Good Morning Mr. Chairman and Honourable Senators,

I'm Jennifer Wagner, Vice President of Sustainability at CarbonCure Technologies. I'm grateful for the opportunity to speak with you today about CarbonCure and the role that clean technologies, such as CarbonCure’s, can play in transitioning Canada to a lower carbon economy.

I'd also like to highlight some of the challenges and opportunities that clean technology companies like CarbonCure have with respect to domestic adoption. I'll close with some policy recommendations for you to consider that could help the federal government realize the full environmental, export and economic benefits of Canadian clean technologies, such as CarbonCure’s.

Halifax-based CarbonCure Technologies offers concrete producers a technology to recycle and sequester waste carbon dioxide (or CO₂) into concrete. CO₂ is sourced from local industrial emitters and is injected into concrete during production. A chemical reaction occurs where the CO₂ is converted into a mineral, thereby becoming sequestered into concrete, while also making the concrete stronger, and less expensive to manufacture.

This technology reduces greenhouse gas emissions, lowers production costs and improves concrete performance. It’s truly a win-win solution. The company has attracted domestic and international venture investment, and has received numerous awards, including the 2015 Top 10 Building Products, the 2016 Manning Innovation Award, the 2016 Global Cleantech Top 100 award.

CarbonCure is also a semi-finalist in the global $20 million NRG COSIA Carbon XPRIZE challenge. Concrete made with CarbonCure's technology has been installed in hundreds of construction projects, including York University's Bergeron Centre and MGM's National Harbor in Washington, DC.

To date CarbonCure's technology has been installed in nearly 50 concrete plants, albeit only 2 of the roughly 900 ready mixed concrete plants in Canada are using the technology. Adoption has principally been in the United States with expansion efforts underway in both Canada and Europe.

The global clean technology market is expected to grow to $2.5T by 2022, yet Canadian companies are capturing less than 2% of the market share. CETA and recent federal climate and innovation policies provide Canadian companies with an opportunity to recapture some of this lost market share.
A special class of clean technologies, known as CO\textsubscript{2} utilization, is recognized as one the most promising sectors and key components of the Paris Agreement and Canadian federal and provincial climate change plans. These technologies, such as CarbonCure’s, allow us to re-think carbon dioxide by converting this harmful GHG into value-added products such as chemicals, plastics, fuels and concrete.

Canada has a global competitive advantage in the CO\textsubscript{2}-utilization technology sector that complements its existing strength in CO\textsubscript{2} capture and geological storage. In fact, 9 of the 27 semi-finalists in the Carbon XPRIZE, a global $20 million CO\textsubscript{2}-utilization competition, are Canadian companies.

A recent report by the Global CO\textsubscript{2} Initiative concluded that CO\textsubscript{2} utilization technologies could create a new market worth more than $1 trillion, and reduce global CO\textsubscript{2} emissions by up to 7 billion tonnes annually, which is equivalent to 15% of global emissions. Investing in this sector could result in this important class of innovative clean technologies developing into a Global Centre of Excellence in Canada.

By fostering the development of a CO\textsubscript{2}-utilization cluster, not only will Canada benefit from the environmental and economic benefits of these technologies, but spillover-benefits will be realized such as increased traditional industry productivity, new business formation, development of Pan-Canadian strategic networks and clean technology business scaling and export. CO\textsubscript{2}-utilization is a particularly important carbon mitigation strategy for the cement and concrete industry.

Concrete is the second most abundant material on earth, is Canada’s largest manufacturing industry and contributes roughly 5% of global greenhouse gas emissions. Due to its size and manufacturing process, it will be especially challenged to comply with CO\textsubscript{2} controls.

The Canadian concrete industry, like many traditional sectors, is built up of players who are “fast followers”. Producers are quick to adopt innovations once the technical viability and economic benefits are demonstrated within their local market.

Canada has the unique opportunity to play a role in catalyzing the adoption of CO\textsubscript{2}-utilization technologies, such as CarbonCure’s, by the 900 Canadian concrete producers. By helping industry to overcome initial technology adoption barriers with a national demonstration program; widespread industry conversion can occur, as is already underway in the United States.

Canada would then capture the full economic and environmental value of this important technology class, while enhancing the competitiveness of concrete manufacturing and fostering the growth and
exportation of Canadian CO₂ utilization technology companies. CarbonCure complements several public policy goals, including the Innovation Agenda, which focuses on clean technology and underlines the importance of commercializing Canadian innovations, and the federal government's mandate to create a greener, more sustainable economy, while supporting clean technologies with export potential.

Upon full rollout of CarbonCure's technology in Canada, greenhouse gases could be reduced by more than 10 megatonnes annually, while also saving concrete manufacturers more than $700 million in production costs through the year 2030.

The Government of Canada's Federal Sustainable Development Strategy outlines sustainable development goals in key strategic areas such as growing a vibrant clean technology industry in Canada that contributes to clean growth and the transition to a low-carbon economy. Specifically, Canada has committed to support the development, demonstration, commercialization, deployment, adoption and export of technologies that reduce GHG emissions.

CO₂-utilization is a priority area of innovation for the cement/concrete industry as they proactively act to reduce emissions and partner with government to create climate change regulations. Supporting the adoption of commercially available CO₂-utilization technologies will assist the domestic industry in transitioning to a low-carbon economy, while also increasing competitiveness of manufacturers and clean technology providers.

**Recommendation**

To summarize, made-in-Canada clean technology companies, like CarbonCure, have a disproportionately strong position in the rapidly growing global CO₂ utilization technology sector. However, these companies struggle to overcome scaling barriers of slow domestic adoption that may lead to failure, relocation to foreign markets or premature acquisition. Domestic adoption is stalled due to the financial, market, and technical risks facing early adopters.

The federal government has an opportunity to realize the full benefits of Canadian clean technologies that provide not only environmental, but also export and economic benefits to Canada. As the current leader in the global race to develop CO₂-utilization technologies, Canada has a unique opportunity to secure its share of this emerging $1 trillion market, which could reduce global emissions by 7 billion tonnes annually, or 15%.
Our recommendation for the Canadian federal government is to put a framework into place to accelerate **domestic industry adoption** of Canadian CO₂-utilization technologies. This framework would pre-qualify Canadian innovators to offer industry early adopters a direct subsidy or conditionally repayable loan, to implement CO₂-utilization technologies, such as CarbonCure, in a limited number of manufacturing facilities across Canada.

While procurement or legislative actions play an important role in moving markets over the long-term, direct financial incentives dedicated for industry early adopters could help Canadian innovators **scale their companies** in the near-term, allowing **Canadians to benefit** from the environmental and economic benefits that these technologies provide, and to **help Canada compete in** the new global low-carbon economy.

Thank you for your time Mr. Chairman and Honourable Senators, and I welcome any questions.