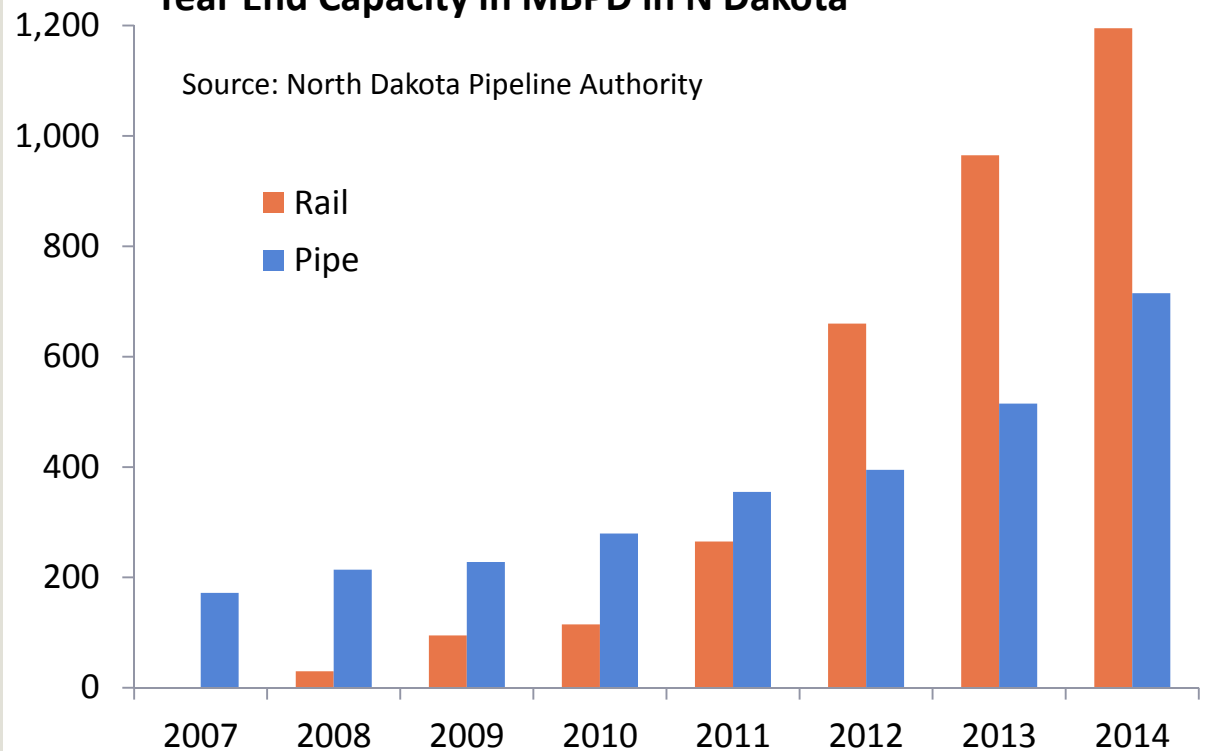


Battle of the Bakken

Rail transports most of the crude from the Bakken. Could Canadian pipeline projects that are on the horizon potentially help move this crude east and undermine rail's dominance?

