

PRE-BUDGET SUBMISSION

**WRITTEN SUBMISSION FOR THE PRE-BUDGET CONSULTATIONS IN ADVANCE
OF THE 2020 BUDGET BY CANADORE COLLEGE**



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CANADORE COLLEGE PROPOSAL:
A NORTHERN CANADA FOOD SECURITY INITIATIVE

LIST OF RECOMMENDATIONS

Recommendation 1: That the government expands its funding programming aimed at providing fresh produce in northern Canada to include funding for the manufacturing and distribution of hydroponic growing pods for Canada's north. This is an affordable and environmentally friendly solution.

Recommendation 2: That the government engage with northern communities and Indigenous leaders to find solutions to the produce shortages plaguing northern Canada.

**THE CHALLENGE: LIMITED ABILITY TO GROW AFFORDABLE FRESH
PRODUCE IN THE NORTH**

Supplying food to the northern regions of Canada for the Indigenous and non-Indigenous communities is uniquely challenging because of geographic and climate realities. There are five predominant issues that affect a healthy supply of produce to residents living in Canada's remote regions. These issues include:

- Affordability
- Adequate supply for the population
- Quality of produce available
- Diversity of produce available
- Inability to grow fresh produce

There are three significant factors that contribute to the challenges that prohibit adequate supply of fresh produce to remote regions of Northern Canada. These factors include;

- The high cost of transportation associated with delivery and distribution logistics of produce to these communities
- The lack of infrastructure to store produce in necessary controlled environments during the transportation and distribution process
- The markets inability to provide the quality, the diverse range of produce and supply levels necessary to meet the demands to feed the population residing in the Northern regions

While the government has launched programs like Nutrition North to address food shortages in northern Canada, produce shortages and sky-high prices are a constant in the north. Far too often the fruits and vegetables sold in northern Canada, however costly, are spoiled by the time they hit the shelves. This not only compromises the quality of the produce but its important nutritional value. Without a fundamental change to the current programs, negative health outcomes are likely to worsen as fresh produce becomes increasingly unavailable or priced out of reach.

As much of the produce shipped to Northern Canada is grown in greenhouse environments, this agriculture sector is also a major contributor of greenhouse gas emissions that is generated

THE SOLUTION – CREATING A FUND TO SUPPORT THE MANUFACTURING AND DISTRIBUTION OF HYDROPONIC ENERGROW PODS TO INCREASE AVAILABILITY OF FRESH PRODUCE IN NORTHERN CANADA

from demand of electricity and carbon dioxide emitted during the transporting of produce to the north. The high level of greenhouse gas emissions released in the shipping of fresh produce to northern Canada only compounds the environmental problem for residents in the far north. Nowhere are the negative impacts of climate change being felt more than in Canada's north. The population there deserves fresh produce at affordable prices that will not further impact climate change in the north.

Currently, the principal federal program that is dedicated to bringing healthy food to isolated northern communities, Nutrition North, offers subsidies on the following:

- a variety of perishable and nutritious food items (fruits, vegetables, milk, eggs, meat and cheese) shipped by air to an eligible community
- "country" or traditional food commercially-processed in the North such as Arctic char, musk-ox and caribou (important sources of nutrients) shipped by air to an eligible community

This program does not currently support locally grown produce, as, up until very recently, local growing was impossible. Thanks to advances in technology, this is no longer the case.

A team from North Bay, Ontario's Canadore College and their private sector partners have developed innovative hydroponic Energrow pods. These pods are available in sizes of 3 meters high x 3 meters wide x 6 meters in length, 3 meters high x 3 meters wide x 12 meters in length and 3 meters wide x 3 meters high x 18 meters in length. Customized sizes are available, however sizing is limited to the modes of transporting the units to site to these remote communities in the north. The Energrow pods, offer a sustainable controlled environment that

enables the production of locally grown produce within the remote areas of northern Canada. Canadore College and their partners have passed the prototype phase, and the Energrow pods are ready to be manufactured and distributed throughout northern Canada.



While this is a relatively low-cost solution, funds may be needed by northern communities to purchase the Energrow pods and have them shipped and operated. Federal money is critical in bridging the funding gap for many communities so that they can have access to this emission-reducing and health-promoting technology.

On average, the cost of the Energrow pods can range from \$120,000 for the smaller units up to \$300,000 much large units. This would include complete assembly, commissioning and monitoring. The best way to adequately price out the system is to understand the application requirements and location to meet the needs of the North communities. Canadore College believes that funding for programs, such as Nutrition North, need to be increased and expanded to include all costs associated with production and distribution of the Energrow pods. The capitalization of the Energrow pods can be reduced as a lease/maintenance program can be applied to maximize funding to expand this technology and localized growing opportunity across Canada.

