

NYISO 2015/2016 ICAP Demand Curve Reset

*Review of Natural Gas Trading Hub
Recommendations*

ICAPWG
June 2, 2016

- **Provide additional information on data sources and methodology**
 - Used in determining net EAS revenue projections, which serve as an offset to the peaking plant gross cost of new entry (CONE)
 - Will be used as part of developing the ICAP Demand Curve values for the 2017/2018 Capability Year, as well as the annual updates for the 2018/2019, 2019/2020 and 2020/2021 Capability Years
 - Follow-up to stakeholder comments at April 25, 2016 ICAPWG meeting

- **Provide decision criteria and recommendation for natural gas hub pricing points**
 - Used in determining hourly variable (short-run marginal) cost of peaking plant to produce Energy

- **Recommend use of SNL Financial for gas cost and emission price data**
 - Energy indices first published in 2002
 - Data availability varies by hub; included as a consideration in selection
 - Most gas hubs include data pre-2012
 - Indices produced in accordance with guidelines issued in FERC Policy Statement on Natural Gas and Electric Price Indices (Docket No: PL03-3-000)
- **Natural Gas Spot Prices**
 - Indices are developed using price and volume data submitted from market participants on actual next-day and forward transactions (i.e., OTC data)
 - Reports volume weighted average price for next day delivery; excludes outliers that are greater than 2 standard deviations from group mean
 - Net EAS model logic aligns reported gas price for a given day with the appropriate Energy market day and applies fixed intraday premium/discounts in real-time
- **Oil Spot Prices**
 - SNL does not provide historical oil spot prices
 - Recommend use of publicly available data from EIA, with an appropriate transportation and fuel tax adder

- **Review of natural gas hubs and indices reflects multiple considerations:**
 - Market Dynamics: Gas hub price index reflects some historical relationship between gas hub pricing and LBMPs (e.g., extent to which LBMPs reflect pricing of the recommended gas hub)
 - Ideally, prices should reflect a long term equilibrium rather than short run arbitrage opportunities (real or apparent), recognizing that other factors influence LBMP price spikes (e.g., congestion)
 - Liquidity: Gas hub price index with consistent depth of historical data
 - Geography:
 - Lines with a geographic relationship to potential peaking plant locations going forward
 - Reported hub price indices (which reflect average prices over a broad geographic area) with a logical nexus to prices at relevant delivery points
 - Precedent/Continuity: Gas hubs supported by information from multiple sources and used for similar purposes (e.g., previous ICAP Demand Curve reset (DCR), stakeholder feedback on preliminary recommendations, prior studies and evaluations)
 - Appropriate choice of price index can vary with study objectives

- Analysis Group reviewed the following hubs for each Load Zone, consistent with prior studies and stakeholder feedback

Zone	CARIS Phase I (2015)	2013 DCR	IMM (2015 SOM)	Other
NYCA - C	TETCO M3	TETCO M3	Dominion N	-
NYCA - F	TGP Zone 6	TGP Zone 6	Iroquois Zn 2	
LHV - G	TGP Zone 6	Iroquois Zn 2 (Dutchess) TETCO M3 (Rockland)	Iroquois Zn 2 (50%) TETCO M3 (50%)	Millennium East* (Rockland)
NYC - J	Transco Zn 6 NY	Transco Zn 6 NY	Transco Zn 6 NY	-
LI - K	Transco Zn 6 NY	Transco Zn 6 NY	Iroquois Zn 2	-

* Feedback provided to Analysis Group during 2016 DCR

Recommendation:

- **Natural gas hubs and pricing points will remain fixed for the duration of the ICAP Demand Curve reset (DCR) period**

- **Natural gas hubs will reflect CARIS assumptions:**
 - Load Zone C: TETCO M3
 - Load Zone F and G: TGP Zone 6
 - Continuing to assess the use of Iroquois Zone 2 as potential alternative (discussed more below)
 - Load Zone J and K: Transco Zone 6 NY

