



Energy Analysts International

Westminster, Colorado



EAI, Inc. (Energy Analysts International)

Viridian Pipeline and Midcontinent Light Canadian Crude Oil Opportunities

**Executive Summary Presentation
for**

**BP Pipeline North American
November 30, 2007**

**Material Includes Extracts from EAI, Inc.'s latest
"North American**

Crude Supply, Logistics and Refining Outlook Study-2007"

Presentation Outline

- ❑ **Viridian Pipeline Project Overview**
- ❑ **Western Canada Crude Export Outlook: Focus on U.S. Midwest-Midcontinent-Gulf Coast Corridor**
- ❑ **Crude Supply Outlook and Transportation Needs: Midwest to Cushing and Gulf Coast Corridors**
- ❑ **Canadian Light/Medium Crude Flow Outlook**
- ❑ **Midcontinent – Cushing Crude Market Assessment and Outlook**
- ❑ **Open Session: Questions and Answers**



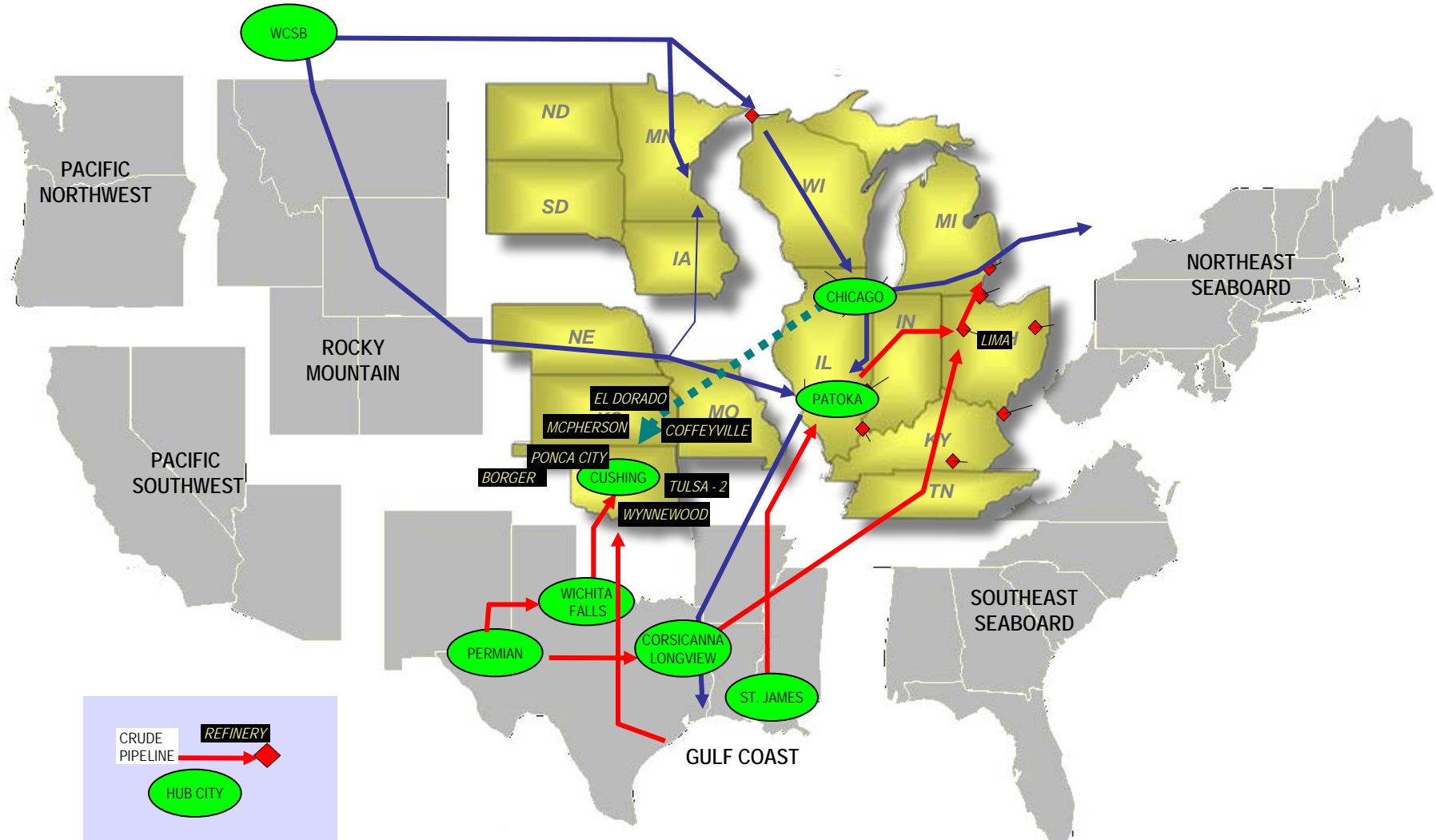
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Viridian Pipeline and Midcontinent Light Canadian Crude Oil Opportunities

Viridian Project Overview

Viridian Project Midcontinent Market Targets

Delivery of Canadian crude to Cushing would have pipeline access to eight Midcontinent – Texas Panhandle refineries with 849 MBPD crude capacity and 794 MBPD runs in 2006.



Viridian Pipeline Project Supply Targets

- ❑ **Overall Project**: Reversal would require placement of additional WTX crude into Midcontinent, West Texas or Gulf Coast refineries plus delivery of Canadian crude volumes into these markets.
- ❑ **Replacement**: Replace declining West Texas and local Midcontinent crude production being processed in Midcontinent – Texas Panhandle refineries.
- ❑ **Incremental Refinery Runs**: Generally Midcontinent refineries have been slowly increasing crude runs. One idled small 15 MBPD refinery at Thomas OK has recently started up.
- ❑ **Displacement**: Displace U.S. Gulf Coast origin volumes consisting of domestic Gulf of Mexico and foreign light – medium sour and foreign heavy crude plus other southern origin volumes into the MC/Cushing.
- ❑ **New Market Opportunities**: Increasing overhang of Cushing crude supply will require new transportation capabilities to the Gulf Coast. This will stabilize Edmonton-Hardisty netbacks from “depressed” market pricing upsets.

