

## Construction Projects: Heavy Oil Upgrading

The following table lists the heavy oil upgrading projects, both upstream and downstream, that have been recently completed or are in the planning, engineering, or construction phase.

Please note that the project statistics here do not include any units under negotiation, in captive markets, or not yet disclosed to the public. Hydrocarbon Publishing engages in an intensive search for correct and accurate information, but the lack of company notice or publication regarding the conclusion or cancellation of construction projects may result in inaccuracies. Also, due to sometimes conflicting and/or incomplete information from different sources, it is possible that some of the projects listed are duplicates. The total additional capacity listings are merely estimates since some companies report only the added capacity while others list the total after new capacity has been established.

[Note: The construction projects listed were gathered from recent issues of *Oil & Gas Journal*, *Hydrocarbon Processing*, and *Worldwide Refinery Business Digest Weekly*. Additionally, information for some of the Canadian projects was assembled based on the latest *Alberta Oil Sands Industry Quarterly Update* (Fall 2010).]

Company	Location	Status (capacity note) <sup>a</sup>	Licensor—engineer—constructor (other contractor)	Est. cost, \$MM	Additional capacity, K b/d <sup>a</sup>			
					2008	2009	2010	2011 & beyond
<b>United States</b>								
BP <sup>c</sup>	Milne Point, AK	U (New, heavy oil upgrader)	N.A.—N.A.—N.A.	100			N.A. (May)	
BP/Husky	Toledo, OH	P (Ex, heavy oil processing)	N.A.—N.A.—N.A.					120 ('15)
ConocoPhillips/Encana	Wood River, IL	P (Ex, heavy oil processing, coker)	N.A.—N.A.—N.A.	4K				55 (N.A.)
Marathon	Detroit, MI	U (Ex, refinery heavy oil processing)	N.A.—Fluor—Fluor					80 ('12)
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 4</b>					<b>0</b>	<b>0</b>	<b>N.A.</b>	<b>255</b>
<b>Canada</b>								
BA Energy (Heartland Upgrader) <sup>c</sup>	Edmonton, AB	P (Ex)	N.A.—N.A.—N.A.	1.5K <sup>b</sup>				185 ('11)
		U (New)	N.A.—Jacobs—N.A.	1.5K <sup>b</sup>				75 (N.A.)
Canadian Natural Resources (Horizon Upgrader) <sup>c</sup>	AB	C (New)	N.A.—Technip—N.A.	10K <sup>b</sup>	135			
		U (Ex To 270K b/d)	N.A.—N.A.—N.A.				135	
Cenovus Energy <sup>c</sup>	Christina Lake	U (Ex To 98K b/d, oilsands)	N.A.—N.A.—N.A.					80 ('13)
	Foster Creek	P (Ex, oilsands)	N.A.—N.A.—N.A.					25 ('19)
		P (Ex, oilsands)	N.A.—N.A.—N.A.					90 (N.A.)
North West Upgrading/Canadian Natural	Sturgeon County, AB	P (New, bitumen upgrader)	Lurgi (gasification)/Chevron Lummus Global (LC-	3.9K				50 ('13)

