EIPC Gas-Electric Interface Study Update
ENGCTF
April 10th, 2014

MISO
Eric Thoms

Status Update

All information regarding this study can be found at: http://www.eipconline.com/Gas-Electric.html

Target 1 – Existing Natural Gas-Electric System Interfaces

- Final draft released Friday, April 4, 2014
- Develop baseline assessment, including descriptions of the natural gas-electric system interfaces, interaction effects, specific drivers of the pipeline/LDC planning process

Target 2 – Infrastructure Capability

- In progress. Planned Completion Date 7/11/14
- Evaluate the capability of the natural gas systems to meet individual & aggregate core & non-core gas demand over a 5- & 10-year horizon, as well as variety of sensitivities.

Target 3 – Contingency Analysis

- Kicked off March 21, 2014. Planned Completion Date 12/26/14
- Identify contingencies on the natural gas system that could adversely affect electric system reliability, & *vice versa*

Target 4 – Duel Fuel vs Firm/Infrastructure Expansion Analysis

- Work officially started as planned on January 31. Planned Completion Date 9/5/14
- Review the operational / planning issues affecting the availability of dual fuel capable generation, including fuel assurance objectives.

Target 1 - Goals

Reports, Stakeholder Comments, & Exhibits for Target 1 can be found at the following link:

http://www.eipconline.com/Gas-Electric_Documents.html

Goals

1. Develop a baseline assessment that includes descriptions of the natural gas-electric system interfaces & how pipeline, storage & LDC infrastructure impact each other
2. Identify the specific drivers of the pipeline / LDC planning processes affecting the availability & operational risks borne by gas-fired generators across the Study Region
3. Evaluate the current level of operational & planning interaction between the bulk electric & natural gas systems
4. Assess the regulatory, commercial, & operational attributes of the gas infrastructure – electric interfaces affecting the performance of gas-fired generation.

What it is not:

Target 1 is not intended to make recommendations.

Target 1 – Report Outline

Each of these sections have portions specific to MISO.
Pertinent page numbers are included in parenthesis.

Executive Summary (ES-1, ES-4, ES-5, ES-10 through ES-22)

1 Natural Gas Facilities & Operations (1-3)

- 1.1 Interstate Pipelines (22-25)
- 1.2 Storage Facilities (31-33, 35-36)
- 1.3 Intrastate Pipelines & Local Distribution Companies (40-41, 45-48, 51-57)

2 Storage & Transportation Options Available to the Electric Sector (67)

- 2.1 Scheduling Practices & Service Priorities (68-76)
- 2.2 Pipeline Services (76-84)
- 2.3 Storage Services (84-86)
- 2.4 Local Distribution Company Services (86-92,96-99)

3 Generator Contracting & Fuel Assurance Practices (112, 114-118)

4 Capacity Release & Secondary Markets (p 127-129, 132-135)

- 4.1 Common Trends Across the Study Region (128-129, 132,135)

5 Key Findings & Observations (147-148)

Key Findings & Observations

- Gas marketers are the most active assignees of released capacity, thereby aggregating secondary capacity entitlements, both in-the-path and out-of-the-path, with other contract entitlements under AMA structures to serve gas-fired generation.