Canada-Midwest-Gulf Coast Pipeline Projects

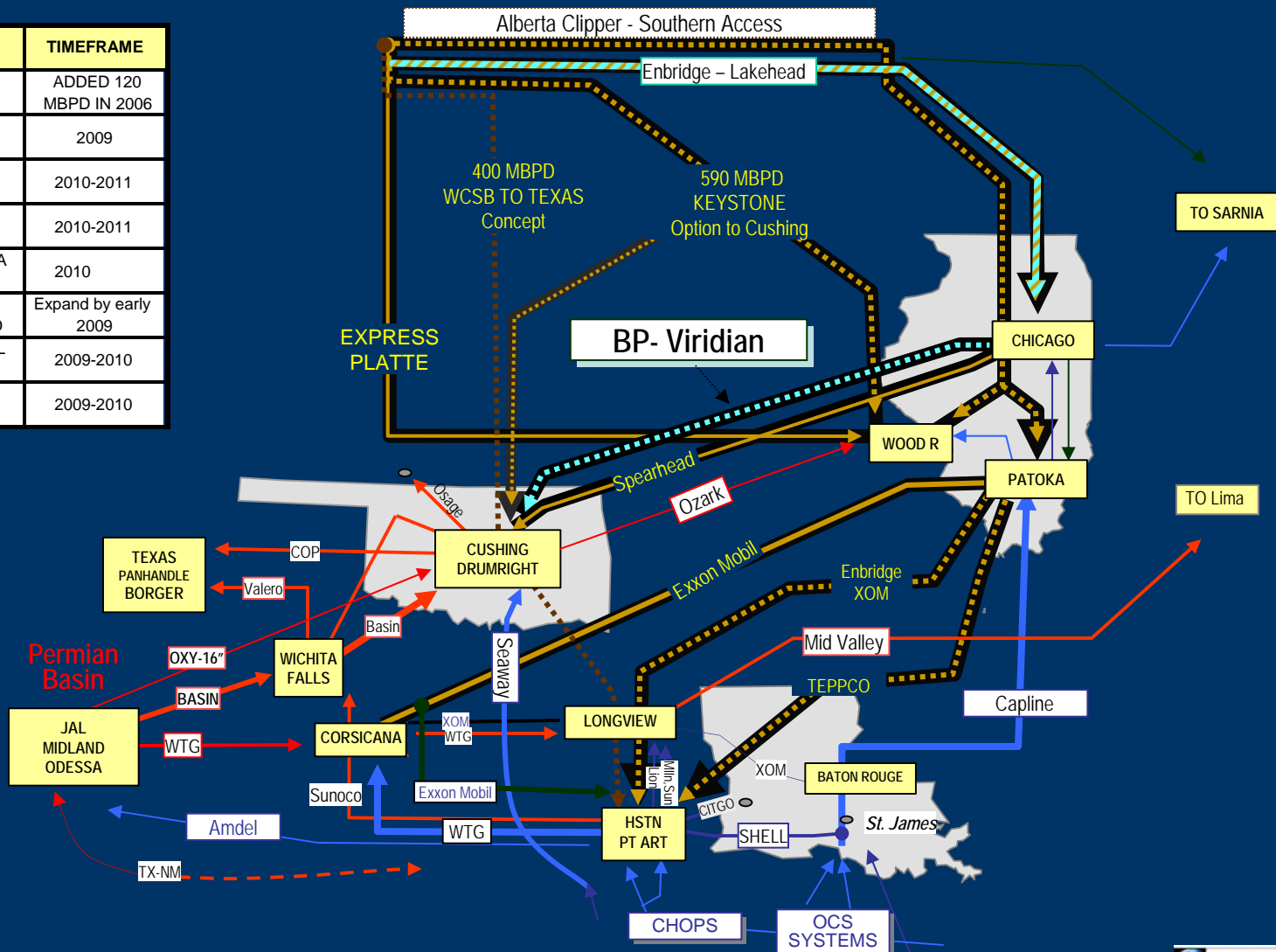
Numerous pipeline projects being pursued – currently BP only “pipe-in-the-ground” solution focused on the Midcontinent light crude market besides Spearhead.

PROJECT NAME	OPERATOR - CAPACITY	TIMEFRAME
SOUTHERN ACCESS	ENBRIDGE 400 BY 2009	ADDED 120 MBPD IN 2006
ALBERTA CLIPPER	ENBRIDGE 450	2009
PAKTOKA TO GULF COAST	ENBRIDGE 400 BY 2009	2010-2011
ALBERTA TO GULF COAST	ENBRIDGE CONCEPT	2010-2011
KEystone	TRANSCANADA 435	2010
SPEARHEAD	ENBRIDGE ADD 65 MBPD	Expand by early 2009
VIrIDIAN	BP REVERSAL LINE-1	2009-2010
TEPPCO	TEPPCO	2009-2010

GRADES

- CDN HVY
- CDN SYN
- WTI-WTS
- OCS-FRN

Dashed where planned





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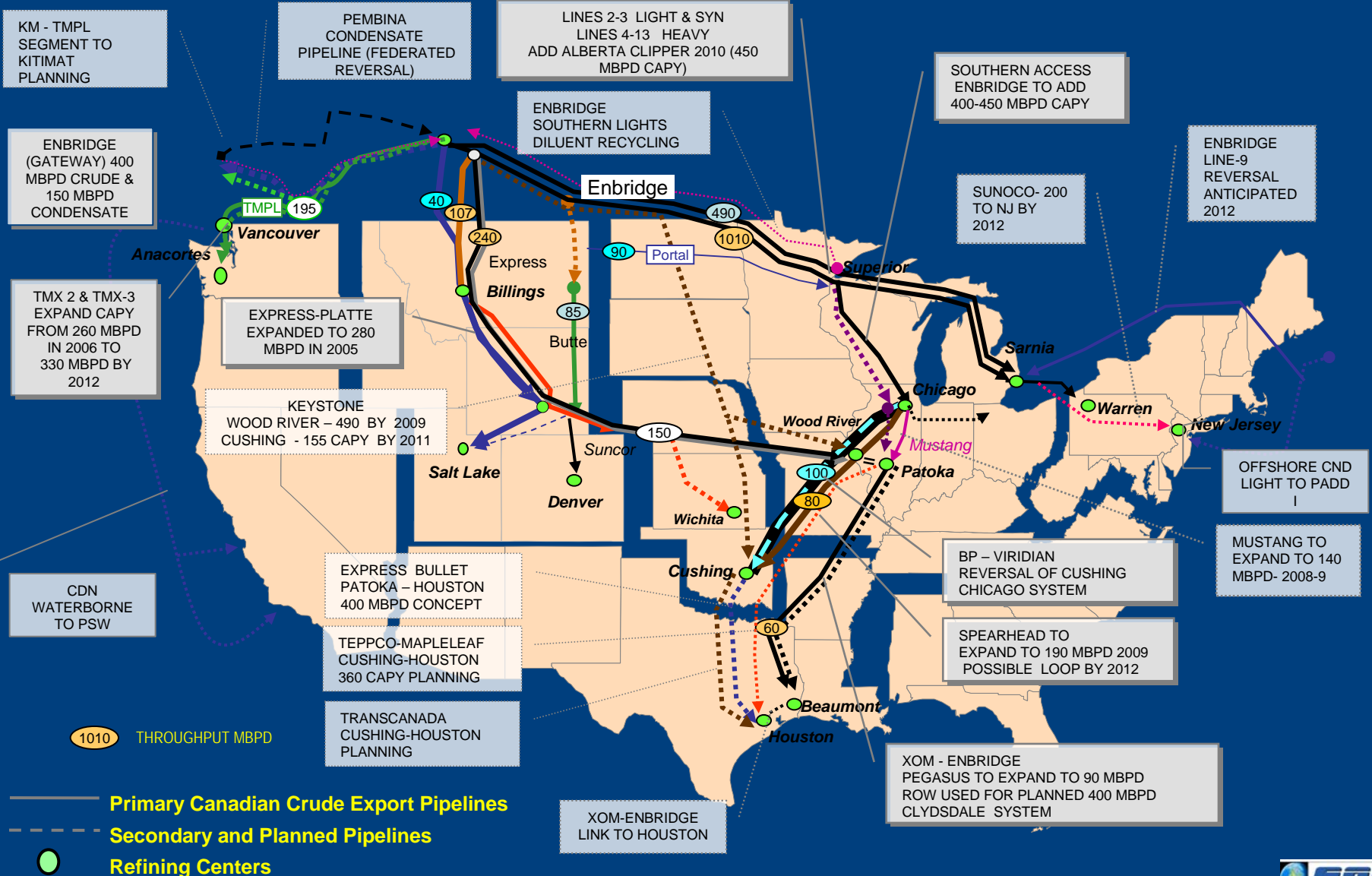
Viridian Pipeline and Midcontinent Light Canadian Crude Oil Opportunities

**Outlook for Western Canadian
Light/Medium Crude Supply with
Focus on Midwest-Midcontinent-Gulf
Coast Corridor**

Western Canada Crude Supply and Distribution Outlook Summary: Focus on Light-Med Grades

- ❑ The overall supply of Western Canadian light and medium crude supply net of Western Canadian refining will continue to grow over the forecast period exceeding 1.5 MMBPD BY 2016.
- ❑ Based on EAI, Inc.'s projections, there will be a total of 1225 MBPD of synthetic production in 2010 and 2165 MBPD by 2016 with 147 and 519 MBPD of this total used for bitumen blending in 2010 and 2016 respectively. The ultimate need for synthetic for bitumen blends will depend on the availability and relative economics of condensate.
- ❑ As part of this analysis the net light/medium crude supply for the U.S. Central Corridor (PADD II) market is treated as the “overhang” supply route. The total light/medium crude expected to push into and through this market is forecast to be 643 MBPD in 2012 and 951 MBPD in 2016. This forecast assumes limited additional penetration of the Pacific Northwest waterborne market, increasing penetration of the Ontario market and increasing synthetic crude for bitumen blending.
- ❑ The movements to the Midwest (Chicago-Wood River) are supply driven – meaning that all supply net of Canadian refinery and other regional U.S. demands are assumed to be refined in the Midwest, Midcontinent or Gulf Coast refinery regions. Some of the crude supply shown in this category will ultimately have to reach the U.S Gulf Coast market to meet the supply push. The earliest this can occur is in the 2010 to 2011 timeframe.

