

Energy Infrastructure Stats & Reference

Companion to the interactive atlas. Figures are approximate, public-knowledge values assembled as a learning aid — good for understanding scale and relationships, not for trading or engineering. Capacities: refineries & crude lines in **kbd** (thousand barrels/day); gas lines & hubs in **Bcf/d**; LNG in **MTPA**.

<p>~20 Mbb/d — U.S. crude refining capacity (world's largest)</p>	<p>~13 Mbb/d — U.S. crude production (world's largest)</p>	<p>~105 Bcf/d — U.S. dry gas production</p>	<p>#1 U.S. is the world's largest LNG exporter</p>
<p>~4 Mbb/d — Canadian crude piped to the U.S.</p>			

The crude oil system CRUDE

North America's crude system is built around moving **heavy Canadian crude** south and **light shale crude** (Permian, Bakken, Eagle Ford) to the coasts. The gravitational centre is the **U.S. Gulf Coast** — the densest refining region on earth (~10 Mbb/d) and now the main crude **export** gateway. Two inland hubs organize pricing and routing: **Hardisty, Alberta** (where Western Canadian Select is priced) and **Cushing, Oklahoma** (the delivery point for WTI futures). Canadian crude reaches the U.S. mainly via the **Enbridge Mainline** and **Keystone**; the 2024 **Trans Mountain expansion** finally gave Alberta a large pipeline to tidewater on the Pacific, opening Asian markets.

Why Cushing matters. It sits where dozens of pipelines cross in Oklahoma, with ~90 million barrels of tank storage. Because WTI futures settle on delivery at Cushing, the amount of oil stored there is one of the most watched numbers in the oil market — a glut at Cushing pushes WTI down relative to Brent.

Major refineries

United States — 8,125 kbd across 23 listed sites · Canada — 1,110 kbd across 6 · Mexico — 2,320 kbd across 8

REFINERY	COUNTRY	OPERATOR	KBD	NOTES
Motiva Port Arthur	United States	Motiva (Saudi Aramco)	630	Largest refinery in North America
ExxonMobil Beaumont	United States	ExxonMobil	630	Expanded 2023; among the largest in the US
Marathon Galveston Bay (Texas City)	United States	Marathon Petroleum	630	Major Gulf Coast complex
Marathon Garyville	United States	Marathon Petroleum	600	3rd-largest US refinery
ExxonMobil Baytown	United States	ExxonMobil	560	Integrated refinery + petrochemicals

REFINERY	COUNTRY	OPERATOR	KBD	NOTES
ExxonMobil Baton Rouge	United States	ExxonMobil	520	Major Mississippi River refinery
BP Whiting	United States	BP	440	Largest inland US refinery; runs Canadian heavy
Phillips 66 / Citgo Lake Charles	United States	Citgo / Phillips 66	430	Lake Charles refining cluster
Valero Port Arthur	United States	Valero	395	Heavy-sour capable
Flint Hills Pine Bend	United States	Flint Hills (Koch)	375	Minnesota; runs Canadian crude
Marathon Los Angeles (Carson/Wilmington)	United States	Marathon Petroleum	365	Largest West Coast refinery
Shell Deer Park / Pemex	Mexico	Pemex (fmr Shell JV)	340	Now wholly owned by Pemex
Pemex Olmeca (Dos Bocas)	Mexico	Pemex	340	Tabasco; new 2023-25, ramping up
Pemex Salina Cruz	Mexico	Pemex	330	Oaxaca; Pacific coast
Irving Oil Saint John	Canada	Irving Oil	320	Largest refinery in Canada; exports to US NE
Pemex Tula	Mexico	Pemex	315	Hidalgo; serves Mexico City
Imperial / Shell / Suncor Sarnia	Canada	Multiple	300	Ontario 'Chemical Valley' cluster
Chevron El Segundo	United States	Chevron	290	LA basin
Pemex Minatitlán	Mexico	Pemex	285	Veracruz
ExxonMobil Joliet	United States	ExxonMobil	275	Illinois
Pemex Cadereyta	Mexico	Pemex	275	Nuevo León
Phillips 66 Sweeny	United States	Phillips 66	265	Old Ocean, TX
Phillips 66 Bayway (Linden)	United States	Phillips 66	260	New Jersey / NY Harbor
Chevron Richmond	United States	Chevron	250	SF Bay
bp Cherry Point	United States	bp	250	Washington; largest in PNW
Pemex Salamanca	Mexico	Pemex	245	Guanajuato
Phillips 66 Ponca City	United States	Phillips 66	210	Oklahoma

