Wider WCS Discount Good for Oil-by-Rail Outlook

- **The discount borne by Western Canadian Select (WCS) crude has widened back to $19/bbl under WTI, finally reflecting the costs of necessary oil-by-rail egress, and we expect differentials to rise further into the low-$20s next year.**
- **Yet another leak and service suspension on the Keystone pipeline highlights the value of flexible rail transportation; the pipeline was carrying nearly 600 kbpd of mostly heavy crude and the restart timeline remains unclear at present.**
- **Alberta's latest provincial budget provided more detail concerning a campaign promise to transfer oil-by-rail contracts signed by the prior government to the private sector, though it remains to be seen when that capacity will actually show up in rail export numbers.**
- **An invitation for Brazil to join OPEC reflects the rising production prospects of the former and the weaker position of the latter in a market dominated by US shale.**

The WCS discount, currently trading at $19/bbl under WTI, looks finally ready to break higher after spending most of 2019 stuck below $12–13/bbl following the start of the Alberta government's oil production curtailment program in January. Lower price discounts are normally something for which to cheer but in this case they have reflected artificial market tightness and are stifling the economics of necessary oil-by-rail services, which have struggled to break even. Oil-by-rail services typically require a discount of $15–20 per barrel to break even (versus $10–13/bbl for the same trip by pipeline), and higher than that to justify committing capital to capacity expansions necessary to facilitate fully uncurtailed Alberta production and likely growth in that output until additional pipelines enter service.

Another value of oil-by-rail relates to its flexible optionality and the fact that it can be called on as the transporter of [reasonable] last resort before crude becomes truly stranded and differentials blow out. The value of rail capacity—or, rather, lack thereof—was made clear in late-2017 when a leak on the Keystone pipeline resulted in immediate service suspension and a months-long capacity reduction even after service resumed, which backed up hundreds of thousands of barrels of heavy crude daily into Alberta storage tanks. The challenge with these outages is that they are by their nature unplanned and difficult to offset in an egress system stretched as thin as Western Canada's—**a point punctuated by yet another leak and service suspension on the Keystone pipeline beginning the evening of October 30th that remains ongoing.**

Oil exports by rail hit an all-time high of more than 350 kbpd in December 2018 yet even that was not enough to prevent the rapid filling of overflowing storage tanks. Curtailment aimed to ease that egress constraint and drain those inventories by reducing the supply overhang by 325 kbpd in January, which relieved the egress bottleneck and freed overloaded rail capacity to drain some

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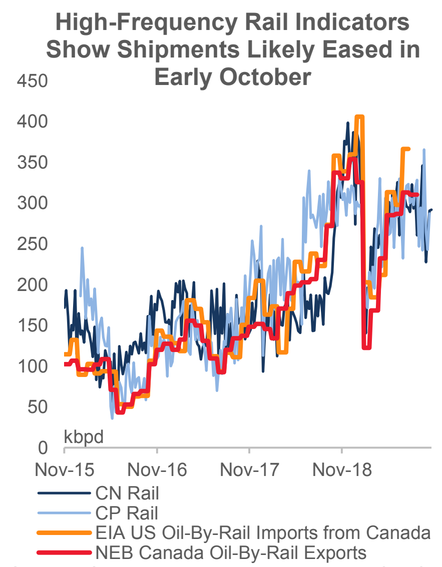
Chart 1



Sources: Scotiabank Economics, NEB, EIA, CN, CP.
Note: CN/CP Rail volumes are total shipments, less 300 kbpd to adjust for structural demand.

Scotiabank Commodity Price Index

September 2019	(% change)		
	M/M	Y/Y	YTD
All Commodity*	**1.5**	**1.2**	**-4.0**
Industrials	**1.7**	**1.6**	**-3.7**
Oil & Gas	3.6	3.7	-3.0
Metal & Minerals	0.5	9.3	2.8
Forest Products	1.0	-13.4	-14.7
Agriculture	**0.1**	**-0.7**	**-5.7**

January 2007 = 100	2019		
	Sep	Aug	YTD avg.
All Commodity	**112.4**	**110.8**	**114.6**
Industrials	**110.4**	**108.5**	**112.5**
Oil & Gas	87.9	84.8	91.0
Metal & Minerals	127.6	127.0	127.0
Forest Products	136.1	134.8	141.1
Agriculture	**123.5**	**123.4**	**126.5**

* Weights: Oil & Gas (39.9%), Metal & Minerals (30.1%), Forest Products (14.7%), Agriculture (15.3%); Full technical note on page 6.

of the inventory glut that had accumulated. Unfortunately the initial cuts proved too steep—potentially due to hiccups in the release of those bloated inventories at the pace required—and over-tightened the Western Canadian oil market, pressured differentials to less than $10/bbl under WTI, and left railcars loitering in railyards with nothing to do.