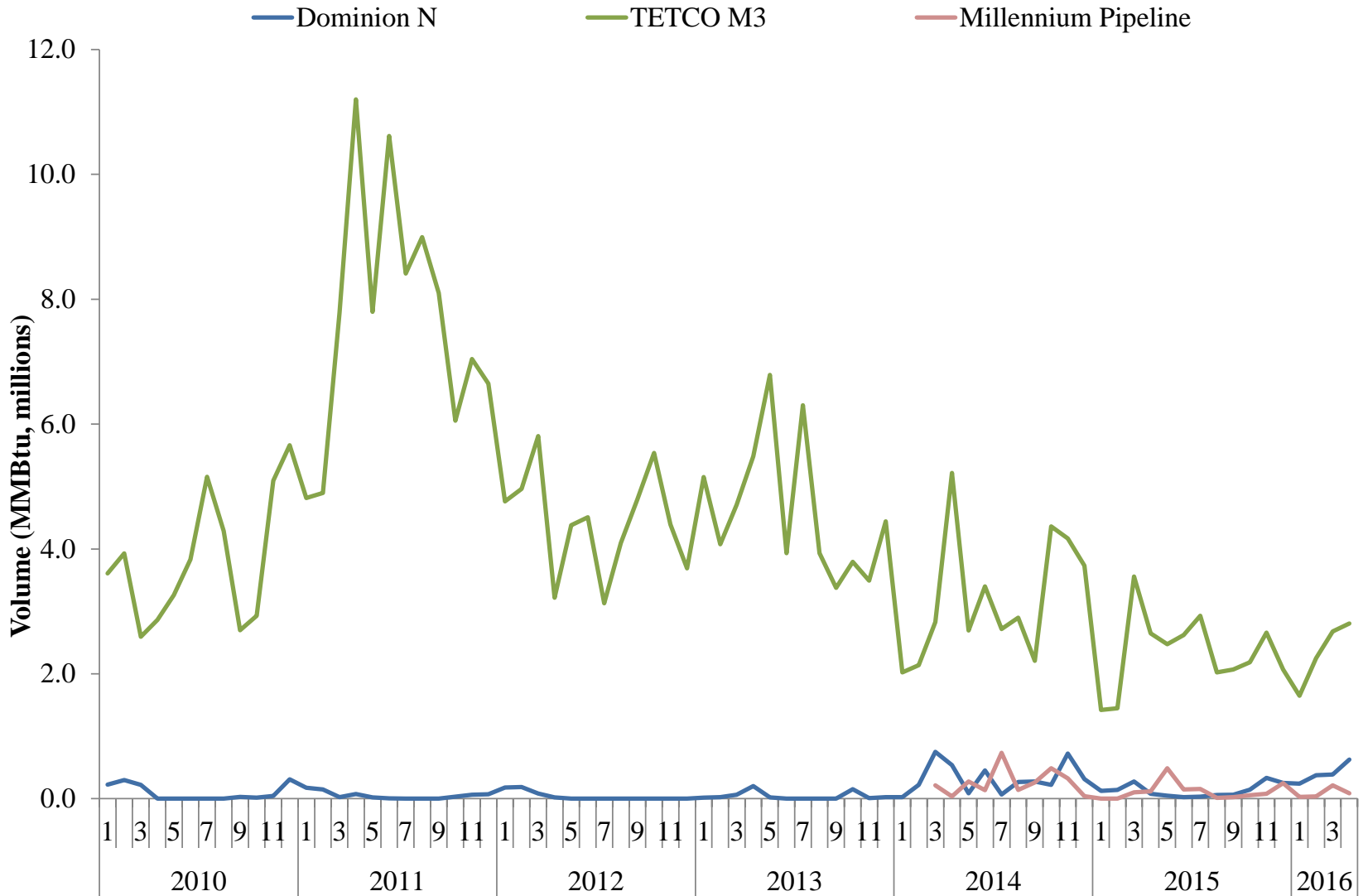
- **The following slides present additional support for these recommendations**

Decision Criteria:

- TETCO M3 has a strong historical precedent for use as a proxy gas pricing hub in Load Zone C, is sufficiently traded, and a strong correlation with market prices

Decision Criteria		TETCO M3	Dominion N	Millennium
Market Dynamics		Yes	Low LBMP correlation	No
Liquidity		Yes	Increasing / Shorter History	Low Volume/Low Trades
Geography		No	Yes	Yes
Recommendation		✓		
Precedent	2013 DCR	Yes	No	No
	CARIS (2015) Phase I	Yes	No	No
	IMM (2015)	No	Yes	No

Load Zone C (Trade Volume, MMBtu)

