

CARES

1.0 Background

The “Centre for Agricultural Renewable Energy and Sustainability” (CARES) established at the University of Guelph, Ridgetown Campus is a hub for applied and adaptive research, training and education, technology transfer, and rural community development in bio-energy and the bioeconomy. Through extended interaction with its constituent community, CARES will build on the historic background and current skills of Ridgetown Campus to support the agriculture and agri-food sector by integrating an applied research program. This program will advance innovation and adoption of bioenergy through risk minimization, bench-marking and creation of value added components.

The fundamental goal of CARES is to create an applied research and demonstration facility that allows full testing and integration of new technologies, with the purpose of providing direct benefits at the farm gate level. Currently, no such centre with an integrated applied agricultural focus exists in Canada. While a few on-farm energy projects containing research components currently exist, there is a need for a much more strategic and integrated approach.

This concept has been developed in collaboration with the following founding organizations:

SOBIN (Southwestern Ontario Bioproducts Innovation Network)
Community Futures Development Corporation of Chatham-Kent
University of Guelph, Ridgetown Campus
University of Guelph
Ontario Ministry of Agriculture, Food and Rural Affairs
Municipality of Chatham-Kent
Agricultural Adaptation Council
Ontario Seed Corn Growers

Together with the support of over 40 stakeholder groups, these founding partners orchestrated the official establishment of the Centre for Agricultural Renewable Energy and Sustainability (CARES) in early 2009.

SOBIN in particular was instrumental in the conception of CARES. The mission of SOBIN is to strengthen the economy of Southwestern Ontario by accelerating the development and adoption of bioproducts, energy conservation and alternative energy sources within and across its industry clusters. Three main goals of SOBIN for achieving this include: 1. Strengthening the agricultural industry by fostering the creation of new value-added markets for agricultural products – such as energy, chemicals and materials – and reduce costs of operations through new bioproducts. 2. Enhancing the chemical industry by helping to generate new cost-effective sources of feedstock for eco-friendly chemical production and develop new biobased chemical products for export. 3. Advancing the automotive industry by introducing effective new bioproduct materials to the industry and its suppliers, including plastics and paints, which will lower production costs, improve performance and create more environmentally friendly outputs.

Essentially, SOBIN is working to build linkages and partnerships between the Agriculture, Chemical and Automotive industries to see these goals achieved. To accomplish this, SOBIN has been working on developing three main initiatives: 1. Working in partnership with the University Western Ontario’s Sarnia-Lambton Research Park to facilitate the development of biobased chemical opportunities. One of the main achievements in this area has been the establishment of the Bioindustrial Innovation Centre (BIC) – which will focus on the development and commercialization of industrial scale opportunities for incorporating biobased feedstock into chemical and fuel production. 2. Involvement in the creation of Ontario BioAuto Council (OBAC). This council has been established to help facilitate the commercialization of biobased

components in automobile manufacturing. The council has a \$5 million investment fund in place to help fund the late stage commercialization of biobased materials by private industry. 3. Working on the development of CARES (Centre for Agricultural Renewable Energy and Sustainability) – to create a centre to demonstrate and help commercialize agricultural renewable energy technologies that will focus on increasing farm gate and rural income.

While all three of these initiatives have their own particular focus, there will be synergies to be gained by building further linkages between them. For instance, by-products associated with some of the processes developed through CARES may have value to processes investigated by the other initiatives? (i.e. the potential for something like glycerin, or the oil gums from biodiesel production to be a feedstock for the creation of other value added chemicals or biocomposites – thereby linking CARES projects with BIC or OBAC projects.

1.1 The identified need

Finding new sources of clean, sustainable energy is often cited as one of the greatest challenges facing society today. Governments, educational institutions and private sector enterprises are seeking solutions through research, development, technology transfer and commercialization activities in areas such as biofuels and other forms of bioenergy. At the same time agricultural producers are faced with increasing economic challenges due to volatile commodity prices and sky-rocketing input costs. Furthermore, agriculture is coming under increasing pressure to recapture and recycle nutrients and improve water quality. Agriculture has also been targeted as a significant sink for carbon sequestration. Renewable energy production, carbon-sequestration, nutrient re-cycling, and clean water in agriculture are pursuits highly amenable to integration. Agriculture underpins many rural economies, and these economies need to diversify to regain stability and stimulate growth. A significant portion of this new green economy is expected to come from agriculture. For these new economies to positively impact rural communities, revenues need to stay in these communities. Hence it is critical that primary producers are enabled to participate as far up the value chain as possible. Currently producers have no central body to turn to for help to engage in this integrated approach, and are largely left to their own devices and taking most of the risk.

1.2 The identified solution

CARES will employ an applied systems approach to refine and integrate renewable and sustainable energy technologies in a manner that will benefit rural Ontario. CARES will help to mitigate risk that farm operations encounter when adopting and implementing new sustainable energy technologies. The efforts of CARES within the area of applied systems and the subsequent generation of benchmark data will help producers make informed investment decisions when considering the adoption of renewable energy technologies. This assistance and risk management provides a vital service to agricultural producers that will ultimately result in additional and diversified income at the farm gate.

With acknowledgement that much research in the area of renewable energy exists globally, CARES seeks to collect, synthesize and apply this multifaceted information and use it to advance the above implementation goals as well to address the larger socioeconomic and biophysical issues associated with agricultural renewable energy projects. Local production and utilization of renewable energy represents a paradigm shift that will have regional and global consequences. CARES will be a clearing house for technical and policy information, make it widely available to the many stakeholders in agricultural renewable energy. In addition, CARES will function to inform public policy with the respect to the role of agriculture in the emerging bioeconomy.

Critical to the success of any far-reaching and multidisciplinary initiative is its geographic location. Strategically situated in a key agricultural area, CARES is also near the end-users (e.g. greenhouse, energy and petrochemical industries) and stakeholders (e.g. local governments, producers, community groups and agri-businesses) that it intends to serve. CARES will have a

unique opportunity to demonstrate to these groups that agricultural renewable energy technologies are real world, economically feasible applications. CARES will create a broad range of programs and services that encourage collaboration with regional partners in order to deliver business and community development initiatives and create a highly skilled workforce.

CARES will bring together an interdisciplinary and highly skilled group of faculty. These participants are from the University of Guelph community (including Ridgetown Campus and other regional campuses), as well as from academic institutions across Canada and the world. CARES will support the highest quality educational programming and applied research in renewable energy relevant to the public, private and non-profit sectors. This allows us to transfer and apply knowledge that will improve the socioeconomic quality of life of people in rural Ontario and ultimately throughout Canada and beyond.