Canadian Export-U.S. Import Crude Oil Network



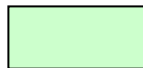
Major Crude Network Projects & Events Schedule

The synthetic crude production outlook is based only projects for which construction has started and is based on planned schedules which are subject to delays.

CRUDE OIL SUPPLY IMPACTS	2007	2008	2009	2010	2011	2012	2013	2014
Upgraders Operating/Underway (MBPD)								
Suncor	280	280	370	370	520	520	520	520
Syncrude	350	350	350	350	350	397	397	397
Albian	155	155	155	245	245	245	245	245
CNRL-Horizon	0	135	135	135	270	270	270	270
Nexen-Long Lake	0	72	72	72	144	144	216	216
BA Energy	0	54	54	54	54	109	109	109
Husky Lloydminster	80	80	80	150	150	150	150	150
TOTAL MINIMUM SYNTHETIC SUPPLY	865	1126	1216	1376	1733	1834	1906	1906
Major Pipeline Projects/Changes								
Enbridge Southern Access								
Enbridge Southern Extension								
Spearhead Expansion			to 190 KBD					
Viridian Reversal			100 KBD					
Ozark/Chicap Shifts								
Keystone Project				435 KBD WR	55 KBD Cush			
Patoka to Gulf Project								
Cushing to Gulf Project								
Refinery Expansions/Conversions								
COP-Borger	20 KBD coker							
COP-WR								
BP-Whiting								
Sinclair-Tulsa								
Husky-Lima								



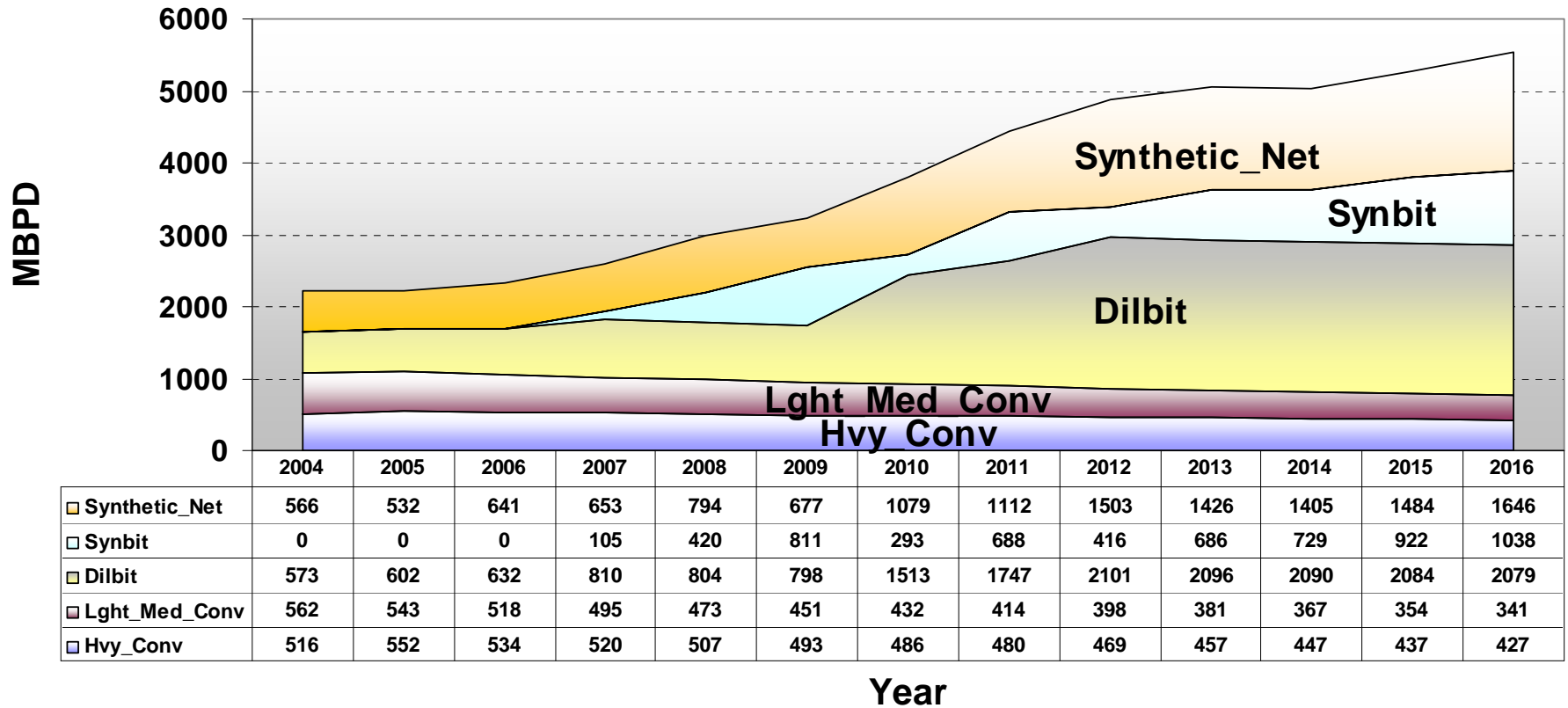
SSP – Syncrude Sweet Premium available-upgraded gas oil/distillate properties



