

Project Brief

Seven projects have been initiated to date through the Ontario Power Authority's partnership with Ontario Centres of Excellence. The OPA and OCE share a vision of Ontario as a leader of innovation in energy. The partnership, through the OPA's Technology Development Fund, leverages the strengths of both organizations to drive commercialization in this important area.

Project 1

Smart Hot Water Storage

- a special valve that allows automatic blending of hot and cold water at outlet of a water heater
- makes use of higher hot water temperatures possible, which in turn allows increasing efficiency and reducing size of water heaters
- potential benefit to gas-fired water heaters as well as electric ones

Project 2

Reducing peak energy consumption for large commercial users

- a load management system with a twist
- control is accomplished without wiring or a central controller and therefore more cheaply installed and operated
- each load point in a plant or warehouse is connected to a smart switch which negotiates with all the other smart switches via wireless to ensure that not too many of them are on at same time
- reduces peak demand which reduces customer costs

Project 3

Using structure of fins of humpback whales to create a more effective wind turbine

- researchers have found that tubercles on whales' fins allow steeper dives and ascents than would be possible with smooth-edged fins
- tubercles allow airfoil to have a steeper angle of attack without stalling

- on a wind turbine, this has the potential to begin generating power at lower wind speeds, thereby increasing number of hours per year each turbine could contribute to electricity supply

Project 4

Biofuel from poultry farming waste

- chickens produce considerable amount of raw material from which a liquid biofuel can be made
- developing technology to use this fuel in a Stirling engine which could then drive a generator

Project 5

Low-grade heat waste as power source for refrigeration

- developing a multi-cycle heat pumping process that has potential to improve energy efficiency in wide range of uses
- technology could 'collect' the low grade heat waste and convert it to a usable source of energy

Project 6

Efficiency through management of sources and flows of "reactive power" and other services

- Services such as the provision of reactive power, spinning reserves and black-start capability are essential to electricity system but not well suited to a competitive marketplace.
- Project explores ways to buy and sell services such as reactive power in a more economically efficient manner.

Project 7

"Smart" ballasts for commercial fluorescent lighting

- "smart ballast" to replace conventional ballast in fluorescent lighting fixture
- simple retrofit operation making existing lighting more intelligent and more efficient