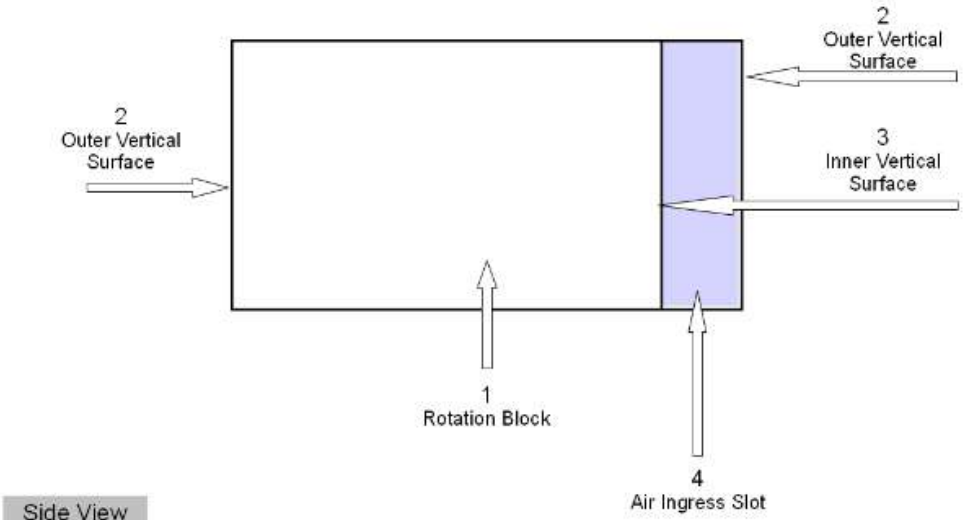
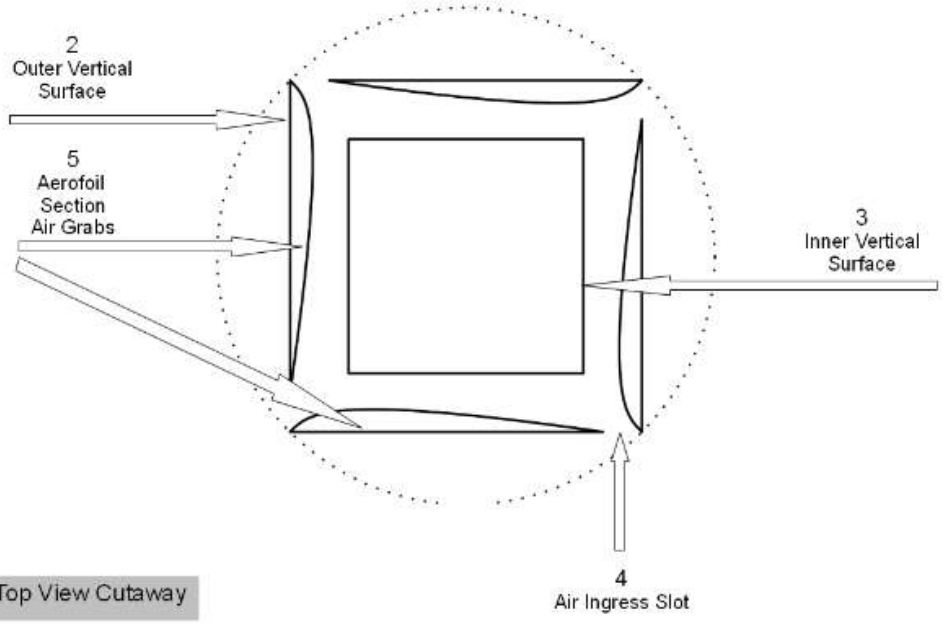
The
Dunn Accelerated Air Turbine