REFINERY	COUNTRY	OPERATOR	KBD	NOTES
Monroe Energy Trainer	United States	Delta Air Lines	190	Only major Northeast refinery left
Imperial Strathcona (Edmonton)	Canada	Imperial Oil	190	Alberta
Pemex Madero	Mexico	Pemex	190	Tamaulipas
Citgo Lemont	United States	Citgo	180	Chicago-area
PBF Martinez	United States	PBF Energy	155	SF Bay
Co-op Regina	Canada	Federated Co-op	145	Saskatchewan
HF Sinclair El Dorado	United States	HF Sinclair	140	Kansas
Shell Scotford	Canada	Shell	100	Alberta; upgrader + refinery
HF Sinclair Sinclair	United States	HF Sinclair	85	Wyoming
Chevron Burnaby	Canada	Parkland	55	BC; fed by Trans Mountain
PES Philadelphia (CLOSED 2019)	United States	(closed)	closed	335 kbd — closed after 2019 fire; site redeveloped
Braya (fmr Come By Chance)	Canada	Braya Renewable	closed	Newfoundland; converting to renewable fuels

Major crude oil pipelines

PIPELINE	OPERATOR	CAPACITY	ROUTE / ROLE
Enbridge Mainline / Lakehead	Enbridge	3,000 kbd	Largest crude system into the US; Canadian crude to Midwest & Ontario
Permian to Gulf (EPIC/Cactus/Gray Oak)	Multiple	2,500 kbd	Permian crude to Corpus Christi & Houston for export
Seaway	Enterprise/Enbridge JV	950 kbd	Cushing to Freeport/Houston (relieves Cushing to Gulf)
Trans Mountain (TMX)	Trans Mountain Corp (Canada)	890 kbd	Alberta to BC Pacific coast; expansion tripled capacity, in service 2024
Dakota Access (DAPL)	Energy Transfer	750 kbd	Bakken crude to Patoka IL, onward to Gulf
Keystone — Cushing to Gulf (MarketLink)	South Bow	700 kbd	Cushing to Gulf Coast refineries
Keystone Pipeline	South Bow (fmr TC Energy)	620 kbd	Hardisty to US Midwest & Cushing (heavy Canadian crude)
Flanagan South	Enbridge	600 kbd	Flanagan IL to Cushing OK
Basin / Pony Express	Plains / Tallgrass	600 kbd	Permian & Rockies crude to Cushing

PIPELINE	OPERATOR	CAPACITY	ROUTE / ROLE
Capline (reversed)	Plains/Marathon	400 kbd	Now flows south: Patoka IL to St. James LA (enables Canadian crude to Gulf)
Express-Platte	Enbridge	280 kbd	Hardisty to Casper WY to Wood River IL

Refined-products pipelines

PIPELINE	OPERATOR	CAPACITY	ROUTE / ROLE
Colonial Pipeline	Colonial	2,500 kbd	Largest US refined-products line: Gulf Coast to New York Harbor
Plantation / products (South)	Kinder Morgan	720 kbd	Gulf Coast products to the Southeast (parallels Colonial)