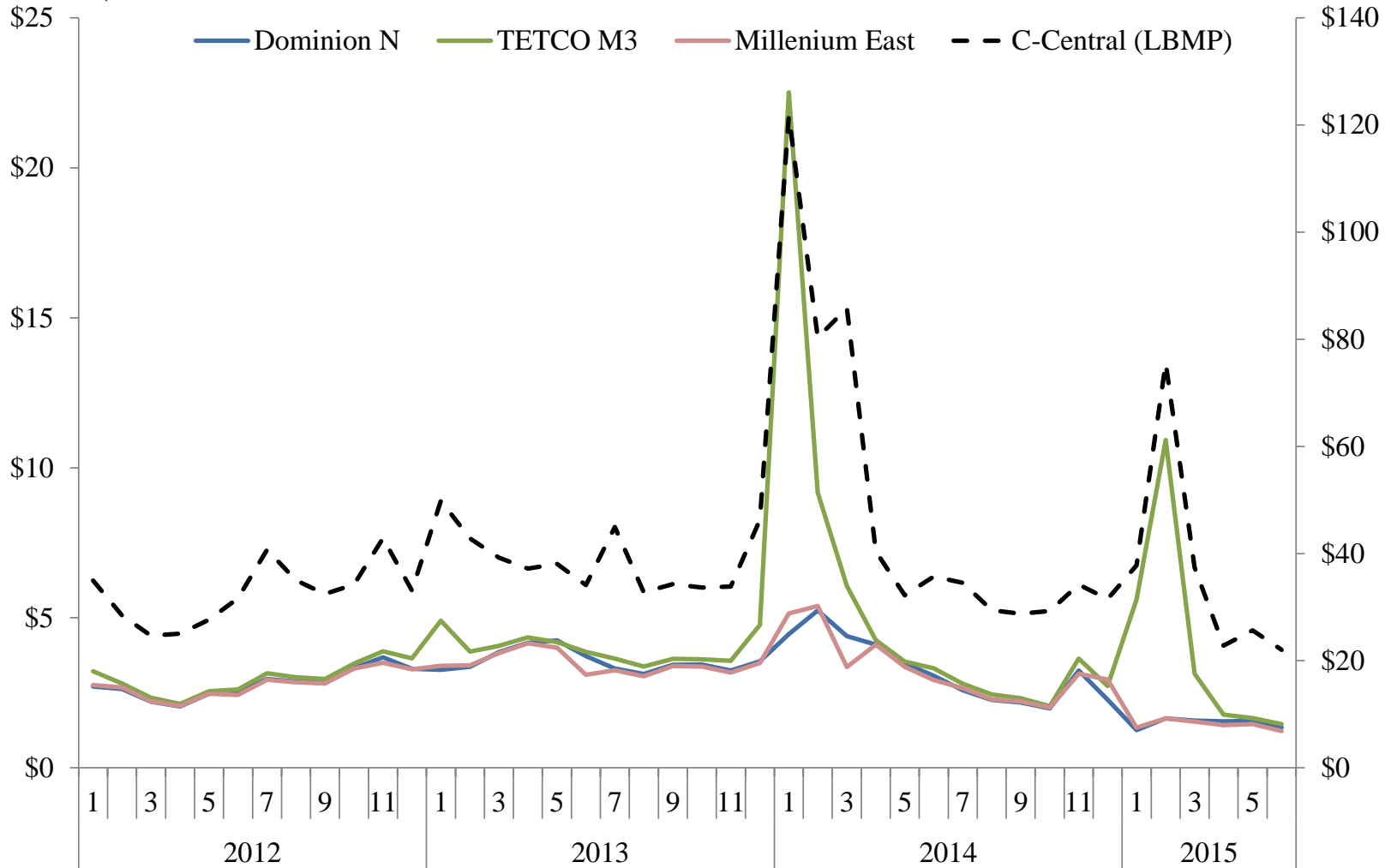


Source: SNL Financial.

Note: SNL Financial began reporting Millennium Hub in March 2014.

