SNS COLLEGE OF TECHNOLOGY

Vazhiamyampalayam,Coimbatore-35

(An Autonomous institution)

Accredited by **NBA-AICTE** and Re-Accredited by **NAAC-UGC with A+ Grade**

Approved by **AICTE,** New Delhi & Affiliated to **Anna University**, Chennai

DEPARTMENT OF CHEMISTRY

COURSE NAME : 23CHT103- ENVIRONMENTAL SCIENCE AND SUSTAINABILITY

I YEAR / I SEMESTER

UNIT : 4. ENERGY RESOURCES

TOPIC : 5.TIDAL ENERGY

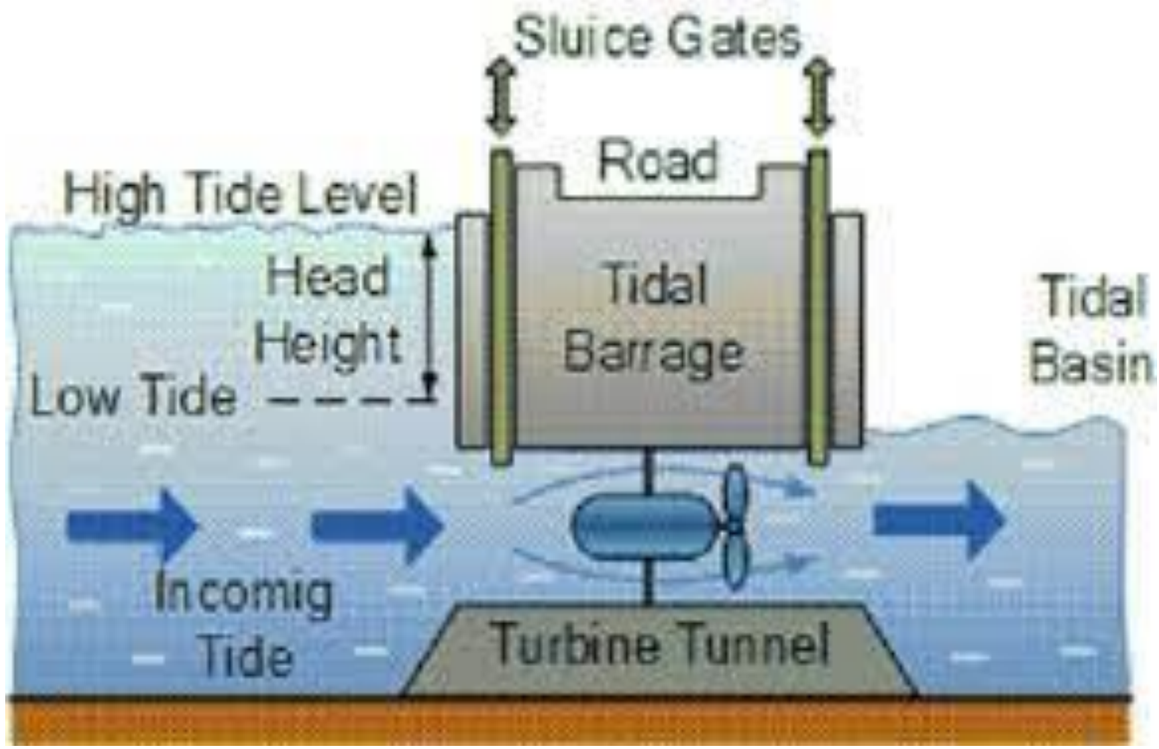
BRAINSTORMING WITH RECAP

INTRO

- Gravitational pull exercised by sun and moon causes tides to develop. Sea level rises and falls depending upon the position of sun moon.
- The ‘high tide’ and ‘low tide’ refer to the rise and fall of water in the oceans. The tidal energy can be harnessed by constructing a tidal barrage.

HIGH TIDE AND LOW TIDE

- During high tide, the sea water is allowed to flow into the reservoir of the barrage and rotates the turbine, which in turn produces electricity by rotating the generators.
- During low tide, when the sea level is low, the sea water stored in the barrage reservoir is allowed to flow into the sea and again rotates the turbine.



TIDAL POWER GENERATION SITES

More than fifty sites have been identified in the world for possible generation of tidal power. As more and more technological advancement take place, even more sites could be identified for tidal power development.

