Synapse
Energy Economics, Inc.

Electricity Supply Prices in Deregulated Markets - The Problem and Potential Responses

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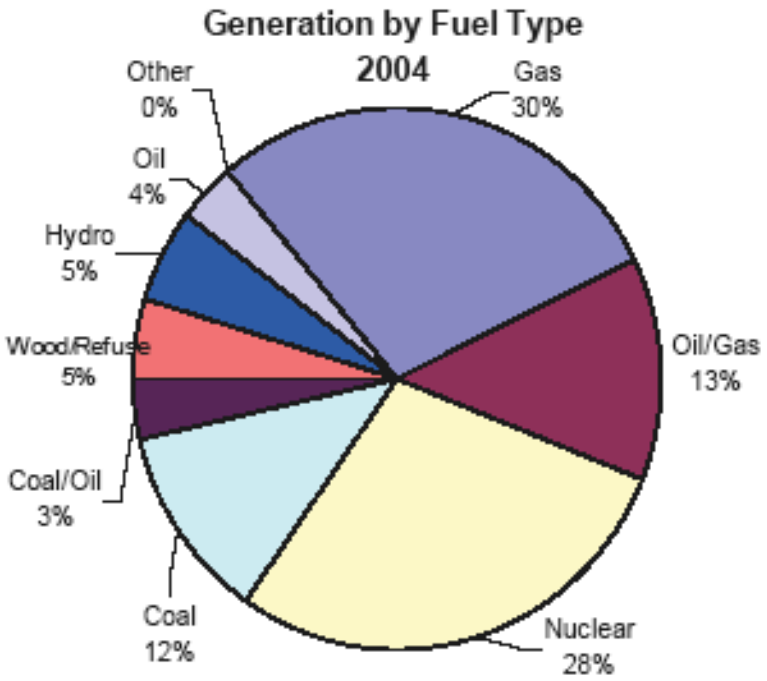
High Prices in Deregulated Supply Markets

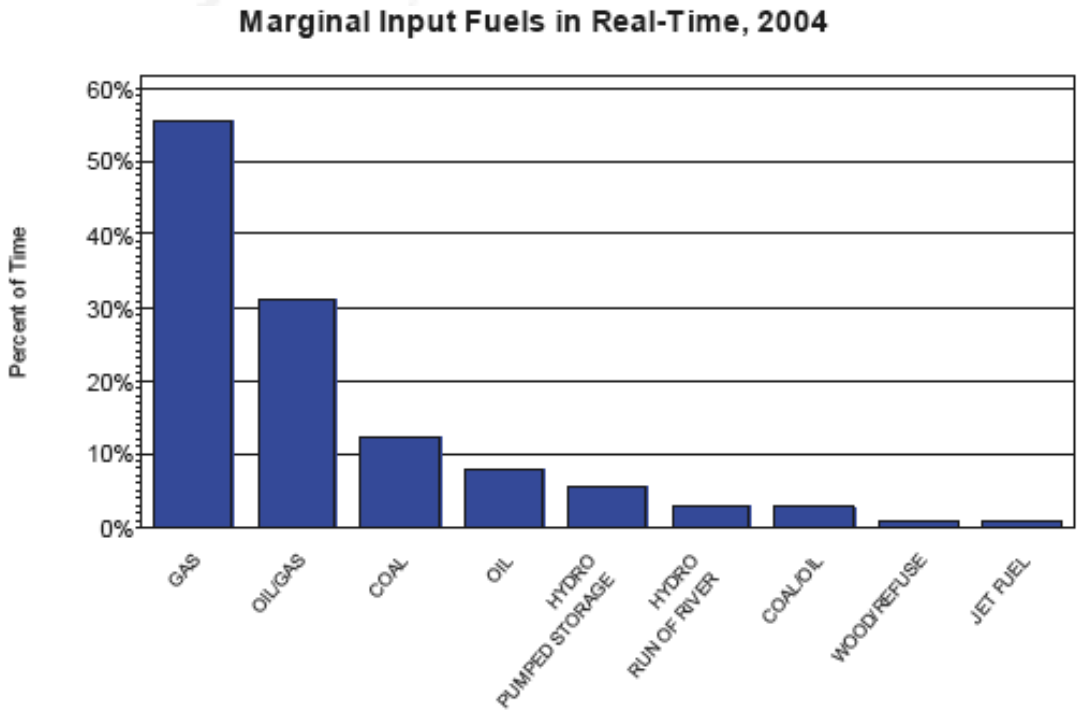
- Electricity supply prices up as much as 65% from 2005 to 2006 (New England)
- Gas-fired units are the dominant **marginal** source, well out of proportion to energy contribution—set hourly clearing price
- Natural gas prices have increased dramatically
- This is not the whole story!

