

**The information Ray Orb quoted:**

**In February 2020, APAS released updated estimates on the financial impacts of the carbon tax to Saskatchewan producers.** At that time, we found that on average, **Saskatchewan farmers could expect to lose 8% of their total 2020 net income to the carbon tax.** For a household managing a 5,000-acre grain farm in Saskatchewan, we estimated would take the form of a \$8,000-10,000 bill.

When the carbon tax increases to \$50/tonne in 2022, APAS estimated this bill would go up to \$13,000-17,000 for the same household – **the equivalent of a 12% decrease in net income.**

The background for Ray Orb's information comes from the APAS PDF: *2020 APAS Carbon Costing Estimates*.

Going back to April 1, 2019, the Federal carbon tax was applied in Saskatchewan, starting at \$20/tonne. It increased \$10/tonne per year until it reached \$50/tonne in 2022. The tax started increasing \$15/tonne until it will reach \$170/tonne in 2030.

While there is an exemption for farm fuels upfront through the use of exemption certificates, farmers still face significant cost increases on other fuel sources including barn heating, grain drying, electricity generation, and costs passed down from railways.

Based on the APAS example, a \$20/tonne carbon tax in 2019 cost a Saskatchewan grain farm producing a 62 bushel/acre wheat crop \$1.95 per acre in 2019. That cost increased to \$5.17 per acre by 2023 (\$65/tonne) and is expected to reach \$13.51/acre in 2030 (\$170/tonne).

The carbon tax is also passed on from the railroads onto producers. Using CN's published carbon tax fee per mile per car (11.29¢), the average mileage from Saskatchewan to port (1,150 miles), the total cost per car for an average haul would be \$129.84. **The total cost on 26 million tonnes of exports is \$36,376,185.**

## **Preliminary Costs of the Federal Carbon Backstop on Saskatchewan Agriculture**

**What does the Federal carbon backstop mean for Saskatchewan agricultural producers?**

- The tax started at \$20/tonne of emissions in 2019 and will increase by \$10/tonne per year until it reaches \$50/tonne in 2022.
- Based on APAS estimates, a \$20/tonne federal carbon tax has cost an average Saskatchewan grain farm **\$1.76 per acre in 2019**. These costs will increase to **\$2.38 for 2020** and rise to **\$3.80 per acre by 2022**.

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

	2019	2020	2021	2022
Natural gas \$/cubic metre	\$0.0391	\$0.0587	\$0.0783	\$0.0979
Gasoline- \$/litre	\$0.0442	\$0.0663	\$0.0884	\$0.1105
Propane- \$/litre	\$0.0310	\$0.0464	\$0.0619	\$0.0774
Diesel- \$/litre	\$0.0548	\$0.0821	\$0.1095	\$0.1369

## What potential costs could an agricultural producer in Saskatchewan face?

### Fertilizer

- Major Canadian fertilizer plants are subject to the output-based pricing system (OBPS) and are assessed to be in a “high competitive risk category” that allows them to emit 90% of their sector’s average emissions intensity with no additional cost. More information is forthcoming.

### Grain Drying

- With propane being taxed at \$0.0391/cubic metre in 2019, grain drying cost an additional \$0.51/acre and go up to \$1.26/acre in 2022.

### Heating and Electricity

- Electricity costs increased by \$0.06/acre in 2019 and will increase \$0.15/acre by 2022.
- Heating costs increased \$0.15/acre in 2019 and increase by \$0.39/acre in 2022.

### Rail Freight

- Average length of haul of 1,150 miles for grain from Saskatchewan to reach port position resulted in additional freight costs of \$0.88 an acre in 2019, increasing to \$1.60 by 2022, assuming 65.2 bushels/acre wheat crop.

### Trucking

- Hauling spring wheat from farm to elevator, travelling on average 63km one way (one way loaded, one way empty) increased trucking costs by \$0.16/acre in 2019 and reach \$0.40/acre in 2022.

What assumptions were made when calculating these costing numbers?

