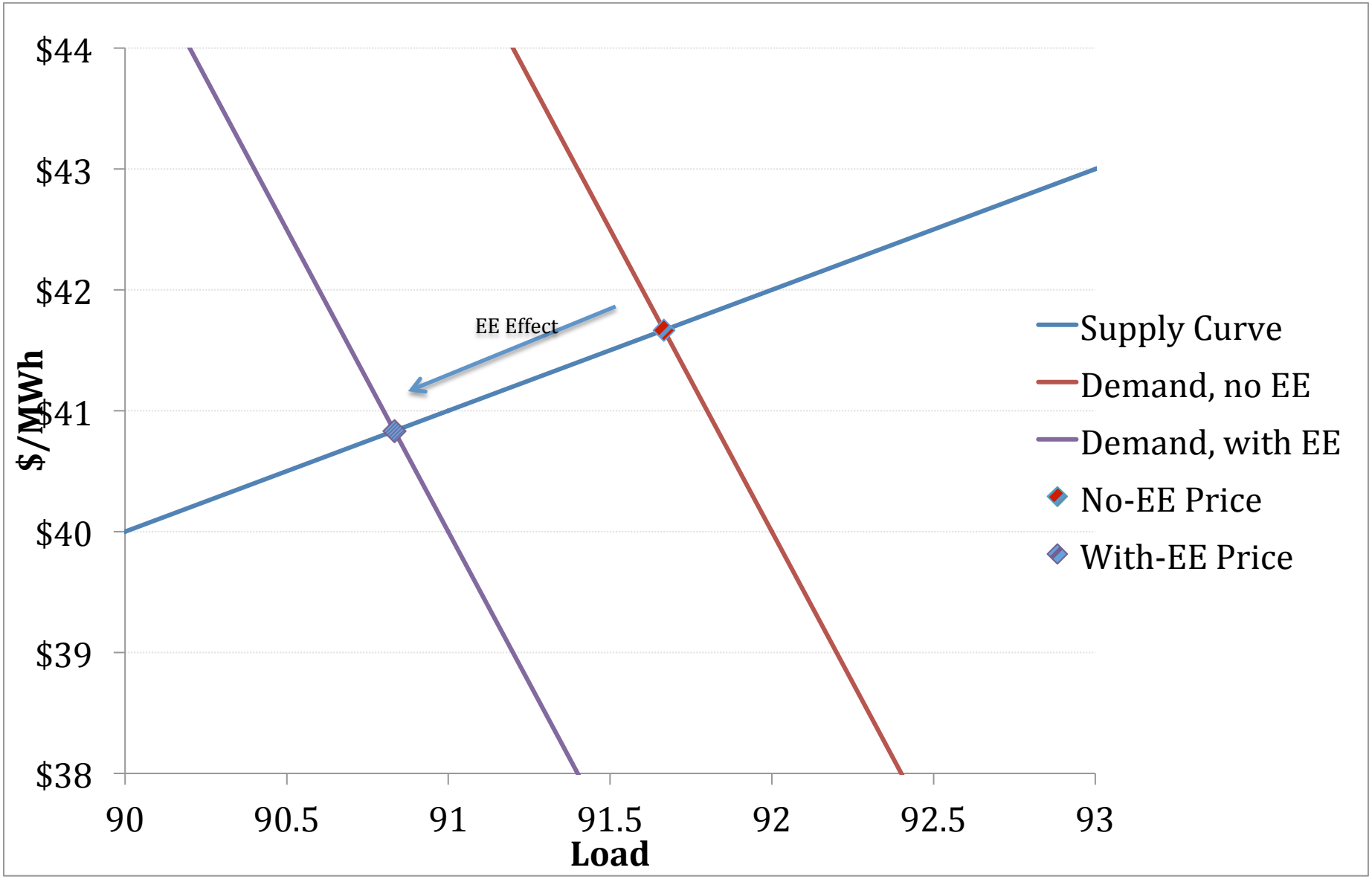
Summary

- **In competitive markets, reducing demand reduces prices**
- **We estimated that effect for IL electric energy prices**
- **Lower price benefits all Illinois electricity consumers**
- **That benefit should be included in IL TRC screening**

Lower Load Means Lower Price



Estimating Market Electric-Energy Price Suppression

- Regress historical hourly prices as function of loads
- Separately analyze on-peak and off-peak hours
- Use data from July 2009 to December 2012
- Express hourly load and price as % of monthly average
  Normalizes away variation in gas prices, capacity, maintenance

