

# Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth

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Germany's Post Office (Deutsche Post) developed and began manufacturing Streetscooter battery electric vans in 2016 to replace its 70,000 vehicle fleet (photo: Reuters 2017).



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- Paul Byron, who has over thirty years of experience working with many of Canada’s largest co-op enterprises.

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## 1.0 Executive Summary

### GM Oshawa Assembly Plant Closure and 2009 Bailout

The GM Oshawa auto assembly plant, which has been operating for over one hundred years, will close this year. The announcement was made on November 26, 2018, and it means the loss of over 15,000 jobs in Ontario, a major loss in manufacturing capacity, and a \$4 billion per year loss to Ontario's GDP.<sup>1</sup> This is happening only ten years after the Canadian and Ontario governments bailed GM Canada out with close to \$11 billion, and over a quarter of this money (\$3 billion) was not paid back.<sup>2</sup> Today, GM is financially strong. In 2018, it made close to \$11 billion (USD) in before-tax profit on global sales of \$147 billion.<sup>3</sup>

### Is there an alternative to closing the assembly plant?

Yes. Instead of accepting the GM Oshawa plant closure, **the Government of Canada can provide leadership in acquiring the facility and financing its retooling to build battery electric vehicles (BEVs).** There is a strong business case for this alternative, based on a triple bottom line prefeasibility analysis that considers the economic, social and environmental benefits.

### What are the triple-bottom line impacts?

1. Keeping and growing Canada's manufacturing capacity and skills to help us meet our needs in the future while decreasing greenhouse gas (GHG) emissions.
2. Reaching a breakeven point by year 4, and making a modest profit in year 5.
3. Creating over 13,000 jobs: up to 2,900 manufacturing-related (including 600 parts supplier jobs) and over 10,000 multiplier jobs.
4. Decreasing CO2 emissions by 400,000 metric tonnes by year 5.
5. Using this triple bottom line, public ownership model as an example for other projects.

### What will it take to make this happen?

1. A public investment estimated at \$1.4 to \$1.9 billion to acquire and retool the Oshawa assembly plant for BEV production, and potentially manufacturing other products.
2. Manufacturing and selling an estimated 150,000 BEVs in the first five years, for total sales of \$5.8 billion. This represents an estimated 1.4 percent market share of new light duty vehicle sales in Canada over the first five years of operation (using the 2018 market value of \$85 billion for just over 2 million vehicles sold).<sup>4</sup>
3. Estimated government procurement of one quarter of the BEVs produced in the first four years, representing about 23,000 vehicles with an estimated value of \$900 million.
4. Working capital requirements estimated between \$120 to \$180 million for the first five years, declining from a high of \$49 million in year 2 to \$14 million in year 5.

### What do the Canadian people want?

1. The environment and economy are the top issues in the federal election.<sup>5</sup>
2. 57 percent of Canadians think our government is doing "too little to combat climate change", and 72 percent of Canadians support the "Green New Deal for Canada".<sup>6</sup>
3. 84 percent of Canadians support government procurement of electric vehicles, and 67 percent want to ban sales of internal combustion engine vehicles by 2030.<sup>7</sup>
4. 65 percent of Canadians would buy a green bond<sup>8</sup> and 20 percent would buy a BEV.<sup>9</sup>
5. 81 percent of Canadians feel climate change is a major threat to our children and grandchildren.<sup>10</sup>

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## 2.0 Summary Overview

### GM Oshawa Plant

It is a tragic irony that General Motors (GM) chose its hundredth anniversary in Oshawa to announce the December 2019 closure of its Oshawa assembly plant. This means **the loss of over 15,000 jobs in Ontario**: 2,200 GM assembly jobs, 300 salaried positions, 500 temporary contract positions, 1,000 inside and 1,000 outside supplier jobs, and a related 10,400 multiplier jobs. The closure of Oshawa's assembly plant is estimated to **decrease Ontario's GDP by \$4 billion per year until 2030**, also reducing federal and provincial revenues by about \$1 billion a year.<sup>11</sup>

Over the months following the November 26, 2018 plant closure announcement, GM and Unifor (formerly the Canadian Auto Workers' union) negotiated the *Oshawa Transformation Agreement* (May 2019)<sup>12</sup> that promises:

- 300 stamping and parts assembly jobs and a \$170 million investment.
- Donating the 87-acre Mclaughlin Bay Reserve to the City of Oshawa.
- A 55-acre test track for autonomous vehicles.

It has yet to be seen, whether GM will keep its promise. But even if they do, it will still mean losing over 13,000 jobs and a major hit to the economy.

This preliminary feasibility study offers an alternative. **The Government of Canada can provide the leadership to acquire the GM Oshawa assembly plant and repurpose the production to building battery electric vehicles (BEVs).** There is a strong business case for this alternative, based on a triple bottom line analysis that considers the economic, social and environmental benefits:

- A public investment estimated at \$1.4 to \$1.9 billion to acquire and retool the Oshawa assembly plant for BEV production, and potentially manufacturing other products.
- Manufacturing and selling an estimated 150,000 BEVs in the first five years of production, for total sales of \$5.8 billion.
- Estimated government procurement of one quarter of the BEVs produced in the first four years, representing about 23,000 vehicles with an estimated value of \$900 million.
- Reaching a breakeven point in year 4, and making a modest profit in year 5.
- Creating over 13,000 jobs: up to 2,900 manufacturing-related (including 600 parts supplier jobs) and over 10,000 multiplier jobs.
- Decreasing CO2 emissions by 400,000 metric tonnes by year 5.

### GM Bailout and Fallout

The Oshawa assembly plant closure gives the impression that GM may be on the financial ropes again. Ten years ago, GM received a bail out of almost \$50 billion (USD) from the United States government and close to \$11 billion (CAD) from the Canadian and Ontario governments. About a quarter of this money, \$11 billion in the USA and \$3 billion in Canada was not paid back.<sup>13</sup> But, today, GM is doing well financially. In 2018, it made close to \$11 billion (USD) in before-tax profit on global sales of \$147 billion, and its enterprise value has almost doubled in four years, from \$77 billion to \$138 billion (USD).<sup>14</sup> While GM was announcing the closure of four U.S. assembly plants and the Oshawa plant – eliminating 14,700 assembly-related jobs in the process – Mary Barra, the GM Chairman and CEO, was about to receive a \$29 million (CAD) compensation package for 2018.<sup>15</sup>

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At the height of Ontario's auto industry in the mid-1980s, 23,000 people worked at GM Oshawa. With successive "free trade" agreements finally eliminating the Auto Pact, GM has been shifting its production to Mexico and China. And, from GM's point of view, the reason is simple: GM pays \$1.30 to \$4.00 (CAD) an hour to its Mexican assembly workers, and \$6.80 (CAD) an hour in China.<sup>16</sup> In comparison, the wage range for assembly workers in GM Oshawa is \$14 per hour (Ontario's current minimum wage) to \$35 per hour (with no increase since 2007), which is similar to Ontario's median full-time employment income of \$68,628 (\$33 per hour equivalent).<sup>17</sup>

Beyond the statistics and the lost pay cheques for workers, the emotional toll on laid off workers, their families, and communities is devastating. "It shatters people's sense of belonging and identity. The human cost of job loss can be enormous, leading to depression, failing marriages or health, and even suicide."<sup>18</sup>

### Triple Bottom Line Evaluation

This preliminary feasibility study uses a triple-bottom line approach to answer this question: ***Can the extremely underutilized GM Oshawa facility be converted to economically, socially and environmentally useful production?*** This is not a traditional feasibility study that only considers the financial return on investment and whether such an operation can match the global market competition from China, Mexico, South Korea or the United States. Rather, it is based on a triple bottom line evaluation, including:

1. An economic analysis of current and emerging market needs, capital investment required, skills and equipment available at the GM facility and in the community, and the potential new products that could be manufactured.
2. Social needs in the Oshawa community for well-paid, dignified work that builds on the city's hundred-year tradition of auto assembly.
3. How production at the plant can address the defining issue of our times, climate catastrophe, and identify ways to build Canada's productive capacity to manufacture the products we will need in the future.

Humanity is at a turning point, and a majority of us realize it, particularly younger people. They are facing a very different world in the coming decades with climate catastrophe, growing wealth inequality, and the erosion of democratic institutions and processes. Climate scientists unanimously agree that human-caused climate change from burning fossil fuels will escalate in the coming years,<sup>19</sup> and unless we take decisive action by 2030<sup>20</sup>, our children and grandchildren will face a very unstable world.

"Business as usual" is no longer working. Canadians need to find a way to collectively re-build our domestic manufacturing capabilities while moving as quickly as possible towards a zero-carbon economy. A recent poll found that 65 percent of Canadians feel that "Canada is not doing enough to fight climate change, and 20 percent would buy an electric car"<sup>21</sup> to help decrease greenhouse gas emissions. This triple bottom line prefeasibility study shows how we can make a difference, starting with the Oshawa assembly plant.

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### Electric Vehicles and Financial Forecasts

Electric vehicles are seen as the future of transportation. GM and other transnational auto companies had already invested \$90 billion in electric vehicle and battery production by early 2018.<sup>22</sup> China is the largest market, currently, for electric vehicles (55% global market share of the 2 million EVs sold in 2018)<sup>23</sup> and this is where the global auto companies are investing their billions, including GM. GM has no plans to build electric vehicles in Canada, even though the Oshawa assembly plant and work force are an ideal fit.

The estimated value of the GM Oshawa assembly plant, given its soon to be mothballed production and resulting hit to cash flow, is in the range of \$1.3 to \$1.6 billion. This is about half of the \$3 billion that has been left unpaid by GM from the 2009 bailout it received from the governments of Canada and Ontario, and it is one-third of the \$4.8 billion purchase price that the government of Canada recently paid for Kinder Morgan's Trans Mountain pipeline. The investment required to retrofit the plant to assemble battery electric vehicles (BEVs) on three or more assembly lines is estimated at \$400 to \$600 million. In 2016, close to \$1 billion in federal government grants and loans were given to fifty private companies for manufacturing, cleantech, innovation, agriculture, mining and telecom, including Fiat-Chrysler (FCA) that received \$86 million.<sup>24</sup> **In order to repurpose the Oshawa assembly plant to manufacture battery electric vehicles, the Government of Canada will need to provide a lead investor role.**

The two financial scenarios developed for this preliminary feasibility study are based on original equipment manufacturing (OEM) financial benchmarks for start-up/small, medium and large auto manufacturers. The financial forecasts are conservative and have a reasonable growth curve in sales revenue based on government procurement of BEV light duty delivery vans, a BEV car and SUV, and other potential vehicles, such as ambulances. The estimated vehicle fleet prices used for these financial forecasts are within the range of current prices for comparable BEVs.

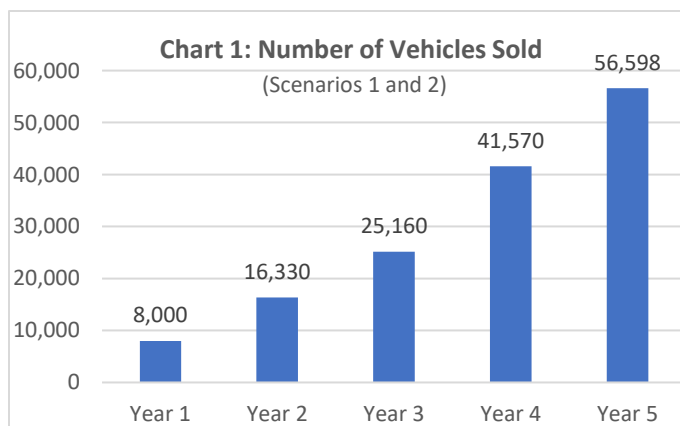


Chart 1 shows the forecasted number of battery electric vehicles that could be manufactured and sold from the repurposed Oshawa assembly plant. Starting in year 1, government procurement (federal, Ontario and the twenty largest municipal/regional governments in Ontario) takes all of the vehicles produced. This helps the new assembly line start up and work out the production kinks. In year two,

sales more than double, as sales open up to municipal car-sharing services (as an integrated part of public transit)<sup>25</sup>, company fleets and private individuals. By year four, with sales exceeding 40,000 BEVs, Scenario 1 reaches its break-even point and Scenario 2 recognizes a small operating profit (\$2.4 million). By the end of year 5, the forecasts show that BEVs will represent 30 to 40 percent of these governments' total fleets, except for Canada Post, which (like the U.S. Postal Service) is expected to replace the majority of their delivery fleet vehicles with BEVs.

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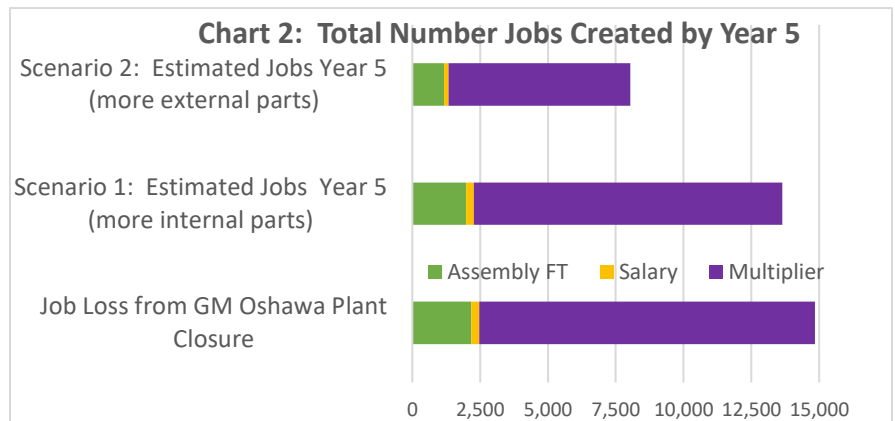
Over the first five years of operation, the sales revenue forecasts grow from \$340 million to about \$2.2 billion. This is a much more conservative growth curve compared to other start-up BEV companies like Tesla (which doubled its global sales in 2018 to \$28 billion CAD), and **because of the focus on public ownership and procurement, the creation of good jobs, and decreasing climate change gases, the public enterprise will not be solely driven by maximizing profits and shareholders' wealth.**

The gross margin (the difference between sales and the cost of goods manufactured) is conservatively forecasted at 14.3 to 14.5 percent of sales in year 1, growing to 16.3 to 16.5 percent in year 5. The auto industry OEM gross margin benchmarks are in the range of 16 percent (Ford) to 22 percent (Honda), and 2018 operating profits range from -1.8 (Tesla) to 9.8 (Honda) percent (as a percentage of sales revenue). Our financial scenarios show an operating loss each year for the first three years. Scenario 1 has a forecasted break even in year 4, increasing to 0.6% operating income (as a percentage of revenue) in year 5. Scenario 2 – with fewer assembly workers building parts in-house – has a small operating profit of \$2.4 million (0.1% of revenue) in year 4, increasing to 0.7% in year 5. ***These preliminary financial models show that it is financially viable to repurpose the Oshawa assembly plant to build battery electric vehicles.***

### Job Creation

The estimated number of jobs created includes assembly jobs, salaried positions, parts suppliers and other multiplier jobs. Auto manufacturing has an economic/job multiplier in the range of five to nine.<sup>26</sup> These forecasts use an economic/job multiplier of five, and use the assembly jobs and salaried positions as the base. Supplier jobs are included in the multiplier.

Chart 2 shows the estimated total number of jobs created as the Oshawa BEV assembly plant scales up by year 5. Starting in year 1 with 325 full-time assembly jobs in Scenario 1 and 200 in Scenario 2, the full-time BEV assembly jobs grow to 1,990 and 1,170 respectively in year 5. Salary positions grow from 50 (Scenario 1) and 30 (Scenario 2) to 290 and 170 respectively, and supplier jobs grow from 100 to 600 in Scenario 1, and 160 to 940 in Scenario 2. The multiplier jobs grow from 1,880 (year 1) to 11,370 (year 5) in Scenario 1, and from 1,140 to 6,700 in Scenario 2. In total, Scenario 1 estimates the creation of 13,600 jobs and Scenario 2 forecasts over 8,000 by year 5. This is in direct contrast to the loss of 5,000 full-time assembly-related jobs (including 2,000 parts supplier jobs) and 12,400 multiplier jobs with GM's Oshawa plant closure in December 2019.



GM and Unifor have negotiated an agreement to create 300 jobs in the paint and stamping plant in 2020.<sup>27</sup> It would be ideal to find a way to maintain these jobs as well, by having GM

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contract the new publicly owned enterprise, consistent with the GM-Unifor 2016 collective bargaining agreement that promised a “secure future for all locations”.<sup>28</sup>

### Democratic, Public Ownership

These financial scenarios, for repurposing the GM Oshawa plant from internal combustion engine (ICE) vehicles to battery electric vehicles (BEVs), will require the commitment and investment of various governments, with the federal government taking the lead. Public or state-owned enterprises play an important role in most economies. In 2018, they accounted for over 20 percent of the world's largest enterprises, compared to ten years ago with only one or two public enterprises in the top echelon.<sup>29</sup> In Canada, the federal government owns 45 public enterprises (Crown Corporations) with assets of over \$1 trillion (which grew by 37 percent since 2013-2014), annual revenue of \$92 billion, and annual net income of \$56 billion (2017-2018).<sup>30</sup> The top two public enterprises are the Canada Pension Plan and Public Sector Pension, with 53 percent of the total assets of all federal Crown Corporations. In addition, provincial and municipal governments own hundreds of enterprises, with total assets exceeding the federal crown corporations.<sup>31</sup>

For this preliminary feasibility study, **we consider democratic, public ownership to include governments, auto workers and community members.** The legal structure of the organization can take many forms, including a crown corporation. In any case, the organization will need to use a board matrix to ensure representation from government, auto workers, community members, people with the experience and skills required for the business, and a diverse mix of people (gender and ethnicity).

**Scenario 1** estimates an initial public investment of \$1.7 to \$1.9 billion, and considers the negotiation of a full-scale purchase of the GM Oshawa assembly plant. This preliminary study provides an estimated enterprise value of \$1.3 billion for the Oshawa assembly plant, and \$400 to \$600 million to retool the plant for BEVs. The GM assembly plant includes the land (702 acres or 284 hectares), buildings (about 10 million square feet) and equipment for the auto and truck lines, the body shop, the paint shop, and the auto warehouse and parking lots (for finished vehicle inventory and employee parking). Examples of other large auto assembly plants that have been purchased (or are under negotiation) for electric vehicle production (including some start-up companies):

- In August 2019, Indian auto maker Mahindra (a finalist for the U.S. Postal Service 180,000 BEV contract worth \$6.3 billion USD) signed a “non-binding letter of intent” to buy GM’s former 364-acre Flint Michigan site, that once employed 27,000 assembly workers. The plan calls for a 1.2 million square foot factory, employing up to 2,000 people over the first five years. Mahindra will be looking for government incentives like the ones recently granted to Fiat Chrysler Automobiles: \$223 million to convert an engine plant into a Jeep assembly line (a total investment of \$1.6 billion USD).
- In July 2019, the former CEO of electric light truck maker Workhorse, announced the formation of Lordstown Motors Corporation to purchase the recently closed GM plant in Lordstown, Ohio. This new joint venture with Workhorse plans to repurpose the plant for battery electric commercial pick-ups and possibly the new US Postal Service delivery trucks. The new company is attempting to raise \$300 million (USD) to do so.<sup>32</sup>
- In January 2017, Rivian, a start-up BEV pick-up and SUV builder, announced the purchase of the mothballed 2.4 million square foot Mitsubishi Motors plant (and



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contents) in Normal, Illinois for \$16 million (USD). Rivian received over \$50 million in tax credits from the municipal and state governments, contingent on the company investing \$175 million (USD) in the plant, and meeting employment targets. In February 2019, Amazon announced an investment of \$700 million, and in April 2019, Ford invested \$500 million in Rivian.<sup>33</sup>

- On May 20, 2010, Tesla Motors and Toyota announced a partnership to work on electric vehicle development, which included Tesla's partial purchase (210 of 370 acres) of the former NUMMI GM Toyota joint venture (which had employed 4,700 people) for \$42 million (USD), mainly consisting of the factory building (5.3 million square feet), and paid an additional \$17 million (USD) for equipment. Tesla also bought a Schuler SMG hydraulic stamping press, worth \$50 million, for \$6 million, including shipping costs from Detroit. Tesla started with 850 assembly workers in 2011, growing to 3,000 in 2013, 6,000 in 2016, and 10,000 by 2018. Tesla received \$465 million (USD) in federal government loans, and \$35 million in tax breaks from California.<sup>34</sup>

**Scenario 2** is more modest, with an estimated capital cost in the range of \$1.2 to \$1.4 billion (an estimated enterprise value of \$800 million plus the \$400 to \$600 million required to retool the plant to assemble BEVs). This scenario will require negotiating the purchase of the Oshawa assembly plant (auto and truck lines) and shared use of the body shop, paint shop, and auto warehousing and parking lots.

