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PROJECT REPORT ON

VARTICLE AXIS WIND TURBINE

MICRO CAPACITY POWER GENERATION.

(1 KW to 5 KW)

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VERTICAL AXIS WIND TURBINE (MICRO CAPACITY).

Wind energy is the most appropriate permanent resource gifted by the nature free of cost to the humanity. It works more or less round the clock irrespective of day or night. So harnessing the wind energy for homes and farms will make revolutionary changes in rural life of India. It will contribute to the happiness of society to the great extent by providing numerous opportunities for self employment through cottage industry. Wind's long-term *theoretical potential is much greater than current* annual world energy consumption.

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In India farm size in general is small. There are about 100 Million farmers in India. In Maharashtra alone 250,000 farmers are waiting for the grid connection, as per official announcement.

Millions of small wind turbines can be installed in India for making farmer self reliant. This shall help overcome the farmers reliance on rain and up lift their life.

Unfortunately there is total vacuum of small capacity vertical axis wind turbine technology in India.

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VERTICAL AXIS WIND TURBINE BASICS

Vertical-axis wind turbines (VAWT's) have the main rotor shaft running vertically.

VAWTs are heavier than HAWT with similar capacity, thus the output voltage and power fluctuates mildly.

For all their advantages, VAWTs can be widely used in off-grid condition such as buildings, telecommunication, outdoor billboards, islands, countryside power station, oilfield, and particularly suitable for in-grid systems.

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Advantages of SVAWT Compared To Horizontal Turbines

- Can accept changes of wind direction with no problem.
- Generator can be on the ground for more easy access, rather than high up in the air.
- Generally begin rotating at lower speeds of 2 m/sec
- Lower operating noise, are nearly quiet.
- Lower susceptibility to cross-winds.
- Operates at low wind speed of 3 m/sec
- Birds friendly and no threat to wild life.
- Easier maintenance and lower maintenance cost.
- Longer operating life due to stable rotor structure.
- 360 degree use of Wind for power generation.

Disadvantages Compared to Horizontal Turbines

- Complicated in structure.
- Wind energy efficiency is typically lower.
- Cost is generally higher.

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BARRIERS TO SMALL WIND TURBINES IN INDIA

Followings are some of the barriers -

- High cost of wind turbines
- Power electronics issues arising due to variable speed operation.
- Lack of effective standards & Information about wind resources.
- Insufficient capitalization

Complicated financial impact – consumer generally look at out of pocket expenses or monthly cash flow, rarely consider life cycle cost.

- Lack of multilateral bank funding

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DRIVING FACTORS SVAWT

The future of the small wind industry depends on the cost of the technology, economic incentives, fossil-fuel prices, consumer awareness, Financial, wind, etc. Energy experts anticipate high growth rates for the production of SWTs if consumer demand increases.

GOVERNMENT POLICY

Like most other renewable energy technologies and in particular the market for “big wind”, the success of the small wind market depends on stable and appropriate support schemes.

With make in India campaign, and government focus on increased use of non conventional power with pre-fixed target of 1550MW wind power generation to achieve by 2020, Small vertical axis wind turbines shall have a very good market for next 10 years.

SAWT is potentially a very good business in India.

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WORLD MARKET FORECAST 2020

The increasing demand for clean and affordable energy all over the world will without doubt lead to an increasing demand for small wind turbines.

In particular in the developing countries, small wind turbines can easily and fast contribute to electrify millions of people in rural areas.

Recent trend of the small wind turbine industry has shown an annual 19 - 35 % increase in the new installed capacity for the past years. The market could subsequently see a steady compound growth rate of 20 % from 2015 to 2020.

Apart from internal market potential export market is also very good, both in developed and developing countries.

