

BOARD STAFF INTERROGATORY #1

INTERROGATORY

Compliance with the Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply and/or Upstream Transportation Contracts

Reference: EB-2008-0280 Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply and/or Upstream Transportation Contracts

Other Considerations

As per Part V of the filing guidelines, please provide an assessment of the potential impacts on existing transportation pipelines in the market (in terms of Ontario customers).

- a) Is Enbridge Gas Distribution Inc. ("Enbridge") planning to decontract transportation for the equivalent volume associated with the proposed long-term transportation contract (i.e., 30,000 GJ/d)? If so, when?
- b) Please identify the pipeline(s) and route(s) for decontracting transportation.
 - i) What is the potential financial impact of decontracting transportation capacity of over 30,000 GJ/d on existing transportation pipeline facilities (in terms of Ontario customers)?
 - ii) Please confirm that Enbridge is aware that TransCanada PipeLines Limited ("TCPL") Mainline long-haul capacity from Empress to Enbridge's CDA and Enbridge's EDA is currently available.

RESPONSE

- a) Currently, Enbridge does not have any plans to decontract transportation on any pipelines as the result of the proposed long-term transportation contract of 30,000 GJ/d. Enbridge has been meeting the gas supply needs of customers migrating from direct purchase to system recently by increasing Dawn purchases and peaking supplies delivered in the franchise (for days when Enbridge's transport from Dawn is fully utilized). The proposed transportation contract is intended to replace some of the spot and peaking supply that have increased as a result of customer migration, with the remainder being addressed through traditional shorter term transportation and gas supplies.

- b) Please refer to the response in a).
 - i) Please refer to the answer in a).
 - ii) Confirmed.

BOARD STAFF INTERROGATORY #2

INTERROGATORY

Compliance with the Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply and/or Upstream Transportation Contracts

Reference: EB-2008-0280 Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply and/or Upstream Transportation Contracts

Other Considerations

As per Part V, 5.2 of the filing guidelines please provide an assessment of the impacts of the long term contract on retail competition (in terms of Ontario customers).

RESPONSE

Given the small size of the Enbridge long-term transportation contract proposal (i.e., 30,000 GJ/d) in relation to the Ontario gas supply and transportation requirements, Enbridge believes this contract will have no significant impact on retail competition.

BOARD STAFF INTERROGATORY #3

INTERROGATORY

Compliance with the Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply an/or Upstream Transportation Contracts

Reference: EB-2008-0280 Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply and/or Upstream Transportation Contracts

Risk Assessment

As per Part IV of the filing guidelines, please identify the risks associated with underutilized transportation capacity in relation to the proposed long-term contract. In particular, what will happen if the anticipated production at Marcellus does not materialize and as a result the natural gas flows into Niagara decline?

- a) Does Enbridge have a risk mitigation plan in place that addresses the risk(s) of underutilized transportation capacity in relation to the proposed long-term transportation contract? Please explain.
 - i) How will Enbridge minimize this transportation risk?
 - ii) Please explain how this risk (of underutilized transportation capacity) will be allocated between ratepayers and/or Enbridge's shareholder.

RESPONSE

Based on the market projections, Enbridge anticipates that Marcellus production will be large in magnitude. As of November 2010, actual production from Marcellus shale according to PIRA was about 1.4 Bcf/d, and market projections for Marcellus gas by energy consultants have to date been increasing relative to past projections. In addition to expectations for increased production from the Marcellus shale, a number of producers and shippers have already committed to bring Marcellus gas to Niagara as shown in Exhibit B, Tab 1, Schedule 1, Table C, page 9.

- a) Enbridge anticipates that the proposed contract will be fully utilized because Marcellus supplies are expected to be abundant and because anticipated annual supply deliveries through the proposed contract represent less than one fifth of the current spot requirements. In addition, Enbridge's supply and transportation

portfolio are flexible enough to allow changes and adjustments in order to minimize the risk of underutilization.

- i) Refer to the response in a).
- ii) For reasons indicated in the response to a) Enbridge does not anticipate this transport will be underutilized. The proposed contract is being undertaken for the benefit of ratepayers and Enbridge's shareholder should not be responsible for any costs associated with under-utilization of the proposed capacity as a result of unanticipated events after preapproval of this contract. Please refer to the response to Board Staff interrogatory #20 at Exhibit I, Tab 1, Schedule 20 for additional information on the treatment of transportation costs.

BOARD STAFF INTERROGATORY #4

INTERROGATORY

Compliance with the Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply an/or Upstream Transportation Contracts
Reference: EB-2008-0280 Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply and/or Upstream Transportation Contracts

Risk Assessment

As per Part IV of the filing guidelines, please identify the risks associated with a decline in system supply demand during the course of the Niagara supply contract.

- a) Does Enbridge have a risk mitigation plan in place that addresses the risk of excess system supply (due to a decline in system supply demand) in relation to the Niagara supply contract? Please explain.
 - i) How will Enbridge minimize this system supply risk?
 - ii) Please explain how this risk (of excess system supply to meet in-franchise requirements) will be allocated between ratepayers and/or Enbridge's shareholder?

RESPONSE

- a) Enbridge does not forecast customer migration, rather Enbridge is required to be a supplier of last resort for its customers and plan for adequate flexibility in its portfolio such that it can be scaled up or down in relation to customer migration. In recent years, there has been significant migration to system supply from direct purchase supply.
 - i) Although Enbridge does not anticipate a significant decline in system supply, Enbridge's supply and transport portfolio is flexible in that most of the contracts are one year or less in duration. Niagara supply constitutes less than 5% of its system supply requirements and less than 1% of the transport contracted to meet system supply and load balancing needs of all its bundled customers. The structure of the portfolio minimizes the risk of stranding capacity as a result of migration away from system supply.

- ii) Please refer to the responses in a) and in i). Enbridge's regulatory model does not compensate Enbridge for assuming gas supply risk. In the unlikely event of a large decline in demand for system supply and consequent stranding of capacity/cost, Enbridge's shareholder should not be liable for any associated costs.

BOARD STAFF INTERROGATORY #5

INTERROGATORY

Enbridge's In-Franchise Customers

Reference: Exhibit B, Tab 1, Schedule 1, page 3 of 11, #10

Enbridge states that "the Niagara to Enbridge CDA contract will improve security and diversity of supply and provide Enbridge with operational and contractual flexibility to meet natural gas demand in its franchise area".

- a) Please confirm that the proposed long-term transportation contract is to serve in-franchise customers system supply demand only.
- b) If not, please explain how serving ex-franchise customers under the proposed long-term transportation contract improve security for Enbridge's in-franchise customers.

RESPONSE

a) and b) Confirmed.

BOARD STAFF INTERROGATORY #6

INTERROGATORY

Landed Cost Analysis

Reference: Exhibit B, Tab 1, Schedule 1, Appendix F

Please provide a table representation of the graph. Please breakdown Enbridge's natural gas supply portfolio itemized by: name of pipeline, route, service, term, volume (GJ/day), receipt / delivery points, cost per year in CDN\$, effective date, and expiration date for each of its supply contracts in its portfolio.

RESPONSE

Please see the response to Board Staff interrogatory #15 which can be found at Exhibit I, Tab 1, Schedule 15. As indicated in the referenced response, some of EGD's gas supply portfolio is procured on a monthly or daily basis in accordance with the EGD Gas Supply Procurement Manual filed with the OEB in June 2007. As a result the requested information is not available for this proportion of EGD's 2011 gas procurement activities.

BOARD STAFF INTERROGATORY #7

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Please provide a detailed table that itemizes Enbridge's transportation portfolio. Please include the following information: name of pipeline, route, service, term, volume (GJ/day), receipt / delivery points, cost per year in CDN\$, effective date, and expiration date for each of the transportation contracts.

RESPONSE

See the table below.

ENBRIDGE GAS DISTRIBUTION TRANSPORTATION PORTFOLIO - NOVEMBER 1, 2010

<u>Supply Source</u>	<u>Pipeline</u>	<u>Service</u>	<u>Volume (GJ/day)</u>	<u>Receipt/Delivery Point</u>	<u>Cost/Year CDN\$</u>	<u>Effective Date</u>	<u>Expiration Date</u>
Dawn/Storage	Union	M12	32,123	Dawn/Kirkwall	773,843	3/31/2004	3/31/2014
Dawn/Storage	Union	M12	1,764,678	Dawn/Parkway	50,240,383	3/31/2004	3/31/2014
Dawn/Storage	Union	M12	10,692	Dawn/Parkway	304,401	11/1/2008	10/31/2011
Dawn/Storage	Union	M12	53,455	Dawn/Parkway	1,521,864	11/1/2009	10/31/2011
Dawn/Storage	Union	M12	20,848	Dawn/Parkway	593,543	11/1/2010	10/31/2011
Dawn/Storage	Union	M12	35,806	Dawn/Kirkwall	862,567	11/1/2000	10/31/2011
Dawn/Storage	Union	M12	107,000	Dawn/Parkway or Kirkwall	3,046,290	11/1/2001	10/31/2011
Dawn/Storage	Union	M12	37,400	Dawn/Parkway	1,064,778	11/1/2002	10/31/2011
Dawn/Storage	Union	M12	106,000	Dawn/Parkway	3,017,820	11/1/2006	10/31/2018
Dawn/Storage	Union	M12	57,100	Dawn/Parkway	1,625,637	11/1/2007	10/31/2019
Dawn/Storage	Union	M12-X*	200,000	Dawn-Parkway-Kirkwall/Dawn-Parkway-Kirkwall	5,986,000	11/1/2011	10/31/2021
Parkway	Union	C1	436,586	Parkway/Dawn	2,868,370	4/1/2006	3/31/2014
Dawn	TCPL	Shorthaul	149,818	Dawn/EGD CDA	10,171,144	11/1/2010	10/31/2011
Dawn	TCPL	Shorthaul	114,000	Dawn/EGD EDA	16,311,120	11/1/2010	10/31/2011
Dawn	TCPL	Shorthaul	572	Parkway/EGD CDA	38,833	11/1/2008	10/31/2013
Dawn	TCPL	Shorthaul	85,000	Parkway/EGD CDA	5,770,650	11/1/2008	6/30/2011
Dawn	TCPL	Shorthaul	40,000	Dawn/Iroquois	5,402,000	4/1/2011	10/31/2012
Dawn/Storage	TCPL	STS	283,892	Parkway/EGD CDA	4,023,587	11/1/2010	10/31/2011
Dawn/Storage	TCPL	STS	70,895	Parkway/Kirkwall/EGD EDA	3,090,710	11/1/2010	10/31/2011
Dawn/Storage	TCPL	STS	9,716	Parkway/EGD EDA	423,575	11/1/2010	10/31/2011
Empress	TCPL	Firm	63,468	Empress/EGD CDA	37,947,930	11/1/2010	10/31/2011
Empress	TCPL	Firm	171,970	Empress/EGD EDA	102,821,981	11/1/2010	10/31/2011
Empress	TCPL	Firm	25,000	Empress/EGD EDA	14,947,663	11/1/2010	10/31/2013
Empress	TCPL	STFT	50,000	Empress/EGD CDA	12,367,655	11/1/2010	3/31/2011
Empress	TCPL	STFT	150,000	Empress/EGD CDA	22,114,350	12/1/2010	2/28/2011
Empress	TCPL	STFT	50,000	Empress/EGD EDA	7,371,450	12/1/2010	2/28/2011
Chicago	Vector/Dawn	Firm	101,285	Chicago/Dawn	9,416,011	12/1/2000	10/31/2015
Chicago	Vector/Dawn	Firm	83,349	Chicago/Dawn	7,748,581	11/1/2008	10/31/2015
Chicago	Vector/Dawn	Firm	52,753	Chicago/Dawn	4,904,209	11/1/2010	10/31/2015
Chicago	Vector/Dawn	Firm	52,753	Chicago/Dawn	4,904,209	11/1/2010	10/31/2015
CREC	Alliance/Vector	Firm	80,000	CREC/Dawn	42,348,760	12/1/2000	10/31/2015
AECO	NOVA	Firm	36,869	AECO/Empress	2,504,382	11/1/2010	10/31/2012

Note : M12X contract will displace an equivalent amount of M12 and C1 volume when it becomes effective.

BOARD STAFF INTERROGATORY #8

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Please confirm that the chart shows TCPL-STFT capacity expiring in 2012.

RESPONSE

All existing TCPL STFT capacity expires on April 1, 2011. The System Reliability proceeding (EB-2010-0231) allows for the continuation of this contracting practice. Enbridge expects to contract for the same level of TCPL STFT in subsequent winters.

BOARD STAFF INTERROGATORY #9

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Please confirm that the chart shows TCPL-FT capacity will be reduced to less than 10% of Enbridge's total transportation capacity starting in 2015.

RESPONSE

Appendix E shows the expiry profile of the existing transportation contracts and does not include any plans for renewals of future transportation requirements. EGD is both a long haul and short haul shipper on TCPL's Mainline. The Company's distribution system interconnects with the Mainline in approximately 40 locations throughout the franchise. Consequently EGD must be an FT shipper on the Mainline for the foreseeable future.

BOARD STAFF INTERROGATORY #10

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Please provide the current status of Enbridge's contract with TCPL including renewal options and associated timelines.

RESPONSE

Please refer to Board Staff Interrogatory #7 at Exhibit I, Tab 1, Schedule 7, for information on the current status of Enbridge's contracts with TCPL. TransCanada's FT contracts require notice of renewal six months prior to contract expiry and Enbridge reassesses its portfolio annually taking into account all the expiring contracts and franchise demand conditions to make supply and transport plans for the year ahead. While it is likely that many TCPL contracts will continue to be renewed annually, Enbridge is not in a position at this time to specifically comment on the renewal options and timelines associated with the existing TCPL contracts.

BOARD STAFF INTERROGATORY #11

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Please confirm that the chart shows Alliance and Vector capacity expiring in 2016.

RESPONSE

The Alliance and Vector capacity shown on the chart in Appendix E expires in November 2015. Enbridge has provided notice of non-renewal of the Alliance capacity for 2016, and will make its renewal decision on the Vector capacity in 2012.

BOARD STAFF INTERROGATORY #12

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Please provide the current status of Enbridge's contract with Alliance and Vector including renewal options and associated timelines.

RESPONSE

Please refer to the response to Board Staff Interrogatory #11 at Exhibit I, Tab 1, Schedule 11, for renewal options and timelines associated with the Alliance and Vector contracts.

BOARD STAFF INTERROGATORY #13

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

If Enbridge's Alliance and Vector capacity is expected to continue beyond 2016, please provide the justification for these decisions including the detailed economic calculations supporting this decision.

RESPONSE

Please refer to the response to Board Staff Interrogatory #11 at Exhibit I, Tab 1, Schedule 11.

BOARD STAFF INTERROGATORY #14

INTERROGATORY

Enbridge's Upstream Transport Contract Demand (or Transportation Portfolio)
Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Please confirm that the chart shows peaking services capacity expiring in 2012.
Please explain what is the "peaking service" listed in the chart and who provides this service?

RESPONSE

Enbridge's peaking service supply contracts expire in April 2011. Enbridge's total peaking supply shown on the chart in Appendix E amounts to 211,014 GJ/d. Of this, 142,434 GJ/d serves the Enbridge CDA and 68,580 GJ/d serves the Enbridge EDA. Enbridge's peaking supply contracts are acquired through an RFP process each year based on an annual gas supply plan which includes peaking requirements. Enbridge has not included supplier names in the chart as that information is competitively sensitive.

BOARD STAFF INTERROGATORY #15

INTERROGATORY

The Niagara to Enbridge CDA Contract

Reference: Exhibit B, Tab 1, Schedule 1, pages 5, 6 and 7 of 11, #15-17

Reference: Exhibit B, Tab 1, Schedule 1, Appendix E

Enbridge indicates that in 2011 Niagara supply will account for 4.79% of the budgeted supply acquisition and that this assumes some displacement of Dawn purchases.

In the Report of the Board entitled *Draft LTC Filing Guidelines for the Pre-Approval of Long-Term Natural Gas Supply and/or Upstream Transportation Contracts* (the "LTC Report") dated February 11, 2009, the Board indicated that it needed to understand "how the contract fits into the utility's overall transportation and natural gas supply portfolio".

- a) Will this percentage (of 4.79%) change over the 10-year term of the proposed long-term transportation contract? Please explain.
 - i) Will the size of the overall supply portfolio change over the 10-year term of the proposed long-term transportation contract? Please explain
- b) Please provide the contract length, price, effective date, and expiration date for each of the supply contracts listed in Table A.
- c) Please provide the types of transportation services, receipt / delivery points, cost per year (in CDN \$), effective date for each of the transportation contracts listed in Exhibit B, Tab 1, Schedule 1, Appendix E.
- d) What is the percentage of Enbridge's proposed long-term transportation contract (in terms of volume (GJ/d)) compared to Enbridge's total portfolio of transportation contracts for firm transportation service? Will the percentage change over the 10-year term of the proposed long-term transportation contract?
 - i) Will the size of the overall transportation portfolio change over the 10-year term of the proposed long-term transportation contract? Please explain

RESPONSE

- a) The 4.79% is calculated using EGD's gas supply acquisition budget for 2011. Consequently this percentage may change over the 10-year term of the proposed contract depending on how the Company changes other elements of its supply and transportation portfolio over time.

Enbridge is the supplier of last resort and must ensure it has sufficient flexibility within its supply and transportation portfolio. As discussed in response to Board Staff Interrogatory #1 at Exhibit I, Tab 1, Schedule 1, this contract is meant to reduce the Company's reliance on spot and peaking supplies. There are a variety of other factors that may impact this percentage, most of which stem from the need to meet system gas demand. These factors include customer growth, migration to and from system supply and load balancing requirements.

- i) Please see the response to a). The size of the supply portfolio will change over time based on factors impacting system demand.
- b) Table A was filed as part of the Company's pre-filed evidence in EB 2010-0146, Exhibit B, Tab 4, Schedule 1. Pages 1 to 3 of that evidence briefly highlight the gas supply contracting and associated commodity cost details related to EGD's gas supply portfolio. At the time of filing for 2011 rates EGD had not entered into any gas supply arrangements for the 2011 Test Year. Subsequent to the filing of that evidence EGD has entered into one year gas supply contracts listed in the attachment below. The remainder of the capacity is filled on a monthly or daily basis in accordance to "EGD Gas Supply Procurement Manual" filed with the Board in June 2007.

EGD GAS SUPPLY ONE YEAR CONTRACTS - NOVEMBER 1, 2010

<u>ALLIANCE SUPPLY (CREC)</u>								
Item No.	TERM GAS SUPPLY	Alliance Receipt Point	Firm Day GJ	Firm Day 10 ³ M ³	Price (\$ CAD/GJ)	Effective Date	Termination Date	Heat MJ/m3
1	Supplier A	CREC	30,000	750.0	AECO MI-.155	Nov. 1,2010	Oct.31,2011	40.00
2	Supplier B	CREC	10,000	250.0	AECO MI-.16	Nov. 1,2010	Oct.31,2011	40.00
3	Supplier B	CREC	10,000	250.0	AECO MI-.155	Nov. 1,2010	Oct.31,2011	40.00
4	Supplier B	CREC	10,000	250.0	AECO MI-.15	Nov. 1,2010	Oct.31,2011	40.00
5	Supplier B	CREC	10,000	250.0	AECO MI-.145	Nov. 1,2010	Oct.31,2011	40.00
6	Supplier B	CREC	5,000	125.0	AECO MI-.14	Nov. 1,2010	Oct.31,2011	40.00
7	Supplier C	CREC	5,000	125.0	AECO DI-.155	Nov. 1,2010	Oct.31,2011	40.00
8	Supplier C	CREC	5,000	125.0	AECO DI-.155	Nov. 1,2010	Oct.31,2011	40.00
<u>VECTOR SUPPLY (Chicago)</u>								
Item No.	TERM GAS SUPPLY	Vector Receipt Point	Firm Day Dth		Price (\$ US/MMBTU)	Effective Date	Termination Date	
1	Supplier D	Northern Border	25,000		NGI Monthly Chicago +.02	Nov. 1,2010	Oct.31,2011	
2	Supplier C	Alliance	20,000		NGI Monthly Chicago +.0175	Nov. 1,2010	Oct.31,2011	
3	Supplier E	Alliance	10,000		NGI Monthly Chicago +.015	Nov. 1,2010	Oct.31,2011	
4	Supplier B	Alliance	50,000		NGI Monthly Chicago +.0075	Nov. 1,2010	Oct.31,2011	

- c) Please see the response to Board Staff Interrogatory #7 which can be found at Exhibit I, Tab 1, Schedule 7.
- d) The proposed long-term transportation contract will comprise less than 1.0% of total firm transportation service. Please see the response to a) for a discussion of the factors that may cause the percentage to change over time.
- i) Please see the response to a). The size of the transportation portfolio will change over time based on factors impacting system demand.

BOARD STAFF INTERROGATORY #16

INTERROGATORY

The Niagara to Enbridge CDA Contract

Reference: Exhibit B, Tab 1, Schedule 1, pages 5 of 11, #15

Enbridge states that the delivery point in the contract from Niagara to Enbridge CDA is Enbridge CDA.

- a) Please provide the exact delivery point or points within Enbridge's CDA.
- b) Please provide a map identifying the delivery points and showing the areas that will have direct access to the new supplies.

RESPONSE

- a) The Niagara to Enbridge CDA contract is delivered to the TCPL Enbridge CDA delivery area. The TCPL Enbridge CDA delivery area covers the following meter stations:

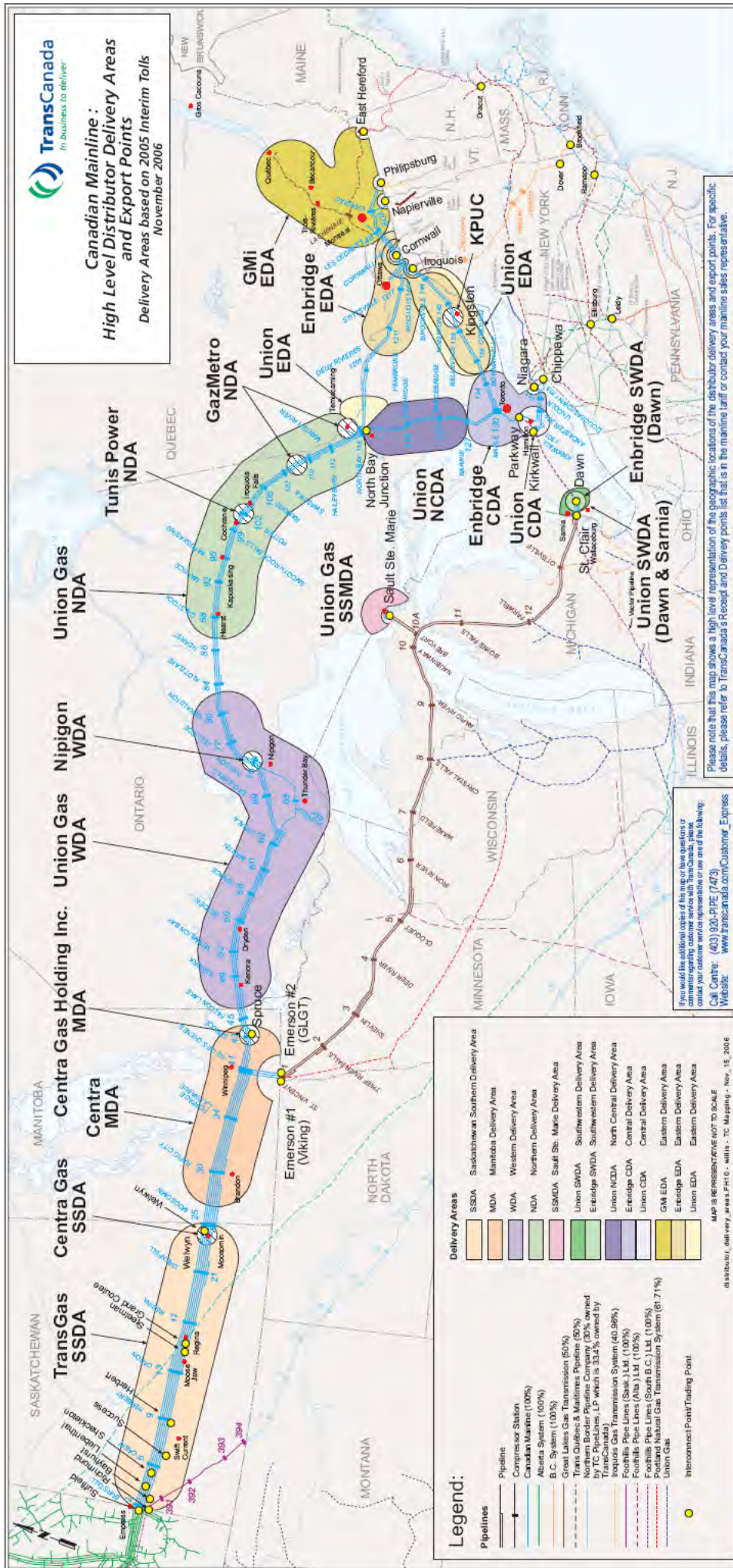
Barrie
Bathurst Gate
Beamsville
Blackhorse
Bondhead
Bowmanville
Brampton
Cookstown
Grimsby
Markham
Mountain Road
Niagara-on-the-Lake
Nobleton
Oro Medonte
Oshawa
Parkway – Enbridge
Pelham Road
Pickering
Richmond Hill

Rugby
Schomberg
Thornton
Victoria Square
Vineland

- b) The following maps show the TCPL toll zones, high level distributor delivery areas, and the Enbridge CDA. A discussion of the delivery areas that will have access to the new supplies can be found in the response to Board Staff Interrogatory #18 at Exhibit I, Tab 1, Schedule 18.



Canadian Mainline :
High Level Distributor Delivery Areas
and Export Points
Delivery Areas based on 2005 Interim Tolls
November 2006



BOARD STAFF INTERROGATORY #17

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, page 2 of 11, #7

Please provide the PIRA study referred to in the evidence. If Enbridge is not able to file the study, please provide an executive summary of the PIRA study.

RESPONSE

Attached please find the PIRA study.



Marcellus Gas Supply: Impacts to Regional Infrastructure and Basis 2010 - 2020

**Harvey L. Harmon, Senior Director
Natural Gas and Global LNG**

**Enbridge Gas Distribution
March 2010**

Introduction

- Supply and Demand projections based on PIRA's Future East Coast Gas Supply: The Impact of Marcellus Shale On the North American Gas Market study released September 2009
 - » Eastern Canada demand based on EGD forecast
- PIRA's view has been and continues to be the development of shale gas both in the Lower 48 and British Columbia is a game changer that will have a major impact on pipeline flows and basis
- PIRA's projections were used to develop a reference case and two sensitivities from RBAC's pipeline specific model of the industry, GPCM Natural Gas Market Forecasting System
- GPCM contains more than 160 existing and proposed pipelines, 150 storage areas, 75 production areas, 45 LNG import terminals, and nearly 500 demand centers.

