

BACKGROUNDER:

Preliminary Costs of the Federal Carbon Backstop on Saskatchewan Agriculture



Background

- Starting April 1, 2019, the Federal backstop carbon tax was applied in Saskatchewan.
- The tax started at \$20/tonne of emissions in 2019 and increased by \$10/tonne per year until reached \$50/tonne in 2022. The tax then started increasing \$15/tonne until it reaches \$170/tonne in 2030.
- An exemption for farm fuel is provided upfront through the use of exemption certificates. The certificate allows a registered distributor to deliver gasoline or light fuel oil (e.g., diesel) to a farm or cardlock provided the fuel is “used exclusively in the operation of eligible farming machinery and for eligible farming activities.”
- Although farm fuel is exempt from the carbon tax, farmers will still face significant cost increases on other fuel sources, including heating fuel, electricity generation, natural gas and propane for grain drying. Producers will also incur indirect costs as railways and other service providers pass the carbon tax down to producers through lower agricultural commodity prices and higher input bills and service charges.
- Based on the APAS example below, a \$20/tonne federal carbon tax in 2019 cost the Saskatchewan grain farm producing and marketing a 62 bushel/acre wheat crop **\$1.93 per acre in 2019**, increasing to **\$7.42 in 2024** (\$80/tonne) and **\$17.31 per acre by 2030** (\$170/tonne).
- Under the assumptions used in these estimates, a **5000 acre farm producing wheat, canola, barley, peas and oats, would incur between \$22.678 and \$30,033 in total carbon tax costs, depending on specific grain drying requirements.**

Table 1. Fuel Charge Rates Applied to Saskatchewan – Effective April 1, 2019

	2019	2024	2030
Natural gas \$/cubic metre	\$0.0391	\$0.1525	\$0.3240
Gasoline- \$/litre	\$0.0442	\$0.1761	\$0.3743
Propane- \$/litre	\$0.0310	\$0.1238	\$0.2631
Diesel- \$/litre	\$0.0548	\$0.2139	\$0.4545

What costs are unknown or still to be determined?

- Indirect costs of transporting inputs
- Transportation costs for livestock and livestock feed
- Increased costs on processors and product handlers (elevators, canola crushers, mills, meat packers), translating into lower commodity prices at the farmgate.
- Cost increases for manufactured products like machinery
- Increased costs for custom service

What assumptions were made when calculating these costing numbers?

Table 2. Calculation of APAS Cost Estimates				
	2019 \$20/tonne	2024 \$80/tonne	2030 \$170/tonne	Assumptions
Electricity	\$0.06/acre	\$0.21/acre	\$0.51/acre	<p>-Estimated 2019 total cost of \$2.74/acre^{1,2}</p> <p>-The \$20/tonne levy resulted in a carbon tax charge of 0.2994 cents /Kwh, representing an avg. cost increase of 2.1% for 2019, equalling a \$0.06 acre carbon tax cost.</p> <p>-This \$0.06.ac increased 355% when price of carbon rose from \$20/tonne to \$80/tonne (\$0.20/acre), and another 212% when the price of carbon increases from \$80 to \$170 tonne in 2030 (\$0.45/acre)</p>
Heating	\$0.15/acre	\$0.59/acre	\$1.24/acre	<p>- Estimated total cost of heating is \$0.39/acre^{1,2}</p> <p>- Natural Gas Rate April 1, 2019: \$0.0998 Cost/m3</p> <p>- Carbon Levy (\$20/tonne): \$0.12 Cost/m3 Natural Gas (40% increase)</p> <p>-(\$0.39 /acre) * (40% increase) = \$0.15 /acre</p> <p>At \$80/tonne (\$0.1525 Cost/m3), estimated cost increase of 390%</p> <p>-(\$0.15/acre) * (390% increase) = \$0.59/acre</p> <p>At \$170/tonne (\$0.3240 Cost/m3), estimated cost increase of 213% from 2024</p> <p>-(\$0.59/acre) * (213% increase) = \$1.24/acre</p>
Grain Drying	\$0.60/acre	\$2.40/acre	\$6.29/acre	<p>- 62 bu per acre wheat yield, weighing 60 lbs./bu to be dried 5 points, removing 3.0 lbs water/bu</p> <p>- Propane energy conversion of 25.3 MJ/L</p> <p>-2500 average Btu required to remove 1 lb. water at a carbon tax of \$1.293 per million BTUs in 2019; \$5.16 in 2024; \$13.50 in 2030</p> <p>-6250 BTUs required to dry grain 3 moisture points</p> <p>- \$0.031/L propane carbon tax for 2019 = \$0.52/acre</p> <p>-\$0.1238/L is 400% increase in cost from \$0.031/L.</p> <p>-(\$0.52) * (400% increase) = \$2.07 in 2024</p> <p>-\$0.2631/L is 262% increase in cost from -\$0.1238/L</p> <p>-(\$2.07) * (262% increase) = \$5.43 in 2024</p>

¹ 2019 Saskatchewan Crop Planning Guide estimate \$4.90 per acre "Utilities"

² "Utilities" breakdown (56% electricity, 28% telephone, 16% heating) as per discussion with Saskatchewan Ministry of Agriculture