Event-Milestone points

Western Canada Crude Supply Outlook

With Southern Lights and Other Condensate Import Sources, Units: MBPD

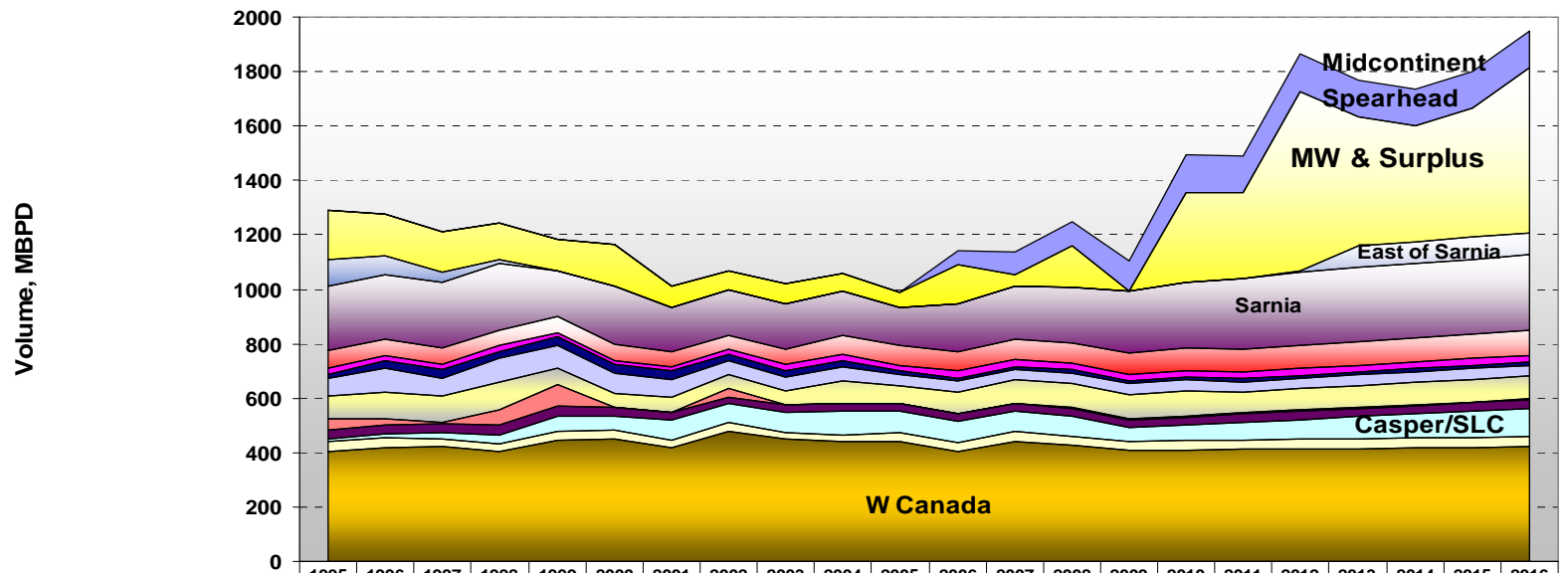


■ Hvy_Conv ■ Lght_Med_Conv ■ Dilbit ■ Synbit ■ Synthetic_Net

Assumes domestic condensate production continues to decline and increasing condensate imports offset decline in the short term.
 Southern Lights project becomes active in 2009-2010 timeframe to increase availability of condensate-light ends
 Blend condensate and synthetic included in dilbit and synbit streams respectively; assuming condensate imports increase beyond
 Southern Lights capacity of 330 MBPD

Western Canada Crude Distribution Outlook Light and Medium Grades; Units, MBPD

Dramatic increase in light crude supply that will need to push south of the US MW refinery markets. Based on Western Canadian condensate availability via production, significant imports and recycle (Southern Lights) and other sources. If foreign condensate is made available in increasing quantities, synthetic supply growth and overhang would be considerable larger.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Midcontinent Spearhead	0	0	0	0	0	0	0	0	0	0	0	49	86	86	113	135	135	135	135	135	135	135	135
MW&Surplus	180	149	146	133	118	156	79	70	74	68	53	145	41	155	0	330	315	660	473	424	473	606	
East of Sarnia	95	73	39	16	0	0	0	0	0	0	0	0	0	0	0	0	0	5	81	81	82	82	
Sarnia	239	237	242	246	168	214	161	166	169	161	143	173	197	200	224	244	261	271	272	273	274	275	
MW/Ohio	63	59	59	55	59	60	58	55	55	70	71	73	75	77	79	81	83	85	87	89	91	94	
MW/Michigan	21	19	21	21	13	14	14	17	24	25	18	27	24	24	25	25	25	25	25	25	25	25	
NT/Superior	18	29	30	26	30	31	32	24	23	23	16	9	10	10	10	10	11	11	11	11	12	12	
NT/Minn	63	85	67	87	86	74	65	51	51	53	41	39	39	39	39	39	39	39	39	39	39	39	
Puget Sound	84	100	95	102	62	53	52	47	52	81	65	79	87	89	91	94	76	78	80	82	84	86	
Other	40	21	5	55	77	0	0	33	0	0	0	2	3	3	3	3	3	3	3	3	3	3	
Warren	35	35	34	37	35	29	29	25	26	28	28	28	28	29	29	30	30	30	31	31	31	32	
Casper/SLC	10	12	21	32	60	50	74	72	76	86	79	78	73	74	47	56	64	72	80	87	96	103	
Billings	34	36	29	31	31	34	31	29	20	25	34	34	34	35	35	36	36	36	37	37	38	38	
W Canada	406	419	423	402	445	450	416	480	452	441	439	403	443	425	408	410	412	413	415	417	419	420	





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**Crude Supply Outlook and Transportation
Needs: Midwest to Cushing and Gulf Coast
Corridors**

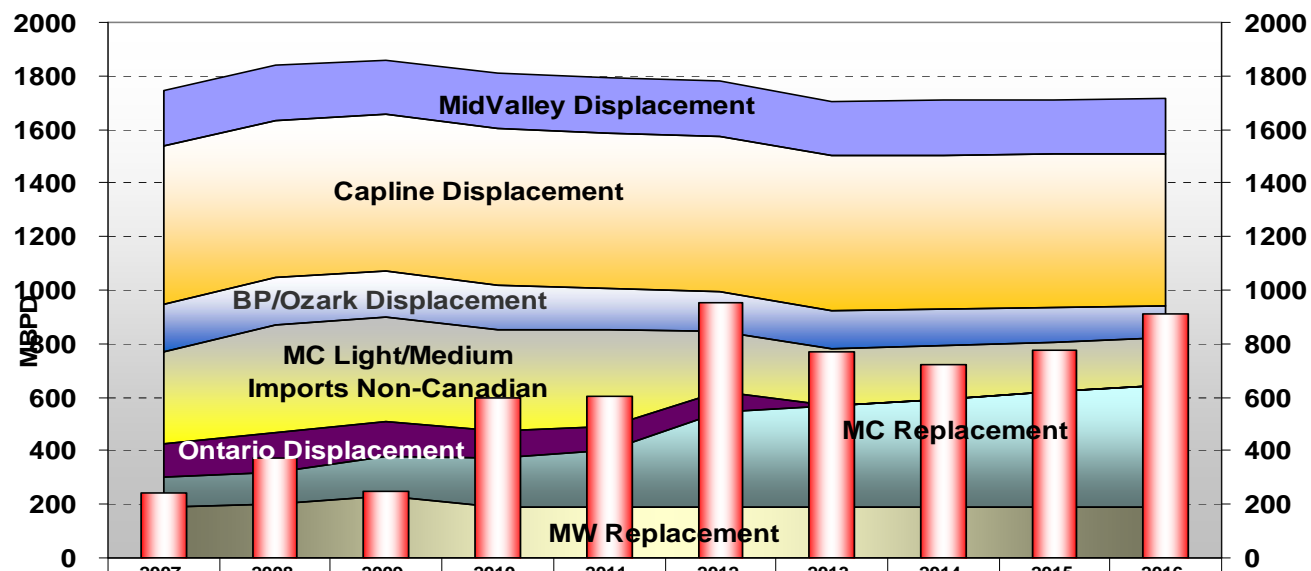
Canadian Light Crude Movements and Pipeline Needs Midwest to Cushing Markets

- The total net light crude surplus from Canada pushing south of the Midwest market will increase to at least 414 MBPD by 2010 and will remain in the 400 to 800 MBPD throughout the forecast period depending on up-grader startup schedules, the availability of condensate for bitumen blending and potential displacement of other MW southern crude sources.
- The total pipeline capacity for transporting light crude from the Midwest (Chicago area) to Cushing is approximately 125 MBPD on the Spearhead system. Spearhead is pursuing an expansion to 190 MBPD by 2009. The light crude surplus will exceed Spearhead capacity starting in 2008 and then in 2010 and beyond.
- If additional supplies of condensate are imported into Western Canada, this will increase the availability of synthetic crude for the Midwest-to-Cushing corridor. For the work presented here, EAI, Inc. is assuming Southern Lights starts up at 180 MBPD in 2010 and ramps up to 240 and 330 MBPD in years 2011 and 2012 respectively.
- Increasing Cushing supply will require market outlets beyond the Midcontinent. In response to this need, there are new pipeline projects being discussed that could provide transport capacity from Cushing to the Gulf Coast. This should be operational after the 2010 timeframe.

Light/Medium Crude Supply Outlook

Canadian Surplus vs Current Sources, U.S. Central Corridor

Canadian light and medium crude supply “surplus” will continue to push into the U.S. Central Corridor refinery markets. Much of BP/Ozark volume will be displaced with Canadian heavy. Primary displacement target for Canadian light is Ontario Line 9 supply, MC crude sourced from the south and Capline non-contract supply.