New England Fuel Mix for Electricity Generation

Generation by fuel…



…and fuel on the Margin

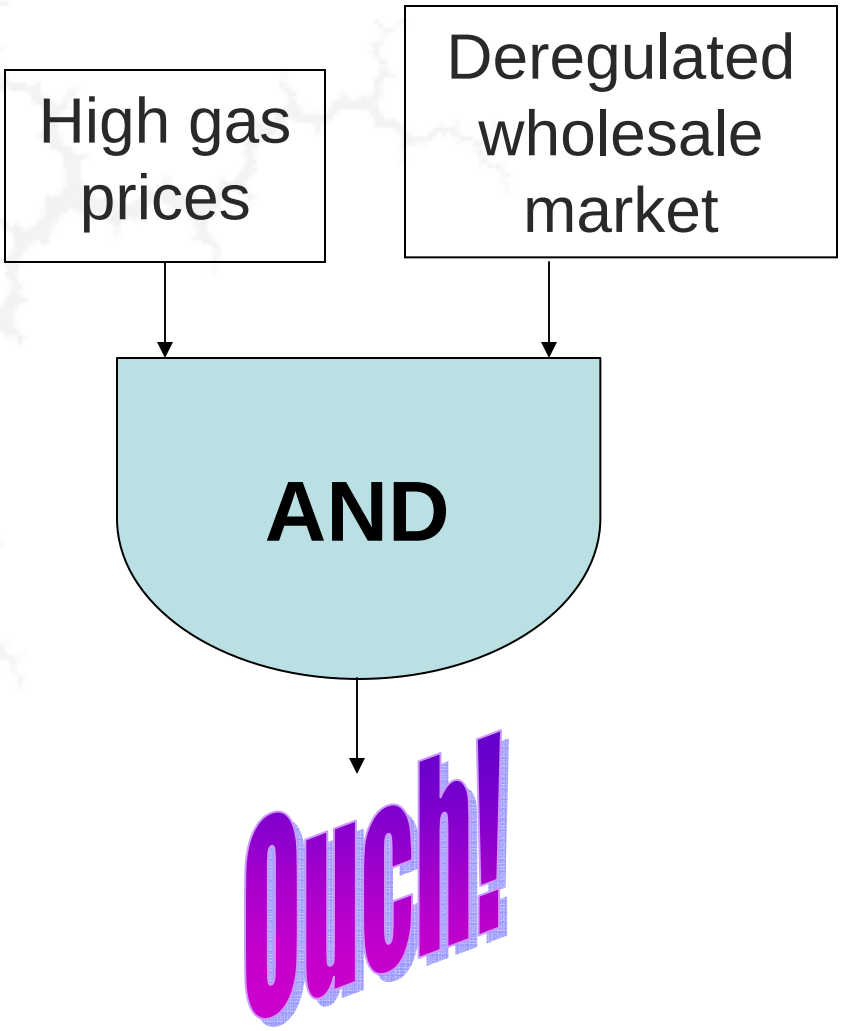


Source: ISO-NE "2004 Annual Markets Report," page 23.