Table 2. Calculation of APAS Cost Estimates				
	2019 \$20/tonne	2020 \$30/tonne	2022 \$50/tonne	Assumptions
Electricity	\$0.06/acre	\$0.09/acre	\$0.15/acre	<ul style="list-style-type: none"> <li>- Estimated current total cost of \$2.74/acre<sup>1,2</sup></li> <li>- At \$20/tonne, carbon tax charge of 0.2994 cents /Kwh, resulting in avg. cost increase of 2.1% for 2019 and increasing at a rate consistent with the carbon tax (\$0.03/acre annually)</li> <li>- <math>(\\$2.74 / \text{acre}) * (2.1\% \text{ increase}) = \\$0.06 / \text{acre}</math></li> <li>- At \$30/tonne, estimated cost increase of another \$0.03/acre</li> <li>- <math>(\\$0.06 / \text{acre}) + (\\$0.03) = \\$0.09 / \text{acre}</math></li> <li>- At \$50/tonne, estimated cost increase \$0.03/acre per year for 2021 and 2022:</li> <li>- <math>(\\$0.09 / \text{acre}) + (0.06 / \text{acre}) = \\$0.15 / \text{acre}</math></li> </ul>
Heating	\$0.15/acre	\$0.23/acre	\$0.39/acre	<ul style="list-style-type: none"> <li>- Estimated current total cost of \$0.39/acre<sup>1,2</sup></li> <li>- Current Natural Gas Rate April 1, 2019: \$0.0998 Cost/m<sup>3</sup></li> <li>- Carbon Levy (\$20/tonne): \$0.0391 Cost/m<sup>3</sup> Natural Gas (40% increase)</li> <li>- <math>(\\$0.39 / \text{acre}) * (40\% \text{ increase}) = \\$0.15 / \text{acre}</math></li> <li>- At \$30/tonne (\$0.0587 Cost/m<sup>3</sup>), estimated cost increase of 59%</li> <li>- <math>(\\$0.39 / \text{acre}) * (59\% \text{ increase}) = \\$0.23 / \text{acre}</math></li> <li>- At \$50/tonne (\$0.0979 Cost/m<sup>3</sup>), estimated cost increase of 100%</li> <li>- <math>(\\$0.39 / \text{acre}) * (100\% \text{ increase}) = \\$0.39 / \text{acre}</math></li> </ul>
Grain Drying	\$0.51/acre	\$0.76/acre	\$1.26/acre	<ul style="list-style-type: none"> <li>- 65.2 bu per acre wheat yield, weighing 60 lbs./bu to be dried 5 points, removing 3.0 lbs water/bu</li> <li>- 2000 average Btu required to remove 1 lb. Water</li> <li>- Propane energy conversion of 25.3 MJ/L</li> <li>- \$0.0391/L of propane carbon tax for 2019, \$0.0464/L in 2020, and \$0.0774/L for 2022 = <math>\\$0.51 / \text{acre}</math> in 2019 increasing to <math>\\$0.76 / \text{acre}</math> in 2020 and <math>\\$1.26 / \text{acre}</math> in 2022.</li> </ul>
Rail Freight	\$0.88/acre	\$1.06/acre	\$1.60/acre	<ul style="list-style-type: none"> <li>- Average length of haul for Saskatchewan grain to export position: 1,150 miles</li> <li>- Railway Carbon Tax Surcharge Rates: \$0.04/mile in Saskatchewan and Alberta (65% of haul) miles); \$0.06/mile in BC (35% of haul)<sup>3</sup></li> <li>- <math>(\\$4.05 \text{ per rail car}) \div (3300 \text{ bushels/rail car}) = \\$0.0164 / \text{bushel}</math></li> <li>- <math>(65.2 \text{ bu/acre}) * (\\$0.0163 / \text{bushel}) = \\$1.07 / \text{acre}</math></li> <li>- At \$50/tonne, estimated cost is \$80.5 per rail car (\$0.0244/bushel)</li> <li>- <math>(65.2 \text{ bu/acre}) * (\\$0.0244 / \text{bushel}) = \\$1.60 / \text{acre}</math></li> </ul>

Trucking Freight	\$0.16/acre	\$0.24/acre	\$0.40/acre	<p>In 2019 at \$20/tonne (\$0.055 carbon cost/litre of diesel):</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></li> <li>= 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</li> <li>(39.4 miles) / 1.39 miles/litre<sup>5</sup></li> <li>= 28.3 litres to farm (from elevator)</li> <li>(28.3 litres to farm) * (\$0.055 carbon cost/litre of diesel) = \$1.55 in carbon costs</li> <li>- Carbon costs for round trip \$2.20 + \$1.55 = \$3.75</li> <li>(\$3.75 per trip) ÷ (1500 bushels/trip<sup>6</sup>)</li> <li>= \$0.0025 / bushel</li> <li><b>(\$0.0025 / bushel) * (65.2 bushels/acre)</b></li> <li><b>= \$0.16/acre</b></li> </ul> <p>In 2020 at \$30/tonne (\$0.0821 carbon cost/litre of diesel):</p> <ul style="list-style-type: none"> <li><b>= \$0.24/acre</b></li> </ul> <p>In 2022 at \$50/tonne (\$0.1369 carbon cost/litre of diesel):</p> <ul style="list-style-type: none"> <li><b>= \$0.40/acre</b></li> </ul>
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#### 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), translating into lower commodity prices at the farmgate.
- Cost increases for manufactured products like machinery
- Increased costs for custom services