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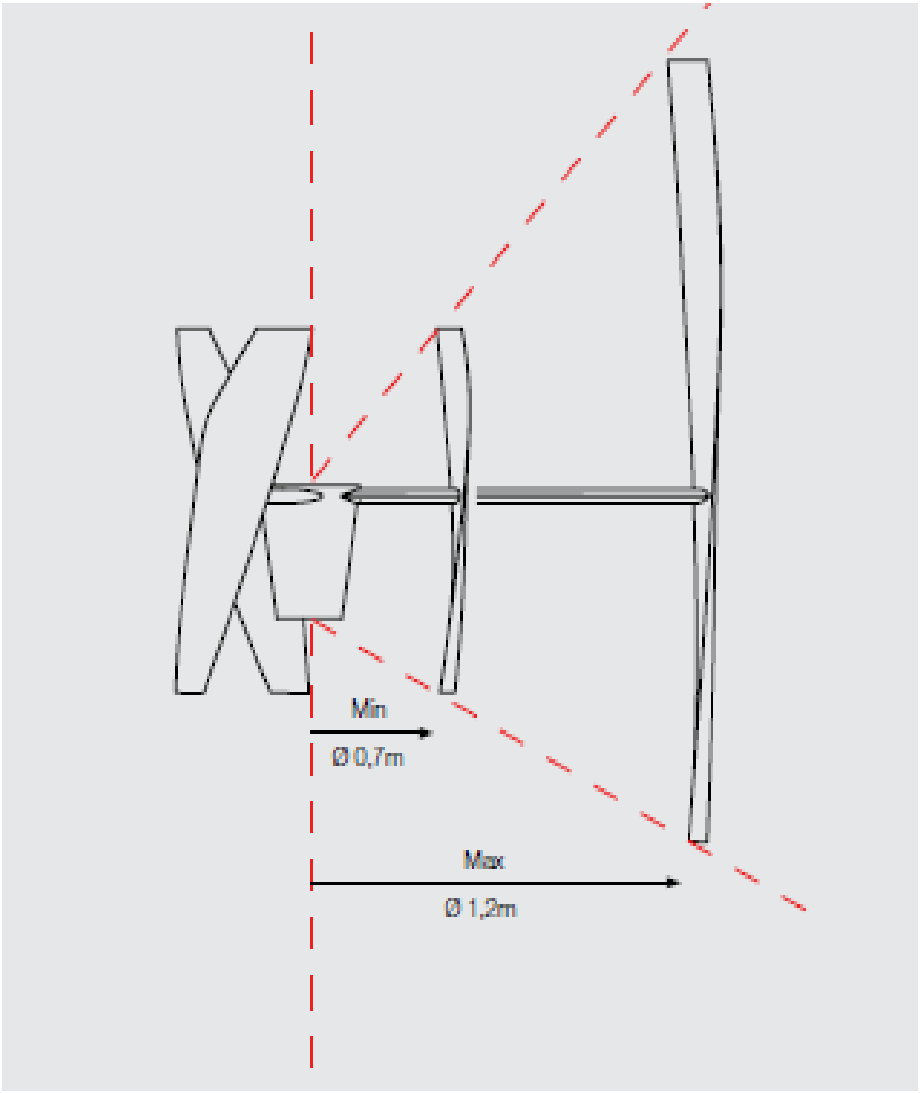
VERTICLE AXIS WIND TURBINE ASSEMBLY.

VARIATION OF



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BUSINESS PLAN

As per the statement of Chief Minister Mr. Devendra Phadanvis, in state there are more than 250,000 farmers who are waiting for the power connection, for more than one year.

Even a 1% share of these farmers can give a substantial business volume to start with.

HOW CAN WE GET THIS BUSINESS VOLUME

The said business volume can be achieved by –

1. Design for the prototypes is ready which need to be productized and tested in the open field like farms, roof tops on the farm house, Roof tops on the buildings etc.
2. Sharing facts & figures of test results with state electricity board & state minister for government contracts.
3. Providing product on Energy Service Company (ESCO) basis.
4. Approval from authorizing agency like MNRE & MEDA can qualify for empanelling.

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BUSINESS PLAN

First year – manufacture/import 5 units for test run/approval from authorizing agencies.

Create manufacturing set up during the period.

Second year – Manufacture 300 units

Third year – Manufacture 500 units

Fourth year – Manufacture 1000 units

Fifth year – manufacture 2000 units

Estimated manufacturing cost (3 KW) – RS. 300,000/-

Estimated sales price (3 KW) – RS. 400,000/-

Estimated investment for plant set up Rs. 20,000,000/-

(Estimated investment for plant set up with JV option RS. 50,000,000)

Estimated working capital required RS. 30,000,000/-

Estimated break even point 195 nos.