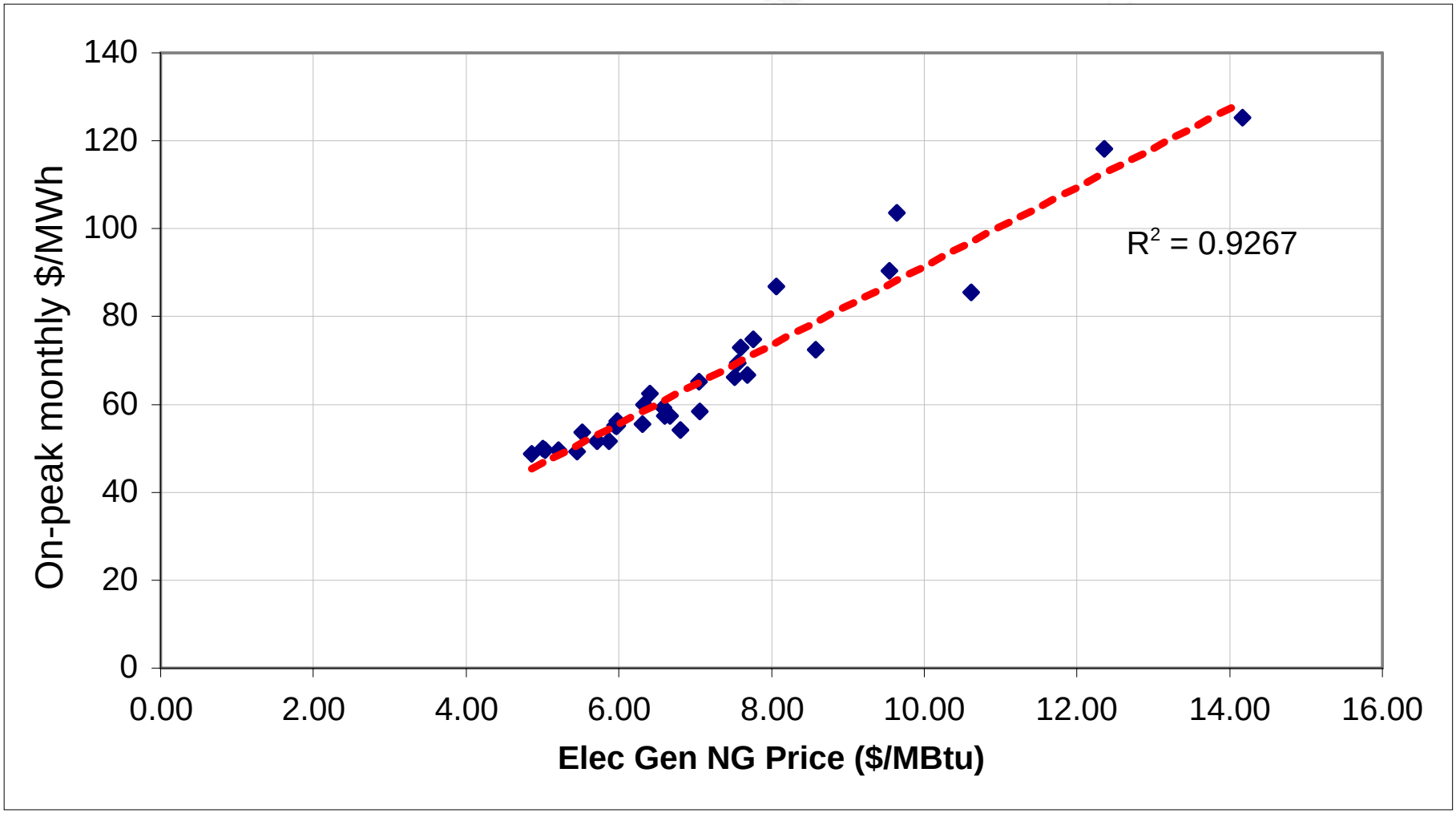
Cause and Effect: Boolean "AND" Function

Logical "AND" Function

Input A	Input B	A "And" B
0	0	0
1	0	0
0	1	0
1	1	1



Natural Gas Prices Drive Wholesale Electricity Prices in New England: 2003-2006



Summary: The Problem in Deregulated Supply Markets

- Increases **greater** than if market was regulated
- High supply prices **will continue** unless policymakers and regulators take action
- Major impact on consumers and economy ($8 billion/year in New England)
- Near-term impact on ratepayers magnified by expiration of rate freezes

Summary
Inventory of Potential Responses

Inventory of Potential Responses:

- Disclaimer - not all will be feasible or advisable in every jurisdiction
- Think creatively to develop a comprehensive list
- Chances of success will increase with support from commercial, institutional and commercial customers
- Some may require legislation
- Some require a regional or national approach – coalitions will be essential
- Impacts will vary by response and by timeframe

Potential Responses

Disclaimer - not all feasible or advisable in every jurisdiction

1. Extend or impose rate caps
2. Challenge any further increases
3. Improve procurement process for “standard offer service”
4. Decrease reliance on electricity supply at market prices
5. Reduce impact of natural gas prices on electricity supply prices
6. Transfer revenues from owners of existing generation to electricity consumers

Potential Responses

Disclaimer - not all feasible or advisable in every jurisdiction

1. Extend or impose rate caps
   a. Use any available leverage (e.g. proposed mergers, rate case) to force regulated utility &/or unregulated parent company/affiliate to absorb the electricity supply costs in excess of the rate cap,
   b. Defer recovery of electricity supply costs in excess of the rate cap.