Diagram 1



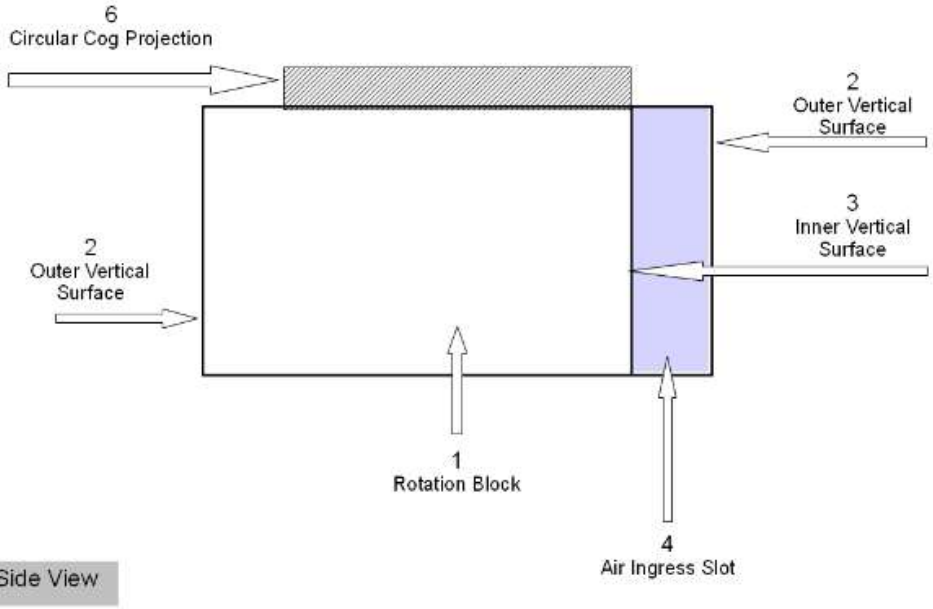
Side View

Diagram 2



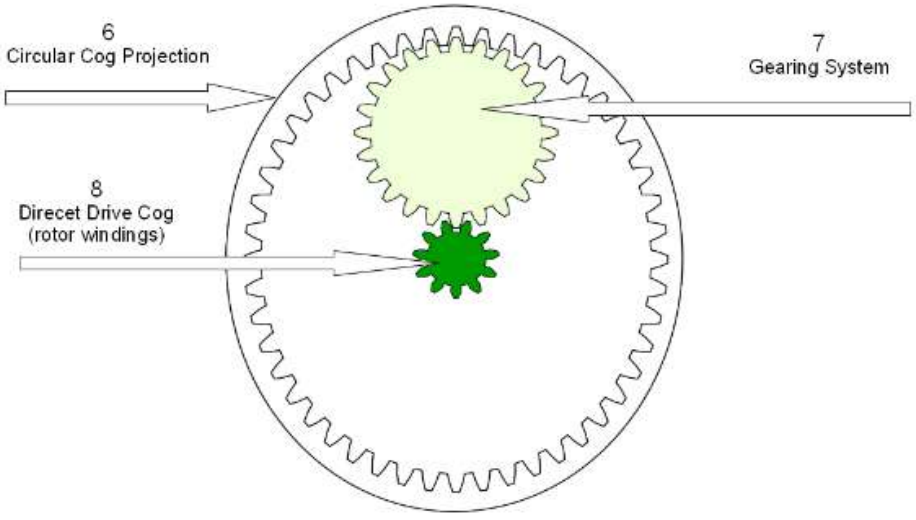
Top View Cutaway

Diagram 3



Side View