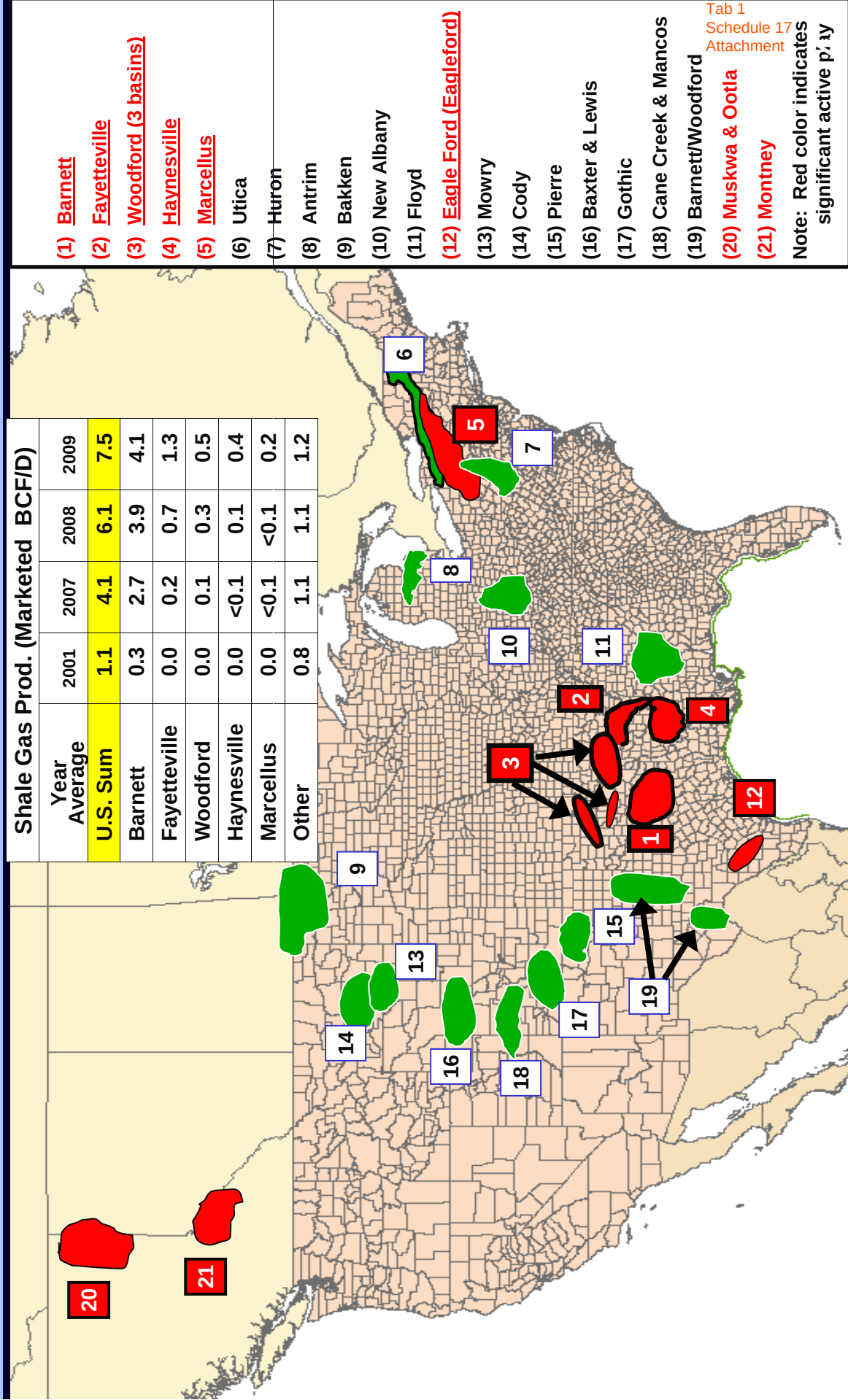
Introduction (2)



- **PIRA assumes that a U.S. CO2 cap and trade scheme will be put in place by 2015 with price at \$15/MT rising to \$26.50 by 2020**
- **Reference Case assumptions through 2020**
 - » North American supply growth including LNG imports of 13.3 BCF/D
 - » North American demand growth 12.9 BCF/D
- **Reference Case Shows Eastern U.S. production (e.g. Marcellus Shale) growing by over 70% (~1.61 BCF/D) by 2015 and over 150% (~3.65 BCF/D) by 2020**
- **Two sensitivities were developed to provide reasonable maximum and minimal bands bracketing the Reference Case**
 - » The Extreme Displacement Scenario (EDS) increases regional supply by over 25% while demand stays nearly flat
 - » The Minimal Displacement Scenario (MDS) decreases regional supply by over 25% while regional demand is up over 14%

North American Gas Market "Era Changer"

Shale Gas Resource Development



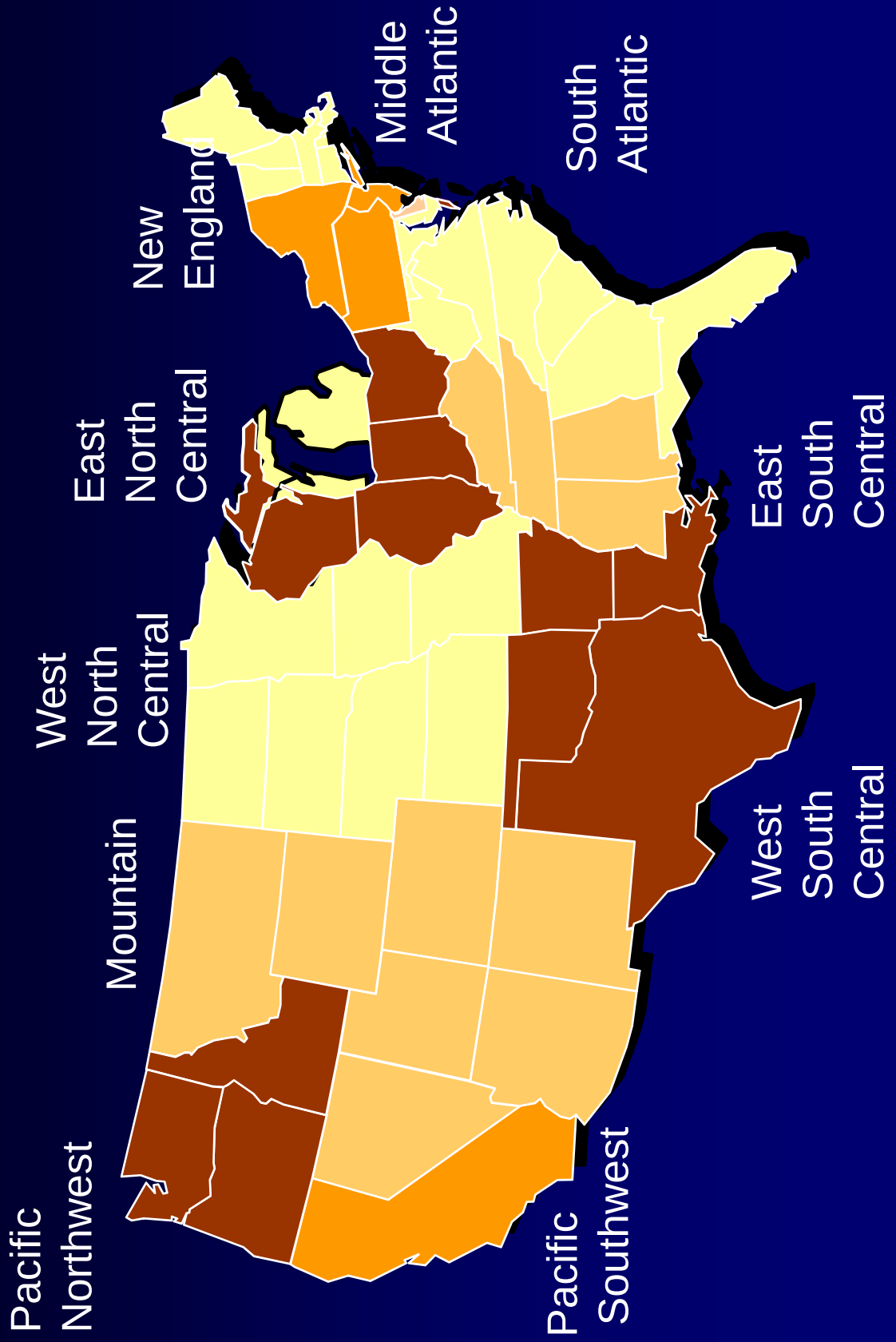
U.S. Shale Gas Set to Minimize Call on Other Production (BCF/D, Except Where Noted)



(Marketed Basis)	2009	2015	2020	2025	09-25
Shale Gas (~4,000)	7.7	19.1	24.6	32.1	+24.5
TCF /Year	2.8	7.0	9.0	11.7	+9.0
R-P Ratio Yrs. (Notional)	143	57	44	34	-----
Haynesville (~700)	0.5	5.5	6.4	7.0	+6.6
Marcellus (~1,500)	0.2	2.2	4.5	6.7	+6.6
Fayetteville (~300)	1.3	3.1	4.0	5.0	+3.7
Barnett (~330)	4.1	4.2	4.0	4.0	-0.1
Woodford (~100)	0.5	1.9	2.2	3.2	+2.7
Eagleford +Other (~1,070)	1.1	2.2	3.5	6.1	+5.0

R-P Ratio values based on 10% recovery factor of 4,000 TCF Gas-In-Place (400 TCF). Numbers in () denote approx. original Gas-In-Place.

U.S. Census Regions

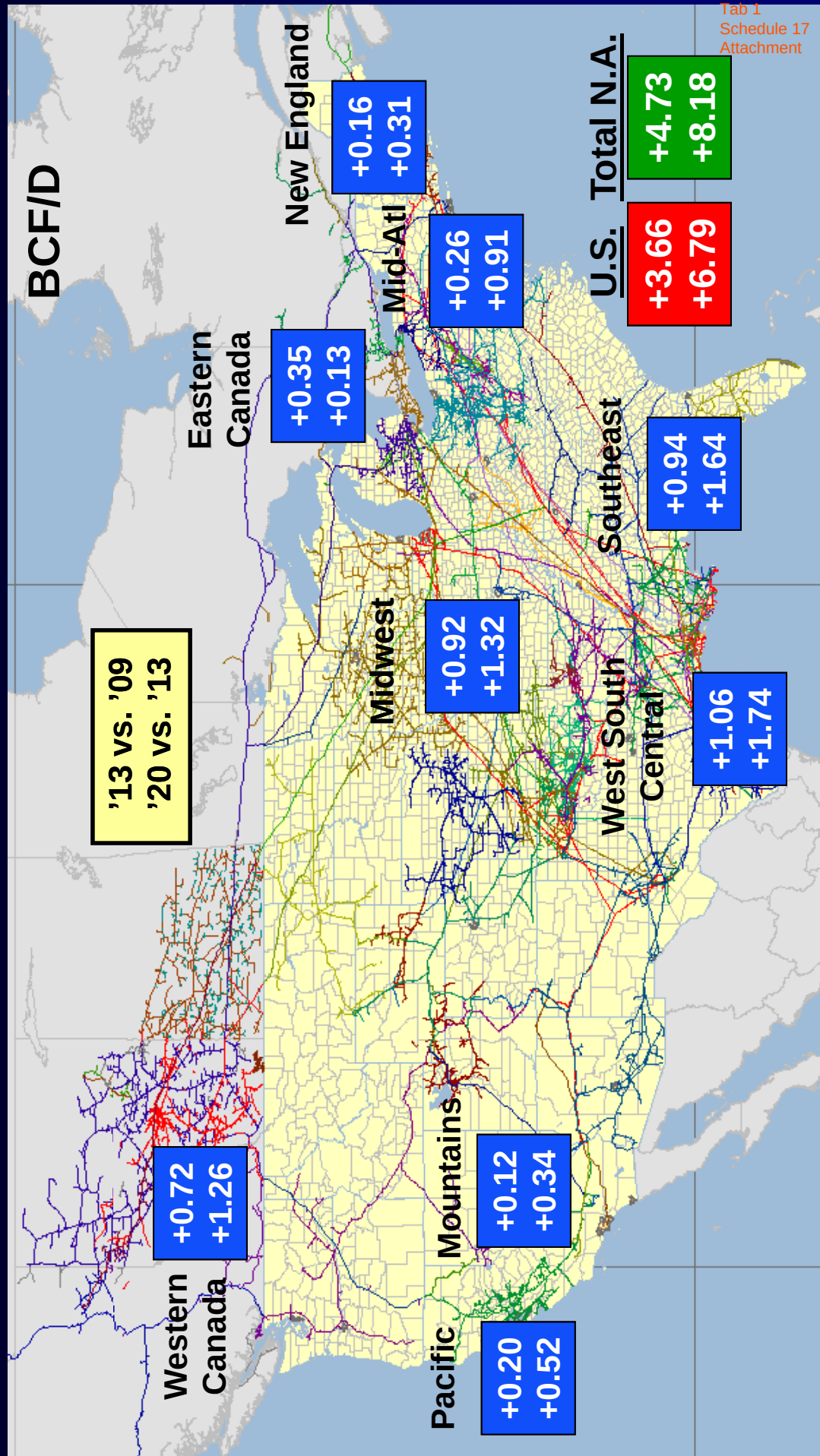




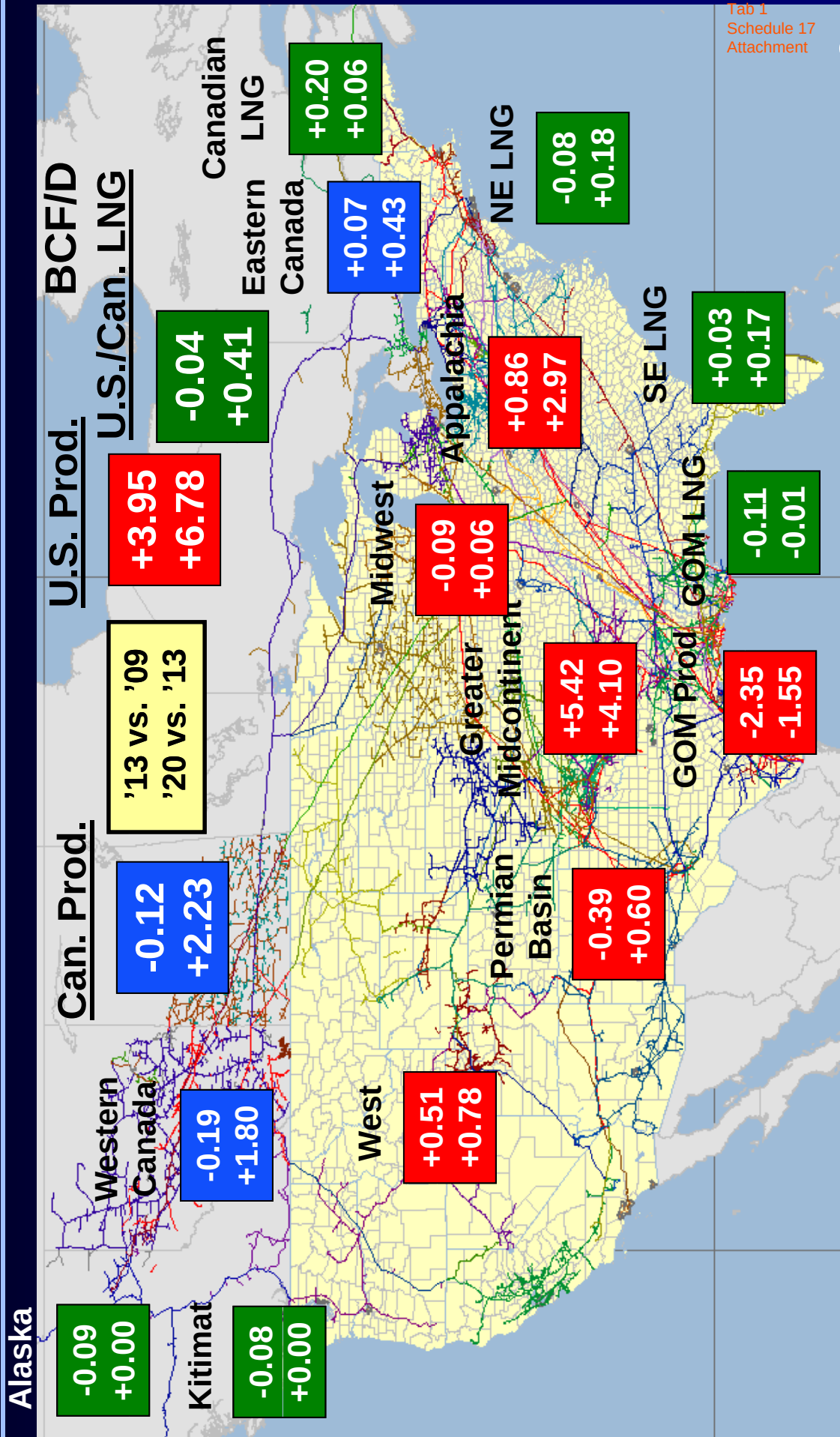
Reference Case

North American Regional Demand Outlook

PIRA



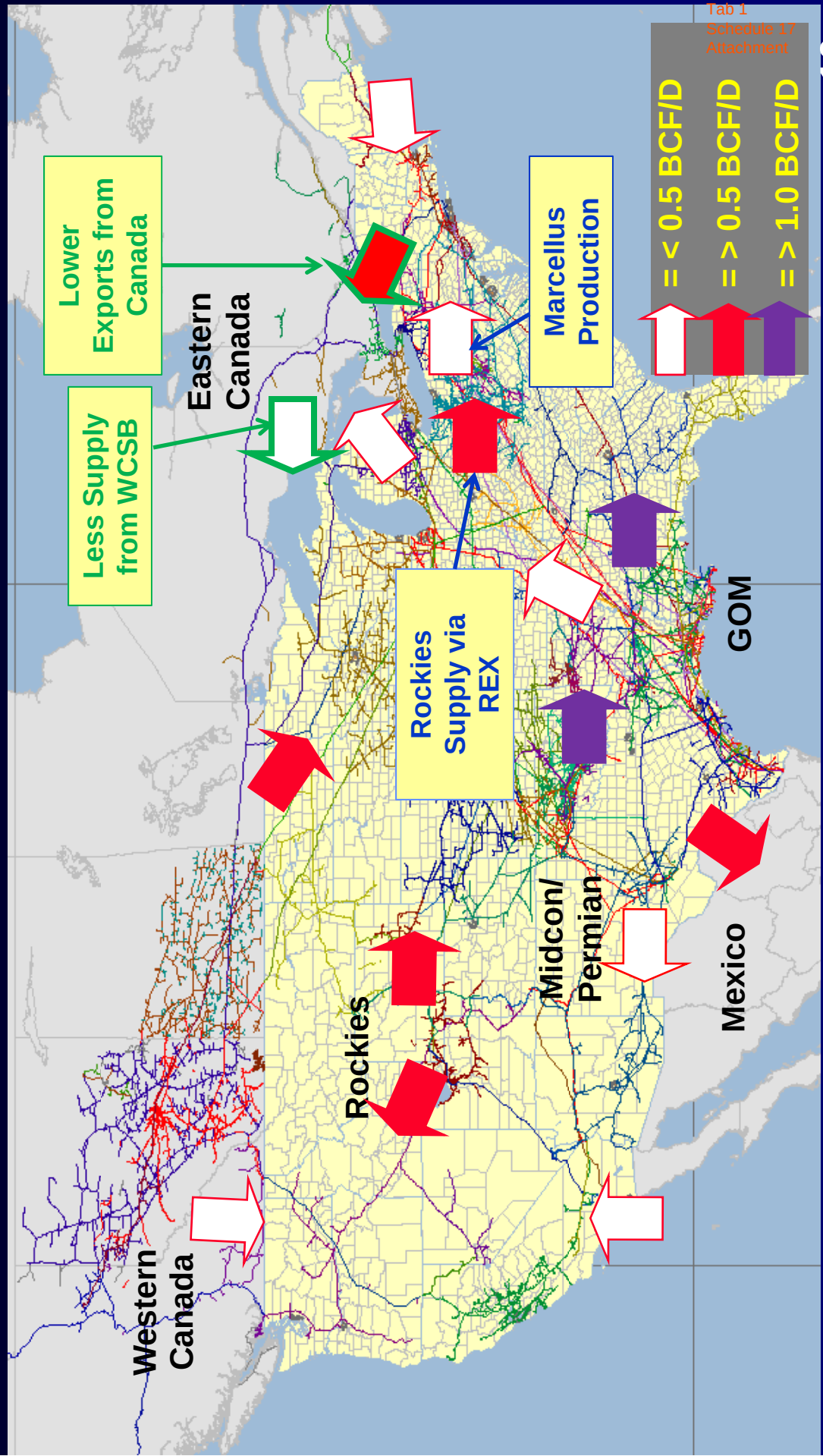
North American Regional Supply Outlook



North American Regional Flow Changes: 2013 vs. 2009

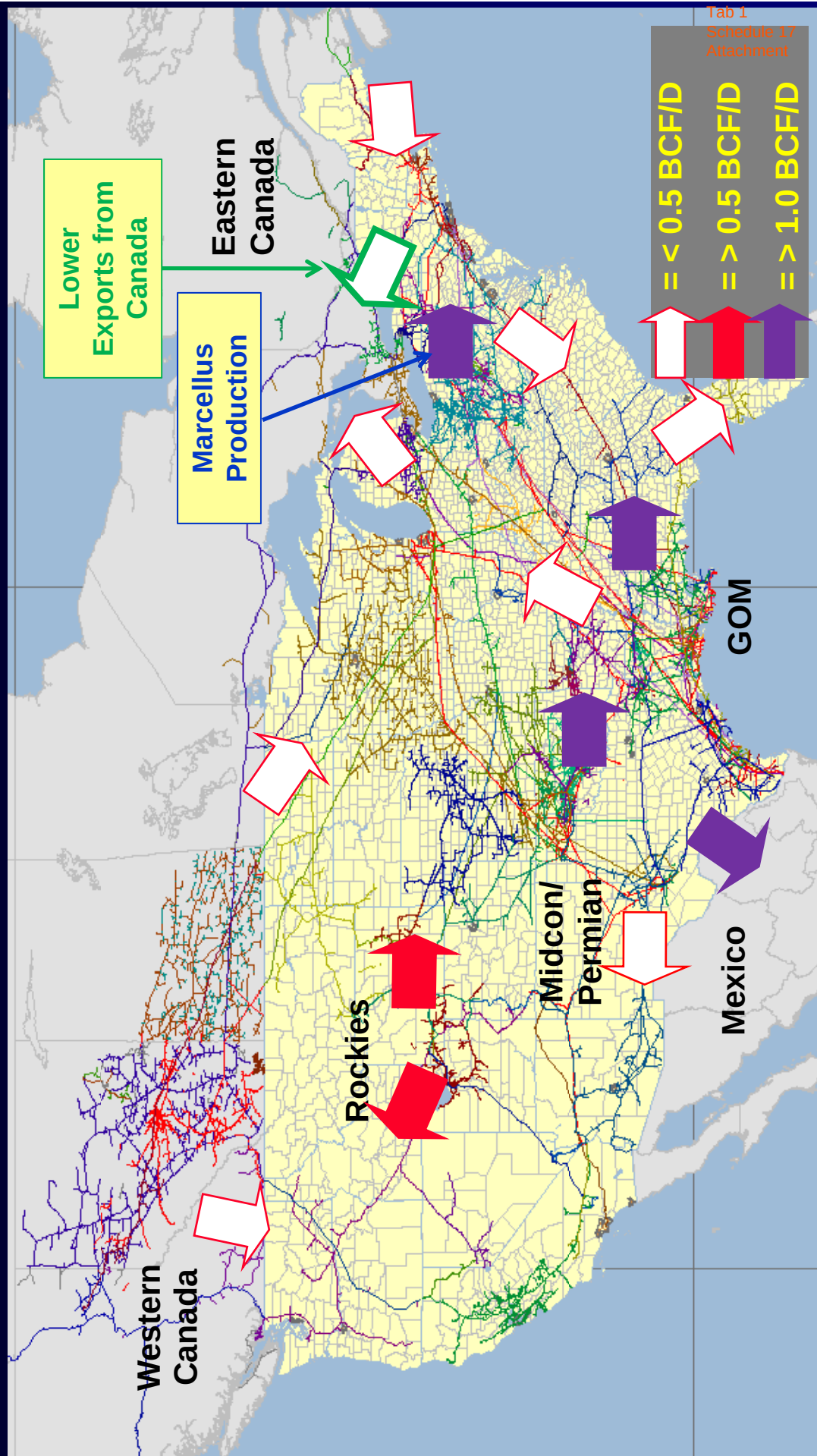
Rockies & Marcellus Supply Push Back WCSB

PIRA



North American Regional Flow Changes: 2020 vs. 2013 Marcellus Pushes Some Gulf Supply from Southeast

PIRA

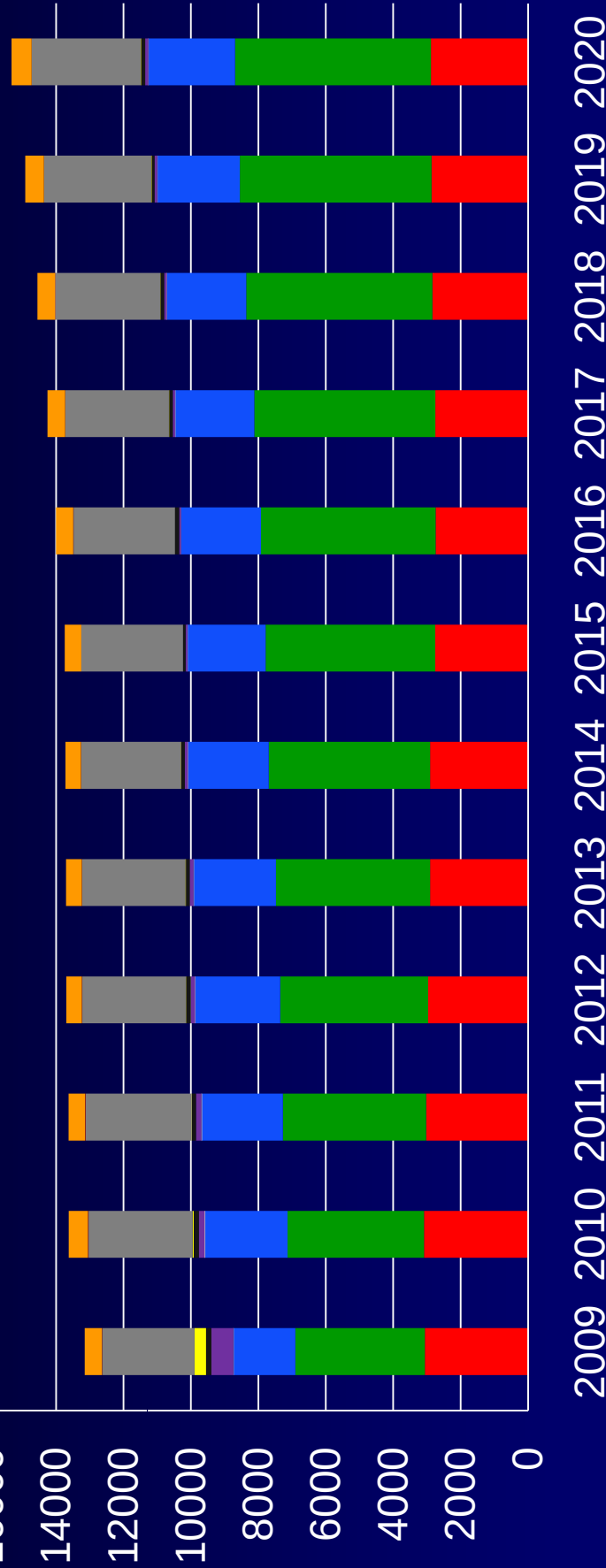


Disposition of Western Canadian Supply: 2009 – 2020



MMCF/D

Volumes down to Eastern Canada (-0.2 BCF/D) and Middle Atlantic (-0.5 BCF/D) while increasing to Western Canada (2.0 BCF/D), East North Central (0.7 BCF/D), and Pacific (0.5 BCF/D)



■ Eastern Canada ■ Western Canada ■ ENC
■ MA ■ MNT ■ NE
■ SA ■ WNC

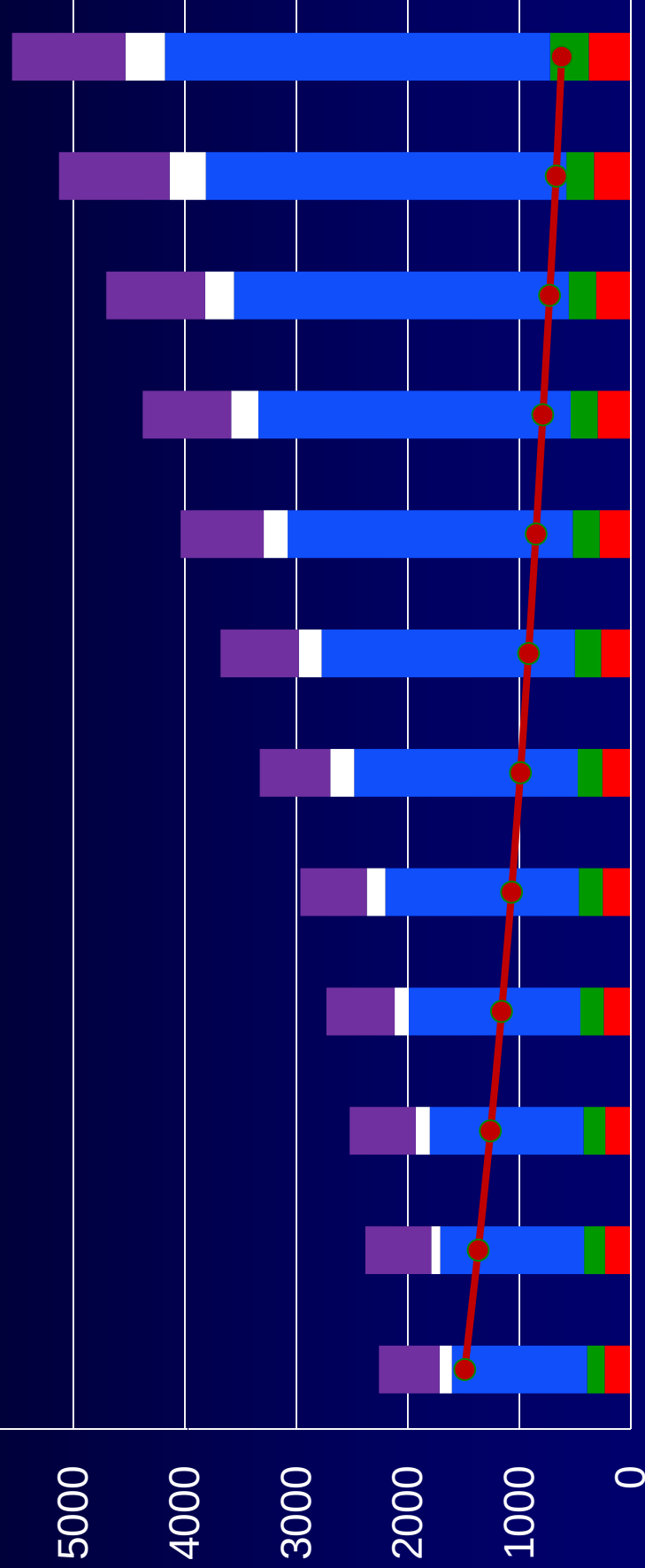
■ ESC
■ PAC

Disposition of Eastern U.S. (Appalachian/Marcellus Shale) Supply: 2009 – 2020



MMCF/D

Heavy increase to Middle Atlantic (2.0 BCF/D) and increases to New England (0.2 BCF/D) and South Atlantic (0.5 BCF/D)



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

ENC ESC MA NE SA Non-Marcellus Production

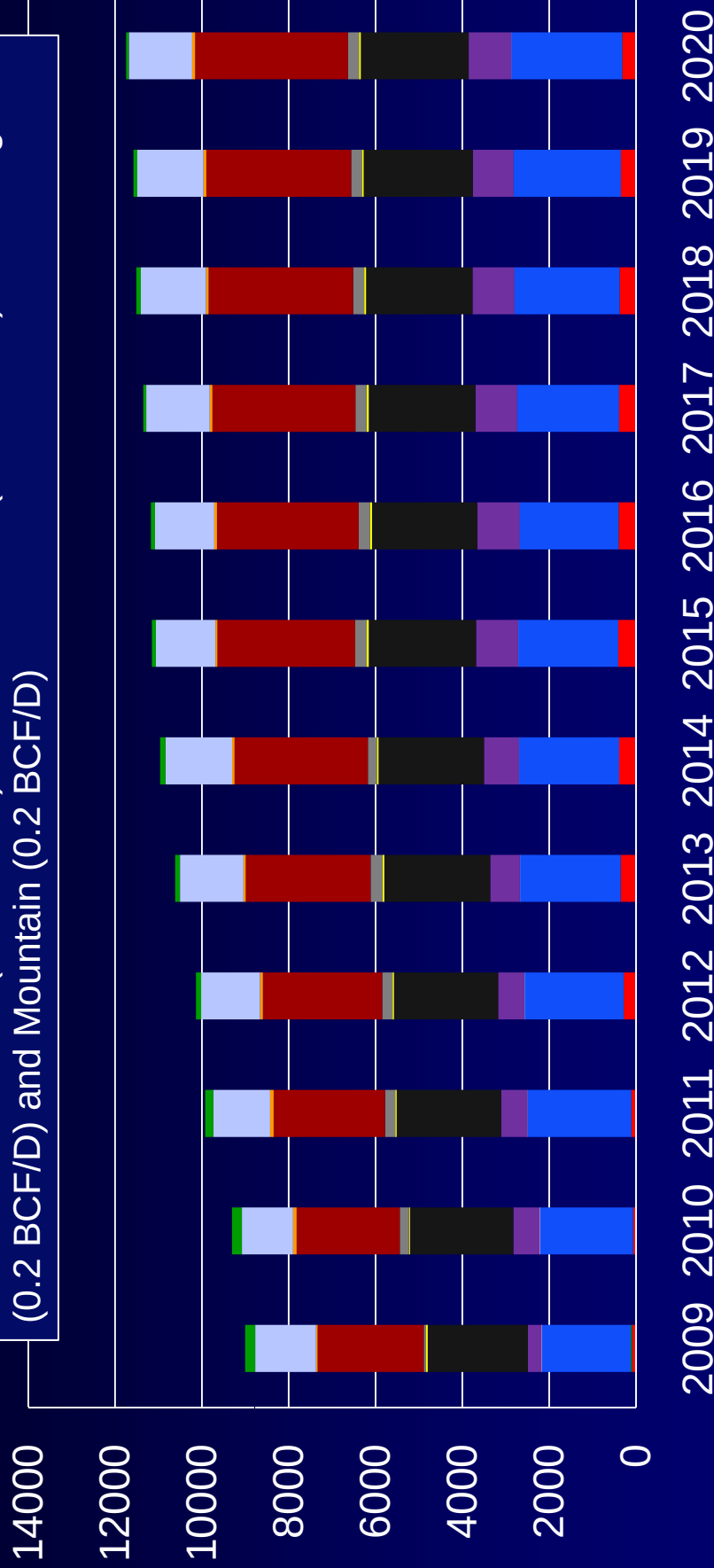
Note – Some Marcellus Production reaches Eastern Canada by displacement

Disposition of Rockies Supply: 2009 – 2020



MMCF/D

Increases to Pacific (1.1 BCF/D), Middle Atlantic (0.7 BCF/D), New England (0.2 BCF/D) and Mountain (0.2 BCF/D)



■ Eastern Canada ■ Western Canada ■ ENC
■ MA ■ MNT ■ SA
■ PAC ■ Mexico ■ WNC

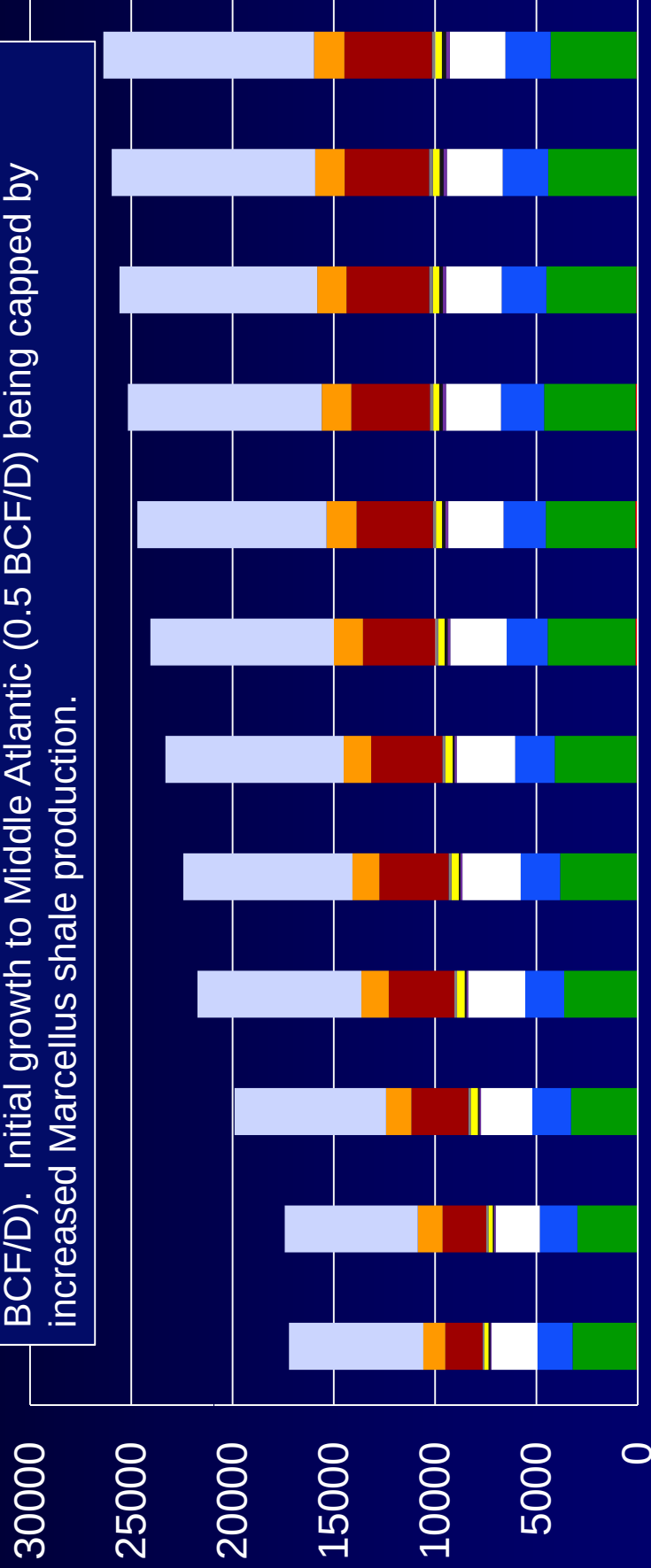
■ ESC
■ NE
■ WSC

Disposition of Midcontinent Shale Supply: 2009 – 2020



MMCF/D

Increased volumes to East North Central (1.1 BCF/D), East South Central (0.5 BCF/D), West South Central (3.8 BCF/D), and South Atlantic (2.5 BCF/D). Initial growth to Middle Atlantic (0.5 BCF/D) being capped by increased Marcellus shale production.