Done – DE, PA, RI

Proposed - IL, MD

Potential Responses

Disclaimer - not all feasible or advisable in every jurisdiction

2. Challenge any further increases
   a. Question the design of new, additional charges proposed to promote investments in new generation capacity (e.g., reliability price mechanism proposed for PJM)
   b. Question the method of allocating funds from carbon allowances (e.g., Regional Greenhouse Gas Initiative)

Potential Responses

Disclaimer - not all feasible or advisable in every jurisdiction

3. Improve procurement process for “standard offer service”
   a. Require entity responsible for SOS to acquire supplies via a portfolio of contracts. (Do not go into the market at any point in time to acquire 100% of supplies for a several month period).

Proposed – DC, ME

Potential Responses

Disclaimer - not all feasible or advisable in every jurisdiction

4. Decrease, or terminate, reliance on electricity supply at market prices
   a. Increase energy efficiency initiatives
   b. Acquire a portion/all of supply at prices tied to actual production costs via build or buy long-term (through utility or public power authority).

      Done – AZ, CO, NY, CA

      Proposed – CT,ME,MT, OH
   c. Return to regulation of electricity supply

      April 2005 brief in US Court of Appeals by coalition including PULP, Public Citizen, NCLC, CO OCC, RI AG, NM AG, UT CCS.

Potential Responses

Disclaimer - not all feasible or advisable in every jurisdiction

5. Reduce impact of natural gas prices on electricity supply prices
   a. Develop a different algorithm to calculate market prices
   b. Reduce electricity use by increasing energy efficiency initiatives
   c. Encourage development of new generation from other sources such as wind and coal.

Potential Responses

Disclaimer - not all feasible or advisable in every jurisdiction

6. Transfer revenues from owners of existing generation to electricity consumers
   a. Collect “over-recovery” of stranded costs (CT – CL&P rate case)
   b. Impose a windfall profits tax (CT – proposed)
   c. Impose a state tax on electricity generation from carbon-intensive and radioactive fuels
      - Define the problem more broadly than rates: “Consumer and economic harm from unreasonable electricity prices.”
      - Tax of 2.5 to 3.0 ¢/kWh would recover 50% of the increase

Illustrative Analysis for New England

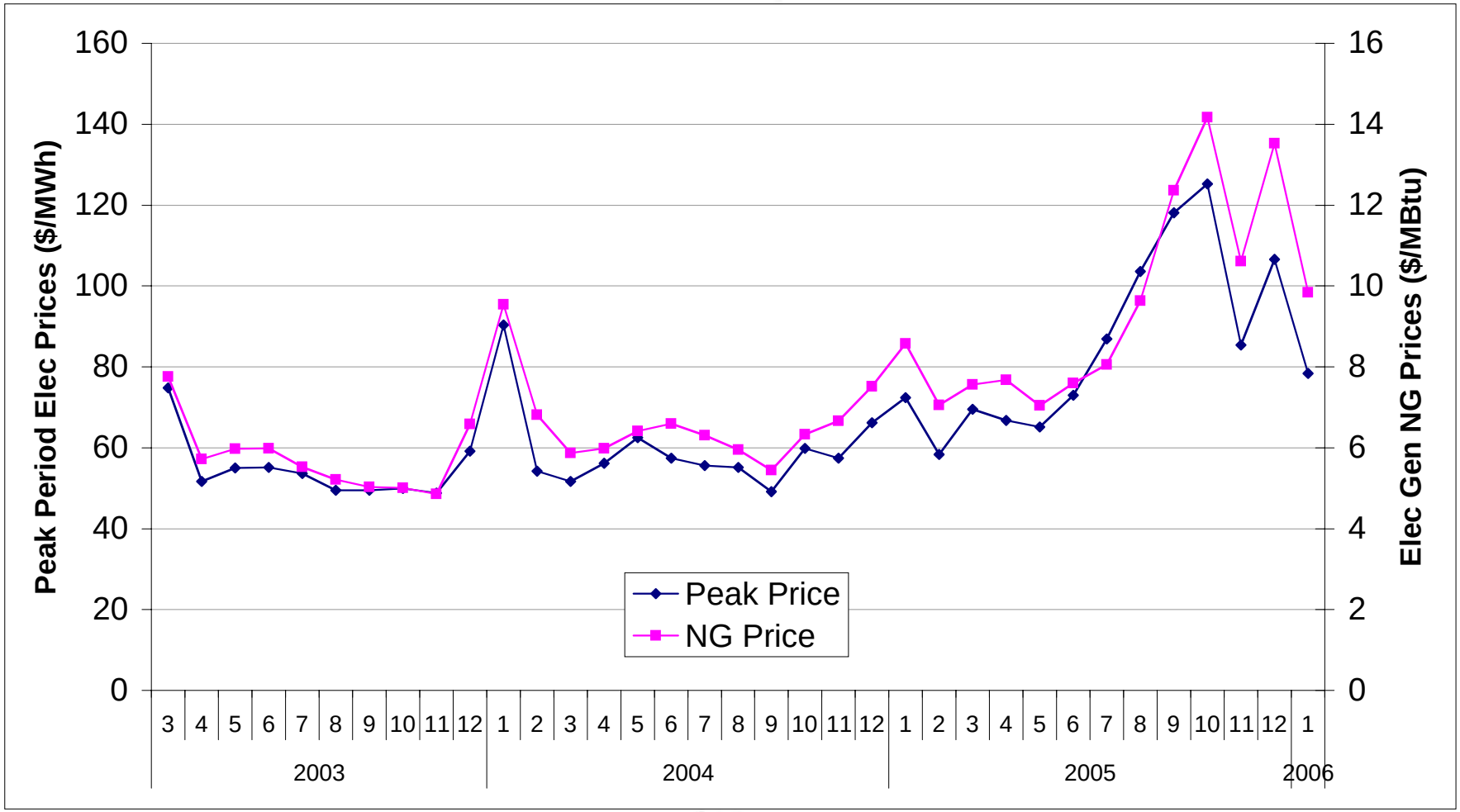
Source: ***Electricity Price Increases: Causes, Effects, and Solutions,*** presented by Bruce Biewald at the Restructuring Roundtable, Boston, MA, May 19, 2006.