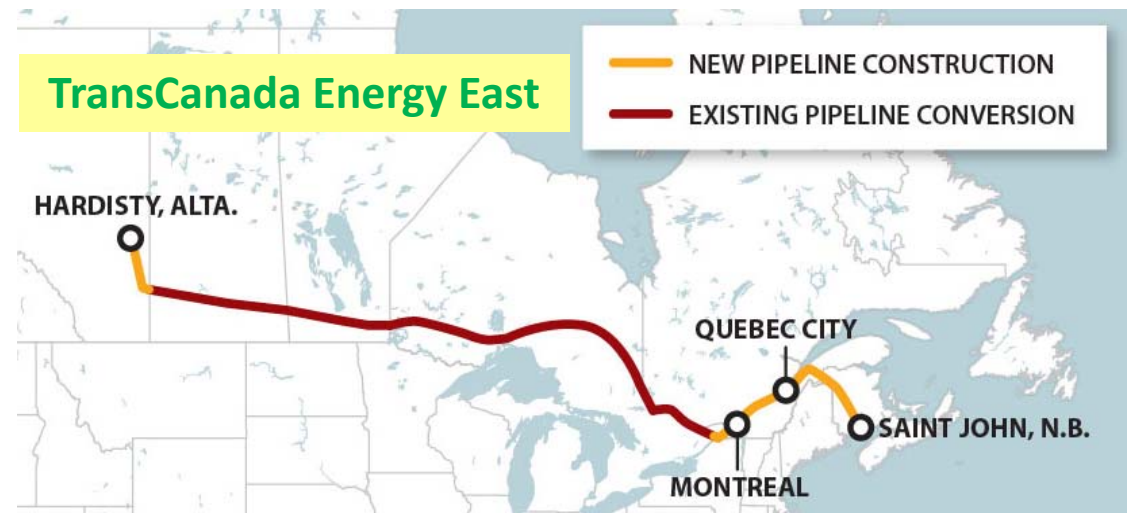
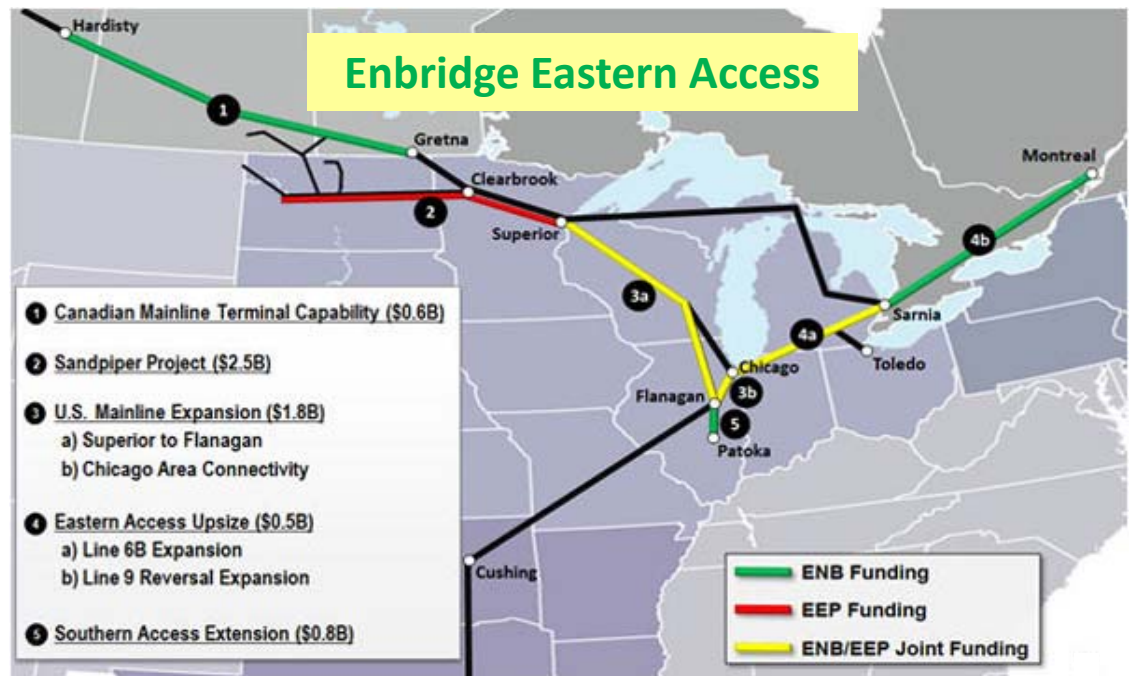
As oil production from the Bakken increased rapidly and pipeline capacity was not able to catch up, rail filled the gap with capacity to transport oil increasing rapidly from practically none in 2008 to 1.2 million barrels per day (BPD) in 2014 versus an increase from 0.2 to 0.7 million BPD for pipelines (chart above). Rail capacity accounts for 63% of total oil transport capacity from North Dakota but in recent months, rail cars transported 60-70% of oil from the state, which leaves close to 40% of capacity not utilized (see page 3).

Year End Capacity in MBPD in N Dakota



Major Canadian projects that could shift the balance...