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

■ Eastern Canada ■ ENC

■ MNT

■ SA

■ Mexico

■ WNC

■ ESC

■ NE

■ WSC

■ MA

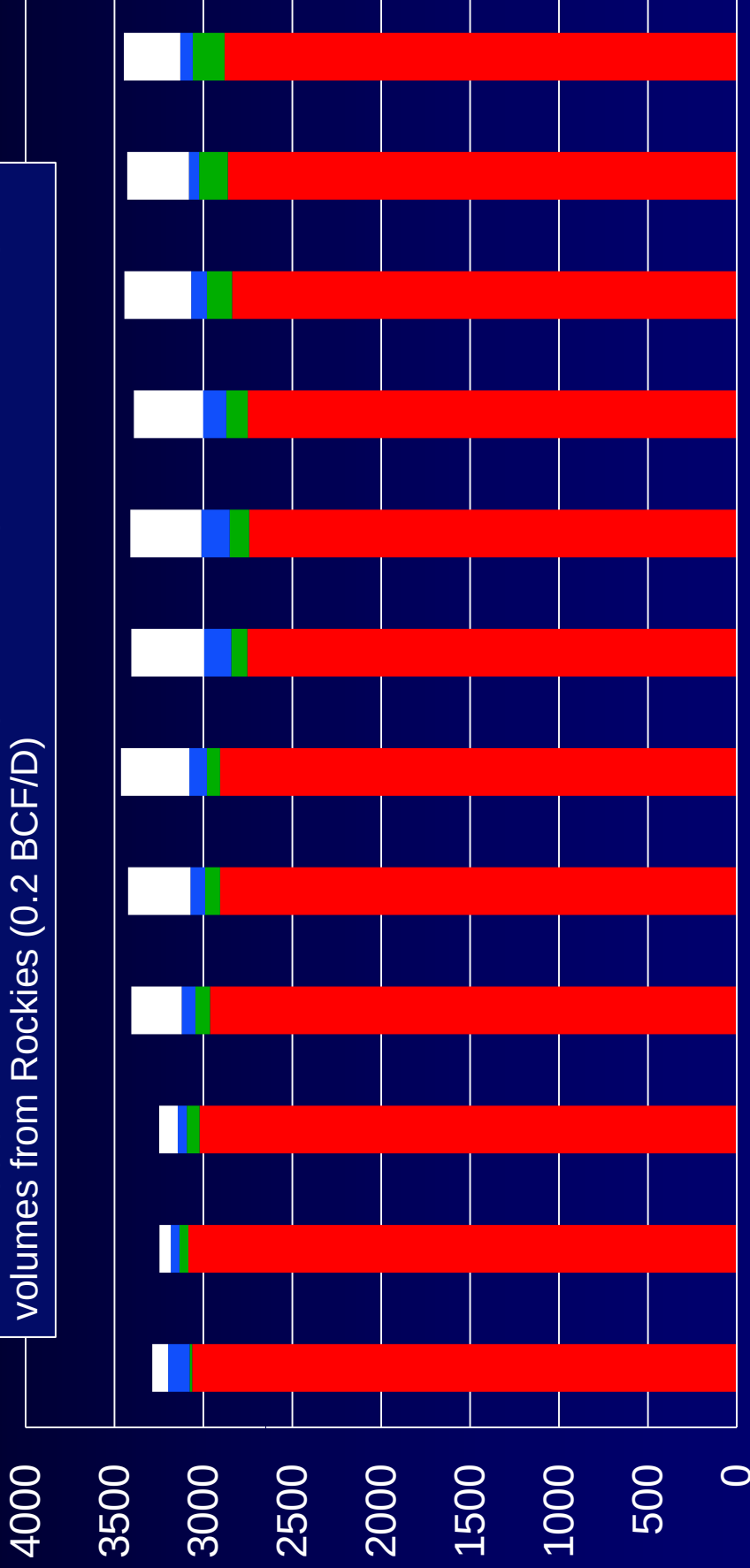
■ PAC

Eastern Canada Supply Sources: 2009 – 2020



MMCF/D

Less supply from Western Canada (-0.2 BCF/D) while increasing volumes from Rockies (0.2 BCF/D)



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

■ Western Canada ■ Eastern Canada ■ Other ■ Rocky Mountains

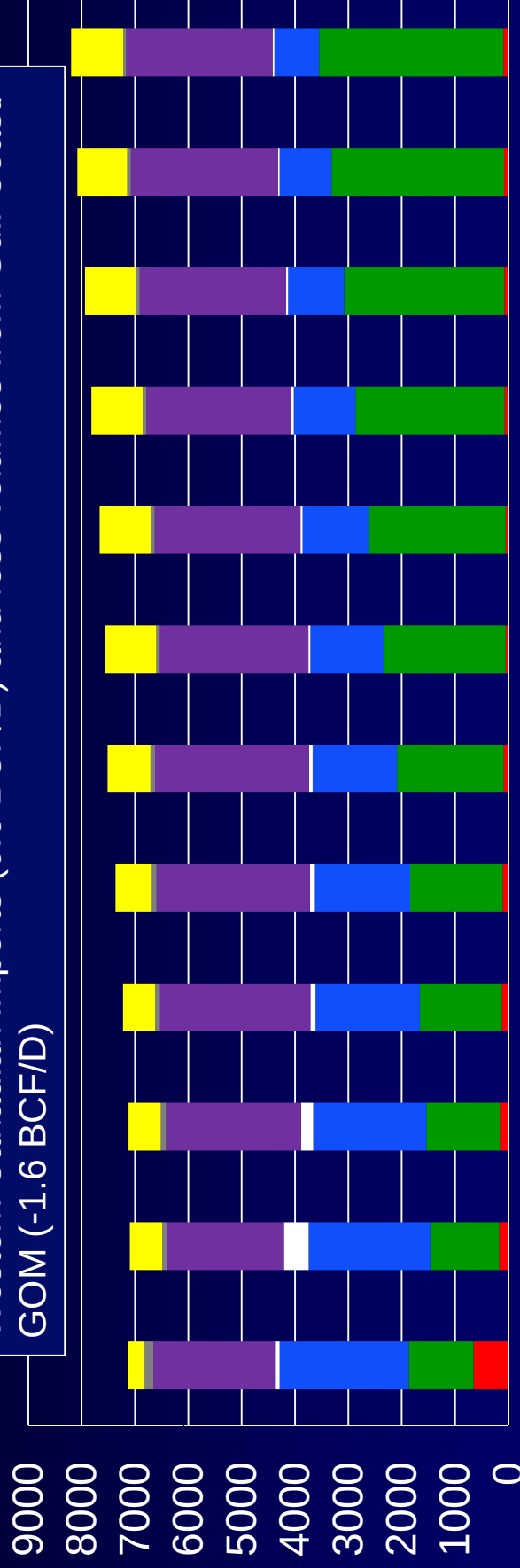
Note – Other Supply is primarily Midcontinent Shale & Midwest

Middle Atlantic Supply Sources: 2009 – 2020



MMCF/D

Very large increase in Eastern U.S. (2.2 BCF/D) and smaller increases in Midcontinent Shale (0.5 BCF/D) and Rockies (0.7 BCF/D) replace less Western Canadian imports (0.6 BCF/D) and less volumes from Gulf Coast/GOM (-1.6 BCF/D)



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

- Western Canada
- LNG
- Rocky Mountains
- Midcontinent Shale
- Other
- Gulf Coast/GOM
- Eastern US

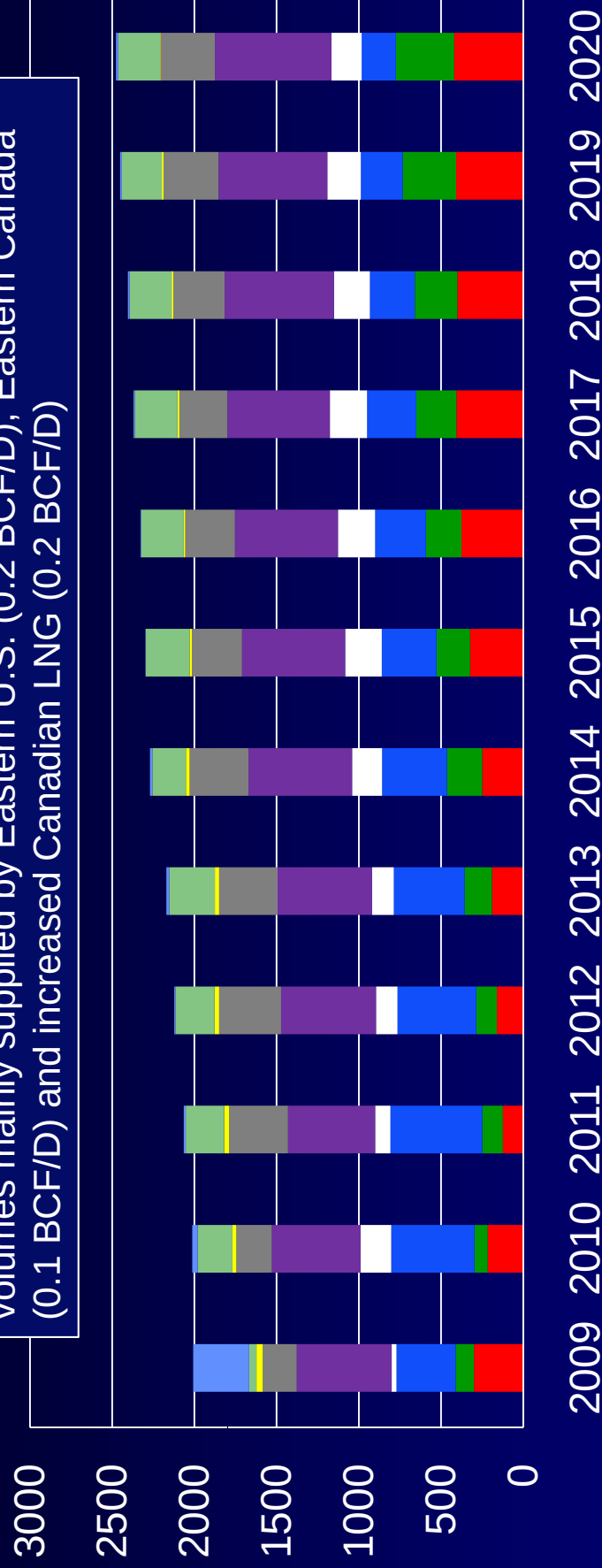
Note – Other Supply is primarily Eastern Canada, Midwest & Permian

New England Supply Sources: 2009 – 2020



MMCF/D

Western Canadian imports fall to nearly zero (-0.3 BCF/D) with increased volumes mainly supplied by Eastern U.S. (0.2 BCF/D), Eastern Canada (0.1 BCF/D) and increased Canadian LNG (0.2 BCF/D)



- Eastern Canada
- LNG-CAN
- Other
- Eastern US
- LNG-USA
- Rocky Mountains
- Gulf Coast/GOM
- Midcontinent Shale
- Western Canada

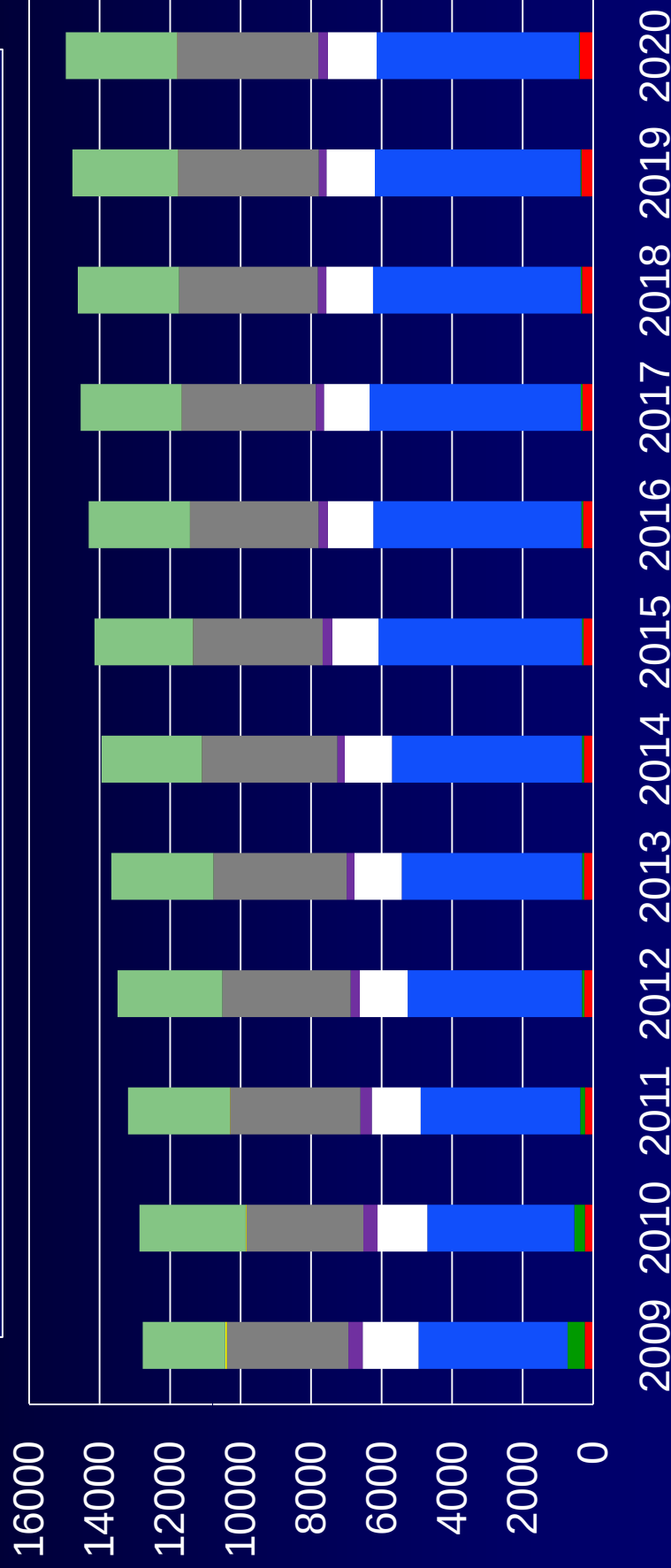
Note – Eastern Canadian supply is primarily Sable Island and Deep Panuke while LNG-CAN is Canaport

Midwest (ENC & WNC) Supply Sources: 2009 – 2020



MMCF/D

Increase in supply from Midcontinent Shale (1.5 BCF/D), Western Canada (0.8 BCF/D) and Rockies (0.6 BCF/D)



■ Eastern US

■ Midwest

■ Other

■ Gulf Coast/GOM

■ Permian Basin

■ Western Canada

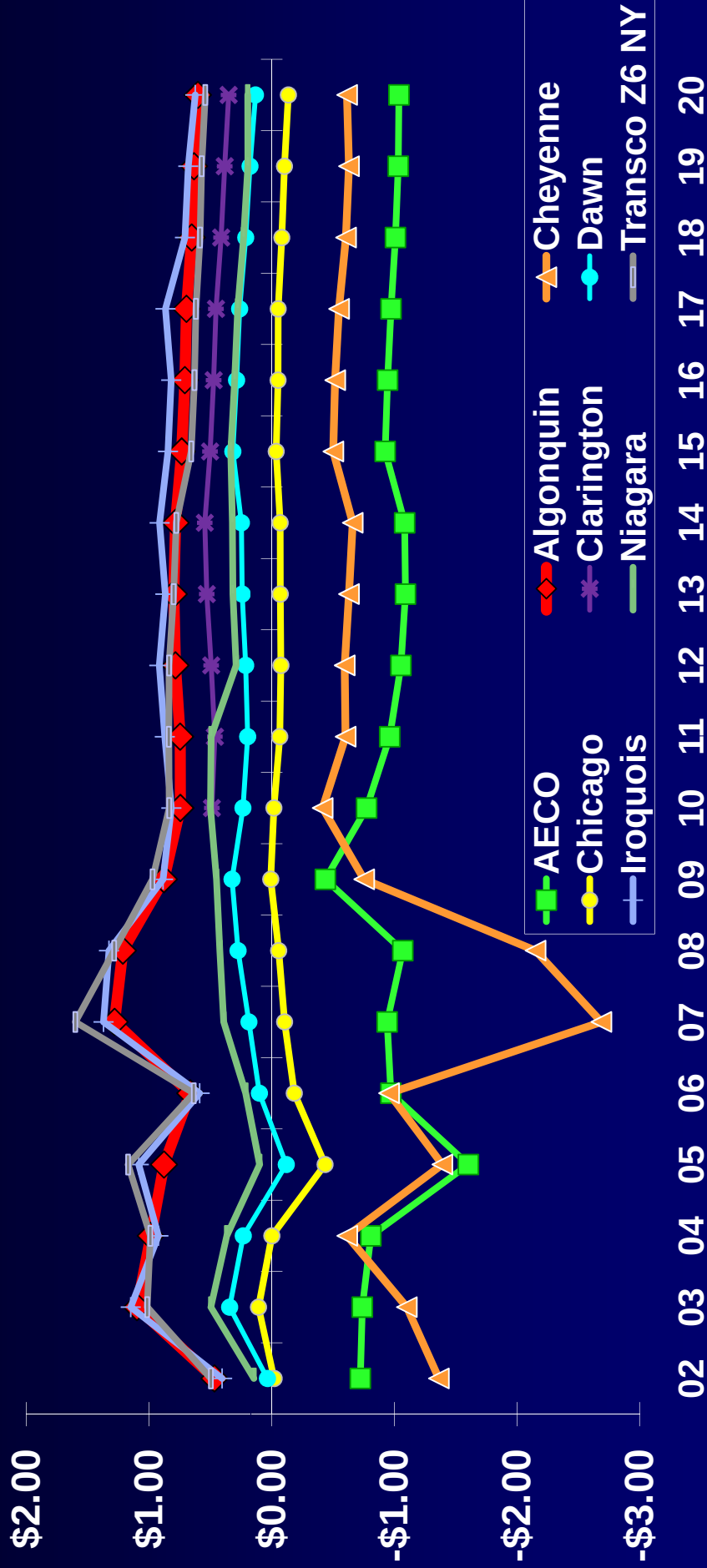
■ Midcontinent Shale

■ Rocky Mountains

North America Regional Gas Basis Summary: 2002 – 2020



Basis compared to Henry Hub

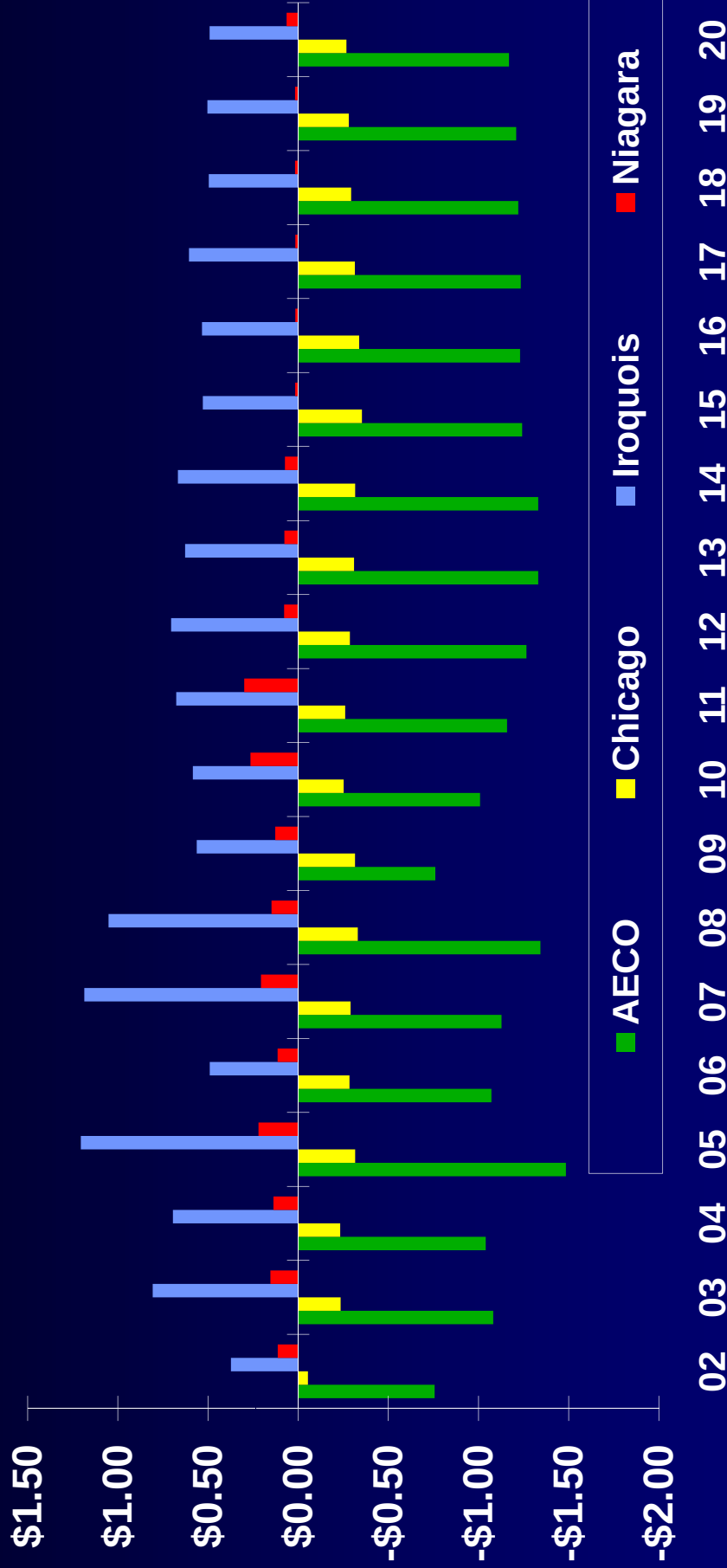


Overall convergence due to additional infrastructure & growing shale supply. Iroquois and Niagara basis reduced due to Marcellus growth and additional pipelines while AECO basis weakens initially from less volumes to Eastern Canada and U.S. Northeast caused by high TransCanada tolls and more competition. Cheyenne basis raised due to completion of Rockies Express Pipeline.

Key Supply Compared with Dawn: 2002 – 2020



Basis compared with Dawn

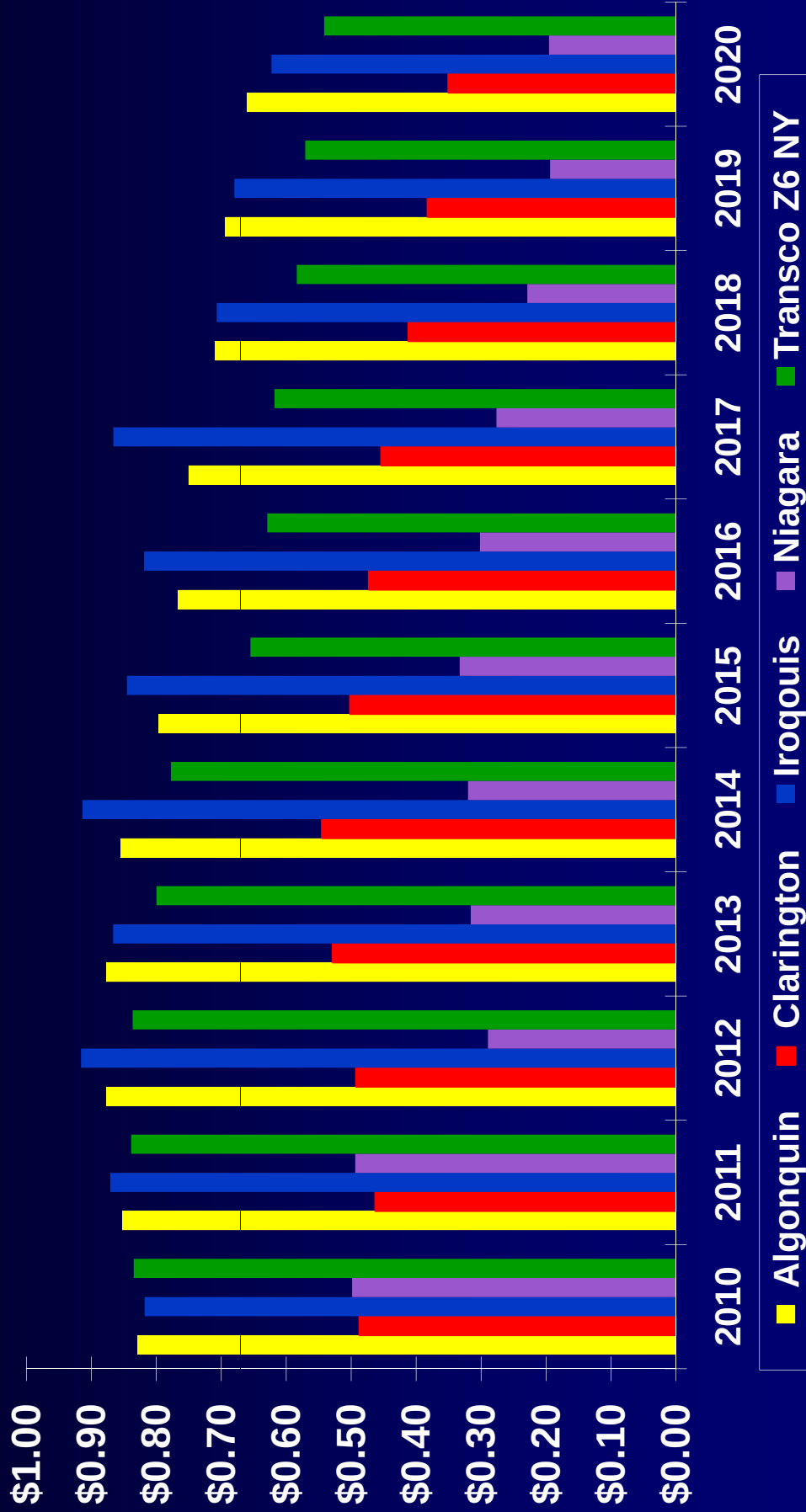


Niagara and Iroquois basis weaken due to Marcellus growth while Chicago and AECO pricing stay relatively flat

Eastern Basis Compared With Henry Hub: 2010 – 2020



Basis compared with Henry Hub

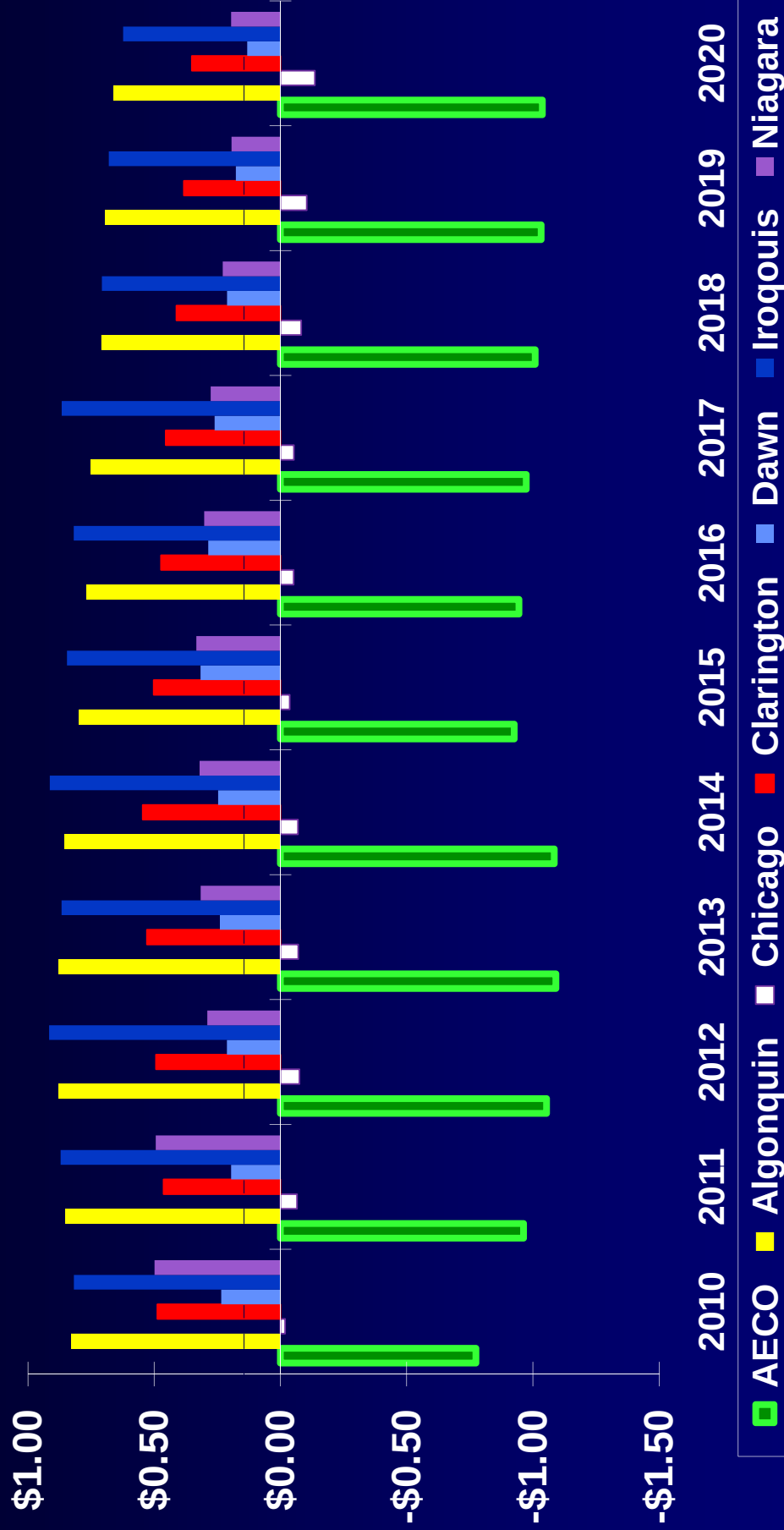


All basis points lower with additional Rockies supply (via REX) and growth of Marcellus Shale

Basis for Current & Potential EGD Supply: 2010 – 2020



Basis compared with Henry Hub



AECO basis weakens due to high TCPL tolls while Dawn increases in short term due to pipeline constraints before weakening post 2015. Chicago is roughly flat while Northeast basis slowly decreases due to growth of Marcellus Shale.