Recent Electricity Supply Price Increases for Small Customers in New England

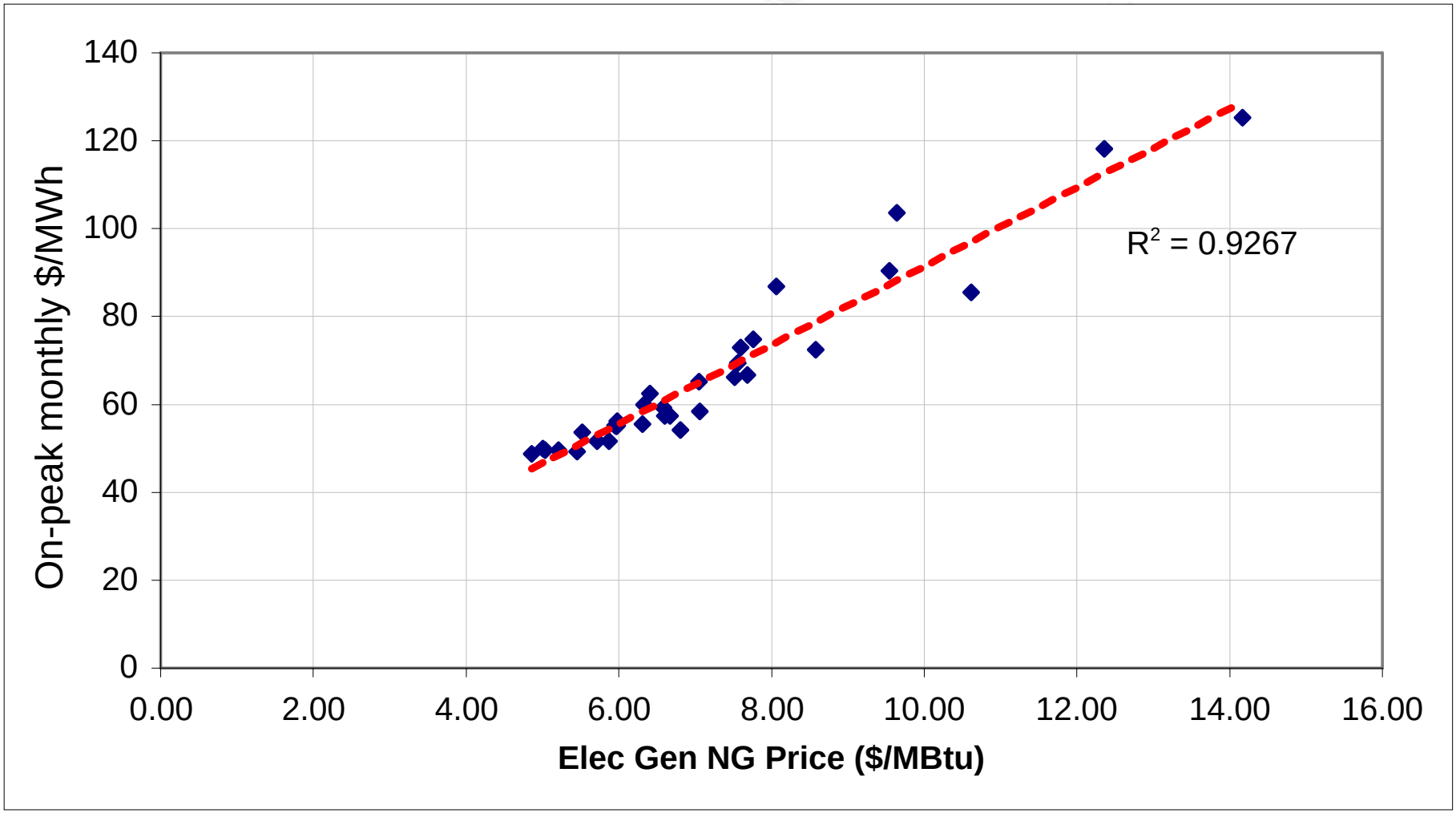
	Supply Price in ¢/kWh (prior period)	Supply Price in ¢/kWh (new period)	Increase
Narragansett (RI)*	6.7 (8/04 to 9/06)	10.0 (1/07 to 5/07)	49%
CMP (ME)	6.9 (3/05 to 2/06)	8.4 (3/06 to 2/07)	21%
Bangor Hydro (ME)	7.1 (3/05 to 2/06)	8.7 (3/06 to 2/07)	22%
NSTAR/BECo (MA)**	7.7 (7/05 to 12/05)	12.7 (1/06 to 6/06)	65%
Granite State (NH)***	5.2 (7/05 to 4/06)	8.6 (5/06 to 10/06)	64%