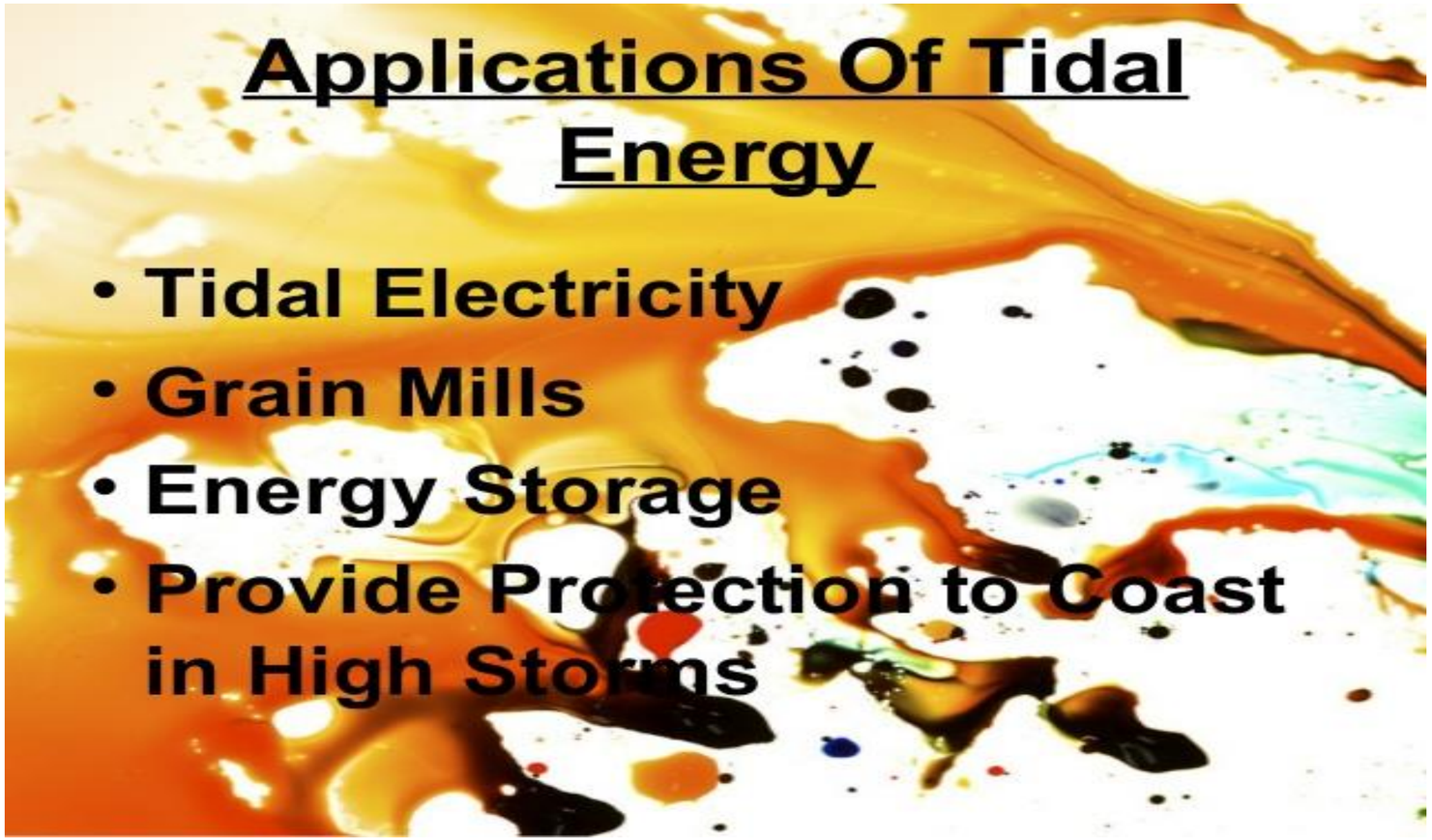
Some of the important sites are:

(*i*) La Rance (France), (*ii*) Severn Barrage (UK), (*iii*) White sea (USSR), (*iv*) Passama- quoddy (USA), (*v*) Gulf of Cambey (India) and (*vi*) Gulf of Kutch (India).

The maximum tidal range in the Gulf of Cambey is about 10.8m and is quite attractive for a tidal plant. However, the silt charge of the Gulf of Cambey is relatively high and needs a closer study for further development.

