

INDIA
TODAY

WHY THE WORLD CAN'T SAVE EARTH

ON-THE-SPOT REPORT FROM PARIS CLIMATE CHANGE SUMMIT
ALSO TEN TECHNOLOGIES THAT COULD MAKE A DIFFERENCE

RNI NO. 28587/75



CLIMATE CHANGE TECHNOLOGIES



A wind turbine converts kinetic energy from wind into electrical power. Aerodynamics is key to maximising output from wind turbines. Turbines used in wind farms are usually three-bladed and pointed into the wind by computer-controlled motors.



Why

- It is a clean source of fuel and does not pollute like power plants, which depend on fossil fuels.
- It is a free, sustainable and renewable resource.
- Harnessing wind energy is becoming increasingly cost-effective.



Cost

- Cost of wind power in India is Rs 6 crore to Rs 7 crore per MW.
- The best wind projects in USA deliver electricity for \$0.05 per kWh, says the International Renewable Energy Agency.



Challenge

- To make wind power more reliable and cost-effective.
- In India, availability of grid and land infrastructure at the state level needs to be adequate, for which the government needs to invest and accord reforms.
- Need for a long-term national uniform policy and regulatory framework for both investments and implementation.

7 Wind Turbines

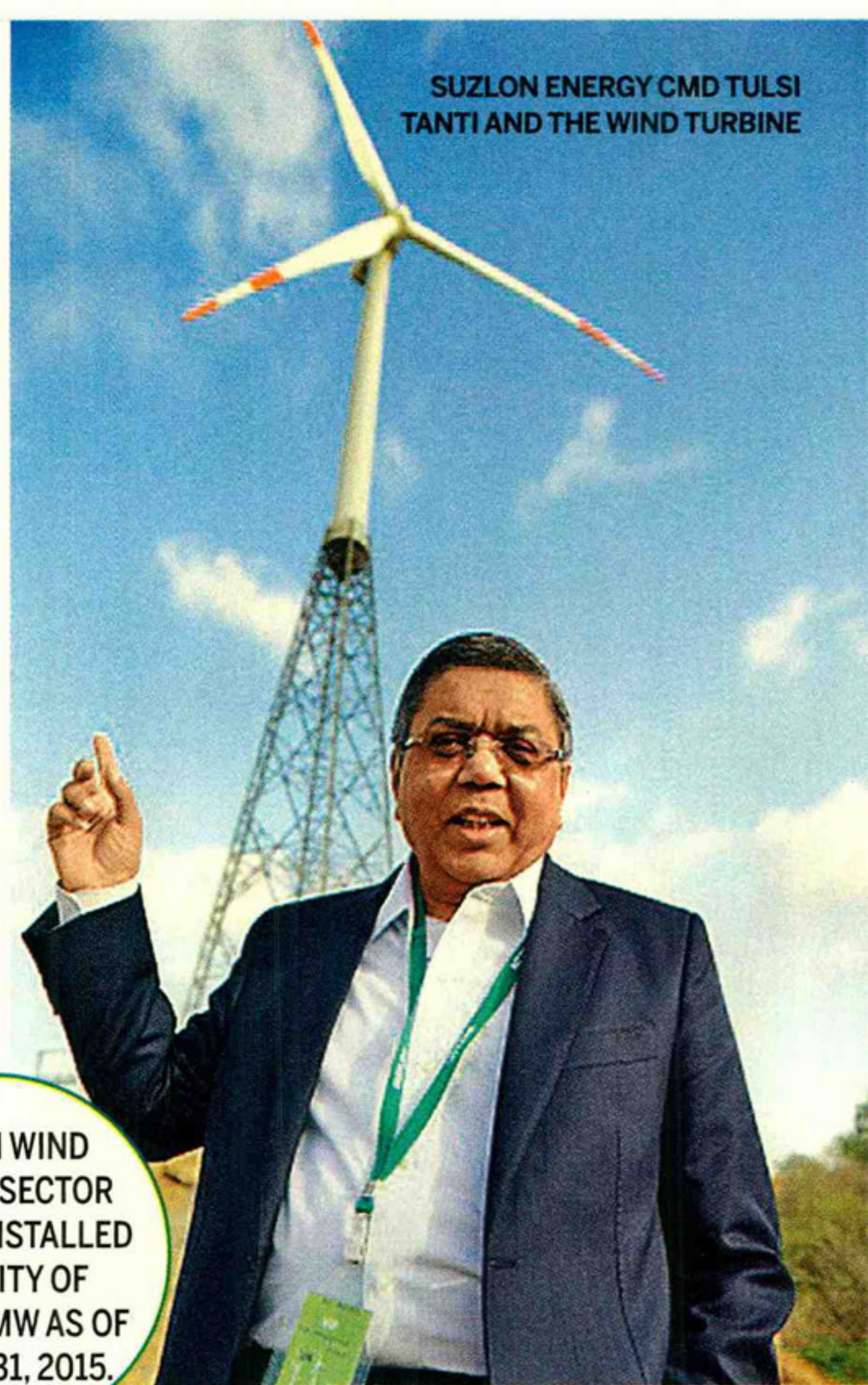
ACTION IN ROTATION

Turbines used in wind farms are usually three-bladed and pointed into the wind by computer-controlled motors. The wind turns the blades, at 10 to 22 revolutions per minute, spinning a shaft, which connects to a generator and makes electricity. Aerodynamics is key to maximising output from wind turbines. Improvements in computational fluid dynamics analysis and the resulting optimisation of rotor speeds and pitch control directly translate into overall increased turbine and wind park production.