Note: These supply prices are only the generation component of retail rates. The other major component of total retail rates are transmission, distribution and other charges.

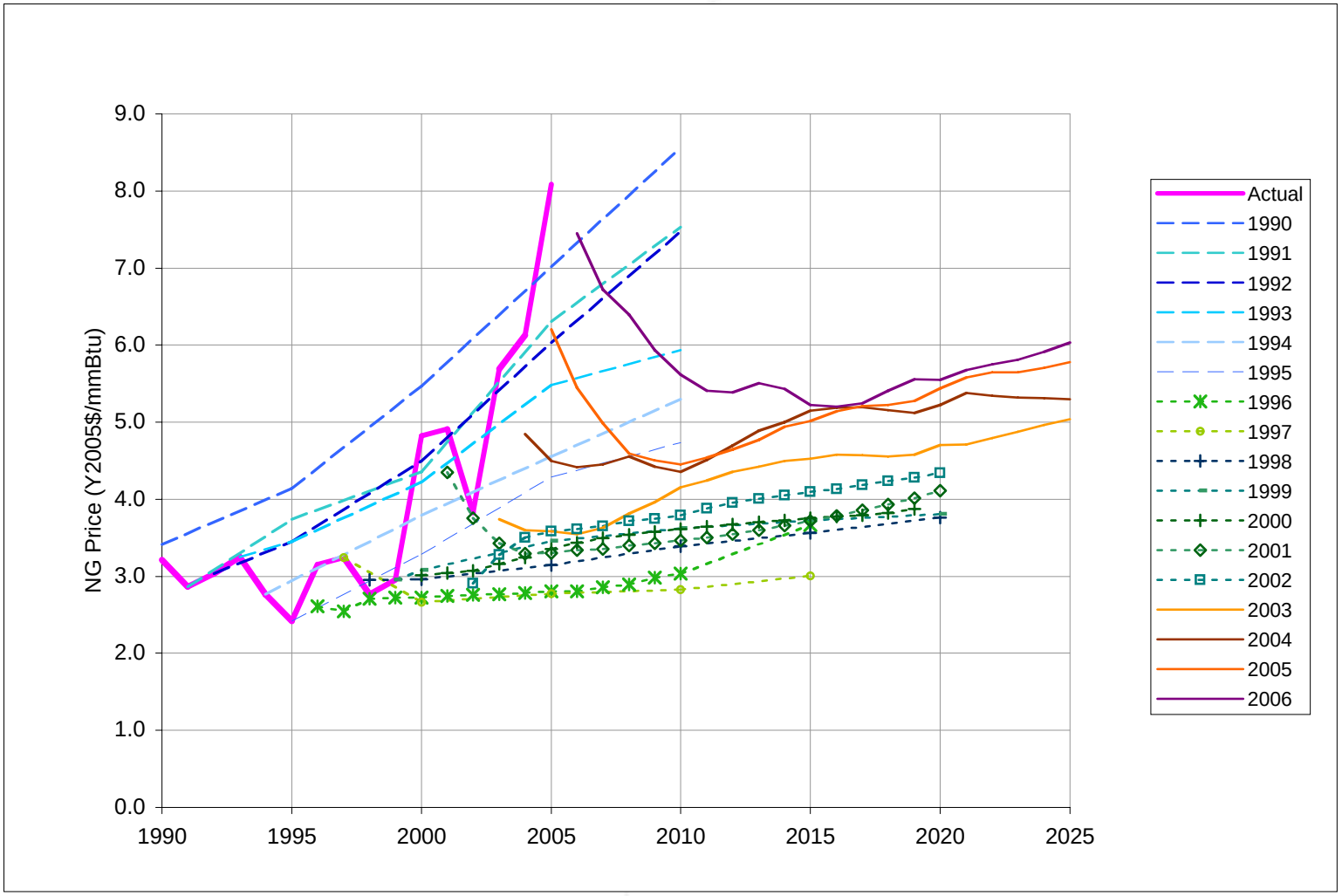
Natural Gas Prices Drive Wholesale Electricity Prices in New England: Time Series



