

## Feedback on the potential modifications to Ontario Net-Metering to add Community Net-Metering

November 22, 2020

### **Summary**

With alignment of our mission to accelerate the world's transition to sustainable energy, Tesla appreciates the opportunity to provide feedback and supports the Ministry of Energy, Northern Development and Mines' efforts to expand the current net-metering regulations to create new economic opportunities for solar and battery storage.

Adding community net-metering into the current net-metering framework requires attention in a few different areas: (1) deciding who is eligible participate in the program; (2) evaluating the program design requirements; and (3) considering how community net-metering will affect the correlated regulations. While supportive of the proposed community net-metering policy in principle, Tesla's comments focus on highlighting the different opportunities for community net-metering and their respective applications in the Ontario market in order to avoid time-consuming and costly hurdles experienced by others who previously implemented similar types of programs.

It is important to consider the following items while finalizing the requirements for community net-metering:

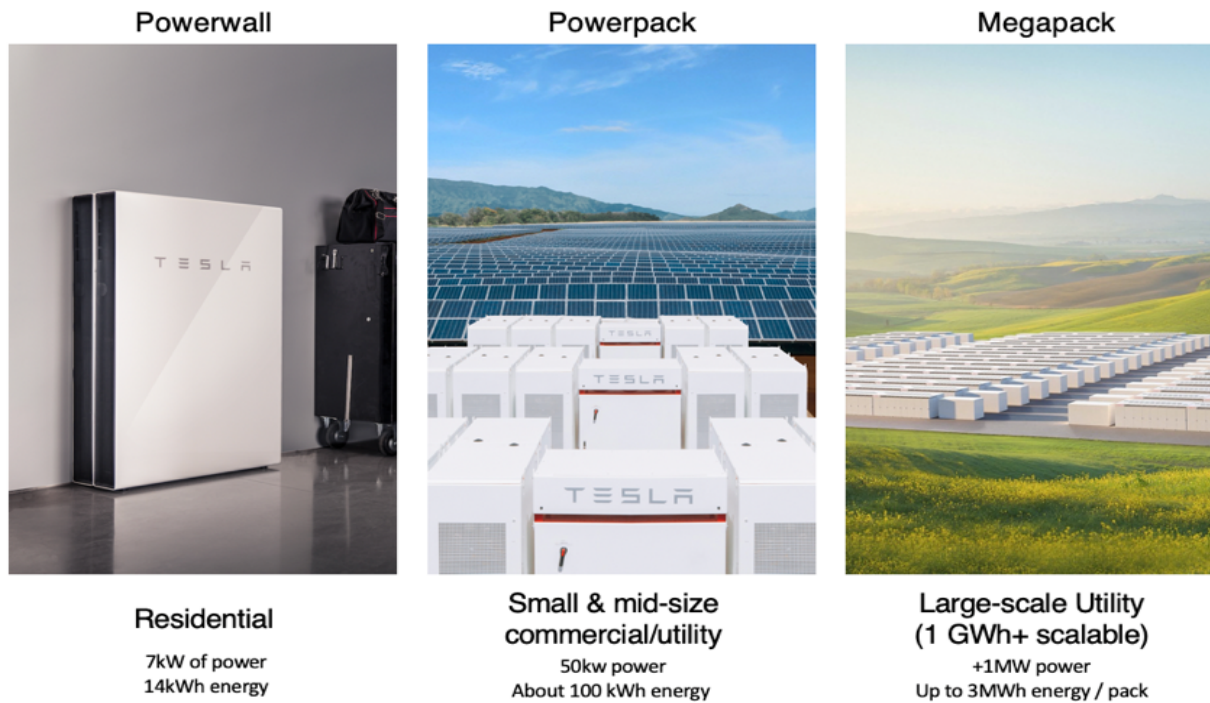
1. Allowing third party-ownership of community net-metered assets<sup>1</sup>
2. Permitting behind-the-meter generation and energy storage
3. Evaluating all options to determine the type of energy system that would best suite a particular community before moving forward with a project
4. Enabling widespread development of community-net-metering policies and restraining from restricting the policies to a handful of demonstration projects

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<sup>1</sup> Please also refer to Tesla Motors Canada ULC's submission on third party ownership of net-metered assets submitted to the Ontario government in 2018.