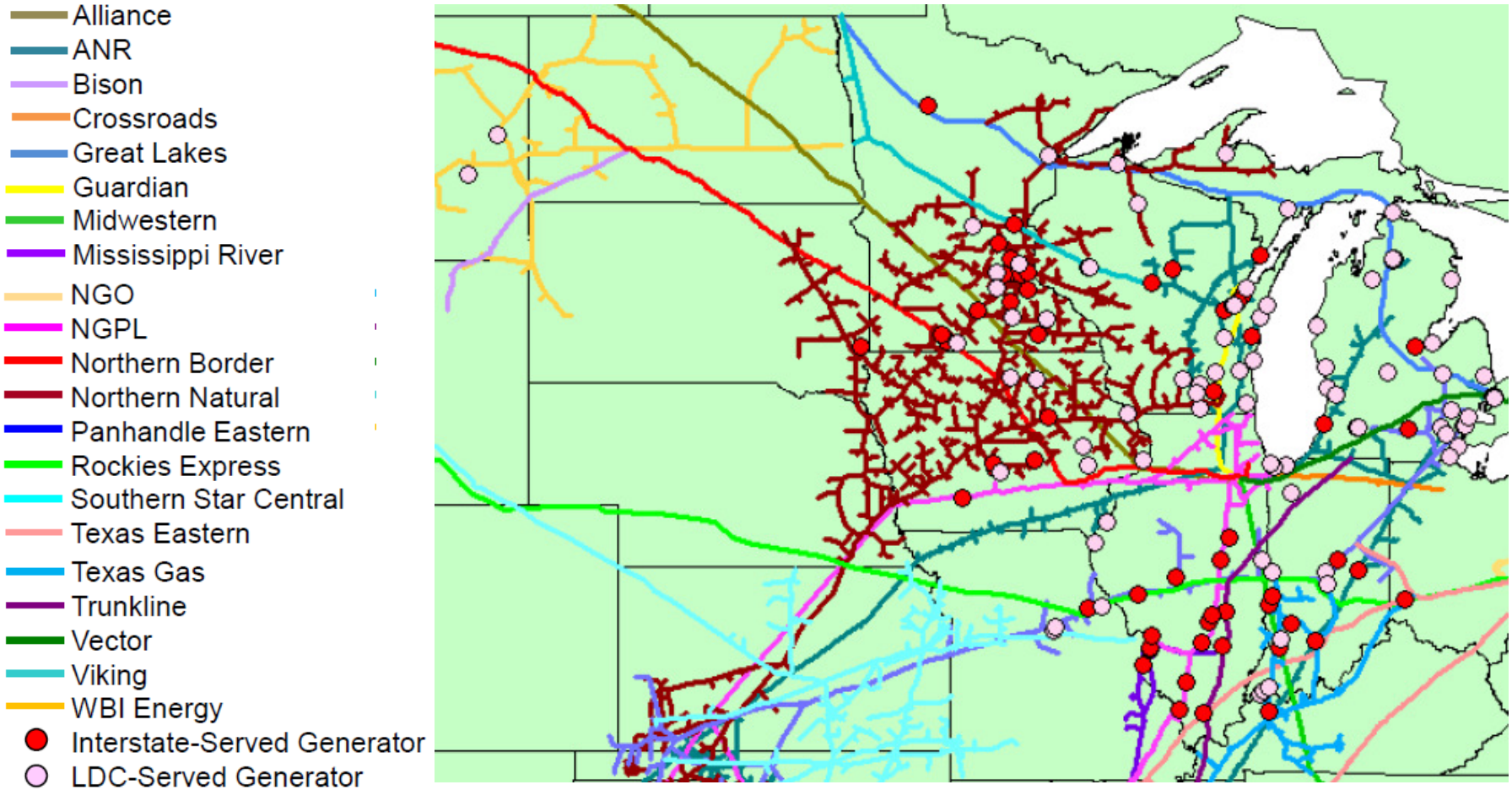
- Gas-fired generators generally do not hold primary or secondary entitlements, opting instead to conduct business with gas marketers or gas suppliers under short term marketing arrangements, or more formal AMAs. In both cases, the commodity is typically bundled just in time to meet the scheduling requirements in the DAM or RTM. There are exceptions, however. Some vertically integrated utilities in MISO have firm entitlements.

Key Finding & Observations

- Nearly all transactions are recallable by the assignor. Released capacity generally does not provide the assignee with fuel assurance throughout the heating season. We understand that recall rights are most often exercised during the heating season. Hence, secondary capacity rights do not provide fuel assurance to the assignee during cold snaps or outage contingencies. There is little or no financial incentive for LDCs to release capacity without recall rights. Moreover, inclusion of the right-to-recall provides primary entitlement holders with valuable option benefits on long-haul rights from the Gulf of Mexico.