Company	Location	Status (capacity note) <sup>a</sup>	Licensor—engineer—constructor (other contractor)	Est. cost, \$MM	Additional capacity, K b/d <sup>a</sup>			
					2008	2009	2010	2011 & beyond
Resources <sup>c</sup>			Fining)—N.A.—N.A.					
		P (Ex To 150K b/d, bitumen upgrader)	N.A.—N.A.—N.A.	17.6K				100 (N.A.)
Northern Alberta Oil <sup>c</sup>	N.A.	P (New, heavy oil upgrader)	WaveChem—N.A.—N.A.					5 (N.A.)
OPTI/Nexen (Long Lake Upgrader) <sup>c</sup>	Ft. McMurray, AB	C (New)	N.A.—Fluor/Propak/Air Liquide—Fluor/Ledcor/Air Liquide/Flint PCL	5K		72		
Royal Dutch Shell (Scotsford Upgrader 1) <sup>c</sup>	Ft. Saskatchewan, AB	U (Ex To 155K b/d)	Shell/Uhde—Bechtel—na	14.3K				100 ('11)
Suncor (Voyaguer Upgrader) <sup>c</sup>	Ft. McMurray, AB	S (Ex To 550 K b/d, upgrader)	N.A.—N.A.—N.A.	5.9K				200 ('12)
Total E&P Canda (Total upgrader) <sup>c</sup>	Edmonton, AB	F (New)	N.A.—N.A.—N.A.					150 ('15)
Total E&P Canada (Northern Lights Upgrader) <sup>c</sup>	Fort Hills, AB	S (New)	N.A.—N.A.—N.A.					50 ('11)
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 15</b>					<b>135</b>	<b>72</b>	<b>135</b>	<b>1,460</b>
<b>Latin America and the Caribbean</b>								
Petrobras	Rio de Janeiro, Brazil	F (To 150K b/d, heavy oil processing)	N.A.—N.A.—N.A.	8.4K				N.A. ('13)
Reficar	Cartegena, Colombia	F (Re Ex To 165K b/d, refinery heavy ends)	N.A.—N.A.—N.A.	1.4K				85 ('12)
Petronas/PDVSA/O NGC/Repsol/IOCL <sup>c</sup>	Anzoategui, Venezuela	P (New, heavy oil upgrader)	N.A.—N.A.—N.A.					200 ('14)
PDVSA/JGC	Puerto La Cruz, Venezuela	F (Heavy oil upgrader)	N.A.—KBR—N.A.					N.A. (N.A.)
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 4</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>285</b>
<b>Western Europe</b>								
SONHOE	Teesside, England	F (New, heavy oil upgrader)	N.A.—N.A.—N.A.	4K				200 ('14)
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 1</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>200</b>
<b>CIS and Central/Eastern Europe</b>								
Sonic Technology Solutions <sup>c</sup>	Albania	U (New, heavy crude upgrading)	N.A.—N.A.—N.A.				1 (June)	
TANECO	Nizhnekamsk,	S (Refinery heavy ends)	CLG—N.A.—N.A.					N.A. (N.A.)

Company	Location	Status (capacity note) <sup>a</sup>	Licensor—engineer—constructor (other contractor)	Est. cost, \$MM	Additional capacity, K b/d <sup>a</sup>			
					2008	2009	2010	2011 & beyond
	Russia							
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 2</b>					<b>0</b>	<b>0</b>	<b>1</b>	<b>N.A.</b>
<b>The Middle East</b>								
Saudi Aramco	Manifa Bay, Saudi Arabia	E (New, heavy oil processing)	N.A.—FW—N.A.					900 ('11)
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 1</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>900</b>
<b>Africa</b>								
SAMIR	Mohammedia, Morocco	P (Bitumen; <i>270K t/y</i> )	Porner—Porner—N.A.					4.5 ('11)
ENI <sup>c</sup>	Republic of Congo	P (New, bitumen upgrader)	N.A.—N.A.—N.A.	1.56K (€1K)				N.A. ('13)
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 2</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>4.5</b>
<b>Asia-Pacific</b>								
Chennai Petroleum Corp	Manli, India	P (New, residual upgrader)	N.A.—N.A.—N.A.	4.3K <sup>b</sup>				N.A. ('13)
GS Caltex	Yosu, South Korea	U (New, heavy oil upgrader)	N.A.—GS Engineering & Construction—GS Engineering & Construction	564			113	
Hyundai Oilback	Daesan, South Korea	U (New, heavy oil upgrader)	N.A.—N.A.—N.A.	1.58K				52 (June '11)
<b>REGIONAL TOTAL NUMBER OF PROJECTS = 3</b>					<b>0</b>	<b>0</b>	<b>113</b>	<b>52</b>
<b>WORLDWIDE TOTAL NUMBER OF PROJECTS = 32</b>					<b>135</b>	<b>72</b>	<b>249</b>	<b>3,156.5</b>
<b>WORLDWIDE TOTAL NEW CAPACITY</b>					<b>3,612.5</b>			
<sup>a</sup> Capacity is given in thousands of b/d; if capacity was given in other terms, it has been converted to K b/d for the Additional capacity columns, but given in the original denomination as a capacity note in italics. <sup>b</sup> Cost includes other projects. <sup>c</sup> Upstream HOU plant; i.e., primary product is synthetic crude rather than refined products. <b>C:</b> completed. <b>E:</b> engineering. <b>P:</b> planning. <b>U:</b> under construction. <b>S:</b> suspended. <b>By:</b> amount of capacity increase. <b>Ex:</b> expansion. <b>Re:</b> revamp. <b>To:</b> total capacity after project completion. <b>Up:</b> upgrade.								

This information was last updated in Oct. 2010.