Neither scenario includes the purchase of GM's Canadian Technology Centre or test track. Instead, ***the new publicly owned organization will build a state-of-the-art Transportation-Environment Center that will employ engineers, technicians and skilled trades people who will research future product needs, build and test prototypes, and help re-invigorate Canada's manufacturing capabilities.***

By paying a good wage to auto workers – this study proposes the existing GM Oshawa tier 1 wage of \$35 per hour for assembly workers – it will be possible to gain the workers' commitment by investing in their jobs through shared-ownership of the new organization. The scenarios in this study will require leadership and mobilization of the workers and the broader community to persuade our governments to try a new model of democratic, public ownership. Governments will need to negotiate alongside the workers and community to gain public ownership of the GM Oshawa plant. The financial forecasts include a start-up investment of \$10,000 from each of the workers combined with community investment for a total of \$37.5 million in Scenario 1, and Scenario 2 estimates \$25 million in investment from workers and the community.

### Environmental Impact

Transportation is the second largest source of greenhouse gas (GHG) emissions in Canada, accounting for a quarter of our total emissions, and almost half of these come from cars and light trucks (including SUVs).<sup>35</sup> In Canada's light vehicle market, four pick-up trucks filled four of the top five sales positions in 2018.<sup>36</sup> The market share for all light trucks sold in Canada was 70 percent in 2018, up from 68.6 percent in 2017.<sup>37</sup> These vehicles have a much higher profit margin for the manufacturers (15 to 20 percent) than cars (3 percent), and are not the types of energy conserving vehicles that need to be produced, given that the average pick-up truck uses 14 litres of fuel per 100 km (17 miles per U.S. gallon),<sup>38</sup> and emits more than 4.71 metric tonnes

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of CO2 per year per vehicle.<sup>39</sup> This is the reason that the Government of Canada recently announced targets for sales of zero-emission vehicles: 10 percent of new light-duty vehicle sales to be zero-emission vehicles by 2025, 30 percent by 2030, and 100 percent by 2040. And in May 2019, the new \$300 million federal purchase incentive program was opened to encourage more Canadians to buy zero-emission vehicles.

The calculation of greenhouse gas (GHG) emission reductions from moving to BEV from ICE cars and light trucks, depends on the efficiency of the gasoline engine, the weight of the vehicle, the distances travelled, and the source of electricity generation. The U.S. Environmental Protection Agency provides calculators for GHG Emissions, including ICE cars and light trucks.<sup>40</sup> Since closing the last coal fired electrical generating station in Ontario in 2014, **over 93 percent of Ontario's electricity generated comes from non-greenhouse gas emitting resources** (nuclear, hydro, wind and solar).<sup>41</sup> The GHG emission reductions in this study are substantial, growing from a 35,000 metric tonne CO2 reduction in year 2 (the first full year of BEV operation), with compounding growth each year to a total of 400,000 metric tonnes by the end of year 5.

### Conclusion

This preliminary feasibility study uses a triple bottom line approach to evaluate whether the GM Oshawa assembly plant could be repurposed to manufacture BEVs and other potential products that will help Canadians meet their needs while also decreasing greenhouse gas emissions.

The study began with a financial analysis of how the Oshawa assembly plant could be used to manufacture BEVs for government procurement to help the federal, provincial and municipal government vehicle fleets meet their climate change commitments. From a financial point of view, using original equipment manufacturing (OEM) benchmarks, the study shows that the new operation could reach a financial break-even by year 4 and make a small profit by year five. This would require an estimated capital investment of \$1.2 to \$1.9 billion by governments to purchase the Oshawa plant and retool it for BEVs.

From a social point of view, rather than accepting the loss of over 5,000 assembly-related jobs at GM Oshawa, and an additional 10,000 multiplier jobs, this study shows that public investment and procurement can kick-start the new BEV assembly plant to create an estimated 2,300 to 2,900 manufacturing-related jobs and an additional 5,700 to 10,700 multiplier jobs, for a total of eight to thirteen thousand jobs by year 5.

Regarding the environmental impact of the shift to battery electric vehicles from internal combustion engines, greenhouse gas emissions are estimated to decrease in a compounding manner from 35,000 metric tonnes of CO2 after the first year on the road, to an estimated total of 400,000 metric tonnes by the end of year 5.

A number of GM Oshawa workers were interviewed regarding their point of view on repurposing the assembly plant to manufacture battery electric vehicles. They agreed that the plant has the equipment and layout required for assembling BEVs, and in the words of one worker: "There's no doubt in my mind that we can do this . . . that in 2019 we can build anything we like if there was the money or will behind it." And given the climate crisis, another worker commented: "This is a perfect opportunity to say this idle plant can now be used for the new technology, electric vehicles, solar panels, wind turbines, and other products."

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### **3.0 Canada's Auto Manufacturing Industry**

#### **Historical Context**

The evolution of the Canadian auto industry cannot be understood through the lens of “market forces” alone, or even primarily. The Canadian government has played a decisive role in the rise (and fall) of the industry. After the Second World War, automakers in Canada could never have survived in direct competition with a U.S. industry that had developed earlier, enjoyed a major advantage in access to capital, and had a much larger consumer market.

The Canadian government's chosen historical instrument for supporting domestic auto manufacturing was tariff protection. If companies wanted to sell in Canada, they would need to build facilities in Canada and thereby “jump” the tariff wall. An added incentive in the inter-war years was the ability of U.S. auto companies to use their Canadian base for duty-free export to the British Commonwealth.

The Canadian auto industry consequently developed as a series of branch plants of the U.S. industry with a small number of Canadian, American, and European auto component plants. There was significant auto industry growth in the post World War Two economic and baby boom, but by the late 1950s a number of problems required a response. For one, the industry was highly concentrated in Ontario and this meant that while other regions experienced the tariff-induced higher vehicle prices, they didn't share in the production benefits. Complaints from other provinces festered regarding the costs of protecting Ontario's auto manufacturing capacity.

More importantly, the tariffs did not solve the trade deficit problem. Canadians still imported large numbers of models not assembled in Canada, and while the number of vehicles assembled in Canada increased dramatically, key components were imported from the U.S. (a concession Canada made to encourage more assembly plants). The result was an accelerating trade deficit in the motor vehicle sector that overwhelmed Canada's surplus in raw materials. By the mid-60s, it was clear that this was unsustainable.

#### **The Auto Pact**

With growing competition from Europe and Japan, the U.S. auto majors sought more flexibility in “rationalizing” their fragmented North American operations. The outcome was an innovative Canada-U.S. agreement (popularly known as the “Auto Pact”) that promised lower car prices, a more efficient industry, and more jobs. Its essence was to combine the two-way duty-free flow of vehicles and components that the companies (and consumers) wanted with investment and job guarantees to offset Canada's branch-plant vulnerability. In particular, to escape having to pay tariffs on the back and forth flow of vehicles and parts across the U.S.-Canada border, each of the U.S.-based auto majors had to assemble vehicles in Canada with an overall value at least as great as the value of their sales in Canada.

The result was deeper regional integration of the industry, economies of scale in Canadian plants (which were subsequently reconfigured to export most of their production to the U.S.), modest reductions in car prices, a dramatic increase in Canadian auto investment, an easing of the auto trade deficit with the U.S., and an increase in Canadian jobs. By 1974, auto industry employment was almost 50 percent higher than it was in 1964, the year before the Auto Pact.

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Two key aspects of the Auto Pact were the 1:1 production-to-sales ratio and Canadian Value-Added requirements.<sup>42</sup> In 1965, Canada exported just 48,000 vehicles to the United States, representing six percent of Canadian production, while the U.S. exported around 64,000 vehicles to Canada, a mere 0.6 percent of U.S. production of North American vehicles. A decade later, in 1975, Canada exported 849,000 vehicles to the U.S., representing 59 percent of Canadian production, while the U.S. exported 698,000 vehicles to Canada, or 8 percent of U.S. production.<sup>43</sup> By 1975, the industry directly supported more than 100,000 Canadian middle-income manufacturing jobs, and by 1977, Canadian value added in vehicles and parts was five times greater than in 1964.<sup>44</sup>

### **The Oil Crisis and Globalization**

After the oil crisis in the early 1970s, the focus shifted from the auto trade deficit with the U.S. to the deficit with Asia, particularly Japan. The neoliberal counter-revolution that began at the end of the 1970s with Margaret Thatcher and Ronald Regan, with its bias for regulating competition through global markets rather than through state intervention, included the steady expansion of “free trade” and the gradual erosion of the special protections Canadian workers and communities had benefited from within the North American industry. Though the Japanese companies did, under threat of protectionism, eventually bring some production to Canada, employment in auto manufacturing peaked in the 1990s, declined significantly in the early years of the millennium, and fell at an accelerating rate after the Financial Crisis of 2008-2009.

The 1989 Canada-U.S. Free Trade Agreement (FTA) was the beginning of the end for the Auto Pact’s Canadian safeguards, and in 1994 Canada implemented the global rules of the World Trade Organization (WTO) Uruguay Round, which provided the basis for ending the Auto Pact. Both Japan and the European Union contended that key features of the Auto Pact were inconsistent with global trade rules, and they won this argument before the WTO’s dispute settlement panels. On February 19, 2001, Canada officially ended the Auto Pact.<sup>45</sup>

### **2008-2009 Financial Crisis**

In 2008, a series of events drove the Big Three North American automakers to the verge of bankruptcy: Rising gas prices, decreased demand for their larger vehicles (SUVs and pick-ups), and the global financial collapse. GM Canada received \$10.8 billion in a bailout from the Canadian and Ontario governments. While \$8 billion was paid back, the remaining \$2.8 billion now represents a loss for taxpayers. The U.S. government provided the auto sector with \$49.5 billion (USD) and was only repaid \$38.3 billion, for a loss of \$11.2 billion for taxpayers.<sup>46</sup>

Canada’s automotive industry is mostly made up of assembly plants that are owned and operated by foreign automakers (USA and Japan), along with hundreds of manufacturers of automotive parts and systems (including larger companies like Magna, Linmar and Martinrea). Over the course of the 1980s and 1990s, the market and production share of Detroit’s Big Three in Canada diminished as the Japanese automakers made significant gains and opened manufacturing facilities in Ontario. Even with these new entrants, the number of workers in the industry peaked at 172,000 at the turn of the millennium, and has steadily dropped (by 27 percent) to today’s number of 125,000.<sup>47</sup>

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### Trade and Investment Protection Agreements

“Existing free trade and investment agreements not only increase inequalities but also contribute to the carbon emissions that increasingly threaten the wellbeing of our planet.” (Ethan Earle and Andreas Günther, Beyond NAFTA 2.0, July 2019).<sup>48</sup>

Trade agreements as currently negotiated, provide tariff treaties and investor protection rules to encourage the free movement of capital to support global supply chains. They weaken the rights of workers, including their ability to form unions and bargain collectively. And, they discourage democratically-elected governments to create economic and green development strategies. The negotiations are so secretive and corporate-dominated, that they virtually guarantee investor-friendly outcomes.

In a recently published document – that was incubated at a 2017 conference that brought together trade unionists, labor activists, environmentalists, farming groups, trade experts, and allies from across Mexico, Canada, and the US – the following overarching principles were outlined for trade agreements that meet the needs of people and the planet:<sup>49</sup>

1. Human rights in the broadest sense, including economic, social, cultural and environmental rights, must have primacy over corporate and investor rights, and there needs to be legally binding obligations on transnational corporations.
2. Democratic governments must have the policy space to pursue and prioritize local and national economic development, good jobs for their citizens, and the preservation, promotion and restoration of public services.
3. Citizens, communities, and the environment have the right to protection through public interest regulations.
4. A climate-friendly approach should be adopted whenever pursuing trade and investment, which can no longer be allowed to outpace the carrying capacity of the planet.

In the place of investor protection agreements, we need to negotiate fair trade agreements that are equitable in the distribution of benefits, favour democratic institutions over corporate power, are respectful of the Earth’s limits, and supportive of the development needs of poorer countries.

Jim Stanford, an economist at Unifor for over two decades, provides this overview of the Canadian auto industry and free trade agreements:

*There is no inherently “Canadian” character to our automotive industry; whatever models are assigned to Canadian plants, and the destination for their final sale, are determined fully by the profit-maximizing decisions of the global OEMs who manufacture here. European and Asian OEMs have been encouraged to maintain strong production footprints in their home countries, even for export-destined output, by a range of economic and policy levers (including export promotion, non-tariff limits on imports, currency depreciation, government equity shares, and political suasion). Although there are four million more vehicles being built in North America today than when NAFTA was signed, two thirds of the added production went to Mexico, one-third to the U.S., and Canada has seen no growth.<sup>50</sup>*

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### The Current Situation

The May 8, 2019 announcement that 300 out of 5,000 assembly-related jobs would be salvaged at General Motors' (GM) sprawling Oshawa auto assembly plant will mean that 90 percent of the site's 10 million square feet of buildings will stand empty at the end of 2019. When this massive auto plant was operating at full capacity (in the mid-1980s), GM Oshawa employed 23,000 people.

A number of factors have come together to exacerbate the Canadian auto industry's vulnerability:

1. Relatively slow growth of the "mature" automobile market in North America.
2. Rapid productivity growth with automation/robotics replacing workers.
3. The corporate shift in supply chains to low-wage jurisdictions like Mexico and China.
4. The imminence of driverless cars will likely mean more vehicle sharing and fewer vehicles produced.
5. The requirement of moving from a fossil fuel energy economy and internal combustion engines to electric vehicles that use renewable energy.
6. The U.S. auto corporations will continue to attempt to maximize their profits by shifting their production to China and Mexico.

### 4.0 Triple Bottom Line Analysis and Methodology

Triple bottom line analysis has been applied in thousands of business cases since the introduction of the concept by John Elkington in 1994.<sup>51</sup> This preliminary feasibility study answers the following question: ***Can the extremely underutilized GM Oshawa facility be converted to economically, socially and environmentally useful production?***

This is not a traditional feasibility study that only considers the financial return on investment and whether such an operation can match the global market competition from China, Mexico, South Korea or the United States. Rather, it is based on a triple bottom line evaluation, including:

1. An economic analysis of current and emerging market needs, capital investment required, skills and equipment available at the GM facility and in the community, and the potential new products that could be manufactured.
2. Social needs in the Oshawa community for well-paid, dignified work that builds on the city's hundred-year tradition of auto assembly.
3. How production at the plant can address the defining issue of our times, climate catastrophe, and identify ways to build Canada's productive capacity to manufacture the products we will need in the future.

***Five preliminary feasibility criteria*** framed the research and are evaluated in the study:

1. The potential number of well-paid manufacturing-related jobs (of the 5,000 that are being lost) and multiplier jobs (over 10,000 that are being lost) that could be retained in Ontario.
2. The potential for converting fossil-fuel internal combustion engine (ICE) vehicles to electric vehicles (zero emission), and the resulting decrease in greenhouse gas emissions.

## Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth

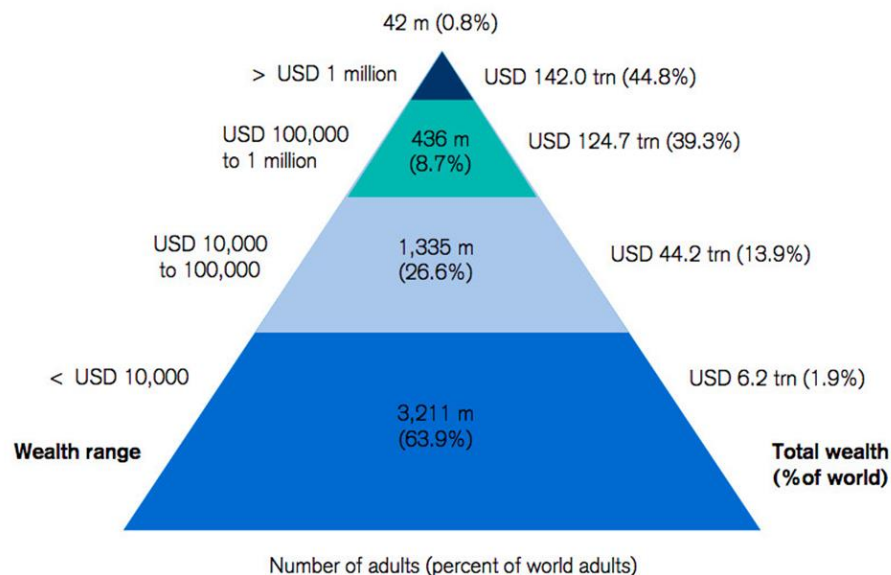
3. The potential for some form of democratic, public ownership of the triple-bottom line production at the Oshawa plant.
4. How the GM Oshawa example can be used to inspire the conversion of other Canadian-based manufacturing facilities to triple-bottom line production.
5. The important role that governments need to play in creating policies that are supportive of triple bottom line economic development as a way to harness the collective entrepreneurship of industry, workers and communities.

### 4.1 Economic Situation

#### Growing Economic Inequality

Economic inequality has been on the rise across the globe since the 1970s. Some countries have reduced the numbers of people living in extreme poverty, but inequality has continued to grow as the richest individuals amass unprecedented levels of wealth. “Among industrial nations, the United States is by far the most top-heavy, with much greater shares of national wealth and income going to the richest 1 percent than any other country.”<sup>52</sup>

**Figure 1: The global wealth pyramid 2018**



Source: James Davies, Rodrigo Lluberas and Anthony Shorrocks, Credit Suisse Global Wealth Databook 2018

Figure 1 shows the Credit Suisse global wealth pyramid for 2018. Less than one percent of the world’s population (42 million people) controls 45 percent of the world’s wealth. And, the 2,208 billionaires in the world control more wealth than 3.7 billion people, about half the world’s population.<sup>53</sup>

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Figure 2 shows the share of total income that the top one percent received from 1900 to 2014 in some of the wealthiest countries in the world.<sup>54</sup>

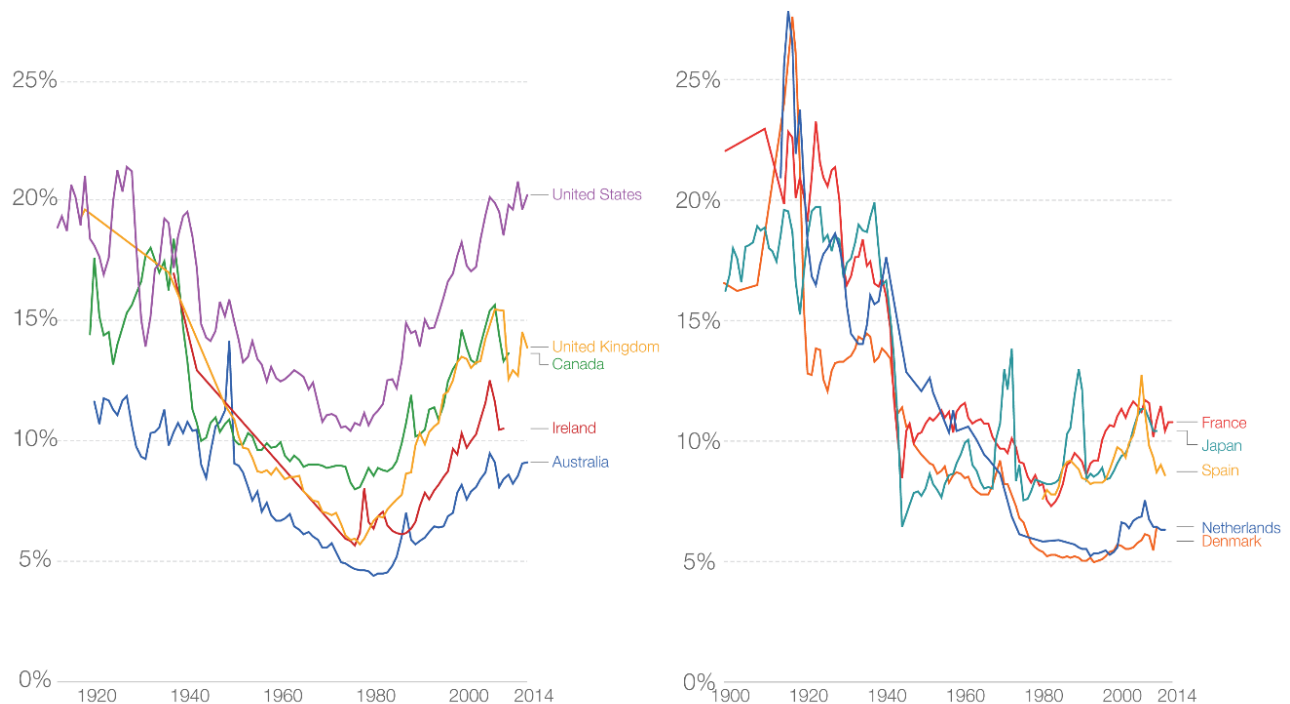
### Figure 2: Top 1% Share of Income Since 1900