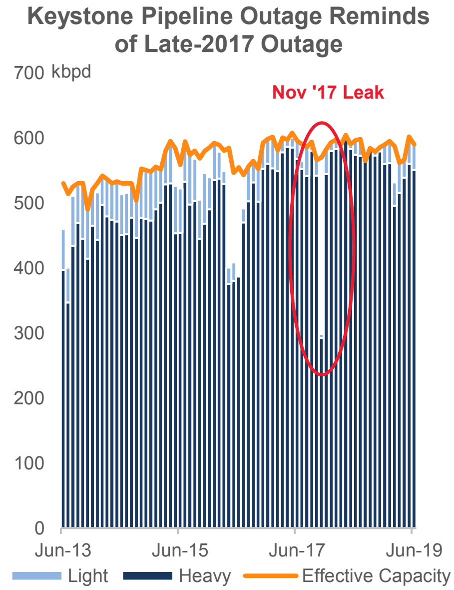
Oil-by-rail shipments collapsed to around 130 kbpd by February before rebounding to around 300 kbpd, where they have remained since May according to statistics from the recently-renamed Canada Energy Regulator (formerly the National Energy Board). Oil-by-rail volumes need to rise to keep up with easing curtailment and to build out necessary rail capacity but artificially tight differentials are short-circuiting the natural price signal—high-frequency weekly data from CP and CN Rail even hint at a potential weakening of shipments in early October (chart 1) at a time when the Western Canadian oil sector needs those numbers moving higher.

Reflecting the obvious tightness following the curtailment roll-out, the provincial government increased production limits by 75 kbpd in February from the initial level of 5.56 MMbpd. Allowable production was lifted by 25 kbpd in each month (except July) between April and October and smaller increases are planned for November and December to bring total production to 5.81 MMbpd, bringing year-end curtailment easing to 250 kbpd vs an initial cut of 325 kbpd. We are now entering the most sensitive portion of the easing process where each subsequent production increase could push the western Canadian oil market back into egress deficit. As in so many things, a small egress deficit is a good thing—sending steady price signals—in this environment while too large an egress deficit brings us back to price differential blowouts witness in late-2018. As inventory levels reverse and begin to rise Canadian crude differentials will widen, signaling when pipeline space has become insufficient and additional rail services are necessary. Inventory trends have been promising and stock levels have fallen roughly 10 million barrels over the past six months to 65 million barrels as of August. However, the November 2017 Keystone outage resulted in an initial ~8 million barrels of backed up crude (chart 2) which would undo much of the inventory progress achieved by the curtailment program thus far if the ongoing Keystone outage lasts weeks rather than days.

Curtailment has disproportionately impacted the supply of non-upgraded bitumen from oil sands operations (chart 3), which is typically blended with lighter condensate and sold to the market as WCS. Conventional producers pumping a variety of grades of crudes outside the oil sands are typically much smaller than their bituminous brethren and have been exempted from the province's curtailment policy. Synthetic (i.e. upgraded) crude supply has also been resilient, given that upgraders typically have lower-value non-upgraded production that can be cut back to fulfill curtailment requirements.

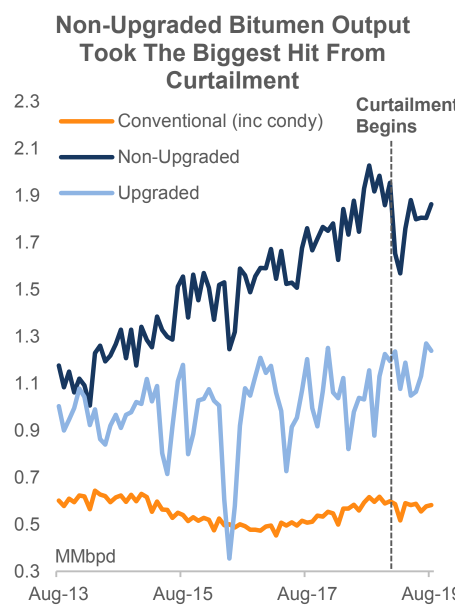
We expect that the province will keep at least some of the curtailment program running (50–75 kbpd vs 100 kbpd by end-2019) until Line 3 enters service in late-2020. Alberta's UCP government provided more details regarding the oil-by-rail contract signed by the prior government, which Premier Jason Kenney vowed to transfer back to the private sector. The government's budget included a $1.5 billion provision to "extricate" the Alberta taxpayer from the contracts, though most public commentary indicates that this is an upper bound and the hit from transferring the contracts will more likely be in the range of $800–900 million. The budget justifies