Rail Freight	\$0.96/acre	\$3.73/acre	\$7.92/acre	<p>- Average length of haul for Saskatchewan grain to export position: 1,150 miles</p> <p>- 2019 Railway Carbon Tax Surcharge Rates: \$0.04/mile in Saskatchewan and Alberta (65% of haul); \$0.06/mile in BC (35% of haul)³</p> <p>- (\$54.05 per rail car) ÷ (92.8 tonnes per car) = \$0.58 per tonne. 62 bushels = 1.64 tonnes</p> <p>- (1.64 tonnes)*(\$0.58 carbon tax) = \$0.96/acre in 2019</p> <p>-2024 Railway Carbon Tax Surcharge Rates: \$0.1390/mil in Sask and Alb; \$0.2659 in BC</p> <p>-\$210.93 per rail car) ÷ (92.8 tonnes per car) = \$2.27 per tonne. 62 bushels = 1.64 tonnes</p> <p>- (1.64 tonnes)*(\$2.27 carbon tax) = \$3.73/acre in 2024</p> <p>-Assuming rail carbon surcharges increase at rate equal to federal carbon price, cost increases 213%</p> <p>-\$3.73/acre)*(213%) = \$7.92/acre in 2030</p>
Trucking Freight	\$0.16/acre	\$0.49/acre	\$1.35/acre	<p>In 2019 at \$20/tonne (\$0.055 carbon cost/litre of diesel):</p> <p>- Hauling fully loaded Super B of loaded wheat 63km (39.4 miles) to elevator⁴</p> <p>(39.4 miles) / 0.99 miles/litre⁵</p> <p>= 39.8 litres farm to elevator</p> <p>(39.8 litres farm to elevator) * (\$0.055 carbon cost/litre of diesel) = \$2.20 in carbon costs</p> <p>- An empty Super B uses 40% less fuel</p> <p>(39.4 miles) / 1.39 miles/litre⁵</p> <p>= 28.3 litres to farm (from elevator)</p> <p>(28.3 litres to farm) * (\$0.055 carbon cost/litre of diesel)</p> <p>= \$1.55 in carbon costs</p> <p>- Carbon costs for round trip \$2.20 + \$1.55 = \$3.75</p> <p>(\$3.75 per trip) ÷ (1500 bushels/trip⁶)</p> <p>= \$0.0025 / bushel</p> <p>(\$0.0025 / bushel) * (62 bushels/acre)</p> <p>= \$0.16/acre</p> <p>In 2023 at \$0.2139/L = \$0.64/acre</p> <p>In 2030 at \$0.4545/L = \$1.35/acre</p>

³ CN and CP Carbon Tax and Environmental Surcharge Tariffs Available Online

⁴ Average distance from farm to elevator in Saskatchewan as per 2002 Quorum report Commercial Trucking Rates in the Movement of Western Canadian Grain

⁵ 4.5 mpg or 0.99 mpl consumption by fully loaded Super B and 1.39 mpl for an empty Super B as per discussion with industry

⁶ 1500 bushel capacity for an average Super B as per discussion with industry

2024 Carbon Tax Costs – 5000 acre farm in black soil zone

The example below shows the potential financial impact of the carbon tax on a 5000 acre grain farm from the Black Soil Zone of Saskatchewan in 2023. Costs are calculated using the methodology provided for wheat with per acre electricity (\$0.21) and heating costs (\$0.59) applying consistently to all crops, and adjustments made for volume differences in trucking and rail freight for each crop type.

Table 3 – Carbon Tax Costs without Grain Drying

Crop	Yield (bu/ac)	Acres	Electricity/ Heating	Rail Freight	Trucking	Total 2023 Carbon Costs
Canola	48	1600	\$1,280	\$3,954	\$620	\$5,854
Wheat	62	1600	\$1,280	\$6,128	\$960	\$8,369
Barley	69	700	\$560	\$2,387	\$374	\$3,321
peas	51	700	\$560	\$2,206	\$346	\$3,111
oats	123	350	\$280	\$1,507	\$236	\$2,023
Total		5000	\$3,960	\$16,182	\$2,536	\$22,678

Table 4 – Carbon Tax Costs with Grain Drying

The table below shows the cost estimates with addition of carbon tax on grain drying fuel under difficult harvest conditions. The totals in the table below represent carbon tax costs before grain drying (\$22,678), total grain drying carbon costs (\$7,356), how much crop was dried and at what moisture level, and finally total carbon costs incurred that year with grain drying (\$30,033).

Crop	Carbon tax before grain drying	Carbon Tax on grain drying	Drying Requirements: (M = Moisture %)	Total CO2 tax
Canola	\$5,854	\$1.05 x 960 acres = \$1012	60% of acres, removing 3.4% M	\$6,866
Wheat	\$8,369	\$3.08 x 1280 acres = \$3,943	80% of acres, removing 6.4% M	\$12,311
Barley	\$3,321	\$1.45 x 560 acres = \$815	80% of acres, removing 3.4% M	\$4,136
peas	\$3,111	\$0.75 x 420 acres = \$315	60% of acre, removing 1.9% M	\$3,426
oats	\$2,023	\$4.54 x 280 acres = \$1271	80% of acres, removing 8.4% M	\$3,294
Total	\$22,678	\$7,356		\$30,033