

# ICAP Demand Curve Review

**New York ISO  
ICAP Working Group**

April 22, 2004

**LEVITAN & ASSOCIATES, INC.**

# Overview

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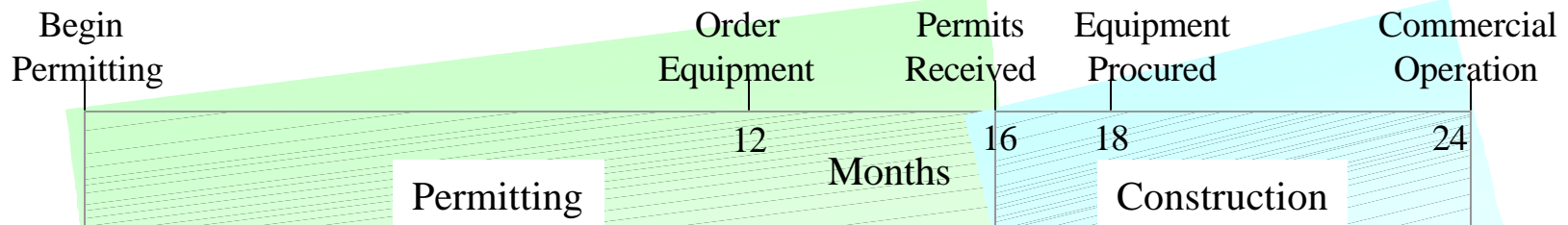
- ❑ Zones J, K, & ROS for '05, '06, & '07

## LAI Approach:

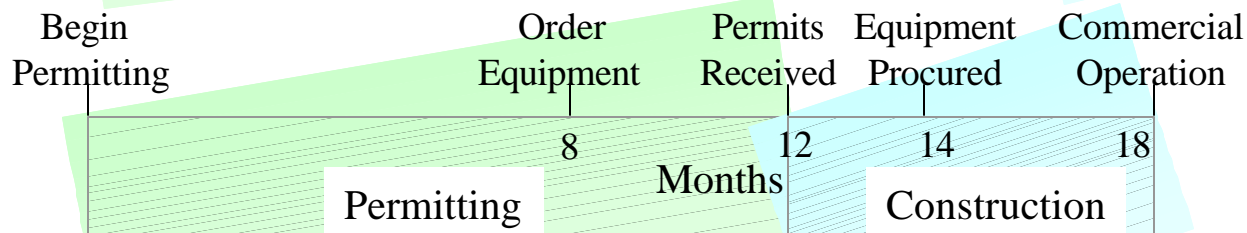
- ❑ Define Gas Turbine Peakers
  - ❖ Capital Costs, Performance
- ❑ Forecast Net Revenues
  - ❖ Energy & Ancillary Services Less Operating Costs
  - ❖ MarketSym – Topology, Fuel Costs, Bid Behavior, Supply / Demand
- ❑ Levelize Required ICAP Revenues
- ❑ Project Schedule / Q & A