**Background**

Tesla is a sustainable energy company that manufactures and sells electric vehicles and solar and energy storage products. We are focused on creating a complete energy and transportation ecosystem from solar generation and energy storage to all-electric vehicles that produce zero tailpipe emissions. On the energy side of the business, Tesla offers two solar products; Solar Panels and Solar Glass Roof, and three energy storage products as shown below:



**FIGURE 1: TESLA ENERGY STORAGE PRODUCTS**  
 POWERWALL; POWERPACK; MEGAPACK

Tesla’s leadership in the battery storage industry and market is undeniable. This is demonstrated through the range of storage products we offer and the scale at which these projects are often deployed. Whether it’s a single Powerwall to store and deliver clean electricity in a home, scalable networks of thousands of Powerwalls aggregated into virtual power plants, or large-scale batteries exceeding hundreds of megawatts that providing grid-level blackout prevention and other services, Tesla’s leadership on energy storage is unmatched.

In addition to our global projects, Tesla’s energy storage products have been in significant demand in Canada. In total, Tesla has deployed approximately 287 MWh of capacity across Canada despite only recently starting deployments of large scale storage projects in the country. The majority of utility and industrial-scale product sales have been in Ontario, Alberta and Nova Scotia. Powerwall has also

experienced success in Canada, particularly in Ontario where a large portion of all Canadian Powerwall products have been deployed.

## **Impact of Community Net-metering for Ontarians**

### *Community Net Metering Ensures the Continuation of Ontario's Public Health*

In 2019, approximately 94% of electricity in Ontario was produced from zero-carbon emitting sources.<sup>1</sup> While 2019 represented the second lowest demand year for electricity in 25 years,<sup>2</sup> some areas of the province saw increases in demand (Windsor-Essex, due to agricultural demand). Additionally, Ontario's long-term energy outlook suggests increased electricity demand (particularly in the residential, commercial and agricultural sectors but also, to a lesser degree, for EVs).<sup>3</sup> Given the significant and successful, decade-long, effort to transitioning off fossil power in Ontario, forgoing this progress by meeting new electricity demand with polluting sources of generation would be unfortunate. Providing more options for the population to continue to generate and consume zero-carbon emitting energy can help people, communities, and businesses thrive with reliable, clean and economical energy.

In other countries, we have seen how rooftop solar had helped reduce the need for large scale grid investments or unhealthy fossil fuel generation, which in turn has prevented people from being exposed to harmful emissions including sulfur dioxide, nitrogen oxides and mercury. The detrimental consequences of fossil fuel generation can continue to be avoided in Ontario by providing the opportunity for diverse types of renewable generation and storage to be integrated into the energy mix. Community net metering, paired with solar and community-level storage systems, will protect public health and lead to cleaner air, as it will allow for a larger number of people to participate in renewable energy generation and consumption.

### *Community Net Metering Will Likely Create More Local Green Jobs*

The Canadian solar market is experiencing rapid growth, with 99% of its generated presence being in the Ontario market.<sup>4</sup> CANSIA estimates that by end of this year, the solar industry will have created approximately 65,000 job-years, employing a labour force of approximately 10,000 people per year in Canada.<sup>4</sup> The scope of roles in the industry range from early-stage project roles, such as manufacturing and construction to operations and project maintenance.<sup>4</sup> Creating the opportunity for community net-metering to thrive in Ontario means an increased number of jobs are likely to be created in the Province, as Tesla expects a community net metering policy would support accelerated demand for solar and storage products.