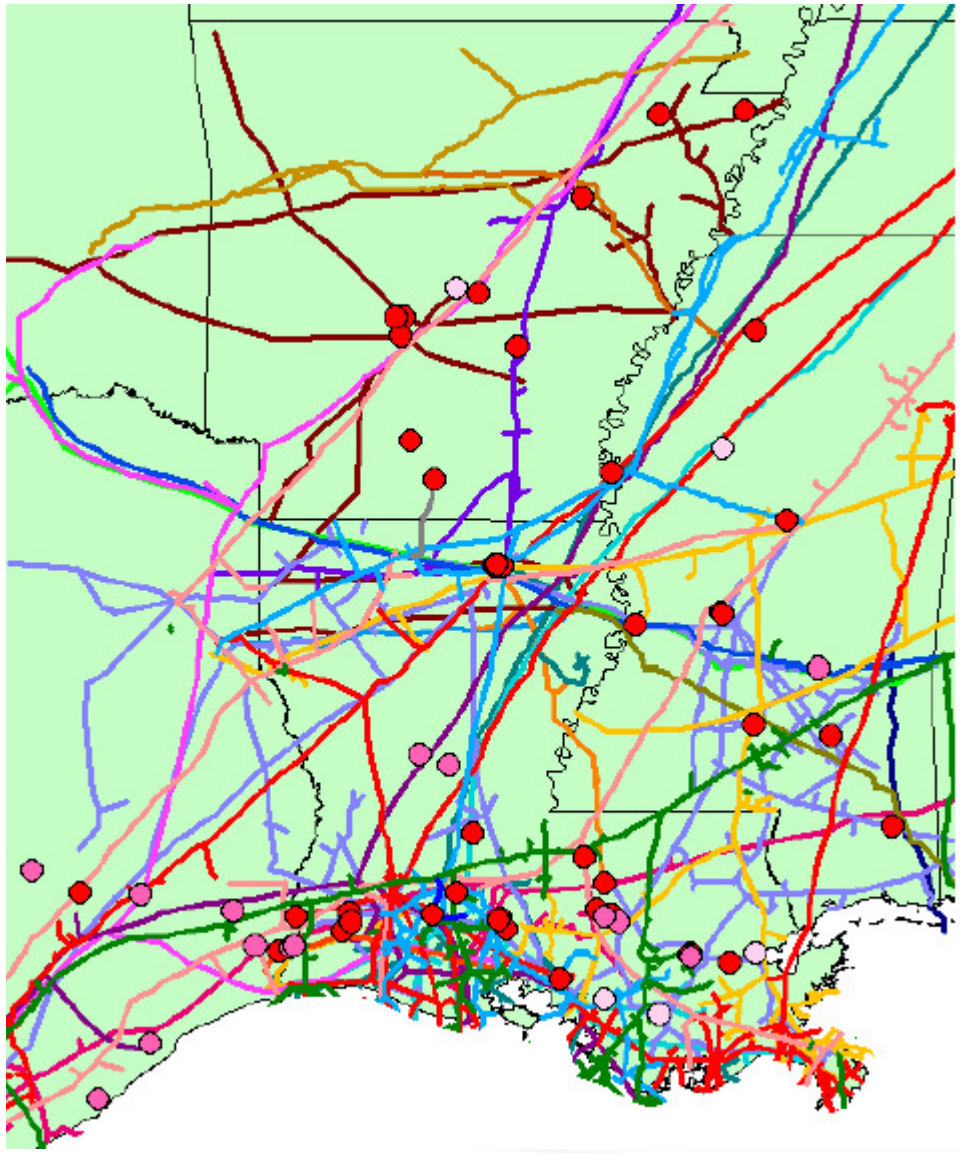
- Segmentation and receipt / delivery point flexibility provide entitlement holders with valuable opportunities to recoup margin from innovative transactions oriented around shale gas production from Marcellus. These features of the secondary market are beneficial to assignor and assignee, alike.
- Capacity releases across the Study Region are generally short-term in nature, for one year or less, more often for one month or less.