Reference Case Summary (1)



- **PIRA's Reference Case shows Shale Gas is here to stay**
 - » Significant increased volumes from Midcontinent shale, British Columbia shale, and Marcellus shale in addition to increased Rockies supply drives most pipeline flow and price changes
 - » Increased shale gas production driving most new pipeline infrastructure
- **Lower WCSB production and higher tolls on the TransCanada mainline makes Western Canadian supply on the margin for both the U.S. Northeast and Eastern Canada**
 - » Significant decline in TransCanada mainline volumes particularly to Eastern Canada and exports to U.S. Northeast
 - » More Western Canadian volumes arrive via Dawn to Eastern Canada and U.S. Northeast

Reference Case Summary (2)



- **Forecast of improving British Columbia shale production largely replaces decline in WCSB**
 - » Western Canada remains the largest supplier to Eastern Canada
 - Mainly due to lack of alternative infrastructure
 - » More Western Canadian supply flows to Eastern Canada via Dawn
- **LNG is a small portion of supply and becoming less and less of a factor**
 - » Growing global demand (particularly Asian) and pricing indexed to oil makes most LNG uncompetitive with Henry Hub pricing
- **Increased Marcellus shale production displaces Canadian exports via TransCanada and Gulf Coast supply via Texas Eastern, Tennessee Gas Pipeline and Transco Pipeline to Northeast**
- **Reference Case show basis lower at Northeast basis points**

Reference Case Summary (3)



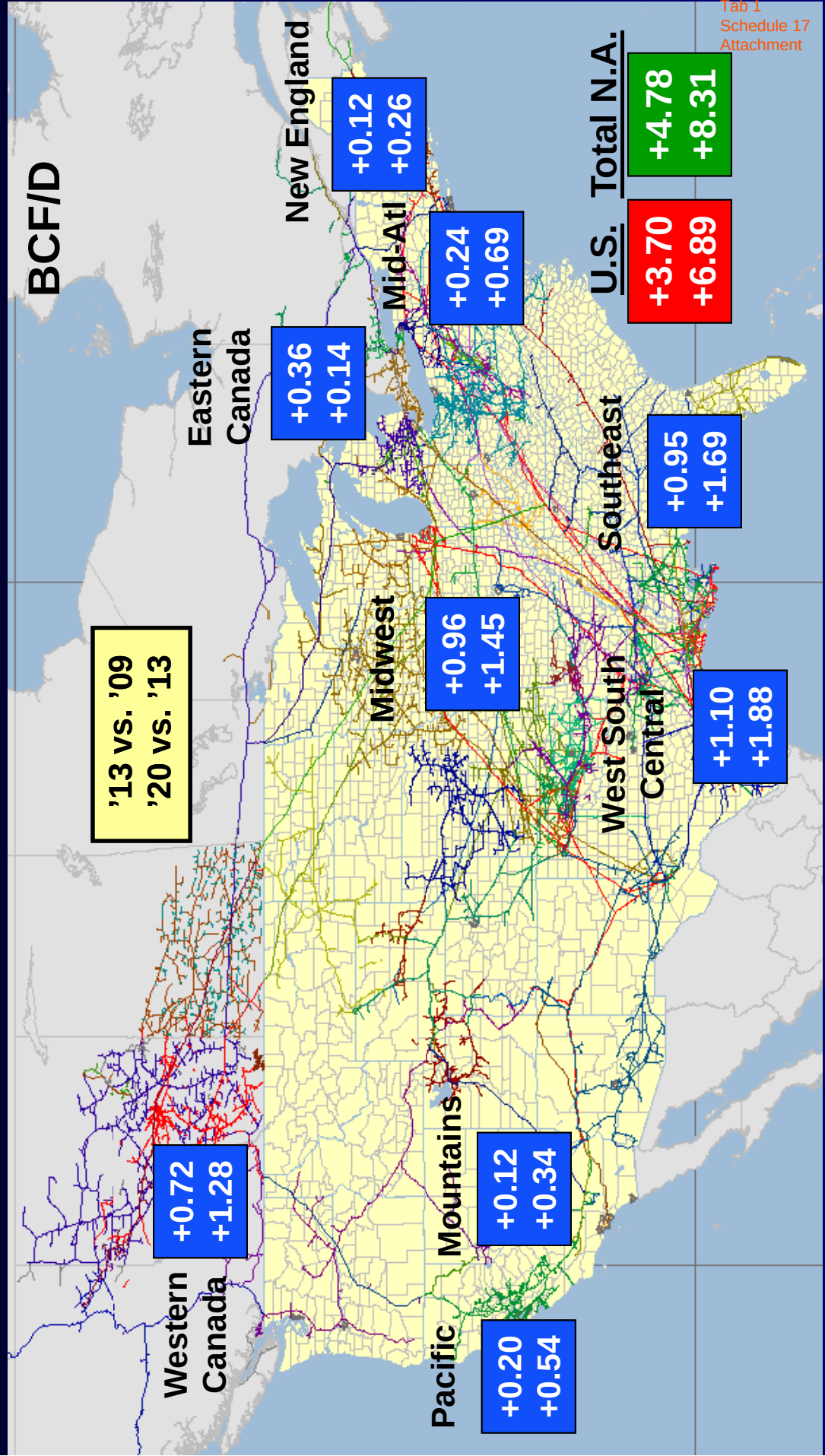
- Chicago stays flat while Dawn increases initially due to pipeline constraints downstream
- Basis at AECO initially weakens through 2013 due to high TCPL tolls before strengthening
 - » AECO basis will go even higher if British Columbia shale does not develop as fast as projected
- Continued fading of regional differentials makes supply at Chicago, Clarington and Niagara as compared to Dawn more attractive
- Large increases in Marcellus shale production are even more likely to create possible backhauls at Niagara or Chippawa (Empire)

Extreme Displacement Scenario:

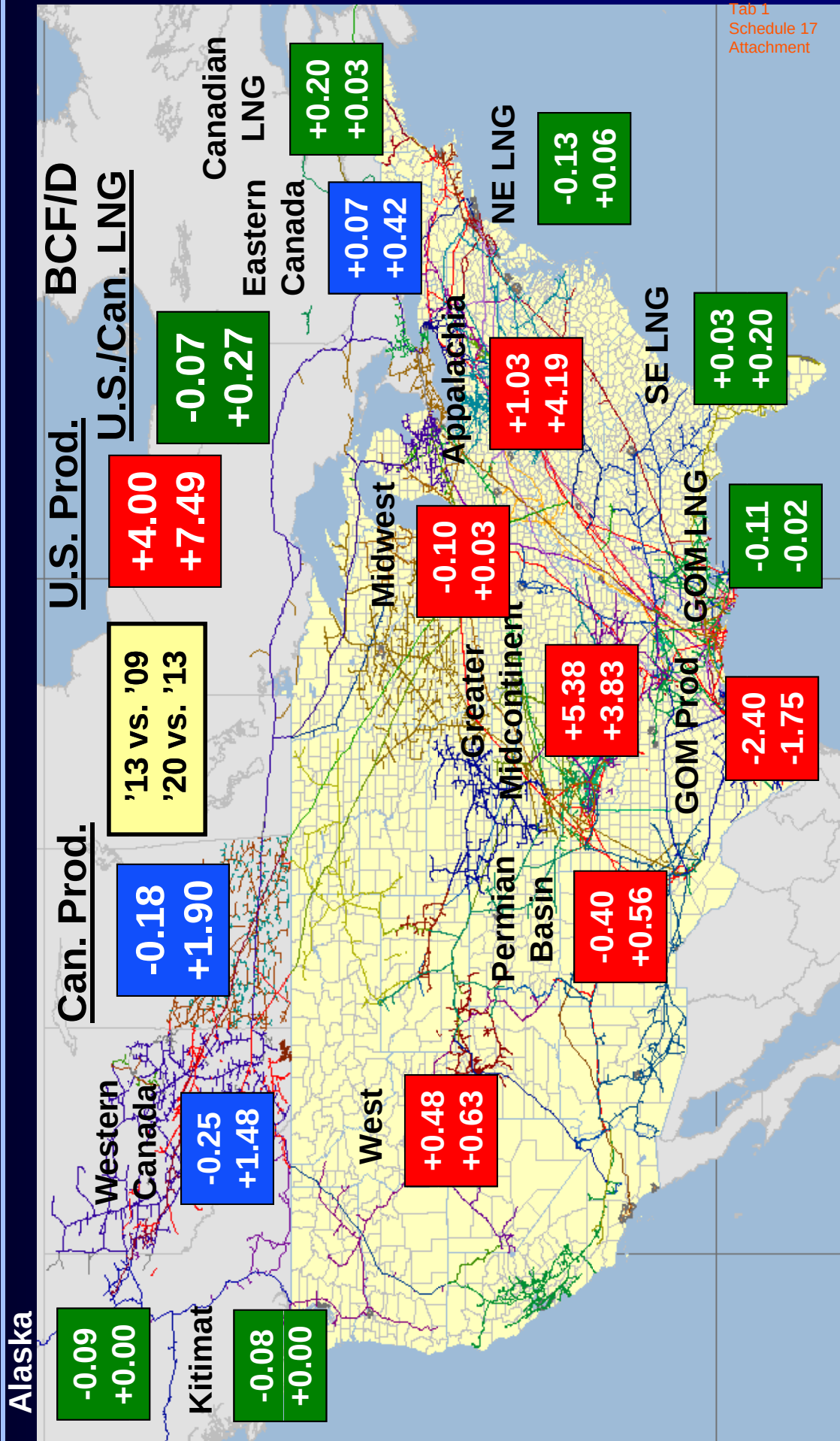


This scenario assumes a mix of weaker-than-expected Northeast Coast demand growth and stronger-than-expected growth of local supply (i.e. the Marcellus Shale). This creates an even more aggressive displacement of existing suppliers and would-be suppliers (e.g. Rockies, Gulf Coast and Greater Midcontinent producers). For this scenario to occur, less gas-fired power generation is developed while costs to develop the Marcellus Shale are less than projected with fewer-than-expected environmental concerns. Regional demand stays nearly flat while regional supply is up 26% over the reference case.

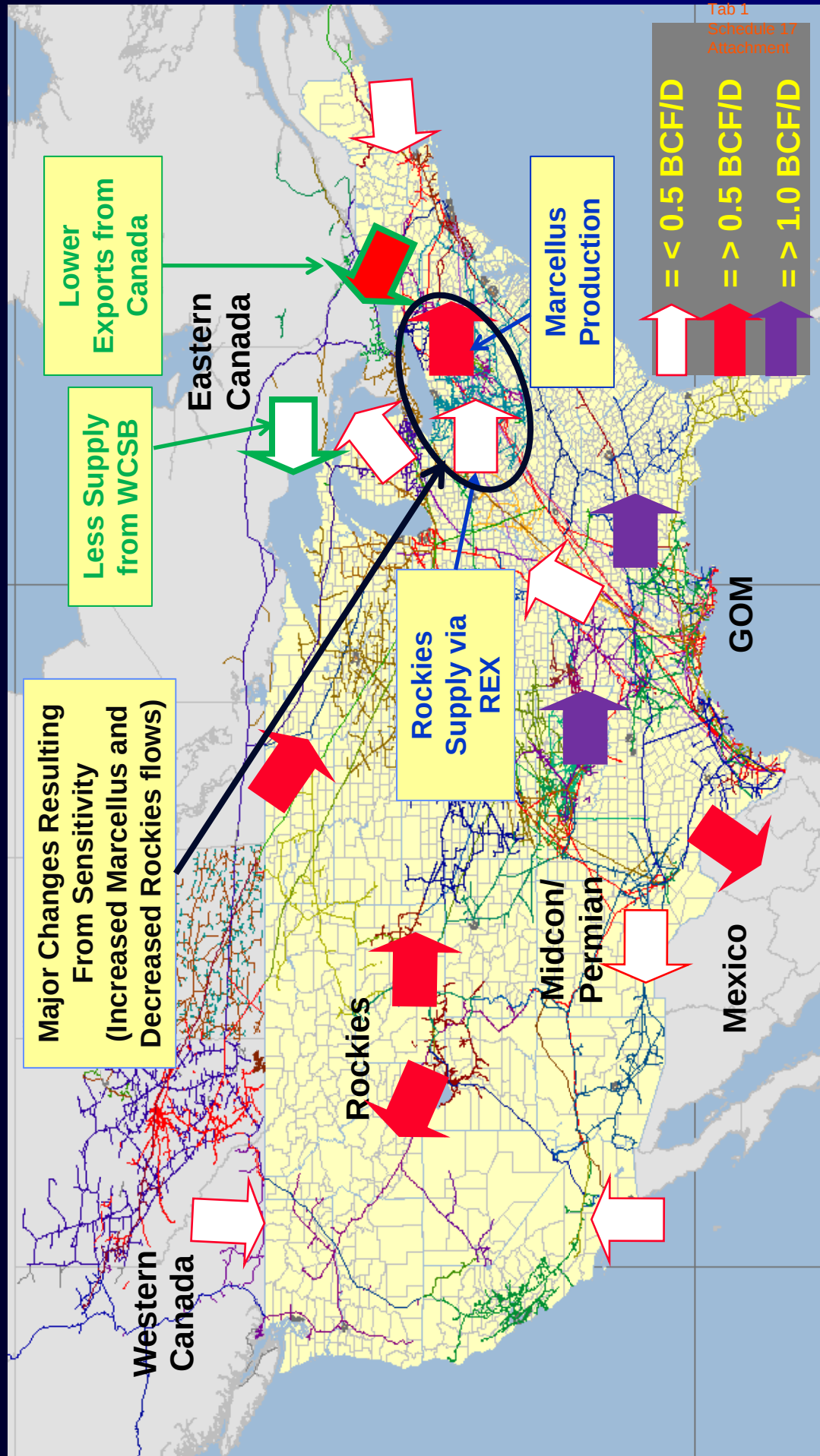
Extreme Displacement Scenario North American Regional Demand Outlook



Extreme Displacement Scenario North American Regional Supply Outlook



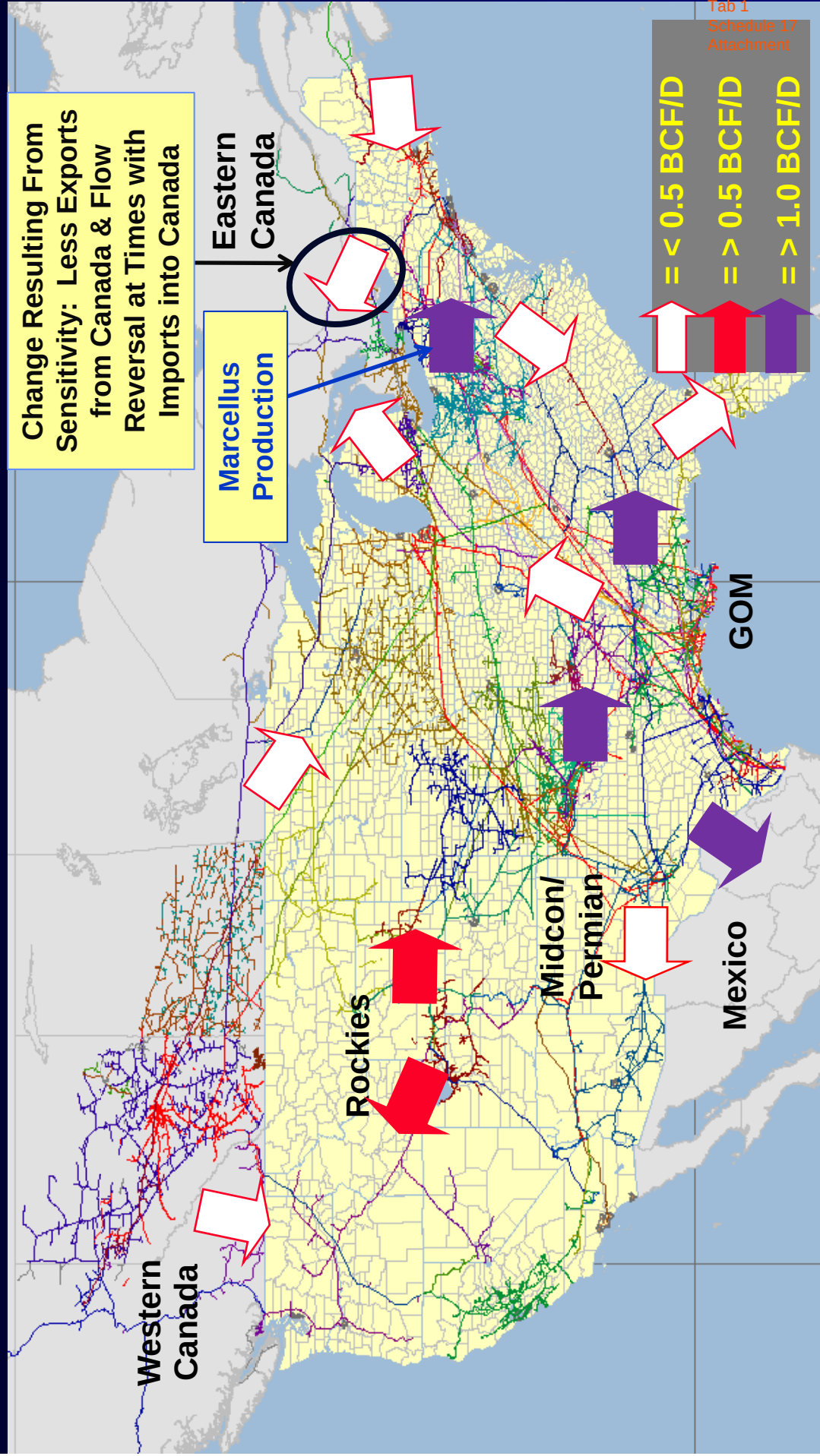
Extreme Displacement Scenario North American Regional Flow Changes: 2013 vs. 2009



Extreme Displacement Scenario



North American Regional Flow Changes: 2020 vs. 2013

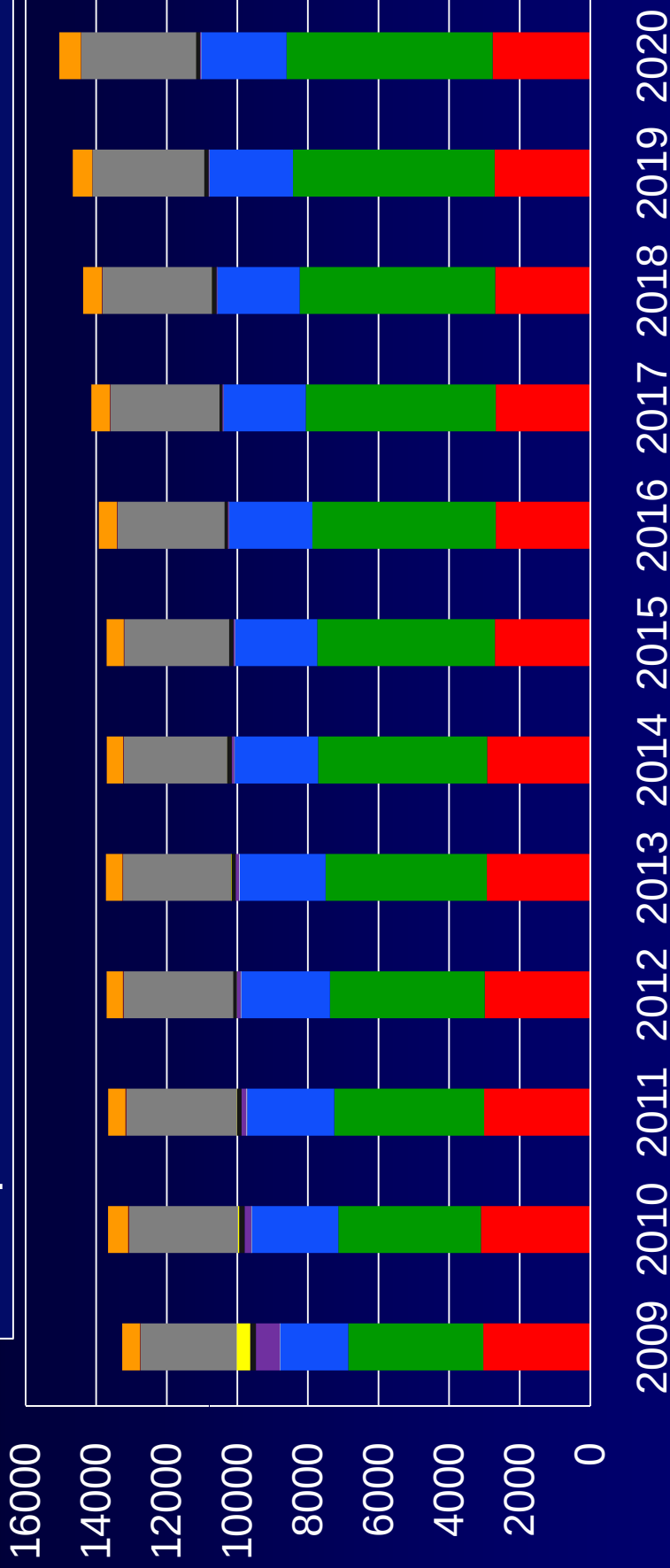


Extreme Displacement Scenario Disposition of Western Canadian Supply



MMCF/D

Slightly less Western Canadian volumes (~0.1 BCF/D) to Eastern Canada
as compared with Reference Case



■ Eastern Canada
■ MA
■ SA

■ Western Canada
■ MNT
■ WNC

■ ENC
■ NE

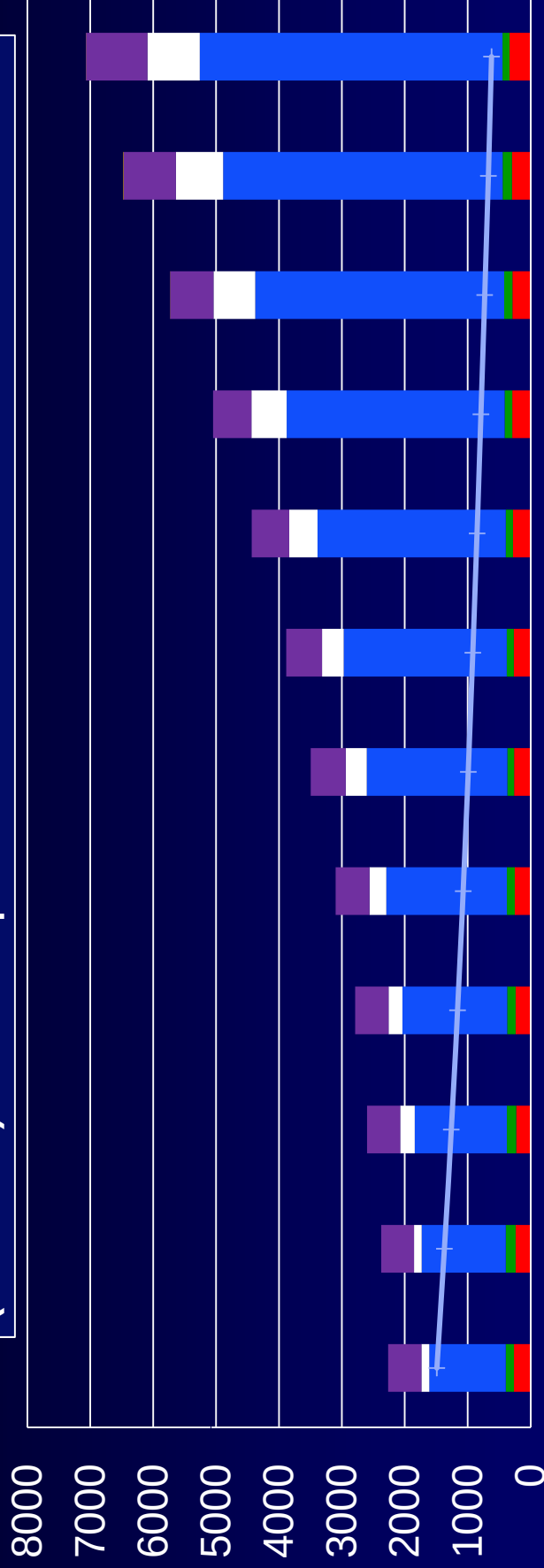
■ ESC
■ PAC

Extreme Displacement Scenario Disposition of Appalachian (Marcellus) Supply



MMCF/D

Even more volumes to Middle Atlantic (1.4 BCF/D) and New England (0.5 BCF/D) when compared with Reference Case



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

ENC

MA

SA

ESC

NE

Eastern Canada

Non-Marcellus Production

Extreme Displacement Scenario Disposition of Rockies Supply



MMCF/D

Less volumes to Middle Atlantic (-0.4 BCF/D) and New England (-0.2 BCF/D) while more to South Atlantic (0.3 BCF/D), Eastern Canada (0.1 BCF/D) and ENC (0.2 BCF/D) when compared to Reference Case

14000

12000

10000

8000

6000

4000

2000

0

2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

■ Eastern Canada
■ MA
■ PAC

■ Western Canada
■ MNT
■ SA

■ ENC
■ Mexico
■ WNC

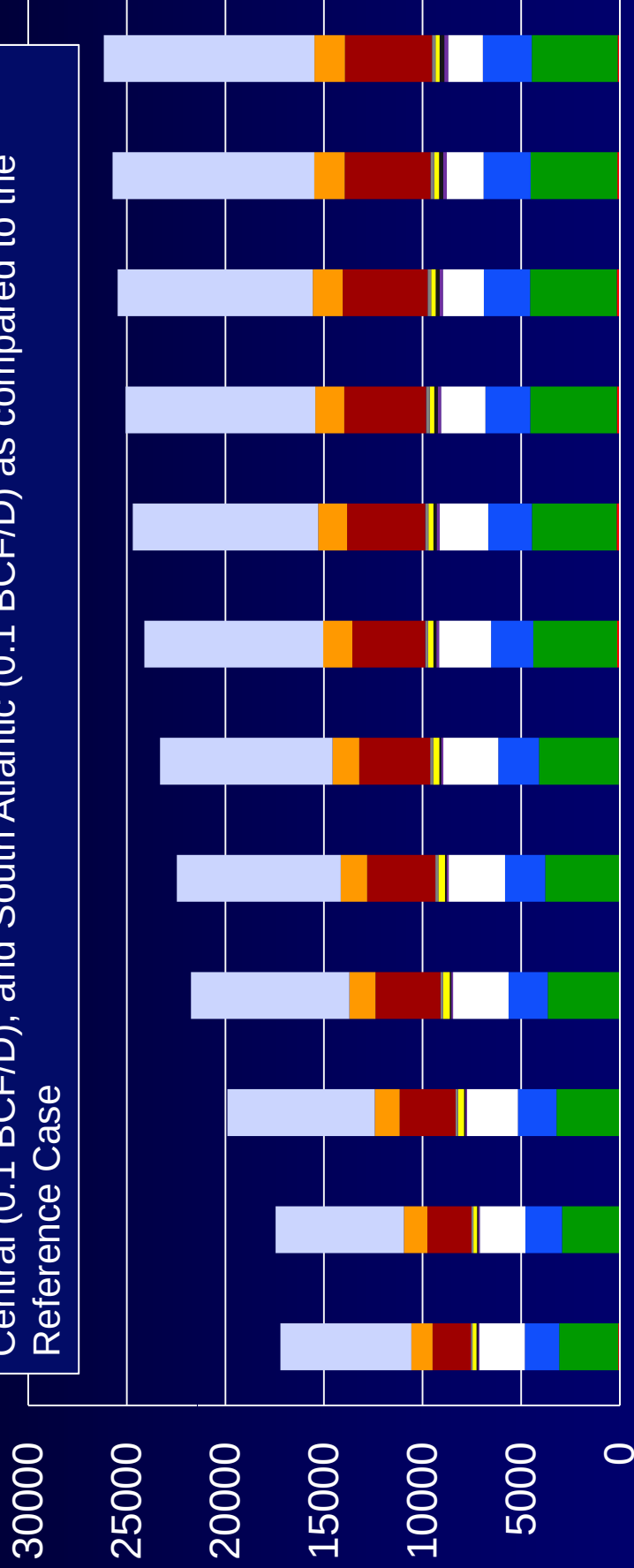
■ ESC
■ NE
■ WSC

Extreme Displacement Scenario Disposition of Midcontinent Shale Supply



MMCF/D

Decreased volume to Middle Atlantic (-1.0 BCF/D) with increased volumes to West South Central (0.3 BCF/D), East South Central (0.2 BCF/D), East North Central (0.1 BCF/D), and South Atlantic (0.1 BCF/D) as compared to the Reference Case



