

# A wind-win situation

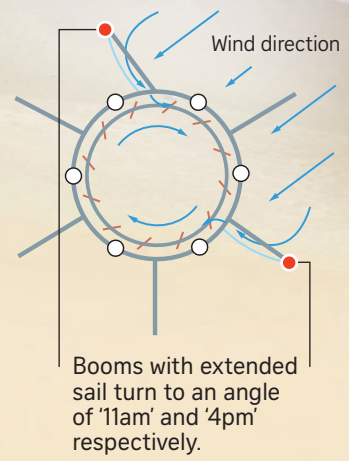
There are many obstacles to tapping wind energy, including costs. For an equivalent throughput of energy, harnessing the wind can cost double that of using solar energy. Large wind turbine systems require considerable space and must be placed above and away from buildings. They are also less effective in low-wind conditions.

Singaporean Andrew Vaz believes his Guide Vane Augmented Vertical Axis Wind turbine (GV turbine for short) is the solution. The inventor says his system can produce two to four times more throughput than the conventional three-bladed turbines.

He is in talks with developers to build wind farms to generate the energy needed to convert seawater into methanol.

## HOW GV TURBINE WORKS

- 1 Specially designed and constructed sails gather and direct wind to the fibreglass vertical wings.
- 2 The wings generate 'lift', turning the guided vanes within the carousel. This aerodynamic physics is the same principle behind the ability of a 100 tonne aircraft to fly with only 20 tonnes of thrust, and the reason why sailing boats go faster than the wind.
- 3 Built-in alternators along the vanes then convert the mechanical energy into electrical energy – in the form of alternating current to generate electricity. Rotors along the guiderails allow for high speed rotation.



## PROJECTED REVENUE

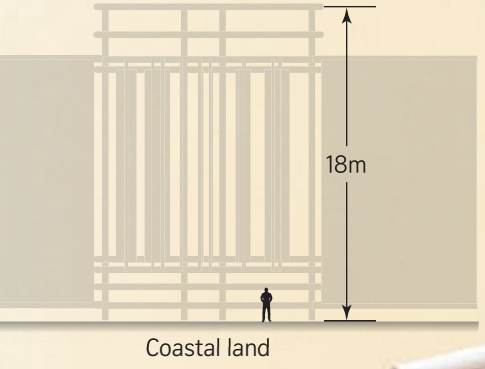
An estimate between 3-blade type and GV turbine

TURBINE TYPE	ANNUAL ENERGY	ANNUAL REVENUE AT 10C KWH
3-blade type	2,500 MWh/year	\$250,000
GV turbine	10,000 MWh/year	\$1,000,000

## CHEAPER METHANOL PRODUCTION

A cheaper alternative fuel to petrol and diesel, methanol is used to power up electric cars and combustion engines for car, trucks and ships. Low-cost electricity generated by GV turbine can be used in the extraction of hydrogen and oxygen from seawater. These gases are later combined with carbon in a Fisher Tropsch catalytic converter to produce synthetic hydrocarbons – methanol.

**Vertical wings**  
Articulated fibre glass wings move together with wind speeds and wind direction, offering the most effective way to harness energy.



### Retractable sails

When two sails are deployed, the other four will be furled to the end. Due to constant exposure to harsh sunlight and corrosive sea winds, these durable sails will still need to be replaced after five years.

### Support

It requires 12 bore piles for support, unlike the traditional three-blade turbines of similar rated output that require 40 to 50 bore piles for better support.

- As GV wind turbine can operate at lower wind speeds, it does not require the use of prime coastal land.
- Coastal countries with access to seawater can tap this type of energy harnessing system to produce methanol.
- Built with lighter and smaller prefabricated parts, the turbine can be transported in standard shipping containers.
- GV wind turbine can be deployed offshore with self-extending legs to the seabed.

## THE COST COMPARISON

