

Technology Endorsements

ABB Inc.

When Emergent Waste Solutions invited Nick Masucci, Business Development Manager Biomass - Renewable Energy at ABB Inc, to sit down with us at our offices in Richmond BC he was intrigued. ABB had just spent time and resources on developing a pyrolysis technology and, due to the inherent challenges, had walked away from it. They had also devoted energy to helping a private company perfect their proof of concept pyrolysis system, without achieving the hoped-for breakthrough.

Against this backdrop it is understandable that there was scepticism about us having solved the age-old problems with pyrolysis: incomplete breakdown of the feedstock, cross-contamination of the separated elements, and poor economics. However, after his own analysis, subsequent to studying our engineering documents, and the feedback from his engineering team, Nick determined that we did indeed solve the problems and that we were an economically viable solution to society's waste challenges.

This is what Nick Masucci had to say about the ATS Technology: ***"The ATS technology is years ahead of any solution I have seen"*** ... Manager Business Development Biomass Renewable Energy, ABB Inc.

UBC Scientist – Amir M. Dehkhoda, PhD in Chemical & Biological Engineering

EWS was approached by the chemical engineering department of UBC to help them with a government backed research project designed to demonstrate that biochar can become a graphene substitute for certain applications.

During his thesis research Dr. Dehkhoda had tried to show that biochar could be chemically rearranged such that the molecules would have the requisite structure for conducting electricity. Unfortunately, the biochar he selected for his research lacked the purity and necessary characteristics to obtain the desired results.

The project Dr. Dehkhoda undertook under the government Engage program utilized Emergent biochar from EWS and it was with this material that Dr. Dehkhoda succeeded where the previous experiments had failed.

Dr. Dehkhoda had this to say about Emergent biochar: "Among the biochar material that I have investigated so far, ***EWS' biochar showed the most promising characteristics and performance*** in electrochemical adsorption applications." ... Amir M. Dehkhoda, PhD in Chemical & Biological Engineering.

Soil/Plant Scientists – Anayansi Cohen-Fernandez, PhD & David Galvez, PhD

Doctors Anayansi and David are graduates of the University of Alberta in Edmonton. She is a soil reclamation and restoration specialist while David is a plant nutrition specialist. Together they form Coastal Raintree Consulting (CRC), based in Gibsons BC.

EWS has consulted with CRC regarding our biochar, and a number of rigorous tests around the effectiveness of Emergent biochar have been conducted under their supervision. Additionally, CRC have developed the biochar-based formulas for the EWS Grow Medium blends that are in production and being sold through BC wholesaler Stellar Inc.

Here is what Dr. Anayansi had to say about our biochar: "In our current greenhouse trial, EWS Biochar has **outperformed traditional soil amendments** increasing crops productivity by enhancing germination and improving the physical and chemical profile of the substrate." ... Dr. Anayansi Cohen-Fernandez, Senior Land Reclamation Specialist, Coastal Raintree Consulting.

Biochar Expert – Don Harfield, P.Eng, P.M.P.

Mr. Harfield is a retired engineer and past Team Leader with Alberta Innovates Technology Futures (now InnoTech Alberta). During his tenure at InnoTech Don headed up the team that together constitutes one of the most knowledgeable groups in Canada around the subject of biochar.

Don's team operates two simple pyrolysis systems at their research centre in Vegreville Alberta and consults with both industry players and government bodies. They have manufactured biochar from a tremendous variety of feedstocks, from both the agriculture and forestry industries. Don has attended domestic and international conferences, representing Canada, Alberta and InnoTech, where he has been a panel member and keynote speaker. Even after retirement, he is sought after as a leading resource on all things biochar.

This is one of the things that Don had to say about Emergent Biochar: "The EWS system technology **appears to have a particular advantage through the steam addition** which improves the biochar quality based on recently supplied lab data." ... Don Harfield, P.Eng, P.M.P.