Interstate Pipelines & Gas-Fired Generators in MISO North/Central

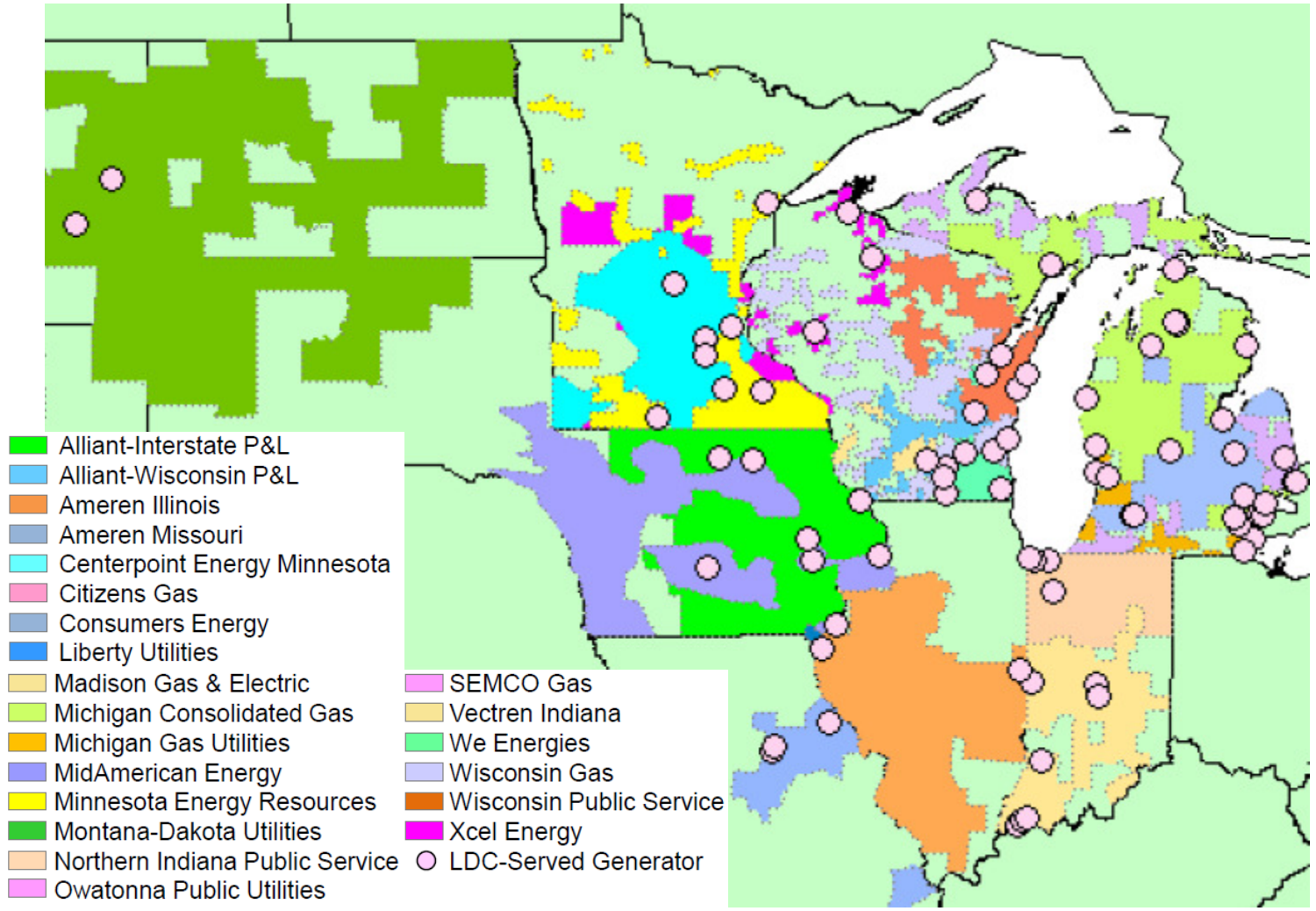


Interstate Pipelines & Gas-Fired Generators in MISO South

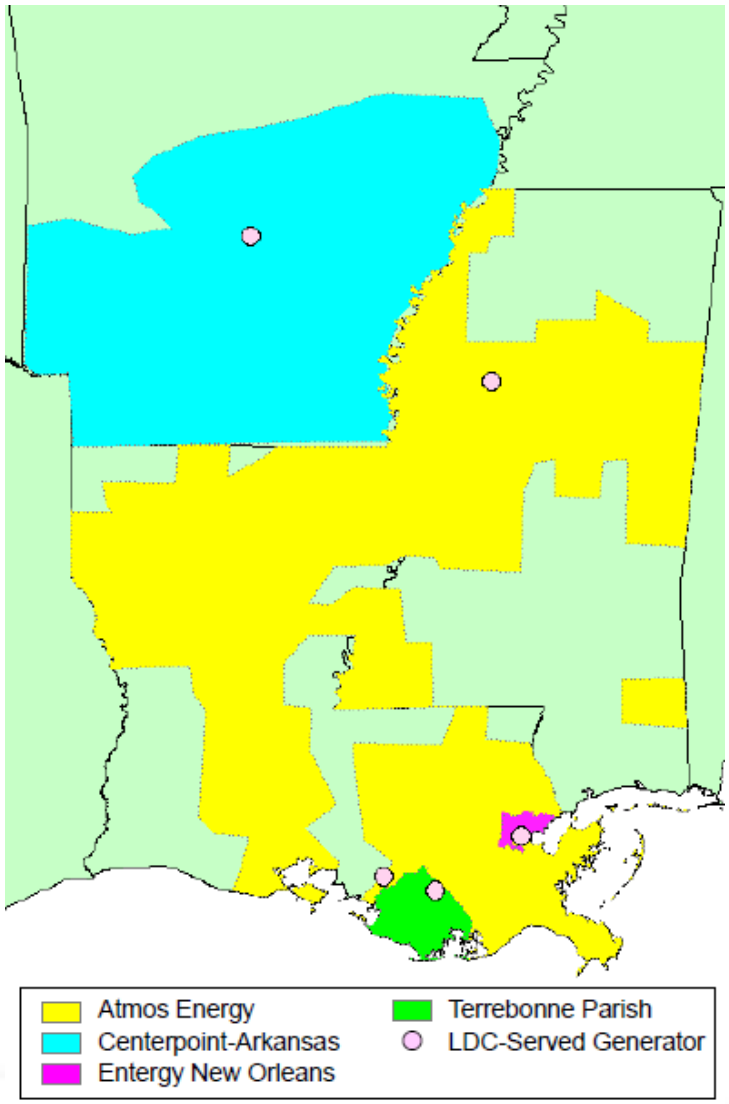
- AM MidLa
- ANR
- Columbia Gulf
- Destin
- Egan
- Enable
- Fayetteville Express
- Florida Gas
- Gulf Crossing
- Gulf South
- KM Louisiana
- Midcontinent Express
- Mississippi River
- NGPL
- Ozark
- Sabine
- Southeast Supply Header
- Southern
- Tennessee
- Texas Eastern
- Texas Gas
- Tiger
- Transco
- Trans-Union
- Trunkline
- Interstate-Served Generator
- Intrastate-Served Generator
- LDC-Served Generator