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<sup>2</sup> Ontario Independent Electricity System Operator (IESO) 2019 Year in Review. See: [http://www.ieso.ca/en/Corporate-IESO/Media/Year-End-Data#:~:text=Ontario's%20energy%20demand%20in%202019,energy%20resources%20\(Figure%20\).&text=Distribution%2Dlevel%20load%20contributed%20114.6%20TWh.](http://www.ieso.ca/en/Corporate-IESO/Media/Year-End-Data#:~:text=Ontario's%20energy%20demand%20in%202019,energy%20resources%20(Figure%20).&text=Distribution%2Dlevel%20load%20contributed%20114.6%20TWh.)

<sup>3</sup> IESO Annual Planning Outlook 2020

<sup>4</sup> CANSIA, 2020, "Roadmap 2020", [https://www.cansia.ca/uploads/7/2/5/1/72513707/cansia\\_roadmap\\_2020\\_final.pdf](https://www.cansia.ca/uploads/7/2/5/1/72513707/cansia_roadmap_2020_final.pdf)

Enabling community net-metering and establishing supportive policies could provide a great opportunity for many Ontarians. Policies and investments supporting community net-metering will contribute to the bettering of the Province’s electricity system, create jobs and help in the fight against climate change.

**Response to “Changes to Ontario’s Net-Metering Regulation to Support Community-Based Energy Systems”**

**Participation System**

Proposed:

Electricity utilities enter into a net metering arrangement with the customer leading the community net metering demonstration project

Tesla is generally supportive of policies that establish a relationship between customers and utilities for community net-metering. However, important changes to the government’s proposal would better accomplish the goal of minimizing costs and maximizing clean energy and air benefits. Prohibiting or restricting (whether intentionally or unintentionally) opportunities for communities and utilities to enter into other forms of contracts -- other than the typical customer/utility one -- would stifle innovation and investment. Requiring that all components of the equipment be owned by the same entity would limit the deployment of qualifying energy resources by disadvantaging some established business models that may be more cost effective for communities, ratepayers and utilities.

Reports suggest community solar, solar-plus-storage installations, and large projects are forecasted to account for most of the commercial solar market.<sup>5</sup> They estimate that over the next few years, community solar will account for 30% of the market, followed by solar-plus-storage accounting for 19%, and large projects accounting 23%.<sup>5</sup> In addition, in the United States, the majority of community solar and solar storage hybrid systems were nearly all owned by third parties.<sup>5</sup> Allowing third parties to also enter into agreements has enabled several jurisdictions in the United States to foster a thriving solar industry sector.<sup>5</sup> Limiting participation exclusively to customers entering into community solar asset opportunities discourages practical, economical and innovative business models and seems contrary to the government’s overarching policy objectives for the electricity market.

Recommendation:

- **Ensure that the proposed community net-metering arrangement does not discourage third party ownership of community net-metered assets.** Restricting ownership to communities or utilities exclusively will reduce investment and potentially lead to higher costs. Ontario’s regulation should ensure no regulatory barriers are created that undermine proven business models and

<sup>5</sup> Greentech media, April 2018, “Commercial Solar May Be 78% Third-Party Owned by 2021”, <https://www.greentechmedia.com/articles/read/commercial-solar-expected-to-be-78-third-party-owned-by-2021>

provide more flexibility and choice to Ontarians. **Specifying the utility asset arrangement without comment or support for alternatives results in a loss of customer choice.**

## Design Considerations

### *Single vs Multiple Entity Net-Metering*

Proposed:

The customer who leads the community net metering demonstration project can use more than one meter to manage generation and loads within the community, and generation credits are transferrable between these meter billing accounts

Tesla is supportive of allowing a customer leading community net metering projects to use multiple meters to manage the generation and loads within a community and the issuance of credits between accounts. Indeed, this is necessary for community net metering to function properly. However, this approach, called “single-entity virtual net metering”, is not the only approach that should be enabled, though it does provide an opportunity in the following example scenarios:

- **Enables individuals or entities with multiple meters to participate.** Entities owning multiple buildings and wanting to generate renewable energy could utilize single-entity net-metering and dispatch credits throughout properties.
- **Provides a solution for Universities and District School Boards.** For educational institutions, the aforementioned model would be ideal. The “main customer” to the utility would be the educational institution itself, and it could generate electricity and distribute the awarded credits to the respective campuses and metered accounts.