Natural Gas Prices Drive Wholesale Electricity Prices in New England: 2003-2006



Forecasts of Natural Gas Prices Have Not Been Accurate



Source: Compiled by Synapse from EIA's Annual Energy Outlook reports.

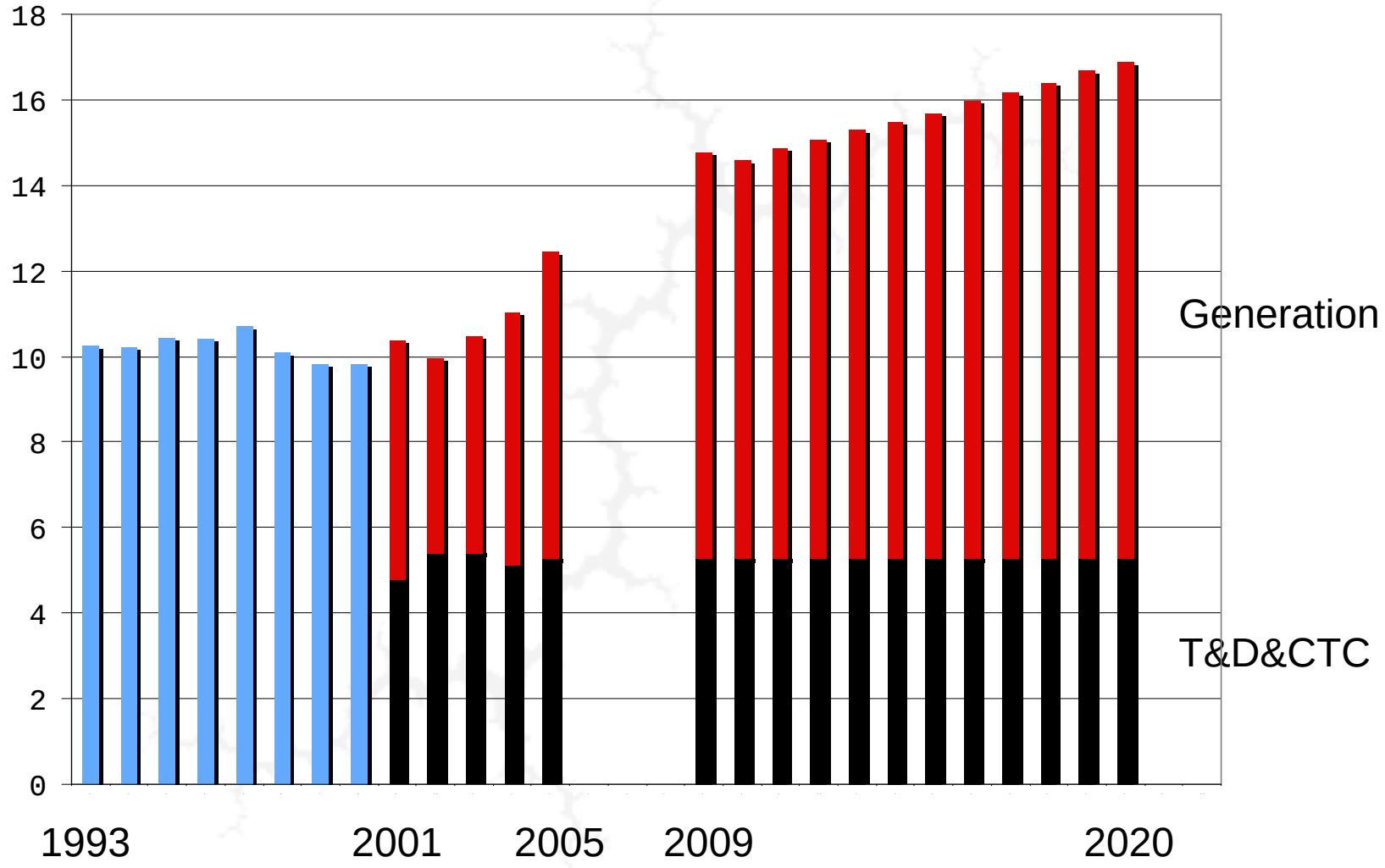
Natural Gas Prices

Gas prices on the rise:

- 1995 = $2/MMBtu
- 2002 = $4/MMBtu

- 2009 expected $10/MMBtu
- Lots of volatility and uncertainty

Average Electricity Price in New England for Retail Customers of IOUs (¢/kWh)



Illustrative Calculation of the Effect of Gas Prices on Electricity Consumers (page 1 of 4)

Simplified system:

Electricity demand = 130,000 GWH/year

Gas units supply 50% of the annual demand

Gas units are “on the margin” 100% of the time

Heat rate of marginal gas units is 8500 Btu/kWh

Electricity capacity and related adders are 2.5 ¢/kWh in the “market” cases

T, D & other is 5 ¢/kWh on average ($6.5 billion/year)

Illustrative Calculation of the Effect of Gas Prices on Electricity Consumers (page 2 of 4)

At burner-tip natural gas prices of $4/MMBtu

Regulated Electricity Supply		**5.0 ¢/kWh**
(based on actual cost of supply from each type of generation)		
Electricity supply market price		
energy	= $4/MMBtu x 8,500 Btu/kWh =	3.4 ¢/kWh
capacity	=	2.5 ¢/kWh
total	=	**5.9 ¢/kWh**

At burner-tip natural gas prices of $10/MMbtu

Regulated Electricity Supply		**7.3 ¢/kWh**
(based on actual cost of supply from each type of generation)		
Electricity supply market price		