Crude storage & trading hubs

HUB	OPERATOR	ROLE
Cushing	Multiple	WTI delivery point — 'Pipeline Crossroads of the World'
Hardisty	Multiple	Western Canada crude hub (WCS pricing); rail + pipe
Patoka	Multiple	Illinois hub linking Canadian/Bakken crude to Gulf
St. James	Multiple	Louisiana Gulf hub; LOOP onshore terminus
LOOP (Louisiana Offshore Oil Port)	LOOP LLC	Only US deepwater port able to load/unload VLCCs
Midland	Multiple	Permian Basin crude pricing point
Nederland / Beaumont terminals	Multiple	Gulf export/storage cluster
Guernsey	Multiple	Wyoming crude hub

The natural gas system GAS

Gas infrastructure has been reshaped twice in 20 years: first by the **shale boom** (which turned **Appalachia's Marcellus/Utica** into the continent's biggest gas field, ~35 Bcf/d), and then by the **LNG export boom** on the Gulf Coast. The old pipeline map pointed gas *from* the Gulf *to* the Northeast; today many lines have **reversed** to carry Appalachian gas outward, and Gulf lines increasingly feed LNG terminals rather than northern cities. Gas trades against one benchmark — **Henry Hub** in Louisiana — with big regional discounts where pipelines are full, most infamously **Waha** in the Permian, where associated gas is so abundant that prices routinely go **negative**.

Processing vs refining. Unlike crude, gas isn't "refined." Raw gas is **processed** near the wellhead to strip out water, CO₂, sulphur and **natural gas liquids** (ethane, propane, butane — themselves valuable). What's left, "dry" methane, goes straight into transmission pipelines and is burned largely as-is.

Major natural gas pipelines

PIPELINE	OPERATOR	CAPACITY	ROUTE / ROLE
Transco (Transcontinental)	Williams	17.0 Bcf/d	Largest US gas pipeline: South Texas & Gulf to New York City
NGTL / TC Canadian Mainline	TC Energy	15.0 Bcf/d	Alberta gas gathering + eastward mainline across Canada
Texas Eastern (TETCO)	Enbridge	11.0 Bcf/d	Gulf Coast to the Northeast; now moves Appalachian gas too
El Paso / Transwestern	Kinder Morgan	5.5 Bcf/d	Permian & San Juan gas to California/Arizona
Rockies Express (REX)	Tallgrass	4.8 Bcf/d	Meeker CO to Clarington OH; bidirectional (now carries Appalachian gas west)
Florida Gas Transmission	Energy Transfer/Kinder Morgan	3.6 Bcf/d	Texas gas across the Gulf states to peninsular Florida
Rover	Energy Transfer	3.25 Bcf/d	Appalachian (Marcellus/Utica) gas to Midwest & Dawn Hub ON
Northern Border	TC Energy / ONEOK	2.4 Bcf/d	Western Canada & Bakken gas to Chicago area
Mountain Valley Pipeline (MVP)	Equitrans	2.0 Bcf/d	Marcellus WV to Transco Station 165 in VA (in service 2024)
Kern River	Berkshire Hathaway	1.8 Bcf/d	Rockies gas to Southern California (Bakersfield)
Alliance	Enbridge	1.6 Bcf/d	Rich gas from BC/Alberta directly to Chicago
Ruby	Tallgrass/Pembina	1.5 Bcf/d	Opal WY to Malin OR (Rockies gas to West Coast)
Gulfstream	Williams/Enbridge	1.3 Bcf/d	Offshore subsea line: Mississippi/Alabama to Florida

Natural gas price & storage hubs

HUB	TYPE	ROLE
Henry Hub	Price hub	US natural gas benchmark (NYMEX settlement)
Waha	Price hub	Permian gas hub; site of negative prices from oversupply
Chicago Citygate	Price hub	Major Midwest demand hub
AECO / NIT	Price hub	Alberta gas benchmark (Canadian)
Opal	Price hub	Rockies gas hub
Dominion South	Price hub	Appalachia (Marcellus) gas pricing point
Dawn Hub	Storage hub	Large Ontario storage/trading hub for the NE

LNG export terminals

The U.S. went from zero LNG exports in 2015 to the world's largest exporter. Nearly all capacity is on the **Gulf Coast**; Canada's first big terminal, **LNG Canada** in Kitimat BC, began shipping in 2025 with a shorter route to Asia.