While the preceding scenarios provide potentially helpful consideration, it is important to remember that the use case for community net-metering will differ across the province – depending on which entities are involved, what goals they have, and what issues they are trying to solve.

Recommendation:

- **In addition to single-entity net-metering, Tesla suggests including a pathway for “multiple-entity net-metering” in community net-metering projects.**

Contrary to single net-metering systems, multiple-entity net-metering provides more flexibility in terms of range and scalability. Allowing multiple entity net-metering would provide an opportunity for electricity generated by an installation to be distributed by local distribution companies and attributed to multiple customers, such as entire communities or neighbourhoods, based on their ownership shares of the installation. Although the administrative costs of the utility can arguably increase because of the greater complexity of the credit distribution, the overall costs of community net-metering would significantly lower

through economies of scale. Tesla believes multi-entity net metering is important to bring to Ontario for the following reasons:

- **Targets city-centers and lower income communities:** An important use case for multiple-entity net-metering is the opportunity presented for condo and apartment buildings. As of the 2016 census, 28% of Canadian families lived in apartment buildings, Toronto being the 3<sup>rd</sup> largest hotspot for multiplex homes.<sup>6</sup> As of currently, this population cannot participate in net-metering and would not be eligible to participate in single-entity community net-metering. Outside of big cities, lower income families residing in multiplex buildings could also greatly benefit from the addition of multiple-entity community net-metering in the new regulations.
- **Provides an option for indigenous communities:** Multiple-entity community net-metering would enable all households on a reserve to part-take in the program. The government highlights its interest in applying the community net-metering model to indigenous communities, and this would be less feasible without the possibility for several households within a community to participate.
- **Encourages diverse and innovative business models:** One of the key goals outlined in the government's proposal is to provide a conducive environment for creativity and innovation. Allowing multiple-entity metering would do just that.

#### Consider Lessons Learned from Other Jurisdictions

- **Brief:** PG&E, the largest utility in California, is testing a "Community Microgrid Enablement Tariff". The systems involved will be eligible to provide distribution services and participate in demand-side management programs and CAISO markets while they are connected to the grid. The example of the Redwood Coast Airport is one to take as a model when including multiple customers to part-take in a community net-metering program. This project includes 19 customers, including Redwood Coast Airport and US Coast Guard air rescue station. Redwood Coast Energy Authority owns and operates 2.2MW Solar and 8.8 MW Tesla battery system (that powers the microgrid during emergencies), and PG&E owns and operates the distribution systems across which power flows (overseeing the operation of the microgrid's island mode when the regional grid is inoperable, or the utility implements a public safety power shutoff).<sup>7</sup> This pilot project serves as an excellent example of how multi-customer Micro-grids can be structured. Customers get the benefit of sharing infrastructure, which is proven to be less costly than traditional methods.<sup>8</sup>

<sup>6</sup> Statistics Canada, 2016, "Dwellings in Canada", <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016005/98-200-x2016005-eng.cfm>

<sup>7</sup> Microgrid knowledge, September 2020, "Multi-Customer Microgrid", <https://microgridknowledge.com/multi-customer-microgrid/>

<sup>8</sup> Greentech Media, August 2020, The Elusive 'Microgrid Tariff' Begins to Emerge in California, <https://www.greentechmedia.com/squared/dispatches-from-the-grid-edge/the-elusive-microgrid-tariff-begins-to-emerge-in-california#:~:text=The%20California%20Public%20Utilities%20Commission,for%20commercially%20viable%20microgrid%20projects.>