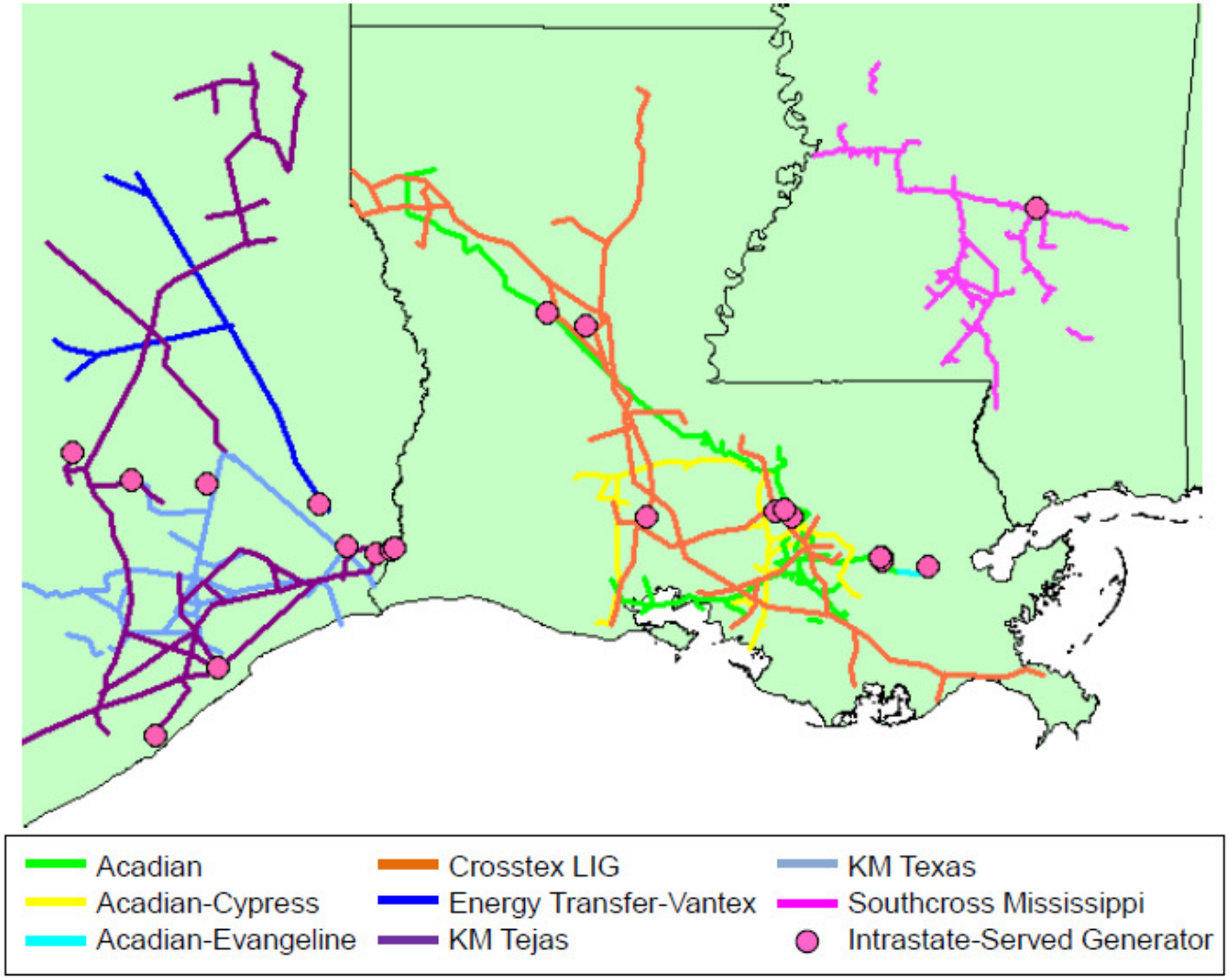
LDCs Serving Generators in MISO North/Central