LNG TERMINAL	OPERATOR	MTPA	NOTES
Sabine Pass LNG	Cheniere	30	Largest US LNG export terminal
Plaquemines LNG	Venture Global	20	Louisiana; new (first LNG late 2024)
Golden Pass LNG	QatarEnergy/ExxonMobil	18	Under construction; startup ~2025-26
Corpus Christi LNG	Cheniere	15	Texas; expanding (Stage 3)
Freeport LNG	Freeport LNG	15	Texas
LNG Canada (Kitimat)	Shell-led JV	14	BC; first cargoes 2025 — first large Canadian LNG
Cameron LNG	Sempra	12	Hackberry, LA
Calcasieu Pass LNG	Venture Global	10	Louisiana
Cove Point LNG	Berkshire Hathaway	5.25	Maryland
Costa Azul LNG	Sempra Infraestructura	3.25	Baja California, Mexico; Pacific export
Elba Island LNG	Kinder Morgan	2.5	Georgia

Producing basins

Almost everything above starts here. A handful of basins dominate: the **Permian** for oil (and enormous associated gas), **Appalachia** and **Haynesville** for gas, and the **Alberta oil sands** for heavy crude.

BASIN / REGION	PRODUCES	NOTES
Permian Basin	Oil & gas	Largest US oil basin; ~6+ Mbbbl/d oil plus huge associated gas
Bakken (Williston)	Crude oil	North Dakota/Montana light tight oil
Eagle Ford	Oil & gas	South Texas oil + gas + condensate
Anadarko (SCOOP/STACK)	Oil & gas	Oklahoma oil & gas
Denver-Julesburg (Niobrara)	Oil & gas	Colorado oil & gas
Appalachia (Marcellus/Utica)	Natural gas	Largest US gas region (PA/OH/WV) — ~35 Bcf/d
Haynesville	Natural gas	Louisiana/E. Texas dry gas; feeds Gulf LNG
WCSB (Montney/Duvernay)	Oil & gas	Western Canada oil & gas; feeds LNG Canada
Athabasca Oil Sands	Crude oil	Alberta bitumen (mined + in-situ); source of WCS heavy crude
San Juan	Natural gas	New Mexico/Colorado gas
Gulf of Mexico (offshore)	Oil & gas	Federal offshore oil & gas (~1.8 Mbbbl/d oil)

Offshore Gulf of Mexico

The federal offshore Gulf produces ~1.8 Mbb/d of oil plus gas from deepwater platforms, gathered by subsea pipelines back to Louisiana/Texas. **Port Fourchon**, LA is the onshore service base for most of it, and **LOOP** — the Louisiana Offshore Oil Port — is the only U.S. terminal that can fully load the largest tankers (VLCCs).

ASSET	OPERATOR	ROLE
Thunder Horse	bp	Major deepwater oil/gas platform
Mars / Olympus	Shell	Mississippi Canyon deepwater hub
Perdido	Shell	Ultra-deepwater spar, western GoM
Appomattox	Shell	Norphlet play deepwater host
Port Fourchon	—	Services ~90% of GoM deepwater activity

Crude-by-rail

When pipelines are full or don't exist, crude moves by **rail** — flexible but costlier and lower-volume. It surged during the Bakken boom (moving oil to coastal refineries with no pipeline access) and is a persistent relief valve for **Alberta heavy crude** when takeaway pipelines fill up. It rises and falls with the pipeline-capacity cycle.