- Additional Features:** The front-of-the-meter design provides an opportunity for the output of the grid-tied solar capacity to be redirected to the microgrid in island mode. This means that the customers can operate indefinitely because the "community" included the Tesla batteries into their system.<sup>2</sup> Interfacing on the utility side of the meter enables the multi-faceted solar system to bid into the wholesale market, net-meter the airport, and supply the microgrid and batteries in times of need. This allows RCEA to generate new revenue, reduce operational costs for a major customer, and ensure resilience in wildfire and mudslide prone California, all from one solar farm.

As shown through the previous examples, allowing multiple-entity net-metering would enable a variety of options for the people, communities, businesses, and other entities of Ontario. Tesla strongly believes this is something to consider when officialising requirements for the newly proposed community net-metering policies.

*Inclusion of Behind-the-Meter Generation and Energy Storage*

Proposed:

Behind the meter renewable generation, and potentially energy storage, are part of the community electrical system serving customers within the community

**Tesla strongly supports the government’s proposal to include both behind-the-meter generation and energy storage.** Throughout the discussion so far, Tesla has outlined several examples of how community net-metering could come to play in Ontario (universities, district school boards, apartment and condo buildings, indigenous communities, etc.), and although these examples have all related to behind-the-meter generation, it is important to acknowledge these examples would not be as successful without energy storage.

Recommendations:

- Allow behind-the-meter energy generation**
- Include energy storage as a potential participant of community net-metering programs**

Including behind-the-meter generation provides a great amount of flexibility to customers and including energy storage in any renewable generation system is vital to maximizing the capital value of the solar investment and to providing the highest value operating service to the grid.

Energy storage can provide almost any grid service required other than producing electrons. Storage can act like generation, providing fast-responding ancillary services, shifting energy production from off-peak times to on peak times, reducing the need for new peaking generation capacity, and providing blackstart

capabilities. Storage can also act as transmission and distribution infrastructure, providing voltage support, reducing line losses, offsetting the need for new lines or transformers, and providing transmission and distribution congestion relief. Further, energy storage can provide benefits directly to customers when located on-site, providing back-up power, reducing demand charges, arbitraging time-of-use rates, and allowing for self-consumption of onsite generation like solar.

Battery storage can provide many benefits to customers when paired with behind-the-meter generation. Although Ontario is home to the majority of solar energy installations in Canada<sup>9</sup>, harsh winters cause concerns of reliability and stability. To demonstrate the vast potential and scalability of the products, Tesla presents a “Virtual Power Plant” (VPP) model to show how an entire community can be served with a hybrid of solar and storage, while also being connected to the grid and participating in community net-metering.

Tesla views VPPs as a critical priority in transitioning the world to sustainable energy. Behind the meter storage has unique characteristics because it can directly support customer energy needs, while being used for controlled market participation. Orchestration is critical to achieving this goal, as is proper market integration and the continued development of new and improved customer offerings. The data available from VPP assets can also help networks operate more safely. Power Networks have low visibility on voltage issues and power imports and exports from residential properties. VPP assets can provide this valuable data to enable the identification of faults early and remedy network issues before a problem arises. Data is critical for enabling dynamic export. An exemplary model of virtual power plants is one in South Australia:

- The South Australian Virtual Power Plant (SA VPP) was developed by Tesla with the support of the South Australian Government as an innovative approach for reducing the energy bills for South Australian housing trust tenants and private customers. International jurisdictions look to South Australia as a leader in both utility scale renewable energy and in managing the high penetrations of distributed energy. The work that Tesla is doing in South Australia is world class in both areas, and increasingly we are using our South Australia projects to drive new business development for our global energy work program.
  - *Project size:* 1,000 residential 5kW solar installations, paired with Tesla Powerwall (5kW/13.5kWh) battery systems, have been installed for the South Australia VPP, with plans to expand to 50,000 homes over the years to come.
  - *Additional benefits:* Customers also benefit from Tesla’s “Storm Watch” software. Severe weather is the leading cause of power outages. The Storm Watch settings allows the Powerwall to communicate with the National Weather Service to know when severe