Our World  
in Data

## Share of Total Income going to the Top 1% since 1900

The evolution of inequality in English speaking countries followed a U-shape

The evolution of inequality in continental Europe and Japan followed an L-shape



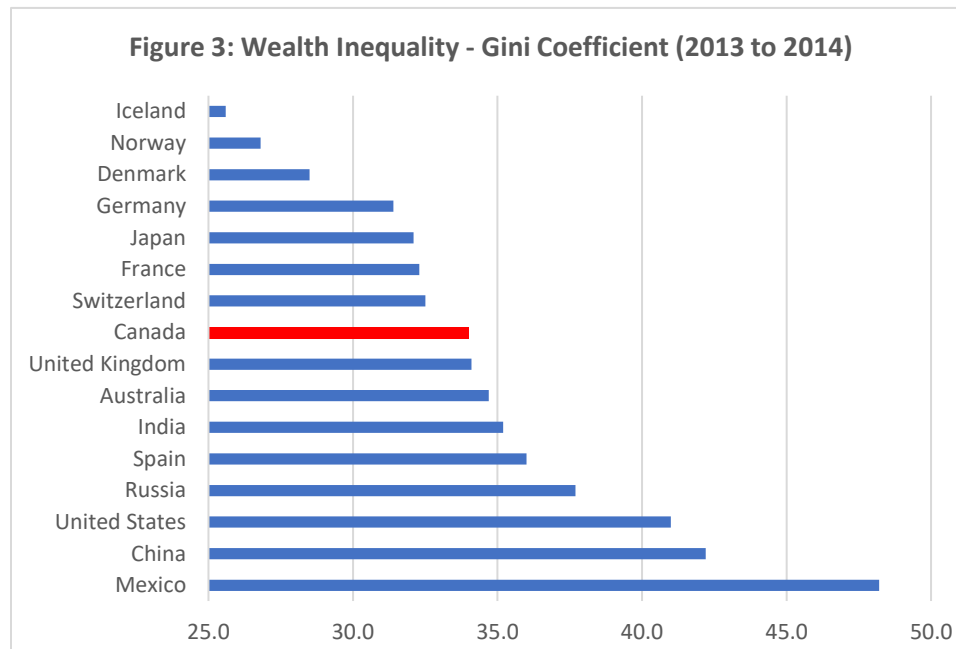
Data source: World Wealth and Income Database (2018). This is income before taxes and transfers. This data visualisation is available at [OurWorldinData.org](http://OurWorldinData.org). There you find the raw data and more visualisations on inequality and how the world is changing. Licensed under CC-BY-SA by the author Max Roser.

The top one percent in the United States have doubled their share of income since Ronald Regan introduced “supply-side” economics in the 1980s, regaining the position they held before the Great Depression in the 1930s. In Canada, the top one percent follow a similar U-shaped curve, but it is not as pronounced (15 percent of annual income versus 20 percent in the USA). The countries shown in the graph on the right-hand side have a L-shaped curve, showing the impact of political decisions such as higher progressive income and inheritance taxes that fund social programs.

The World Bank uses the Gini coefficient to measure income inequality. The higher the number (up to 100), the more economic inequality. Figure 3 shows the Gini coefficient for a selection of countries.<sup>55</sup> Canada is in the middle of the pack with a Gini of 34.0, compared to the United States’ 41.0, or Iceland with the lowest inequality in the world at 25.6. In 1989 (the second year of the USA-Canada Free Trade Agreement), Canada’s Gini was 28.0, and it has continued to climb since then.



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Canada's auto industry has wages that are significantly higher than the overall average in the Canadian labour market,<sup>56</sup> because of high productivity and collective bargaining. Historically, this has helped employees in other manufacturing industries negotiate fairer wages. However, "the Canadian auto industry peaked in 1999, when it assembled a record of over 3 million vehicles, and ranked as the 4th largest auto producer in the world. Since then the Canadian industry lost about one-third of its footprint (and shed about 50,000 jobs in assembly and parts production)."<sup>57</sup>

In 2012, the Canadian Auto Workers (CAW, the precursor to Unifor) made a significant concession to the "Detroit Three" automakers. A two-tier wage structure was negotiated "which held wages steady for existing workers but cut the pay and pension benefits for new hires."<sup>58</sup> The net result is growing inequality, with lower wages and pensions for autoworkers, higher compensation to corporate executives, and greater dividends to stockholders.<sup>59</sup>

### Global Economic Outlook

The United Nations is expecting global economic growth to weaken, mostly because of trade tensions between the two largest economies, the United States and China.<sup>60</sup> "Following an expansion of 3 percent in 2018, world gross product growth is now projected to moderate to 2.7 percent in 2019 and 2.9 per cent in 2020, reflecting a downward revision from the forecasts released in January." The accelerated effects of climate change are also viewed as a significant downside risk on the world economy and development progress.<sup>61</sup>

The escalating trade tensions between the U.S and China are a major risk for the North American automotive industry. According to UBS's Global Wealth Management Chief Investment Officer Mark Haelele, the latest conflict raises the possibility that "tariffs could also be placed on auto imports."<sup>62</sup>

## **Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth**

A number of economic and political forces over the past number of years have decreased capital investment in Canada, including:

- plunging oil prices (particularly for bitumen)
- new U.S. tariffs on Canadian lumber imports;
- the overhaul of the North American Free Trade Agreement;
- border levies on steel and aluminum;
- the threat of tariffs on automobiles and uranium.<sup>63</sup>

Business investors do not like uncertainty, and Donald Trump's unpredictable trade policy has coincided with a surge in publicly traded companies using profits to buy back their own shares.<sup>64</sup> "I understand the need to make sure there's not unfair trade practices, and I would support that, but we need stability because we invest billions of dollars," Don Walker, CEO of Ontario-based Magna International, North America's largest auto parts supplier, said at an event in Washington in June (2019). "Those are long-term assets, we need to know we're going to get a return on them." Walker emphasized that Magna spends far more money in the United States than it does in Canada.<sup>65</sup>

Since the global financial collapse in 2008 and 2009, the capitalist economic system has produced wage stagnation, more precarious work, increasing inequality, growing political instability, and the impending climate crisis. People are recognizing that a new kind of economy is needed: fairer, more inclusive, less exploitative, and less destructive of society and the planet.

Michael Jacobs, a former U.K. prime ministerial adviser to Gordon Brown, put it this way: "The voters have revolted against neoliberalism. The international economic institutions – the World Bank, the International Monetary Fund – are recognising its downsides." Meanwhile, the 2008 financial crisis and the previously unthinkable government interventions that halted it have discredited two central neoliberal orthodoxies: that capitalist economies cannot fail, and that governments cannot step in to change how the economy works.<sup>66</sup>

Given GM's recent decision to effectively close its Oshawa assembly plant, while investing billions in other jurisdictions with lower wages and less stringent environmental standards, there is good reason for governments in Canada to take a leadership role to ensure Canada maintains and grows its manufacturing capacity to meet our future challenges. Simply allowing large corporations to abandon viable manufacturing facilities and communities in search of higher profits, particularly after having been saved from bankruptcy by taxpayers' dollars is not an adequate response on behalf of Canadians.

### **Canada and Ontario**

Canada's Parliamentary Budget Office (PBO) projects growth in the Canadian economy to slow to 1.6 per cent in 2019 (from 1.8 per cent in 2018). They project that quarterly real GDP growth will recover through 2020 as investment and exports recover. Economic growth is then projected to slow to 1.7 per cent in 2021 and 1.6 per cent in 2022. Basically, PBO's economic forecasts reflect the view that possible upside and downside outcomes are equally likely. The most important downside risk is weaker exports due to increased protectionism (i.e. the trade wars between the U.S. and China), and the most important upside risk is stronger consumer spending financed by increased debt.<sup>67</sup>

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Ontario has 39 percent (14.5 million people) of Canada's population and has a ten-year average annual growth rate of 1.1 percent, with an annual GDP of \$854 billion (2018). Eighty percent of its exports go to the United States (and 54 percent of imports originate in the USA), and motor vehicles and parts are the number one export, representing 33 percent.<sup>68</sup> The labour force is well educated and productive, and while the official unemployment rate is 5.7 percent (Statistics Canada, August 2019), **approximately 22 percent of jobs are precarious**: low wages, no pension, no union and/or small firm size.<sup>69</sup>

Ontario has launched a \$40 million, three-year strategy to help keep auto industry jobs in the province. Unifor has dismissed the strategy as a repackaging of existing government programs. A government document on the strategy stated that Ontario auto assembly plants account for 13 percent of vehicle production in North America, but the province has only received 6 percent of new investment since 2009. The auto sector represents 18.4 percent of Ontario's manufacturing economy, and 85 per cent of vehicles and parts are exported.<sup>70</sup>

In addition to the 5,000 assembly-related jobs that will be lost with the closure of the GM Oshawa plant, the impact on Ontario GDP and broader economy is significant. The closure of the assembly plant is estimated to reduce GDP and employment in Ontario over the coming decade, with GDP declining by about \$4 billion per year to 2030, and with 14,000 fewer jobs (each year) by 2025.<sup>71</sup> Ontario and federal government revenues are also expected to decline by \$500 million a year for both levels of government to 2030.<sup>72</sup>

### The City of Oshawa and GM Workers

The City of Oshawa, with a population of almost 160,000, grew by 6.6 percent between the 2011 and 2016 Census, faster than the Ontario average of 4.6 percent. Oshawa is the largest city in Durham Region and is 60 km from Toronto's Downtown core.<sup>73</sup> The city had a "Sector Analysis and Cluster Development Strategy"<sup>74</sup> completed in 2013 that needs updating; however, **the strengths of advanced manufacturing (for example, electric vehicles and mobility devices), sustainable energy, and information technology could be combined into a state-of-the-art Transportation-Environment Center that could employ engineers, technicians and skilled trades people who would research future product needs, build and test prototypes, and help re-invigorate Canada's manufacturing capabilities.**

To gain the perspective of GM Oshawa assembly plant workers, four semi-structured qualitative interviews were completed, including: a skilled trade retiree, a young GM worker, a worker with a supplier plant, and a skilled trade worker. **A consistent concern expressed by these workers was the climate crisis and the need to take action at all levels to address it.** In this regard, they support converting the Oshawa plant to BEV production, and expressed their pride in the Oshawa assembly plant that "was consistently at the top of all North American plants for quality and productivity, at around 32 hours of labour per vehicle."

**The assembly workers agreed that the GM plant has the equipment and layout required for BEV assembly, and the changeover could be achieved by building a team of engineers, millwrights, electricians and other skilled trades to design and build the assembly lines.** In other words, changing the plant for BEV production is feasible. In the words of one respondent: "These guys can make anything work. There's no doubt in my mind that we can do this. I am

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fairly certain that in 2019 we can build anything we like if there was the money or will behind it.”

The Oshawa assembly plant could be altered to accommodate three or more assembly lines to produce different BEVs. One worker noted that only a portion of the plant would be needed to produce Canada Post BEVs or hydro vehicles:

*Unless it's full production, only part of the plant would be required for the numbers that we're looking at for the post office vehicles, or maybe hydro vehicles. But, having said that, I think the other part of the plant can be used for other things: solar panels, wind turbines, etc. In line with the climate crisis that we have, this is a perfect opportunity to say this idle plant can now be used for the new technology, or the electric vehicles. We put batteries in hybrid vehicles now . . . the actual changeover can be done in a few months.*

**The other workers agreed that changing the existing lines could be carried out in about three to six months.** GM Oshawa produces hybrid vehicles, so it already has some of the skill sets and equipment to produce BEVs, and full use of the plant would potentially require thinking beyond automotive production. Oshawa is seen as being the most appropriate site for BEV production and would foster spin-off industries. Indeed, Oshawa already has a centre that can provide the environmental engineering research that could support retooling the Oshawa plant.

While the workers agreed that additional funding from the federal and provincial governments would be essential to purchase the plant, they also referred to the bailout provided to GM in the wake of the 2008 economic crisis:

*Who says that we've got to purchase the building? Why don't we just say that the building's been paid for with the government handouts, with the profits that the corporation has made on the backs of the workers? ... really, it should belong to the country ... to Ontario ... to the workers. Why should GM be allowed to continue to own that property?”*

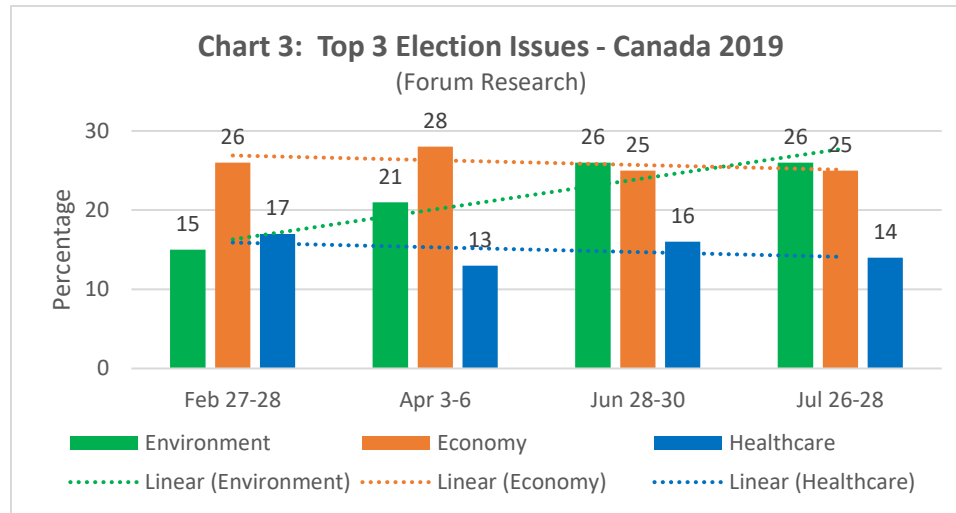
### 4.2 Socio-political Situation

#### The Environment

The environment is on international and national political agendas in a way it has never been. Central to the new discourse is a “Green New Deal” (GND), inspired by American President Franklin D Roosevelt’s call in the mid 1930s for major investments in a “New Deal” and in social programs to create jobs, diminish insecurity and advance equality. Since addressing the environment will mean phasing out certain sectors of the economy, in the name of both fairness and getting affected workers on side, the GND emphasizes its support for a “Just Transition”.

In Canada, there is growing popular support for addressing environmental issues (particularly the climate crisis), and a series of recent polls (*Forum Research*, August 2, 2019) shows the momentum.<sup>75</sup> Chart 3 provides a summary of the Forum Research polls, starting in February with 15 percent voter support for the environment as a leading election issue, growing to 21 percent in April, 26 percent in June, and remaining steady in July. The economy is the other top election issue. Voters in British Columbia (33%), Ontario (28%) and Quebec (28%) rate the environment higher than the economy. Another recent poll found that 65 percent of Canadians feel that “Canada is not doing enough to fight climate change, and only 4 percent say they were not willing to make changes in their daily lives to help prevent climate change (and 20 percent would by an electric car).”<sup>76</sup>

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And, there is also skepticism, especially in regard to the promise of a “just transition”, among working people. Workers know that the economic restructuring they face is carried out by global corporations competing with each other for private profits. This is not the kind of planning that will deliver on any transition being either effective or just. It will take political will and public investment to convince voters that a Green New Deal and a Just Transition are more than abstract slogans.

### Canada’s Green New Deal

On May 6, 2019, the same day the federal government released an update on the impact of climate change in Canada (temperatures rising at twice the global average), “The Pact for a Green New Deal” was launched across the country. This non-partisan coalition is calling for a move away from fossil fuels and cutting emissions in half by 2030, while protecting jobs. “The Green New Deal is essentially a road map to shift the Canadian economy to address issues like economic inequality, green transportation and job creation.”<sup>77</sup>

Canada’s Green New Deal has been endorsed by 100 signatories, including the largest unions, youth leaders, Indigenous groups, environmental economists and 50 prominent Canadians, including K.D. Lang, Rufus Wainwright, Dr. David Suzuki, Cobie Smulders, and Neil Young.<sup>78</sup>

The formal “Pact for a Green New Deal” demands we:

- cut GHG emissions in half by 2030,
- protect critical cultural and biological diversity,
- create a million jobs, and
- respect the constitutionally enshrined and internationally recognized rights of Indigenous peoples.

This grassroots group calls on all federal political parties, in the lead up to the October election, to put versions of the Green New Deal that meet these goals in their election platforms. An April 2019 poll by Abacus Data shows a clear majority of Canadians (61%) support the idea of a Green New Deal,<sup>79</sup> and this is reinforced by an August 2019 Research Co. poll that found that:<sup>80</sup>

- 62 percent of Canadians think the economy should shift away from oil and gas, and

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- 60 percent also believe “global warming is a fact and is mostly caused by emissions from vehicles and industrial facilities.”

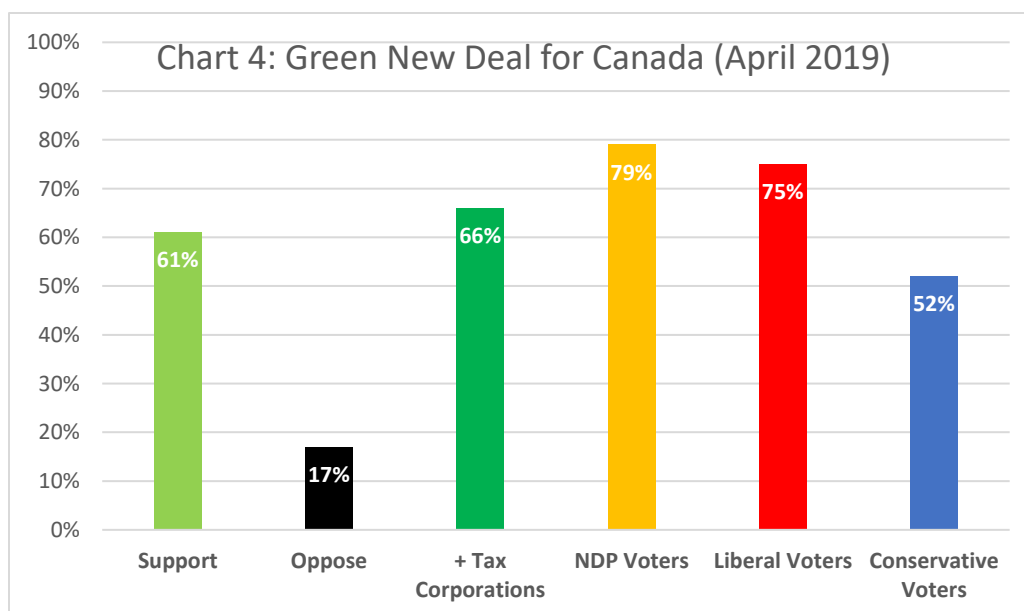
Since their launch in May 2019, The Pact for a Green New Deal has organized and held more than 150 town hall events across Canada. So far, the town halls have attracted more than seven thousand participants, each “representing environmental groups, labour unions, faith groups, political parties, city councils, community and neighbourhood associations, Indigenous organizations, women’s organizations, the Fight for \$15 and Fairness, student unions, and local media.”<sup>81</sup>

At each town hall, organizers asked participants to share “their red lines and green lines”: The things that should not be in Canada’s Green New Deal, and the things that people need in a Green New Deal in order to support it. Among the main red lines, “putting a stop to the industries, institutions, and practices that endanger our future and accelerate environmental destruction,” beginning with the fossil fuel and plastics industries. Core green lines include a shift to 100 percent renewable energy no later than 2040, an immediate end to fossil fuel subsidies, and a freeze on new fossil fuel extraction and transportation projects.<sup>82</sup>

In April 2019, an Abacus Data poll posed this question to two thousand Canadians:

*To address climate change, some politicians and economists have proposed a Green New Deal: A massive government jobs program and investment in clean energy, green technology, and electrification. The Green New Deal would aim to move Canada to 100% clean energy by 2030 and make it so Canada produces and consumes the same amount of carbon emissions by 2050. Based on this information, what do you think about the government developing a plan to implement a Green New Deal?*

Chart 4 shows the results. A majority (61%) of Canadians support the Green New Deal for Canada, and only 17 percent oppose it. **When people were asked if they would support the plan if it required corporations and the wealthy to pay higher taxes, their support increased to 66 percent.**



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Unfortunately, the Ontario government is moving in the opposite direction, as shown by these examples of cuts they made in their first year of office:<sup>83</sup>

- Cancelled the cap and trade program.
- Ended the electric and hydrogen vehicle incentive program.
- Cut more than 700 green/renewable energy projects.
- Removed electric vehicle chargers from GO station parking lots.