**Monthly Average
Spot Fuel Prices
(\$/MMBtu)**

DAM LBMP



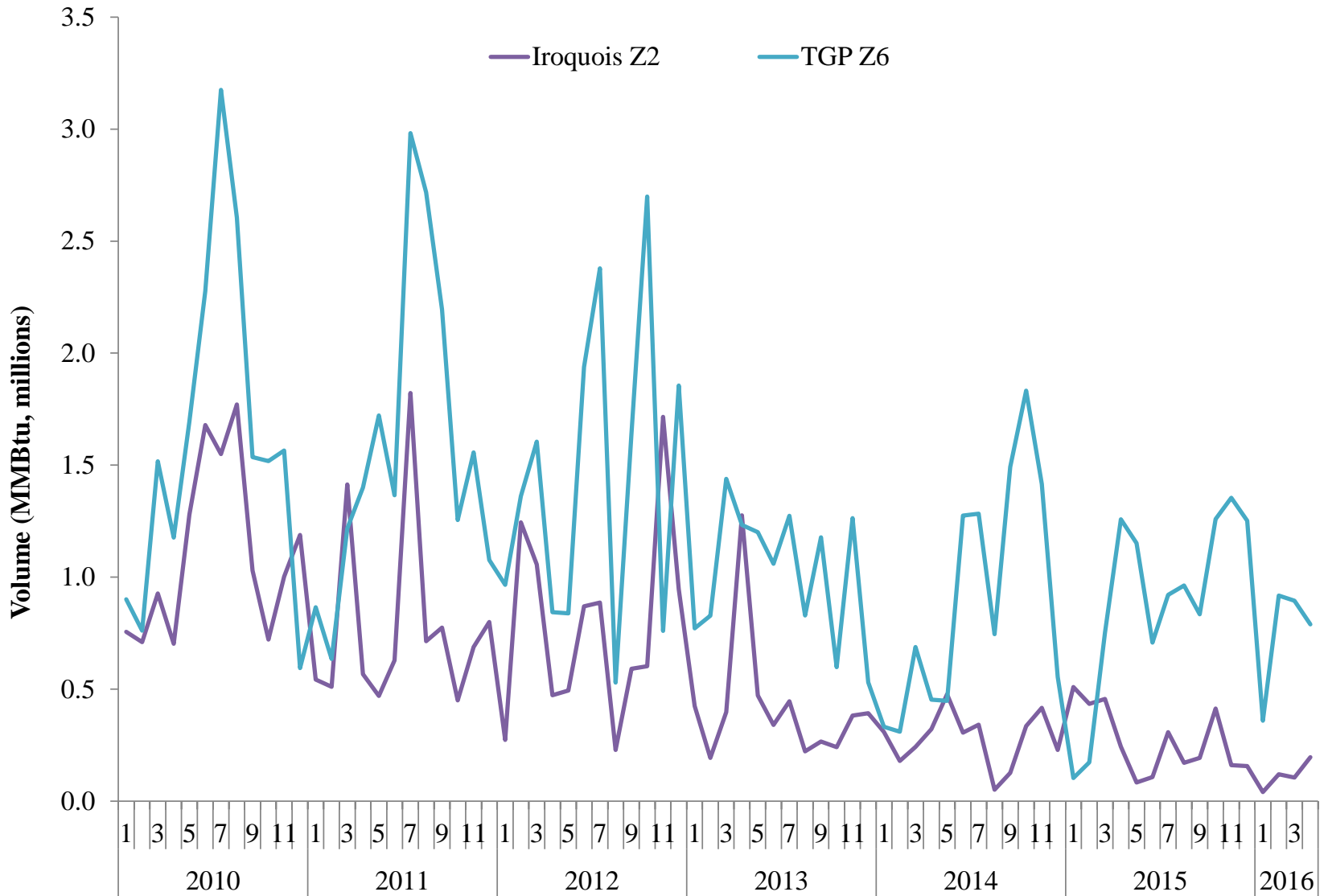
Source: ICE (Millennium East); SNL (All Others).

Decision Criteria:

- TGP Z6 has a strong historical precedent as a proxy gas hub in Load Zone F, is sufficiently traded, and a strong correlation with market prices;
- Notably, Iroquois Zn 2 is similarly situated with respect to alignment with decision criteria. Compared to TGP Z6, Iroquois Zn 2 also benefits from potentially greater geographical proximity, and may face less risk of spurious pricing from ISO-NE market events (e.g., imports from Canaport)

Decision Criteria		TGP Z6	Iroquois Zn 2
Market Dynamics		Yes	Yes
Liquidity		Yes	Variable
Geography		No	Yes
Recommendation		✓	?
Precedent	2013 DCR	Yes (Load Zone F)	Yes (Load Zone G)
	CARIS (2015) Phase I	Yes (Load Zone F and G)	No
	IMM (2015)	No	Yes (Load Zone F)

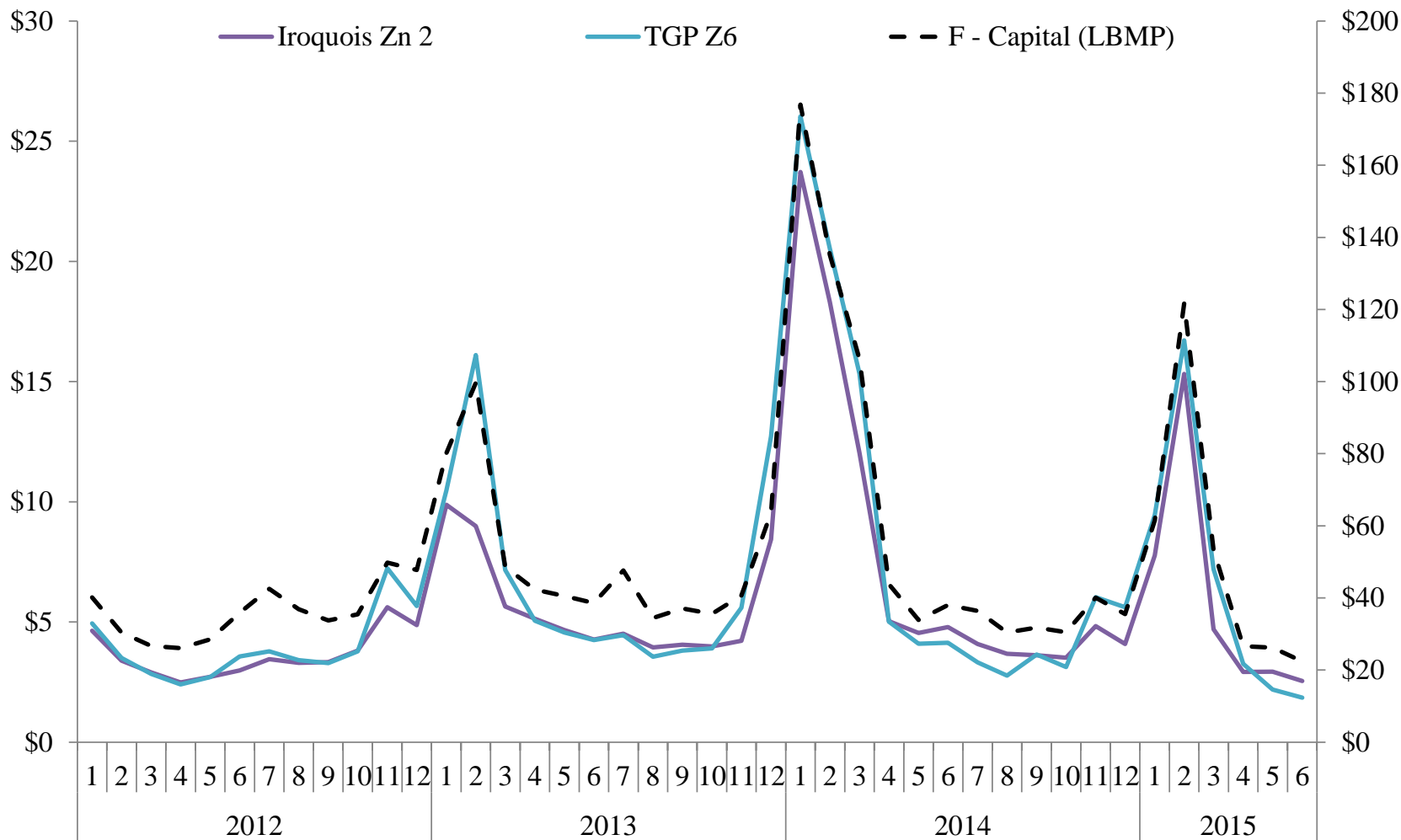
Load Zone F (Trade Volume, MMBtu)