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

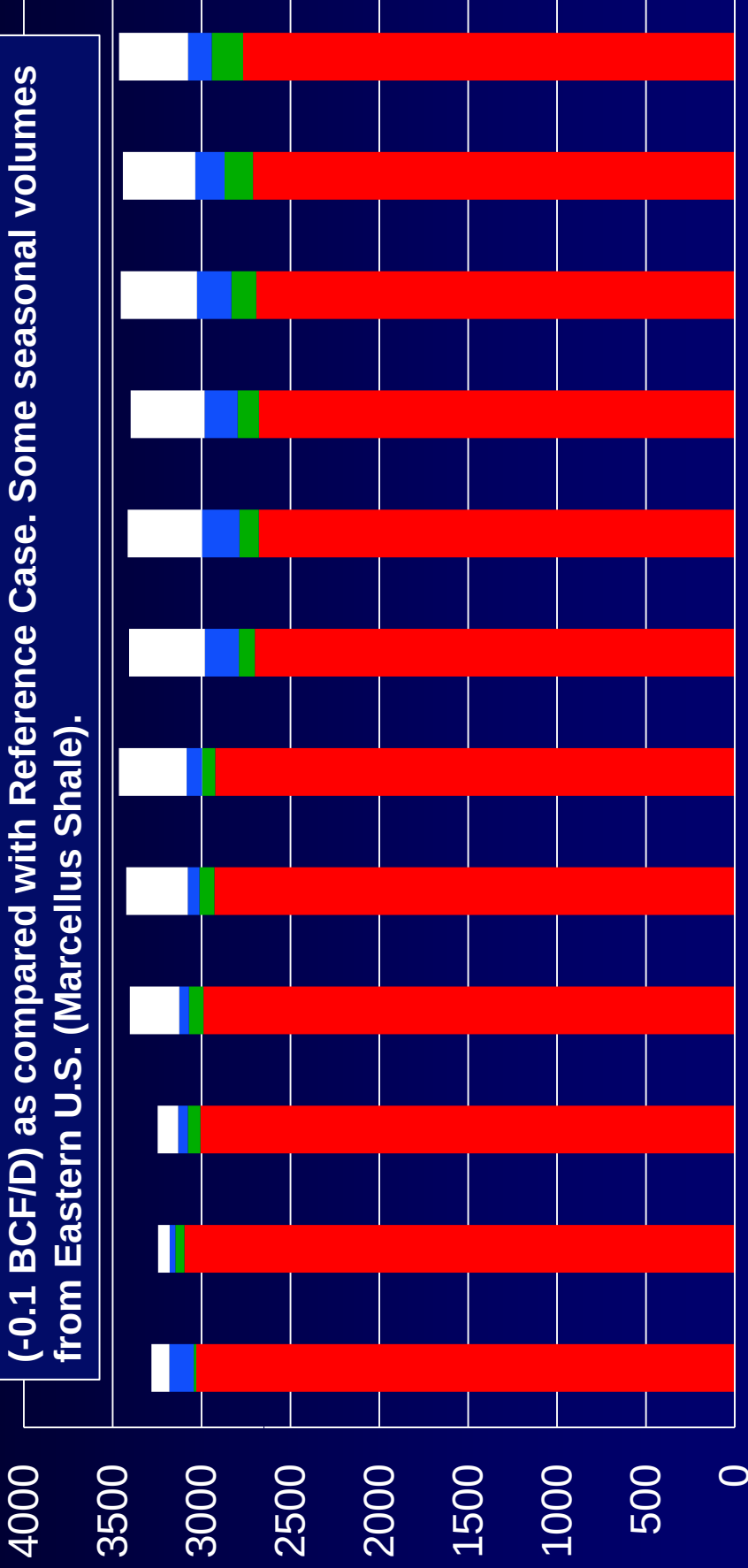
- Eastern Canada
- MNT
- SA
- ENC
- Mexico
- WNC
- ESC
- NE
- WSC
- MA
- PAC

Extreme Displacement Scenario Eastern Canada Supply Sources



MMCF/D

More supply from Rockies (0.1 BCF/D) and less from Western Canada (-0.1 BCF/D) as compared with Reference Case. Some seasonal volumes from Eastern U.S. (Marcellus Shale).



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

■ Western Canada ■ Eastern Canada ■ Other ■ Rocky Mountains

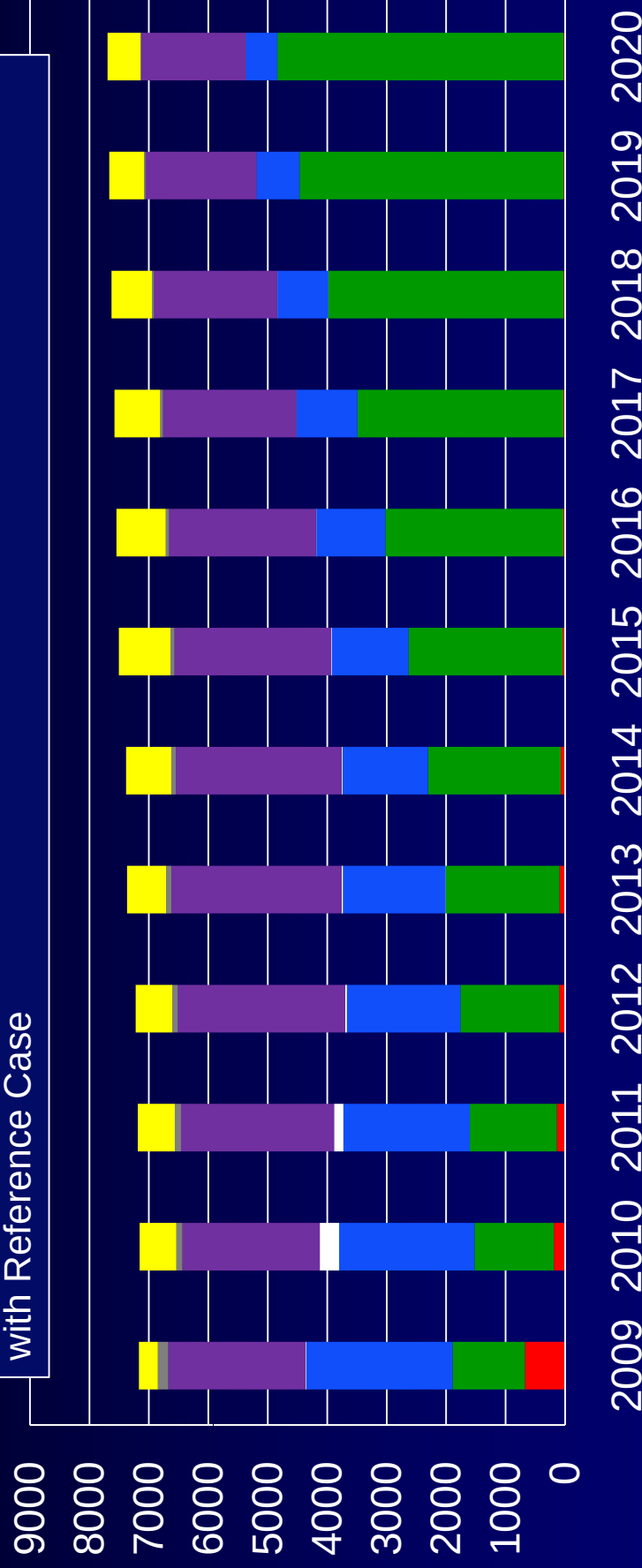
Note – Other Supply is primarily Midcontinent Shale & Midwest

Extreme Displacement Scenario Middle Atlantic Supply Sources



MMCF/D

Heavy increase Eastern U.S. (1.4 BCF/D) replacing Gulf Coast/GOM (-0.3 BCF/D), Midcontinent (-1.0 BCF/D) and Rockies (-0.4 BCF/D) as compared with Reference Case



- Western Canada
- LNG
- Rocky Mountains
- Eastern US
- Midcontinent Shale
- Gulf Coast/GOM
- Other

Note – Other Supply is primarily Midwest & Permian

Extreme Displacement Scenario New England Supply Sources



MMCF/D

Increased volumes from Eastern U.S. (0.5 BCF/D) with declining volumes from Gulf Coast/GOM (-0.2 BCF/D), Midcontinent Shale(-0.1 BCF/D) and Rockies (-0.2 BCF/D) as compared with the Reference Case

3000

2500

2000

1500

1000

500

0

2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

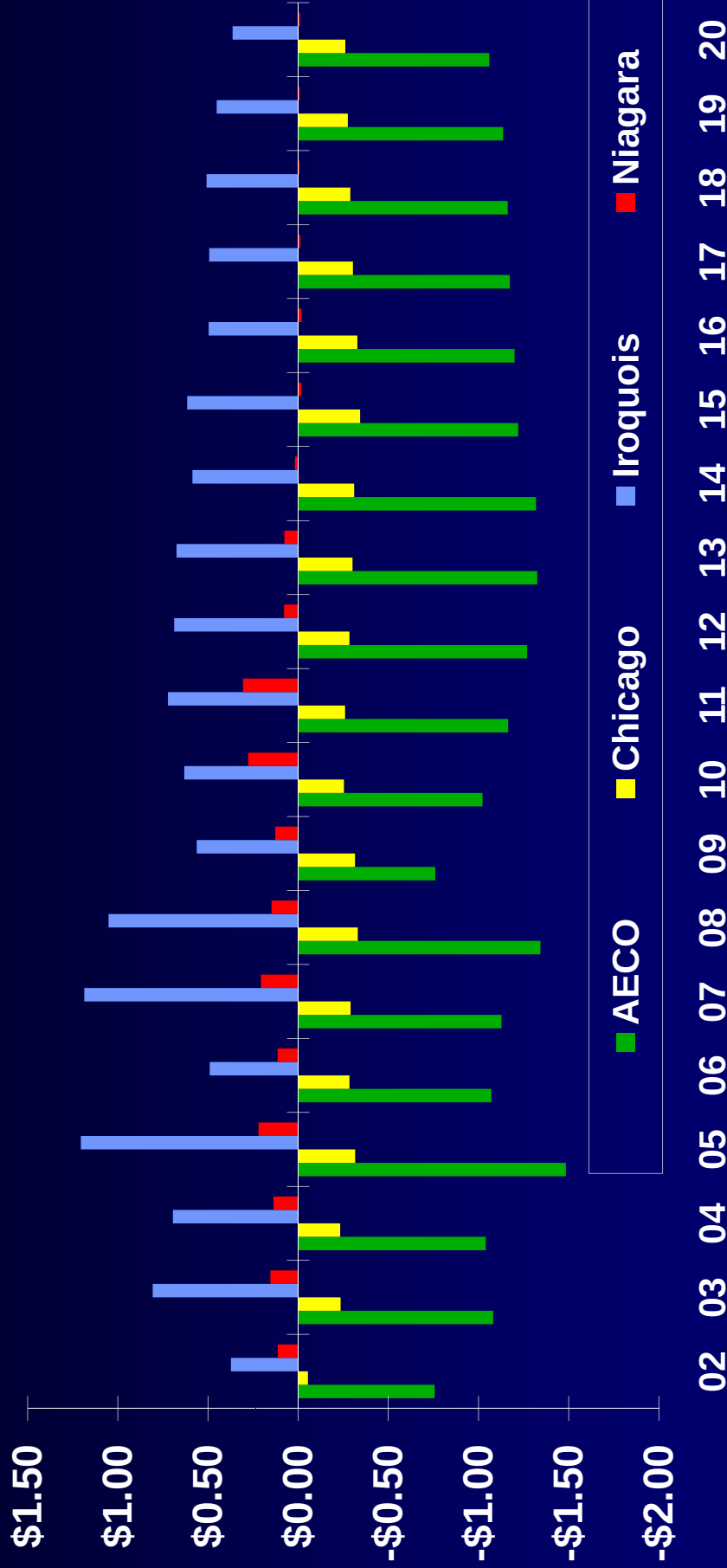
- Eastern Canada
- LNG-CAN
- Other
- Eastern US
- LNG-USA
- Rocky Mountains
- Gulf Coast/GOM
- Midcontinent Shale
- Western Canada

Note – Eastern Canadian supply is primarily Sable Island & Deep Panuke while LNG-CAN is Canaport

Extreme Displacement Scenario Key Supply Compared with Dawn: 2002 – 2020



Basis compared with Dawn

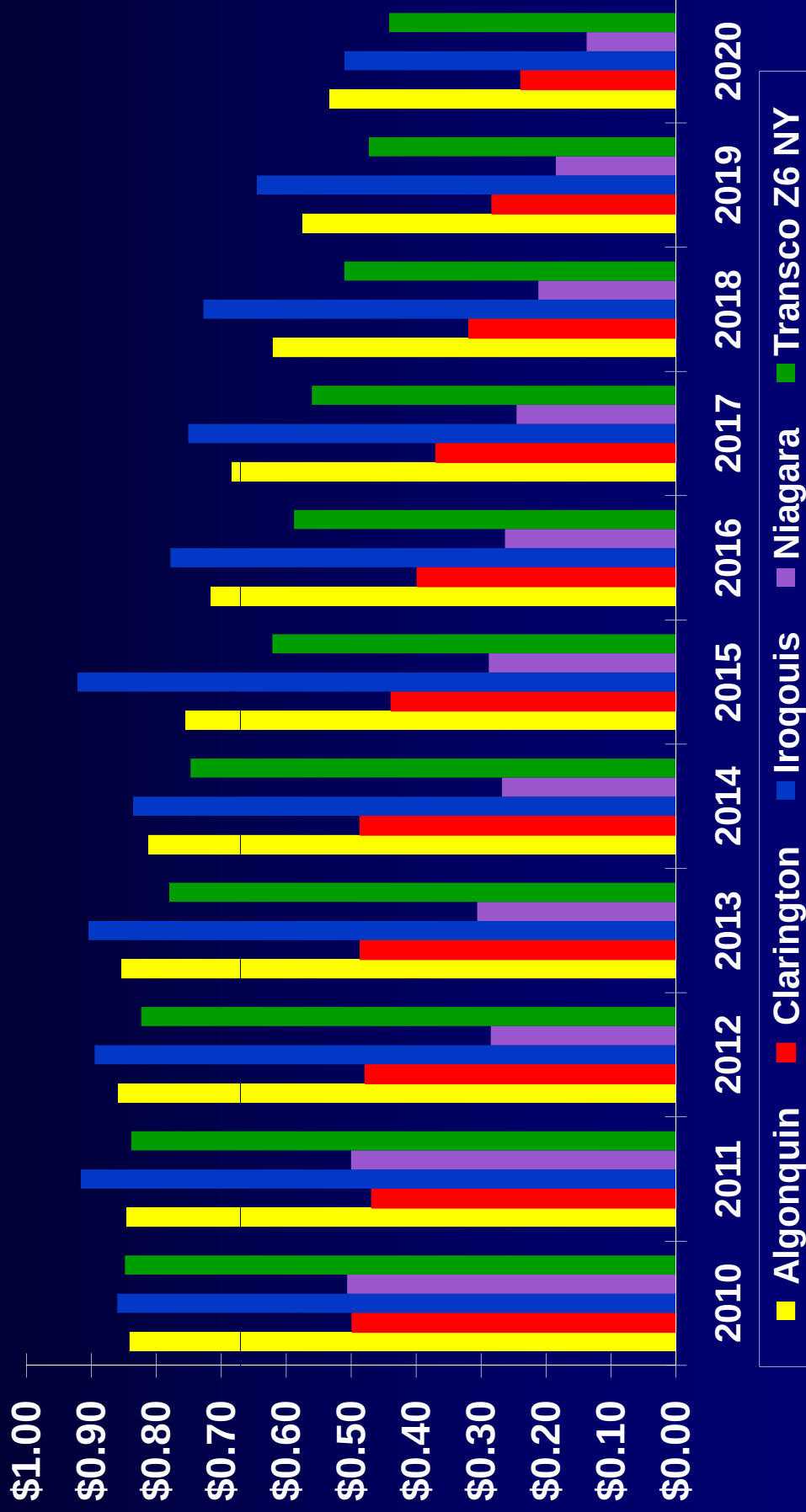


Compared with reference case, AECO basis strengthen and Chicago basis strengthens slightly while Iroquois and Niagara basis weaken

Extreme Displacement Scenario Eastern Basis Compared With Henry Hub: 2010 – 2020



Basis compared with Henry Hub

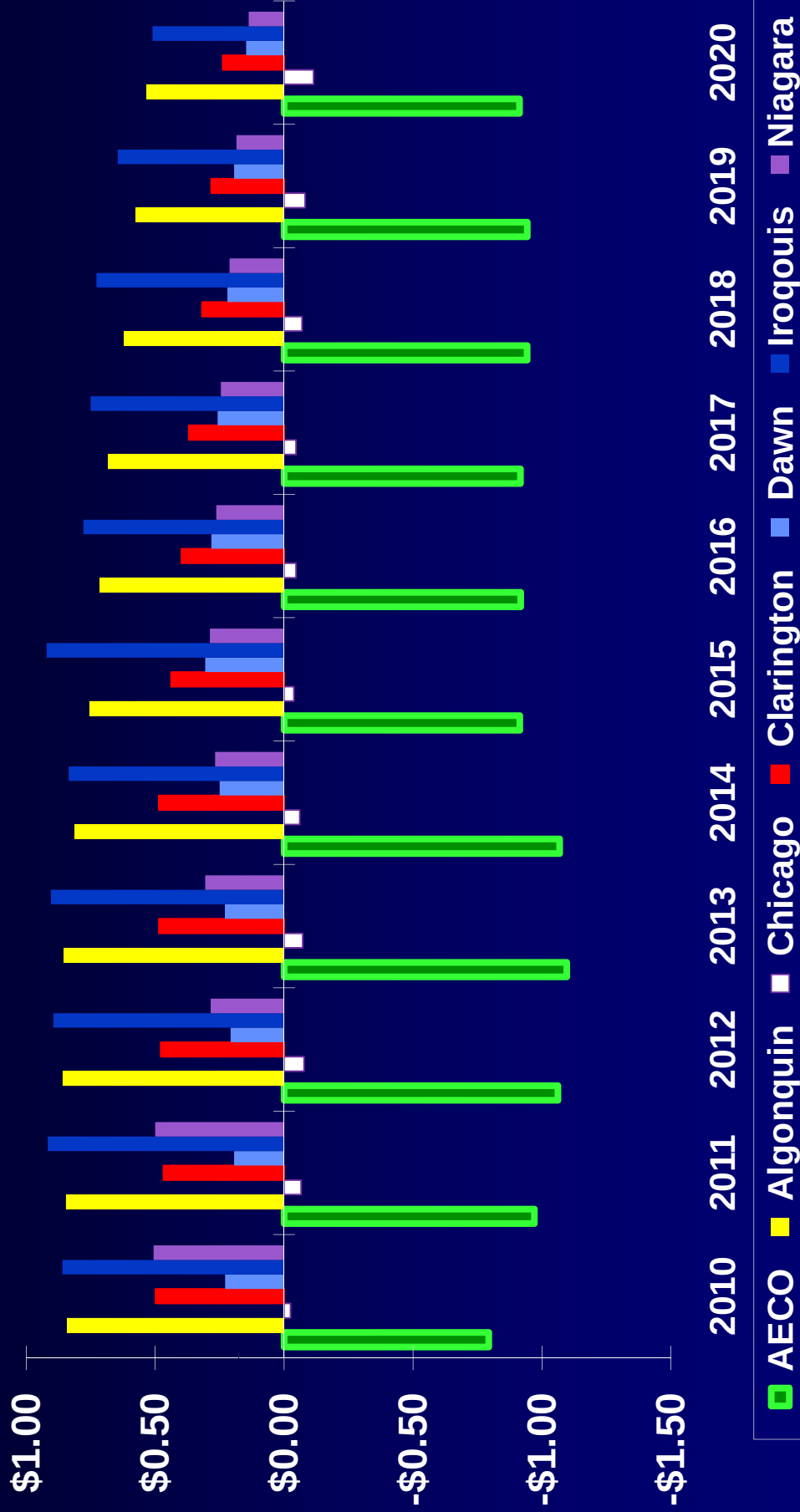


All Eastern basis points lower compared to Reference Case due to faster growth of Marcellus Shale

Extreme Displacement Scenario Basis for Current & Potential EGD Supply: 2010 – 2020



Basis compared with Henry Hub



AECO slowly rises while Chicago and Dawn are nearly flat while the Northeast points decline as compared with the Reference Case

Extreme Displacement Scenario Summary (1)

PIRA

- **Extreme Displacement Scenario (EDS) provides ~25% more Marcellus shale supply to the Northeast (Middle Atlantic and New England)**
 - » Compared to the Reference Case, the big loser is Midcontinent Shale supply followed by Rockies supply
 - » Small volumes of Eastern U.S. volumes (Marcellus) directly supply Eastern Canada
 - » Compared to Dawn, AECO basis strengthens and Chicago basis strengthens slightly while Iroquois and Niagara basis weaken
 - » All Eastern basis points lower compared to Reference Case due to faster growth of Marcellus Shale
 - » AECO basis slowly rises while Chicago and Dawn are nearly flat
- **Recent PIRA analysis indicates Marcellus shale production is growing significantly faster than the Reference Case making the EDS case more possible**

Extreme Displacement Scenario Summary (2)



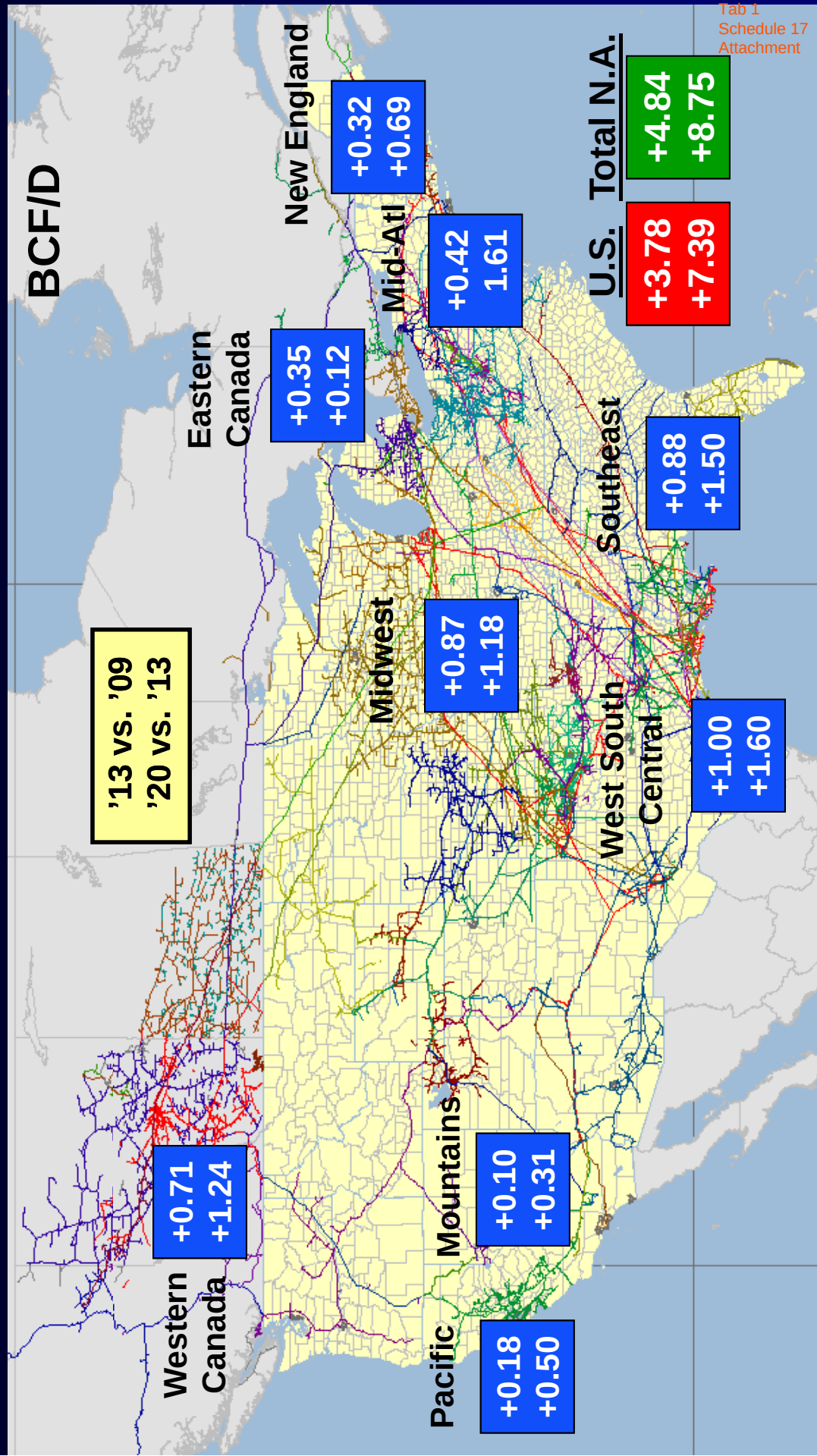
- Pipeline constraints in the GPCM model prevented more Marcellus & Rockies supply from accessing Eastern Canada
 - » These can be eliminated with more pipeline capacity built to Dawn and further downstream to Ontario and Quebec
- Only small volumes of Eastern U.S. supply (Marcellus) directly access Eastern Canada mainly on a seasonal basis
 - » Pipeline constraints prevent more additional Eastern U.S. supply (Marcellus) exports to Eastern Canada
 - » GPCM model does not show volume displacement
 - » Important to note Eastern U.S. supply (Marcellus) is accessing Eastern Canada via displacement

Minimal Displacement Scenario:



This scenario combines stronger-than-expected Northeast Coast demand growth and slower growth of local supply. It would provide existing and would-be external gas supplies, including LNG, a greater cushion from market displacement. Factors causing this scenario would be greater-than-expected environmental concerns, lower regional prices and capital access issues hindering local shale gas expansion, while government policy initiatives stimulate the region's gas demand. These initiatives could include hard-line carbon taxation that places coal-fired electric generation at risk and programs aimed at converting commercial fleet vehicles to CNG. Regional demand is up 14% while regional supply is down 27% over the reference case.