Diagram 4



Top View

Diagram 5

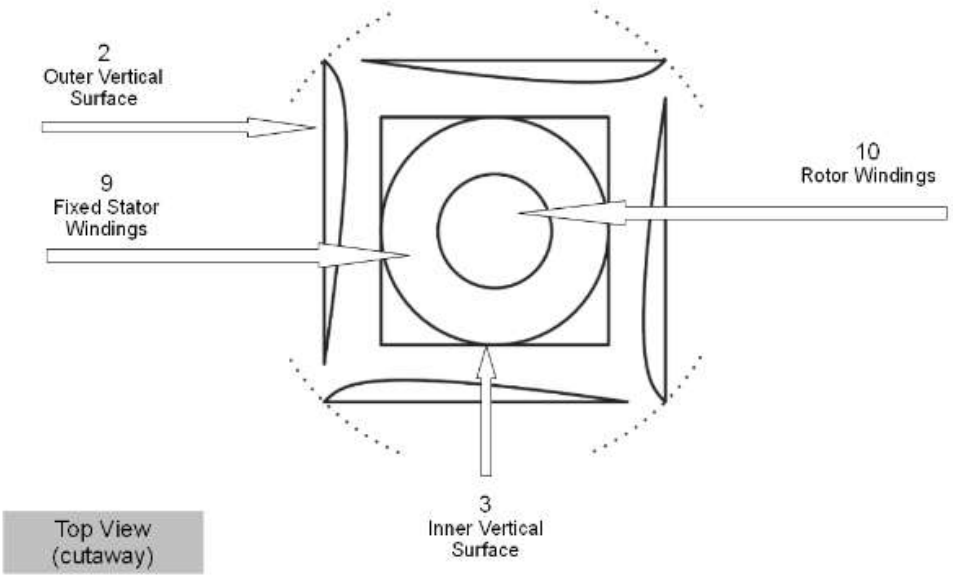


Diagram 6

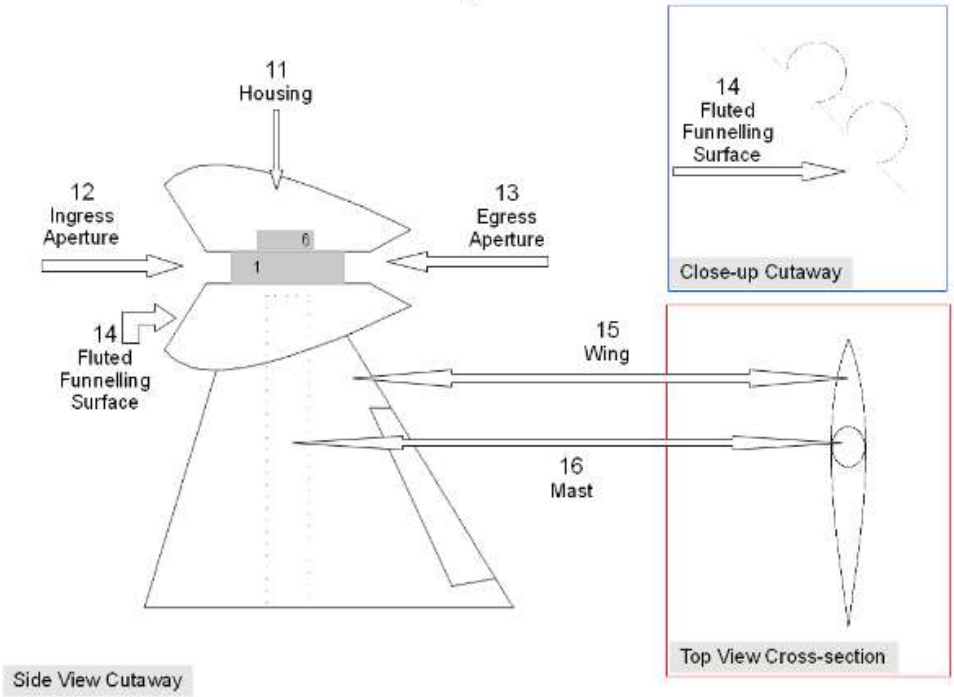


Diagram 7