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<sup>9</sup> NRCAN, October 2020, “Renewable Energy Facts”, <https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/renewable-energy-facts/20069>



weather is on the horizon and automatically triggers Storm Watch. This mode pushes the limits and charges Powerwall to maximum capacity, so it can provide backup power. When activated, the Tesla app notifies customers that they are in Storm Watch mode, and it remains active until the weather event ends.

This example provides a vision for behind-the-meter generation and storage and demonstrates how communities can be served through the combination of both resources.

### *Additional Design Considerations*

The community net-metering proposal does an excellent job of recognizing that there are improvements to be made with regards to the indigenous communities' energy systems. Off-grid communities, depending on diesel, face several challenges including the cost and transportation of liquid fuels to their communities.<sup>10</sup> Remote indigenous communities may not get benefits from the proposed regulation unless significant and very costly transmission infrastructure is put in place. These types of transmission extensions are likely to be underutilized, regardless of community net metering, and subject to disruption from winter storms in remote areas where repair services will be slow to respond.

It is worth noting that transmission extensions are often not the most effective method of supporting remote communities. The goal should be to transition these communities to reliable renewable electricity (wind, solar and biofuels) delivered through a robust microgrid. For remote communities, community net metering and microgrids should be evaluated as an alternative to possible transmission extensions. Microgrids and local generation would likely be far more cost effective and reliable.

### Consider Lessons Learned from Other Jurisdictions

Tesla has a number of successful Microgrid projects across the globe – all solving a unique problem. Although the specific problems change, the underlying first principles of these projects remain the same. The current method of providing electricity is costly, inefficient, unreliable, and polluting, while clean energy and storage products provide a green and simplified solution.

- American Samoa Power Authority project on the Ta'u Island: Located more than 4,000 miles from the West Coast of the United States, the island now hosts a solar power and battery storage-enabled microgrid that can supply nearly 100 percent of the island's power needs from renewable energy. Previously, the island was powered by diesel generations, and it was extremely costly to

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<sup>10</sup> NRCAN, "Reducing diesel energy in rural and remote communities", <https://www.nrcan.gc.ca/climate-change/green-infrastructure-programs/reducing-diesel-energy-rural-and-remote-communities/20542>

operate the system. Unpredictable tropical storms could make the shipping of diesel to this island difficult, and the energy system was in turn unpredictable. The new solar plus storage arrangement provides significant cost-savings, removing the hazards of power intermittency and eliminating the risk of power outages.

Relating back to the case of remote indigenous communities in Ontario, similar results could be achieved by pairing renewable energy with energy storage. The underlying similarities are that transportation of diesel to these communities is costly and can be unpredictable due to storms – whether they be tropical or in this case, winter storms.

Recommendations

- **Explore opportunities to make community net metering a positive economic opportunity for remote communities and indigenous communities that are already transmission connected.**
- Support communities that are not transmission connected by deploying robust microgrids powered by renewables like solar, wind, hydro and biomass.

**Limiting to Demonstration Projects**

Proposed:  
 Limited participation in the demonstration (e.g., total number of projects; capacity limits for individual projects and/or all projects)

We believe restrictive regulations for deployment of solar and storage projects are unnecessary, since there are so many case studies around the world which we can study and learn from. Limited participation through demonstration projects is appropriate when testing a new concept. However, in this case, there is nothing new. A significant number of States, as well as Provinces, can be examined to learn about community net-metering. If having demonstration projects is necessary, they should be evaluated quickly, and if successful, the regulations should be available to everyone soon after.