# Peaker Definition

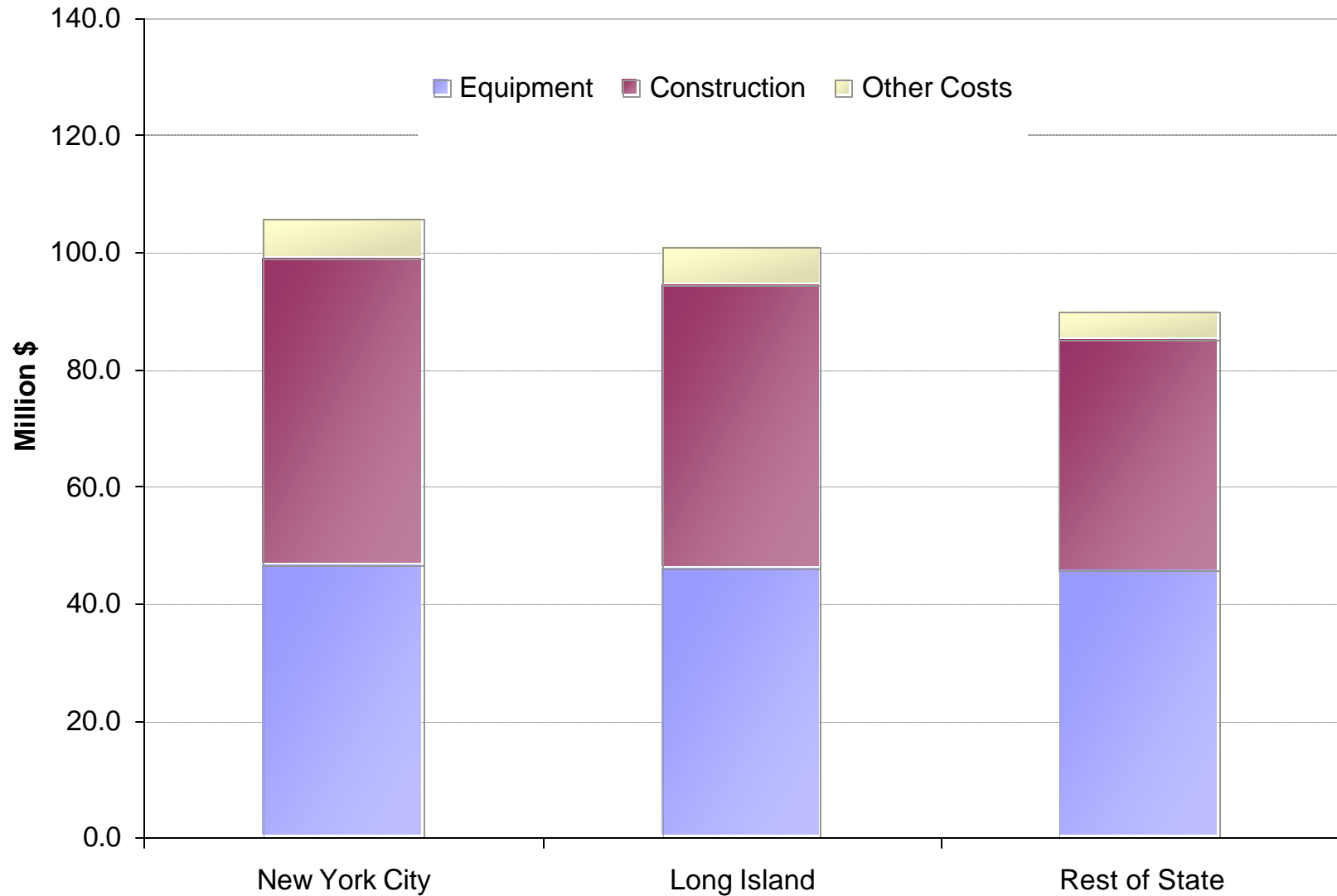
- ❑ Merchant Plant @ Brownfield Site
- ❑ 96 MW Aeroderivative Plant
  - ❖ Twin LM6000 w/ Sprint
  - ❖ Meet existing emission regulations
- ❑ 24 Month Schedule for NYC and LI



- ❑ 18 Month Schedule for ROS



# Peaker Definition – Capital Cost



# Peaker Definition – Capital Costs (2004)

	<b>Zone J</b>	<b>Zone K</b>	<b>ROS</b>
Owner's Costs	\$ 6,711,000	\$ 6,425,000	\$ 4,795,000
Equipment	\$ 41,500,000	\$ 41,500,000	\$ 41,500,000
Engineering & Design	\$ 4,000,000	\$ 3,500,000	\$ 3,000,000
Construction	\$ 52,430,000	\$ 48,500,000	\$ 39,510,000
<u>Startup &amp; Testing</u>	<u>\$ 1,000,000</u>	<u>\$ 1,000,000</u>	<u>\$ 1,000,000</u>
Total Cost	\$ 105,641,000	\$ 100,925,000	\$ 89,805,000
Unit Cost (per kW)	\$ 1,124	\$ 1,074	\$ 955