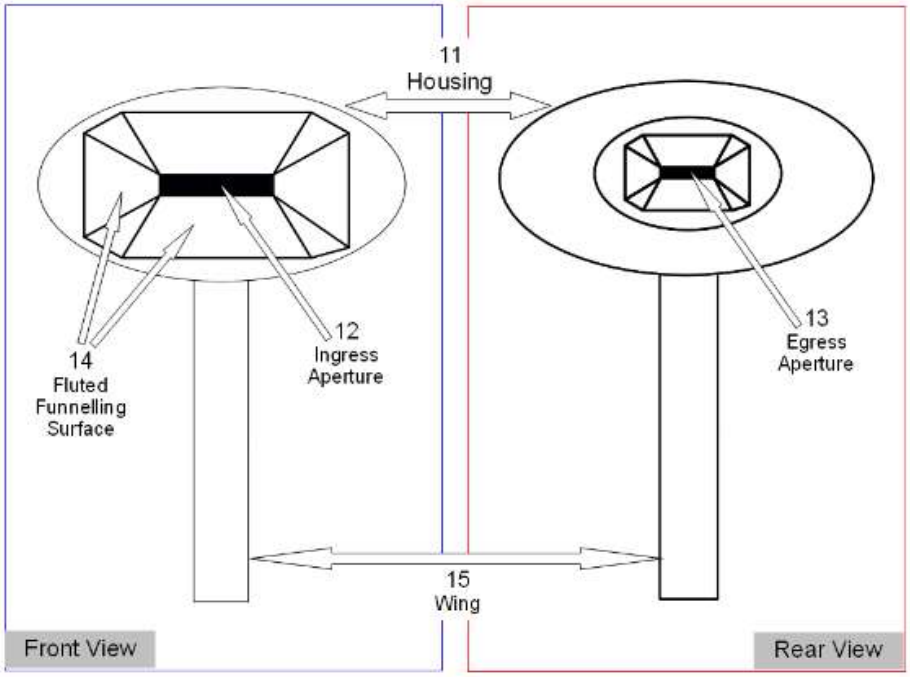


Diagram 8

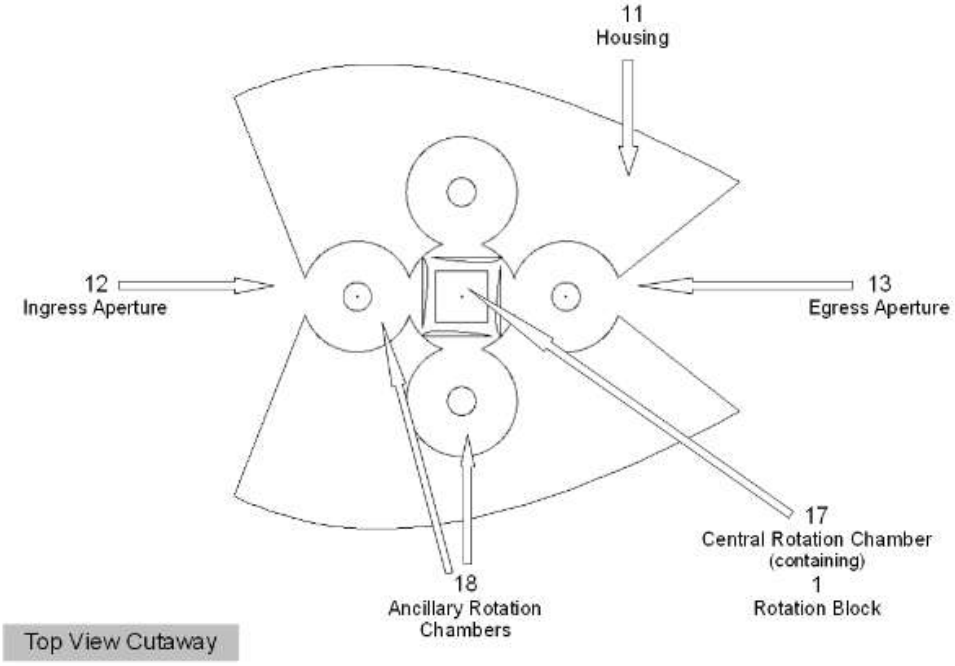
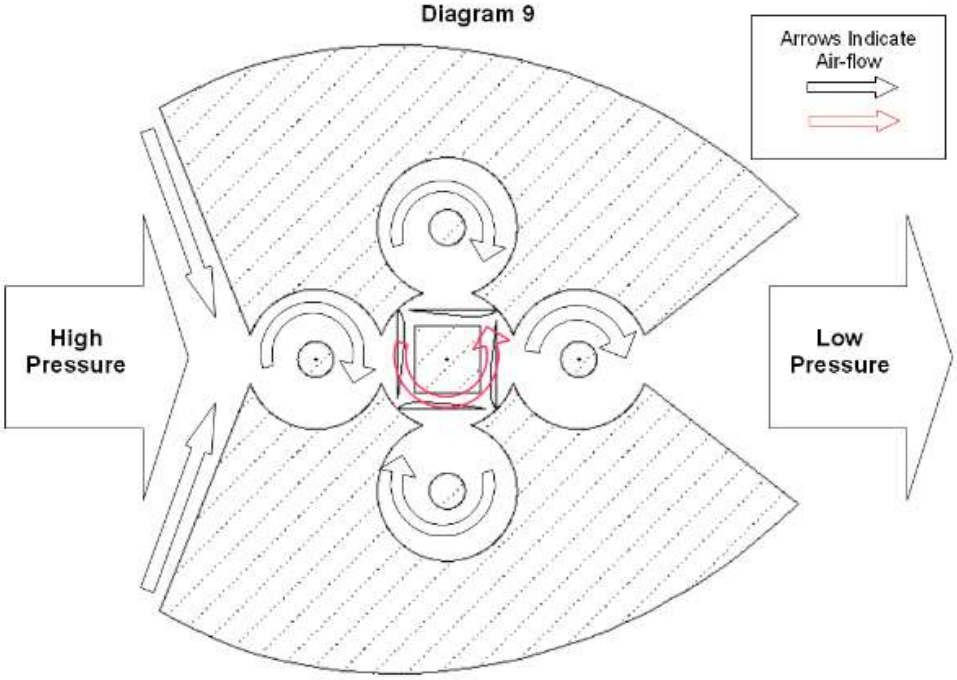
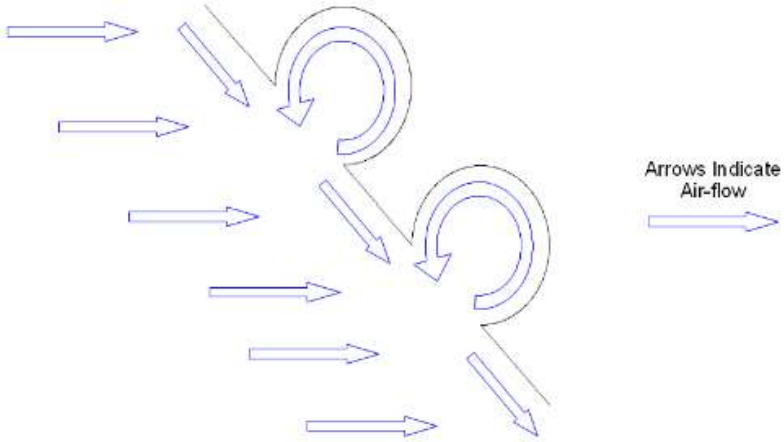