Chart 2



Sources: Scotiabank Economics, CER.

Chart 3



Sources: Scotiabank Economics, AER.

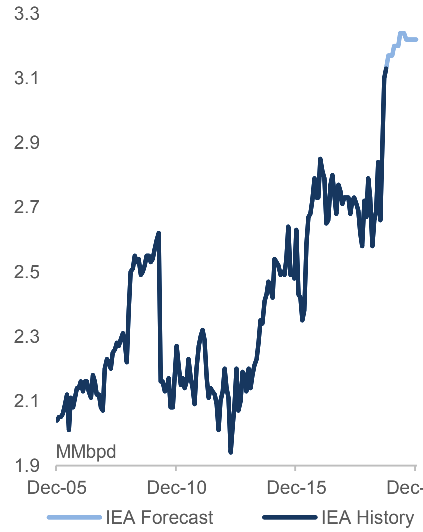
this provision by pointing to the $1.8 billion expected loss on the program (revenue of $8.8 billion against costs of $10.6 billion) which this would avoid. As with much of the oil-by-rail program since its inception it is difficult to fully unpack those estimates, but it is safe to say that the program would have operated at a loss over the past 4-5 months if it had been in operation given the tighter differentials mentioned above.

OPEC INVITES A NEW MEMBER TO JOIN THE BELEAGUERED BAND

Saudi Arabia invited Brazil to join OPEC in a sign of both the former's rising production and the latter's weakened state in a market dominated by US shale growth. Brazilian president Bolsonaro has added his support for the idea, which if implemented would install Brazil as OPEC's third-largest producer behind Saudi Arabia and Iraq. Brazilian production has risen from around 2 MMbpd in 2013 to more than in 3.1 MMbpd as of September (chart 4), mostly off the expansion of operations in the prolific pre-salt offshore fields. The type of crude being produced is nearly as important as the volume, and the barrels coming out of the Lula field in particular are of a sweet medium quality that is especially valuable in today's increasingly diesel-driven market. It remains to be seen 1) whether Brazil will accept the offer and join the production cartel, and 2) if the political boost from joining OPEC would offset the natural incongruence of the union given that Brazil hopes to continue growing output.

Chart 4

Brazilian Oil Production Advances On Pre-Salt Build-Out



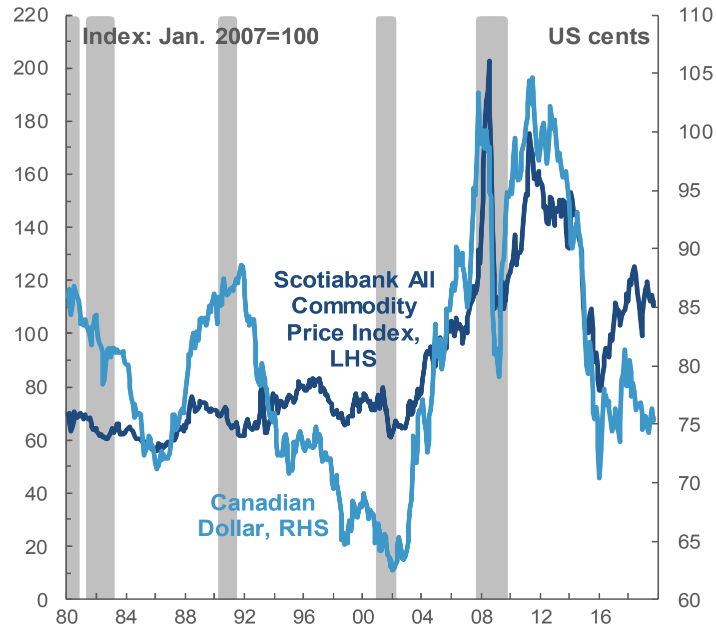
Sources: Scotiabank Economics, IEA.