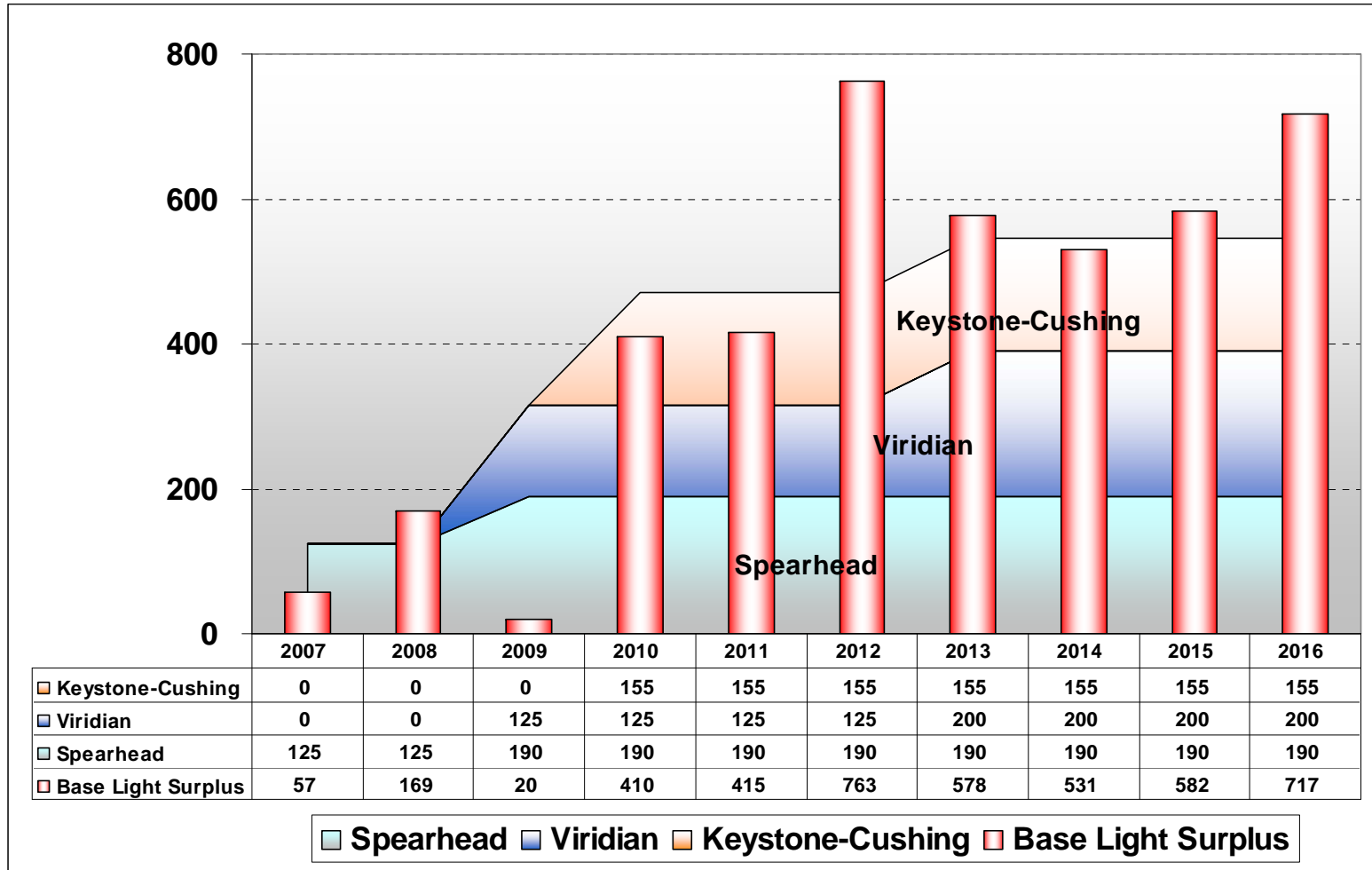


	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ontario Displacement	205	205	205	205	205	205	205	205	205	205
MidValley Displacement	590	588	586	584	583	581	579	577	575	573
Capline Displacement	180	174	170	165	155	146	139	132	125	118
MC Light/Medium Imports	341	406	393	377	359	230	215	201	189	178
BP/Ozark Displacement	126	147	125	106	90	77	0	0	0	0
MC Replacement	115	115	150	180	211	353	379	404	428	451
MW Replacement	187	204	231	190	190	190	190	190	190	191
Canadian Surplus to MW/MC/GC	244	373	251	600	605	953	768	721	772	909

Capline maintained at current levels less Valero-Memphis drop-offs; Mid Valley movements maintained at 2006 levels-consists of WTI, Offshore foreign and US GOM crude supply.

Canadian Light Crude Movement Potential for Midwest to Cushing Corridor

Light crude (primarily synthetic) from Canada will likely exceed Midwest to Cushing pipeline capacity by 2010. Falloff in 2009 & 2014 due to condensate supply constraints & the use of synbit to meet transportation specs. Increasing supplies of condensate beyond Southern Lights and assumed import levels would increase surplus of light crude for transport south.





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**Canadian Light/Medium Crude Flows
Western Canada-Midwest-Midcontinent
Corridor**

CANADIAN LIGHT/MEDIUM CRUDE FLOW OUTLOOK: 2007¹⁹

EAI, INC. LIGHT CRUDE FLOWSHEET
YEAR: 2007

Western Canada	
Supply	
Coventional	495
Synthetic	705
NGL's	
	<u>1,200</u>
Demand	
PNW	87
Roc Mtn	107
Local	443
Syn for Diluent	52
	<u>689</u>
Enbridge Export	<u>511</u>

Northern Tier	
Supply	
Enbridge	511
	<u>511</u>
Demand	
Mn Demand	39
Enbridge Export	<u>472</u>

Note: 115 bpd of LSB moved off light lines on to heavy lines into Superior.

Superior	
Supply	
Enbridge	472
	<u>472</u>
Demand	
Local	
Line 5	225
	<u>225</u>
Enbridge Export	<u>247</u>

Note: Line 5 movements at capacity of 365 bpd

Midwest	
Supply	
Enbridge	247
	<u>247</u>
Demand	
Local	187
Net Export	<u>59</u>

Sarina	
Supply	
	<u>225</u>
Demand	
	<u>197</u>

Warren	
Supply	
	28
Demand	
	<u>28</u>

Cushing	
Supply	
Viridian	
Spearhead	0
	<u>59</u>
Demand	
Local	
	<u>0</u>

BASIS/CAVEATS

- 1) If upgrading projects delay, surplus for movement south of the Midwest will be delayed
- 2) Capline held constant at 2006 levels and MidValley movements to Midwest are maintained constant and declined based on WTX declines respectively. If Capline volumes are displaced with Western Canadian light crude, this would reduce Midwest overhand of light crude
- 3) Displacement of Capline supply would require at least Southern Access capacity to transport crude south to Patoka and downstream refinery markets

CANADIAN LIGHT/MEDIUM CRUDE FLOW OUTLOOK: 2009²⁰

EAI, INC. LIGHT CRUDE FLOWSHEET
YEAR: 2009

Western Canada		
Supply		
Coventional	451	
Synthetic	1,083	
NGL's		
		<u>1,534</u>
Demand		
PNW	91	
Roc Mtn	83	
Local	408	
Syn for Diluent	406	
		<u>988</u>
Enbridge Export		<u>546</u>

Northern Tier		
Supply		
Enbridge	546	
		<u>546</u>
Demand		
Mn Demand	39	
		<u>39</u>
Enbridge Export		<u>507</u>

Note: 115 bpd of LSB moved off light lines on to heavy lines into Superior.