In contrast, Japan's automotive strategy utilizes a co-operative approach across industrial stakeholders, and has a target to reduce greenhouse gas (GHG) emissions from vehicles produced by domestic automakers by 80 percent (90 percent for passenger vehicles) – including exported vehicles – to be achieved by 2050 with a combination of hybrid electric vehicles (HEVs), BEVs, plug-in hybrid electric vehicles (PHEVs), and fuel cell electric vehicles (FCEVs).<sup>84</sup>

The government of Canada has outlined a vision for future electric vehicle uptake accompanied by a zero-emissions vehicles (ZEVs) mandate in Quebec (similar to one in California), and British Columbia announced legislation for the most stringent ZEV mandate worldwide: 30 percent ZEV sales by 2030 and 100 percent by 2040. This places British Columbia in a similar framework as the ten states in the United States that have implemented a ZEV mandate.<sup>85</sup>

### Green Jobs Oshawa

*Green Jobs Oshawa* is a group of GM workers facing the closure of the city's massive GM facility, workers from affected supplier plants, GM retirees and community supporters. Their argument is straightforward:

1. If GM doesn't want the facility, the municipality and other levels of government should place it under democratic public ownership and convert it to useful production.
2. Since everything about how we live, produce and travel will have to be converted to prevent environmental catastrophe, this provides an obvious focus for the plant, with electric vehicles being the most obvious place to start at GM Oshawa.
3. The capacity to address such needs clearly exists:
  - With moderate modifications, the facility's body shop, paint shop, and assembly lines can produce electric vehicles.
  - Nearby suppliers have the flexibility to meet the demands for parts.
  - Workers in the community have the needed skills (Oshawa-built vehicles have regularly stood at or near the top in global rankings of vehicle quality).
  - Further technical capacities exist in Ontario's tool and die sector, among Canadian battery makers, the engineering capacities in aerospace and mass transit, and in Canada's high-tech sector.
4. More ambitiously, the creation of an environmental-transportation research center in Oshawa could hire hundreds of engineers to support the Oshawa facility, as well as other future manufacturing ventures across Canada.

For this to happen, governments will have to be actively involved. Not just to place the Oshawa facility under democratic public ownership (which will address national needs in a way that is responsive to the local community and the workers producing the products), but also to provide the financial resources, technical support, and above all, creating the political context to make such a venture successful. The latter includes accelerating environmental standards to stimulate demand for the products (like B.C. and Quebec) and using the procurement powers of the

## Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth

federal, provincial, and municipal governments and institutions to buy the products (for example, post-office vehicles, hydro vehicles, ambulances, shuttle buses, construction and mining equipment).

The prime question, therefore, is a political one. How to gain governments' commitment to realizing this common sense alternative, combining the environment imperative to address the climate crisis, while also maintaining and developing the capacity to produce what we need economically and socially (including a skilled workforce in well-paid jobs).

A basic barrier will be the question of whether we can afford such a venture. This is a rather obtuse question since a generation of young people – our sons, daughters, and grandchildren – *know* that moving in such a direction is absolutely necessary. They, and many of us, are understandably frustrated with statements like “we don't have the money” when the money was so readily found in 2009 to bail out GM and write off some \$3 billion of what it owed the Canadian and Ontario governments (with Chrysler as well recently being forgiven \$445 million in past loans from Ontario). Public ownership of the Oshawa assembly plant provides an opportunity to at least test and experiment with what is possible in creating a better future.

### 4.3 Environmental Situation

#### The Anthropocene

The term “Anthropocene” was first used in the year 2000 by Nobel laureate Paul Crutzen.<sup>86</sup> Along with his colleagues, Mario Molina and Sherwood Rowland, they won the 1995 Nobel for proving that the ozone layer, which shields the planet from ultraviolet light, was thinning at the poles because of rising concentrations of manmade chlorofluorocarbon (CFC) gases, that were commonly used in aerosol sprays and as coolants in refrigerators.<sup>87</sup>

Since 2002, the Geological Society has been considering whether “The Anthropocene” should be used as the scientific term to denote the end of the Holocene (the past 11,700 years, since the last ice age receded), and the beginning of this new geological epoch, in which human beings have the most significant impact on the earth. To determine whether it is a new geological epoch, the Geological Society needs to determine the beginning of the Anthropocene, and they are now considering the 1950s, “when the collective actions of humans suddenly began to put much more strain on the natural world than ever before.”<sup>88</sup>

Near the beginning of the Holocene, with the invention of agriculture, gathering and hunting societies began to give way. And after thousands of years of relatively stable global temperatures, sea level, and atmospheric carbon dioxide, things began to change dramatically. During the Holocene, the amount of carbon dioxide (CO<sub>2</sub>) in the air, measured in parts per million (ppm), was between 260 and 280. Since 1958 (the first year CO<sub>2</sub> measurements were made at Hawaii's Scripps Oceanographic Institute) carbon dioxide has increased from 315 to 415 ppm (May 2019).<sup>89</sup> Climate scientists consider 350 ppm of carbon dioxide as a safe level, required to maintain a relatively stable climate ([www.350.org](http://www.350.org)).

The increased concentration of carbon dioxide in the atmosphere, caused by burning fossil fuels (87 percent of CO<sub>2</sub> emissions) and widespread deforestation (9 percent of CO<sub>2</sub> emissions),<sup>90</sup> has had a direct impact on average global temperature: growing from the twentieth century



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average of 13.9°C to 14.7°C, a 0.84°C increase (6 percent).<sup>91</sup> The most recent report from the United Nations' International Panel on Climate Change (IPCC, October 2018 )<sup>92</sup>, estimates that “global warming is likely to reach 1.5°C between 2030 and 2052, if it continues to increase at the current rate (0.2°C per decade).”

### The Paris Agreement

If human-caused global warming can be held to a 1.5°C increase (the aspirational goal of the 2015 Paris Agreement), the impacts of climate change will be less harsh. However, **if we continue with business as usual, we are expected to reach 3°C to 5°C above pre-industrial global average temperature,<sup>93</sup> and the impacts will be catastrophic.** Table 1 shows the projected impacts from the Paris Agreement’s aspirational increase in temperature of 1.5°C, compared to a 2°C increase (a further increase in global temperature would have even greater impacts).<sup>94</sup>

<b>Table 1: Expected Climate Change Impacts</b>	<b>+1.5°C</b>	<b>+2°C</b>
Sea level rise by 2100	48 cm (19")	56 cm (23")
Increase in ocean acidity by 2050	17%	29%
Increased frequency of warm extremes over land	129%	343%
Increased frequency of rainfall extremes over land	17%	36%
Population exposed to water scarcity	271 m	388 m
Population exposed to severe drought	132.5 m	194.5 m
Average drought length (months) N.A.	+1	+1
Average crop yield change by 2100:		
Corn	-6%	-9%
Wheat	-5%	-4%
Global per capita GDP in 2100	-8%	-13%
Annual flood damage losses from sea level rise	\$10.2 tn	\$11.7 tn

Sea level rise is expected to be in the range of two to three feet (with a 3°C increase), which means that many large (and small) coastal cities would be permanently flooded, including Miami, Houston, New York, Boston, Baltimore, Halifax, London, Shanghai, Bangkok, Lagos, Manila and Hong Kong. With an increase in temperature of over 3°C, an estimated 187 million people could be displaced from their homes.<sup>95</sup> Ocean acidity (higher PH levels from CO<sub>2</sub>) will lead to significant species decline, including 90 to 100 percent bleached coral reefs.

Weather will continue to become more extreme and less predictable with more severe storms, floods and drought. Potable water will become more scarce and major food crops (like corn, wheat and rice) will suffer declining harvests.

The economic impacts are difficult to predict; however, global GDP is expected to decline and the cost of annual flood damage will be in the trillions of dollars.

***The alternative to allowing these scenarios to happen is to switch from a fossil fuel energy economy to an energy conservation and renewable energy economy as quickly as possible.*** It will mean that \$1 to \$4 trillion in fossil fuel assets will become “stranded”;<sup>96</sup> however, building-

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envelope renovation, distributed renewable energy installations, local food production, electric vehicles, and public infrastructure programs could all significantly benefit the economy.

### Canada's Climate Crisis

In Canada, temperatures are rising twice as fast as the global average,<sup>97</sup> and we are experiencing:

*forest infestations of pests like the mountain pine beetle; vanishing glaciers that feed watersheds; loss of Arctic sea ice on which animals like seals and polar bears depend; extinction of populations of temperature-sensitive salmon like sockeye; increasing ocean acidity that inhibits shellfish growth; destruction of park ecosystems; explosive growth in rat and poison ivy populations; extended prairie droughts; deaths from heat stroke; huge fires; massive floods...*<sup>98</sup>

Canada has committed to cutting its national emissions by 30 per cent below 2005 levels by 2030, that is the equivalent of 513 megatonnes of carbon dioxide (Mt CO<sub>2</sub> eq). As of [the latest federal update](#) in December (2018), we are on track to reduce projected emissions by 199 megatonnes, leaving us 79 megatonnes (28%) short of the goal, under the best case scenario.

To date, the decrease in CO<sub>2</sub> has largely come from closing coal-fired power plants in Ontario (that used to supply 25 percent of Ontario's electricity).<sup>99</sup> The oil and gas, and related transportation sectors remain Canada's largest contributors to GHG's: 52 percent of total emissions in 2017. While Canada was responsible for only 1.6 percent of global GHG emissions in 2014, we were still the ninth highest GHG producer in the world. And, on a per capita basis, we produce more carbon than any other G20 nation.<sup>100</sup>

### Decreasing GHG Emissions with Electric Vehicles (EVs)

***To prevent GHGs from pushing global warming beyond 2°C, the International Energy Agency (IEA) estimates that 40 percent of new vehicle sales worldwide must be plug-in EVs by 2040*** (with most remaining vehicles fueled by biofuels).<sup>101</sup> The market share for electric vehicles in Canada was 1.9 percent in 2018, and with the cancellation of Ontario's EV rebate program in July 2018, sales in the first quarter of 2019 fell 54 percent in Ontario (EV sales of 1,219, down from 2,633 Q1 sales in 2018).<sup>102</sup> In contrast, Quebec and British Columbia continue their rebate program and sales in Quebec during the first quarter were up 56 per cent to 3,814 vehicles while sales in B.C. were up 100 per cent to 2,718.

On May 1, 2019, the federal government introduced their rebate program (up to \$5,000) and sales of ZEVs (Zero Emission Vehicles) in the first two quarters have somewhat recovered (14,000 vehicles), and now have a 3 percent market share. A recent public opinion poll found that 70 percent of Canadians support this incentive, and four-in-ten would increase the amount.<sup>103</sup> This represents an annual reduction of 36,000 tonnes of greenhouse gas emissions, or 429,000 tonnes over the twelve-year expected life of the vehicles.<sup>104</sup> The market share targets set for ZEVs by the federal government are 10 per cent by 2025, 30 per cent by 2030 and 100 per cent by 2040.

***Ontario's transportation sector is responsible for more than one-third of the province's greenhouse gases (GHGs).*** A 2015 Plug'n Drive report suggested that modestly increasing EVs'

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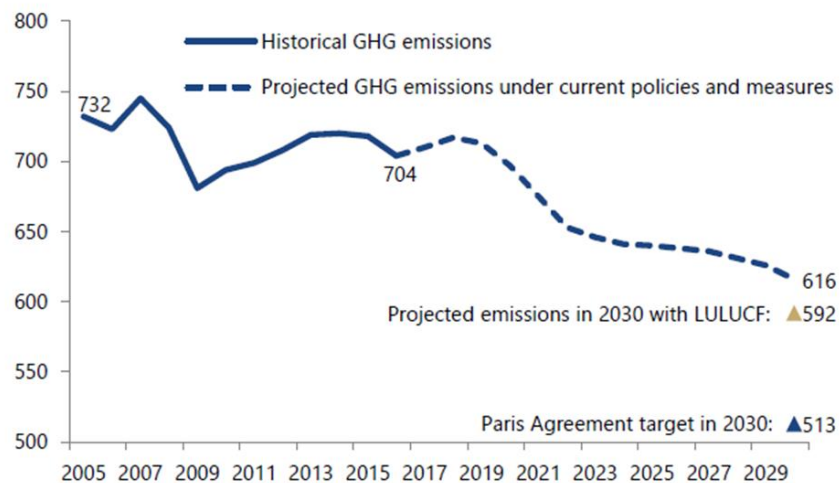
share of annual new car sales to 5 percent in 2020 (14,161 EVs in Ontario) would reduce the province's GHG emissions by as much as 222,000 tonnes by 2020. Because of Ontario's low-emission electricity generating system, drivers can slash their vehicle's GHG emissions by up to 90 percent by switching their gasoline-powered car for a comparable EV.<sup>105</sup>

Under the Paris Agreement, Canada has committed to reduce its GHG emissions by 30 per cent below 2005 levels by 2030, to a level of 513 megatonnes (Mt) of CO<sub>2</sub> equivalent. Canada's Parliamentary Budget Officer (PBO) estimates that an additional carbon price rising from \$6 per tonne in 2023 to \$52 per tonne in 2030 would be required to achieve Canada's GHG emissions target under the Paris Agreement. This charge would be in addition to the \$50 per tonne federal fuel charge that is scheduled to be in place in 2022. Combined with the \$50 per tonne federal fuel charge, households could face an explicit carbon price of \$102 per tonne in 2030.

**Figure 4: Greenhouse Gas Emissions Under Current Government of Canada Policies**

### Canada's GHG emissions projected under current policies

Megatonnes of CO<sub>2</sub> equivalent



Source: Environment and Climate Change Canada.

Note: Projected emissions levels correspond to the Additional Measures Case in Environment and Climate Change Canada's 2018 GHG emissions projections report. LULUCF refers to Land Use, Land Use Change and Forestry. The projection period covers 2017 to 2030.

As shown in figure 4, with the current policies being followed by the Canadian government, Canada will fall well short (47%) of its commitment to decrease GHGs by 219 megatonnes of CO<sub>2</sub> in the Paris Agreement.

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### 5.0 Preliminary Marketing Plan

In 2018, the global electric car fleet exceeded 5.1 million, up 2 million from the previous year, and almost doubling the number of new electric car sales. The People's Republic of China remains the world's largest electric car market (almost half of the world's EVs with 2.3 million vehicles), followed by Europe (1.2 million) and the United States (1.1 million). Norway is the global leader in terms of electric car market share.<sup>106</sup> According to the Norwegian Road Federation, pure electric cars and hybrid cars in Norway accounted for 46% of all new car sales in 2018, 52% in 2017, and 40% in 2016. **Norway's parliament has set a resolution goal that by 2025 all cars sold should be zero emissions.**<sup>107</sup> Iceland has the second largest market share at 17 percent.<sup>108</sup>

**Government policies play a critical role in creating demand for electric vehicles.** Leading countries use a variety of measures, including:<sup>109</sup>

- fuel economy standards
- government grants, tax credits, equity and loans to encourage manufacturing of zero emission vehicles
- rebates that help bridge the cost gap between electric and conventional vehicles
- support for the deployment of charging infrastructure
- government procurement

EV uptake typically starts with the establishment of a set of government targets, followed by the adoption of vehicle and charging standards. An EV deployment plan often includes procurement programmes to stimulate demand for electric vehicles and to enable an initial roll-out of publicly accessible charging infrastructure.<sup>110</sup>

Another effective policy is the gradual increase of taxes on carbon-intensive fuels, combined with the use of location-specific distance-based charges (this supports the long-term transition to zero-emissions vehicles while maintaining government revenue from taxes on transportation).<sup>111</sup>

In addition to electric cars, the global inventory of electric two-wheelers was 260 million by the end of 2018 and there were 460,000 electric buses. In freight transport, electric vehicles (EVs) were mostly deployed as light-commercial vehicles (LCVs), which reached 250,000 units in 2018.<sup>112</sup>

### Germany's post office takes on automakers with its electric van

April 11, 2017



German logistics group Deutsche Post DHL Group plans to take on automakers by stepping up production of its Streetscooter electric van and selling it to external customers. Germany's postal network, Deutsche Post, developed the Streetscooter for internal use to keep emissions low as online shopping creates more demand for parcel deliveries.

However, it has been considering whether to sell it to others and on Tuesday said it would seek another production site and double annual output to 20,000 vans by the end of the year. It plans to sell around half of this year's production to third-party customers.

The company designed and built its own vans, exploiting sweeping changes in manufacturing technology, allowing it to meet growing demand for e-commerce deliveries without adding to air pollution in German cities. The group decided to make its own van after conventional vehicle makers turned down requests to build the electric vans.

The company expects demand for the van, which will start selling at a price of 32,000 euros (\$34,000), from municipal authorities, strategic partners and large fleet customers. In an interview with newspaper Rheinische Post, Gerdes said he could imagine production of up to 100,000 vans a year across 10 factories in the long run.

<https://europe.autonews.com/article/20170411/ANE/170419974/germany-s-post-office-takes-on-automakers-with-its-electric-van>

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The International Energy Association's Global EV Outlook 2019 explores the future development of electric vehicles through two scenarios.<sup>113</sup>

1. **New Policies Scenario** shows the impact of already announced policies. By 2030, global EV sales reach 23 million and inventory exceeds 130 million vehicles (excluding two/three-wheelers). In this scenario, China would maintain its world lead with 57% share of the EV market in 2030, followed by Europe (26%) and Japan (21%).
2. **EV30@30 Scenario**, shows the impact of the Electric Vehicle Initiative's campaign to reach a 30% market share for EVs in all modes except two-wheelers by 2030. EV sales and stock nearly double by 2030: sales reach 43 million and the stock numbering more than 250 million. EVs would account for 42% of all vehicle sales in 2030 in China. Almost half of all vehicles sold in 2030 in Europe would be EVs (partly reflective of having the highest tax rates on fossil fuels). The projected share of EVs in 2030 in Japan is 37%, over 30% in Canada and the United States, 29% in India, and 22% in aggregate of all other countries.

Transportation is the second largest source of greenhouse gas (GHG) emissions in Canada, accounting for a quarter of our total emissions, and almost half of these come from cars and light trucks.<sup>114</sup> In Canada's light vehicle market, four pick-up trucks filled four of the top five sales positions in 2018.<sup>115</sup> The market share for all light trucks (including SUVs) sold in Canada was 70 percent in 2018, up from 68.6 percent in 2017.<sup>116</sup> These vehicles have a much higher profit margin for the manufacturers (15 to 20 percent) than cars (3%), and are not the types of energy conserving vehicles that need to be produced, given that the average pick-up truck uses 14 litres of fuel per 100 km (17 miles per U.S. gallon),<sup>117</sup> and emits 4.71 metric tonnes of CO<sub>2</sub> per year per vehicle.<sup>118</sup> This is the reason that the Government of Canada recently announced targets for sales of zero-emission vehicles in Canada: 10 percent of new light-duty vehicle sales to be zero-emission vehicles by 2025, 30 percent by 2030, and 100 percent by 2040. And in May 2019, the new \$300 million federal purchase incentive program was opened to encourage more Canadians to buy zero-emission vehicles.

### 5.1 Marketing Objectives

The marketing objectives for the repurposing of the GM Oshawa assembly plant and the change to democratic public ownership will rely on effectively marketing the triple bottom line benefits of the proposal:

1. **Economic:** Instead of having Oshawa's massive, historical auto assembly plant completely under-utilized (at a time when GM and other global auto makers are investing billions in electric vehicle manufacturing in China, in joint ventures with the Chinese government), Canadians can build their economic resilience by investing in BEV production, and creating new assembly, research and development, engineering, and management jobs. The estimated government investment required including start-up capital and working capital is estimated in the range of \$1.3 to \$1.9 billion. This represents a small percentage of the combined annual budgets of the Canadian and Ontario governments, a range of 0.2 to 0.4 percent.
2. **Social:** Creating new, well paid BEV manufacturing jobs and multiplier jobs – growing from a range of 1,300 to 2,300 in year one, to 8,000 to 13,000 by year five – is a significant social and community benefit for Oshawa, Ontario and Canada. Not only does this initiative provide income for people and their families, it provides hope for all Canadians, and it can be used as a test case for other examples of democratic public ownership to help our society cope with the challenges of the climate crisis.