# Peaker Definition – Performance

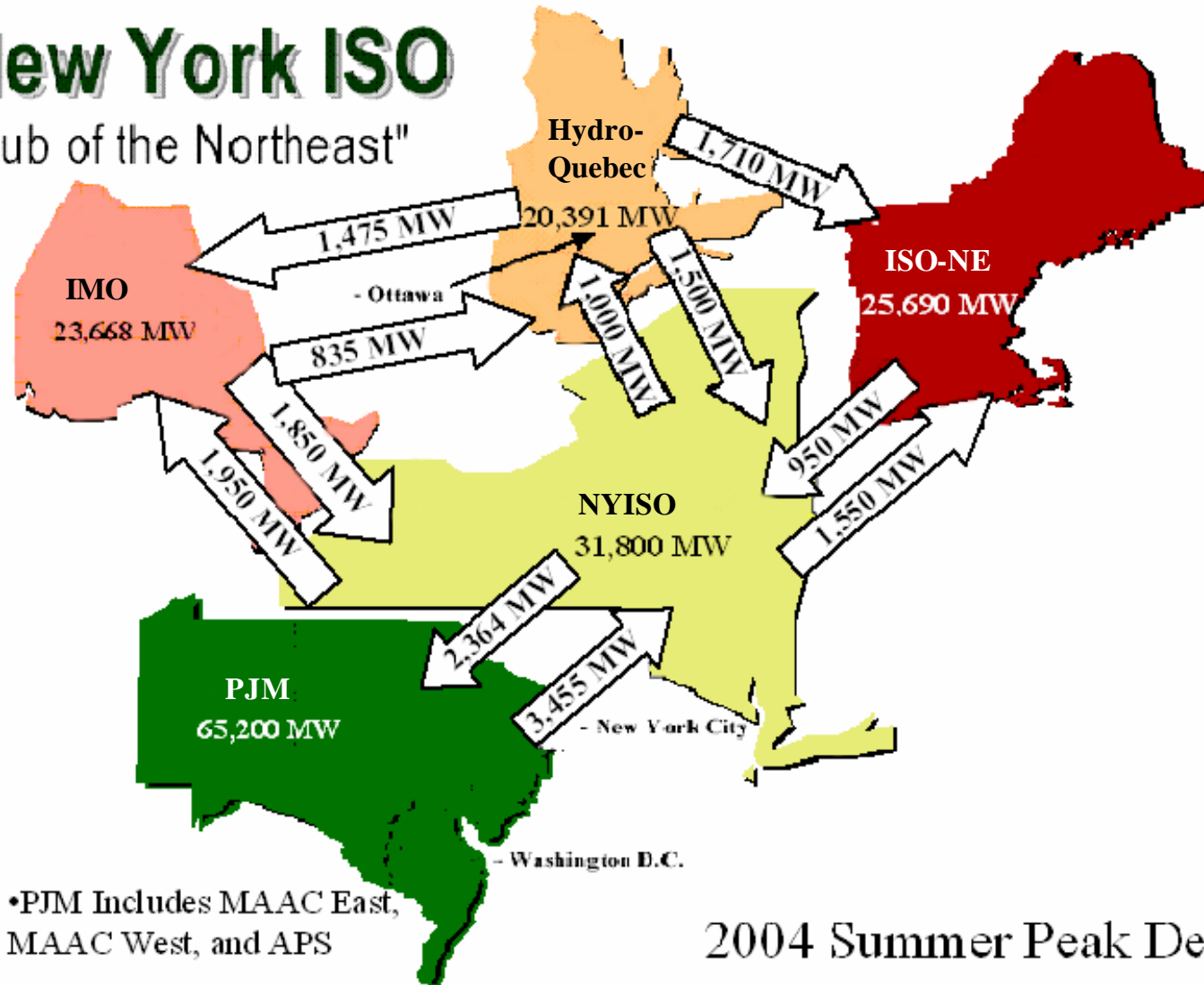
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- ❑ Output (summer conditions)
  - ❖ 96 MW gross                      94 MW net
  