Price Outlook		2000–2018						
			Period		2019ytd	2019F	2020F	2021F
Oil & Gas		Low	Avg.	High				
Crude Oils								
West Texas Intermediate	USD/bbl	17.45	62.20	145.29	56.76	57	55	62
North Sea Brent Blend	USD/bbl	17.68	65.29	146.08	64.21	64	59	65
WCS - WTI Discount*	USD/bbl	-50.00	-17.35	-5.50	-12.34	-13	-19	-24
Natural Gas								
Nymex Henry Hub	USD/MMBtu	1.64	4.74	15.38	2.54	2.61	2.64	2.75
Metals & Minerals								
Base Metals								
Copper	USD/lb	0.60	2.41	4.60	2.73	2.70	2.75	3.00
Nickel	USD/lb	2.00	7.06	24.58	6.27	6.50	7.50	8.00
Zinc	USD/lb	0.33	0.87	2.10	1.17	1.15	1.08	1.05
Aluminium	USD/lb	0.56	0.87	1.49	0.81	0.90	0.90	0.90
Bulk Commodities								
Iron Ore	USD/t	39	101	194	95	90	72	65
Metallurgical Coal	USD/t	39	135	330	185	184	150	150
Precious Metals								
Gold	USD/toz	256	910	1,895	1,377	1,400	1,550	1,475

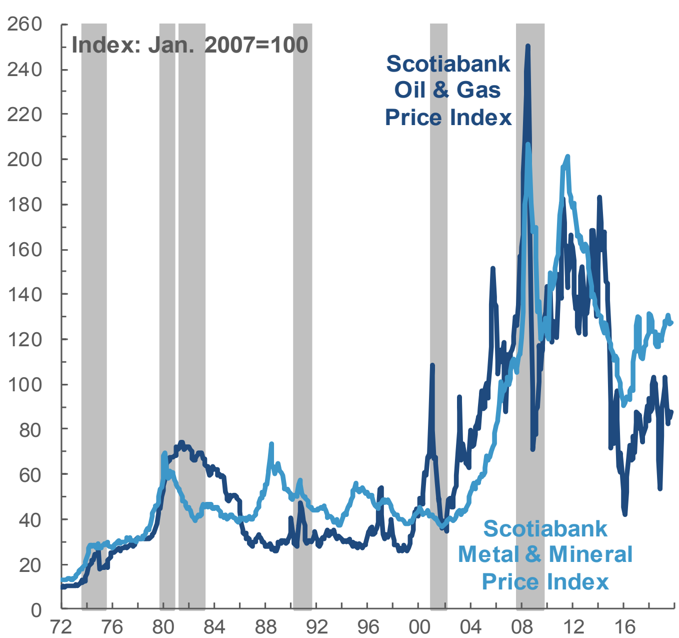
* 2008-17 average.