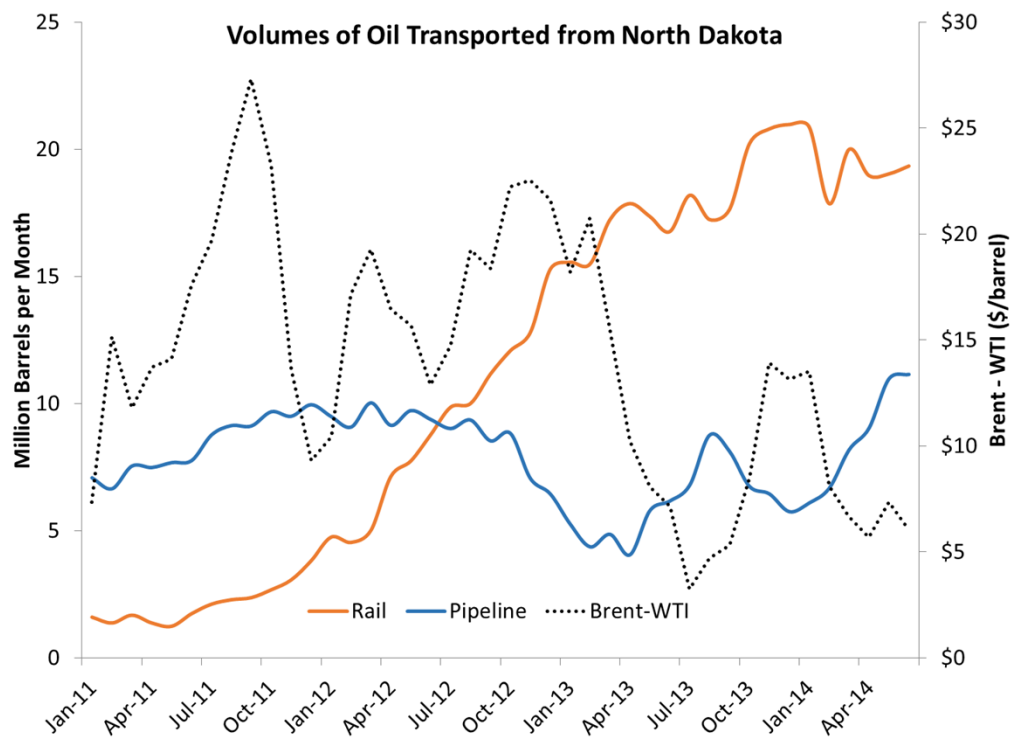
- Enbridge (Eastern Access Project, top) is being proposed for Canadian oil sands and U.S. (Bakken) light oil carriage to Ontario. An associated project, Trailbreaker, would carry liquids to Maine for export. Enbridge also is continuing to move forward with facilities that would enhance rail operations.
- TransCanada (Energy East, bottom) would ship Canadian oil sands production east. Could Bakken volumes flow through TCPL? Could Bakken volumes flow through TCPL?
- Both projects face substantial hurdles.
- TCPL proposes to convert an underutilized gas pipeline, raising questions about natural gas delivery to eastern Canada and the “call” on U.S. natural gas to make up the difference for both Canadian and U.S. customers.



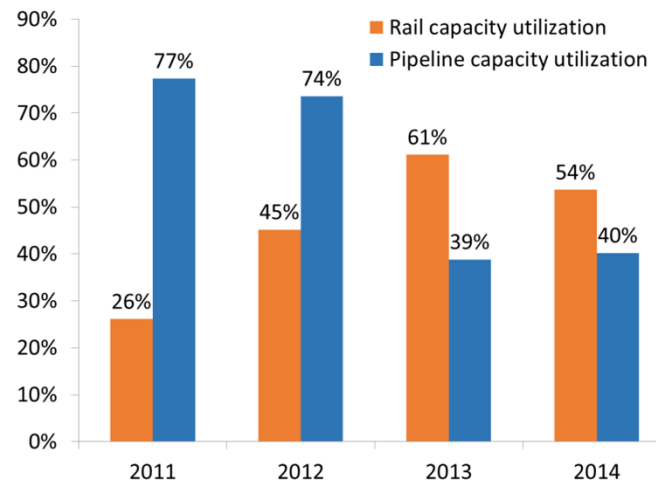
Brent Premium Determines Rail Volumes

Crude Type	2011	2012	2013	2014Q1
WTI	\$95.04	\$94.13	\$97.99	\$ 98.69
Dated (DTD) Brent	\$111.26	\$111.67	\$108.66	\$108.21
Brent at East Coast ^a	\$113.76	\$114.17	\$111.16	\$110.71
Bakken Crude	\$98.35	\$88.36	\$92.87	\$ 94.90
Brent-WTI	\$16.22	\$17.54	\$10.67	\$ 9.52
Brent-Bakken	\$12.91	\$23.31	\$15.79	\$13.31
Bakken + Rail costs ^b	\$113.35	\$103.36	\$107.87	\$109.90