- ❑ Heat Rate (summer conditions)
  - ❖ 8,962 Btu/kWh net (LHV)
  
- ❑ Emission Reduction Systems
  - ❖ Water / ammonia injection
  - ❖ SCR / CO catalyst @ 90% reduction
  - ❖ 2.0 ppm NO<sub>x</sub> / 15 ppm CO
  - ❖ 10 ppm ammonia slip

# Forecast – Model Topology

## New York ISO

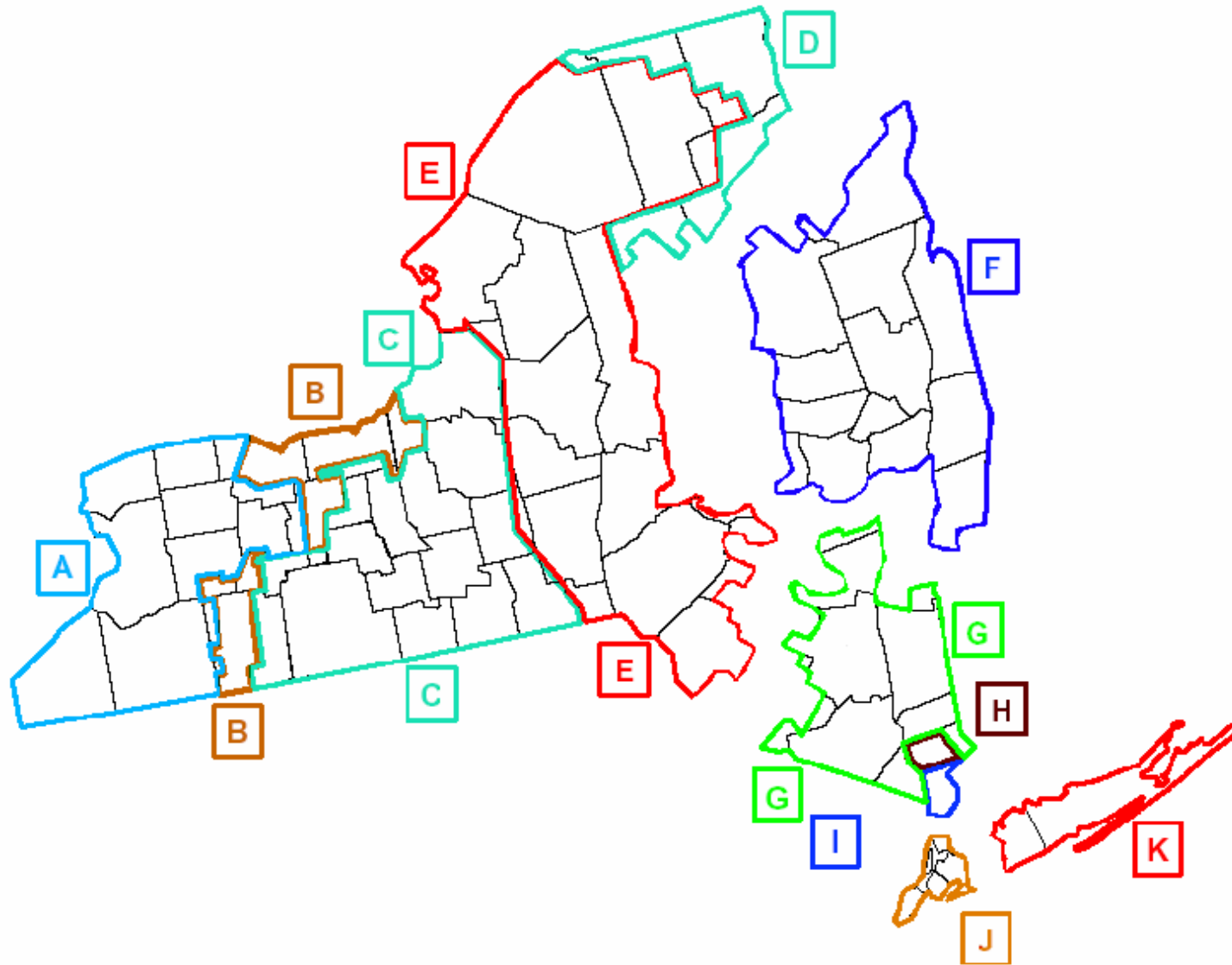
"Hub of the Northeast"



