DEPARTMENT OF CIVIL ENGINEERING

TEAM C HELIX

PRESENTS

WAVE POWER

MADE BY:

SAURABH KASHYAP **SAURABH ANGRAL**

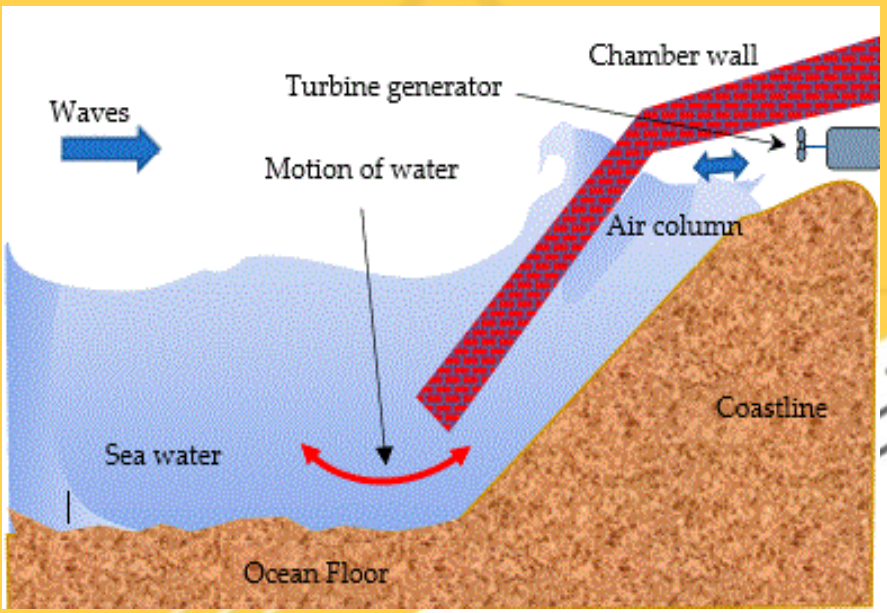
INTRODUCTION: Wave power is the capture of energy of wind waves to do useful work – for example, electricity generation, water desalination, or pumping water. A machine that exploits wave power is a **wave energy converter** (WEC).

Wave power is distinct from tidal power, which captures the energy of the current caused by the gravitational pull of the Sun and Moon. Waves and tides are also distinct from ocean currents which are caused by other forces including breaking waves, wind, the Coriolis effect, cabbeling, and differences in temperature and salinity.

OBJECTIVE:

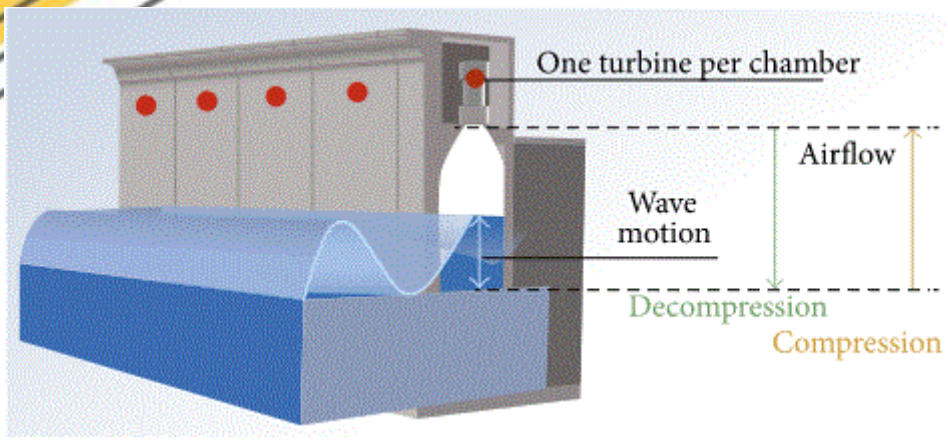
- To fully utilize the freely available energy in the form of electricity.
- To provide an alternative solution for clean energy in the form of sea and it's everlasting.

EXECUTION /PROCESS: Wave Power is a type of power device that produces electricity by utilizing the plentiful oceanic wave. It is built onto or near to the rocks and it is close to the sea bottom, as shown in Figure 4. The water is compressed and decompressed, and when the wave enters the chambers, the water level increases, and it creates high air pressure which drives the turbine. The air pressure inside the chamber under this condition is much greater than atmospheric pressure (14.7 psi). When the water falls back to the sea, the air pressure under this condition is much lower than atmospheric pressure. For this reason, air enters again into the chamber from outside, finding no other way. As a result, the air then flows in negative direction. It drives the turbine in such a way that it can produce electricity.

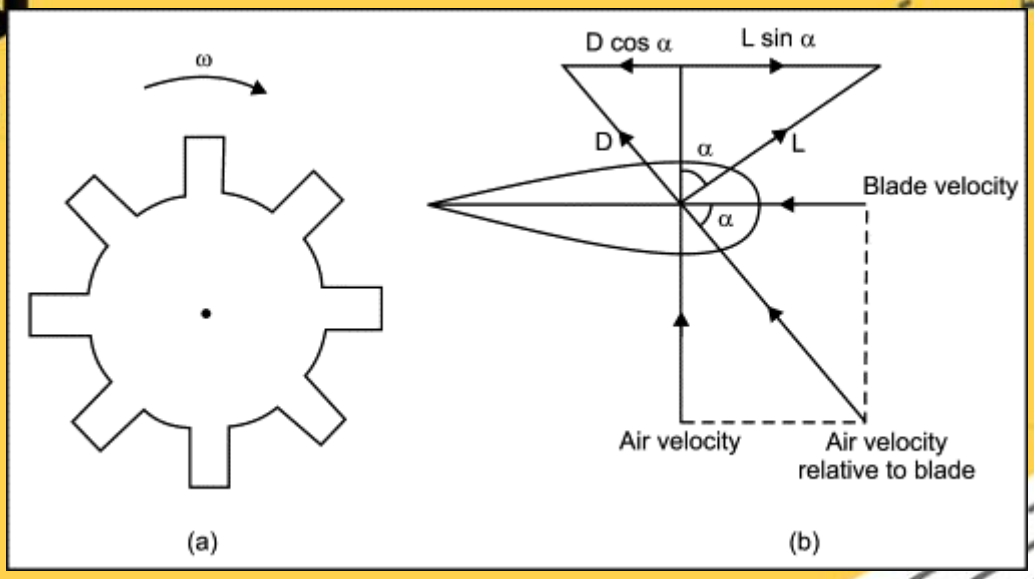


Background

An Oscillating Water Column (OWC)-based energy converter is basically a device that transforms the mechanical energy of the waves into electric power.



A key feature of the OWC is the design of the air turbine, known as the Wells turbine. It has the remarkable property of spinning in the same direction irrespective of the direction of air flow in the column! Unlike conventional turbine blades, the blades in a Wells turbine are symmetrical about the direction of motion



The shape of the blade is designed such as to maximise the net force on the blade and the operational efficiency of a Wells turbine is around 80 per cent.

LEARNING OUTCOMES:

- Wave power production is much smoother and more consistent than wind or solar resulting in higher overall capacity factors.
- Power produced from them is much steadier and more predictable day to day and season to season.
- Unlike wind and solar energy, energy from ocean waves continues to be produced round the clock.

SOCIAL BENEFITS:

- Generating clean energy at low cost throughout the day.
- The energy obtained can be used to operate ocean water desalination plants, thus reducing the dependency on fossil fuels and also reducing drinking water shortage.
- Because waves originate from storms far out to sea and can travel long distances without significant energy loss
- Wave energy contains about 1000 times the kinetic energy of wind.