Scotiabank All Commodity Price Index

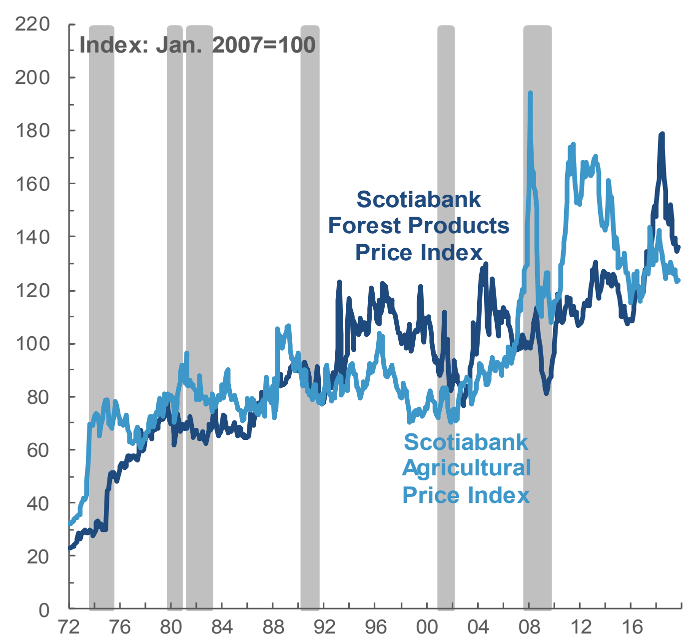
Canadian Dollar vs. Commodity Prices

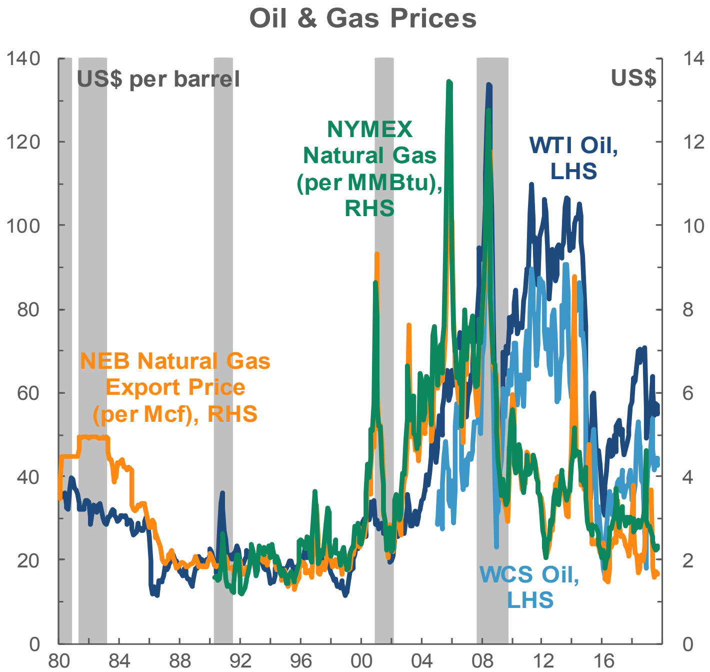


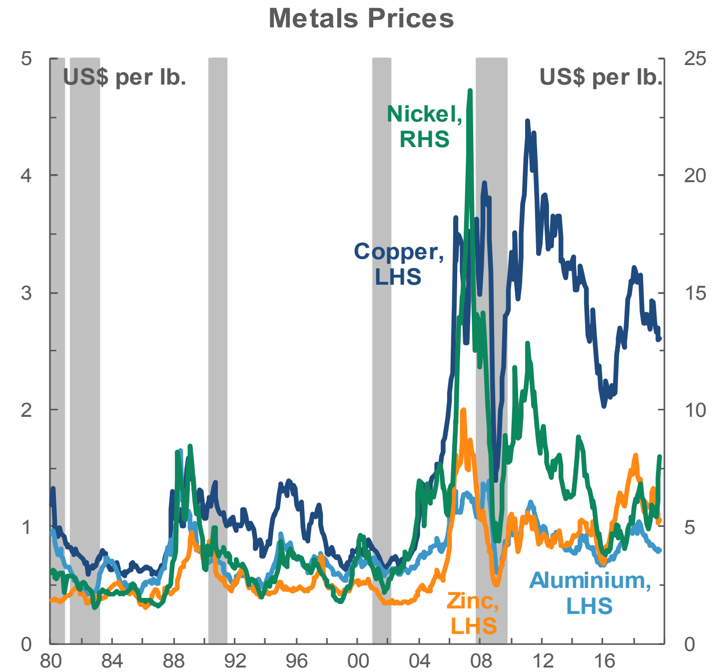
Scotiabank Oil & Gas and Metal & Mineral Indices