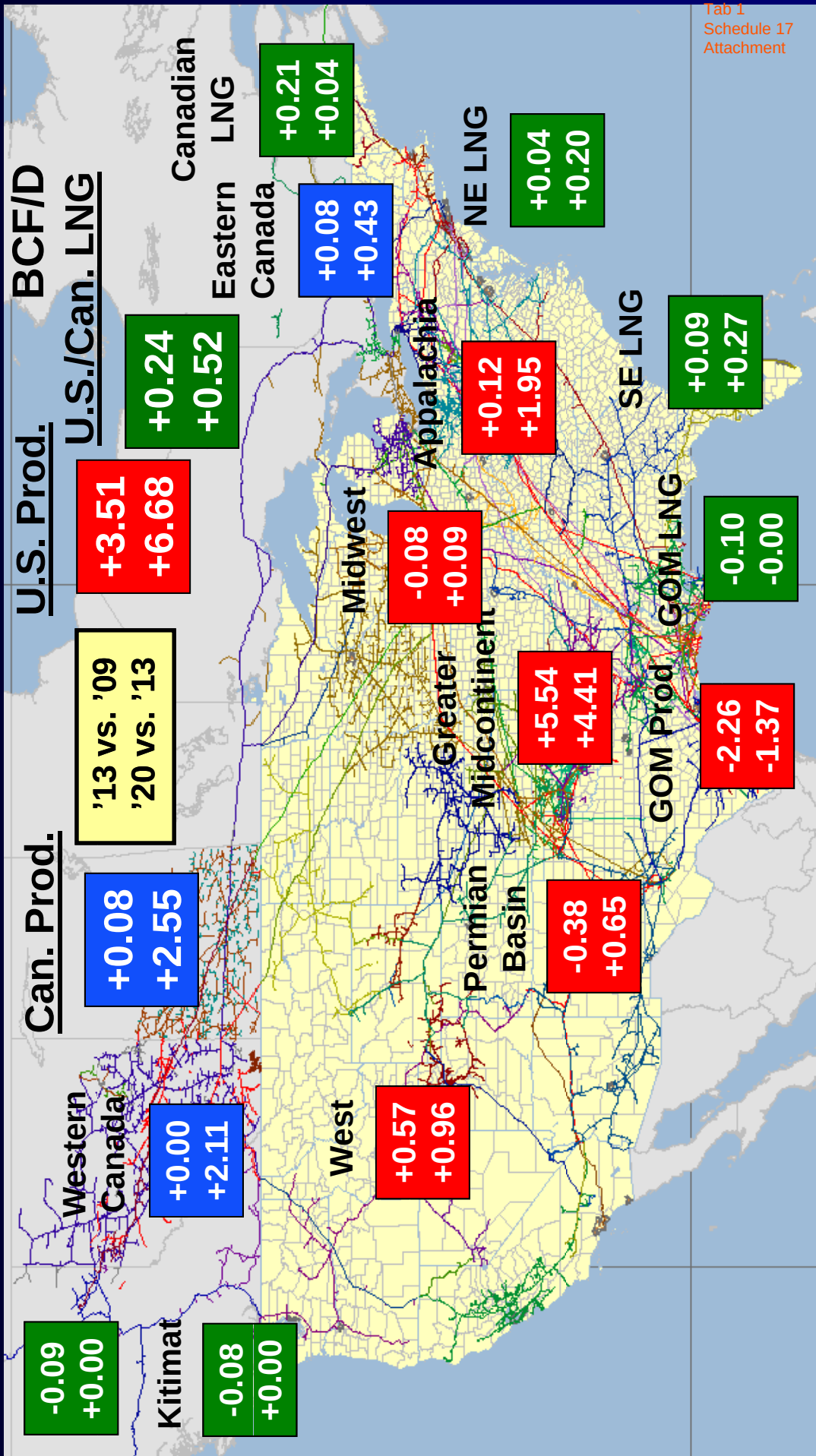
Minimal Displacement Scenario North American Regional Demand Outlook



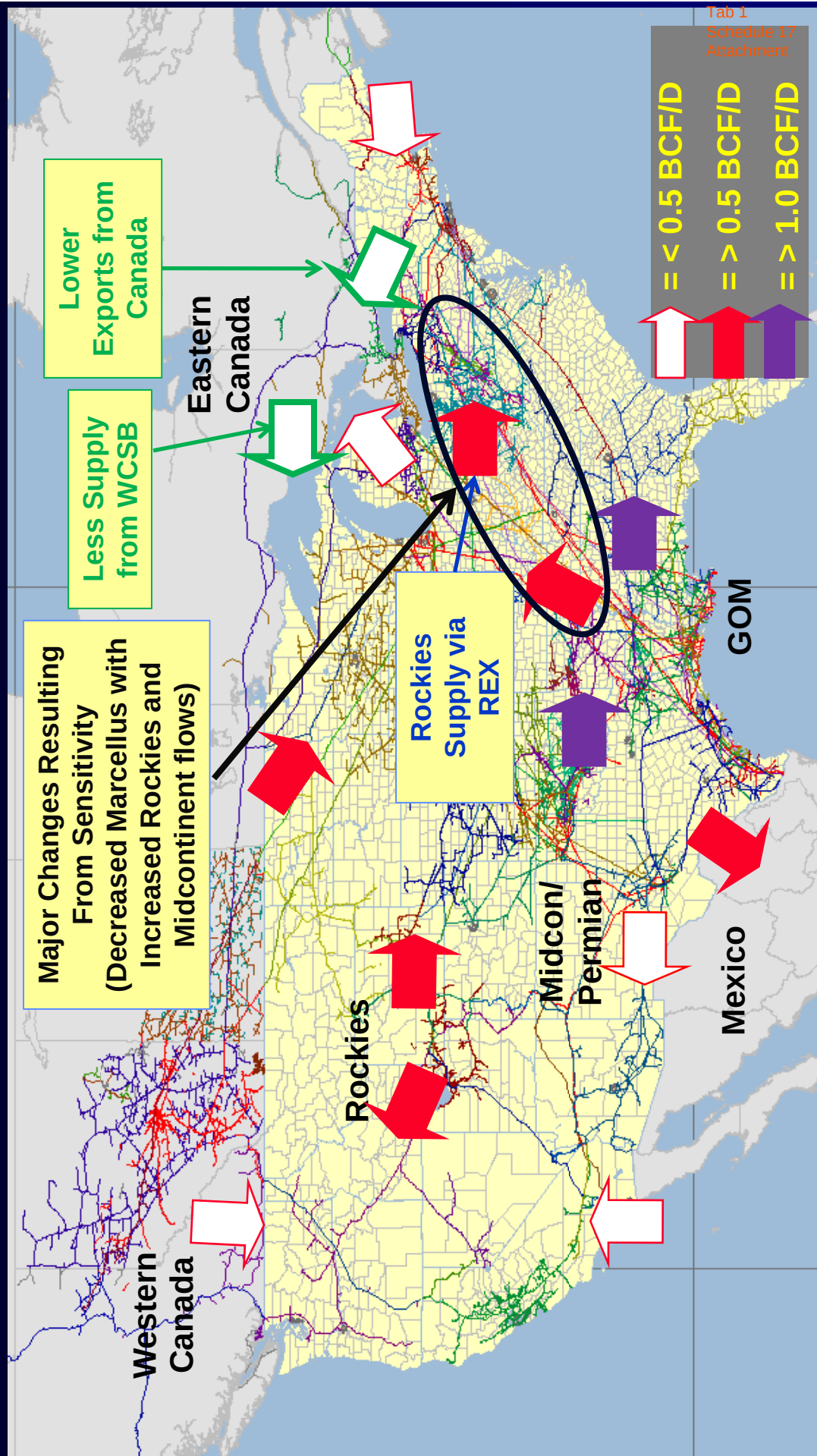
Minimal Displacement Scenario North American Regional Supply Outlook



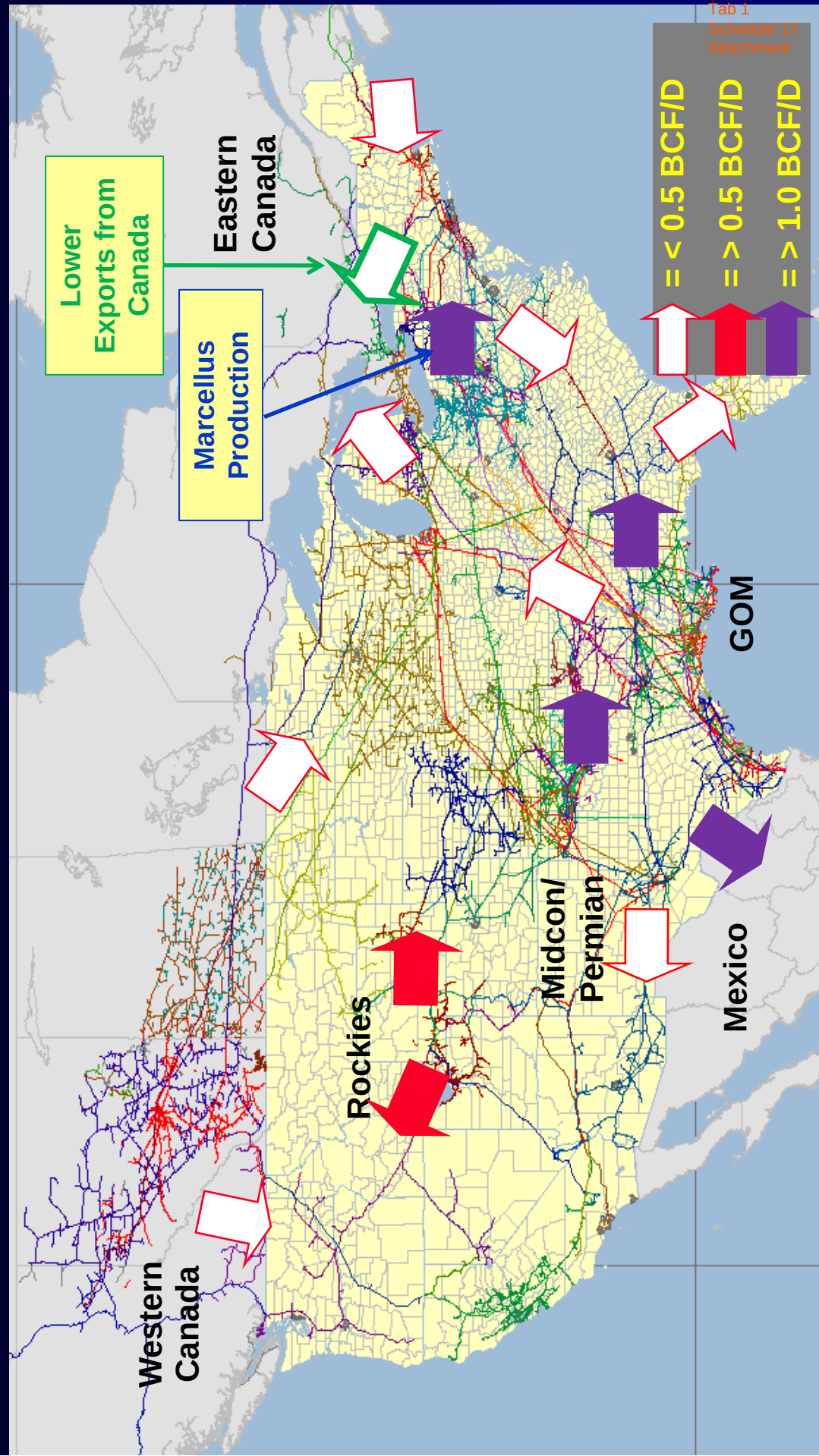
Alaska



Minimal Displacement Scenario North American Regional Flow Changes: 2013 vs. 2009



Minimal Displacement Scenario North American Regional Flow Changes: 2020 vs. 2013

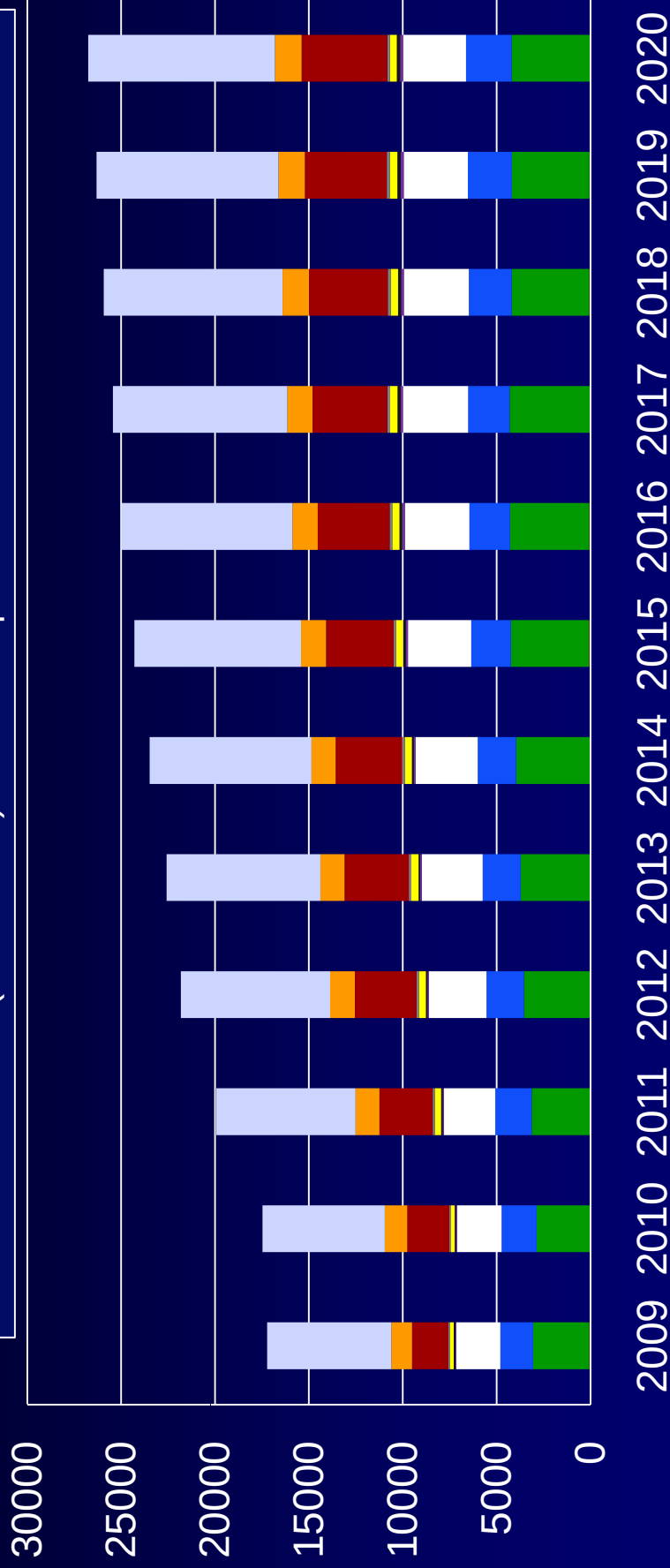


Minimal Displacement Scenario Disposition of Midcontinent Shale Supply



MMCF/D

More volume to Middle Atlantic (0.6 BCF/D), East South Central (0.2 BCF/D), and South Atlantic (0.2 BCF/D) when compared with Reference Case



■ Eastern Canada ■ ENC
■ MNT ■ Mexico
■ SA ■ WNC

■ ESC
■ NE
■ WSC

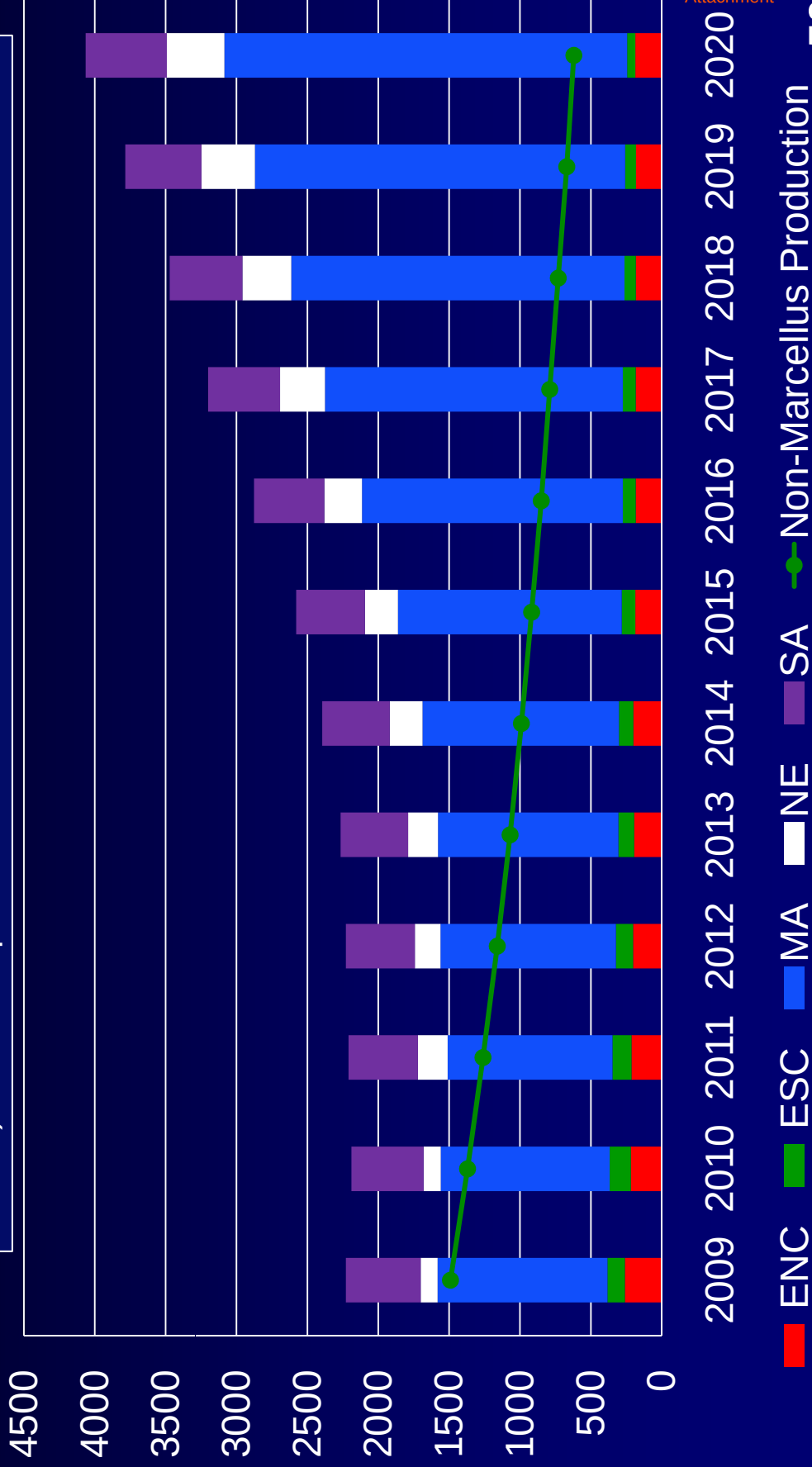
■ MA
■ PAC

Minimal Displacement Scenario Disposition of Appalachian (Marcellus) Supply



MMCF/D

Much less volumes to Middle Atlantic (-0.6 BCF/D) and South Atlantic (-0.5 BCF/D) when compared with Reference Case

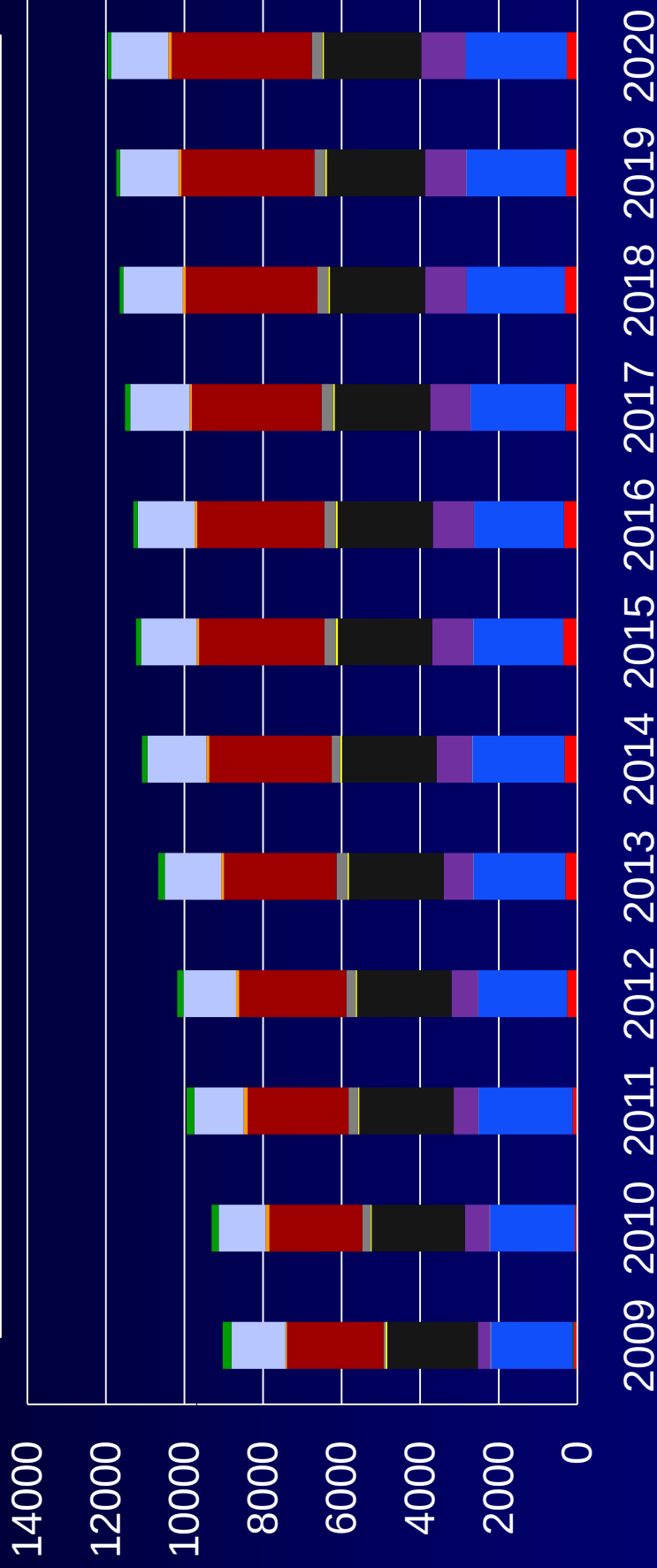


Minimal Displacement Scenario Disposition of Rockies Supply



MMCF/D

More volumes to Middle Atlantic (0.2 BCF/D) when compared to Reference Case



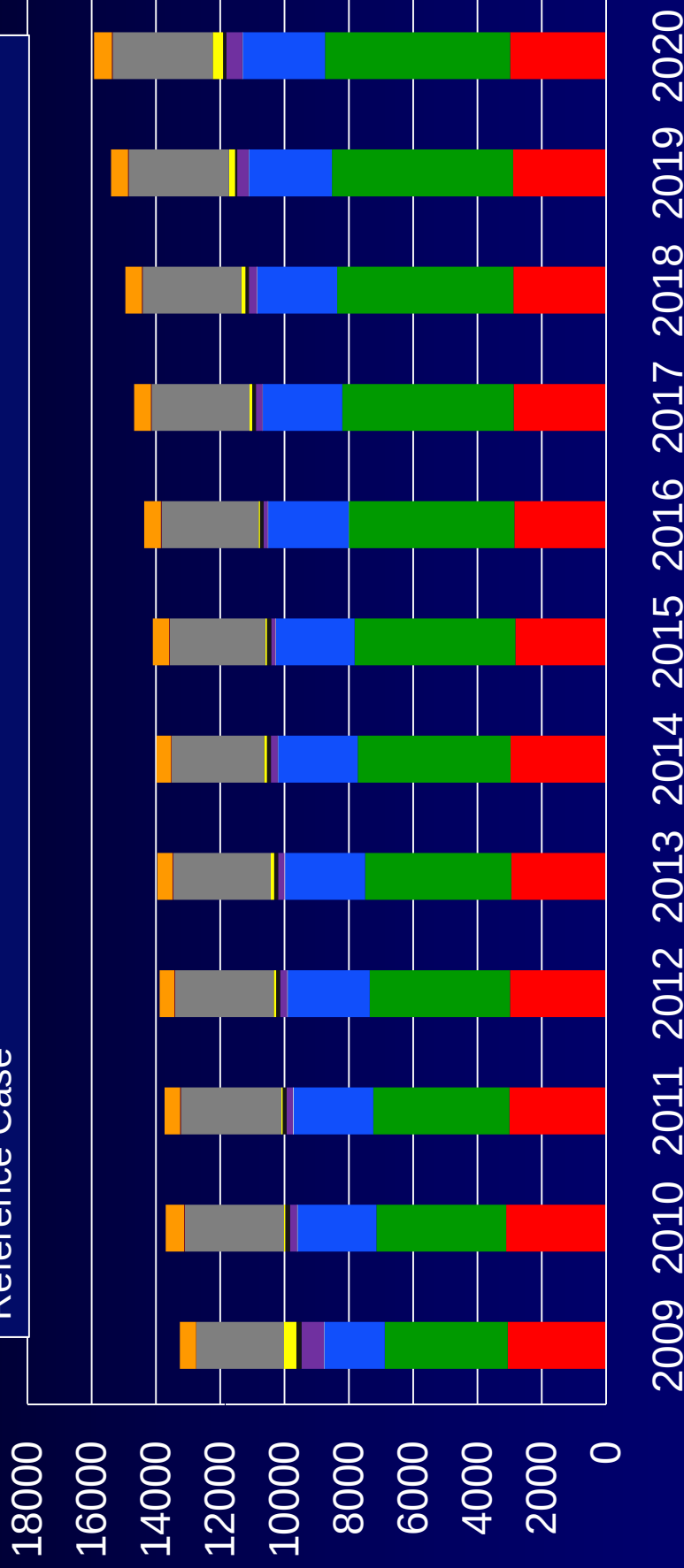
■ Eastern Canada ■ Western Canada ■ ENC
■ MA ■ MNT ■ SA ■ Mexico ■ WNC
■ PAC ■ ESC ■ NE ■ WSC

Minimal Displacement Scenario Disposition of Western Canadian Supply



MMCF/D

More volumes to Eastern Canada (0.2 BCF/D) when compared to Reference Case



■ Eastern Canada ■ Western Canada ■ ENC
■ MA ■ MNT ■ WNC
■ SA ■ NE

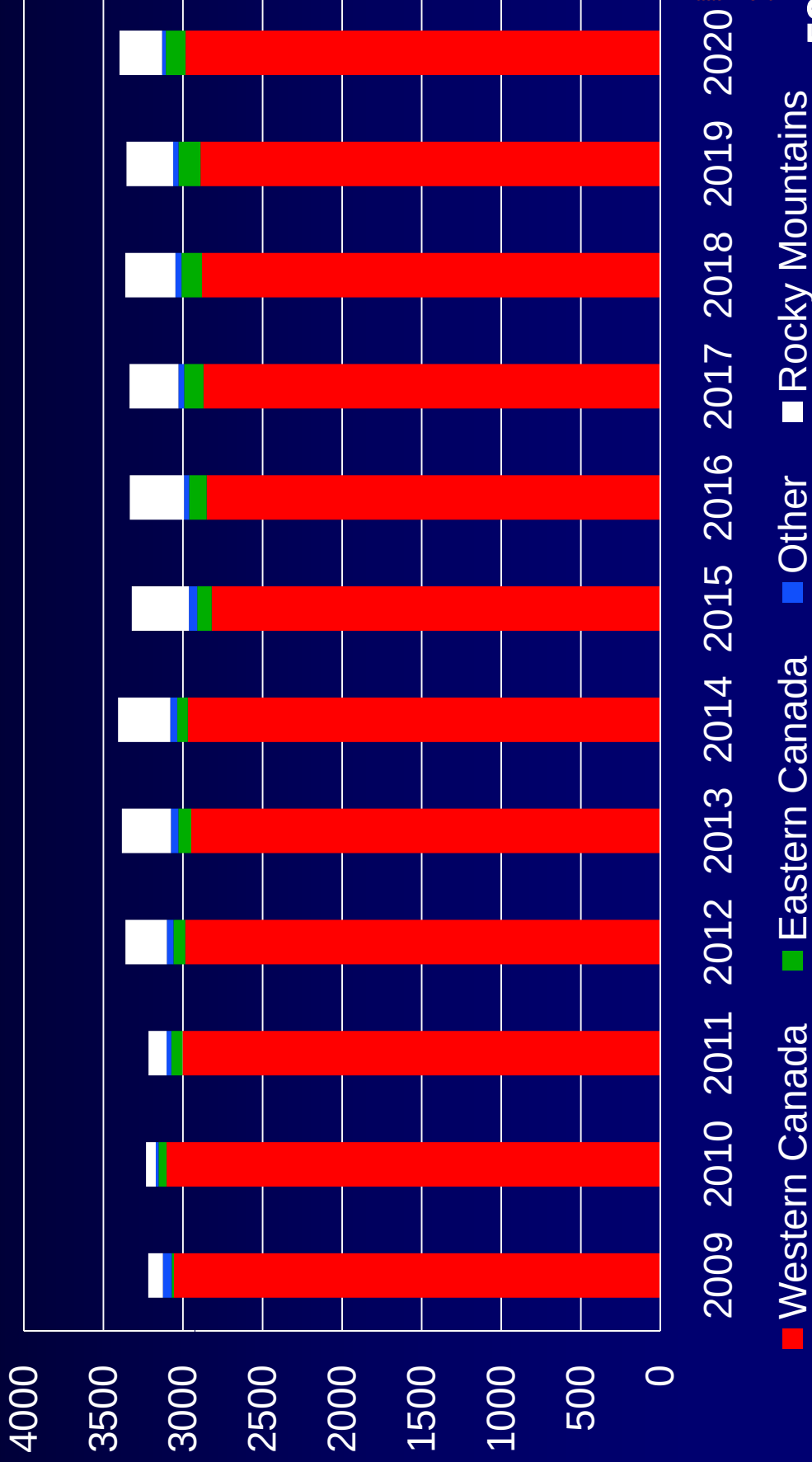
■ ESC
■ PAC

Minimal Displacement Scenario Eastern Canada Supply Sources



MMCF/D

More supply from Western Canada (0.2 BCF/D) and less from Rockies
(-0.1 BCF/D) as compared with Reference Case

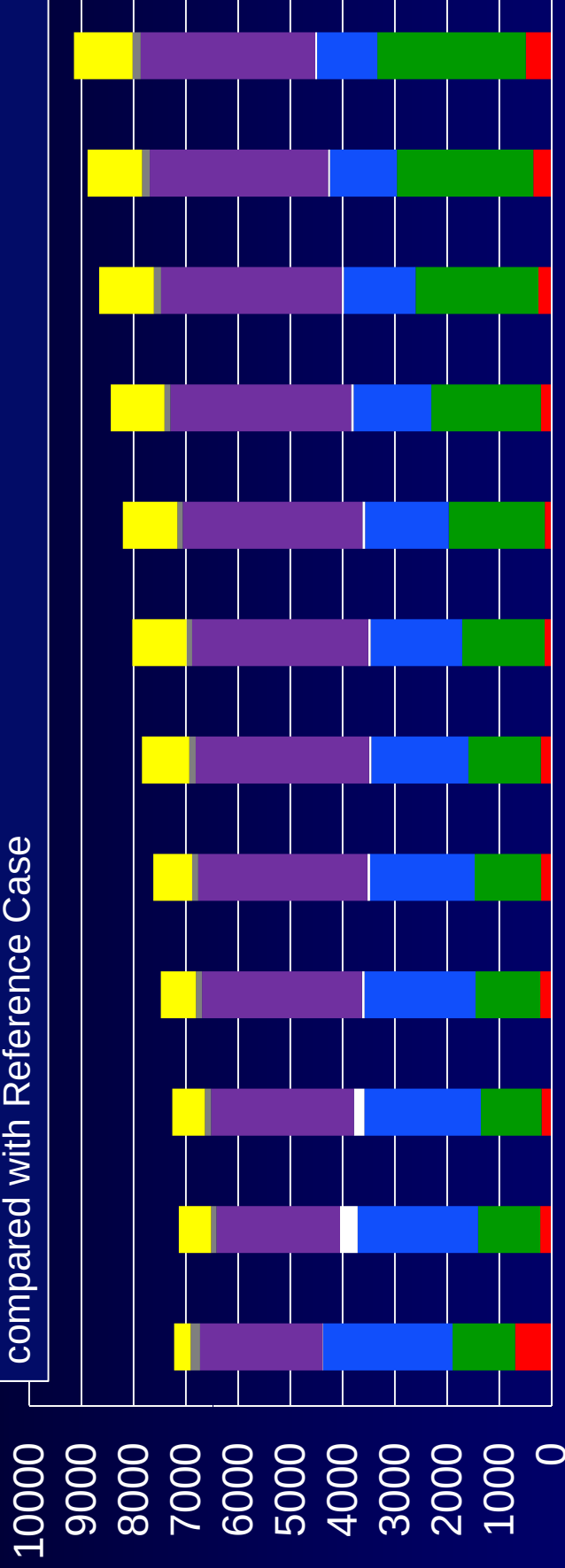


Minimal Displacement Scenario Middle Atlantic Supply Sources



MMCF/D

Decline in Eastern U.S. (-0.6 BCF/D) replaced by Western Canada (0.4 BCF/D), Gulf Coast (0.3 BCF/D), Midcontinent (0.6 BCF/D) and Rockies (0.2 BCF/D) as compared with Reference Case



