



# MICROBIAL FUEL CELL: ENERGY FROM WASTEWATER

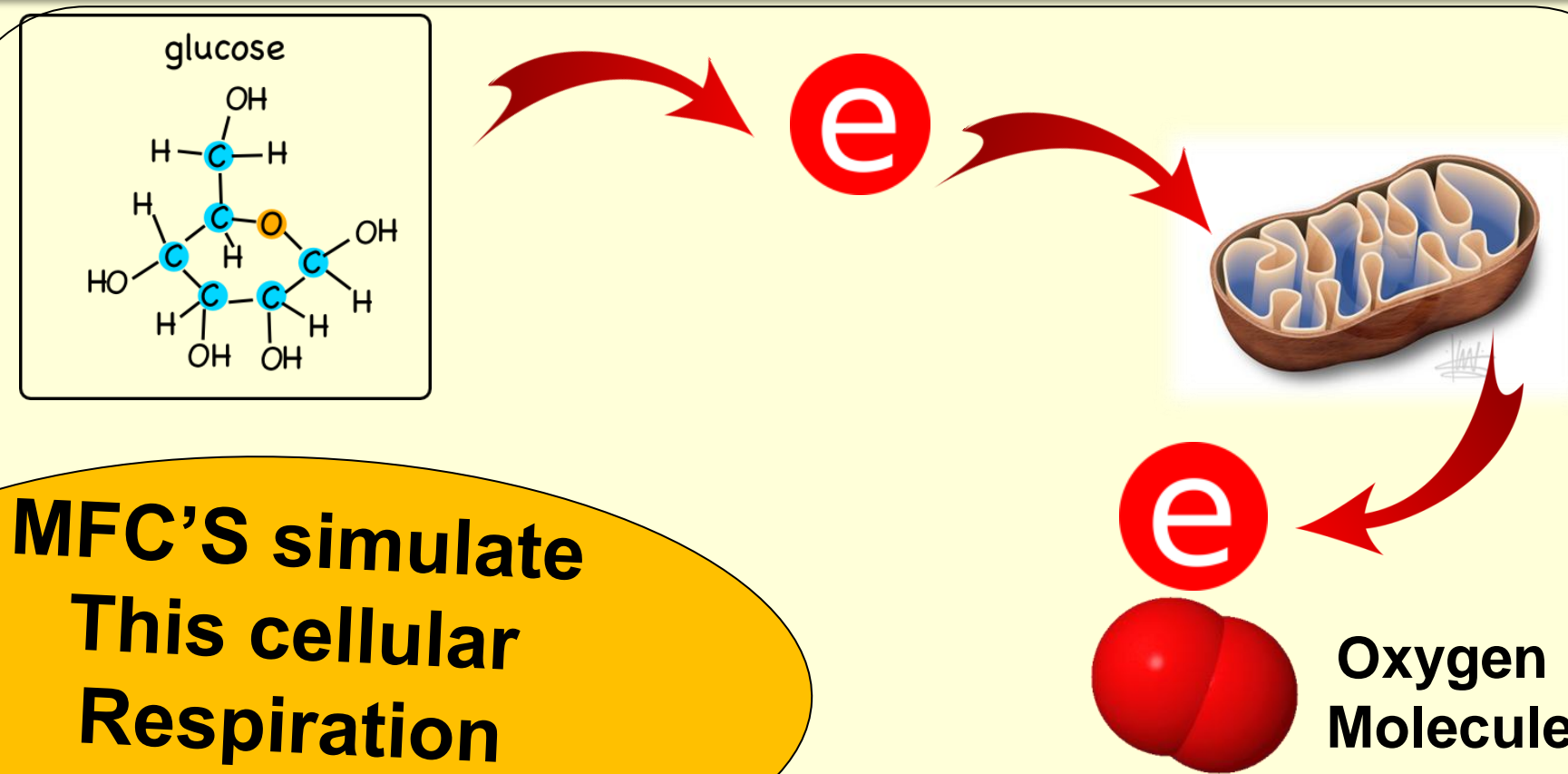
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## What is MFC ?