Benefits of Grow Pods

MODULAR GROW UNITS



Fully integrated energy and monitoring system.

DC Electrical System

BIPV Solar: 14 kW
 Battery Storage: 37.5 kWh
 System Voltage: 48 Vdc
 Monitoring: OpSica #2



AC Electrical System

Inverters: 7.2 kW
 Supply: 120/240 Vac
 Service Panel: 80 Amps
 Monitoring: OpSica #2



Energrow pods utilize renewable, green energy technology, not diesel, to provide power, lighting, and hydroponic technology to the pods. The food produced within each system is isolated from pesticides, air pollution and other forms of contaminants, leading to a product that is beyond organic in terms of flavour and nutritional density. A key advantage that the Energrow pods offer is the lengthening of the growing season to all year round, even in the north. Existing greenhouse technologies have a far more limited growing season.

Produce output is based on the size of the units. This proprietary technology significantly outperforms traditional greenhouse technology by avoiding the many limitations of greenhouses, including drastic seasonal and temperature fluctuations, contamination, and inefficient use of space. In comparison, the proprietary **Energrow pod technology can be used to grow food year-round in ideal conditions.**

Each energrow pod generates its own energy to deliver heating, cooling, and electricity for its lighting and other horticultural systems with the use of solar panels. During the winter months when sun exposure is at a minimum, a 10 KW/h wind turbine is used to supplement each Energrow pod's power requirements, the combined system will also include state-of-the-art battery storage technology to ensure 3 days of full autonomy.

GROWING HEALTHY FOOD AND GROWING NORTHERN ECONOMIES

The opportunity exists to generate economic stimulus for remote and northern communities by **developing an agriculture sector** in each community to cultivate locally grown produce. This will improve the quality and affordability of food by eliminating the high cost of transportation and inventory spoilage. The quality locally grown produce will be affordable, nutritional in value, and environmentally friendly.

PRODUCTION OUTPUT COMPARISON: GREENHOUSE VERSUS GROW PODS TECHNOLOGY

The following chart compares the performance of greenhouse and grows pod technologies per square meter annually by crop:

Current Greenhouse output averages	Kg/square meter/annually	Grow Pods output averages	Kg./square meter/annually
Tomato	44 kg	Tomato	132 kg
Pepper	37 kg	Pepper	111 kg
Cucumber	32 kg	Cucumber	96 kg

For the Energrow pod systems, there are two factors that increase yield:

- The environment the Energrow pods deliver is precisely controlled and customized for specific crops and is far superior to that of a greenhouse. This factor alone **can almost double yields**.
- The Energrow pod technology is not limited by single levels as found in traditional greenhouses. In a standard pod unit, produce can be stacked up to a three unit vertical configuration. This would **minimize the foot print required** and centralize the solar and wind generation requirements.

BUILT IN NORTHERN ONTARIO FOR NORTHERN CANADA

The Energrow pods and lighting and control solutions would be manufactured in North Bay, Ontario, and can be customized to meet community produce needs. Unassembled units would be shipped to the remote sites where the Energrow pod crews would assemble and commission a pod every two and half days.

Training, maintenance, and operating packages are supported by a state-of-the-art monitoring system, providing real-time information to guarantee success. The overarching intention is to partner with Indigenous and other communities in developing Energrow pod farms to meet community food development programs.

Each Energrow pod is monitored by the manufacturer to ensure optimum operation and minimum downtime for maintenance. The operation of the Energrow pods will be taught by Canadore College to local community members under the guidance of the manufacturer.

ABOUT CANADORE COLLEGE

Canadore College of Applied Arts and Technology recognizes the effort and financial resources the federal government has deployed as part of its Food Security Initiative to supply food to northern and remote communities of Canada.

As an educational institution in North Bay, Canadore College is proud to be partnered with over 59 First Nation Communities in Ontario and Quebec. Through this partnership program, Canadore College has gone beyond its traditional role as an educator to facilitating and deploying leading edge technologies to improve the quality of life for its Indigenous partners.

A LASTING IMPACT FOR CANADORE COLLEGE'S STUDENTS AND COMMUNITY

Canadore College trains 3,750 students each year through applied learning, leadership and innovation. The college provides access to over 65 full-time quality programs and has outstanding faculty and student services. The College's three campuses - the Aviation Campus, Commerce Court and the Education Centre - and its students contribute nearly \$290 million to the regions of Nipissing and Parry Sound. Approximately **1,000 students graduate from Canadore each year**, and they join 41,000 alumni working across the globe.

CONTACT INFORMATION

We would be pleased to present our submission to the Finance Committee. Canadore College would also be happy to host consultations during the Finance Committee's upcoming consultation tour at our North Bay campus. Please do not hesitate to reach out to me anytime.

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