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

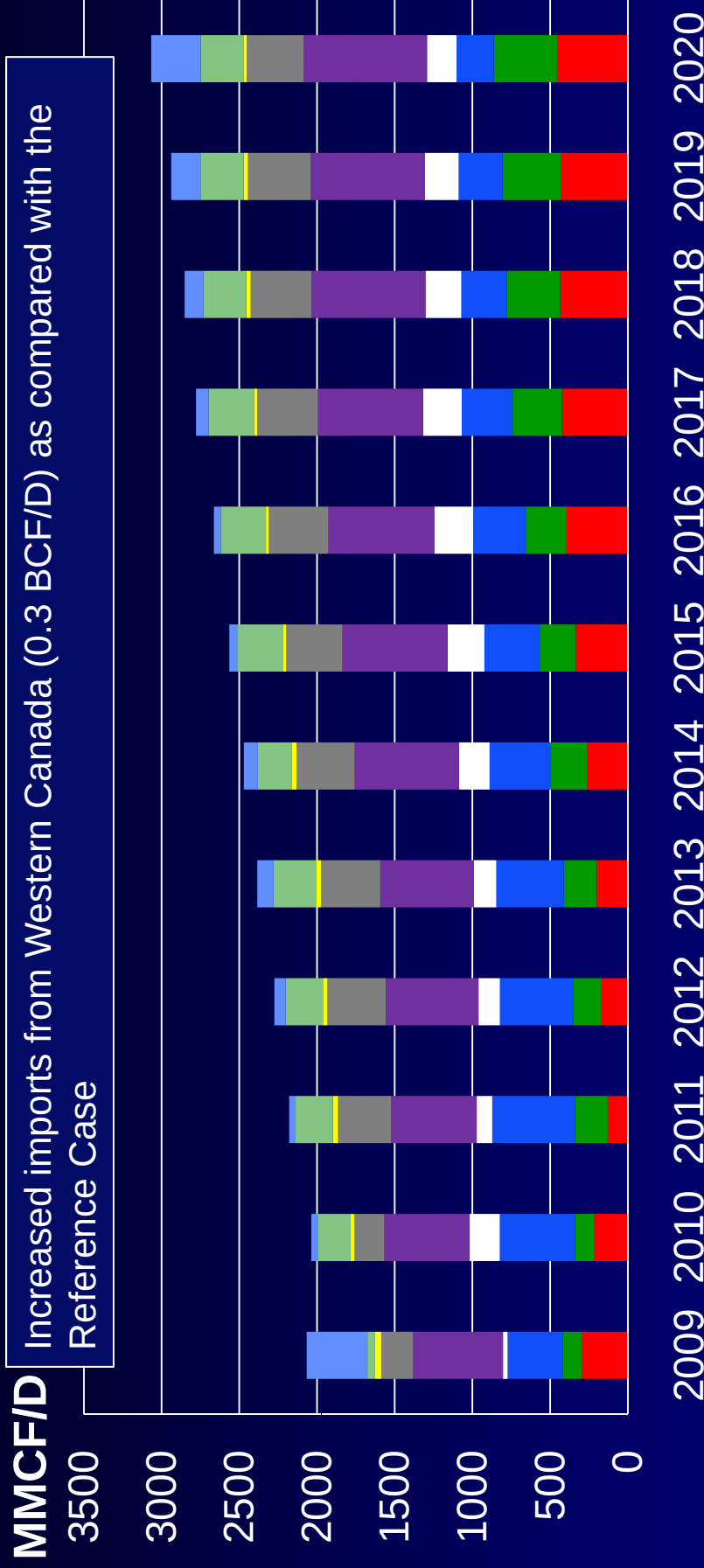
- Western Canada
- LNG
- Rocky Mountains
- Eastern US
- Midcontinent Shale
- Gulf Coast/GOM
- Other

Note – Other Supply is primarily Eastern Canada, Midwest & Permian

Minimal Displacement Scenario New England Supply Sources



MMCF/D



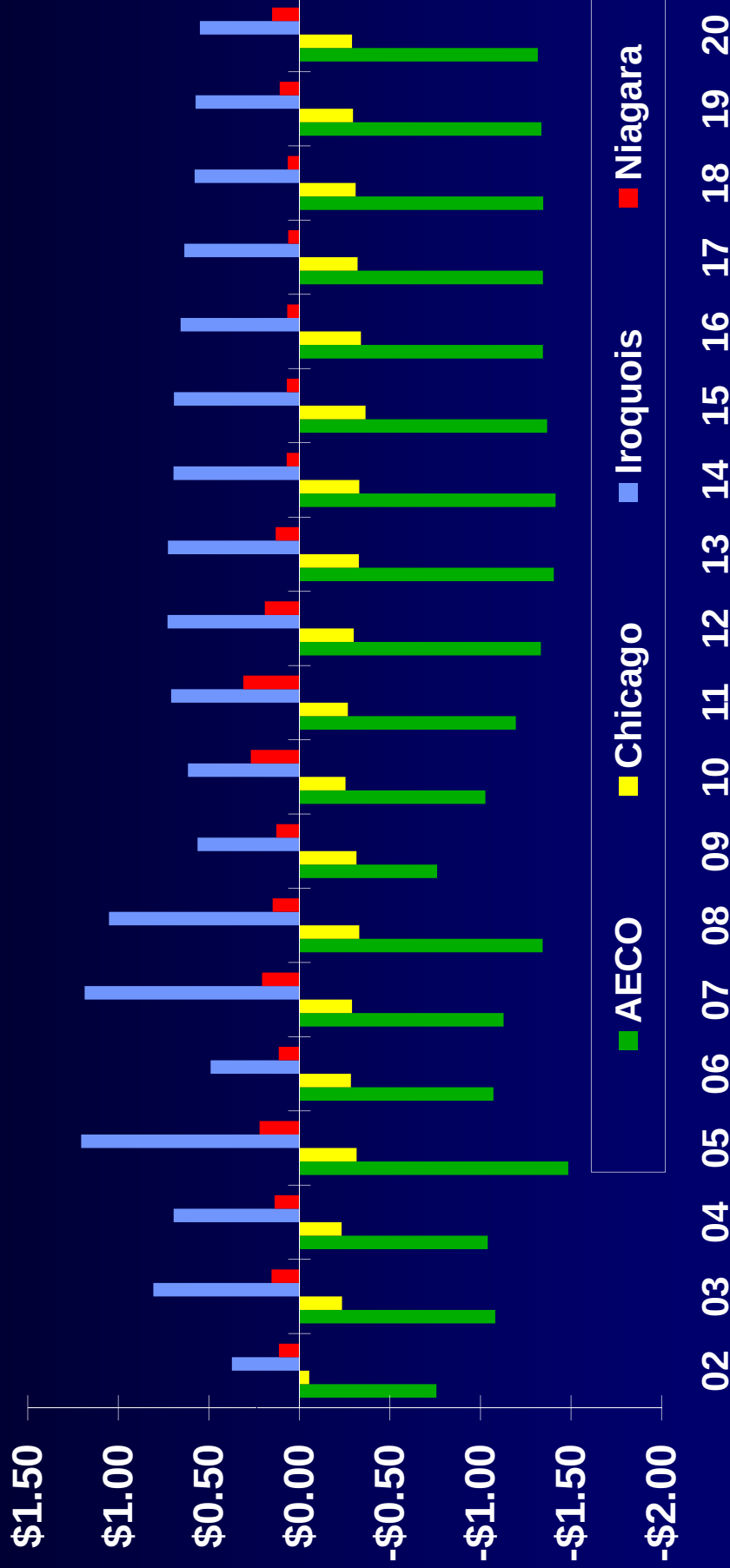
- Eastern Canada
- LNG-CAN
- Other
- Eastern US
- LNG-USA
- Rocky Mountains
- Gulf Coast/GOM
- Midcontinent Shale
- Western Canada

Note – Eastern Canadian supply is primarily Sable Island & Deep Panuke while LNG-CAN is Canaport

Minimal Displacement Scenario Key Supply Compared with Dawn: 2002 – 2020



Basis compared with Dawn

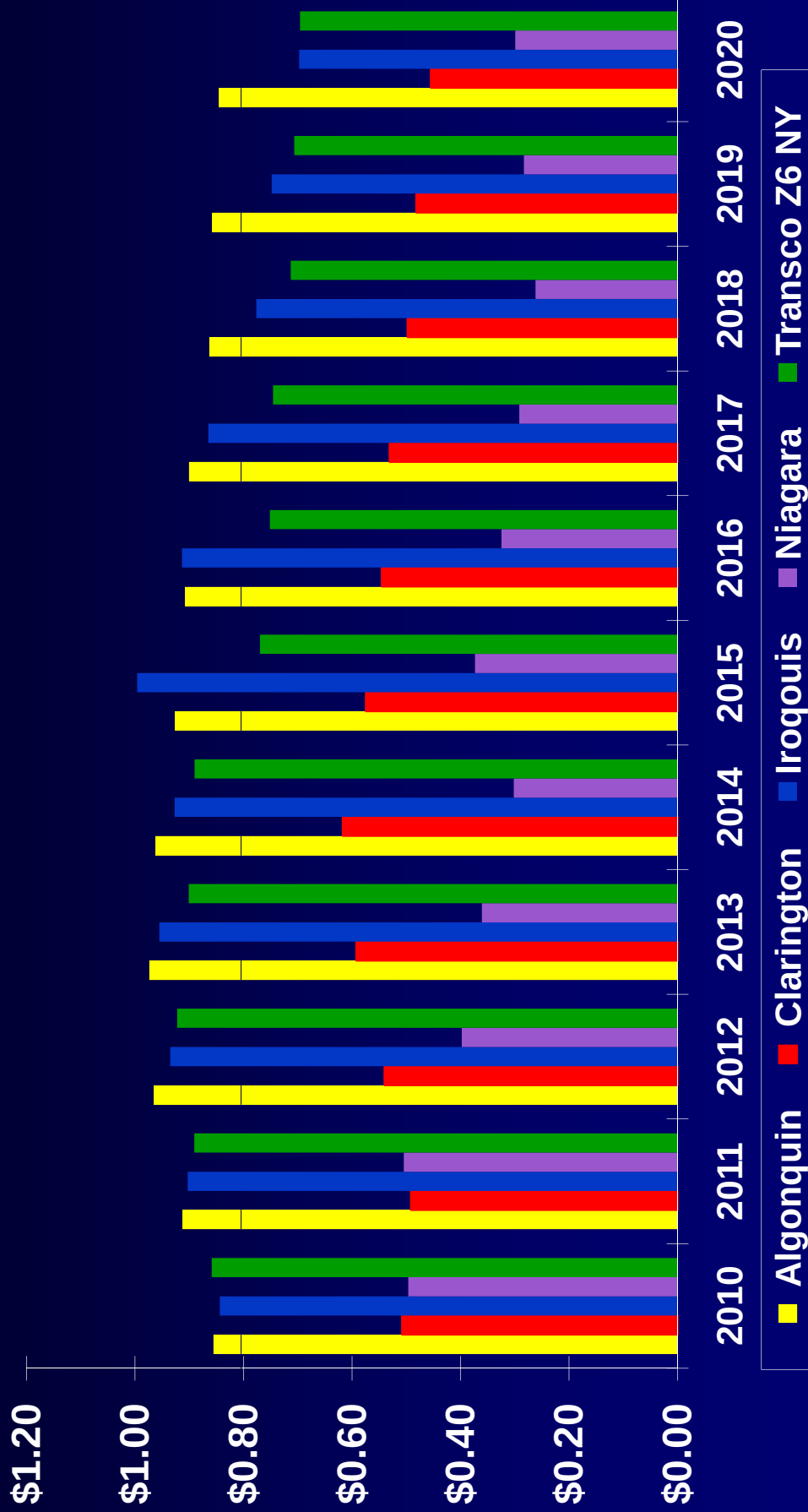


Niagara and Iroquois basis increase due to lack of Marcellus growth while Chicago and AECO weaken due to growth of Midcontinent Shale which accelerates slightly compared with Reference Case

Minimal Displacement Scenario Eastern Basis Compared With Henry Hub: 2010 – 2020



Basis compared with Henry Hub

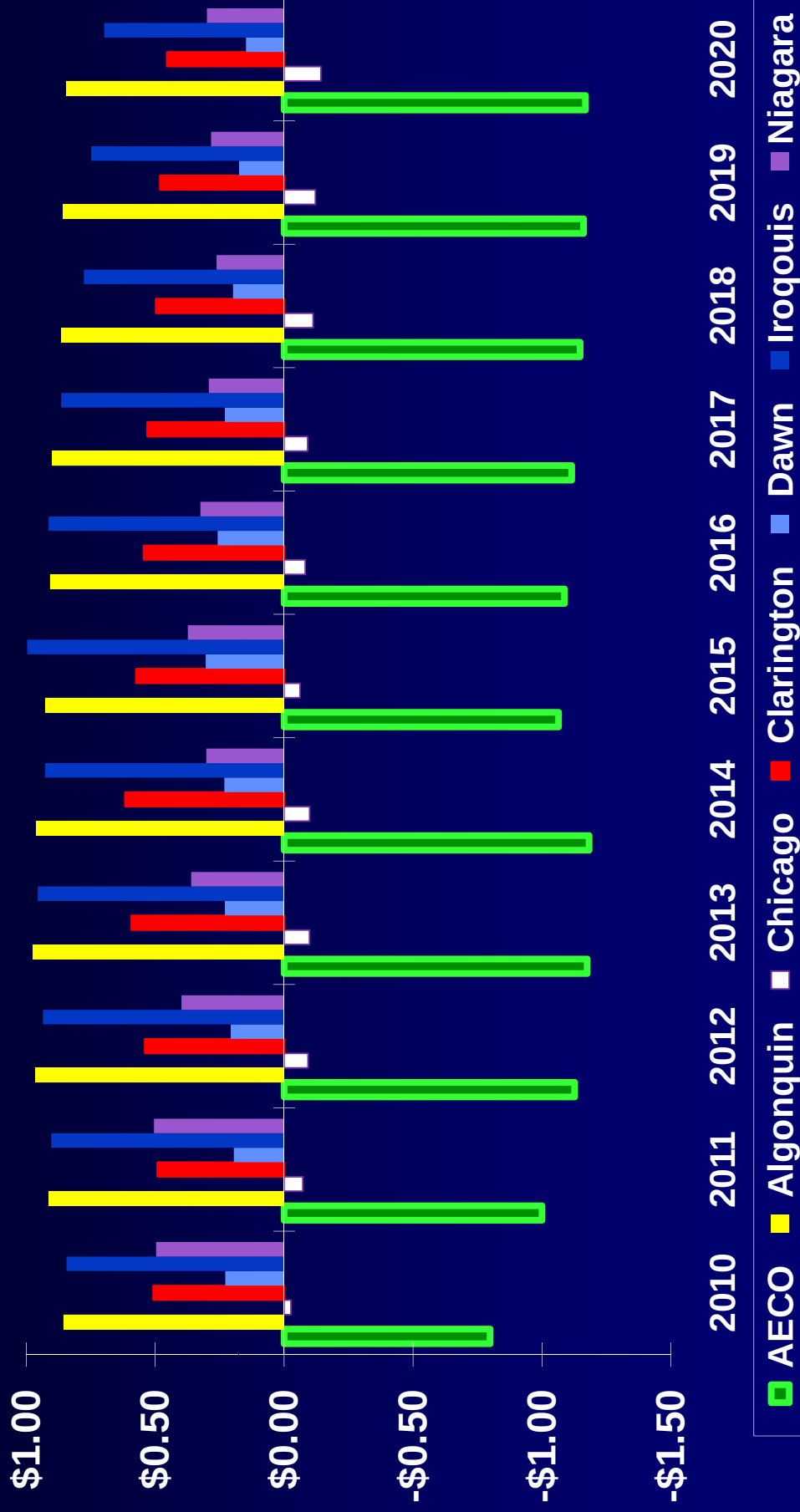


All Eastern basis points increase compared to Reference Case due to slower growth of Marcellus Shale

Minimal Displacement Scenario Basis for Current & Potential EGD Supply: 2010 – 2020



Basis compared with Henry Hub



AECO, Chicago and Dawn basis weaken compared with Reference Case while Northeast basis points all rise due to slower Marcellus Shale growth

Minimal Displacement Scenario Summary



- **Minimal Displacement Scenario (MDS) assumes ~25% less Marcellus shale growth compared to the Reference Case meaning less supply to the Northeast**
 - » The big winner is Midcontinent shale
 - » The buildup of Marcellus shale is much slower though there is still a large increase post-2013
- **MDS shows slower growth of Rockies production supplying Eastern Canada**
- **AECO, Chicago and Dawn basis weaken compared with Reference Case while Northeast basis points all rise due to slower Marcellus Shale growth**
 - » Compared with Dawn, Niagara and Iroquois basis increase due to lack of Marcellus growth while Chicago and AECO weaken due to growth of Midcontinent Shale which accelerates slightly compared with Reference Case



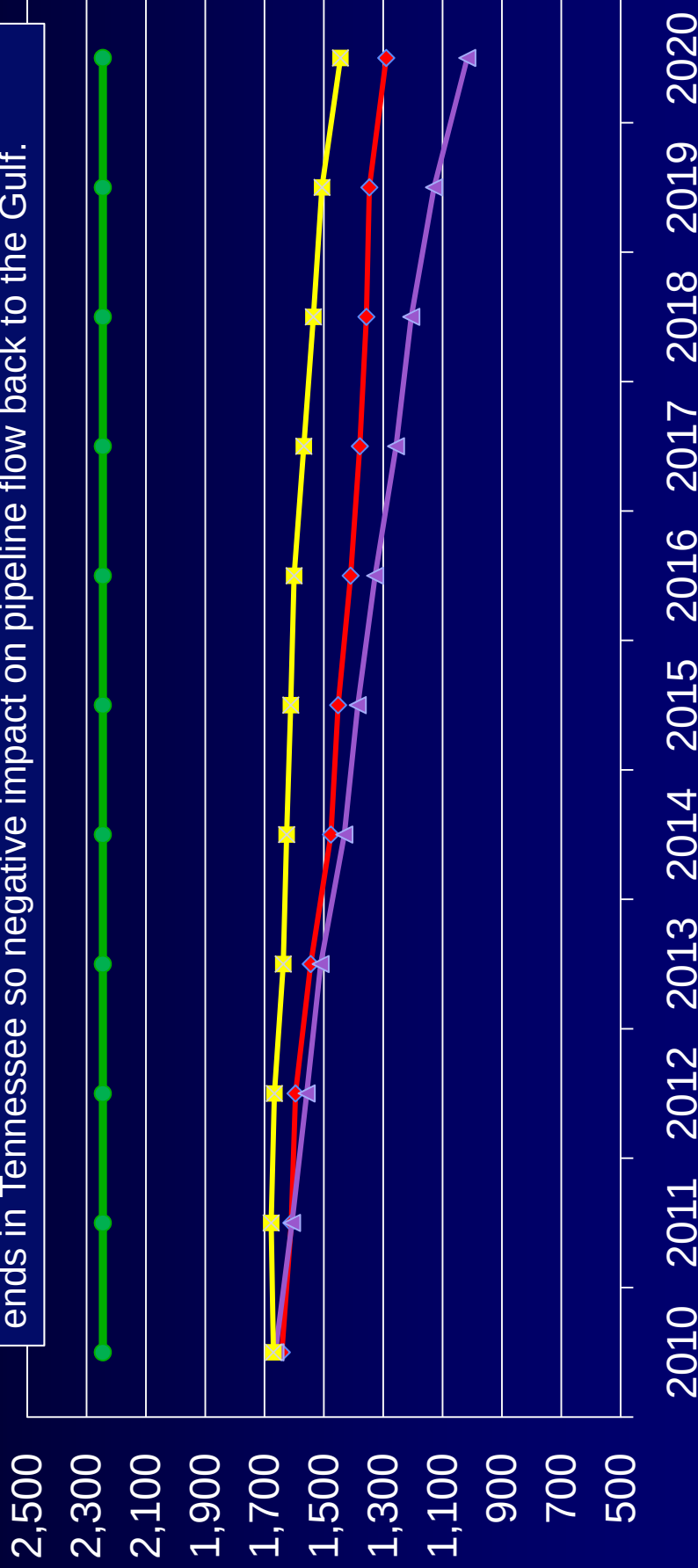
Pipeline Flows

Texas Eastern M1 Zone-East Volumes: 2010 - 2020



MMCF/D

All cases show declining upstream volumes due to growth of Marcellus Shale with less capacity utilization from more Marcellus Shale growth. Tetco M1 ends in Tennessee so negative impact on pipeline flow back to the Gulf.



Reference Case

Tetco M1-East Capacity

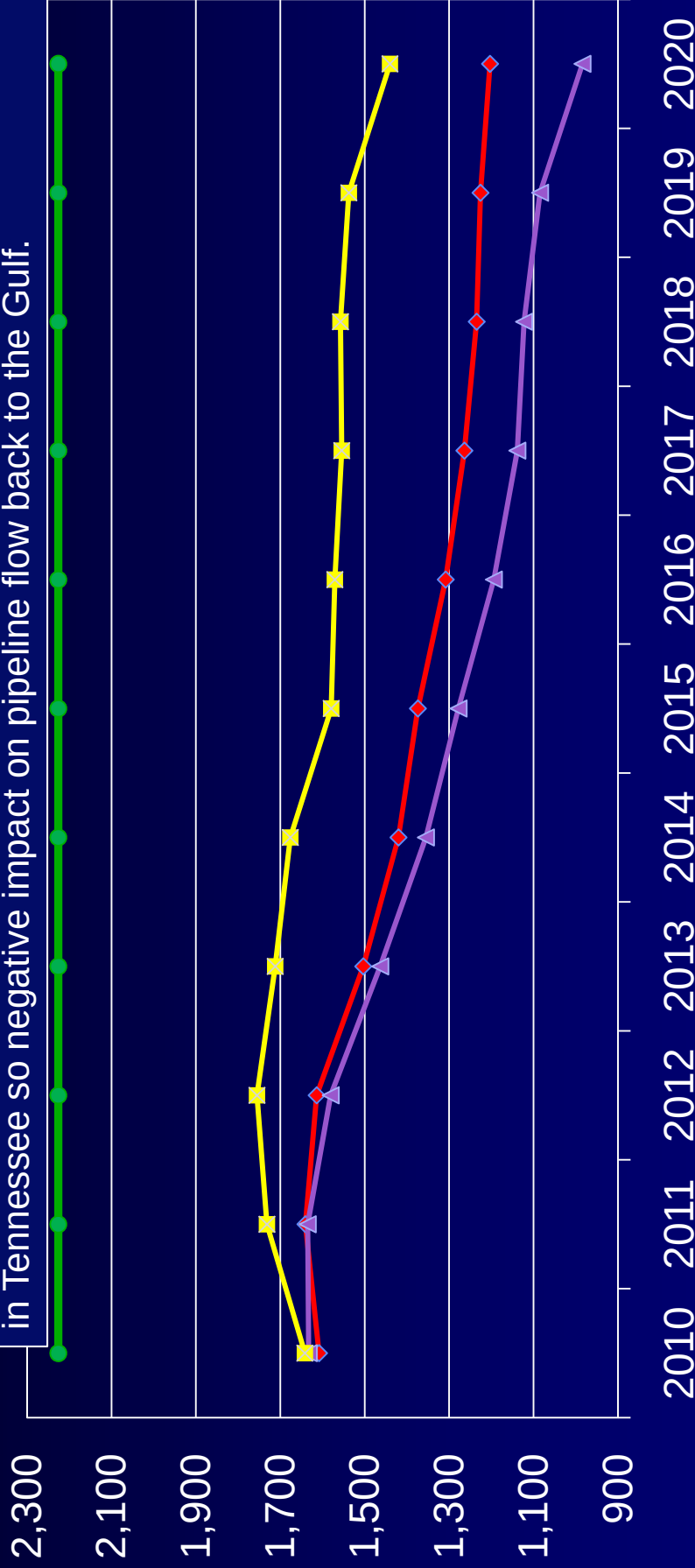
Extreme Displacement Scenario

Texas Eastern M2 Zone-Kentucky Ohio: 2010 - 2020



MMCF/D

All cases show declining upstream volumes due to growth of Marcellus Shale with less capacity utilization from faster Marcellus Shale growth. Tetco M1 ends in Tennessee so negative impact on pipeline flow back to the Gulf.



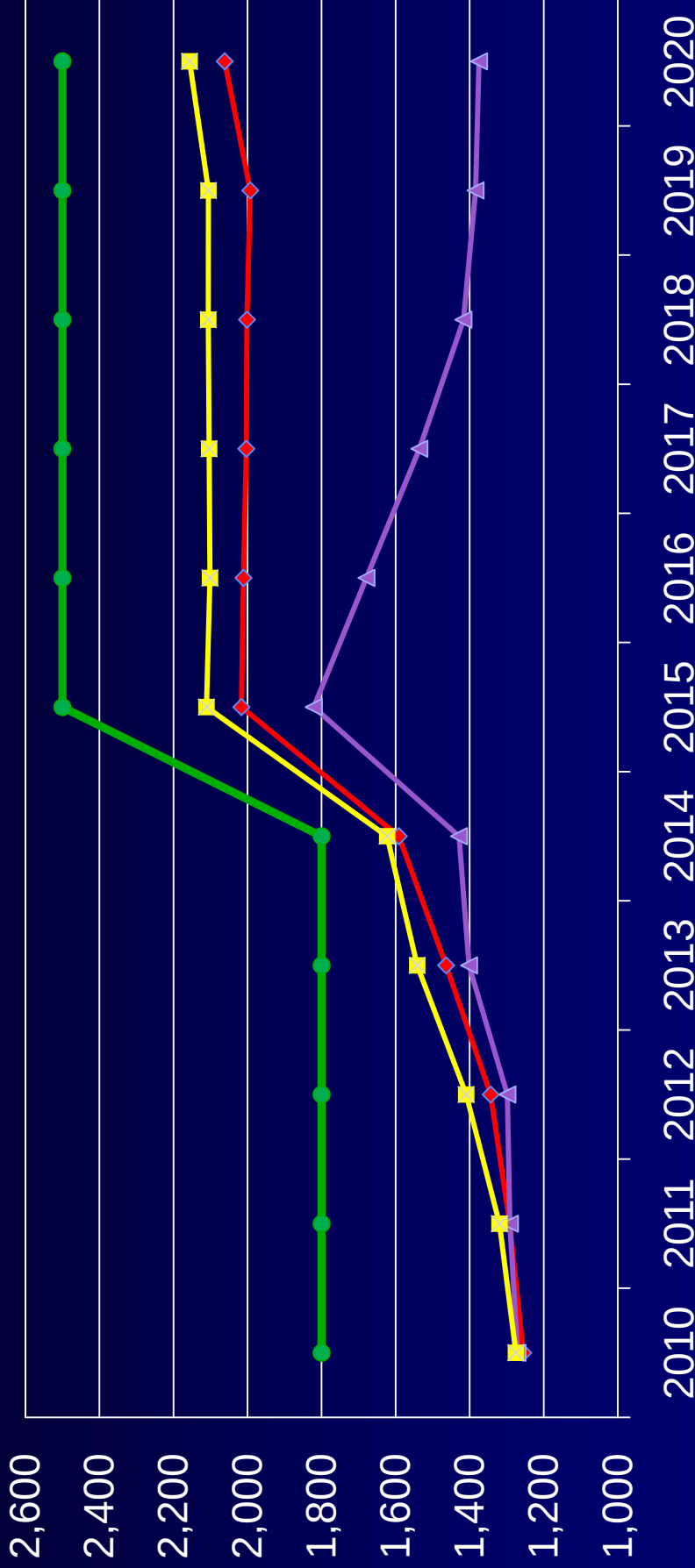
Reference Case
Extreme Displacement Scenario
Minimal Displacement Scenario
Tetco M2 Zone-KY OH Capacity

Rockies Express Zone 3 to Clarington (Main Delivery Point to Northeast): 2010 – 2020



MMCF/D

The cases show increasing Rockies supply serving the Northeast except for the higher Marcellus growth case (EDS)

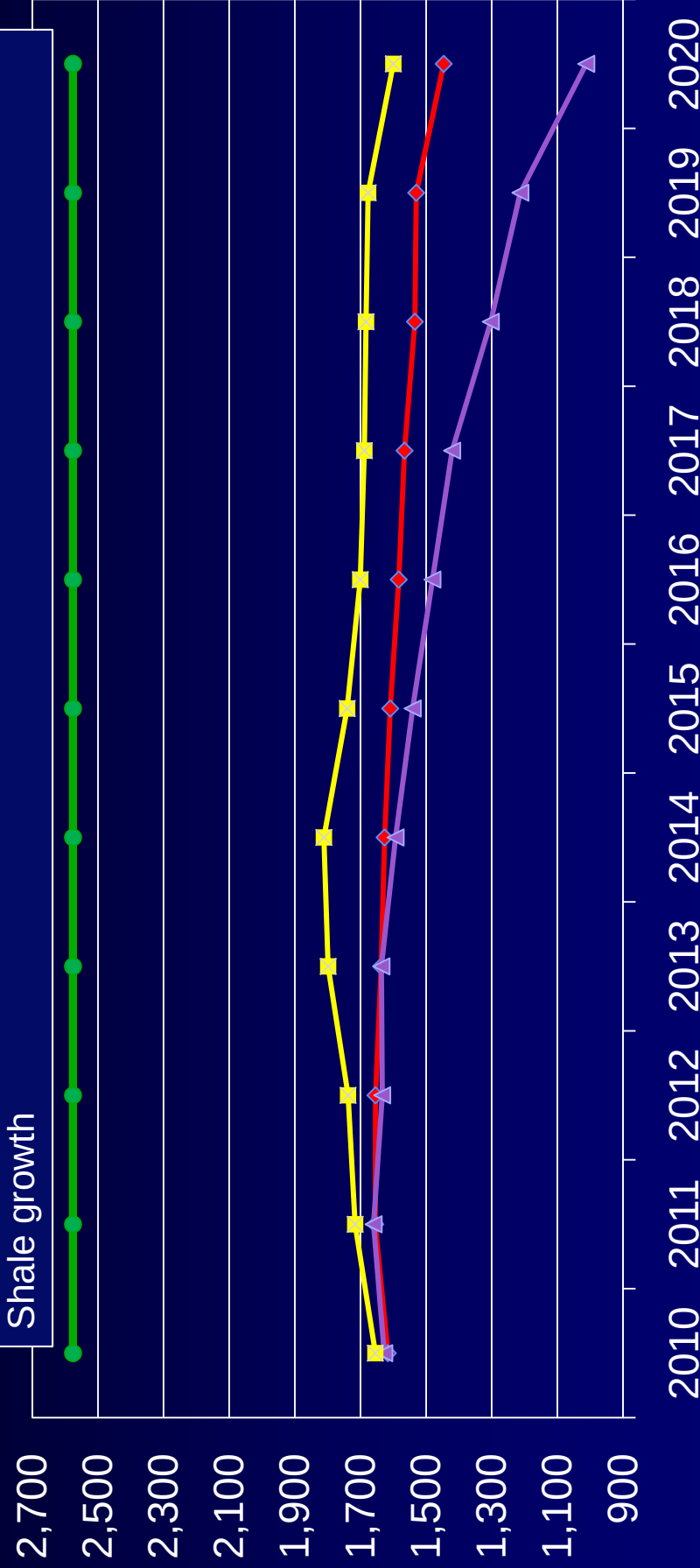


Tennessee Gas Pipeline Zone 2 (Upstream of Northeast): 2010 – 2020



MMCF/D

Similar to Tetco, all cases show declining upstream volumes due to growth of Marcellus Shale with even less capacity utilization from faster Marcellus Shale growth



Reference Case

TGP Zone 2 Capacity

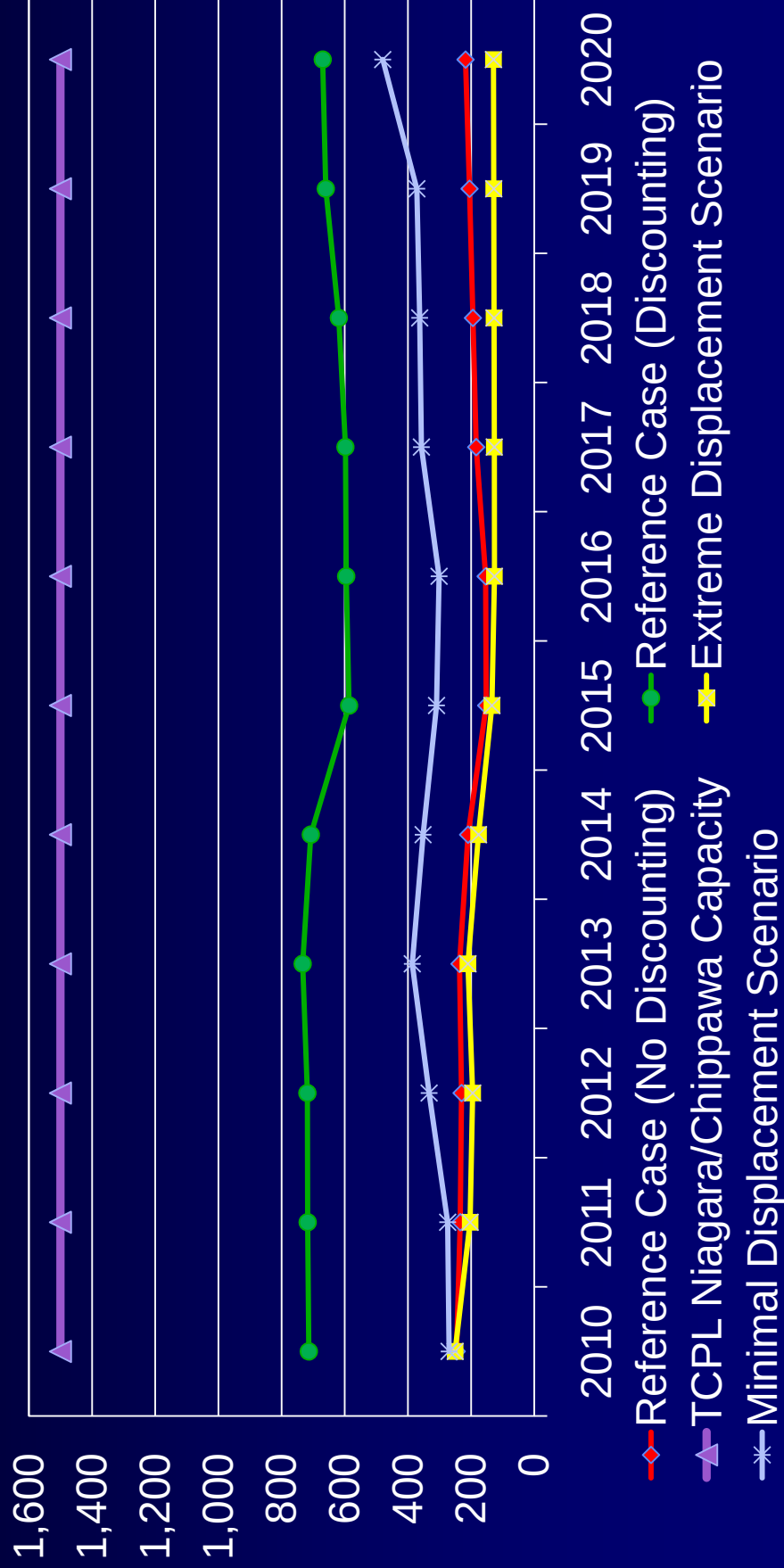
Extreme Displacement Scenario Minimal Displacement Scenario

TransCanada Volumes Kirkwall to Niagara/Chippawa: 2010 – 2020



MMCF/D

The Reference Case shows much lower capacity utilization with no discounting. Except for the low Marcellus Shale growth sensitivity (MDS), export volumes are minimal.