Adjust for % of retail load affected by market price

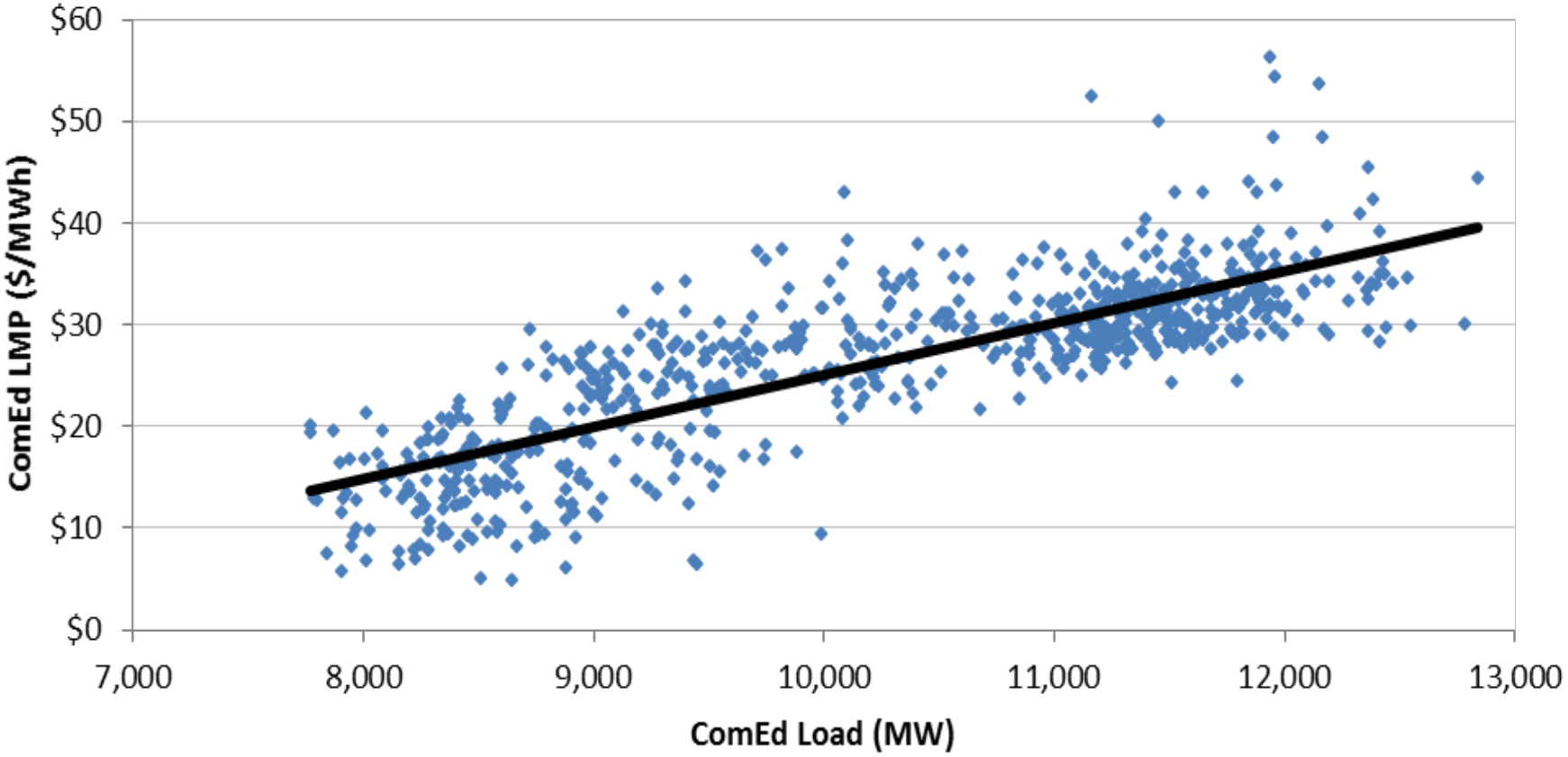
- **Only customers of restructured utilities**
- **Short-term hedging by existing contracts**
  - IPA
  - ARES
  - Aggregators

Adjust for erosion of effects over time due to:

