

NCSL Energy Supply Task Force

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# Gas Electric Harmonization – Market Issues

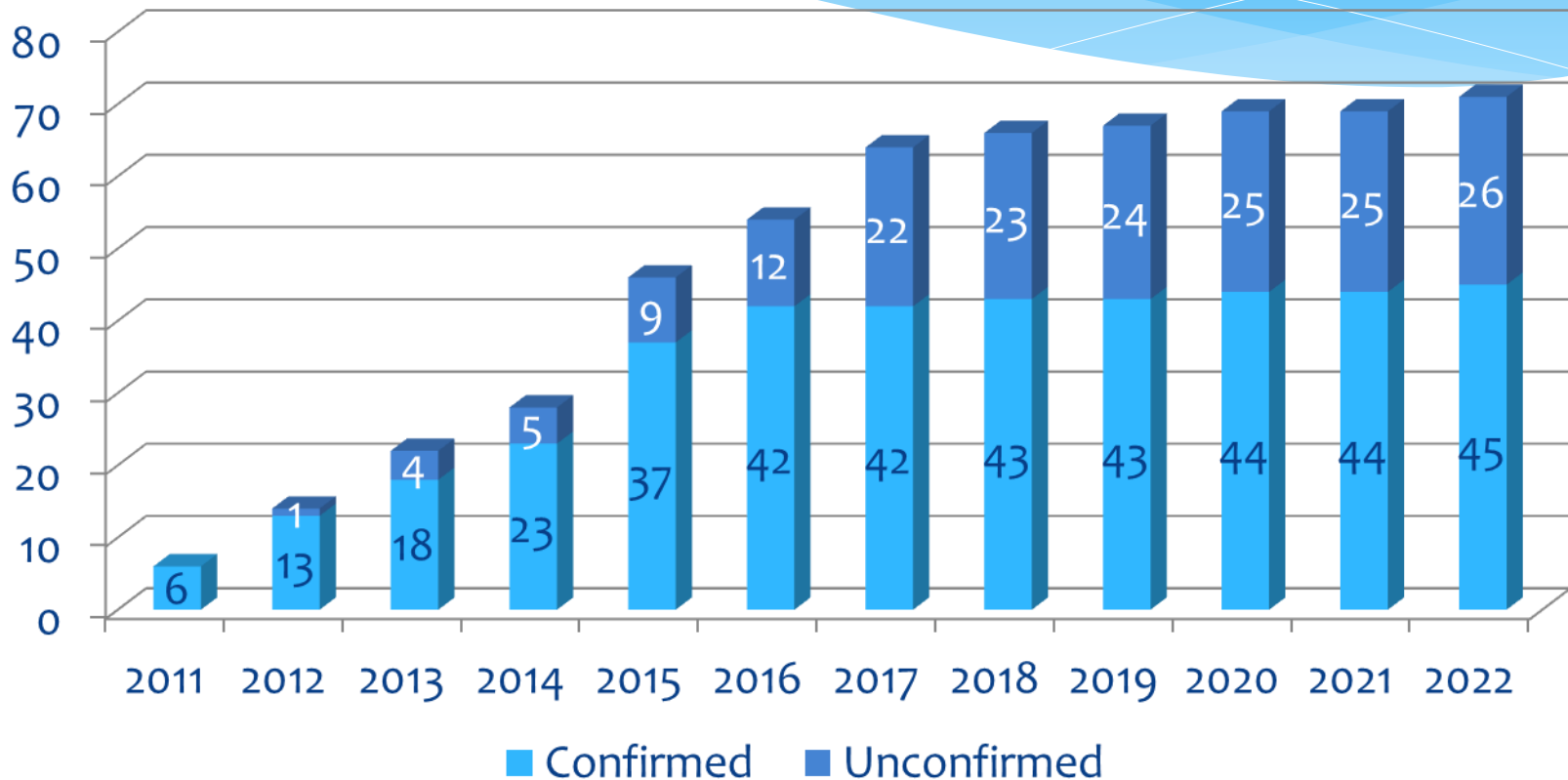
# Foundation for discussion

- \* The electric industry didn't evolve uniformly across the country
- \* Likewise, the gas and electric industries did not evolve uniformly
- \* Capitalism = diversity
- \* Nobody's methods are right and nobody's are wrong
- \* We have to find a way to weave together the two industries

# Why?

- \* New EPA regulations are resulting in massive coal plant retirements
- \* Peaking generation resources are needed to backup increasing Renewable Energy Resource Capacity
- \* More than 100 gigawatts of gas-fueled electric generation is on the drawing board for the next 10 years
- \* That's almost half of all electric generation in the US
- \* The gas pipelines were not designed for this

# Cumulative fossil generation retirements\*



Cumulative confirmed retirements: 44

Cumulative unconfirmed retirements: 26

\* Gigawatts

# Apples and oranges

- \* FERC Chairman Jon Wellinghoff proposal – demand response (DR) for the gas pipelines
- \* In 2012, EnerNOC – leader in managing electric DR – announced it would also manage natural gas
- \* DR for gas may help, but it's not a silver bullet
- \* Physics is the problem
  - \* Electricity moves at roughly 122,946 miles per second
  - \* Gas moves through the pipelines at roughly 18 MPH