Recommendations

- **Make community-net-metering available province-wide**, and not limit participation to a few projects

**Implications for Current Regulations**

Proposed:  
 Billing of sub-metered customers within the community is in accordance with Ontario’s Energy Consumer Protection Act, 2010, the Unit Sub-Metering Code, and any other applicable codes and rules

Tesla is supportive of this requirement and has no additional comments at this time.

Proposed:  
Reporting requirements to measure performance

Tesla is supportive of this requirement, although some information may be commercially sensitive or subject to supplier-customer non-disclosure agreements. Such conditions must be taken into account in any reporting requirements established.

Recommendation:

- Develop specific reporting metrics and avoid requiring reporting of commercially or customer sensitive data that is not directly related to administering the program or projects.

Proposed:  
Compliance with all applicable electricity codes and rules in Ontario.

Tesla is supportive of this requirement and always places safety as the top priority. We have no additional comments at this time.

Proposed:  
Net metering agreements that describe the roles, responsibilities, and obligations between the utility and lead community net metering customer

Tesla is supportive of written agreements which outline the roles, responsibilities and obligations of all parties involved. This has been shown to keep programs well organized. We also recommend that third-party owned developers be allowed to own and operate projects and that guidelines be developed to support participation.

**Conclusion**

If implemented, the proposal presented would greatly benefit many communities in Ontario. Tesla has offered a range of additional suggestions and enhancements to further contribute to the success of community net-metering in Ontario. To sum, Tesla generally supports the government's proposals to expand the current limitations of the community net-metering policies, drive innovation and investment, and deliver a great energy system.

Ultimately, Ontario's efforts will be most effective when a wide range of business models and options are offered to the diverse Ontarian communities. Tesla stands ready to support the government in the further development of any of its policy concepts, drawing on its extensive international experience. If you have any



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Thank you for the opportunity to provide these comments.

## Appendix

### About Tesla Inc.

We design, develop, manufacture and sell high-performance fully electric vehicles (“EVs”) and energy generation and storage systems, and also install and maintain such energy systems and sell solar electricity. We are the world’s first vertically integrated sustainable energy company, offering end-to-end clean energy products, including generation, storage and consumption. We have established and continue to grow a global network of stores, galleries, vehicle service centers, Mobile Service technicians, body shops, Supercharger stations and Destination Chargers to accelerate the widespread adoption of our products, and we continue to develop self-driving capability in order to improve vehicle safety. Our sustainable energy products, engineering expertise, intense focus to accelerate the world’s transition to sustainable energy, and business model differentiate us from other companies. Tesla Inc. is the largest supplier to EVs to Canada and draws on an extensive Canadian-based supply chain to build and deliver its vehicles and other products.

### About Tesla Motors Canada ULC

Tesla’s Canadian subsidiary, Tesla Motors Canada ULC, is one of Canada’s largest electric vehicle industry employers, with over 750 current Canadian-based employees working in manufacturing and machining, research and development, administration, infrastructure, and vehicle sales/service. Tesla’s growth in Canada includes more than just passenger car sales. Tesla and its Canadian subsidiary:

- (1) operate three R&D labs in Canada;
- (2) operate a manufacturing facility in Richmond Hill, Ontario;
- (3) operate the most-used, coast-to-coast, EV charging network in Canada;
- (4) have a recognized and extensive workforce development program (University of Toronto Engineering, Co-op Employer of the Year); and,
- (5) are suppliers of large-scale energy storage products to Canadian industries and utilities.

Tesla’s three battery-focused R&D facilities in Canada are driving innovation in chemistry and longevity, cathode manufacturing innovation, and state-of-the-art, high speed manufacturing automation. Tesla’s Richmond Hill manufacturing facility develops and builds what we believe to be the world’s leading high-speed, continuous-motion assembly equipment for advanced EV batteries. The high-speed battery manufacturing lines designed and built at Tesla’s Richmond Hill facility are being deployed to Tesla factories around the world and will be used by Tesla to manufacture the world’s most advanced EV batteries.