CORRIDOR	CARRIERS	ROUTE / ROLE
Bakken to East Coast (rail)	BNSF/CSX etc.	Crude-by-rail corridor: Bakken to Albany NY & NE refineries
Bakken to Pacific NW (rail)	BNSF	Crude-by-rail: Bakken to Washington refineries
Alberta heavy to Gulf (rail)	CP/CN + US roads	Heavy-crude-by-rail: Hardisty/Edmonton to St. James LA

Price benchmarks — the vocabulary of the market

Crude oil

WTI	West Texas Intermediate — light, sweet U.S. crude priced at Cushing; the U.S. benchmark.
Brent	The global seaborne benchmark (North Sea); WTI usually trades a few \$/bbl below Brent.
WCS	Western Canadian Select — heavy, sour Alberta blend priced at Hardisty; trades at a discount to WTI (the "WCS differential") that widens when takeaway is tight.
Mars / LLS	Gulf Coast medium-sour and light-sweet grades.

Natural gas

Henry Hub	Louisiana; the U.S. gas benchmark (NYMEX settlement).
Waha	Permian hub; trades at a steep, sometimes negative discount ("basis") to Henry Hub.
AECO	Alberta benchmark; the Canadian reference price.
Dom South	Appalachian price; often discounted when takeaway pipes are full.
JKM / TTF	Asian & European LNG benchmarks — the prices Gulf LNG chases when it exports.

Key flows, bottlenecks & recent changes

Cross-border & export flows

Canada → U.S.: ~4 Mbbbl/d of crude (mostly heavy) flows south — Canada is by far the largest source of U.S. crude imports, feeding Midwest and Gulf refineries built for heavy oil. **U.S. → Mexico:** the U.S. exports large volumes of **gasoline, diesel and natural gas** south; Mexico's Pemex refineries have historically run below capacity (the new Olmeca/Dos Bocas refinery aims to change that). **U.S. → world:** crude exports (post-2015, when the ban was lifted) and LNG exports both flow mainly out of the Gulf Coast.

Watch-items

Permian takeaway. The Permian produces more oil *and* gas than its pipelines can always carry. Oil takeaway drives new crude lines to Corpus Christi/Houston; gas takeaway shortfalls are why Waha gas prices collapse. New pipes (e.g. Matterhorn gas, 2024) periodically relieve it.

The LNG pull. Each new Gulf LNG train (Plaquemines and Corpus Christi Stage 3 ramping now, Golden Pass next) adds demand that tightens Henry Hub and reroutes gas toward the coast.

Trans Mountain (2024) roughly tripled Alberta's pipeline capacity to the Pacific, narrowing the WCS discount and giving Canadian heavy crude direct access to Asia and the U.S. West Coast.

Glossary

kbd	Thousand barrels per day (1,000 bbl/d). "630 kbd" = 630,000 barrels a day.
Mbbl/d	Million barrels per day.
Bcf/d	Billion cubic feet of gas per day — the unit for gas pipelines & production.
MTPA	Million tonnes per annum — the unit for LNG plant capacity (~0.13 Bcf/d per MTPA).
Sweet / sour	Low- vs high-sulphur crude. Sour needs more complex refineries.
Light / heavy	Density of crude. Shale oil is light; oil-sands crude is heavy.
NGL	Natural gas liquids — ethane, propane, butane separated during gas processing.
Upgrader	Facility that turns heavy bitumen into lighter "synthetic" crude before refining.
Associated gas	Gas produced alongside oil (e.g. in the Permian) — often a by-product.
Basis / differential	The price gap between a regional hub and the benchmark.
Takeaway	Pipeline capacity available to move product out of a producing basin.

Sources & caveats. Compiled from public/industry general knowledge (EIA, company disclosures, pipeline operators) as a learning reference, ~2025. Capacities and routes are approximate and change with expansions, reversals and market conditions; pipeline paths on the map are schematic. Not for trading, engineering, or compliance use. Basemap: Natural Earth (public domain). Alaska (Prudhoe Bay, the 800-mile Trans-Alaska Pipeline to Valdez) is omitted from the map for clarity but is a significant part of the U.S. crude system.