Estimated payback period – 20 months

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BUSINESS PLAN

S. no.	Description/year	Year 1	Year 2	Year 3	Year 4	Year 5
1	Quantity	5	300	500	1,000	2,000
2	Pre_operative cost	2,500,000				
3	Land & building	Leased building		Invest in land & building		
4	Plant & machinery	20,000,000				
5	Prototyping cost	2,500,000				
6	Interest @ 15%	3,750,000	7,050,000	9,750,000	16,500,000	30,000,000
7	Working capital		27,000,000	45,000,000	90,000,000	180,000,000
8	Estimated sales value	0	120,000,000	200,000,000	400,000,000	800,000,000
9	Estimated manufacturing cost	0	90,000,000	150,000,000	300,000,000	600,000,000
10	Estimated value addition	0	22,950,000	40,250,000	83,500,000	170,000,000

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CAPITAL REQUIREMENT & ESTIMATED PAYBACK PERIOD

The project shall require an investment of about RS. 20,000,000 (RS. Two Crore) for local manufacturing.

The land & building will be initially leased . Land & building of about 5000 sq. feet, with 50 KW connected power is required.

Working capital for manufacturing about 300 units in the second year is estimated at 30,000,000 (RS. Three crore)

Total investment for project is about 5 Crore, which includes the working capital for about 300 units.

The investment required is mainly for the imports of critical components, and set up of assembly line & testing lab.

Estimated capital requirement –

Imports of critical components like Blades, Controllers etc. for first lot of 50 assemblies. RS. 5,000,000/-

Set up of fabrication unit, assembly line. RS. 5,000,000/-

Set of in house test equipments. RS. 2,500,000/-

The market share at 300 units is less than 0.001% of 1550 MW wind power generation target set by government.

The project can be made in “Make in India” or “Start up” schemes announced by Government recently.

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OPTION_COLLABORATION WITH RENOWNED MANUFACTURERS

We are in discussion with three renowned overseas manufacturers for possible co-operation.

All three parties are willing to co-operate with us. There support will vary from component supply to license manufacturing, and/or JV.

We estimate that the capital requirement shall go up to 5 crore in case of JV. The detailed financials are being worked out.

With JV, brand advantage can be availed, as well as time required for approval from MEDA and MNRE will minimize, as the product is EU & CE approved.

Approval from MEDA, MNRE is necessary qualification for empanelling.

The estimated time period for approval from these agencies is between 1 to 2 years.

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OUR CONTRIBUTION IN PROJECT

VAWT shall be a plug and play device.

We have analyzed the project in detailed and short listed the critical components which need to be imported initially, all other components shall be manufactured locally. The critical components shall be localized in three years.

We have capacity & capability of Technology transfer, design, development of mechanical components and systems , development of reliable power electronics, Supply chain management, etc.

We have our design & manufacturing drawings ready for productization.

Prospective overseas channel partners are ready to share their drawing & design, do the required changes for making a reliable product at affordable price in India.

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MAIN PROMOTERS BACKGROUND

MR. NANDKISHOR SAROLKAR promoter is Mechanical engineer, backed up with post graduation in Management (Production as well Marketing management, two principal subjects), having wide experience of over 39 years in the international as well local industry of repute. His major exposure (20 years) is in the international market.

Mr. Nandkishor Sarolkar was Nominated member of Kenya Beureo of Standards.

His last assignment in India CEO/managing Director of M/S. BERICAP India Pvt. Ltd. "Bericap" is MNC with head quarters at Germany,

"BERICAP" is preferred supplier to brand owners like Coke, Pepsi, Evian, Nestle, HP, Johnson & Johnson etc.

Mr. Sarolkar is owner of three no IP (design registration) in INDIA.

Mr. Sarolkar is having hands on experience in LT power generation & distribution.

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WHAT DO WE NEED FROM A PARTNER

We need funding to take the project forward.

We already have spent more than Rs 2,500,000 towards the development of drawings, visit the installation, study the different types of VAT.

We also have identified a source for starting the device by miniature battery in case of no wind/low wind. Once the equipment is started with battery it will keep running.

The technology is recent development from Europe, and as such we need to take the patent on the design and process as well.