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3. **Environmental:** Decreasing greenhouse gas emissions by using BEVs in Ontario is a particularly effective strategy because more than 93 percent of the electricity generated in the province is emissions free.<sup>119</sup> The forecasted replacement of almost 150,000 internal combustion engine vehicles with battery electric vehicles will result in a decrease of 400,000 metric tonnes of CO<sub>2</sub> in the first five years.

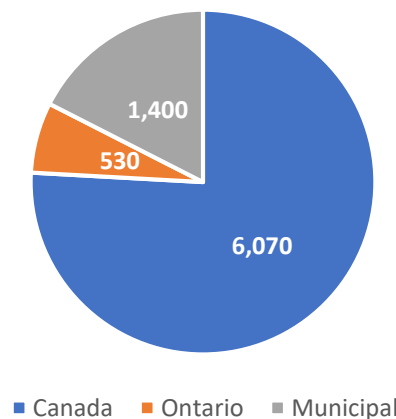
### 5.2 Target Markets

#### Public Procurement

Public procurement is a common practice, and it represents 12 percent of GDP in OECD countries.<sup>120</sup> In Ontario, one example is Hydro One. In 2018, it injected \$1.3 billion into Ontario's economy through procurement, and 85 per cent was spent on Ontario suppliers.<sup>121</sup>

Chart 5 shows the number of BEVs forecasted to be purchased by three levels of government in year 1. The Ontario government is forecasted to purchase 530 BEVs (an estimated value of \$22 million), the twenty largest Ontario municipalities are forecasted to purchase 1,400 (\$59 million), and the federal government purchases 6,070 (\$259 million). This government procurement for their vehicle fleets will provide the new start-up public enterprise with an important proving ground for its vehicles and will help them get out into the public eye, also encouraging private purchases.

**Chart 5: Government Procurement of BEVs Year 1**  
(Number of Battery Electric Vehicles)



Over the course of the first five years of operation, vehicle sales are forecasted to increase six-fold, to over 56,000 BEVs in year 5. These sales will represent various sizes and types of BEVs including automobiles, SUVs, light duty delivery and service trucks, police cars, and potentially \$20 million in ambulance sales per year beginning in year 2. The forecasts also include sales to innovative municipalities that will begin to use BEVs for car-sharing services as an integrated part of their public transit systems.

By the end of year 5, the federal government is forecasted to replace 30 to 40 percent of their vehicle fleet, while Canada Post (like its much bigger cousin in the U.S.) will have replaced 85 percent of its 13,000 fleet with electric vehicles. This will be an inspiring sight for the people of Canada in their collective challenge to decrease the impact of climate change. In the United

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States, the U.S. Postal Service has 180,000 ICE vehicles that it is replacing with electric vehicles over seven years, with an expected price of \$8.3 billion (CAD).

### Private Sales

In addition to government procurement, private sales for company fleets and individual households will also increase over time. While the up-front cost of an electric vehicle may appear high, with the new incentive from the government of Canada (up to \$5,000 per electric vehicle) partially replacing the incentive eliminated by the Ontario government, sales are picking up. And, most car buyers are not aware of the cost savings of operating an electric vehicle over the course of its much longer useful life.

As gas prices increase, the savings from owning a BEV also increase. And, with very few moving parts (20 versus 2,000 in an ICE vehicle), maintenance costs approach a marginal cost of zero.

As lithium and cobalt battery prices continue to fall, the price of BEVs will also fall. Overall, it means a growing market for BEVs and a shrinking market for ICE vehicles. It is a major technological market disruption, and **it is a very good time for public ownership of this OEM technology.**

BC Hydro crunched the numbers on operating costs for a BEV versus an ICE vehicle, assuming 20,000 kilometers per year of driving, and this is the result:<sup>122</sup>

- Save \$1,770 per year on gasoline/energy.
- Save \$1,200 to \$1,500 a year on maintenance.
- In ten years, the total savings, \$32,700, approaches the purchase price of a BEV.

While economics will drive the private purchase of BEVs, there are additional motivations for early adopters, including: improved driving experience (quick acceleration in particular), environmental benefits, independence from oil companies, and technological superiority.<sup>123</sup>

### Driverless Vehicles

The technology and automobile companies, and ride share companies, like Uber and Lift, are all betting that driverless vehicles will become the norm within the next five to ten years.

One such proponent is Tony Seba, an economist at Stanford University, and a board member or advisor to several alternative energy start-ups. Autonomous EVs on demand, also known as

### GTHA Consumer Survey Highlights (May 2017)

**Price:** The top reason gas car owners choose not to purchase an EV is price by a wide margin. 31% of respondents believe EVs are too expensive. The second reason, range anxiety, came in a distant second at 13%.

**Incentives:** Only 5% of gas car owners are knowledgeable about Ontario's incentive program (*now eliminated*).

**Motivation:** Concern for the environment is the main reason for EV owners to drive an electric car (36%). Unfortunately, the link between climate change and individual vehicle choice is not understood by roughly 30% of conventional car owners.

**Driving Behaviour:** EV Owners drive farther and more frequently on a daily basis. On average, EV owners commute approximately 14km more a day than gas car owners - 46km vs 32km. 60% of EV owners drive up to 60km per day. Additionally, more than 25 % of EV Owners commute more than 60 km per day and 12 % commute more than 100km per day.

**Education:** While a large share of both groups hold undergraduate degrees, almost 40% of EV owners hold a graduate or professional graduate degree with a concentration in engineering and technology-related fields.

**Age:** The plurality of EV owners are 30-39 years old (27% of sample), with 40-49 and 50-59 years old age bands each representing 20% equally. This might indicate a higher generational willingness to adopt a new technology.

<https://www.plugndrive.ca/wp-content/uploads/2017/07/EV-Survey-Report.pdf>

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“Transportation as a Service” or TaaS, will be ten times cheaper than personal vehicle ownership the day it is approved, which Tony Seba estimates to be 2021.<sup>124</sup>

Every time there has been a ten times improvement in technology, there has been a market disruption. Seba expects 40 percent of the cars in 2030 to still be privately owned, with the remaining 60 percent being comprised of fleet vehicles that will drive 95 percent of passenger vehicle miles at all hours of the day and night for pennies, saving the average family \$6,000 per year on transportation.<sup>125</sup> In a report written together with James Arbib from the Silicon Valley think tank RethinkX, Tony Seba went further:<sup>126</sup>

*By 2030, within 10 years of regulatory approval of autonomous vehicles (AVs), 95% of U.S. passenger miles traveled will be served by on-demand autonomous electric vehicles owned by fleets, not individuals, in a new business model we call “transport-as-a-service” (TaaS). The TaaS disruption will have enormous implications across the transportation and oil industries, decimating entire portions of their value chains, causing oil demand and prices to plummet, and destroying trillions of dollars in investor value — but also creating trillions of dollars in new business opportunities, consumer surplus and GDP growth.*

Not all auto and tech executives agree. In April 2019, Ford CEO Jim Hackett said that the industry had **“overestimated the arrival of autonomous vehicles.”** Chris Urmson, the former leader of Google’s self-driving car project, and now the CEO of the self-driving startup Aurora, says that driverless cars will be slowly integrated onto our roads “over the next 30 to 50 years.”<sup>127</sup>

Before autonomous vehicles take over the roads, people will need to be convinced that they are not dangerous. **A Reuters/Ipsos opinion poll found that half of U.S. adults think automated vehicles are more dangerous than traditional vehicles operated by people, while nearly two-thirds said they would not buy a fully autonomous vehicle.** Two-thirds of survey respondents said self-driving cars should be held to higher government safety standards than traditional vehicles driven by humans. “I’m concerned that even when we get the technology absolutely right, we will not have the business,” said investor and corporate adviser Evangelos Simoudis, managing director of Synapse Partners, which invests in autonomous vehicle technology startups.<sup>128</sup> And, one of the main competitors for privately-owned self-driving cars, public transit, continues to grow with fleets of electric buses and the potential for electric car-sharing.

### BYD launches electric bus output at Ontario plant July 2, 2019



BYD Co., China’s largest electrified vehicle maker, opened its second North American electric bus assembly plant, in Newmarket, Ontario.

The 45,000-square-foot factory will first focus on assembling buses for the Toronto Transit Commission, Canada’s largest transit operator, BYD said last week. Last year, BYD landed an order from the Toronto agency for 10 40-foot-long electric buses with an option for 30 more.

BYD opened its first electric bus assembly plant Lancaster, Calif., in 2013, with 100 employees. The factory now employs about 1,000 people.

The Ontario plant is BYD’s sixth electric bus plant outside China. The company also assembles electric buses in Scotland, Brazil, Hungary and France.

BYD, based in Shenzhen, is listed in Hong Kong and Shanghai. It is partly owned by U.S. billionaire Warren Buffett. For the first five months of this year, it delivered 119,082 electric and plug-in hybrid vehicles globally, more than doubling the tally a year earlier. The number includes 1,467 electric buses.

<https://canada.autonews.com/automakers/byd-launches-electric-bus-output-ontario-plant>



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## 5.3 Marketing Mix

### 5.3.1 Product Mix

The closure of the Oshawa assembly plant provides an opportunity for Canadians to build manufacturing capacity for BEVs and develop new products that can help decrease GHG emissions. The initial base of production will fulfill government procurement needs for replacing their ICE vehicle fleets with BEVs (30 percent of their fleets within five years, with the exception of Canada Post at 85 percent replacement over 5 years). Preliminary estimates for these vehicle fleets include the federal government (public service vehicles, Canada Post and the RCMP), the Ontario government (public service, Ontario Power Generation, Hydro One, and the Ontario Provincial Police), and the top twenty municipal governments in Ontario (including regional and municipal police vehicles). If governments are able to increase the speed of replacing their existing ICE fleets with BEVs, it will bolster the feasibility of repurposing the Oshawa assembly plant.

This preliminary feasibility study has created two scenarios to repurpose the Oshawa assembly plant for battery electric vehicle production. **Scenario 1** uses a business model with more labour inside the assembly plant including parts manufacturing. **Scenario 2** uses a business model with fewer internal manufacturing workers, substituting outside parts suppliers to provide a higher percentage of parts. Both scenarios include three suggested initial BEVs for the purposes of developing these sales forecasts:

1. A light utility delivery truck
2. A sedan (or possibly a compact and a mid-sized, using flexible assembly lines)
3. A SUV

The exact format of these vehicles will need to be determined in negotiations that meet the procurement requirements of various governments.

In the first year of operation, government procurement will jump start the sale of the first two vehicles, and help work out the production inefficiencies. In year 2, the SUV will be introduced. Over the first five years of forecasted sales, the light trucks are estimated to represent 26% of sales revenue, the sedan (or sedans) about 47%, and the SUV 27%. In total, over the first five years, government procurement is estimated to be about one fifth of total sales.

### What Is an Electric Vehicle?

An **electric vehicle (EV)**, uses one or more electric motors for propulsion. Electric vehicles can include electric cars, trucks, buses, trains, planes, boats, bicycles, motorcycles and scooters, and spacecraft.

The first electric vehicles were introduced in the mid-1800s, when electricity was a preferred method for automobile propulsion, providing a level of comfort and ease of operation that could not be achieved by the gasoline cars of the time. After the invention of the auto assembly line by Henry Ford, the internal combustion engine (ICE) replaced the electric drive for automobiles, but electric power continued for other vehicle types, such as trains and smaller vehicles of all types.

Electric vehicles are distinct from fossil fuel-powered vehicles in that they can receive their power from a number of sources, including fossil fuels themselves, nuclear power, and renewable sources such as tidal power, solar power, and wind power. This energy is then transmitted to the vehicle through use of overhead lines, wireless energy transfer, or a direct connection through an electrical cable. The electricity may then be stored onboard the vehicle using a battery, flywheel, supercapacitor, or fuel cell. Vehicles making use of engines working on the principle of combustion can usually only derive their energy from a single or a few sources, usually non-renewable fossil fuels.

At the outset of this century, increased concern over the environmental impact of the petroleum-based transportation infrastructure, along with the specter of peak oil, led to renewed interest in an electric vehicles.

<https://www.thoughtco.com/history-of-electric-vehicles-1991603> and <https://phys.org/tags/electric+vehicles/>

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These sales forecasts are conservative. Sales could increase more quickly if:

- governments decide to increase the pace of their fleet replacement,
- more private sales are realized, or
- other new products are manufactured that are not included in these financial forecasts.

As the sales grow for BEVs, the Transportation-Environment Center will continue its research and development on other useful mobility products and services that will meet the needs of an aging population and address the climate crisis. Car sharing services could be organized on a co-operative Internet platform that would be democratically owned and operated by municipal governments. Municipalities could install fleets of compact BEVs at airports, train and subway stations, that could be temporarily rented for personal use, or as driverless cars. Municipalities could set the standards for these car-share fleets, and have them manufactured in Oshawa.

Design is an important aspect to consider in the marketing of the BEVs. People need to find the designs useful and appealing, and people have a long love affair with “beautifully designed automobiles”. The Oshawa BEVs will need to meet this requirement with whatever products it creates. Design will be a key ingredient in success.

BYD provides an example of how the auto industry invests in design. On June 26, 2019, they opened “The Design Center” with three internationally renowned automobile design experts, including:<sup>129</sup>

- Wolfgang Egger, Global Design Director, who worked on a number of award-winning models as design director for Italian and German luxury automakers.
- JuanMa Lopez, Global Exterior Design Director, previously designed car interiors and exteriors for Italian super car brands.
- Michele Jauch-Paganetti, Global Interior Design Director, was responsible for interior design at leading German marques.

The Oshawa Bev assembly plant will likely need to make an arrangement with an existing automobile maker to license or purchase the design and technology for its BEVs.



**A clay model of the BYD Concept**



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Here are some examples of other models of BEV sedans, light duty trucks and delivery vans, and there are many others.



Nissan Leaf



Chevrolet Bolt



Renault's Experimental Last-Mile Delivery Van EZ-FLEX



R1S SUV at the 2018 LA Auto Show



R1T pick-up at the 2018 LA Auto Show



Tesla Model 3



Mercedes-Benz SLS AMG 2012

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### 5.3.2 Price

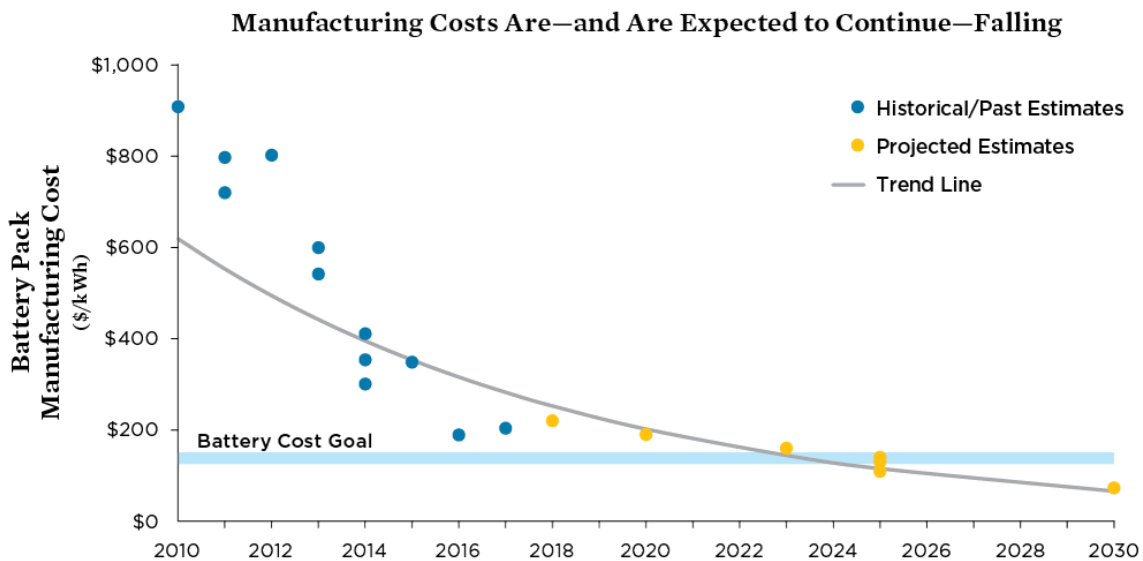
The price of battery electric vehicles has and will continue to decrease as economies of scale, and particularly battery prices decrease with improving technology. For several years, analysts have been using 50 percent as the battery cost of the total cost of a BEV. That has changed: In 2019, it's one-third and by 2025, it is expected to be one-fifth of total vehicle cost.<sup>130</sup>

When the first mass-market EVs were introduced in 2010, their battery packs cost an estimated \$1,000 per kilowatt-hour (kWh). In 2018, Tesla's Model 3 battery pack cost \$190 per kWh (a drop of 81 percent seven years), and General Motors' 2017 Chevrolet Bolt battery pack cost about \$205 per kWh.<sup>131</sup>

Other costs of battery electric vehicles, compared to ICE vehicles will also decrease. Electric vehicle chassis and body costs will drop slightly, while those same costs will rise modestly for combustion vehicles "as a result of light-weighting and other measures to help comply with emissions targets, and by 2030, costs for motors, inverters and power electronics could be 25 to 30 percent lower than they are today."<sup>132</sup>

EVs are forecast to cost the same or less than a comparable gasoline-powered vehicle when the price of battery packs falls to between \$125 and \$150 per kWh. Analysts have forecast that this price parity can be achieved as soon as 2020, while other studies have forecast the price of a lithium-ion battery pack to drop to as little as \$73 / kWh by 2030, as shown in Figure 5.<sup>133</sup>

**Figure 5: Forecasted Electric Vehicle Battery Pack Cost**



Electric vehicle batteries store large amounts of energy that can be discharged quickly, safely, and smoothly, giving electric vehicles (EVs) instant acceleration, responsive handling, and fast recharging times. These are very attractive qualities for many drivers.

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Table 2 shows the revenue forecasts for BEV manufacturing in Oshawa. Over time, the prices of the light utility vehicle and sedans BEVs decrease ten percent, while the SUV price decreases by 7 percent in four years. There is also a deposit on each vehicle when ordered which will be credited on the final sale price.

<b>Table 2: BEV Revenue Forecasts</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
BEV Light utility vehicle	5,335	6,000	7,000	9,000	11,000
Price (\$2,500 deposit)	\$44,200	\$42,874	\$41,588	\$40,756	\$39,941
<b>Total Sales LUV BEV (\$000s)</b>	<b>\$235,807</b>	<b>\$257,244</b>	<b>\$291,114</b>	<b>\$366,804</b>	<b>\$439,350</b>
BEV Sedans	2,665	5,330	10,660	21,320	29,848
Price (\$2,000 deposit)	\$39,000	\$37,830	\$36,695	\$35,961	\$35,242
<b>Total Sales BEV Model A (\$000s)</b>	<b>\$103,935</b>	<b>\$201,634</b>	<b>\$391,170</b>	<b>\$766,693</b>	<b>\$1,051,902</b>
BEV SUV		5,000	7,500	11,250	15,750
Price (\$2,500 deposit)		\$45,000	\$43,650	\$42,777	\$41,921
<b>Total Sales BEV Model B (\$000s)</b>		<b>\$225,000</b>	<b>\$327,375</b>	<b>\$481,241</b>	<b>\$660,263</b>
Total Canadian Vehicle Sales	8,000	16,330	25,160	41,570	56,598
<b>Total Canadian Sales Revenue (\$000s)</b>	<b>\$339,742</b>	<b>\$683,878</b>	<b>\$1,009,659</b>	<b>\$1,614,738</b>	<b>\$2,151,515</b>

The two financial scenarios developed for this preliminary feasibility study are based on original equipment manufacturing (OEM) financial benchmarks for start-up/small, medium and large auto manufacturers. Our financial forecasts are conservative and have a reasonable growth curve in sales revenue based on government procurement of BEV light duty delivery vans, sedans and an SUV model. The prices for these vehicles are in the mid-range for BEVs: \$44,200 for the light duty truck, \$39,000 for the sedans, and \$45,000 for the SUV, and fleet volume purchases will likely receive a volume discount. In comparison, the German Post Office light duty vehicle costs \$45,900, a Chevrolet Bolt is \$50,600, and Nissan Leaf, Ford Focus or Hyundai Ioniq prices are around \$40,500.