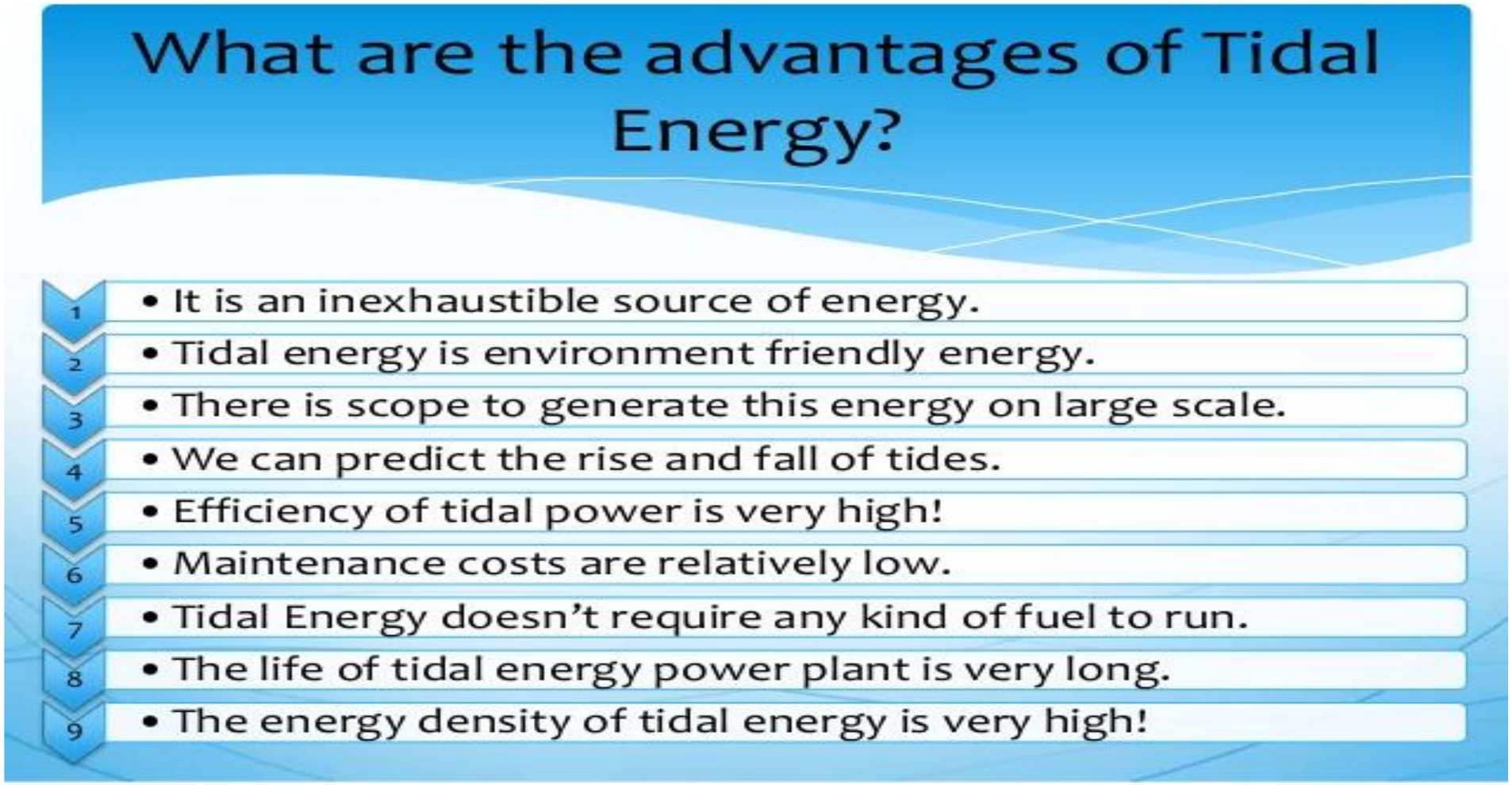
The Gulf of Kutch has a maximum spring tide of 7.5 m and the silt charge is relatively low

TIDAL ENERGY-APPLICATIONS




Activity

TIDAL ENERGY-ADVANTAGES



TIDAL ENERGY-DISADVANTAGES

Disadvantages

- Economic recovery of energy from tides is feasible only at those sites where energy is concentrated in the form of tidal range of about 5m or more and the geography provides a favorable site for economic construction of a tidal plant. Thus, it is site specific.
- Changing tidal range in two week periods produces changing power.
- The turbines are required to operate at variable head.
- Requirement of large water volume flow at low head necessitates parallel operation of many turbines.
- Tidal power plants disrupt marine life at the location and can cause potential harm to ecology.

TIDAL ENERGY -SIGNIFICANCE

- Tidal power plants do not require large areas of valuable lands as they are on the bays or estuaries.
- As the sea water is inexhaustible, it is completely independent of the uncertainty of precipitation (rainfall)
- It is pollution-free energy source, as it does not use and any fuel and also does not produce any wastes.

ASSESSMENT

List out the various uses of tidal energy

SUMMARY

REFERENCES

1. Dr. A.Ravikrishnan, Environmental science & Engineering" Srikrishna hitech Pub. Co. Ltd,2013.
2. G.Tayer Miller :Environmental Science", Cenage Learning India Pvt Ltd, 2011.
3. Benny joseph, "Environmental science & engineering" Tata McGraw-Hill.Pub.Co.Ltd. New Delhi.2009.