Diagram 9



Top View Cutaway

Diagram 10



Fluted Funnelling
Surfaces

The
Dunn Accelerated Air Turbine

Preamble

The Dunn Accelerated Air Turbine is designed to generate electricity by exploiting the pressure gradient that forms when the free flow of the wind is obstructed by a building, feature of the landscape or specifically designed for the purpose stand alone system.

This document will describe – with diagrams and text – the specifically designed for the purpose stand alone system – hereafter referred to as 'the system'.

Table of System Features (Components)

Feature (Component)	Number		Appearing in Diagram (D): On Page (P)
Rotation Block	1	▶	D1:P2. D3:P3. D6(grayed area):P4. D8:P5.
Outer Vertical Surface	2	▶	D1:P2. D2:P2. D3:P3 D5:P4
Inner Vertical Surface	3	▶	D1:P2. D2:P2. D3:P3 D5:P4
Air Ingress Slot	4	▶	D1:P2. D2:P2. D3:P3
Aerofoil Section Air Grabs	5	▶	D2:P2.
Circular Cog Projection	6	▶	D3:P3. D4:P3. D6(grayed area):P4.
Gearing System	7	▶	D4:P3.
Direct Drive Cog (Rotor Windings)	8	▶	D4:P3.
Fixed Stator Windings	9	▶	D5:P4
Rotor Windings	10	▶	D5:P4
Housing	11	▶	D6:P4. D7:P5. D8P5.
Air Ingress Aperture	12	▶	D6:P4. D7:P5. D8:P5.
Egress Aperture	13	▶	D6:P4. D7:P5. D8:P5.
Fluted Funneling Surfaces	14	▶	D6:P4. D7:P5. D10:P6.

Table of System Features (Components) continued

Feature (Component)	Number		Appearing in Diagram (D): On Page (P)
Wing	15	►	D6:P4. D7:P5.
Mast	16	►	D6:P4.
Central Rotation Chamber	17	►	D8:P5.
Ancillary Rotation Chambers	18	►	D8:P5.

► Diagrams 9 and 10: Page 6, are – self explanatory - air-flow diagrams.

System Description

This system is designed to exploit the pressure gradient created when the free flow of the wind is obstructed: by the system, to generate electricity.

What follows is a description: of the system, that employs text and reference numbers (indicating – features, diagrams and pages).

References numbers used throughout this description will all adhere to the following format.

- All reference numbers will be enclosed within square [] brackets.
- Within the square brackets the first number – followed by a colon – will reference the feature being described.
- The second number (group of numbers) – followed by a colon – will reference the diagram/s in which the feature referenced by the first number appears.
- Where multiple diagrams are being referenced their respective reference numbers will be separated by commas – followed by a colon.
- The third number (group of numbers) will reference the page/s on which the diagram/s referenced by the second number (group of numbers) appears.
- Where multiple pages are referenced their respective reference numbers will be separated by commas followed by a (closing) square bracket.

The system is provided with a central mast (feature 16) [16:6:4] around which the whole system freely rotates.

Fixed to the top of the mast there is provided the fixed stator windings (feature 9) [9:5:4] of an electrical generator.

Features 16 and 9 are the only none moving components of the system.

The stator windings (feature 9) are located within the freely rotating rotation block (feature1) [1:1,3,6 grayed area,8:2,3,4,5] which attaches to the mast via a bearing equipped collar (not illustrated).

The rotation block is equipped with aerofoil section air grabs (feature 5) [5:2:2]. These are designed to harvest (by acting like an aeroplane's wing in reverse) kinetic energy from the moving airstream and impart a tendency to the rotation block (feature1) to rotate in one direction only.