- **Price-induced demand increases**
- **Effect on generators**

Historical Example

- **ComEd LMP as Function of ComEd Load (October 2012)**



Econometric Results

- **1% load reduction causes 2% price reduction**
- **How large is the area causing this effect?**
  - Not clear
  - More than Illinois
  - Less than MISO + PJM
  - Illinois represents about 25%–50% of relevant load
- **1% Illinois load reduction cause 0.5%–1% load reduction in Illinois**

Price Reduction as an Avoided Cost

- **If market energy price is $50/MWh, a 1% Illinois load reduction would:**
  - Reduce price about 25¢/MWh–50¢/MWh
  - Each MWh of savings reduces prices for 99 MWh of remaining load
  - Each MWh of savings produces price benefits of
    99 MWh × 25¢/MWh ≅ $25/MWh, or
    99 MWh × 50¢/MWh ≅ $50/MWh

Similar Results in Other Analyses

- **2014 IPA Annual Report: Clean Power Research on solar**
  - Average levelized price effect = $59/MWh
  - Range of estimates = $30/MWh–$82/MWh
- **2013 Regional Analysis for New England utilities**
  - 1% load reduction causes
    ~2.2% price reduction on-peak
    ~1.2% price reduction off-peak
- **2014 Analysis for Maryland Energy Administration**
  - Results very unstable, up to $17/MWh on-peak, $5/MWh off-peak
  - MD load less than half of IL, so benefits would be lower
- **2009 NYSERDA renewables assessment**
  - Adding 1% load in renewable energy causes ~1.1% price reduction
- **2009 PJM Analysis**
  - 1% load reduction causes 1%–3.3% price reduction

Short-Term Price Hedging Effects

- **IPA 2014 Procurement Plan hedging:**
  - 75% of energy in current year (varies over course of year)
  - 50% for year 2
  - 25% for year 3
- **Difficult to assess hedging by competitive retailers**
  - Residentials offered fixed rates for 1 to 24 months
  - Businesses offered both fixed-price & indexed products

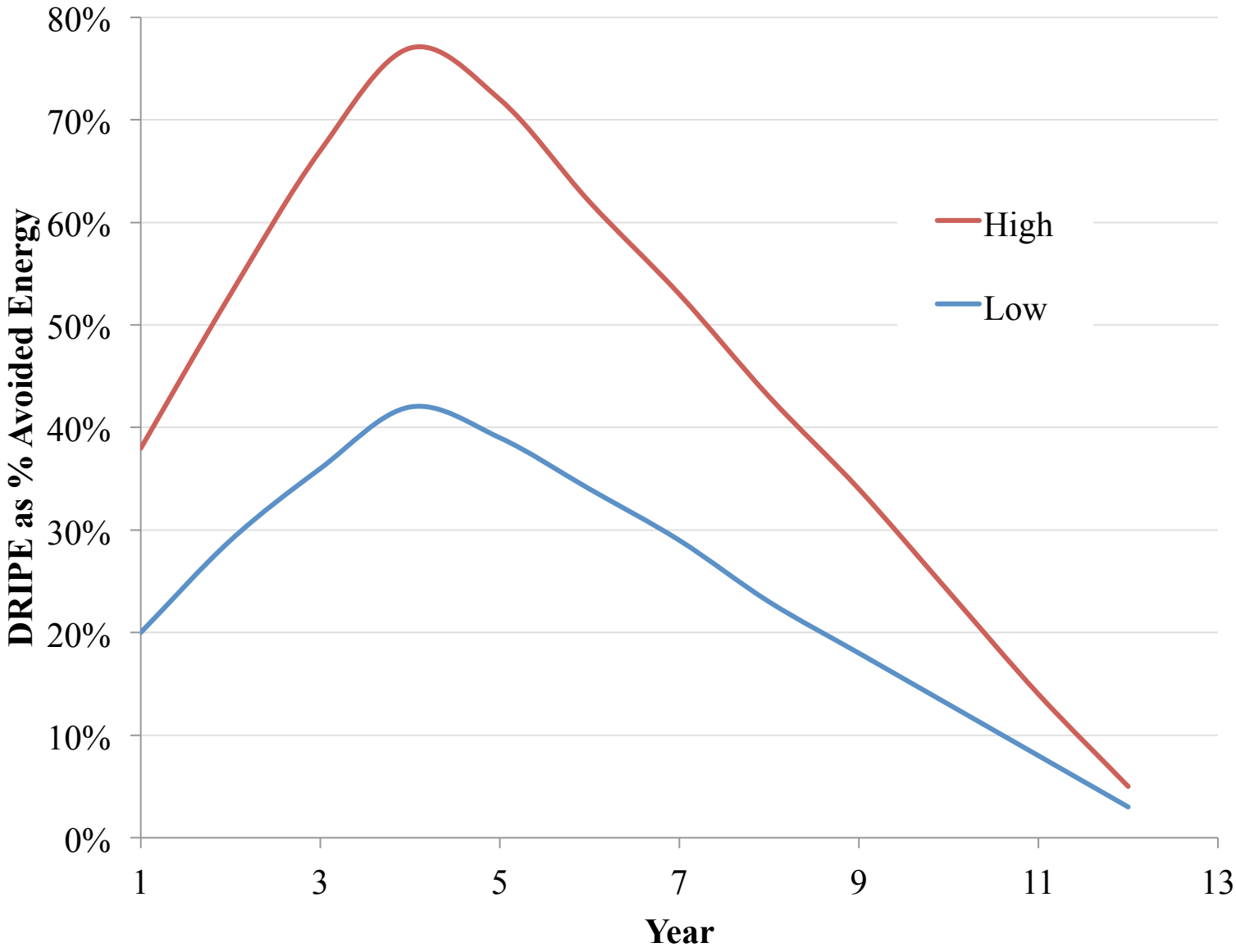
  Little info available on distribution of contracts by duration