### 5.3.3 Promotion

To make this project feasible, the federal government will need to take leadership and work with the Ontario and municipal governments to make a commitment to procuring the forecasted vehicle numbers in years 1 and 2 particularly. Once the public sees these vehicles on the road in various configurations (public service vehicles, Canada Post, Hydro One, OPP) and read stories and see pictures in the mainstream and social media, the other aspects of a marketing strategy including direct sales of vehicles (like Tesla), test driving at various locations, and no-hassle purchasing and delivery, will reinforce the public's commitment to purchase the Oshawa BEVs for their own use. The financial forecasts include money to support the marketing and sales function, using industry benchmarks; however, with the public procurement and media strategy, heavy spending on television advertising should not be necessary.

As the price of BEVs and conventional cars converge (within the next three years), ***the inherent advantages of electric vehicles will win over people***, particularly when they realize that travel range or distance is not an issue.<sup>134</sup>

1. Higher performance and less noise
2. More energy-efficient (about four times more energy efficient than a conventional car)

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3. Lower maintenance and fuel costs (about one quarter of the operating costs of an internal combustion vehicle)
4. Substantially lower carbon and air pollution

All levels of government will play an important role in promoting the Oshawa BEVs by adopting a set of measures that have been proven in many countries.<sup>135</sup>

1. Establish a vision and a set of targets in parallel with the adoption of vehicle and charging standards.
2. Procurement programmes are important instruments to kick-start demand for electric vehicles and stimulate automakers to increase the market availability of EVs. They also help to enable an initial roll-out of publicly accessible infrastructure.
3. The use of appropriate economic incentives is effective, especially as long as electric vehicle purchase prices are higher than purchase prices for internal combustion engine vehicles. They are also relevant for the early deployment of charging infrastructure.
4. Complementary measures often include regulatory instruments to increase the value proposition of electric vehicles, such as waivers to access restrictions. These are typically grounded on better environmental performance such as local air pollution.
5. Minimum requirements to ensure the EV readiness in new or refurbished buildings and parking lots, and the deployment of publicly accessible chargers on highway networks and in cities are also crucial to achieve increased EV adoption and to boost consumer confidence.
6. Scaling up EV adoption also requires measures that provide incentives to increase the availability of vehicles with zero- and low tailpipe emissions; crucial instruments include fuel economy standards, zero-emissions vehicle mandates and ratcheting up the ambition of public procurement programmes.

The most important promotion will be the media relations regarding this initiative, and the pride and inspiration Canadians will feel about manufacturing BEVs and decreasing GHG emissions.

Last July, the Ontario government cancelled its electric vehicle incentive program, and on May 1, 2019, the federal government announced a number of supportive programmes:

1. **Purchase and Lease Incentives** – Up to \$5,000 off the purchase of a new fully electric or plug-in hybrid electric vehicle with a base model MSRP of less than \$45,000.
2. **Zero-Emission Vehicle Infrastructure Program** - The program will support electric vehicle charging infrastructure deployment in multi-unit residential buildings (MURBs), workplaces, public places.
3. **On Street** - municipalities, and regional and provincial governments, or their partners, for electric vehicle charging infrastructure for on-street parking.
4. **Corporate and Delivery Fleets** - The program will support zero-emission vehicle infrastructure for dedicated corporate fleets.
5. **Mass Transit** - zero-emission infrastructure for public transit e.g. inner-city buses.

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### 5.3.4 Place

The main geographic market in the first three or four years will be Ontario, the GTHA, large municipalities, and selected federal government procurement across Canada (for example, Canada Post and the RCMP). Year 1 will start with government procurement for the federal government fleet, the Ontario government and the top twenty municipalities in Ontario. In year 2, sales will expand to private sales in Ontario and other provinces. In other words, the Oshawa BEVs will be focused on meeting the needs of the local and domestic markets.

### 6.0 Organization and People

This study was initiated because a group of Unifor workers at GM Oshawa and representatives of the Canadian Worker Co-op Federation thought that there was potential to use the GM Oshawa plant to build electric vehicles and keep the jobs and economic activity in the community, while also helping to mitigate greenhouse gas emissions. Over the course of a few months, and a number of regular meetings, it was determined to move forward with a preliminary feasibility study.

#### Democratic Public Ownership

The underlying premise of this study is that democratic public ownership (with participation of governments, workers and community members) is the best organizational structure to build more resilience in Oshawa and other communities (including keeping jobs, manufacturing know-how, and the wealth generated in our communities) and deal with the climate crisis. The evidence is mounting that the existing business model under globalization is resulting in growing inequality, environmental degradation, and political instability.

In Canada, the federal government owns 45 public enterprises (Crown Corporations) with assets of over \$1 trillion (which grew by 37 percent since 2013-2014), annual revenue of \$92 billion, and annual net income of \$56 billion (2017-2018).<sup>136</sup> The top two public enterprises are the Canada Pension Plan and Public Sector Pension, with 53 percent of the total assets of all federal Crown Corporations. In addition, provincial and municipal governments own hundreds of enterprises, with total assets exceeding the federal crown corporations.<sup>137</sup>

Other western democratic countries actively support democratic public enterprise ownership. For example, Germany has rules requiring firms with more than 500 employees to have workers represented on their boards of directors. France, Norway and Sweden all have similar laws regarding board-level employee representation.<sup>138</sup> Democratic public ownership means that there is a redistribution of power, in decision-making and in ownership. It could involve:

- governments investing in publicly-owned enterprises (like crown corporations),
- employees taking ownership of part of every company,

#### State-owned Enterprises

State-owned enterprises (SOEs) are an important element of most economies, including many more advanced economies. SOEs are most prevalent in strategic sectors such as energy, minerals, infrastructure, other utilities and, in some countries, financial services. The presence of SOEs in the global economy has grown strongly in recent years. Today they account for over a fifth of the world's largest enterprises as opposed to ten years ago where only one or two SOEs could be found at the top of the league table.

OECD (2018), Ownership and Governance of State-Owned Enterprises: A Compendium of National Practices, 2018. <http://www.oecd.org/corporate/ca/Ownership-and-Governance-of-State-Owned-Enterprises-A-Compendium-of-National-Practices.pdf>

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- local politicians reshaping their city’s economy to favour local, ethical businesses over large transnational corporations, or
- politicians making policies that favour co-operatives over private corporations.

In the United States, a policy paper written by Peter Gowan of “The Next System Project” details how providing “right to own” policies could support the transition from shareholder corporations to worker ownership:<sup>139</sup>

1. Provide sources of finance and revenue that are not dependent on the profit-driven, speculative stock market;
2. Technical assistance and expert knowledge on a broad basis to worker-owners and those in the process of considering a transition; and
3. Mechanisms to encourage solidarity between worker-owned businesses and an expansionary orientation of individual businesses and the sector as a whole.

These are the kinds of policies and processes that the Mondragon system of co-operatives in Spain has followed since their beginning in 1956. Today, the system has assets of \$38 billion, annual revenues of \$18 billion (CAD), and employs 81 thousand people of whom 74 percent are worker-owners, and 43 percent are women.<sup>140</sup> Most of the enterprises are industrial, operating in a wide variety of sectors, including: automotive parts, bicycles, iron casting, rail, aeronautics, engineering, and machinery. And, unlike transnational corporations, the ratio of highest to lowest paid is 6 to 1 (as one example, GM’s ratio is 457 to 1).

In Canada, two examples of large worker-owned businesses are the Ambulance Co-ops in Quebec that have 1,575 employee owners, and Harmac Pulp Mill in Nanaimo British Columbia with 320 employee-owners.

### 7.0 Financial Forecasts

#### 7.1 Capitalization of the Oshawa BEV Plant

The estimated capital investment required in both of the scenarios in this preliminary feasibility study are shown in Table 3. **The total level of public investment represents less than one-half of one percent of the annual combined federal and Ontario government budgets.**

<b>Table 3: Start-up Investment (\$000s)</b>	<b>Scenario 1</b>	<b>Scenario 2</b>
GM Oshawa Enterprise Value	\$1.3 billion	\$800 million
Estimate for BEV production retooling	\$400 to 600 million	
<b>Total</b>	<b>\$1.7 to \$1.9 billion</b>	<b>\$1.2 to \$1.4 billion</b>

In **Scenario 1**, the value of the GM Oshawa Assembly plant (not including the technology centre and the test track) is estimated at \$1.3 billion. Scenario 1 considers the negotiation of a full-scale purchase of the GM Oshawa assembly plant. This includes the land (702 acres or 284 hectares), buildings (about 10 million square feet) and equipment for the auto and truck lines, the body shop, the paint shop, and the auto warehouse and parking lots (for finished vehicle inventory and employee parking), as shown in Figure 6. Both scenarios also require an additional \$400 to \$600 million in estimated capital investment required to retrofit the plant to assemble BEVs. With the assumption of a one-to-one ratio of equity to debt, this would require



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approximately \$900 million in public equity investment, and a government green bond issue or a commercial loan (guaranteed by the federal government) of the same amount.

**Scenario 2** is more modest, with an estimated enterprise value of \$800 million (and the \$400 to \$600 million for retooling). It will require negotiating the purchase of the Oshawa assembly plant (auto and truck lines), and shared use of the body shop, paint shop, and auto warehousing and parking lots. The equity investment would be \$600 to \$700 million with a matching amount in government green bonds or a commercial loan.

**Figure 6: Aerial Map of the GM Oshawa Assembly Plant and Grounds**



Vehicle Production: B – Body Shop, C – Chassis, D – Truck Frame Line, P – Paint, M - Stamping  
Other: S – South Supplier Park, E – Power House, W – Waste Water, A – South Main Office

Neither scenario includes the purchase of GM’s Canadian Technology Centre or test track. Instead, the new publicly owned organization will build a state-of-the-art Transportation-

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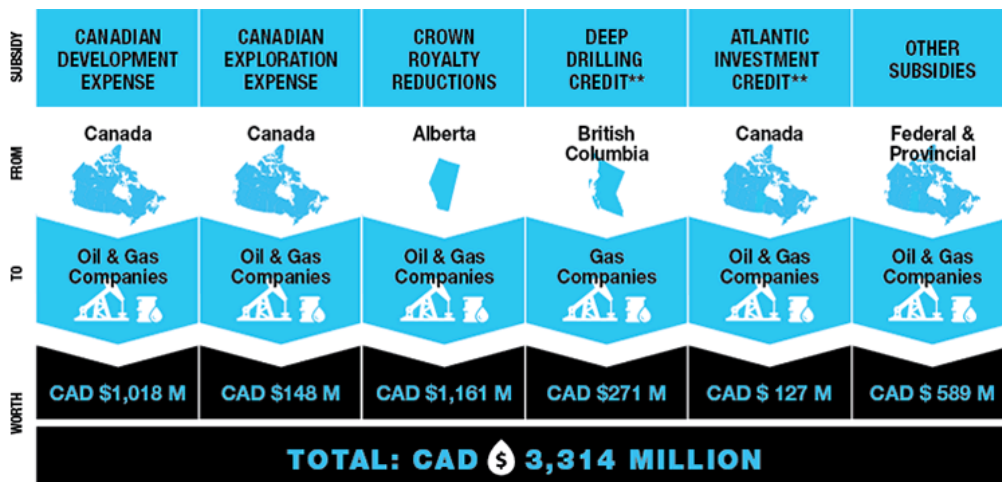
Environment Center that will employ engineers, technicians and skilled trades people who will research future product needs, build and test prototypes, and help re-invigorate Canada’s manufacturing capabilities. **The Oshawa assembly plant can be seen as an experiment in a publicly-owned, democratic, triple bottom line business. The lessons learned can be documented and disseminated across the country to help other Canadian communities develop their manufacturing capabilities and resilience, while finding creative new ways to decrease GHG emissions.**

By paying a good wage to auto workers – this study proposes the existing GM Oshawa tier 1 wage of \$35 per hour for assembly workers – it will be possible to gain the workers’ commitment by investing in their jobs through shared-ownership of the new organization. The scenarios in this study will require leadership and mobilization of the workers and the broader community to persuade our governments to try a new model of democratic, public ownership. Governments will need to negotiate alongside the workers and community to gain public ownership of the GM Oshawa plant. The financial forecasts include a start-up investment of \$10,000 from each of the workers combined with community investment for a total of \$37.5 million in Scenario 1, and Scenario 2 estimates \$25 million in investment from workers and the community.

The form of the investment could be voting shares, preferred shares, bonds, debentures, a wage check-off loan and a non-refundable deposit on BEVs. Over time, workers and community members would continue to invest to maintain the jobs and wealth in their community, and pay dividends and interest to the investors (including the governments).

This level of public investment is reasonable. In the past year, the Government of Canada invested \$4.8 billion to acquire the Trans Mountain pipeline. Financing costs for Trans Mountain Corporation totaled \$87 million. In its first seven months of public ownership, Trans Mountain Corp. (TMC) reported a net loss of \$36 million.<sup>141</sup> Each year, the Canadian government provides about \$3.3 billion in subsidies for oil and gas producers (mostly foreign owned). That includes measures like reduced property taxes and special tax deductions for the industry, as well as direct infusions of cash from the government to oil companies.<sup>142</sup> Figure 7 shows the breakdown of these government subsidies.

**Figure 7: Canadian Government Subsidies for Oil and Gas Corporations (2015)**



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Furthermore, Export Development Canada provides, on average, over \$10 billion in government-backed support for oil and gas companies every year. **EDC contributes 12 times more financial support to the oil and gas sector than it does to clean technologies.**<sup>143</sup>

The Government of Ontario provided nearly \$700 million in subsidies for fossil fuel consumption in 2018. \$700 million in public money to expand natural gas, fund tax exemptions for aviation and rail, and support tax cuts for coloured fuel use in agriculture. Strictly from an economic point of view, fossil fuel subsidies produce negative side effects. They incentivize pollution and distort the market, unfairly handicapping clean energy alternatives. They significantly stunt Canada's urgent need to combat climate change and slow our transition to a low-carbon economy.<sup>144</sup>

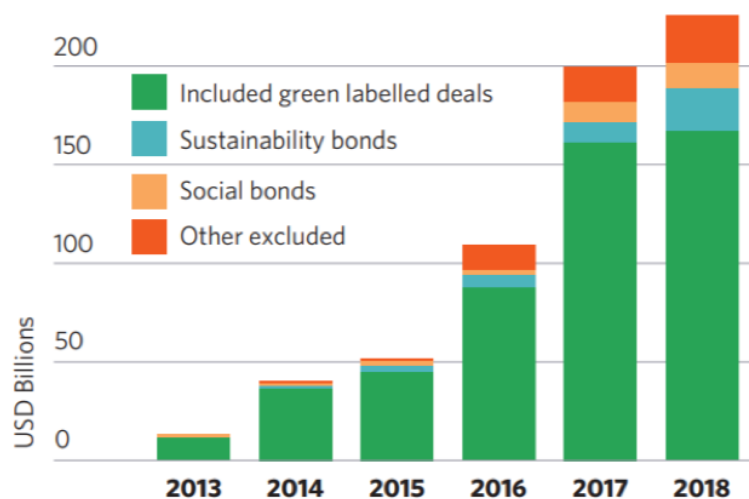
### Carbon Divestment and Green Bonds

Globally, there are now 1,000 institutional investors with combined assets of over \$6.2 trillion (USD) who have committed to carbon divestment, including many major insurance companies and the first country to divest from fossil fuels, the Republic of Ireland.<sup>145</sup>

Figure 8 shows the rapid growth of the global green bond market:<sup>146</sup>

- In 2018, labelled green bonds sold: \$168 billion (USD)
- Market share: USA 20%, China 18%, France 8%, Germany 5%, Netherlands 4%
- Top 3 issuers Fannie Mae USA (USD \$20 bn), Industrial Bank China, (USD \$9.6 bn), Republic of France (USD \$6 bn)
- Cumulative green bond issuance since 2007: \$521 billion (USD)
- USA leading with USD \$119 bn, followed by China USD \$78 bn and France USD \$57bn

**Figure 8: Growth of Global Green Bond Market (2013 to 2018)**



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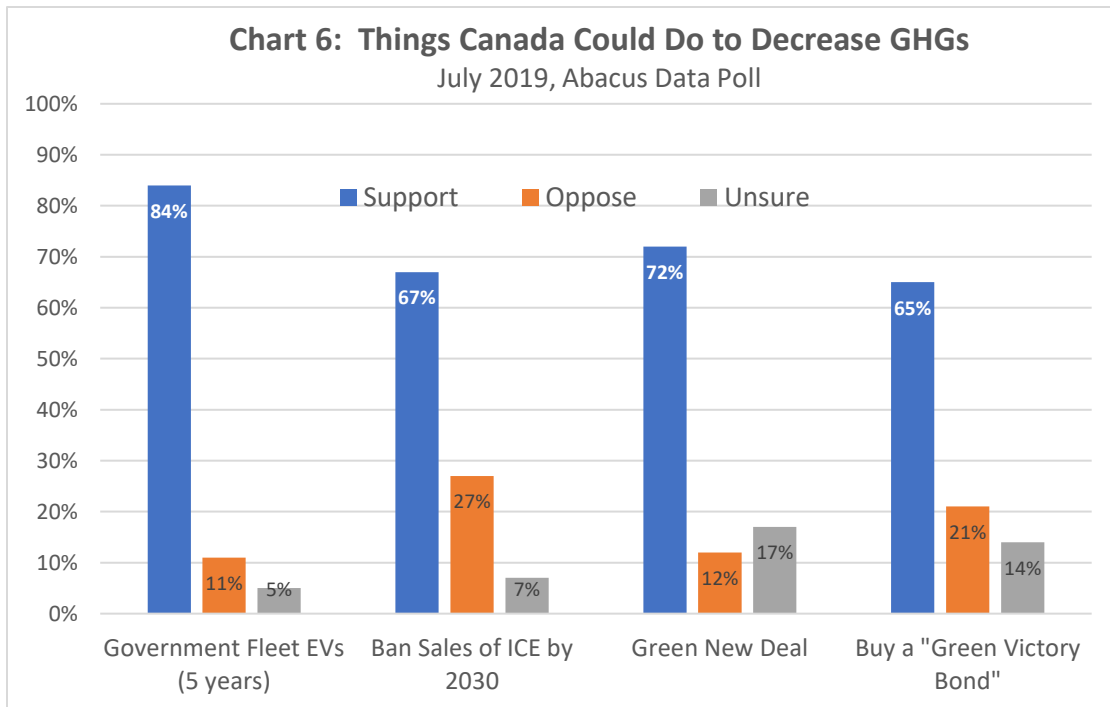
### Investments in EVs

Investments in electrified vehicles by 2018 included \$19 billion by automakers from the United States, \$21 billion from China and \$52 billion from Germany. The bulk of these investments will flow into China, where the government has enacted escalating electric-vehicle quotas starting in 2019.<sup>147</sup> So, like Canada and the United States, Europe could lose further auto manufacturing jobs to China. However, a recent study by Cambridge Econometrics – endorsed by BMW, Renault-Nissan, Valeo, ABB, trade unions, consumer group BEUC and green NGOs – concluded that 206,000 net jobs could be created in the EU through a shift to clean vehicles.”<sup>148</sup>

### Canadians Support EVs, Government Procurement and Green Bonds

In a recent Abacus Data Poll (July 2019), 57 percent of Canadians think the current federal government is doing too little to combat climate change.<sup>149</sup> So, what would Canadians support to reduce greenhouse gas emissions? Chart 8 shows that Canadians are well ahead of their own governments:

- 84%** support the transition of all government vehicles to EVs (like Canada Post) over 5 years
- 67%** support banning the sale of all gas-powered vehicles by 2030
- 72%** support (up from 66% in April 2019) a Green New Deal
- 65%** support buying a “Green Victory Bond” to pay for public infrastructure to tackle GHGs



The triple-bottom line objectives that would result from the estimated public investment (\$1.4 to \$1.9 billion and government procurement to replace Canada Post’s and other government fleet vehicles with BEVs) are significant:

1. Keeping and growing Canada’s manufacturing capacity and skills to help us meet our needs in the future while decreasing greenhouse gas (GHG) emissions.
2. Reaching a breakeven point in year 4, and making a modest profit in year 5.

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3. Creating over 13,000 jobs: up to 2,900 manufacturing-related (including 600 parts supplier jobs) and over 10,000 multiplier jobs.
4. Decreasing CO2 emissions by 400,000 metric tonnes by year 5.
5. Using this triple bottom line, public ownership model as an example for other projects.

