

1. Blue Power Features:

There are many benefits of this energy [1]:

1. It is a cleaner energy, it does not leave pollutants to the environment or release CO₂ gas, or greenhouse gases.
2. A renewable energy source that is more reliable than other renewable sources worldwide, it is always available.
3. Do not need any kind of fuel, the electric power produced is stable, more efficient.
4. More cost-effective than solar or wind power, and cost-competitive with other renewable sources.
5. It has a small environmental footprint, since it does not cause significant damage to the environment and does not require much resources to set up its plants.
6. The useful life of the plant for the purpose of producing this energy, according to expert's estimate, is 75-100 years old.
7. Works on the recycling of natural resources (seawater or sewage water), and does not affect the amount of salts in nature.

2. Osmotic Processes Process:

Osmosis: The process of moving through a semipermeable membrane of liquids selectively for a liquid characterized by its high chemical capacity and lower osmotic pressure (pure water) to a solution characterized by lower chemical properties and higher osmotic pressure (Salt Water) [2].

The difference in salt concentrations in the water makes the process of osmosis occur through the selective membrane, which allows water to pass through very small pores and prevents many molecules and other ions from passing. The process of transferring pure water to salt water is to reduce water salinity and equalize it through the semi-permeable membrane. This causes an increase in the height of the water column in the

saltwater side and thus creates pressure in the other direction, known as Pressure Retarded Osmosis (PRO) which is used to move or rotate turbines generating electricity. This process can be reverse osmosis from the saline to the other side, so we get pure water instead of salt water in the so-called Reverse Osmosis (RO), but in this case need more pressure to push the salt water to flow through the membrane to the pure water.

The main determinant in the process of osmosis is the decrease of salts in the saline side, which slows down the flow force and therefore the pressure generated. Therefore, the large speed requires to emptying the two sides and pumping back in order not to overlap between them, as well as the need for periodic maintenance of the membrane for possible damage due to deposition of plankton from salts and other impurities, whose use expires within 6 months if this is not addressed. The osmotic pressure ($\Delta\pi$) if applied as a hydraulic pressure (ΔP) will prevent the net transfer of water.

3. Osmotic Membrane:

It used to separate between two water currents, and is called a Selective Semipermeable Membranes. It is considered a type of biological or synthetic membrane (Organic Filter) that allows some molecules or ions to pass through the spread, or sometimes allow passage through more specialized processes in terms of facilitated propagation or active transport.

As for the active membrane, is described as a membrane that "allows" some particles to pass (and by size), while the Selectively Permeable Membrane "selects" what passes through it (size is not a factor) [3].

References:

- [1] Dineshkumar U. Adokar, Dhanesh S. Patil, Amrita Gupta, 2013, " *Generation of Electricity by OSMOSIS*" *International Journal of Emerging Technology and Advanced Engineering* ,Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 3.
- [2] Andrea Achilli a, Tzahi Y. Cathb, Amy E. Childressa, 2009, "*Power Generation with Pressure Retarded Osmosis: An Experimental and Theoretical Investigation*" *Journal of Membrane Science* 343, 42–52 .journal homepage: www.elsevier.com/locate/memsci p. 42-43.
- [3] Duranceau, S.J and J.S Taylor, 2010, Chapter 11 Membrane Processes” in *Water Quality and Treatment*, 6th Edition. Ed. J. K. Edzwald. New York: McGraw-Hill; 11-1 to 11-106.