

## BACKGROUND:

# 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 was initiated at \$20/tonne of emissions in 2019 and escalated annually by \$10/tonne until reaching \$50/tonne in 2022. Subsequently, the tax increased by \$15/tonne annually until it reaches \$170/tonne in 2030.
- An exemption for farm fuel is provided through exemption certificates. The certificate permit registered distributors to deliver gasoline or light fuel oil (e.g., diesel) to farms or cardlocks for “eligible farming machinery and activities.”
- Despite farm fuel being exempt from the carbon tax, farmers face substantial cost increases on other fuel sources, including heating fuel, electricity generation, natural gas and propane for grain drying. Additionally, indirect costs arise as railways and other service providers transfer the carbon tax to producers through lower commodity prices and higher input bills and service charges.
- According to APAS’s example, 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).
- Using these estimates, a **5,000-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**

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

## Outstanding Cost Considerations

- Indirect costs related to transporting inputs.
- Transportation costs associated with livestock and livestock feed.
- Elevated costs for processors and product handlers (elevators, canola crushers, mills, meat packers), potentially resulting in reduced commodity prices at the farmgate.
- Heightened costs for manufactured products such as machinery
- Increased costs for custom service

## Assumptions Utilized in Cost Calculations

- Standardized Carbon Tax Rates: Consistent application of federal carbon tax rates based on established government guidelines.
- Uniform Energy Costs: Fixed electricity and heating costs per acre applied uniformly across all crops.
- Volume Adjustments: Adjustments made for varying volumes in trucking and rail freight based on crop type.
- Grain Drying Conditions: Assumed challenging harvest conditions necessitating grain drying, impacting the total carbon tax expenses.

**Table 2. Calculation of APAS Cost Estimates**

	<b>2019 \$20/tonne</b>	<b>2024 \$80/tonne</b>	<b>2030 \$170/tonne</b>	<b>Assumptions</b>
<b>Electricity</b>	\$0.06/acre	\$0.21/acre	\$0.51/acre	- Estimated 2019 total cost of \$2.74/acre <sup>1,2</sup> - 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. - This \$0.06.ac increased 355% when price of carbon rose from \$20/tonne to \$80/tonne ( <b>\$0.20/acre</b> ), and another 212% when the price of carbon increases from \$80 to \$170 tonne in 2030 ( <b>\$0.45/acre</b> )
<b>Heating</b>	\$0.15/acre	\$0.59/acre	\$1.24/acre	- Estimated total cost of heating is \$0.39/acre <sup>1,2</sup> - Natural Gas Rate April 1, 2019: \$0.0998 Cost/m3 - Carbon Levy (\$20/tonne): \$0.12 Cost/m3 Natural Gas (40% increase) - ( <b>\$0.39 /acre</b> ) * ( <b>40% increase</b> ) = <b>\$0.15 /acre</b> At \$80/tonne (\$0.1525 Cost/m3), estimated cost increase of 390%. - ( <b>\$0.15/acre</b> ) * ( <b>390% increase</b> ) = <b>\$0.59/acre</b> At \$170/tonne (\$0.3240 Cost/m3), estimated cost increase of 213% from 2024. - ( <b>\$0.59/acre</b> ) * ( <b>213% increase</b> ) = <b>\$1.24/acre</b>

<sup>1</sup> 2019 Saskatchewan Crop Planning Guide estimate \$4.90 per acre "Utilities."