•PJM Includes MAAC East, MAAC West, and APS

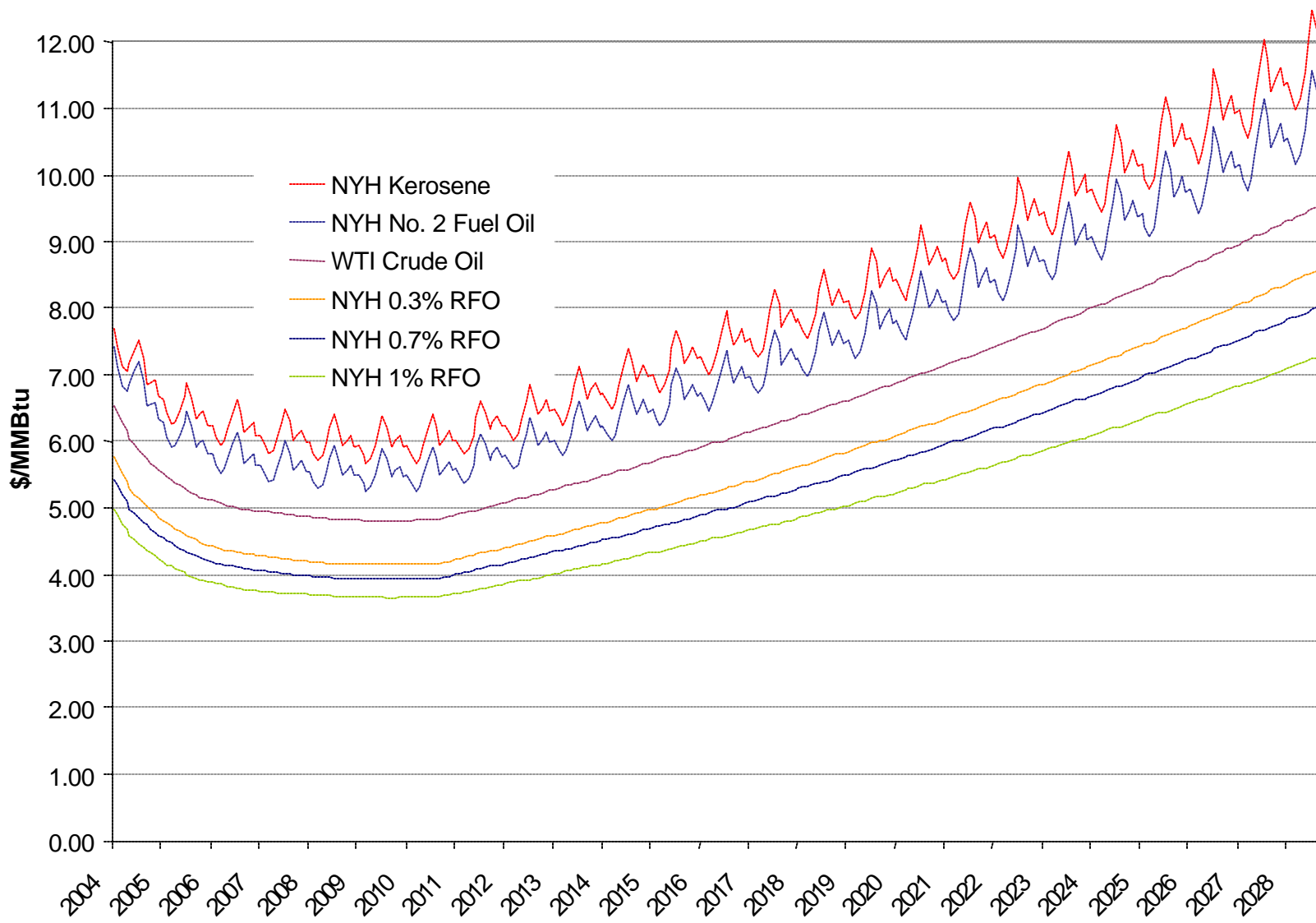
2004 Summer Peak Demands

# Forecast - NYISO Topology

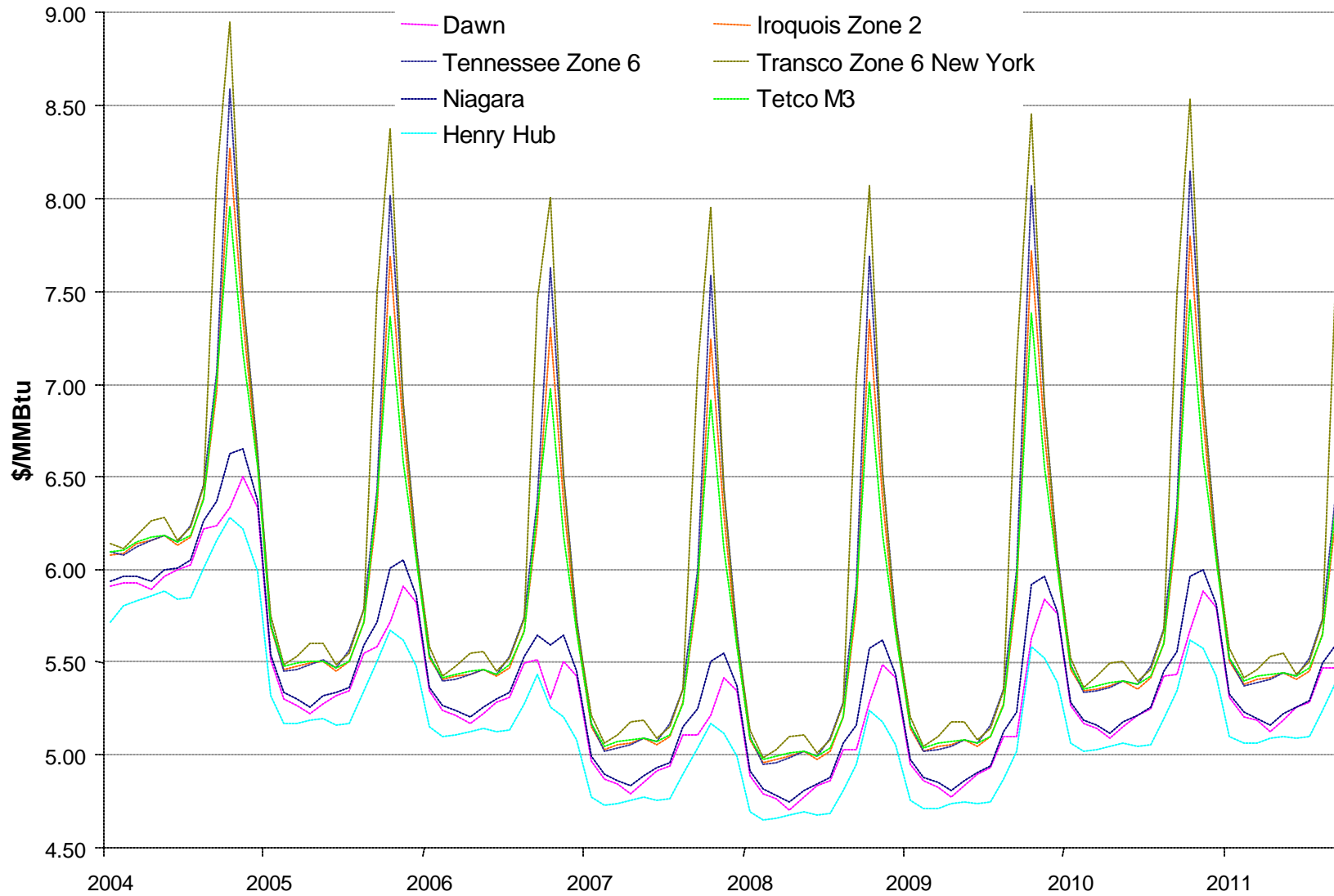




# Forecast – Fuel Oil Costs



# Forecast – Gas Costs

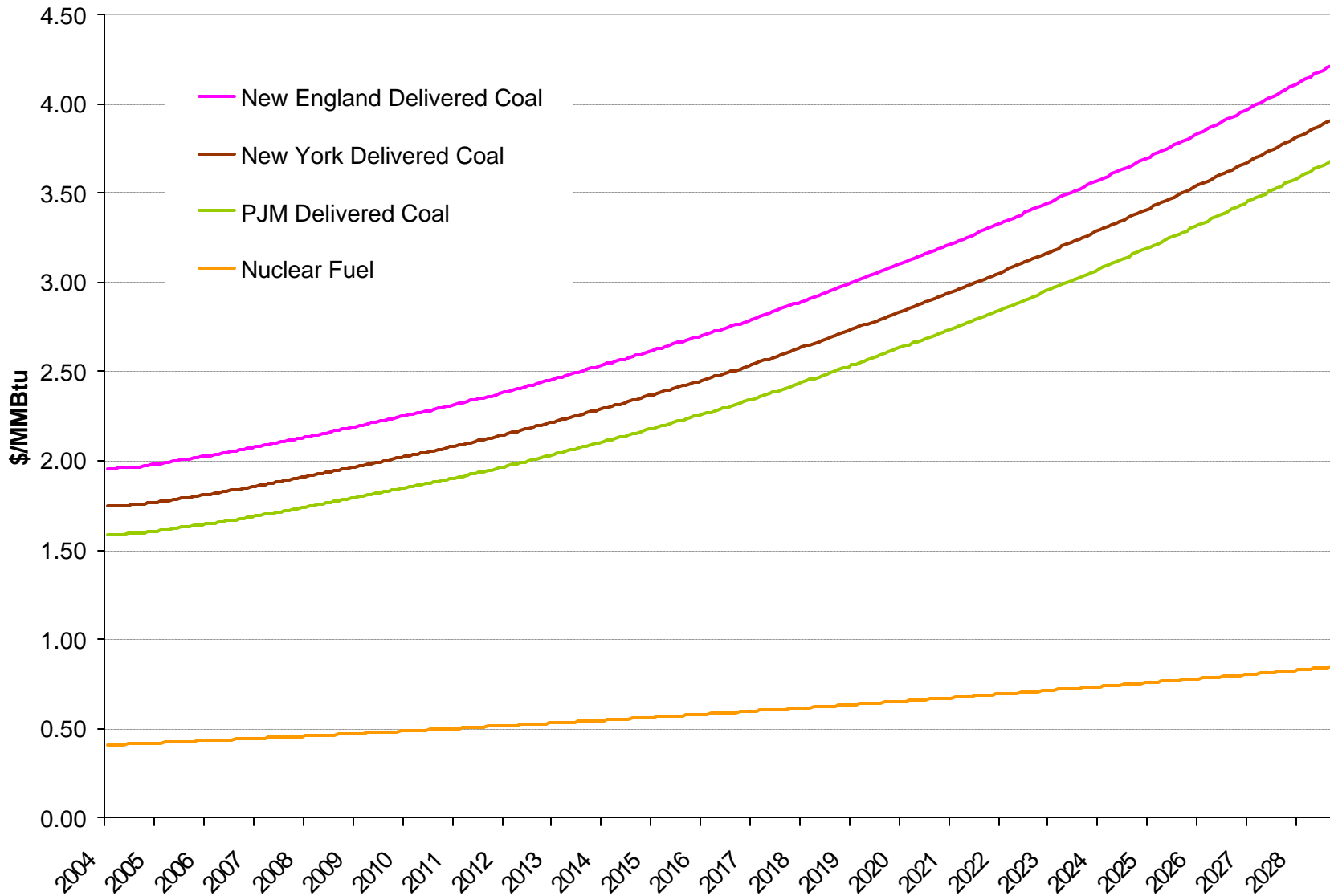


# Forecast – Regional Trading Hubs

## Gas Supply to Generation by Trading Hub

	Transco Z6-NY	TETCO M3	IGT-Z2	Tennessee Zone 6	Dawn	Niagara
<b>NY-Zones A-E</b>						X
<b>NY-Zone F</b>			X			
<b>NY-Zones G-I</b>	X		X			
<b>NY-Zone J</b>	X					
<b>NY-Zone K</b>	X		X			
<b>PJM-E</b>	X	X				
<b>PJM-W</b>		X				
<b>New England</b>			X	X		
<b>Ontario</b>					X	
<b>Quebec</b>					X	