Superior		
Supply		
Enbridge	507	
		<u>507</u>
Demand		
Local		
Line 5	225	
		<u>225</u>
Enbridge Export		<u>282</u>

Note: Line 5 movements at capacity of 365 bpd

Midwest		
Supply		
Enbridge	254	
		<u>254</u>
Demand		
Local	231	
		<u>231</u>
Net Export		<u>23</u>

Sarina		
Supply		
		<u>253</u>
Demand		
		<u>224</u>

Warren		
Supply		
		29
Demand		
		<u>29</u>

Cushing		
Supply		
Viridian		
Spearhead	0	
		<u>0</u>
Demand		
Local	23	
		<u>23</u>
		<u>0</u>

BASIS/CAVEATS

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CANADIAN LIGHT/MEDIUM CRUDE FLOW OUTLOOK: 2010²¹

EAI, INC. LIGHT CRUDE FLOWSHEET
YEAR: 2010

Western Canada		
Supply		
Conventional	432	
Synthetic	1,226	
NGL's		
		<u>1,658</u>
Demand		
PNW	94	
Roc Mtn	92	
Local	410	
Syn for Diluent	147	
		<u>742</u>
Enbridge Export		<u>916</u>

Northern Tier	
Supply	
Enbridge	916
	<u>916</u>
Demand	
Mn Demand	39
Enbridge Export	<u>877</u>

Note: 115 bpd of LSB moved off light lines on to heavy lines into Superior.

Superior	
Supply	
Enbridge	877
	<u>877</u>
Demand	
Line 5	273
	<u>273</u>
Enbridge Export	<u>604</u>

Note: Line 5 movements at capacity of 365 bpd

Midwest	
Supply	
Enbridge	604
	<u>604</u>
Demand	
Local	190
Net Export	<u>414</u>

Sarina	
Supply	
	<u>273</u>
Demand	
	<u>244</u>

Warren	
Supply	
	30
Demand	
	<u>30</u>

Cushing	
Supply	
Viridian	
Spearhead	0
	<u>414</u>
Demand	
Local	
	<u>0</u>

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- 2) Capline held constant at 2006 levels and MidValley movements to Midwest are maintained constant and declined based on WTX declines respectively. If Capline volumes are displaced with Western Canadian light crude, this would reduce Midwest overhand of light crude
- 3) Displacement of Capline supply would require at least Southern Access capacity to transport crude south to Patoka and downstream refinery markets

CANADIAN LIGHT/MEDIUM CRUDE FLOW OUTLOOK: 2012²²

EAI, INC. LIGHT CRUDE FLOWSHEET
YEAR: 2012

Western Canada		
Supply		
Coventional	398	
Synthetic	1,711	
NGL's		
	<u>2,109</u>	
Demand		
PNW	78	
Roc Mtn	109	
Local	413	
Syn for Diluent	208	
	<u>808</u>	
Enbridge Export		<u>1,301</u>

Northern Tier	
Supply	
Enbridge	1,301
	<u>1,301</u>
Demand	
Mn Demand	39
Enbridge Export	<u>1,262</u>

Note: 115 bpd of LSB moved off light lines on to heavy lines into Superior.

Superior	
Supply	
Enbridge	1,262
	<u>1,262</u>
Demand	
Line 5	273
	<u>273</u>
Enbridge Export	<u>989</u>

Note: Line 5 movements at capacity of 365 bpd

Midwest	
Supply	
Enbridge	956
	<u>956</u>
Demand	
Local	190
Net Export	<u>766</u>

Sarina	
Supply	
	<u>306</u>
Demand	
	<u>275</u>

Warren	
Supply	
	30
Demand	
	<u>30</u>

Cushing	
Supply	
Viridian	
Spearhead	0
	<u>766</u>
Demand	
Local	
	<u>0</u>

BASIS/CAVEATS

- 1) If upgrading projects delay, surplus for movement south of the Midwest will be delayed
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- 3) Displacement of Capline supply would require at least Southern Access capacity to transport crude south to Patoka and downstream refinery markets

CANADIAN LIGHT/MEDIUM CRUDE FLOW OUTLOOK: 2014²³

EAI, INC. LIGHT CRUDE FLOWSHEET
YEAR: 2014

Western Canada	
Supply	
Conventional	367
Synthetic	1,769
NGL's	
	<u>2,136</u>
Demand	
PNW	82
Roc Mtn	124
Local	417
Syn for Diluent	365
	<u>987</u>
Enbridge Export	<u>1,149</u>

Northern Tier	
Supply	
Enbridge	1,149
	<u>1,149</u>
Demand	
Mn Demand	39
Enbridge Export	<u>1,110</u>

Note: 115 bpd of LSB moved off light lines on to heavy lines into Superior.

Superior	
Supply	
Enbridge	1,110
	<u>1,110</u>
Demand	
Line 5	385
	<u>385</u>
Enbridge Export	<u>725</u>

Note: Line 5 movements at capacity of 365 bpd

Midwest	
Supply	
Enbridge	724
	<u>724</u>
Demand	
Local	190
Net Export	<u>534</u>

Sarina	
Supply	
	<u>385</u>
Demand	
	<u>354</u>

Warren	
Supply	
	31
Demand	
	<u>31</u>

Cushing	
Supply	
Viridian	
Spearhead	0
	<u>534</u>
Demand	
Local	
	<u>0</u>

BASIS/CAVEATS

- 1) If upgrading projects delay, surplus for movement south of the Midwest will be delayed
- 2) Capline held constant at 2006 levels and MidValley movements to Midwest are maintained constant and declined based on WTX declines respectively. If Capline volumes are displaced with Western Canadian light crude, this would reduce Midwest overhand of light crude
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Midcontinent-Cushing Crude Market Assessment and Outlook