## Preliminary Costs of the Federal Carbon Backstop on Saskatchewan Agriculture

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. The carbon tax costs are calculated using the methodology outlined in the per-acre carbon costs for wheat. Costs are calculated for each crop type, with adjustments for yield and specific drying requirements. Production, revenue, and business expenses are based on the projections found in the 2020 Saskatchewan Crop Planning Guide.<sup>1</sup> The cost impacts are shown at the 2020 carbon tax rate of \$30/tonne of CO<sub>2</sub> and the 2022 carbon tax rate of \$50/tonne CO<sub>2</sub>.

In 2020, the 5000-acre farm will pay \$10,432 in direct and indirect carbon taxes, representing 8% of their total net income. At the 2022 carbon tax rate, the farm would pay \$16,681 in direct and indirect carbon taxes, representing 12.5% of their net income.

**Table 1: Production and Revenue by crop**

Crop	Yield (bu/ac)	Price	Gross Revenue	Variable Costs	Other Costs	Net Revenue per acre	Acres	Total Revenue
Canola	53.8	\$10.70	\$575.66	\$351.80	\$152.11	\$71.75	1600	\$114,400
Wheat	64.7	\$6.42	\$415.37	\$238.93	\$152.11	\$24.33	1600	\$38,928
Barley	74.6	\$4.70	\$350.62	\$255.32	\$152.11	-\$56.81	700	-\$39,767
peas	58.4	\$6.85	\$400.04	\$250.83	\$152.11	-\$2.90	700	-\$2,030
oats	139.4	\$3.02	\$420.99	\$207.16	\$152.11	\$61.72	350	\$21,602
<b>Total</b>							<b>5000</b>	<b>\$133,133</b>

**Table 2: 2020 Carbon Tax Expenses**

Crop	Carbon tax before grain drying	Carbon Tax on grain drying	Drying Requirements: (M = Moisture %)	Total CO2 tax
Canola	\$1.44 x 1600 = \$2,304	\$0.24 x 960 acres = \$230	60% of acres, removing 3.4% M	\$2,534
Wheat	\$1.61 x 1600 = \$2,583	\$0.65 x 1280 acres = \$832	80% of acres, removing 6.4% M	\$3,415
Barley	\$1.78 x 700 = \$1,246	\$0.47 x 560 acres = \$263	80% of acres, removing 3.4% M	\$1,509
peas	\$1.51 x 700 = \$1,057	\$0.17 x 420 acres = \$71	60% of acre, removing 1.9% M	\$1,578
oats	\$2.83 x 350 = \$990	\$1.45 x 280 acres = \$406	80% of acres, removing 8.4% M	\$1,396
<b>Total</b>	<b>\$8,630</b>	<b>\$1,802</b>		<b>\$10,432</b>

**Table 3: 2022 Carbon Tax Expenses**

Crop	Carbon tax before grain drying	Carbon Tax on grain drying	Drying Requirements:	Total CO2 tax
Canola	\$2.25 x 1600 = \$3,600	\$0.60 x 960 acres = \$576	60% of acres, removing 3.4% M	\$2,099
Wheat	\$2.52 x 1600 = \$4,032	\$1.63 x 1280 = \$2,084	80% of acres, removing 6.4% M	\$2,978
Barley	\$2.76 x 700 = \$1,932	\$0.79 x 560 = \$442	80% of acres, removing 3.4% M	\$5,773
peas	\$2.36 x 700 = \$1,652	\$0.43 x 420 = \$180	60% of acres, removing 1.9% M	\$1,892
oats	\$4.32 x 350 = \$1,519	\$2.37 x 280 = \$664	80% of acres, removing 8.4% M	\$2,183
<b>Total</b>	<b>\$12,735</b>	<b>\$3,942</b>		<b>\$16,681</b>