^a Assuming shipping cost of \$2.50 per barrel from Northern Europe to New York Harbor
^b \$1.50 (throughput) + \$10.50 (freight) + \$1.50 (destination charges) + \$1.50 (car lease) = \$15.00 (Industry quote)



Rail gained market share from pipelines since late 2010 as Bakken production increased and Brent premium at the East Coast provided an incentive to ship eastward even with estimated rail costs of \$15 per barrel (see Table). The Brent premium weakened from \$16-17 per barrel in 2011 and 2012 to less than \$11 in 2013, falling to below \$4 in mid-summer, as a result of which pipelines recovered some market share at the expense of railroads. So far, in 2014, the Brent-WTI spread is averaging about \$7 with mid-summer lows of \$3-4 pulling it down. In recent months, less than 55% of rail capacity has been used (less than 640,000 BPD as compared to almost 700,000 BPD in late 2013).



Pros and Cons of Rail and Pipeline

Pipelines face permit delays. Pipeline and Hazardous Material Safety Administration takes a closer look at reversals and conversion along with its “Call to Action” for increased safety. Pipelines are considered less flexible in responding to changing market demands due to large capital investment requirements and regulatory hurdles.

Railroads may lose some of their competitive advantage if regulations require the use of double hulled tanks and impose additional safety measures in response to recent rail accidents. The US DOT just released its draft proposals in July 2014, which calls for a two-year phase out of the older tank cars (DOT 111A), slower train speeds, and new braking systems. Canadian regulations allow a three-year phase out. As leasing companies such as Union Tank Car, American Rail Car Leasing, CIT and GE actually own the majority of the rail cars instead of the railroads, the cost will likely have minimal impact on their revenues and instead will ultimately pass to the shippers in the form of higher lease rates. In addition, the cost can be amortized over the term of the lease, which is typically 10 years. Assuming the cost of a new rail car is \$150,000 this would result in an additional \$1.85/barrel, *assuming the car was only used once a month*. Retrofitting of existing cars would substantially reduce this cost.

Railroads have been losing revenue with less coal shipments since 2011. Top two railroads (UP and BNSF) have been able to keep the losses to a minimum but CSX and NS each lost about \$1 billion between 2011 and 2013. Revenues from oil transport provide some relief. Although UP has not lost much revenue from coal transportation (stable at about \$3.9 billion), the share of coal revenues fell to 19% in 2013 from 22% in 2010 and 2011. The share of revenues from oil transportation has increased to 5.8% in 2013 whereas no oil revenues were disclosed in 2010. Although BNSF does not disclose revenues from oil, the share of revenues from coal declined to 23% in 2013 from 27% in 2010/11 despite being stable at about \$4.9 billion, implying additional revenues from other freight such as oil. In 2012 10K, CSX discusses the decline in coal revenues but indicates that it is seeing an increase in volume of energy and energy related markets such as frac sand, LPG and crude oil owing to the increase in shale drilling activity.

However, with Brent premium declining and potential competition from Canadian pipelines, the future call on rail is uncertain.

	Coal Rev 2010	Oil Rev 2010*	Coal Rev 2011	Oil Rev 2011	Coal Rev 2012	Oil Rev 2012	Coal Rev 2013	Oil Rev 2013
UP	22% (\$3.5B)	ND	22% (\$4.0B)	4.2% (\$0.8B)	19.9% (\$3.9B)	5.6% (\$1.1B)	19% (\$3.9B)	5.8% (\$1.2B)
BNSF	27% (\$4.3B)	ND	27% (\$5.0B)	ND	24% (\$4.9B)	ND	23% (\$4.9B)	ND
CSX	31% (\$3.3B)	NM	32% (\$3.7B)	NM	27% (\$3.2B)	ND**	24% (\$2.9B)	ND
NS	28% (\$2.7B)	NM	31% (\$3.5B)	NM	26% (\$2.9B)	NM	23% (\$2.5B)	NM

* UP begins moving crude oil for first time in 2010.

** Not Disclosed (ND) indicates revenue generated from crude oil transportation but not reported separately. Not Mentioned (NM) indicates no discussion of revenues from oil.