Midcontinent Crude Supply Outlook

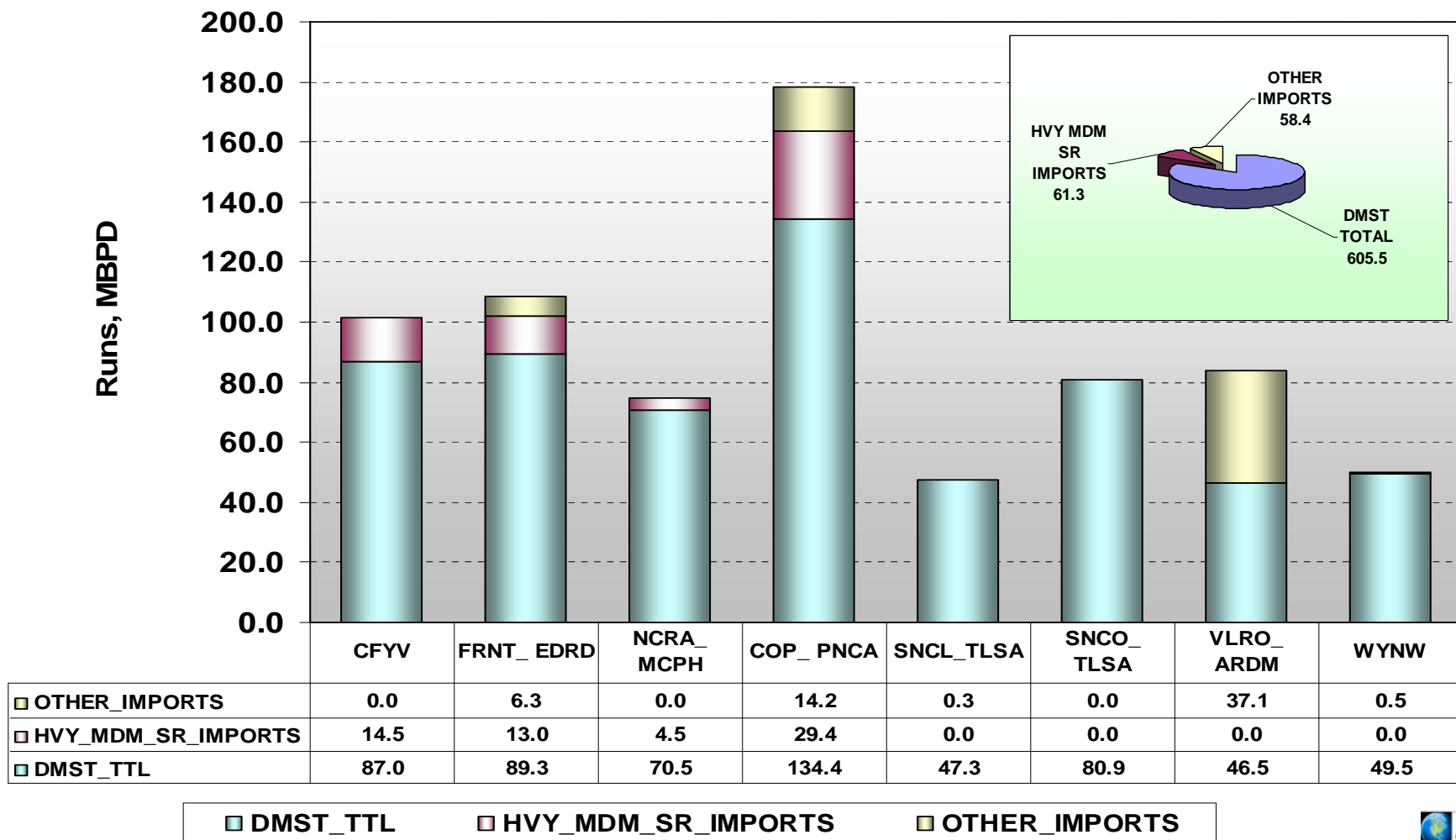
Domestic Sources

- ❑ **Production** : Midcontinent crude production is forecast to decline from roughly 272 MBPD in 2006 to 185 MBPD by 2016. This represents an average annual decline rate in excess of 3.0 percent per year.
- ❑ **Other Crude Sources**: In addition to local sources of supply, MC refiners use WTS and WTI crudes, crude sourced in North Texas, Rocky Mountain crude received via Platte PI, crude supply sourced on Seaway consisting of US GOM sources and offshore foreign and Canadian sources transported on the Express-Platte and Enbridge-Spearhead systems. Platte has been constrained to ship crude east of Guernsey over the last couple of years.
- ❑ **Refining** : Total refinery crude runs were 725 MBPD in 2006 consisting of 605 MBPD domestic and 120 MBPD foreign sources. There are several moderate expansion projects underway including increased capability to process heavy crudes (Sinclair installing a coker and Frontier expanding their coker).
- ❑ **Logistics and Distribution**: The total local, Permian and North Texas crude supply that is available to MC refiners was estimated to be 534 MBPD in 2006 not including the supply that is transported on BP to Whiting and the WTX-Gulf supply that is transported to the Delek and Valero-Lima plants. This composite supply source is expected to decline from 534 MBPD in 2006 to 465 and 300 MBPD in 2011 and 2016 respectively. In the 2010 to 2011 timeframe, liberation of WTX-NM crude from the Whiting and Lima plants could add another 120 MBPD of crude availability to these figures. The conversion of the COP-WR plant to heavy will also displace some WTI-WTS crude sources.

Midcontinent Refinery Crude Sources

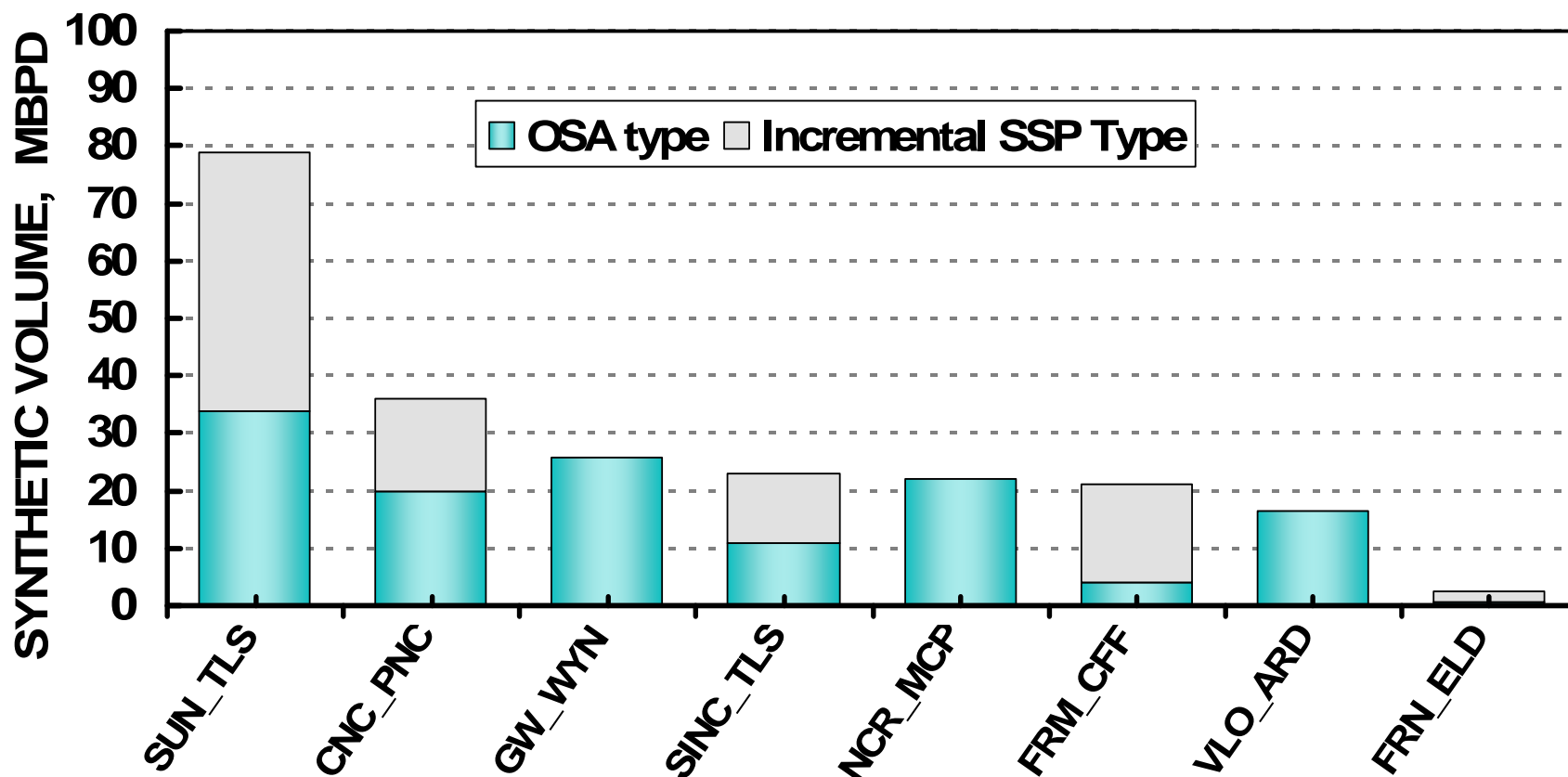
Domestic vs Imports with Hvy & Med Sour Breakout

Total Midcontinent crude runs at 725 MBPD with 605 domestic and 120 foreign imports. Approximately 61 MBPD is heavy to medium sour foreign



Midcontinent Estimated Synthetic Crude Market

Current Crude Slate With Substitution of Suncor OSA or Syncrude SSP for Light Sweet Crudes – Based on 45 Cetane Blended Diesel Pool. Total estimated light sweet crude processed in Midcontinent 350 MBPD out of 680 MBPD processed in 2006. Total market for OSA type syncrude at 134 MBPD increasing to 226 MBPD with improved syncrude quality such as SSP. As synthetic crude grows in surplus, it will most likely become attractive for refiners to substitute synthetic for conventional sour streams (WTS, Green Canyon, etc)-this will tend to increase the MC market for synthetic. The conversion of the Sinclair refinery to heavy crude by 2011-2012 will decrease the MC market for light crude.