Source: SNL Financial.

Monthly Average Spot Fuel Prices (\$/MMBtu)

DAM LBMP



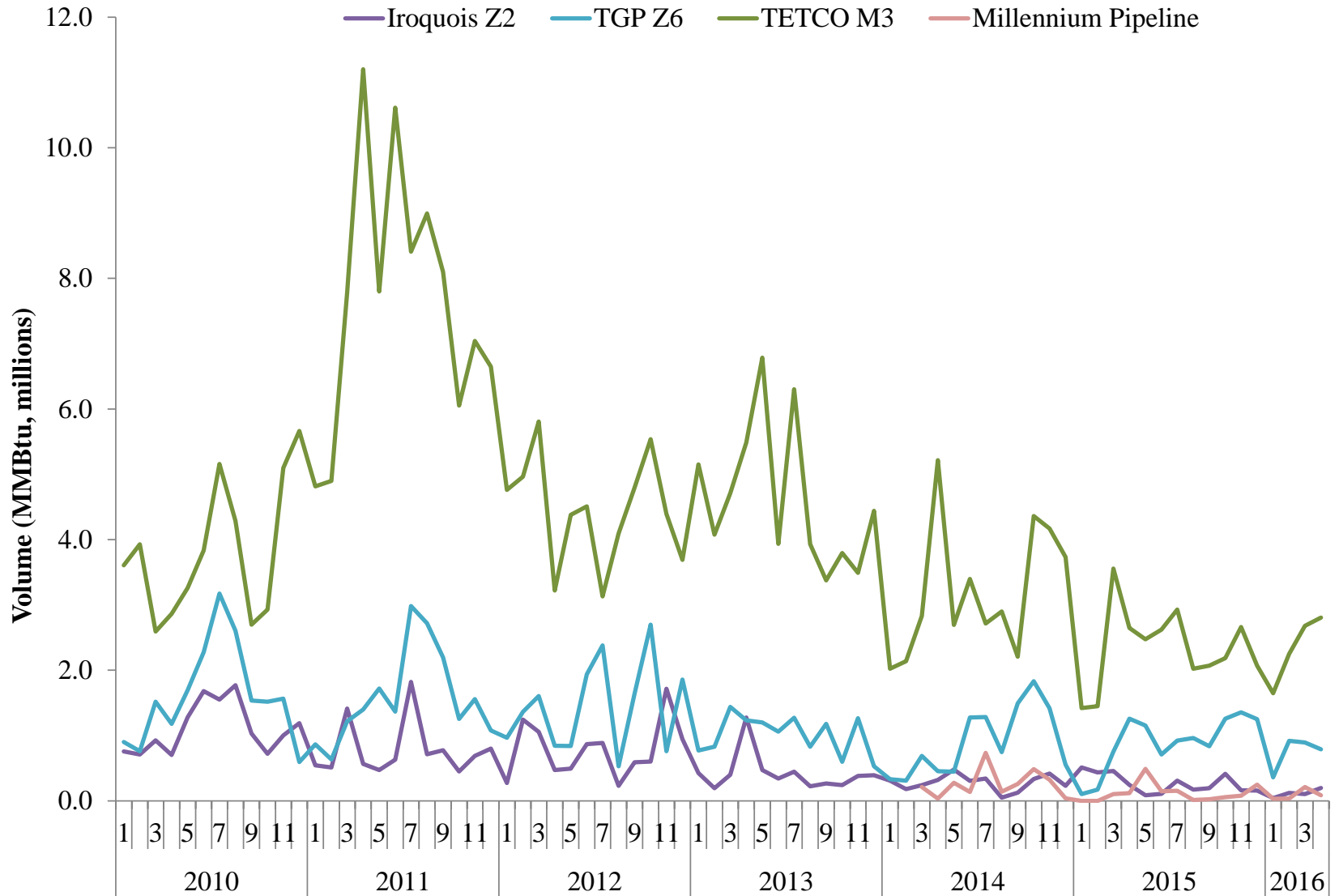
Source: SNL Financial.