energy	= $10/MMBtu x 8,500 Btu/kWh=	8.5 ¢/kWh
capacity	=	2.5 ¢/kWh
total =		**11.0 ¢/kWh**

Illustrative Calculation of the Effect of Gas Prices on Electricity Consumers (page 3 of 4)

	Regulated Electricity Supply		Market Electricity Supply	
	Average Retail Rate (¢/kWh)	Cost to Consumers (billion $/year)	Average Retail Rate (¢/kWh)	Cost to Consumers Billion ($/year)
$4/MMBtu gas	**5** +5 10	**6.5** +6.5 13.0	**5.9** +5.0 10.9	**7.7** +6.5 14.2
$10/MMBtu gas	**7.3** +5.0 12.3	**9.5** +6.5 16.0	**11** + 5 16	**14.3** + 6.5 20.8

The first item in each cell is generation, the second is T,D & other, the third is total.

Illustrative Calculation of the Effect of Gas Prices on Electricity Consumers (page 4 of 4)

	Regulated Electricity Supply		Market Electricity Supply	
	Cost to Consumers (billion $/year)		Cost to Consumers (billion $/year)	
$4/MMBtu gas	13	--	14.2	
$10/MMBtu gas	16	**23% increase**	20.8	**60% increase**

Effect on the Regional Economy

- Synapse IL Study (2003): 10 to 20 jobs lost for every million dollars increase in annual electricity costs.
- An increase in annual electricity costs of $8 billion would result in loss of 80,000 to 160,000 jobs.
- Note: Electricity cost increases associated with new initiatives such as efficiency programs and carbon taxes would not harm the local economy since those revenues fund programs in the region and hence stay in the region. Also such increases are dramatically smaller.