Note: NCRA, Wynnewood Refining and Valero Ardmore with new-expanded hydrocrackers technically could process all OSA type synthetic crude but most likely not displace sour and heavy crudes.



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**Open Session
Questions and Answers**



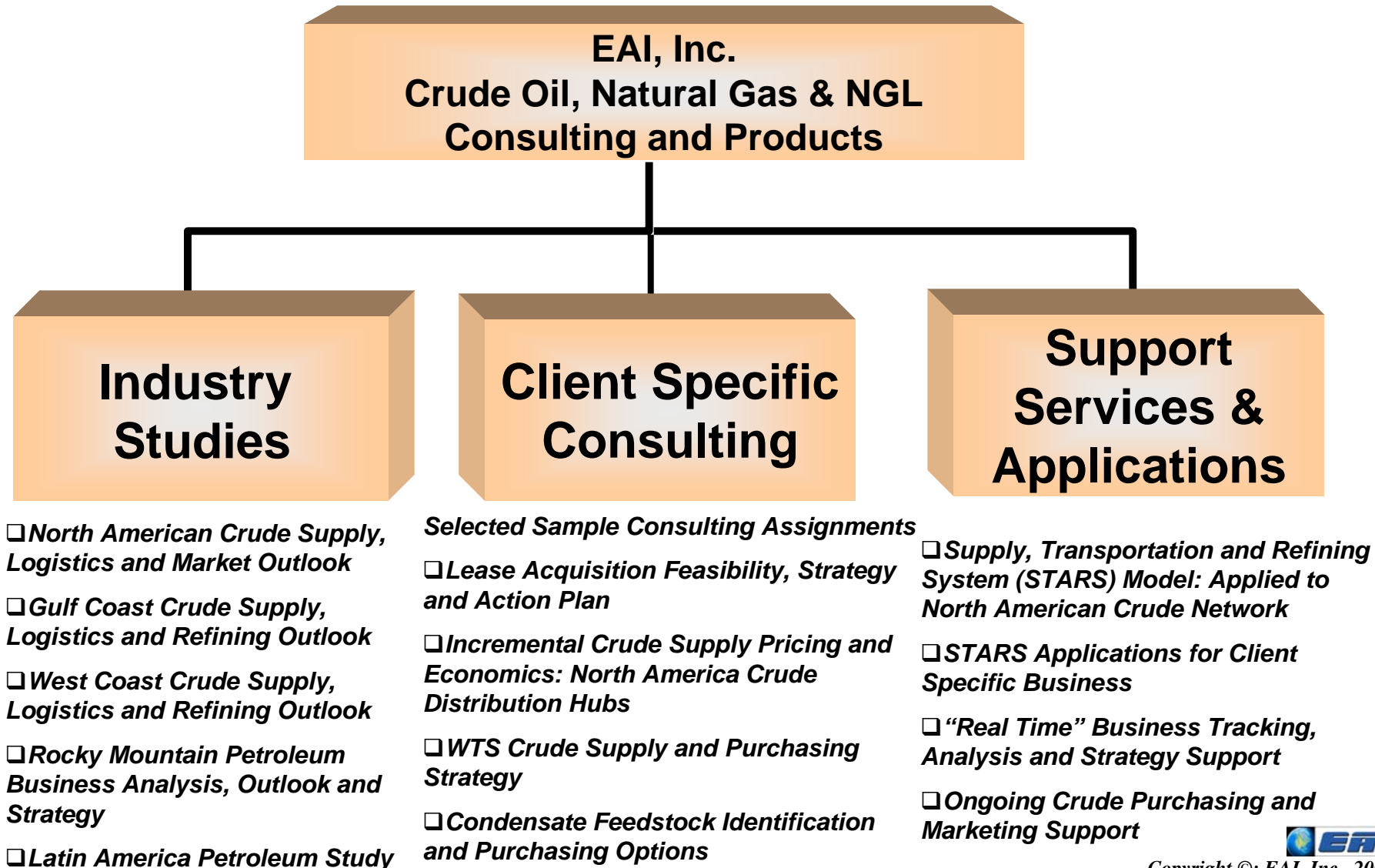
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Viridian Pipeline and Midcontinent Light Canadian Crude Oil Opportunities

**EAI, Inc.
Product Consulting
Services and Products
Crude Oil Supply, Marketing and
Logistics Business Area**

EAI, Inc. Consulting, Products and Services

Energy Resources Group



Geographical Areas Detailed

West Coast Crude Supply, Logistics & Refining

Rocky Mountain Petroleum Analysis and Outlook

Gulf Coast Crude Supply, Logistics & Refining

Canadian Crude Supply, Logistics & Refining

North America Crude Supply, Logistics & Refining

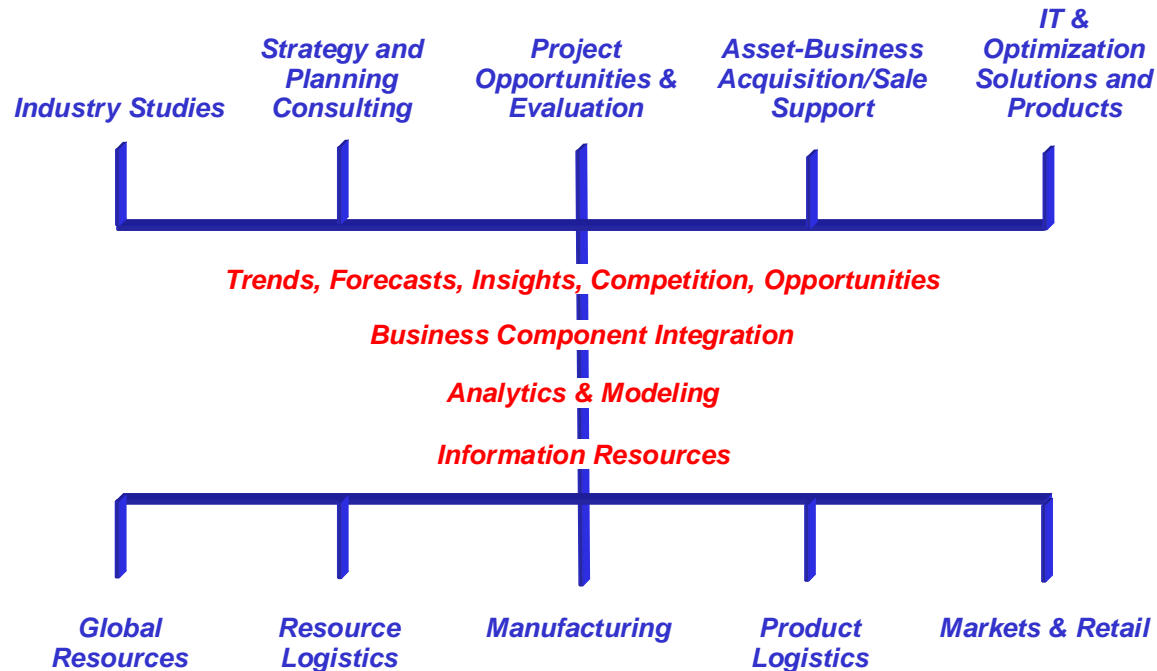
Latin American & Other Global Crude Supply Outlook

Business Components Detailed

- ❑ **Crude production forecasts** by geological province, grade and distribution hub
- ❑ **Refinery specific** crude demand by grade and source for given configuration/operation outlook
- ❑ **Crude transportation logistics** addressing bottlenecks, expansion needs, new projects and costs.
- ❑ **Crude pricing** and supply economics taking into account grade, market and transportation differentials
- ❑ **Company positions,** integration and involvement in new projects

Study & Consulting Topic-Issue Focus

- **Refinery crude slate** planning & strategy
- **Transportation needs** and project evaluation
- **Crude marketing,** valuation and pricing strategy
- **Resource development** planning and economics
- **Integrated strategy &** analysis rigorously linking upstream-midstream & downstream components of business



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