

Going with the wind

Using wind as a viable source of energy is more than just a lot of hot air

DIANA NETHERCOTT

EDGEwise

Wind energy is among the fastest growing renewable energy technologies in the world. Canada ranks as the 11th largest nation in terms of installed wind energy capacity.

Existing wind energy systems in Canada can generate enough wattage to power 563,000 homes—or 0.8 per cent of national electricity demand. To learn more about the wind energy industry in Canada and BC, visit the Canadian Wind Energy Association at www.canwea.com.

Crawford's research is funded by the Natural Sciences and Engineering Research Council.

Crawford is a member of UVic's Institute for Integrated Energy Systems (IESVic), a leader in the promotion and development of creative energy alternatives through original research on energy technologies and their integration into society's energy systems.

UVic researchers were awarded more than \$106 million in outside research grants and contracts in 2007/08. This more than doubles the research support of the previous five-year period.


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by Tara Sharpe

Currant Crawford is not afraid of a little wind. Air in all its gusty glory is as necessary to his research as it is to the wings of an airplane.

Crawford, a professor in the University of Victoria's Department of Mechanical Engineering, designs rotor blades for wind generators.

"Back in the days when ships moved by sail alone, seafarers relied on the wind to bring them home," says Crawford. "I think wind is going to show us the way once more, at least as one reliable option for renewable and sustainable energy."

Not that long ago, Crawford was a graduate student studying aerodynamic wing design for aircraft, but soon altered course to a cleaner use of energy. While a PhD student at Cambridge University, he developed the sophisticated computer modeling system which is now at the core of his current research at UVic.

Crawford has a one-metre blade sitting on his office desk built from coordinates supplied to a UK company that manufactures small wind turbines for individual homes and farms. He's currently working on several other proposals, including a possible

project with a Quebec company that manufactures one- to two-megawatt machines, each with the capacity to supply 1,000 homes with power.

An upcoming addition to his lab will be a nifty gizmo with a complicated name—a "rapid prototyping machine." Its action is similar to piping decorations onto a cake: Crawford enters a particular set of coordinates and the machine spits out a small plastic test blade.

The real deal is much larger, generally measuring between 25 and 50 metres in length, and made out of wood, fibreglass or carbon composites. These massive blades are usually mounted in pairs or as a trio on towers that can reach up to 150 metres high. The blades turn a shaft that powers a generator, which produces the electricity.

The world's biggest wind-energy producers are Germany, the US, Spain, Britain and Denmark. In Canada, Quebec and Alberta are the leaders, but BC has lagged behind. That may soon change, predicts Crawford.

"Our province has a deeply entrenched hydro power legacy from the 1970s," he says, "but with a growing population and a concurrent rise in energy demand, wind is ready for the taking."

There are criticisms related to wind farms, including concerns about noise, bird migratory paths, Aboriginal traditional lands, private-interest investment and taxpayer subsidy. These issues can be addressed with responsible development and siting, says Crawford.

The variable power from wind generation is not necessarily difficult to address either. "Consumers usually require the most energy in the coldest months, when the wind is fiercest," says Crawford. "And we can store three years' worth of hydro-electric energy to fill in the 'gaps' during less windy times of the day or year."

Location is crucial. According to Crawford, prime sites are on hilltops in remote areas or out at sea, both of which are far from the transmission grid and hard to access.

Emerging initiatives include a wind project near Chetwynd in the Peace River district, a wind park near Dawson Creek, a wind farm near Prince Rupert and a potential island project in Hecate Strait.

"We seem to be taking a leadership role in BC on a number of fronts with respect to global change and sustainability," says Crawford. "Let's not wait to power a societal transition to a sustainable future."

Crawford with a blade prototype.

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