# Contracts

- \* Pipelines are expensive to build
- \* New pipelines are needed to service new electric plants
- \* Gas transporters want a guarantee of demand for their product before they invest – 100% plant capacity, 24 x 7
- \* Few electric plants run that steadily
- \* Peakers may run at 50% capacity, a few days a year
- \* The math between these conflicting needs is cost prohibitive for the electric industry
- \* Cost recovery becomes an issue

# Markets

- \* Traditionally, gas nominations occur twice daily for day-ahead and twice for same-day purchases
- \* Electricity schedules vary by RTO, but can be real-time as frequently as every 15 minutes
- \* Gas day is 9 a.m. – 8:59 a.m. CST
- \* Power day is 12 a.m. – 11:59 p.m. in the respective dispatch zone

# RTO bid award schedules

RTO	Day-Ahead Offer/Bid Due	Day-Ahead Award	Re-Bid Period (for units w/no cleared MW)	Reliability commitment by RTO	Real Time Change for Energy Offer Allowed?
PJM	12 PM Eastern	4 PM Eastern	4-6 PM Eastern	6 PM Eastern and then throughout actual operating day	No (real-time offer based on day-ahead or re-bid offer)
SPP	11 AM Central	4 PM Central	4-5 PM Central	5 PM Central and then throughout actual operating day	Yes, up to 45 minutes prior to the operating hour
ERCOT	10 AM Central	1:30 PM Central	*1 None; <i>however</i> uncommitted resources may change their offer at any point 60 minutes prior to operating hour.	2:30 PM Central day-ahead; and then an hourly process up to 60 min prior to operating hour	Yes, up to 60 minutes prior to the operating hour for resources not committed in day-ahead or during day-ahead reliability period
MISO	11 AM Eastern	3 PM Eastern	3 - 4 PM Eastern	4 PM Eastern and then throughout actual operating day	Yes, up to 30 minutes prior to the operating hour

\*1- ERCOT's day-ahead reliability unit commitment essentially uses the day-ahead offer from the generator.



# NAESB gas nominations

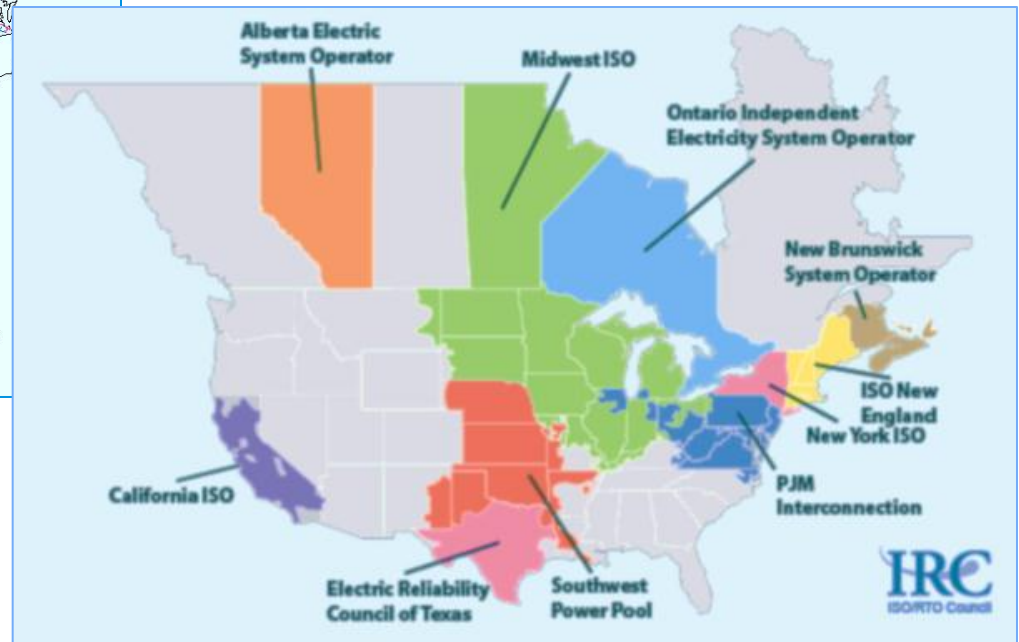
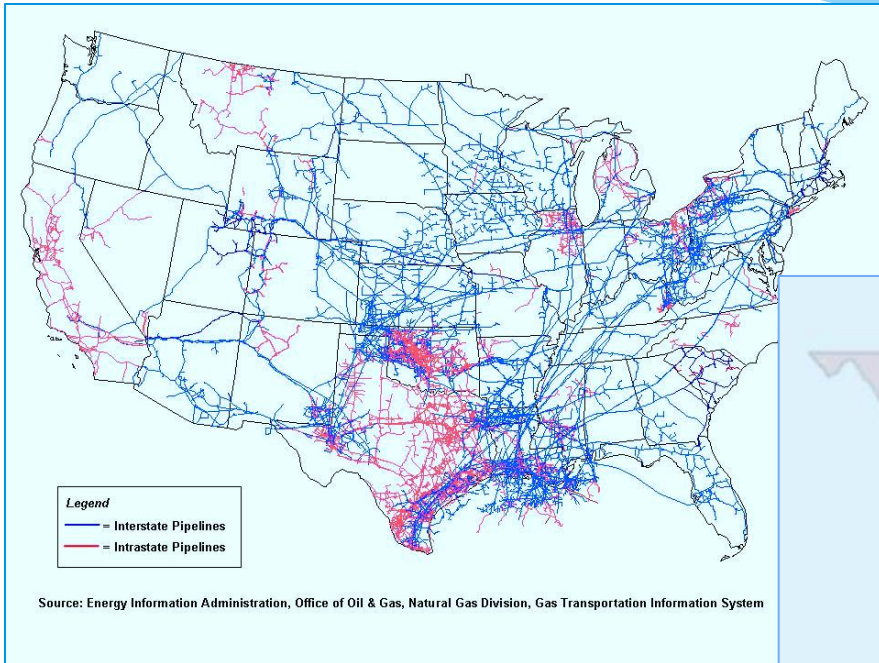
NAESB Nomination Cycle	Nomination Time (Central)	Nomination effective	Bumping Interruptible Transportation	Bumping Notice (Central)	Schedule Confirmed (Central)
Timely	11:30 AM the <b>day prior to gas flow</b> that would begin at 9:00 AM next day	Day-Ahead	Yes (1)	4:30 PM Day-Ahead	4:30 PM Day-Ahead
Evening	6 PM the <b>day prior to gas flow</b> that would begin at 9:00 AM next day	Day-Ahead	Yes (1)	10 PM Day-Ahead	10 PM Day-Ahead
Intra-Day 1	10 AM the day of gas flow	Day of	Yes (1)	2 PM Day of	2 PM Day of
Intra-Day 2	5 PM the day of gas flow	Day of	No (2)	Not Applicable	9 PM Day of