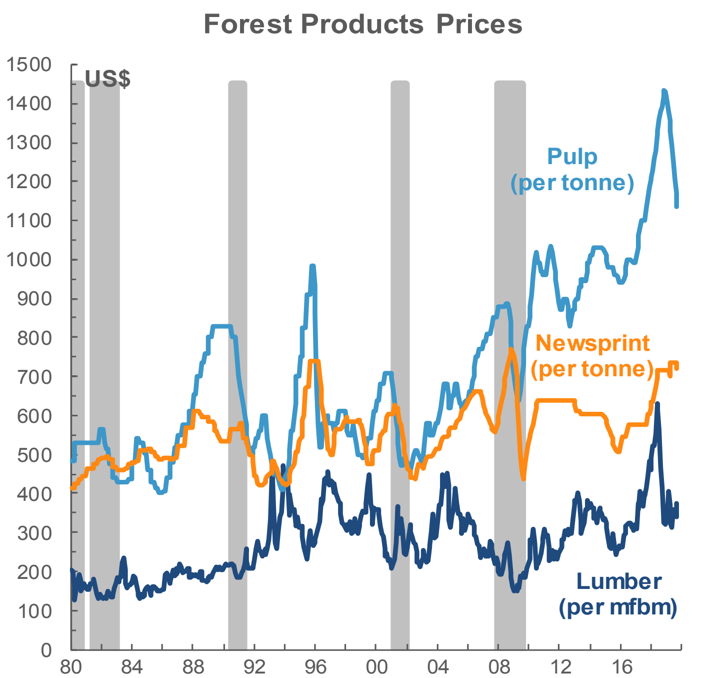


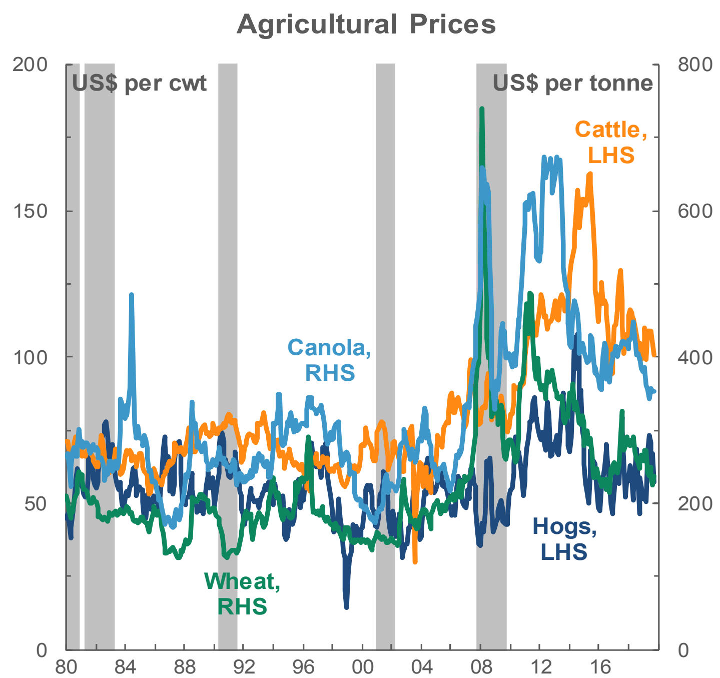
Scotiabank Forest Products & Agricultural Indices




Oil & Gas Prices
US$ per barrel
US$
NYMEX Natural Gas (per MMBtu), RHS
WTI Oil, LHS
NEB Natural Gas Export Price (per Mcf), RHS
WCS Oil, LHS
0 20 40 60 80 100 120 140
0 2 4 6 8 10 12 14
80 84 88 92 96 00 04 08 12 16


Metals Prices
US$ per lb.
US$ per lb.
Nickel, RHS
Copper, LHS
Zinc, LHS
Aluminium, LHS
0 1 2 3 4 5
0 5 10 15 20 25
80 84 88 92 96 00 04 08 12 16


Forest Products Prices
US$
Pulp (per tonne)
Newsprint (per tonne)
Lumber (per mfbm)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500
80 84 88 92 96 00 04 08 12 16


Agricultural Prices
US$ per cwt
US$ per tonne
Cattle, LHS
Canola, RHS
Hogs, LHS
Wheat, RHS
0 50 100 150 200
0 200 400 600 800
80 84 88 92 96 00 04 08 12 16

Technical Note
Scotiabank Commodity Price Index — Principal Canadian Exports
January 2007 = 100

This Index has been designed to track the spot or transactions prices paid in U.S. dollars for key Canadian commodities and resource-based manufactured goods in export markets. The weight of each component is based upon its net export value in 2010. Prior to January 2007, the weight of each component was based on its export value in 1995-97, except for crude oil & refined petroleum products, uncoated freesheet paper and linerboard, where net exports were used. Canada imports a significant quantity of these products, and use of their export value alone would have overstated the importance in Canada's trade performance.

The following prices are included:

OIL & GAS

Crude Oil & Refined Petroleum Products (US$ per bbl) MSW light sweet crude oil at Edmonton (previously Edmonton Par crude) and Western Canadian Select heavy oil at Hardisty, Alberta; price differentials off WTI near-by futures from Bloomberg.

Natural Gas (US$ per mcf) Average export price quoted by the National Energy Board.

Natural Gas Liquids (NGLs – Propane, Butane, Ethane & Pentanes-Plus) (US$ per bbl), Propane at Edmonton & Sarnia.

