GPRC | VITAL

THE MICROALGAE TECHNOLOGY PROJECT

TURNING POLLUTANTS INTO PRODUCTS

GPRC is currently one of Canada's Top 50 Research Colleges, and GPRC Research & Innovation is leading the way on projects with potential world-wide significance. Through the Pollutants to Products (P2P) initiative, three innovative clean technologies - all supported by exceptional worldwide IP-protection, research, and publication - have been developed. These groundbreaking technologies and their applications have the capacity to position Grande Prairie at the forefront of the world's cleantech industry. Microalgae technology is currently the primary focus of our research and development, and we are proud to house the most efficient photobioreactor in the world.

▶ THE RESEARCH

Microalgae are naturally abundant single-cell plants which use sunlight, carbon dioxide, water, and a blend of more than a dozen nutrients to grow. From 10 to 100 times more efficient at capturing and transforming pollutants than trees or crops, microalgae clean air and water, and produce oxygen with no harmful environmental side effects.

For decades, these aquatic organisms have shown great promise in their potential to absorb and transform pollutants. The environment they require to do so efficiently, however, has never been successfully replicated by scientists within a large-scale commercial setting. With GPRC's P2P sunlight dilution system, balanced nutrient recipe, and economical harvesting and recycling system, this potential is optimized and the microalgae grow rapidly, doubling or tripling every day. The entire P2P system therefore transforms itself on a daily basis, capturing pollutants which exist in our air and our water: carbon dioxide (60%), carbon monoxide (90%), acid rain compounds (90%), and nitrogen oxide (90%).

The microalgae project has been in the works for more than 10 years and is now ready to move to the pre-commercial pilot stage. This sustainable technology is protected by two patents and has enormous potential to help to combat climate change, clean our environment, yield natural and useable bio-products, create employment in the cleantech field, and achieve financial returns.

POLLUTANTS TO PRODUCTS

TECHNOLOGIES FOR A GREENER FUTURE

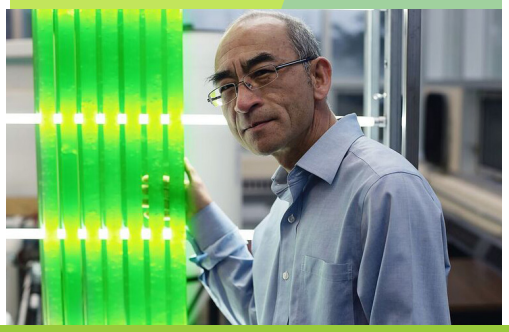
▶ THE APPLICATION

Our research indicates that P2P microalgae technology provides a more sustainable carbon capture platform compared to current capture and storage practices (sequestration), which require large facilities and substantial manpower but may not provide a definitive solution for environmental welfare. We have the potential to target greenhouse gas emissions with no unsafe residue; in fact, the byproducts of this technology include biofuel, fibre, and food. The material produced is very high in both omega-3 fatty acids and in protein, and may be used as a source of nourishment suitable for humans as well as feedstuffs for animals.

We believe successful commercialization will not only remove pollutants from our air and water, it will generate organic material using a system that is up to 100 times more productive than agricultural crops. According to recent scientific studies, replacing 30% of the world's animal feed with algae could ultimately decrease the level of carbon dioxide in our environment to that which was present in pre-industry times.

P2P Microalgae Technology Pre-Commercial Pilot Budget

- **Technical and Scientific Development**
  $850k
- **Engineering, Automation, and Operational Services**
  $350k
- **1,000 s.f. Glass Greenhouse**
  $340k
- **30,000 L Photobioreactor**
  $250k
- **Plastic Injection Circulation System**
  $200k
- **Product Development**
  $200k
- **1,000 s.f. Testing Area**
  $200k
- **Supports**
  $150k



▶ THE NEXT STEP

Over a decade of research and development has positioned GPRC Research & Innovation at a stage of pre-commercial pilot for the microalgae technology project. The pilot system will consist of 500 photobioreator panels, each of which will house 56 glass tubes, and a total capacity of 30,000 litres of microalgae. The system will be housed in a production greenhouse, and we anticipate it will produce 10 tonnes of dry microalgae and capture a net 12 tonnes of carbon dioxide on an annual basis.

To advance the potential of this technology, we require a total of $3 million to expand research and laboratory space, procure staff and services, and purchase specialized equipment. With currently available government funding sources and our excellent track record in securing grants, we are confident $1 million in industry funding will generate approximately $2 million from these other sources.