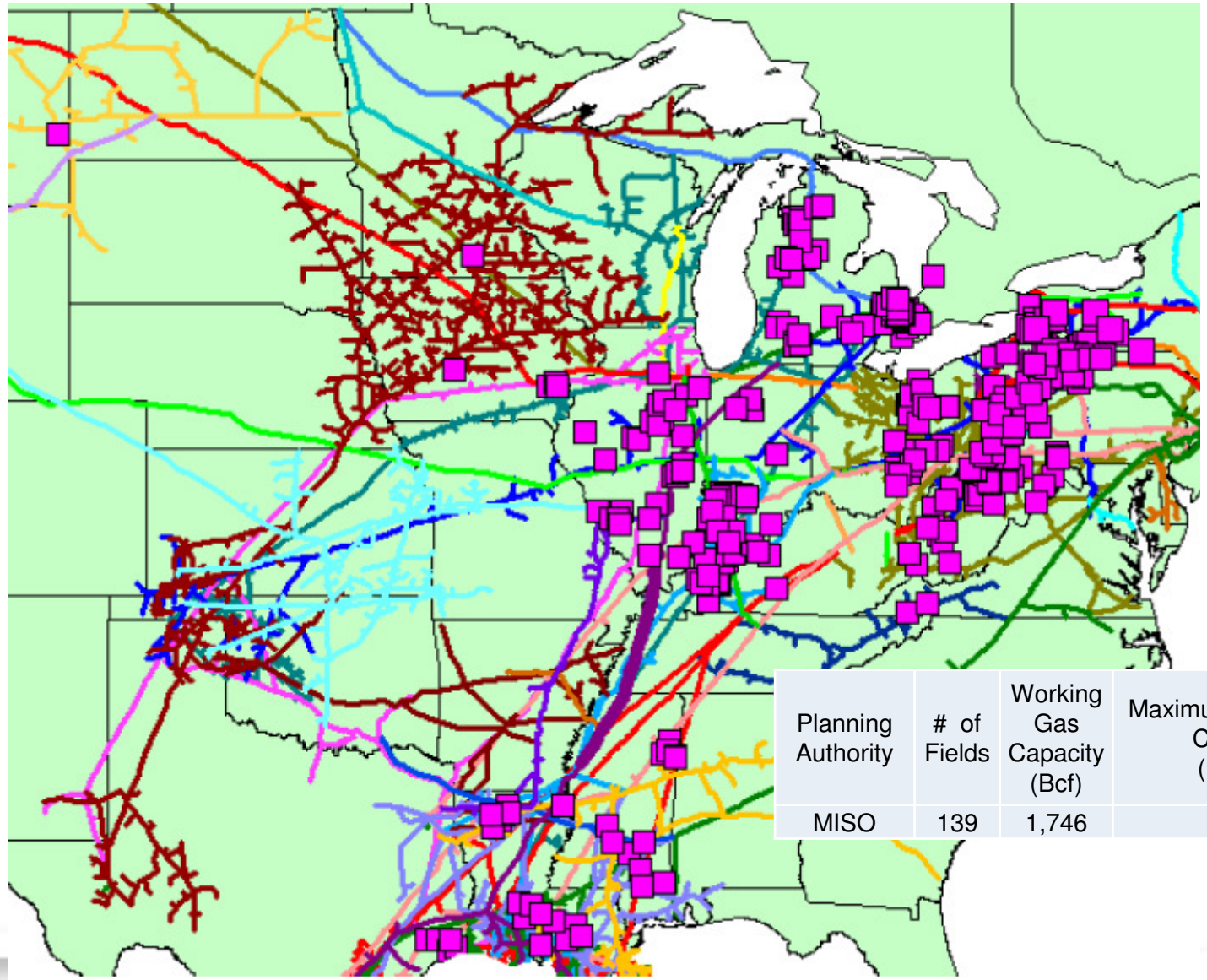
LDCs Serving Generators in MISO South



Intrastate Pipelines Serving Generators in MISO South



Underground Storage Facilities

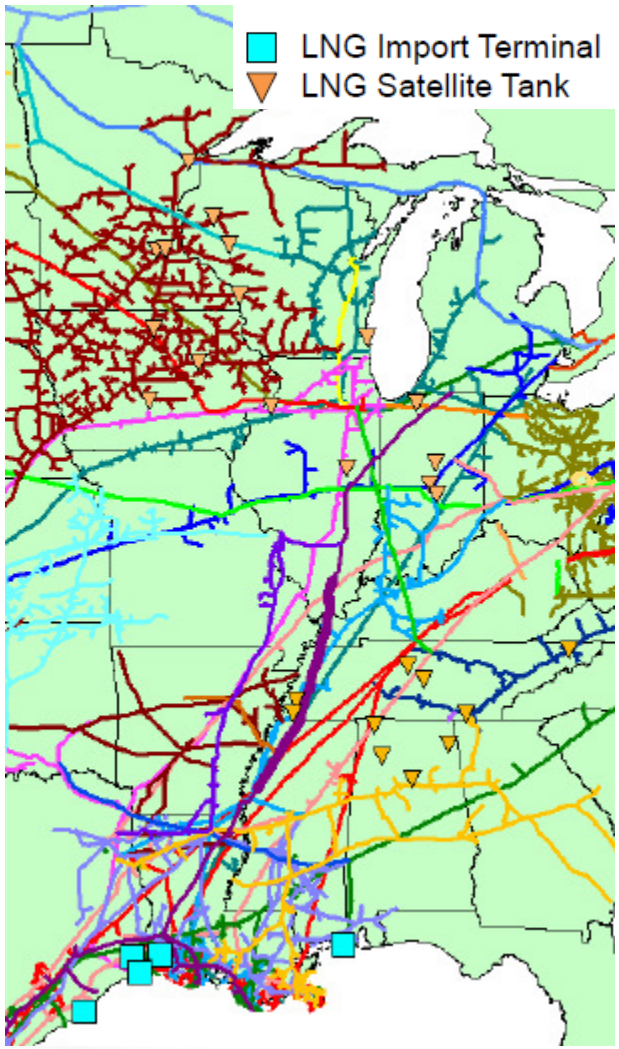


Planning Authority	# of Fields	Working Gas Capacity (Bcf)	Maximum Withdrawal Capability (MMcf/d)
MISO	139	1,746	51,155

Liquid Natural Gas (LNG) Facilities

There are several LNG peaking facilities located in MISO North/Central.

There are six LNG import terminals in or near MISO's southern region.



QUALITATIVE ASSESSMENT OF GAS-ELECTRIC INTERFACE CAPABILITY

The color coding is relational, based on the gas-electric interface attributes observed in the six Participating Planning Authorities (PPA).

Green = Favorable gas-electric interface conditions relative to the other PPAs. The absence of pressing concerns regarding the operational & commercial infrastructure available to generation companies.

Yellow = Neutral conditions, not clearly favorable or unfavorable to generation companies.

Red represents comparatively unfavorable conditions.

	Criterion	PJM	MISO	NYISO	ISO-NE	TVA	IESO
Natural Gas Supply	Gas Supply Portfolio Diversity						
	Pipeline Connectivity Level						
	Conventional Storage Deliverability						
	LNG Storage Capability						
Electric-Gas Interface	Firm Transportation Entitlements						
	Direct Pipeline Connectivity						
Electric/Gas Tariff	Pipeline or LDC Penalties						
	LDC Provision of Flexible Service						
	Active Secondary Market						

Penalty charges for unauthorized overpulls:
Both pipelines & LDCs have provisions memorialized in their tariffs to safeguard against scheduling conduct that degrades service to firm customers.

Under normal operating conditions, pipelines typically do not require shippers to keep strictly to scheduled quantity levels or to uniform hourly flows, so long as any daily imbalance is resolved within a time frame agreeable to the pipeline, & any non-uniform hourly flows within the gas day are manageable by the pipeline.