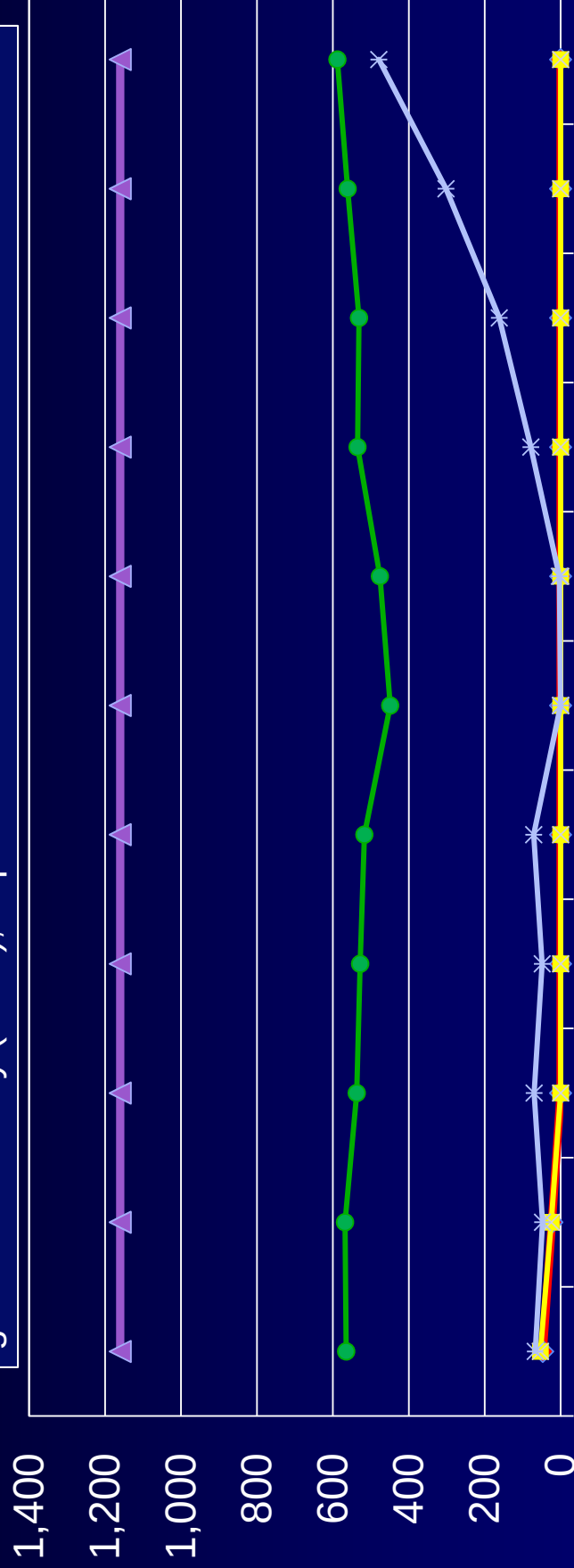


TransCanada Volumes Ontario to Iroquois: 2010 – 2020



MMCF/D

The Reference Case shows much lower capacity utilization with no discounting. Similar to Niagara exports, except for the low Marcellus Shale growth sensitivity (MDS), export volumes are minimal.



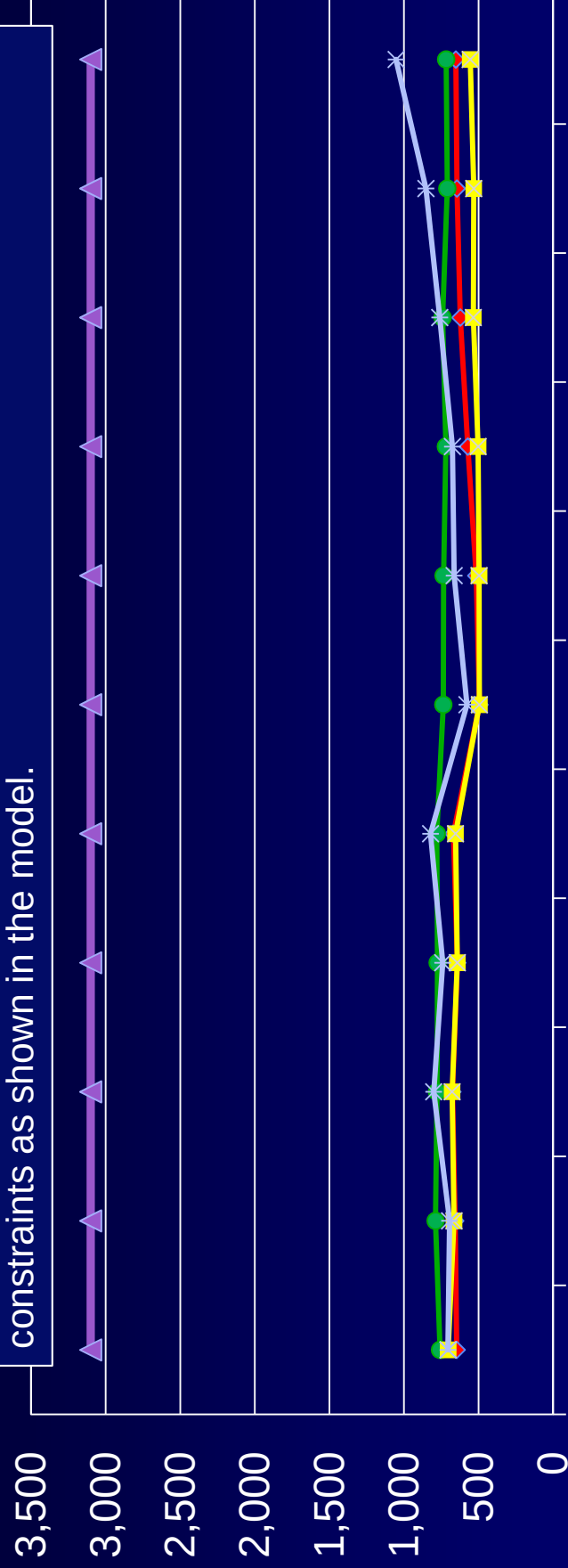
- Reference Case (No Discounting)
- Reference Case (Discounting)
- TCPL Iroquois Delivery Capacity
- Minimal Displacement Scenario
- Extreme Displacement Scenario

TransCanada Volumes Ontario NDA: 2010 – 2020



MMCF/D

The Reference Case shows much lower capacity utilization with no discounting. The sensitivities do not show much change in capacity utilization because volumes can not go much lower due to capacity constraints as shown in the model.



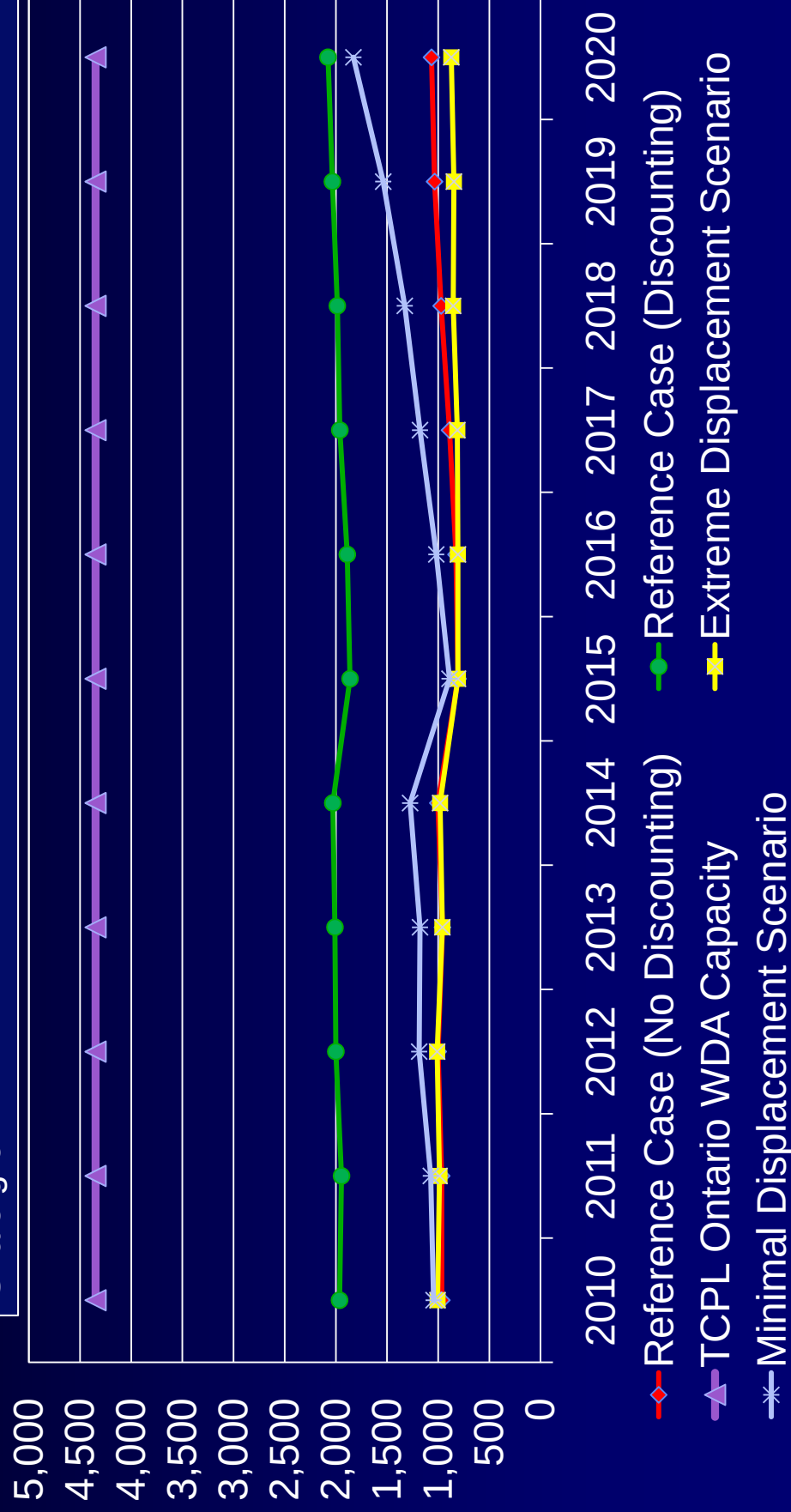
- Reference Case (No Discounting)
- Reference Case (Discounting)
- TCPL Ontario NDA Capacity
- Minimal Displacement Scenario
- Extreme Displacement Scenario

TransCanada Volumes Ontario WDA: 2010 – 2020



MMCF/D

The Reference Case shows much lower capacity utilization with no discounting.
The sensitivities show decreasing capacity utilization with faster Marcellus Shale growth.



Short Term 2010-2013 Conclusions (1)



- **Four main supply drivers for this short term forecast:**
 - » Huge increase in Greater Midcontinent shale gas (>5 BCF/D) more than offsets decline in GOM production
 - » Increased Rockies production accesses U.S. Northeast via Rockies Express Pipeline (REX)
 - » Decreasing North American LNG imports
 - » Decreasing Western Canadian production
- **New gas-on-gas competition in the Northeast particularly the Middle Atlantic states**
 - » Rockies supply via REX and growing Marcellus production displaces Canadian imports
 - » All Northeast basis points weaken due to additional supply and limited demand growth

Short Term 2010-2013 Conclusions (2)



- **Increasing gas-on-gas competition in the Midwest (WNC & ENC)**
 - » Midcontinent, Rockies & Western Canada production displace Permian, Midwestern and Gulf Coast supply
 - » Chicago basis stays negative to Henry Hub
- **Eastern Canada receives more Rockies supply mainly at the expense of Western Canadian supply**
- **Overall, less Western Canadian supply to Eastern Canadian and U.S. Northeast markets**
 - » If more infrastructure (i.e. capacity) was added to Dawn and Parkway, the share of Western Canadian production supplying Eastern Canada would decline even further
 - » More Canadian exports to Midwest and Western U.S. markets
 - » With Alliance able to access supply in British Columbia, its supply reliability should not be an issue

Medium Term 2014-2020 Conclusions (1)



- **Three main supply drivers for this medium term forecast:**
 - » Another huge increase in Greater Midcontinent shale gas (>4 BCF/D) more than offsets continued decline in GOM production
 - » Large increase in Marcellus shale gas (~3 BCF/D)
 - » Increasing Western Canadian production from mainly British Columbia Shale
- **Basis nationally is converging due to additional infrastructure being built**
- **Increasing gas-on-gas competition in the Northeast**
 - » The combination of lower WCSB production and higher tolls on TransCanada mainline has made Canadian supply less competitive
 - » Increased Marcellus production displaces Canadian imports and Gulf Coast supply
 - » Marcellus production displaces some Gulf Coast supply in Southeast
 - » All Northeast basis points continue to weaken

Medium Term 2014-2020 Conclusions (2)



- **Midwest (WNC & ENC) gas-on-gas competition continues**
 - » Midcontinent, Rockies & Western Canadian volumes meet all growth in this period
 - » Chicago stay nearly flat while Dawn basis starts to weaken due to the increased gas-on-gas competition in the Midwest
- **Eastern Canada receives more Rockies supply mainly at the expense of Western Canadian supply**
- **Overall, less Western Canadian supply to Eastern Canadian and U.S. Northeast markets**
 - » More Canadian exports to U.S. Western and Midwest markets
- **Increased British Columbia production a key to Western Canadian production retaining a high share of Eastern Canada demand**
- **GPCM model does not show displacement volumes (via backhauls)**
 - » Likely some Marcellus shale is being used to supply Eastern Canada

2010-2013 Recommendations (1)



- The large increase in U.S. unconventional production (i.e. Midcontinent & Marcellus shale along with Rockies) provides opportunities to lower natural gas costs
 - » Contract expirations on TransCanada are opportunities to diversify EGD supply portfolio
- EGD should keep a watchful eye on projects being developed for Marcellus that can cause displacement of current Canadian exports via Niagara, Chippawa (Empire) and Waddington as that may create some opportunities both for supply and transportation
 - » The open seasons announced in February 2010 by TransCanada, National Fuel (Empire Pipeline) and Union Gas to gauge interest in moving gas into Ontario are a good example
 - » Importing Marcellus supply at Niagara via Tennessee is another possible route that could make commercial sense

2010-2013 Recommendations (2)



- The GCPM model shows increased supply imported into Canada at Dawn, but restricted by capacity constraints
 - » If EGD can receive more supply downstream of the Parkway constraint, increasing Vector capacity or participating in other Dawn expansion projects should lower supply costs

2014-2020 Recommendations



- While TransCanada Mainline capacity will still be necessary to supply Eastern Canada, the Reference Case shows it has become the highest supply cost to Eastern Canada and will remain that way through 2020
 - » The only way that could change is significant discounting which has not happened historically
- Continued fading of regional differentials makes supply at Chicago, Dawn, Clarington and Niagara more attractive
- If Marcellus Shale growth approaches the high case (EDS), Northeast basis points weaken and are even more attractive
- Regardless large increases in Marcellus shale production even in the low case (MDS) in this time period are even more likely to create possible backhauls at Niagara or Chippawa (Empire)



BOARD STAFF INTERROGATORY #18

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

Will all in-franchise customers in Enbridge's CDA have direct access to the Marcellus supplies? Please explain.

RESPONSE

The Niagara CDA contract is notionally intended to meet the needs of system supply customers in the CDA. Delivery of this supply to the CDA is illustrated on the maps attached to the response to Board Staff Interrogatory #16 at Exhibit I, Tab 1, Schedule 16. However, EGD manages the daily load requirements of all in franchise customers in an integrated manner through its role as the system operator. For instance, in the winter, supplies to the CDA and EDA may be adjusted through direct flows and diversion on TCPL transport. In the summer and depending on market demand conditions some Marcellus supply may be moved from Niagara to Kirkwall to be injected into storage using C1 and M12x contracts. This gas will be withdrawn in the winter to serve CDA and/or EDA customers. Therefore all in franchise customers in the CDA and EDA have direct access to the Marcellus supplies.

BOARD STAFF INTERROGATORY #19

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

Enbridge indicates that, in conjunction with Union M12 and TCPL short-haul services, the proposed transportation contract “will provide Enbridge with the option to flow gas to either the Enbridge CDA or the Enbridge EDA in the winter to meet Enbridge’s winter requirements. In the summer, Enbridge could utilize its C1/M12x services with Union to move this gas to storage at Dawn”.

a) Will all in-franchise customers in Enbridge’s EDA have direct access to the Marcellus supplies? Please explain.

RESPONSE

Please see the response to Board Staff Interrogatory #18 at Exhibit I, Tab 1, Schedule 18.

BOARD STAFF INTERROGATORY #20

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

Will the rate classes that benefit from the proposed long- term contract be responsible for any additional costs related to the contract (e.g., decontracting costs, underutilized transportation capacity, excess system supply to meet in-franchise requirements)?

RESPONSE

In the event that actual utilization varies from forecast, costs and savings would be flowed through the PGVA to customers using Board approved cost allocation and rate design methodologies. Please refer to Board Staff Interrogatory #21 at Exhibit I, Tab 1, Schedule 21 for additional discussion on cost allocation.

BOARD STAFF INTERROGATORY #21

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

Is Enbridge able to decontract transportation from the proposed long-term contract?
(see B1.10 Union)

- a) If so, what is the financial impact of decontracting transportation?
 - i) Will these costs be recovered from Enbridge's in-franchise customers? For example, are these costs allocated evenly across Enbridge's delivery areas and rate classes? Please explain.

RESPONSE

- a) EGD will not be decontracting other transportation. As noted in the response to Board Staff Interrogatory #1 at Exhibit I, Tab 1, Schedule 1, EGD has been faced with increased migration to system supply. As a result, its gas supply portfolio reflects an increase in Dawn spot purchases and peaking supplies. The Niagara CDA contract will displace an equivalent quantity of spot and peaking supply.
- b) Enbridge's Board approved cost allocation and rate design methodology uses postage stamp ratemaking. Accordingly, system average costs are charged to both the CDA and EDA customers. The rates charged to various rate classes are derived from a specific cost allocation methodology. Transportation costs are allocated based on annual deliveries to system and Western T customers. Spot and peaking supply costs are allocated based on rate class specific load profiles.

BOARD STAFF INTERROGATORY #22

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

What are the implications and consequences should the Board decide not to approve this Application.

RESPONSE

In the event that the Board does not approve this application, EGD would require alternative transport and supply to meet the needs of its system customers that would have been met through this contract. This would decrease the diversity of supply that would have existed if this contract were approved and may also increase EGD's supply costs. EGD does not believe that it is prudent to meet the needs of system gas customers through increases in spot purchases and peaking supplies beyond the level necessary to maintain flexibility in its portfolio. Other alternatives include increases in transport and supply from existing basins/hubs or supply from growing basins other than Marcellus. Given the proximity of Marcellus supply and its favourable/comparable landed cost to other elements of EGD's portfolio, EGD believes that it is prudent to consider Marcellus supply to meet the needs of its system supply customers.

BOARD STAFF INTERROGATORY #23

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

Please provide the financial impact on the long term contract if the TCPL's interim toll application (filed with the National Energy Board on December 9, 2010) is approved.

RESPONSE

Please refer to the table below. In the event that the TCPL interim toll application is approved the landed cost for Niagara supply increases from \$6.69/GJ to \$6.78/GJ and the landed cost for Empress supply decreases from \$7.14/GJ to \$6.85/GJ. Based on the proposed TCPL tolls, Niagara supply remains competitive with other alternatives.

Long Term Contract Landed Cost Analysis With TCPL's Interim Tolls (Niagara and Empress)

Pipeline/Path (A)	Point of Supply (B)	Basis Differential \$/mmBtu (C)	Supply Cost \$/mmBtu (D) = Nymex + C	Unitized Demand Charge \$/mmBtu (E)	Commodity Charge \$/mmBtu (F)	Fuel Charge \$/mmBtu (G)	100% LFT With Fuel \$/mmBtu (H) = E+F+G	Landed Cost \$/mmBtu (I) = D+H	Landed Cost CAD\$/GJ (J)	Point of Delivery (K)
Niagara	Niagara	0.25	6.57	0.2152	0.0000	0.0181	0.2334	6.80	6.78	Enbridge CDA
Dawn	Dawn	0.21	6.53	0.1856	0.0085	0.0270	0.2132	6.74	6.72	Enbridge CDA
Vector/Dawn	Chicago	-0.10	6.22	0.4412	0.0085	0.0945	0.5423	6.77	6.74	Enbridge CDA
Alliance/Vector/Dawn	CREC	-1.19	5.13	1.8979	-0.3083	0.3266	1.9162	7.05	7.02	Enbridge CDA
TCPL	Empress	-1.01	5.31	1.3990	0.0000	0.1634	1.5624	6.87	6.85	Enbridge CDA

Annual Gas Supply & Fuel Ratio Forecasts	Point of Supply Col (B) above	2013 \$/mmBtu	2014 \$/mmBtu	2015 \$/mmBtu	2016 \$/mmBtu	2017 \$/mmBtu	2018 \$/mmBtu	2019 \$/mmBtu	2020 \$/mmBtu	2021 \$/mmBtu	2022 \$/mmBtu	Average Annual Gas Supply Cost \$/mmBtu Col (D) above	Fuel Ratio Forecasts Col (G) above
Henry Hub		6.52	6.58	6.47	6.43	6.43	6.13	6.07	6.12	6.19	6.26	6.32	
Niagara	Niagara	6.84	6.90	6.80	6.74	6.70	6.36	6.26	6.31	6.35	6.42	6.57	0.28%
Dawn	Dawn	6.76	6.83	6.78	6.72	6.69	6.34	6.24	6.25	6.29	6.35	6.53	0.41%
Vector	Chicago	6.45	6.51	6.43	6.38	6.38	6.05	5.96	5.98	6.02	6.07	6.22	1.08%
Alliance	CREC (AECO+Basis)	5.28	5.35	5.39	5.34	5.30	4.97	4.88	4.93	4.95	4.95	5.13	4.44%
TCPL	Empress (AECO+Basis)	5.45	5.52	5.57	5.51	5.48	5.15	5.06	5.10	5.13	5.13	5.31	3.08%

Source of Assumptions:

Gas Supply Prices Col (D): PIRA Energy Group; March 2010

Basis (CREC and Empress) Col (D): Average of monthly forward curves

Transportation Tolls Col (E & F): Tolls in effect on Alternative Routes at the time of Enbridge's Analysis for Dawn, Chicago and CREC Point of Supply

Transportation Tolls Col (E): Interim Tolls for Niagara and Empress Supply

Fuel Ratios Col (G): Average ratio over 2010 (Jan - Sep) or Pipeline Forecast

Foreign Exchange Col (J): \$1 Us = 1.051 CDN

Energy Conversions Col (I): 1 Dth = 1 mmBtu = 1,055,056 GJ's

Real Commodity Prices were used for the Analysis

BOARD STAFF INTERROGATORY #24

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

Is Enbridge supportive of the December 9, 2010 TCPL application for 2011 interim tolls and the related settlement agreement filed with the NEB? Please explain.

RESPONSE

Attached is EGD's submission to the NEB in response to TCPL's application for 2011 interim tolls. While EGD is appreciative of TCPL's efforts to make the Mainline competitive with other alternatives, EGD would like to gain a better understanding about the long term implications of cost deferrals and other elements contained in TCPL's proposal. EGD is seeking maintenance of current tolls as interim tolls for 2011 in the meantime. The NEB has since approved the continuation of current tolls as interim tolls for 2011.

December 16, 2010

FILED ELECTRONICALLY

Ms. Anne-Marie Erikson
Secretary
National Energy Board
444 – 7th Avenue S. W.
Calgary, Alberta
T2P 0X8

Dear Ms. Erikson:

RE: TransCanada PipeLines Limited (“TransCanada”) and NOVA Gas Transmission Ltd. (“NGTL”) Application for Approval of Mainline Interim 2011 Tolls and Alberta System 2011 Interim Rates (“Application”)

Enbridge Gas Distribution Inc. (“EGD”) is both a long-haul and short-haul shipper on TransCanada’s Mainline system, currently holding firm transportation (“FT”) contracts with a total capacity of more than 1 million GJ/day – representing approximately 20% of all TransCanada FT contracts. EGD is the largest natural gas distributor in Canada, serving approximately 1.9 million customers in Ontario, and adding another 40,000 customers annually. EGD is dependent upon the Mainline system to supply its customers. EGD’s distribution system interconnects with TransCanada’s Mainline in approximately forty locations. EGD therefore expects to remain a Mainline shipper for the foreseeable future.

We have the following comments regarding the Application.

The Application, based on a 2011-2013 proposal (the “Proposal”) that TransCanada expects to file in early 2011, proposes a reduction in long-haul tolls and an increase in short-haul tolls relative to current tolls for EGD. TransCanada’s 2011 proposed interim FT toll for Empress to the Enbridge CDA is \$1.3544/GJ (at 100% load factor), and assumes every element of the yet-to-be filed Proposal is accepted. As the alternative, TransCanada suggests a toll of \$2.9055/GJ for the same transportation path using the existing toll design and assuming full disposition of deferral accounts. In comparison, the current toll is \$1.6381/GJ.

While EGD appreciates TransCanada’s efforts to propose toll methodologies that will improve the competitiveness of the Mainline, and provide short term toll adjustments through the deferral of costs and other short term contributions, there is further work to be done to improve the longer term aspects and implications of the Proposal. EGD remains hopeful that such improvements can be negotiated and will result in broader shipper support of TransCanada’s efforts.

In light of the above, EGD submits that approval of the Application on an interim basis is premature. A more comprehensive examination of the short and long term consequences, and

specifically the impact of the significant deferral of costs proposed, is needed. Additional time is also required for EGD and other shippers to obtain and assess further information regarding the Proposal.

EGD favours maintenance of the current toll on an interim basis as the least prejudicial toll option pending further review of the Proposal. Approval of the current tolls on an interim basis, instead of the Application, would reduce the likelihood of significant toll impacts in the event that all elements of the Proposal are not accepted.

In summary, we respectfully request that the Board maintain Mainline system tolls at the level approved in Board order TG-06-2009 on an interim basis until stakeholders can more fully examine the impacts of the Proposal. Maintenance of the current toll strikes the best balance between shipper/ratepayer impacts and TransCanada's need to recover costs while stakeholders are negotiating a more widely accepted settlement.

Please direct any correspondence regarding the Application to EGD's representatives as follows:

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Yours very truly,



Tania Persad
Senior Legal Counsel, Regulatory

cc: Jennifer Scott, Senior Legal Counsel, TransCanada PipeLines Limited

BOARD STAFF INTERROGATORY #25

INTERROGATORY

Benefits and Costs

Reference: Exhibit B, Tab 1, Schedule 1, pages 3 of 11, #10

The Canadian Association of Petroleum Producers (CAPP) filed a letter dated December 10, 2010 with the National Energy Board concerning TCPL's 2011 interim toll application. In that letter CAPP indicated that "the trend in the east has been increasingly to use the Mainline for short haul transportation on TransCanada, in particular Dawn, while shedding long haul". The current TCPL cost allocation and toll design methodologies have resulted in excessively high long haul tolls. Taking into consideration CAPP's concerns, please comment on the whether the application presently before the Ontario Energy Board exacerbates or mitigates the issues raised by CAPP in its letter as it relates to the transportation costs paid by Ontario consumers.

RESPONSE

The application presently before the Ontario Energy Board is neutral with respect to the issues raised by CAPP in its letter to the NEB. As noted in the response to Board Staff Interrogatory #21, found at Exhibit I, Tab 1, Schedule 1, EGD is not seeking to decontract other transportation in order to contract for the Niagara to Enbridge CDA transport path.