Experiments are currently underway to develop more efficient, longer and lighter blades from carbon and fibre, instead of steel and glass, as these are more flexible and have a lower chance of developing cracks. Aerodynamic experts are also working on smaller turbines for more efficiency. In the developed world, research efforts are on to improve reliability of wind turbines, increase capacity and reduce costs. For instance, the US government's Wind Program works with industry partners to increase the performance and reliability of next-generation wind technologies while lowering the cost of wind energy. The program's research efforts have helped to increase the average capacity factor (a measure of power plant productivity) from 22 per cent for wind turbines installed before 1998 to an average of 33 per cent at present.

Pune-based Suzlon Energy Ltd is a leading player in wind turbines in India, and has a global installed portfolio of more than 14 GW across six continents. It brought in new technologies to harness low wind sites, when in November last year, it expanded its capacity at Kutch, Gujarat, wind farm to 1,100 MW. For this, it used the world's tallest hybrid tower, the S97-120 m.

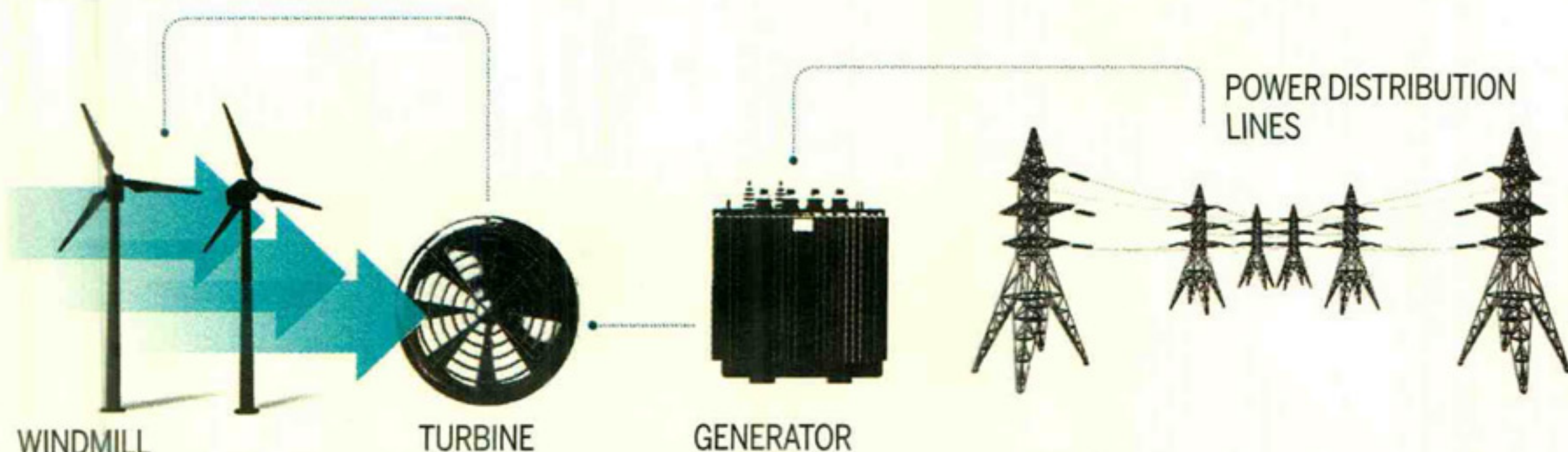
INDIAN WIND ENERGY SECTOR HAD AN INSTALLED CAPACITY OF **23,439** MW AS OF MARCH 31, 2015.



SUZLON ENERGY CMD TULSI TANTI AND THE WIND TURBINE

AFP

HOW IT WORKS



More efficient materials and lighter blades maximise output from wind turbines, making them viable.

—M.G. Arun