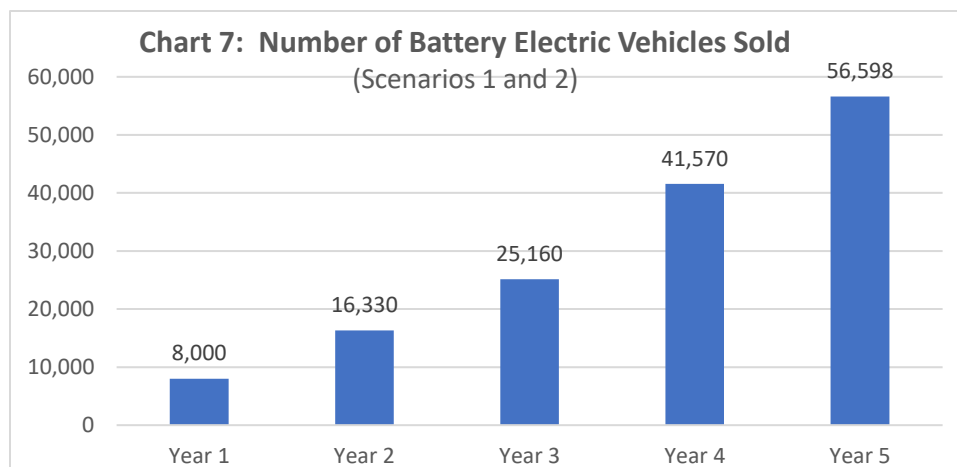
### 7.2 Forecasted Income Statement

The revenue forecasts are the same for each scenario and are shown in Table 4. Government procurement from the federal, Ontario and the top twenty municipalities (in Ontario) take the full production of 8,000 BEVs in Year 1. This government procurement strategy is important to both give the plant a kick-start and help provide the motivation for citizens to also switch to BEVs.

<b>Table 4: BEV Revenue Forecasts</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
BEV Light Utility Vehicle (number)	5,335	6,000	7,000	9,000	11,000
Price (\$2,500 deposit)	\$44,200	\$42,874	\$41,588	\$40,756	\$39,941
<b>Total Sales LUV BEV (\$000s)</b>	<b>\$235,807</b>	<b>\$257,244</b>	<b>\$291,114</b>	<b>\$366,804</b>	<b>\$439,350</b>
BEV Sedans (number)	2,665	5,330	10,660	21,320	29,848
Price (\$2,000 deposit)	\$39,000	\$37,830	\$36,695	\$35,961	\$35,242
<b>Total Sales BEV Model A (\$000s)</b>	<b>\$103,935</b>	<b>\$201,634</b>	<b>\$391,170</b>	<b>\$766,693</b>	<b>\$1,051,902</b>
BEV SUV (number)		5,000	7,500	11,250	15,750
Price (\$2,500 deposit)		\$45,000	\$43,650	\$42,777	\$41,921
<b>Total Sales BEV Model B (\$000s)</b>		<b>\$225,000</b>	<b>\$327,375</b>	<b>\$481,241</b>	<b>\$660,263</b>
Total Canadian Vehicle Sales	8,000	16,330	25,160	41,570	56,598
<b>Total Canadian Sales Revenue (\$000s)</b>	<b>\$339,742</b>	<b>\$683,878</b>	<b>\$1,009,659</b>	<b>\$1,614,738</b>	<b>\$2,151,515</b>

For the purposes of this preliminary feasibility study, Table 4 shows the vehicles considered in the financial forecasts. The pre-order deposits will help the start-up enterprise with cash flow, particularly in year 1, and the customer commitment will support more efficient manufacturing and logistics in the supply chain.

Chart 7 shows the number of vehicles sold each year in the financial forecasts for Scenarios 1 and 2. As production increases, with the support of government procurement, the assembly plant will reach its breakeven point of around 40,000 BEVs.



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The revenue forecasts could increase with:

- Higher replacement targets for government fleets (these forecasts use an overall target of 30% fleet replacement by year 5, with Canada Post replacing 85% of their fleet of 13,000 delivery vehicles),
- More favourable government policies for the shift to electric vehicles,
- The potential for municipal government ride-share programs (integrated with public transit), and
- Manufacturing other vehicles used for public services, like ambulances, shuttle buses, and small school buses.

To reach the forecasted breakeven point in sales by year 4 (about \$900 million), government procurement will represent 25 percent of purchases. After year 1, private company fleets and private individuals will purchase a growing number of vehicles.

Sales revenue is forecasted to double in year 2, and grow by 48% in year 3, 60% in year 4, and 33% in Year 5. This is a reasonable assumption, and is similar to the initial growth curve of other start-up BEV manufacturers like Tesla.

The forecasted income statements for the first five years of operation for scenarios 1 and 2 are shown in detail in Appendix 1. The tables below show the summary income statement forecasts for each scenario.

The financial forecasts are based on auto industry financial benchmarks for small, medium and large original equipment manufacturers (OEMs). The gross margin of 16.3 to 16.5 percent (as a percentage of revenue) that is reached by year 5 is near the lower end of the industry range of 16% to 22% for OEMs. Unlike capitalist firms that are motivated by maximizing profits and shareholders' wealth, our financial scenarios are tempered by our triple bottom line objectives. Therefore, we are forecasting a break-even operation in year 4, and a modest operating profit of \$12 to \$16 million in year 5 on \$2.2 billion in sales.

<b>Scenario 1: Forecasted Income Statements (\$000s)</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Total</b>	<b>Year 5 %</b>
Sales Revenue	339,742	683,878	1,009,659	1,614,738	2,151,515	5,799,533	100.0%
Cost of Goods Manufactured	291,159	581,296	852,152	1,353,151	1,800,818	4,878,576	83.7%
Gross Margin	48,583	102,582	157,507	261,588	350,697	920,956	16.3%
Operating Expenses	60,814	118,311	168,613	261,588	337,788	947,113	15.7%
<b>Operating Income (loss)</b>	<b>(12,231)</b>	<b>(15,729)</b>	<b>(11,106)</b>		<b>12,909</b>	<b>(26,157)</b>	<b>0.6%</b>
Working capital requirements	46,974	48,668	42,167	29,108	14,167	181,084	0.7%
Interest expense (3.95% prime for 15 years)	(34,743)	(32,938)	(31,061)	(29,108)	(27,076)	(154,927)	-1.3%
Income (loss) before income taxes							

<b>Scenario 2: Forecasted Income Statements (\$000s)</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Total</b>	<b>Year 5 %</b>
Sales Revenue	339,742	683,878	1,009,659	1,614,738	2,151,515	5,799,533	100.0%
Cost of Goods Manufactured	290,479	578,561	849,123	1,350,729	1,797,591	4,866,483	83.6%
Gross Margin	49,263	105,317	160,536	264,010	353,924	933,050	16.5%
Operating Expenses	60,814	118,311	168,613	261,588	337,788	947,113	15.7%
<b>Operating Income (loss)</b>	<b>(11,551)</b>	<b>(12,994)</b>	<b>(8,077)</b>	<b>2,422</b>	<b>16,136</b>	<b>(14,064)</b>	<b>0.7%</b>
Working capital requirements	34,713	34,953	28,785	16,983	1,915	117,349	0.1%
Interest expense (3.95% prime for 15 years)	(23,162)	(21,959)	(20,707)	(19,405)	(18,051)	(103,285)	-0.8%
Income (loss) before income taxes							

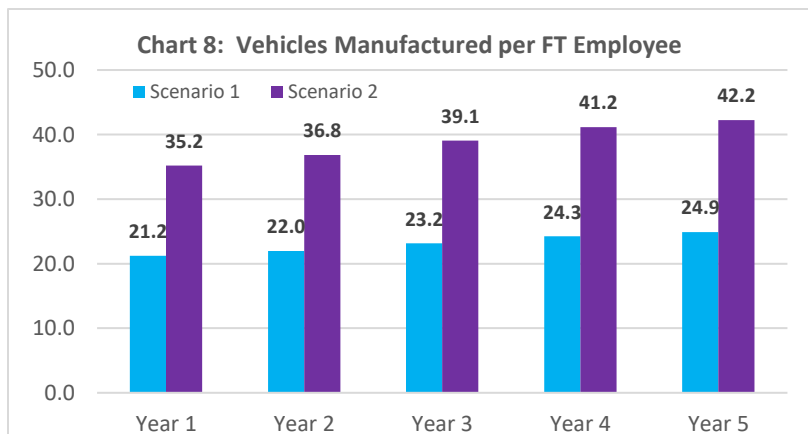
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Scenario 1 uses a manufacturing model that utilizes more in-house labour to manufacture parts (similar to Tesla) compared to Scenario 2 which uses more external parts suppliers (like the current GM Oshawa model). This is why a triple bottom line approach is important. Strictly from a financial point of view, Scenario 2 appears to be the preferred business model, because it requires a lower capital investment, lower labour costs, and is more profitable. However, Scenario 1 creates more in-house assembly jobs and it acquires the entire GM Oshawa assembly plant. This combination of more skilled labour and more manufacturing space provides more opportunity for creating other innovative products and increasing sales revenue.

In both scenarios, there will be a need for working capital to cover operating losses in the first three years of operation and the interest costs from the commercial loan used to capitalize the start-up. Like other public enterprises in Canada and other jurisdictions (including BYD in China), government subsidies are often required for working capital (particularly in the early years). In these financial scenarios, the working capital support begins to decline in year 3 and by year 5 or 6, the cash flow generated from operations is expected to cover the interest costs on the commercial loan, that has a fifteen-year amortization period.

During the initial five-year start-up period, the combination of government procurement and working capital support allows the publicly owned company to **grow employment, attain profitable operations** (at which point it will begin to pay dividends on government, worker and community members' shares), **and decrease CO2 emissions**. These are the three basic objectives of a triple bottom line. If we include the pride, hope and community resilience that the people of Oshawa (and Canada) will experience from repurposing the Oshawa assembly plant to manufacture BEVs, this public ownership model will motivate others to adapt it to meet their needs as the world faces the climate crisis.

Chart 8 shows the number of vehicles produced per year per fulltime employee (assembly and salary employees) growing from 21 in year 1 to 25 in year 5 for Scenario 1 (using an in-house parts production business model that requires more employees), and from 35 to 42 in Scenario 2 (that uses an external parts supply model with fewer employees). The OEM benchmarks for the number of vehicles manufactured per year per employee range from 26 (Toyota-GM Nummi plant at start-up) to 37 (Nissan)<sup>150</sup> for in-house parts production operations (Tesla was 18.6 in 2016), and from 47 (GM Oshawa 2018) to 101 (Smartville Toyota plant in France, that has 90 percent outsourcing for parts).<sup>151</sup>



## Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth

### 7.3 Triple Bottom Line Measures

This preliminary feasibility study uses a triple-bottom line approach to answer this question: ***Can the extremely underutilized GM Oshawa facility be converted to economically, socially and environmentally useful production?*** This is not a traditional feasibility study that only considers the financial return on investment and whether such an operation can match the global market competition from China, Mexico, South Korea or the United States. Rather, it is based on a triple bottom line evaluation, including:

1. An economic analysis of current and emerging market needs, capital investment required, skills and equipment available at the GM facility and in the community, and the potential new products that could be manufactured.
2. Social needs in the Oshawa community for well-paid, dignified work that builds on the city's hundred-year tradition of auto assembly.
3. How production at the plant can address the defining issue of our times, climate catastrophe, and identify ways to build Canada's productive capacity to manufacture the products we will need in the future.

#### Economic

Global auto companies are quickly shifting their investment to electric vehicles (zero emission). They will continue to make profit on their old technology, internal combustion engines (ICE), shifting the environmental costs to our society as long as our governments let them. British Columbia, Quebec, California, some European countries (led by Norway), and China have implemented government policies that support the shift to zero emission vehicles. The result has been the birth of a new industry – electric vehicles – on a large scale.

**This preliminary feasibility study has shown that the soon to be closed GM Oshawa assembly plant could be used for battery electric vehicle (BEV) production, including procurement for government vehicle fleets (like Canada Post and police forces). Eighty-four percent of Canadians support this kind of investment.<sup>152</sup>**

The numbers are clear:

- With a public investment in the range of \$1.2 to \$1.9 billion, governments, workers and community members can repurpose the Oshawa ICE assembly plant to build BEVs for public and private use.
- Government procurement can give the new plant a kick-start, particularly in years 1 and 2, by purchasing 13,400 BEVs (representing about one-fifth of the estimated government fleet). These vehicles will pay for themselves over the course of their ten to twelve-year life through fuel savings and reduced maintenance costs.
- By year 4, the new Oshawa BEV assembly operation is forecasted to break even and make a modest profit in year 5 (in the range of \$12 to \$16 million, or 0.6 to 0.7 percent of sales revenue).
- By year 5, eight to thirteen thousand jobs will be created in Ontario, including 2,300 to 2,900 Oshawa BEV assembly-related jobs.

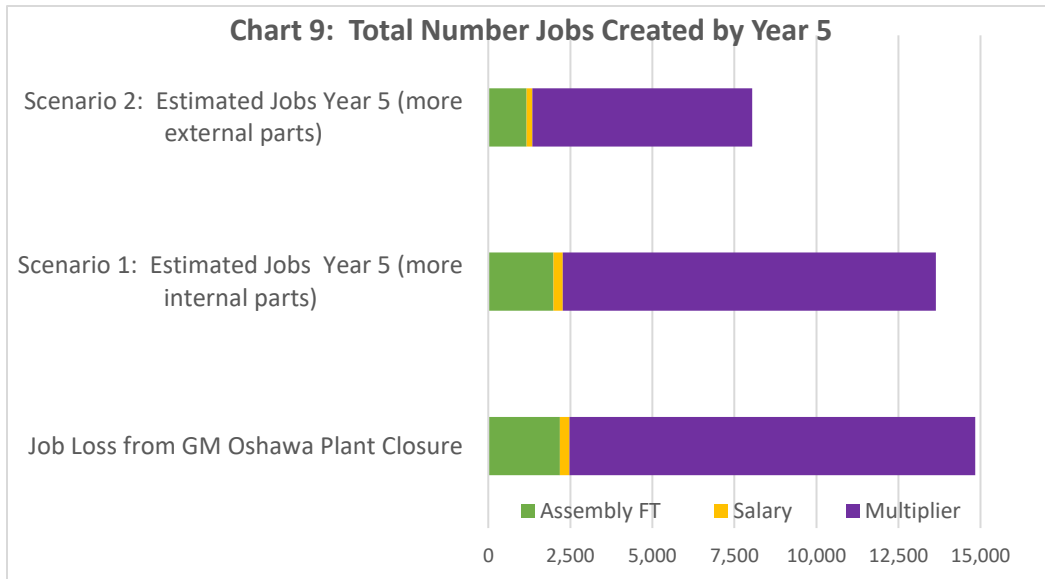
The skills and much of the equipment to build BEVs are already available in Oshawa and from its Ontario supply chain. And, by investing in a cutting-edge transportation and environment



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research hub, many other products could be produced to meet people's needs while also addressing the climate crisis.

Chart 9 shows the estimated total number of jobs that would be created by using democratic ownership to repurpose the GM Oshawa plant to assemble BEVs. A conservative multiplier of 5 (with full-time assembly and salary positions as the base) is used to estimate the number of multiplier jobs that will result from the investment.



### Social

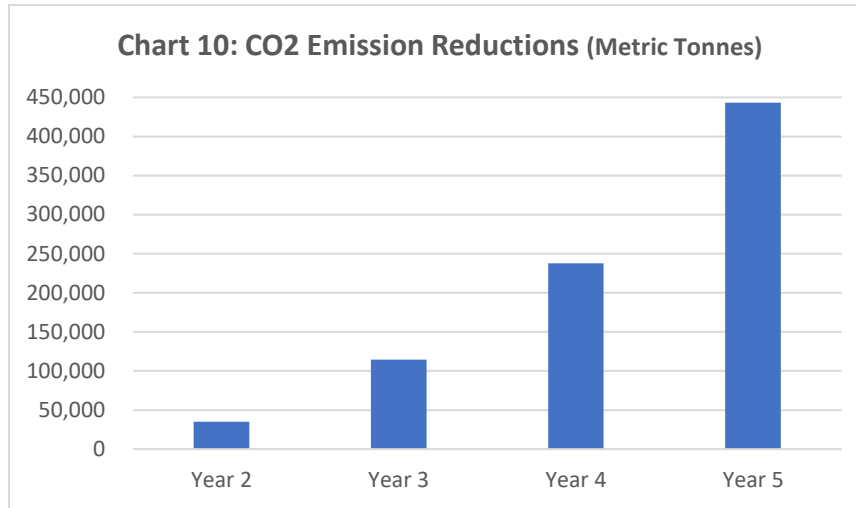
With the impending closure of the GM Oshawa assembly plant, the community will lose over 15,000 jobs. Instead, our governments can do what the voters want them to do: Invest in our communities' resilience and people by rebuilding our manufacturing capabilities to create the products we need as our population ages and we face the climate crisis. This investment will result in good paying jobs (we forecast a \$35 per hour wage for the BEV assembly-related jobs). And, we can do this through democratic ownership (government, workers and community owners invest in and own the BEV assembly plant) of a profitable business.

### Environmental

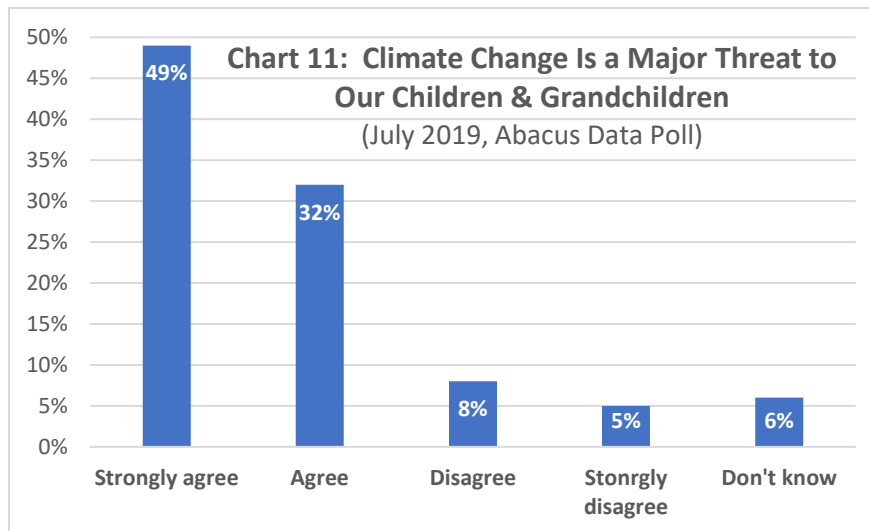
The climate crisis is a defining issue of our times, and people are feeling more anxious and more ready to act. The science is clear that climate change is being accelerated by our economy's reliance on fossil fuels, and we know that we need to change the way we make things, use things, and live our lives.

The closure of the GM Oshawa assembly plant provides a concrete opportunity to make a move in the right direction: democratic ownership to repurpose the Oshawa assembly plant to produce battery electric vehicles. The resulting reduction in greenhouse gases over the first five years of operation, as shown in chart 10, is the equivalent of 400,000 metric tonnes of CO<sub>2</sub>. As more BEVs roll off the assembly line and are put to use, replacing ICE vehicles over the coming years, the greenhouse gas emission benefits will continue to multiply.

## Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth



And, as shown in chart 11, to bolster the scientific evidence, 81 percent of Canadians feel that climate change is a major threat to our children and grandchildren and they want to do something about it so they can feel better and less anxious.<sup>153</sup>



## Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth

### 8.0 Conclusion

*Five preliminary feasibility criteria* framed the research and are evaluated in the study:

1. The potential number of well-paid manufacturing-related jobs (of the 5,000 that are being lost) and multiplier jobs (over 10,000 that are being lost) that could be retained in Ontario.
2. The potential for converting fossil-fuel internal combustion engine (ICE) vehicles to electric vehicles (zero emission), and the resulting decrease in greenhouse gas emissions.
3. The potential for some form of democratic, public ownership of the triple-bottom line production at the Oshawa plant.
4. How the GM Oshawa example can be used to inspire the conversion of other Canadian-based manufacturing facilities to triple-bottom line production.
5. The important role that governments need to play in creating policies that are supportive of triple bottom line economic development as a way to harness the collective entrepreneurship of industry, workers and communities.

This preliminary feasibility study offers an alternative to the closure of the GM Oshawa assembly plant. The Government of Canada can provide the leadership to acquire the GM Oshawa assembly plant and repurpose the production to building battery electric vehicles (BEVs). There is a good business case for this alternative, based on a triple bottom line analysis that considers the economic, social and environmental benefits:

- A public investment of \$1.4 to \$1.9 billion to acquire and retool the assembly plant.
- Manufacturing and selling an estimated 150,000 BEVs in the first five years.
- Creating over 13,000 jobs by year 5.
- Government procurement of one quarter of the BEVs produced in the first four years.
- Reaching a breakeven point in year 4, and making a modest profit in year 5.
- Decreasing CO2 emissions by 400,000 metric tonnes by year 5.