# Forecast – Coal & Uranium Costs



## Forecast – Generator Bid Behavior

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- ❑ Volatility Events During Limited Hours Raise Energy Prices Above Cost-Based Forecast Levels
  - ❖ Generators appear to bid rationally based on variable operating costs for *most* capacity
  - ❖ Last capacity blocks *sometimes* bid at increasing prices (“hockey stick”)
  - ❖ Peakers tend to bid entire capacity as one block up to \$1,000
  - ❖ Energy-limited and low load factor resources have incentive for high bid prices
  
- ❑ Price Volatility Enhances Peaker Energy Revenues

# Forecast – Demand Forecast

- ❑ Preliminary 2004 Gold Book Values to 2013
- ❑ LAI Extrapolation to 2027

	<b>Peak Demand (MW)</b>	<b>Annual Energy (MWh)</b>
2005	32,319	168,005
2010	34,411	177,831
2015	36,078	184,097
2020	37,986	191,466
2025	39,995	199,241

# Forecast – Supply Mix

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- ❑ Near-Term - plants under construction and planned retirements
  - ❖ NYISO
  - ❖ PJM
  - ❖ ISO-NE
- ❑ Long-Term Entry - added to maintain reliability
  - ❖ LAI Entry Model for each market
  - ❖ GTs balanced with CCs
- ❑ Long-Term Attrition
  - ❖ LAI Attrition Model within each market
  - ❖ Retirement if 3 years of negative cash flow

# Forecast – Net Revenues

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- ❑ Peaker Revenues
  - ❖ Energy
  - ❖ Ancillary services
- ❑ Less Variable Costs (Bid Basis)
  - ❖ Fuel
  - ❖ Variable O&M
  - ❖ Emission allowances
- ❑ Less Fixed Costs
  - ❖ Fixed O&M
  - ❖ Site lease, property taxes
  - ❖ G&A, insurance
- ❑ Unrecovered Capital Costs (Levelized)



# Levelization – Assumptions

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- ❑ Life of Unit
  - ❖ 15 v. 20 yrs
  
- ❑ Financing
  - ❖ PPAs should not be necessary
  - ❖ Non-recourse project financing not viable
  - ❖ Parent company on-balance sheet
  - ❖ 60% debt @ 6.5%
  - ❖ 40% equity @ 25% (pre-tax)
  
- ❑ Levelization
  - ❖ Real dollars

# Project Schedule / Questions & Answers

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- ❑ Initial results by mid-May
- ❑ Review by NYISO
- ❑ Final Report by June 4
- ❑ Presentation by end of June
  
- ❑ Questions & Answers