- (1) A Firm nomination for the first 3 nomination cycles has priority over (can “bump”) an already scheduled Interruptible (IT) nomination;
- (2) At the Intra-Day 2 cycle, a Firm nomination will not bump an already scheduled Interruptible nomination

# The mountain is starting to move

- \* Some pipelines have begun more frequent nominations
- \* We need more and we need them everywhere
- \* If the pipeline with increased nominations is sandwiched between two other pipelines with traditional nominations, that doesn't help the buyer

# What's true for gas is true for electricity



# RTO-NAESB scheduling

All Times are Central

**Day Ahead**

	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	
PJM			X				O/R	R	R/RC						
SPP			X					O/R	R/RC						
ERCOT		X			O	RC									
MISO		X				O	R/RC								
GAS			N					C		N				C	
			<-----Timely for Next Day----->						<----Evening for Next Day---->						

**X** = Day Ahead Offer/Bid Due

**O** = Day Ahead Award

**R** = Rebid Period (for units w/no Award)

**RC** = Reliability Commitment by RTO

**N** = Gas Pipeline Nominations Due

**C** = Schedule Confirmed & Bumping Notice for Interruptible Service

- (1) A Firm Gas Transportation nomination for the first 3 nomination cycles has priority over (can “bump”) an already scheduled Interruptible (IT) nomination;
- (2) At the Intra-Day 2 cycle, a Firm nomination will not bump an already scheduled Interruptible nomination

# RTO-NAESB scheduling


All Times are Central

	Day Of																	Next Day									
	11PM	12AM/ 4AM	5AM/ 8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	12AM/ 4AM	5AM	6AM	7AM	8AM	9AM/ 11PM			
PJM	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC										
SPP		RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC									
ERCOT		RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC									
MISO	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC										
GAS					N				C			N				C											
					<-----Intra-Day 1----->							<-----Intra-Day 2----->															

RC= Reliability Commitment by RTO can be changed during the day  
All but PJM allow for changes closer to operating hour

N = Gas Pipeline Nominations Due

C = Schedule Confirmed & Bumping Notice for Interruptible Service  
Bumping Notices not applicable for Intra-Day 2

 Represents the Gas Pipeline Day

- (1) A Firm Gas Transportation nomination for the first 3 nomination cycles has priority over (can “bump”) an already scheduled Interruptible (IT) nomination;
- (2) At the Intra-Day 2 cycle, a Firm nomination will not bump an already scheduled Interruptible nomination
- (3) The Gas day does not match the Electricity Day

# The conundrum

- \* Electric load unexpectedly spikes
- \* Generator needs significant additional gas for tomorrow's load
- \* It's 5 p.m. – gas noms are scheduled for the next day
- \* Even if capacity exists, there's no means by which to contract for it
- \* Generator is shut out – electric customers face brownouts or blackouts, even if there was adequate gas transportation capacity available

# This becomes a reliability issue

- \* Hoping for the best tomorrow morning is not a good reliability strategy
- \* We need consistency
  - \* In the gas markets
  - \* In the electric markets