  When contract ends, no hedging
- **Study assumed**
  - 60% hedged 1st year
  - 40% headed 2nd year
  - 20% hedged 3rd year
  - 2% hedged subsequent years

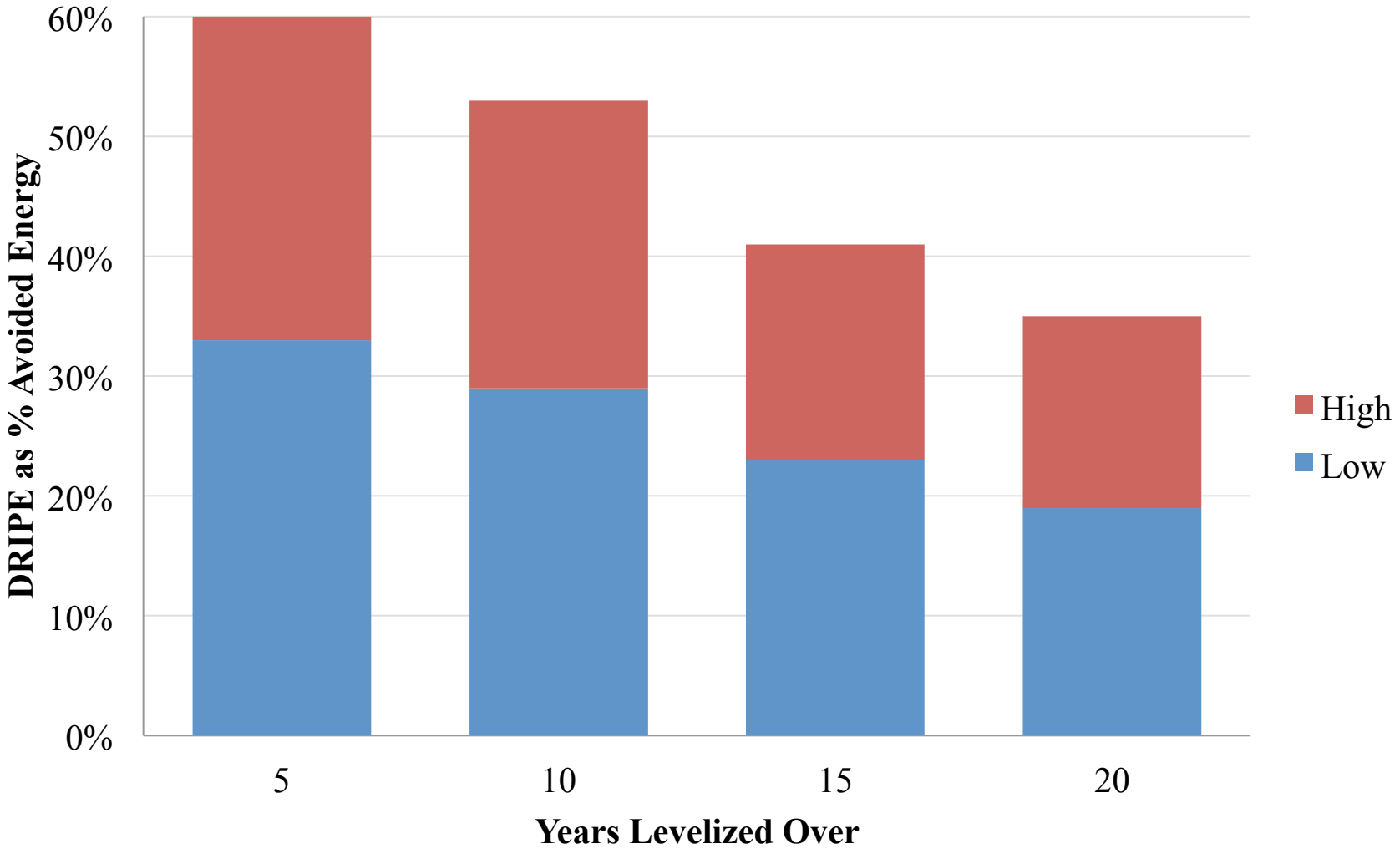
Long-Term Erosion of Price Suppression Effects