Decision Criteria:

- TGP Z6 represents the best balance among decision criteria; provides appropriate granularity and representation of gas price differentials within the G-I region, consistent with prior studies and historical market prices
 - Iroquois Zn 2 remains under consideration for reasons similar to Load Zone F (see slide 9)
- Millennium trading hub is new (2012) and hub index may not fully reflect pricing dynamics at the East end of the line; TETCO M3 may not fully capture market dynamics

Decision Criteria		TGP Z6	TETCO M3	Iroquois Zn 2	Millennium
Market Dynamics		Yes	Partial	Yes	Low correlation
Liquidity		Yes	Yes	Variable	Low Volume/Low Trades
Geography		No	No	Yes	Yes
Recommendation		✓		?	
Precedent	2013 DCR	No	No	Yes	No
	CARIS (2015) Phase I	Yes	No	No	No
	IMM (2015)	No	Yes	Yes	No

Load Zone G (Trade Volume, MMBtu)

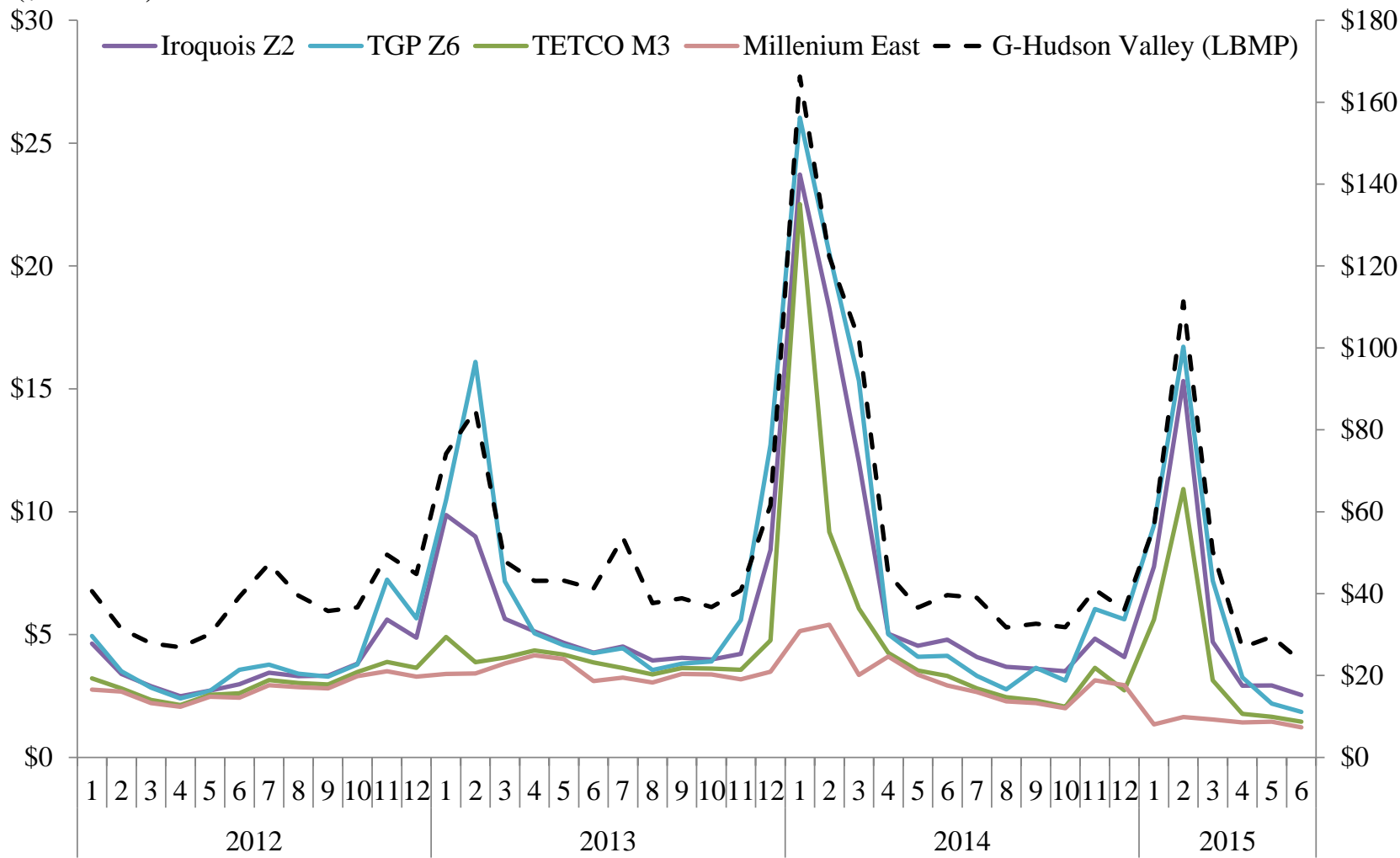


Source: SNL Financial.

Load Zone G (LBMP and Gas Prices)

Monthly Average
Spot Fuel Prices
(\$/MMBtu)

DAM LBMP



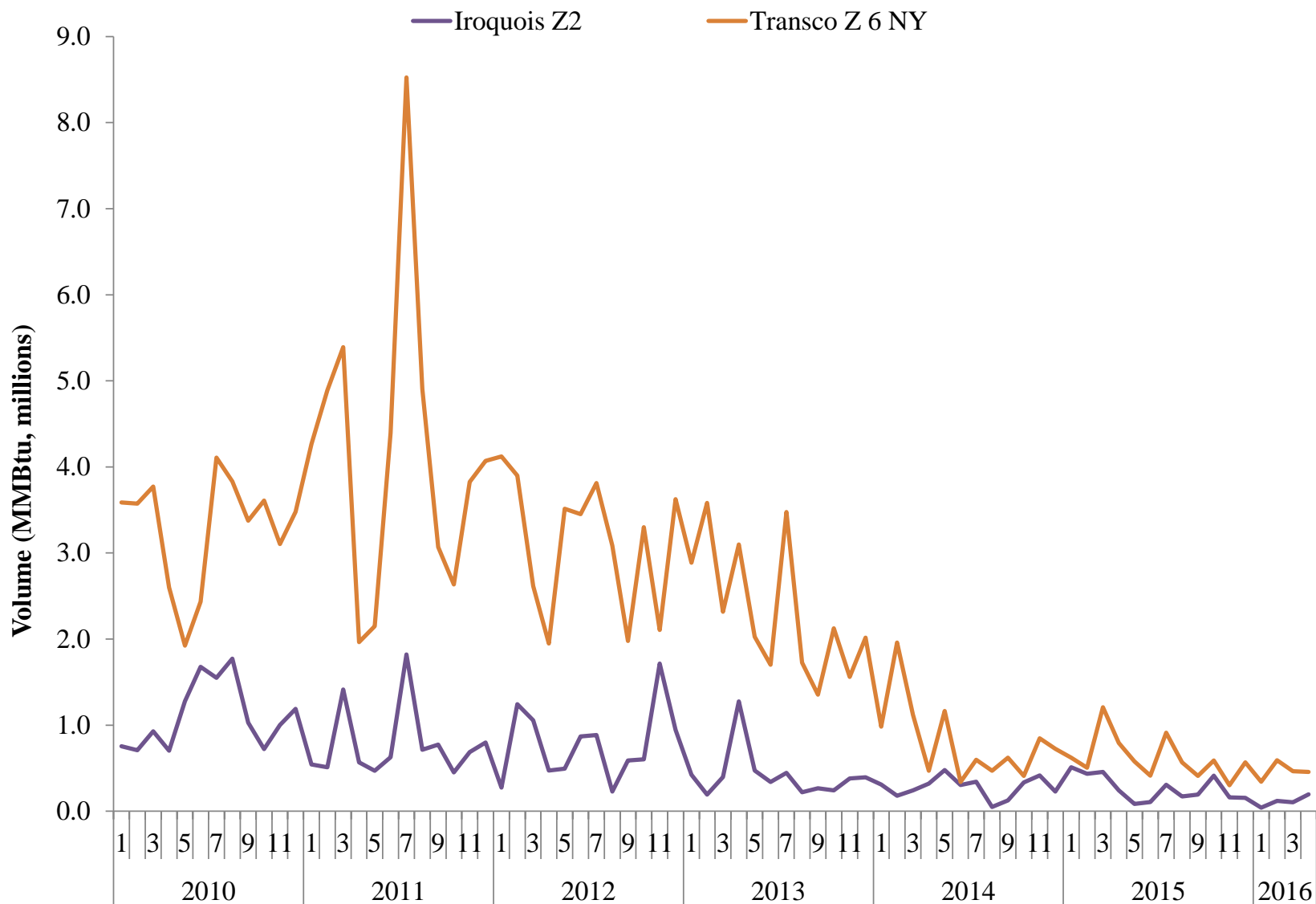
Source: ICE (Millennium East); SNL (All Others).