METALS & MINERALS

Copper & Products (US$ per lb) LME official cash settlement price for grade A copper.

Zinc (US$ per lb) LME SHG cash settlement: prior to Sept 1990, U.S. producers' price for high-grade zinc delivered.

Lead (US$ per lb) LME official cash settlement price; prior to Jan. 1991, U.S. producers' price for common grade delivered.

Aluminium & Products (US$ per lb) since 1979, LME official cash settlement price.

Nickel (US$ per lb) since 1980, LME official cash settlement price.

Gold (US$ per oz) 'LBMA Gold Price PM' as of March 20, 2015.

Potash (US$ per tonne) Standard potassium chloride, spot price, FOB Vancouver.

Sulphur (US$ per tonne) Solid, spot price, FOB Vancouver.

Metallurgical Coal (US$ per tonne) Contract price for premium-grade hard coking coal, FOB Vancouver.

Iron Ore (US cents per dmtu) Spot price fines 62% Fe, CFR Qingdao, China; prior to Jan 2011, term-contract price for concentrates 66% Fe from Labrador/Quebec to Northern Europe (FOB Sept-Iles).

Uranium (US$ per lb) U_3O_8 near-by-futures from Bloomberg.

Molybdenum (US$ per lb) since March 1992, MW dealer oxide.

Cobalt (US$ per lb) MW dealer price.

FOREST PRODUCTS

Lumber & Wood Products, Western Spruce-Pine-Fir 2x4 No.2 & Btr (US$ per mfbm) FOB mill.

Oriented Strandboard (US$ per thousand sq. ft.), U.S. North Central region, 7/16 inch.

Pulp, Bleached Northern Softwood Kraft (US$ per tonne) Transactions price, delivery USA.

Newsprint (US$ per tonne) Average transactions price, 45 grams, delivery Eastern USA.

Groundwood Specialty Papers (US$ per ton) Supercalendered-A paper, 35 lb., delivery USA.

Linerboard (US$ per ton), delivery Eastern USA with zone discounts.

AGRICULTURE

Wheat & Flour (US$ per tonne), DNS No 1 14% protein Duluth, Minn; prior to April 2011 No.1 CWRS, 13.5% protein at St. Lawrence.

Barley (US$ per tonne), Saskatchewan aggregate spot price; historical data No. 1 at Lethbridge, Alberta.

Canola & Oilseeds (US$ per tonne) No.1 Canada, in store Vancouver.

Cattle & Beef (US$ per cwt) Steers over 1,051 pounds at Toronto; from Jan 1993, Ontario average.

Hogs & Pork (US$ per cwt) 100 Index Hogs at Toronto; from Jan 1993, Ontario average.

Fish & Seafood (US$ per lb) West Coast silver coho salmon; Atlantic lobster prices; prior to 1986 cod fillets & blocks.

Scotiabank Commodity Price Index — Components And Weights

Index Components	Net Export Value In 2010 (millions of dollars)	Index Weight (per cent)
OIL & GAS INDEX	**46,537**	**39.90**
Crude Oil & Refined Products	33,231	28.49
Natural Gas & LNG	11,741	10.07
NGLs	1,565	1.34
METAL & MINERAL INDEX	**35,109**	**30.10**
Copper	3,160	2.71
Zinc	1,255	1.08
Lead	579	0.50
Aluminium	6,045	5.18
Nickel	4,246	3.64
Gold	4,678	4.01
Coal	4,757	4.08
Iron Ore	3,346	2.87
Potash	5,161	4.42
Sulphur	457	0.39
Uranium	891	0.76
Cobalt	288	0.25
Molybdenum	246	0.21
FOREST PRODUCTS INDEX	**17,081**	**14.66**
Lumber & Wood Products	4,673	4.01
OSB	812	0.70
Pulp	6,818	5.85
Newsprint	2,734	2.34
Groundwood Spec. Papers	1,971	1.69
Linerboard	87	0.07
AGRICULTURAL INDEX	**17,901**	**15.35**
Wheat & Flour	4,693	4.02
Barley & Feedgrains	1,088	0.93
Canola & Oilseeds	5,398	4.63
Cattle & Beef	1,640	1.41
Hogs & Pork	2,378	2.04
Fish & Seafood	2,704	2.32
TOTAL INDEX	**116,643**	**100.00**