- **Price elasticity of demand**
  - Offsets ~2% of benefit in short run, ~3% of over long term
- **Pressures on power plant fleet:**
  - Accelerated plant retirements
  - Delayed capacity additions
  - Deferred upgrades
  - Shift in new capacity to peakers
    higher energy prices

Net Price Suppression Effect by Year



Levelized over Various Lives



- Does not reflect changing market prices over time

Price Effect is a TRC Benefit

- **Consistent with legislative language**
- **Consistent with measurement of EE costs**
- **Consistent with power procurement**
- **Consistent with practice in other restructured states**

Illinois Power Agency Act (20 ILCS 3855)

- **The health, welfare, and prosperity of all Illinois citizens require the provision of adequate, reliable, affordable, efficient, and environmentally sustainable electric service at the lowest total cost over time, taking into account any benefits of price stability. (§1-5(1))**
- **Escalating prices for electricity in Illinois pose a serious threat to the economic well-being, health, and safety of the residents of and the commerce and industry of the State. (§1-5(3))**
- **To protect against this threat to economic well-being, health, and safety it is necessary…promote investment in energy efficiency and demand-response measures…(§1-5(4))**

Illinois Power Agency Act (20 ILCS 3855) cont.

- **The IPA is to provide "the lowest cost power to the greatest number of people"…(§1-5(F))**
- **The "total resource cost test compares the sum of avoided electric utility costs, representing the benefits that accrue to the system and the participant in the delivery of those efficiency measures, as well as other quantifiable societal benefits, including avoided natural gas utility costs, to the sum of all incremental costs…" (§1-10) Cited in 220 ILCS 5/8-103(a) for electric EE and repeated in 220 ILCS 5/8-104(b) for gas EE**

Consistent with measurement of EE costs

- **EE costs include prices paid to contractors, suppliers, dealers…**
- **Prices include profits throughout the supply chain**
- **Program design that reduces the prices paid to supply chain is treated as better than one paying higher prices**
  - Bulk purchases
  - Competitive contracting
- **Lost profit to EE supply chain is a TRC benefit**

Consistent with power procurement

- **Lower prices are preferred for energy and RECs**
- **Supplier profits are treated as costs**
- **IPA is required to "Develop electricity procurement plans to ensure…electric service at the lowest total cost over time." (20 ILCS 3855/1-5(A))**
  - No instruction to ignore producer profits

Consistent with practice in other restructured states

- **Included in EE screening in 6 of 12 restructured states, Including most of the EE leaders**
  - CT: Entire RTO effects
  - DC:
  - DE:
  - MA: MA effects only
  - MD: MD effects only
  - RI: Entire RTO effects
- **Not used in EE screening in NH, ME, NY, OH, PA, TX**
- **Used in evaluating renewables in ME, NY, OH and MI**
- **VT: Vertically integrated, uses effect for 50% of RTO**

Conservatisms in Analysis

- **Limited to Illinois benefits**
- **Ignores other price effects**
  - Electric capacity
  - Natural gas supply cost (from electric and gas EE)
  - Natural gas basis (from electric and gas EE)
  - Effect of gas price on electric price