



# PYROWAVE

**Integrating the cost to pollute: how to capture the main differentiator of clean technologies to accelerate the export of Canadian clean technology as we rebuild from the COVID-19 global pandemic.**

Within the mandate of the Standing Committee of International Trade about the export of Canadian clean technologies.

**By Jocelyn Doucet**

## By Jocelyn Doucet

Jocelyn Doucet is an entrepreneur, co-founder and CEO of Pyrowave, pioneer in chemical recycling of plastics and PhD in chemical engineering. He recently testified before the Federal Canadian Cleantech Export committee.



While it is generally recognized that Canada provides a healthy environment for clean innovation to launch, it is however lacking when it comes to scaling and exporting these technologies worldwide. Having bootstrapped a technology in the field of plastic recycling from lab to commercial scale over the last decade, I am aware that my experience is unique. I would like to share my understanding of the gaps that could be addressed to accelerate the deployment and export of Canadian clean technology as we rebuild from the COVID-19 global pandemic.

### **Adopting a carbon pricing**

The first element that will accelerate clean technologies here and abroad is putting in place a level playing field so low-carbon cleantech can truly capture their differentiation element at the financial level. One way to do this is by putting a price on carbon.

To give some context, in 2015, the International Monetary Fund issued a report in which they quantified the total subsidies to the fossil-fuel industry. Using their methodology, when we divide the total amount of subsidies by the amount of global emissions produced by combustion of energy feedstock, we obtain a price of approximately \$150/ton CO<sub>2</sub>.<sup>1</sup> If we look at a company like Pyrowave, a technology that turns polystyrene into its virgin basic product called styrene, the carbon emissions between fossil styrene produced by the conventional method is about 3 tons of CO<sub>2</sub> per ton of styrene produced, while recycled styrene produced with our technology is less than 1 ton CO<sub>2</sub>/ton styrene. By applying a carbon pricing derived above, switching from fossil to recycled would create a cost differentiation of \$300/ton. Putting such a price on carbon would therefore create a strong financial incentive for low-carbon solutions.

---

<sup>1</sup> 4,900 billion dollars post tax subsidies divided by 49.5 billion ton of CO<sub>2</sub> emissions x 65.5% of emissions produced by combustion of fossil fuels (Greenhouse gas emissions - Our World in Data)

Emissions of GHG related to fossil fuels combustion is 65% of global reported emissions. <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>

On the consumer side, when you are a global packaging company that buys 100,000 tons/year of styrene material, not switching to recycled will incur additional costs of \$30M year. In this example, while generating measurable environmental benefits, we create economical value.

Actually, recycled styrene, usually sold at a price that is higher than conventional styrene price, becomes cheaper once factoring in the carbon pricing.

### **Adopting policies and tariffs**

In addition to a carbon pricing, policies and specific tariffs can help Canadian clean technologies deploy internationally. Governments can apply regulation to encourage adoption of low carbon products or use tariffs and penalties to benefit specific industries.

In terms of policies, the EU has recently adopted a regulation that fixes targets for minimum content of recycled material in packaging and virgin products. In some jurisdictions, companies not complying with the regulation would have to pay a premium which also creates a financial differentiator that can drive corporate decision in the right direction.

Therefore, importing goods with high carbon footprint could create an unfair advantage against products made using low-carbon technologies. Such idea is called a Carbon Border Tax.

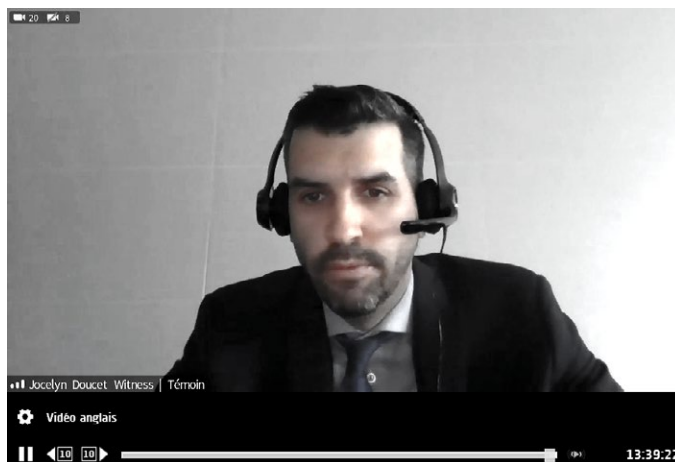
I believe such policies could help Canadian clean technologies. Either by providing a low carbon advantage to local companies currently using Canadian clean technologies or creating opportunities for Canadian clean technologies to implement their solutions in countries who export to Canada and are looking to reduce their carbon tariffs.

### **Conclusion**

My vision of the two solutions proposed are based on the experience I had navigating the ecosystem of clean technology development and its positive impacts on our economic growth and job creation.

Clean technologies are progressive. They represent the evolution of century-old technologies. Adopting clean technologies is adopting progress.

We have seen how rapidly the Canadian government invested in solving large problems like COVID-19. Canada can support the delivery of clean technologies around the world and lead a new clean economy.



Jocelyn Doucet is a chemical engineer and an entrepreneur dedicated to the development and marketing of innovations in connection with the transition in the use of our non-renewable resources to a circular economy business model. He is also the CEO of Pyrowave, a pioneer in electrification of chemical processes.