The rotation block (feature 1) is located within the central rotation chamber (feature 17) [17:8:5].

Projecting up from – and affixed to – the rotation block (feature 1) through the ceiling (not illustrated) of the rotation chamber (feature 17) is provided a circular cog projection (feature 6) [6:3,4,6greyed area:3,4].

The circular cog projection (feature 6) is provided with teeth on its inner surface. These are designed to engage a gearing system (feature 7) [7:4:3] that is bracketed (not illustrated) to – and therefore moves with - the inside of the housing (feature 11) [11:6,7,8:4,5].

The gearing system also engages a central direct drive cog (feature 8) [8:4:3].

The direct drive cog (feature 8) connects: via a spindle (not illustrated), with the rotor windings (feature 10) [10:5:4] located within the fixed stator windings (feature 9).

The central rotation chamber (feature 17): located within the housing (feature 11), is surrounded by ancillary rotation chambers (feature 18) [18:8:6]. The purpose of these chambers is – primarily – to create force feed back loops. As the rotation block (feature 1) rotates air is displaced into these chambers to form rotating columns. As these columns rotate moving air is fed back into the system through the air ingress slots (feature 4) [4:1,2,3: 2,3] of the rotation block (feature 1) to engage – kinetically – with the aerofoil section air grabs (feature 5).

The housing (feature 11) is fixed to the top of a wing (feature 15) [15:6,7:4,5] structure that – in turn – is fixed to the mast (feature 16) via bearing equipped collars (not illustrated).

It might be worth investigating possible benefits to the system's overall performance that could be derived from controlling the (variable) width of the egress aperture (feature 13) [13:6,7,8:4,5,5].

The system is designed to stay – at all times – headed into the wind and does not require a yaw motor.

The provision of the fluted funneling surfaces (feature14) [14:6,7,10:4,5,6] can best be understood by viewing the cross section air flow diagram (10) on page (6).

Advantages of the System

The system develops and exploits an ordered airstream. Conventional wind turbines must be raised up above the chaotic airflow prevalent at ground level.

Smaller systems: designed to provide electricity to remote properties not connected to the national grid, would be much more practicable as a result.

The system (or elements thereof) could be installed directly within a building: such as an office block, with a view to converting the building's 'wind loading' into useful amounts of electrical energy.

(NB Whilst the system might not be capable of meeting a large building's full peak requirement it could still carry on producing energy off peak: when, for instance, office workers had all gone home – so 100% of a building's overall energy requirement could still be met.)

The system takes the production of electrical energy from the wind into the urban environment where it is most needed.

Further Notes

To understand how the Dunn Accelerated Air Turbine operates try and imagine a group of five tornadoes – with four orbital tornadoes all providing force feedback (force amplification) into the fifth, central tornado.

Another thing to bear in mind is that: with conventional systems, energy can only be harvested from the moving air that flows directly over the turbine blades (rotor arms).

Fluctuations in air density/lateral wind pressure also mean that the pressure exerted: by the wind, upon the rotor arms is not uniform which necessitates the system being shut down (with the rotors feathered) at high wind speed to prevent the system becoming unstable which would then lead to catastrophic system failure.

With the Dunn Accelerated Air Turbine energy is harvested, indirectly, from the moving air that flows *around* the system: the faster the wind flow around the system the greater (steeper) the pressure gradient between the front and rear of the system.

The airstream moving through the system is uniform so any stresses induced can be predicted and allowed for when constructing the system.

All of this means that the Dunn Accelerated Air Turbine should be capable of producing useful amounts of electricity at both lower and higher wind speeds than conventional systems.

The amounts of electricity produced would, of course, be dependent upon the size/dimensions/application of the system and its operating principles.

As I am unable to patent my ideas (I haven't got the money) I am making this document available in the public domain.

If any person would like to take up my ideas and develop them further – even to the point of building a 'nuts and bolts' working system – then they have my explicit permission to do so.

Should any person/persons undertake such actions then it is tacitly understood that they do so at their own risk. The author of this document accepts no responsibility whatsoever for any injuries to persons or damages to property that might result from such a course of action.

If anyone has any feedback that they would like to communicate to me: **Peter Dunn**, regarding this document then please do so via my Hubpages profile (follow link below).

http://hubpages.com/profile/peterxdunn

If you could take the time and trouble to read some of my stuff whilst you're there I would be most grateful.

Regards

Peter Dunn