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To Whom It May Concern,

The Ontario Society of Professional Engineers (OSPE) is the advocacy body and voice of the engineering profession. Ontario currently has over 85,000 professional engineers, 250,000 engineering graduates, 6,600 engineering post-graduate students and 37,000 engineering undergraduate students.

On December 15, 2022, the Independent Electricity System Operator (IESO) released the “Pathways to Decarbonization” (P2D) study. The Ministry of Energy is seeking feedback on the findings of the P2D study in this consultation, and, the IESO’s “no-regret” recommendations.

Below are some considerations from OSPE’s Energy Task Force.

### **Electrification of Building Heating and Transportation**

We understand there may be different perspectives on the importance of policy priorities around electrification of building heating and transportation. We believe that energy policies should encourage innovation in clean technologies, support their commercialization, and promote the mass deployment of solutions that are scalable and cost competitive. It is not the role of policy to pick specific technologies; rather, policy should provide a framework that allows for the development of a diverse range of clean energy solutions. Government doesn’t necessarily need to mandate electrification of building heating and transportation if smarter, more cost-competitive solutions are available.

As Canada relies heavily on international trade, we cannot afford to have energy costs that are significantly higher than those of our trade competitors. Therefore, we must prioritize the adoption of solutions that are both clean and cost-effective. By doing so, Ontario can continue to be a national leader in clean energy without sacrificing its economic competitiveness.

### **Ontario’s Unique Climate and Geographic Challenges**

OSPE believes that policy solutions must take Ontario’s unique climate and geographic challenges into account. It is important to base policy decisions on evidence and studies that are specifically focused on the challenges of cold climate countries like Canada. Ontario’s approach to the electrification of building heating and transportation should be informed by the best available evidence and expertise.

### **Pragmatic Approach to Net-Zero Provincial Goal**

A recent study by the IESO suggests that Ontario will require nearly three times the current installed capacity of the electrical system by 2050 to achieve the net-zero federal goal across the province’s economy. While this is an important goal, it is also important to consider the practical challenges that come with achieving it.

One such challenge is the competing demand for skilled labor and natural resources that are required to build new homes and urban infrastructure for Ontario’s growing population. Simply electrifying all energy use may not be a practical solution given these constraints. Therefore, it is important to explore a range of options that



can help meet the net-zero target by 2050. By taking a pragmatic approach to this issue, Ontario can make progress towards these goals while also taking into account the practical realities of achieving them.

### **Integrated Clean District Energy Systems**

To reduce the cost of building heating in urban areas, policies should incentivize the development of integrated clean district energy systems that include clean combined heat and power. Such systems are already being developed in many European cities and have proven to be cost-effective for urban areas. This becomes more significant with the rising number of large data centers, which generate waste heat, and recent advancements in passively safe modular nuclear reactors that can supply both electricity and heat and can be located closer to urban centres.

Producing clean and reliable heat is less expensive than producing clean and reliable electricity on a unit energy basis. Therefore, it makes more sense to focus on developing cost-effective clean heating solutions for urban areas. Integrated clean district energy systems that utilize waste heat and modular nuclear reactors can play a significant role in achieving this goal.

### **Use Of Net-Zero Synthetic Liquid Fuels**

Although electrification of light vehicles in urban areas is cost-competitive, the same cannot be said for heavy-duty vehicles, off-road vehicles, and construction equipment. In these cases, synthetic emission-free liquid fuels may be a more practical option. Additionally, if synthetic liquid fuels become available for this sector, they could be used to complement air-sourced heat pumps for building heating in rural areas on very cold days. Ontario already has an extensive distribution system for liquid fuels, which the province should leverage rather than retire.

Recent studies at MIT suggest that net-zero synthetic liquid fuels can be produced in large refineries from biomass wastes, heat from nuclear reactors, and hydrogen from steam methane reforming with carbon sequestration and storage, at prices competitive with crude oil at \$80 per barrel. This approach could provide a viable solution for heavy-duty vehicles and off-road equipment and help the province move towards a net-zero emissions future.

### **Clean Energy Is Capital Intensive**

Clean energy has a high fixed cost and a low volumetric cost, which is the opposite of high-emission energy. Unfortunately, Ontario's energy policies were developed during a time when the province relied on high-emission energy sources with lower capital costs and much higher volumetric costs. As a result, current energy policies mandate retail energy pricing that recovers costs based on the volume of energy used. This approach discourages clean energy development and encourages continued high-emission energy use. In addition, retail pricing policies discourage the use of available surplus clean energy during off-peak periods because the retail volumetric price set by provincial regulators is several times higher than the actual marginal cost of producing additional clean energy.

To address this issue, Ontario must find a different mechanism than volumetric energy rates to recover fixed costs. Current policies result in the province curtailing surplus clean energy or selling it to adjoining US markets at very low marginal costs of production without recovering any fixed costs. This is not sustainable in the long run, and the province must encourage development of new pricing policies that incentivize clean energy use during off-peak periods and ensure fixed costs are recovered. This will require a shift in energy policy towards supporting clean energy development and finding ways to make it more affordable and accessible for consumers.



The federal and provincial governments must take an integrated approach to energy planning that encompasses all sectors. By doing so, government leaders can capitalize on the synergies among electricity, heating, and transportation requirements and reduce energy waste. Currently, energy producers are discarding significant amounts of energy due to the lack of integrated planning and policy direction. For instance, in Canada, most thermal energy used to generate electricity at nuclear and fossil fuel power plants is wasted. This might have been acceptable in the past, when emissions were not a concern and energy was cheap. However, in today's world, where the impact of emissions on the environment is of paramount importance, this approach is unsustainable. Therefore, it is essential to develop policies that prioritize the efficient use of energy and reduce waste across all sectors. OSPE's Energy Task Force is willing and able to assist in achieving this goal.

OSPE welcomes the opportunity to discuss these matters further. If you have any additional questions please contact Paola Cetares, Public Affairs Manager ([p cetares@ospe.on.ca](mailto:p cetares@ospe.on.ca)) or Sara Mehraban, Policy Analyst ([s mehraban@ospe.on.ca](mailto:s mehraban@ospe.on.ca)).