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

**Table 2. Calculation of APAS Cost Estimates**

	<b>2019 \$20/tonne</b>	<b>2024 \$80/tonne</b>	<b>2030 \$170/tonne</b>	<b>Assumptions</b>
<b>Grain Drying</b>	\$0.60/acre	\$2.40/acre	\$6.29/acre	<ul style="list-style-type: none"> <li>- 62 bu per acre wheat yield, weighing 60 lbs./bu to be dried 5 points, removing 3.0 lbs water/bu.</li> <li>- Propane energy conversion of 25.3 MJ/L.</li> <li>-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.</li> <li>-6250 BTUs required to dry grain 3 moisture points.</li> <li>- \$0.031/L propane carbon tax for 2019 = <b>\$0.52/acre.</b></li> <li>-\$0.1238/L is a 400% increase in cost from \$0.031/L.</li> <li><b>-( \$0.52)*(400% increase) = \$2.07 in 2024.</b></li> <li>-\$0.2631/L is 262% increase in cost from -\$0.1238/L.</li> <li><b>-( \$2.07)*(262% increase) = \$5.43 in 2024.</b></li> </ul>
<b>Rail Freight</b>	\$0.96/acre	\$3.73/acre	\$7.92/acre	<ul style="list-style-type: none"> <li>- Average length of haul for Saskatchewan grain to export position: 1,150 miles.</li> <li>- 2019 Railway Carbon Tax Surcharge Rates: \$0.04/mile in Saskatchewan and Alberta (65% of haul); \$0.06/mile in BC (35% of haul)<sup>3</sup>.</li> <li>- (\$54.05 per rail car) ÷ (92.8 tonnes per car) = \$0.58 per tonne. 62 bushels = 1.64 tonnes.</li> <li>- <b>(1.64 tonnes)*(\$0.58 carbon tax) = \$0.96/acre in 2019.</b></li> <li>-2024 Railway Carbon Tax Surcharge Rates: \$0.1390/mil in Sask and Alb; \$0.2659 in BC.</li> <li>-( \$210.93 per rail car) ÷ (92.8 tonnes per car) = \$2.27 per tonne. 62 bushels = 1.64 tonnes.</li> <li>- <b>(1.64 tonnes)*(\$2.27 carbon tax) = \$3.73/acre in 2024</b></li> <li>-Assuming rail carbon surcharges increase at rate equal to federal carbon price, cost increases 213%.</li> <li><b>-( \$3.73/acre)*(213%) = \$7.92/acre in 2030.</b></li> </ul>
<b>Trucking Freight</b>	\$0.16/acre	\$0.49/acre	\$1.35/acre	<p><b>In 2019 at \$20/tonne (\$0.055 carbon cost/litre of diesel):</b></p> <ul style="list-style-type: none"> <li>- Hauling fully loaded Super B of loaded wheat 63km (39.4 miles) to elevator<sup>4</sup>.</li> <li>(39.4 miles) / 0.99 miles/litre<sup>5</sup> = 39.8 litres farm to elevator.</li> <li>(39.8 litres farm to elevator) * (\$0.055 carbon cost/litre of diesel) = \$2.20 in carbon costs.</li> <li>- An empty Super B uses 40% less fuel (39.4 miles) / 1.39 miles/litre<sup>5</sup></li> </ul>

<sup>3</sup> CN and CP Carbon Tax and Environmental Surcharge Tariffs Available Online

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

<sup>5</sup> 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

<sup>6</sup> 1500 bushel capacity for an average Super B as per discussion with industry

**Table 2. Calculation of APAS Cost Estimates**

				= 28.3 litres to farm (from elevator) (28.3 litres to farm) * (\$0.055 carbon cost/litre of diesel) = \$1.55 in carbon costs. - Carbon costs for round trip \$2.20 + \$1.55 = \$3.75 (\$3.75 per trip) ÷ (1500 bushels/trip <sup>6</sup> ) = \$0.0025 / bushel <b>(\$0.0025 / bushel) * (62 bushels/acre)</b> <b>= \$0.16/acre</b> <b>In 2023 at \$0.2139/L = \$0.64/acre</b> <b>In 2030 at \$0.4545/L = \$1.35/acre.</b>
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**2024 Carbon Tax Costs – 5,000 acre farm in black soil zone**

The following example illustrates the projected financial implications of the carbon tax on a 5000-acre grain farm located in the Black Soil Zone of Saskatchewan in 2023. Costs are calculated based on a standardized methodology using consistent per-acre electricity (\$0.21) and heating costs (\$0.59) across all crops, with adjustments made for volume disparities 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
<b>Total</b>		<b>5000</b>	<b>\$3,960</b>	<b>\$16,182</b>	<b>\$2,536</b>	<b>\$22,678</b>

**Table 4 – Carbon Tax Costs with Grain Drying**

The table below presents cost estimates incorporating the carbon tax on grain drying fuel during challenging harvest conditions. The figures in the table include carbon tax costs before grain drying (\$22,678), additional carbon tax costs specifically related to grain drying (\$7,356), details on the quantity of crop dried and its moisture level, and the overall carbon tax expenses incurred that year, inclusive of 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
<b>Total</b>	<b>\$22,678</b>	<b>\$7,356</b>		<b>\$30,033</b>