Here are the conclusions that have been reached by this preliminary feasibility study for each of the five criteria:

1. The financial forecasts show that over 13,000 jobs could be created within five years of the Oshawa assembly plant being retooled for BEVs: up to 2,900 manufacturing-related jobs (including 600 parts' supplier jobs), and over 10,000 multiplier jobs.
2. The conversion to zero emission vehicles is happening around the world, and Canadians want to make it happen here. The Oshawa plant is an ideal situation: the market, equipment, knowledge, skills and abilities are all in place.
3. The potential is real and the main barrier will be political. The question to ask our elected officials, and the candidates in this federal election: ***Will you invest in the future of our children and grandchildren through the implementation of a Green New Deal for Canada, using the electric vehicle retooling of the Oshawa auto plant as a concrete example?***
4. Making this project concrete will inspire other similar projects in Ontario, Canada, the United States and other countries and communities around the world.
5. There are a number of jurisdictions and countries around the world that are creating policies that support and encourage democratic, public ownership, and the shift to a carbon neutral economy. Tackling the combined issues of growing inequality, the climate crisis, and political instability will require people to work together in democratic

## **Triple Bottom Line Preliminary Feasibility Study of the GM Oshawa Facility: Possibilities for Sustainable Community Wealth**

organizations to find creative solutions to these intertwined issues. Government policies, investment and procurement are practical tools that we can use to target and reach triple bottom line enterprise objectives.

The next step to move this process forward will be to complete a full feasibility study that goes into more detail regarding the potential for government procurement, the types of vehicles required, the capital cost to acquire and retool the Oshawa assembly plant, and a realistic time line for doing so.

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**Appendix 1: Financial Forecasts for Oshawa BEV Assembly Plant**

Forecasted Income Statement	<i>Annual Financial Forecasts (CAN \$ thousands)</i>										
Oshawa BEV Financial Forecasts Scenario 1	Year 1	Year 2	Year 3	Year 4	Year 5						
% Real GDP growth	1.9%	1.6%	1.6%	1.6%	1.4%						
% Inflation (CPI)	2.0%	2.1%	2.1%	2.1%	1.9%						
Unemployment rate	5.7%	5.4%	5.4%	5.4%	5.5%						
% Revenue growth		101.3%	47.6%	59.9%	33.2%						
Number of vehicles sold	8,000	16,330	25,160	41,570	56,598						
New Vehicle Market Share (Canada)	0.4%	0.8%	1.2%	1.9%	2.5%						
Number of Direct FT Assembly Jobs	325	643	940	1,491	1,986						
Average Hourly Fulltime Wage	\$35.00	\$35.70	\$36.45	\$37.22	\$38.00	<i>Annual Financial Forecasts (% of Revenue)</i>					
Number of Multiplier Jobs (5x)	1,884	3,717	5,430	8,571	11,370	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>Sales Revenue</b>	<b>\$339,742</b>	<b>\$683,878</b>	<b>\$1,009,659</b>	<b>\$1,614,738</b>	<b>\$2,151,515</b>	100.0%	100.0%	100.0%	100.0%	100.0%	Benchmark
Direct Labour	39,410	77,962	114,091	180,851	240,970	11.6%	11.4%	11.3%	11.2%	11.2%	10-15%
Direct Materials	108,717	217,473	319,052	507,028	673,424	32.0%	31.8%	31.6%	31.4%	31.3%	20-30%
Assembly Plant	109,737	219,525	322,081	511,872	682,030	32.3%	32.1%	31.9%	31.7%	31.7%	40-50%
Overhead Allocation	33,295	66,336	96,927	153,400	204,394	9.8%	9.7%	9.6%	9.5%	9.5%	
<b>Cost of Goods Manufactured</b>	<b>291,159</b>	<b>581,296</b>	<b>852,152</b>	<b>1,353,151</b>	<b>1,800,818</b>	<b>85.7%</b>	<b>85.0%</b>	<b>84.4%</b>	<b>83.8%</b>	<b>83.7%</b>	80-86%
<b>Gross Margin</b>	<b>48,583</b>	<b>102,582</b>	<b>157,507</b>	<b>261,588</b>	<b>350,697</b>	<b>14.3%</b>	<b>15.0%</b>	<b>15.6%</b>	<b>16.2%</b>	<b>16.3%</b>	14-20%
<b>Operating Expenses</b>											
Research and Development	10,192	19,149	26,251	40,368	51,636	3.0%	2.8%	2.6%	2.5%	2.4%	2.5-10%
Selling, General and Administrative	42,468	83,433	120,149	187,310	243,121	12.5%	12.2%	11.9%	11.6%	11.3%	7-12%
Other	8,154	15,729	22,213	33,910	43,030	2.4%	2.3%	2.2%	2.1%	2.0%	1-7%
<b>Operating Expenses</b>	<b>60,814</b>	<b>118,311</b>	<b>168,613</b>	<b>261,588</b>	<b>337,788</b>	<b>17.9%</b>	<b>17.3%</b>	<b>16.7%</b>	<b>16.2%</b>	<b>15.7%</b>	11-17%
<b>Operating Income (loss)</b>	<b>(12,231)</b>	<b>(15,729)</b>	<b>(11,106)</b>		<b>12,909</b>	<b>-3.6%</b>	<b>-2.3%</b>	<b>-1.1%</b>		<b>0.6%</b>	2-6%
Working capital requirements	46,974	48,668	42,167	29,108	14,167	13.8%	7.1%	4.2%	1.8%	0.7%	0-2%
Interest expense (3.95% prime for 15 years)	(34,743)	(32,938)	(31,061)	(29,108)	(27,076)	-10.2%	-4.8%	-3.1%	-1.8%	-1.3%	-0.1-2.5%
Other income (expense), net											
<b>Income (loss) before income taxes</b>											

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Forecasted Income Statement	<i>Annual Financial Forecasts (CAN \$ thousands)</i>										
Oshawa BEV Financial Forecasts Scenario 2	Year 1	Year 2	Year 3	Year 4	Year 5						
% Real GDP growth	1.9%	1.6%	1.6%	1.6%	1.4%						
% Inflation (CPI)	2.0%	2.1%	2.1%	2.1%	1.9%						
Unemployment rate	5.7%	5.4%	5.4%	5.4%	5.5%						
% Revenue growth		101.3%	47.6%	59.9%	33.2%						
Number of vehicles sold	8,000	16,330	25,160	41,570	56,598						
New Vehicle Market Share (Canada)	0.4%	0.8%	1.2%	1.9%	2.5%						
Number of Direct FT Assembly Jobs	196	383	558	878	1,170						
Average Hourly Fulltime Wage	\$35.00	\$35.70	\$36.45	\$37.22	\$38.00	<i>Annual Financial Forecasts (% of Revenue)</i>					
Number of Multiplier Jobs (5x)	1,137	2,217	3,220	5,050	6,700	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>Sales Revenue</b>	<b>\$339,742</b>	<b>\$683,878</b>	<b>\$1,009,659</b>	<b>\$1,614,738</b>	<b>\$2,151,515</b>	100.0%	100.0%	100.0%	100.0%	100.0%	Benchmark
Direct Labour	23,782	46,504	67,647	106,573	142,000	7.0%	6.8%	6.7%	6.6%	6.6%	4-8%
Direct Materials	176,666	353,565	519,975	828,361	1,101,576	52.0%	51.7%	51.5%	51.3%	51.2%	50-60%
Assembly Plant	55,718	110,788	162,555	258,358	344,242	16.4%	16.2%	16.1%	16.0%	16.0%	20-30%
Overhead Allocation	34,314	67,704	98,947	157,437	209,773	10.1%	9.9%	9.8%	9.8%	9.8%	
<b>Cost of Goods Manufactured</b>	<b>290,479</b>	<b>578,561</b>	<b>849,123</b>	<b>1,350,729</b>	<b>1,797,591</b>	<b>85.5%</b>	<b>84.6%</b>	<b>84.1%</b>	<b>83.7%</b>	<b>83.6%</b>	80-86%
<b>Gross Margin</b>	<b>49,263</b>	<b>105,317</b>	<b>160,536</b>	<b>264,010</b>	<b>353,924</b>	<b>14.5%</b>	<b>15.4%</b>	<b>15.9%</b>	<b>16.4%</b>	<b>16.5%</b>	14-20%
<b>Operating Expenses</b>											
Research and Development	10,192	19,149	26,251	40,368	51,636	3.0%	2.8%	2.6%	2.5%	2.4%	2.5-10%
Selling, General and Administrative	42,468	83,433	120,149	187,310	243,121	12.5%	12.2%	11.9%	11.6%	11.3%	7-12%
Other	8,154	15,729	22,213	33,910	43,030	2.4%	2.3%	2.2%	2.1%	2.0%	1-7%
<b>Operating Expenses</b>	<b>60,814</b>	<b>118,311</b>	<b>168,613</b>	<b>261,588</b>	<b>337,788</b>	<b>17.9%</b>	<b>17.3%</b>	<b>16.7%</b>	<b>16.2%</b>	<b>15.7%</b>	11-17%
<b>Operating Income (loss)</b>	<b>(11,551)</b>	<b>(12,994)</b>	<b>(8,077)</b>	<b>2,422</b>	<b>16,136</b>	<b>-3.4%</b>	<b>-1.9%</b>	<b>-0.8%</b>	<b>0.2%</b>	<b>0.7%</b>	2-6%
Working capital requirements	34,713	34,953	28,785	16,983	1,915	10.2%	5.1%	2.9%	1.1%	0.1%	0-2%
Interest expense (3.95% prime for 15 years)	(23,162)	(21,959)	(20,707)	(19,405)	(18,051)	-6.8%	-3.2%	-2.1%	-1.2%	-0.8%	-0.1-2.5%
Other income (expense), net											
<b>Income (loss) before income taxes</b>											

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Appendix 2: USA Federal Grants and Tax Credits Given to Auto Manufacturers

% Total	Auto Company	USD\$ Subsidy	\$ CAN (@\$1.30)	Years	# Times	Jobs	Average/Subsidy	\$ CAN (@\$1.30)
27.7%	GM	\$5,178,474,003	\$6,732,016,204	1985-2015	15	14,120	\$345,231,600	\$448,801,080
20.7%	Ford	3,872,436,000	5,034,166,800	2000-2018	11	59,940	352,039,636	457,651,527
9.5%	Nissan	1,778,000,000	2,311,400,000	2000, 2005, 2009	4	8,975	444,500,000	577,850,000
9.3%	Toyota	1,735,800,000	2,256,540,000	1985 to 2018	6	15,750	289,300,000	376,090,000
8.2%	Chrysler (Fiat)	1,532,000,000	1,991,600,000	1997, 2010	2		766,000,000	995,800,000
6.9%	Tesla	1,287,000,000	1,673,100,000	2014	1	6,500	1,287,000,000	1,673,100,000
4.9%	Volkswagen	917,300,000	1,192,490,000	1976, 2008, 2014	3	9,000	305,766,667	397,496,667
3.4%	Hyundai-Kia	644,600,000	837,980,000	2002, 2006	2	4,500	322,300,000	418,990,000
2.9%	Benz-Chrysler-Fiat	535,300,000	695,890,000	1993, 2000, 2005, 2009	4	3,000	133,825,000	173,972,500
2.1%	Honda	389,200,000	505,960,000	1999, 2002, 2006	3	5,500	129,733,333	168,653,333
1.4%	Volvo	266,200,000	346,060,000	1999, 2015	2	3,277	133,100,000	173,030,000
1.4%	BMW	253,500,000	329,550,000	1992, 2002	2	400	126,750,000	164,775,000
1.1%	Subaru	203,832,868	264,982,728	1986, 2014	2	2,300	101,916,434	132,491,364
0.7%	Mazda	125,000,000	162,500,000	1984	1	3,500	125,000,000	162,500,000
100.0%	<b>Total</b>	<b>\$18,718,642,871</b>	<b>\$24,334,235,732</b>		<b>58</b>	<b>136,762</b>	<b>\$4,862,462,671</b>	<b>\$6,321,201,472</b>

Source: <https://www.goodjobsfirst.org/megadeals>

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Appendix 3: Vehicles made in Canada 2018



Vehicles manufactured in Canada (as of December 2018)

<b>Company</b>	<b>Location</b>	<b>Products</b>
<a href="#"><u>Fiat Chrysler Canada Inc.</u></a>	Brampton, Ontario	Chrysler 300, Dodge Challenger, Dodge Charger
	Windsor, Ontario	Dodge Grand Caravan, Chrysler Pacifica, Pacifica Plug-in Hybrid
<a href="#"><u>Ford of Canada Ltd.</u></a>	Oakville, Ontario	Ford Edge, Flex, Ford GT* (limited-edition), Lincoln MKT, MKX
<a href="#"><u>General Motors of Canada Ltd.</u></a>	Oshawa, Ontario	Chevrolet Impala, Cadillac XTS, Silverado, Sierra
	Ingersoll, Ontario	Chevrolet Equinox
<a href="#"><u>Honda Canada Inc.</u></a>	Alliston, Ontario	Honda Civic
	Alliston, Ontario	Honda CR-V
<a href="#"><u>Toyota Canada</u></a>	Cambridge North, Ontario	Toyota Corolla
	Cambridge South, Ontario	Lexus RX350, Lexus RX450h Hybrid
	Woodstock, Ontario	Toyota RAV4

Industry Canada, January 10, 2019. <https://www.ic.gc.ca/eic/site/auto-auto.nsf/eng/am00767.html>



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### Appendix 4: Ontario Brownfield Remediation Regulations

This information is from the Canadian Institute for Environmental Law and Policy

<http://cielap.org/brownfields/regulation.html>

Ontario has attempted to address the uncertainties, risks and costs associated with brownfield redevelopment. A series of legislative and regulatory reforms were introduced and implemented to encourage more development of brownfield sites.

The Ontario government began the process of amending brownfield law and policy in 2001 and made further changes in 2007. These changes:

*Established clear requirements for site assessments, including:*

- Procedures on how to conduct [Environmental Site Assessments](#) and [Risk Assessments](#)
- Updated standards for soil and groundwater quality
- [Qualified Persons](#) to conduct site assessments
- [Records of Site Condition](#) (RSCs) to certify the environmental condition of a property at a specific point in time
- Online [Brownfields Environmental Site Registry](#) to provide public notice of RSCs

*Provided some protection from environmental liability*

- Immunity from certain environmental orders for owners of sites for which RSCs have been filed on the [Brownfields Environmental Site Registry](#)
- Protection for secured creditors and municipalities who become involved in a brownfield development, or become owners of a brownfield property

*Established municipal planning tools and financial incentives*

- [Community Improvement Plans](#) that allow municipalities in need of urban revitalization to provide financial incentives, such as grants, loans or tax assistance
- Rebates on development charges in certain circumstances
- Brownfields Financial Tax Incentive Program that cancels all or part of the education property taxes of a property for up to three years

December 2009 amendments to Ontario's brownfields regulation will implement further changes when they come into effect in July 2011.

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### Appendix 5: Canadian Worker Co-operative Federation (CWCF)

The Canadian Worker Co-operative Federation (CWCF) is a national, bilingual membership organization of and for worker and multi-stakeholder co-operatives.

#### **CWCF Vision**

To be a growing, cohesive network of democratically controlled worker co-ops that provide a high quality of worklife, and support the development of healthy, just and sustainable local economies, based on co-operative values and principles.

#### **CWCF Mission**

1. To work in solidarity with our members to achieve our Vision of a Co-operative Economy
2. To support the development of new worker co-ops
3. To strengthen the Federation, to animate the worker co-operative movement; and
4. To represent and promote the Canadian worker co-op movement in Canada and internationally

The CWCF has supported the start-up and development of many successful worker co-ops and works with its developer members to support the conversion of private businesses to co-operatives. It has performed research and created guides on worker co-operative development, and has hosted conferences, some in conjunction with trade union partners.

The CWCF and its developer members have the capacity to support the creation of democratically owned enterprises, and we are interested in applying this ownership model to more capital-intensive businesses, such as GM Oshawa, which have the potential to help address precarious employment on a larger scale, and help mitigate the impact of the climate crisis.

CWCF's policy interventions, primarily at the federal level, have resulted in enabling legislation for RRSP investments in co-operatives and the creation of its *Tenacity Works* community development investment fund. Its efforts within the co-operative sector were also a significant factor in the creation of the Canadian Co-operative Investment Fund. It has professional relationships with many community and co-operative organizations including: CoopZone Developers' Network; Co-operatives and Mutuels Canada; the Ontario Co-operative Association; the Union-Coop Council of the US Federation of Worker Co-ops; The Co-operators; the Canadian CED Network; the United Steelworkers, and SEIU; as well as LEAP and the Green New Deal for Canada.

Co-operative enterprises are a proven legal structure that integrates democratic ownership and decision-making. Co-operatives originated in England in the mid 1800's and follow the seven international co-operative principles.<sup>154</sup> Co-operatives are also leaders in operating and reporting using a triple bottom line. Worldwide, there are over 1 billion people who are members of 3 million co-operative enterprises, and they employ 280 million people.<sup>155</sup> About 40 percent of Canadians are members of a co-operative (including credit unions) and they employ 182,000 people. Canadian co-ops are a growing economic force, with growing membership. In 2015, they contributed \$61.2 billion to the Canadian economy (compared to \$16.4 billion by the automobile manufacturing industry.)<sup>156</sup>

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### Appendix 6: Democratic Ownership and the “Right to Own”

What is certain is that workplace democracy—like other forms of democracy—is shaped and disciplined not just by its internal rules, but also by external forces that limit or expand its potential. This means that what we need is a systemic transitional approach to the political economy of worker ownership, one that is optimistic about its future, but also recognizes and incorporates valid critiques from those who study the topic.

This approach does not need to consider worker ownership the sole form of enterprise under the next economic system, but if we believe that it has a significant role to play in the new economy then we should have a concrete agenda outlining feasible transitional goals to promote the type of workplace democracy we desire.

At that point, it becomes incumbent upon us to offer a path forward for progressive change—policy alternatives that provide sources of finance and revenue that are not dependent on ruthless, profit-driven competition; technical assistance and expert knowledge on a broad basis to worker-owners and those in the process of considering a transition; and mechanisms to encourage solidarity between worker-owned businesses and an expansionary orientation of individual businesses and the sector as a whole.

In our examination of the literature, we have identified measures that could potentially overcome specific obstacles to the creation of a large, transformative, democratic worker-owned sector in the parts of the economy where such enterprises are most viable and beneficial. The British Labour Party is moving in this direction—its manifesto pledges to double the size of the cooperative sector, establish a range of new public supports for worker-owned enterprises, and establish a “right to own,” which would grant workers a “right of first refusal” at the point where a closely held company or site is being closed or sold—this would also include initial public offerings on the stock exchange.<sup>44</sup>

We see the right to own framework as having five necessary legal components, backed up by five more necessary economic and institutional components:

1. The right to buy out a company that is being dissolved.
2. The right to buy out a company that is being sold.
3. The right to have the first opportunity to buy shares that are being floated on the stock exchange.
4. The right to buy out a workplace/plant that is being closed.
5. The right to buy out a workplace/plant that is being sold.

It is widely recognized that simply stating this right without additional sheltering and enabling institutions would have little effect on the economy. We will discuss what those institutions might look like, but the right to own framework must, at a minimum, guarantee:

1. The right to the time necessary to prepare potential buyouts.
2. The right to access expertise necessary to prepare a buyout.
3. The right to access an institutional ecosystem that can provide financial assistance necessary to carry out a prepared buyout.
4. The right to technical assistance and education necessary to operate a financed buyout.
5. The right to access sources of finance and expertise that are structured to promote values of cooperation and solidarity instead of profit-maximization and individual greed.

A framework based on these principles is desirable and viable, but it will require significant attention to detail. The policy proposal that follows is a general technical model for implementing the right to own principles above, based on insights from our review of Marcora, TOPA, and existing worker ownership models. If implemented by an ambitious and visionary government, these principles could provide the basis for a 21st century political economic model of worker ownership, fit for a new democratic economy. This is our contribution to that debate.

This is an excerpt (pages 21 to 23) from a policy paper written by Peter Gowan of The Next System Project in the United States: “Right to Own. A Policy Framework to Catalyze Worker Ownership Transitions”, April 19, 2019.  
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