Decision Criteria:

- Transco Zn 6 NY has a strong historical precedent as a trading hub in Zones J and K, is sufficiently traded, and has a strong correlation with market prices

Decision Criteria		Transco Zone 6 NY (Load Zones J and K)	Iroquois Zn 2 (Load Zone K)
Market Dynamics		Yes	Yes
Liquidity		Yes	Variable
Geography		Yes	Yes
Recommendation		✓	
Precedent	2013 DCR	Yes	No
	CARIS (2015) Phase I	Yes	No
	IMM (2015)	Yes (Zone J)	Yes (Zone K)

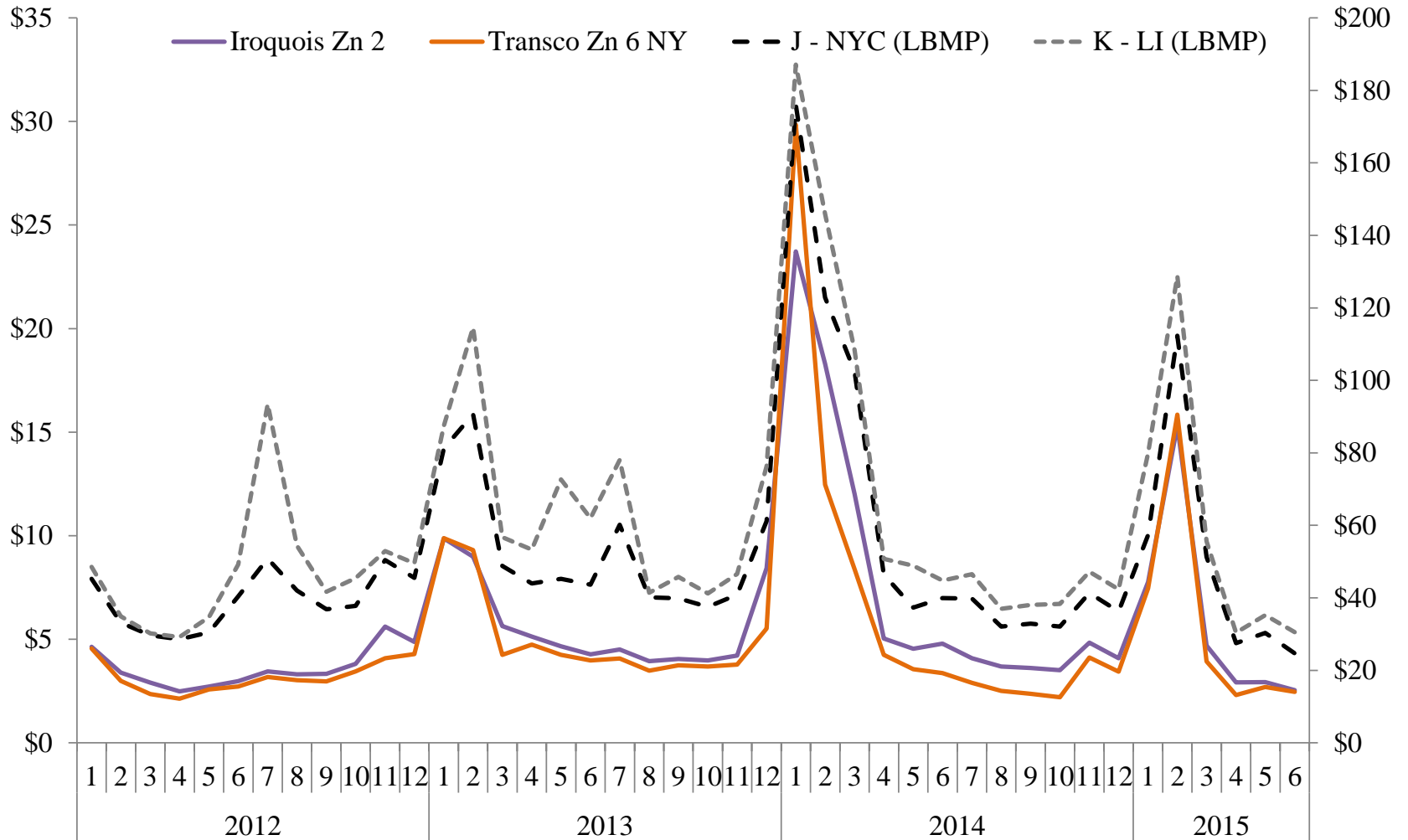
Load Zones J and K (Trade Volume, MMBtu)



Source: SNL Financial.

Monthly Average Spot Fuel Prices (\$/MMBtu)

DAM LBMP



Source: SNL Financial.