Further, pipelines typically do not assess penalties to shippers that take gas within a certain tolerance level above their scheduled quantities.

Both LDCs & pipelines, however, have the ability to assess significant & punitive penalties during extreme operating conditions, when OFOs are in effect, & a shipper's non-ratable takes of unauthorized overpulls, which diverge from the scheduling requirements set forth in the tariffs, threaten to harm pipeline operational integrity.

Stakeholder Schedule

Item	Date	Gas-Electric System Interface Study Stakeholder Schedule
5	4/4/2014	Target 1 Final Draft Report Submitted to DOE (Target 1 Complete)
6	4/23/2014	Post Additional Details on Scenario/Sensitivity Data and Assumptions
7	**5/7/2014**	**SSC Webinar – discuss Target 2 results**
7a		Discuss Target 2 status
7b		Discuss second set of sensitivities
8	5/30/2014	Initial Target 2 Draft Report sent to Stakeholders
8a		Includes results from first set of sensitivities
9	5/30/14-6/27/2014	PPA Stakeholder Group Meetings on Target 2 Results
10	6/13/2014	Stakeholder Comments on Initial Target 2 Draft Report Due
11	**6/25/2014 – 6/26/2014**	**SSC Mid-Point Meeting – 6/25-26/14 (Location – Atlanta, Sheraton downtown)**
11a		Discuss Target 2 Results
11b		Discuss Initial Target 2 Draft Report (only includes the results from the three scenarios and the first set of sensitivities)
11c		Finalize second set of sensitivities (PPAs will determine how many sensitivity runs can be accommodated)
11d		Discuss on-going work in Target 3 and Target 4
12	7/3/2014	Post List of Second Set of Sensitivities
13	**7/25/2014**	**Target 4 Draft Report sent to Stakeholders**
14	7/25/14-8/22/2014	PPA Stakeholder Group Meetings on Target 4 Results
15	**8/1/2014**	**SSC Webinar – discuss Target 4 results**
15a		Discuss Target 2 status
15b		Discuss Target 4 results and draft report

Stakeholder Schedule

Item	Date	Gas-Electric System Interface Study Stakeholder Schedule
16	8/15/2014	Stakeholder Comments on Target 4 Draft Report Due
17	9/5/2014	Target 4 Final Draft Report Submitted to DOE (Target 4 Complete)
18	9/12/2014	Target 2 Revised Draft Report to Include Second Set of Sensitivities
18a		Includes results from second set of sensitivities
19	**9/19/2014**	**SSC Webinar – discuss Target 3 results**
19a		Target 2 Revised Draft Report
19b		Target 3 status and results available
20	9/26/2014	Stakeholder Comments on Target 2 Revised Draft Report Due
21	10/10/2014	Target 2 Final Draft Report Submitted to DOE (Target 2 Complete)
22	11/14/2014	Target 3 Draft Report sent to Stakeholders
23	11/14/2014 - 12/12/2014	PPA Stakeholder Group Meetings on Target 3 Results – between 11/14/14 and 12/12/14
24	**11/21/2014**	**SSC Webinar – discuss Target 3 results**
25	12/5/2014	Stakeholder Comments on Target 3 Draft Report Due
26	12/26/2014	Target 3 Final Draft Report Submitted to DOE (Target 3 Complete)
27	2/17/2015	Draft Revision to Phase II Report to Stakeholders
28	2/25/2015 - 2/26/2015	SSC Final Meeting to Discuss Report
29	3/10/2015	Final Written Stakeholder Input on Draft Report Due
30	4/8/2015	Revised Final Draft Report Sent to DOE
31	6/4/2015	Final Report Submitted
32	6/4/2015	End of Project

Questions

http://www.eipconline.com/Home.html

Participating Planning Authority (PPA) Study Contacts			
Project Manager	Dave Whiteley	d.a.whiteley@att.net	314-753-6200
NYISO	John Buechler Coordinating Committee Chairman	jbuechler@nyiso.com	518-356-6153
ISO-NE	Mark Babula Technical Work Group Chairman	mbabula@iso-ne.com	413-535-4324
PJM	Gary Helm	helmm@pjm.com	610-666-2273
MISO	Eric Thoms	ethoms@misoenergy.org	651-632-8454
TVA	Ian Grant	isgrant@tva.gov	423-751-8721
IESO	Dan Rochester	dan.rochester@ieso.ca	905-855-6363