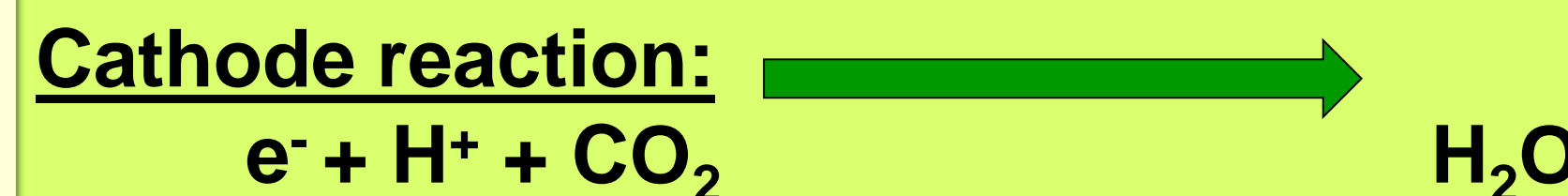
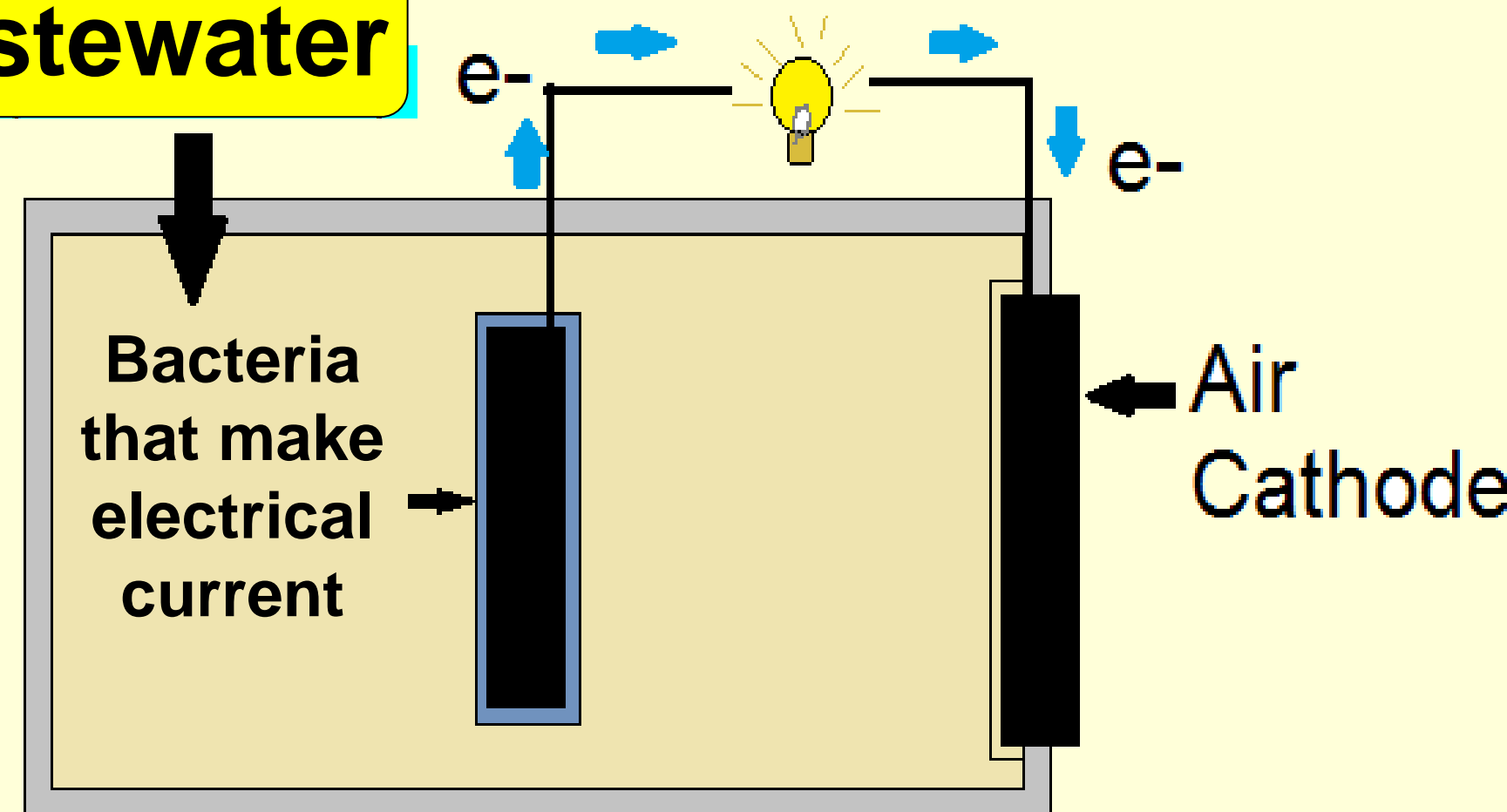
MFC's extract chemical energy of waste water and convert it to electric energy.

## How does it work?

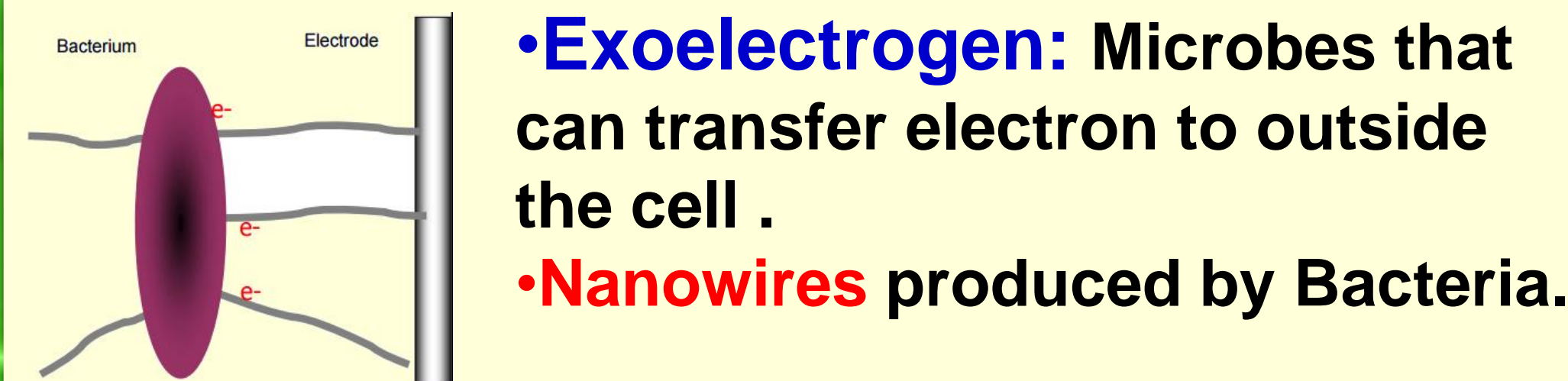


MFC'S simulate This cellular Respiration process

wastewater

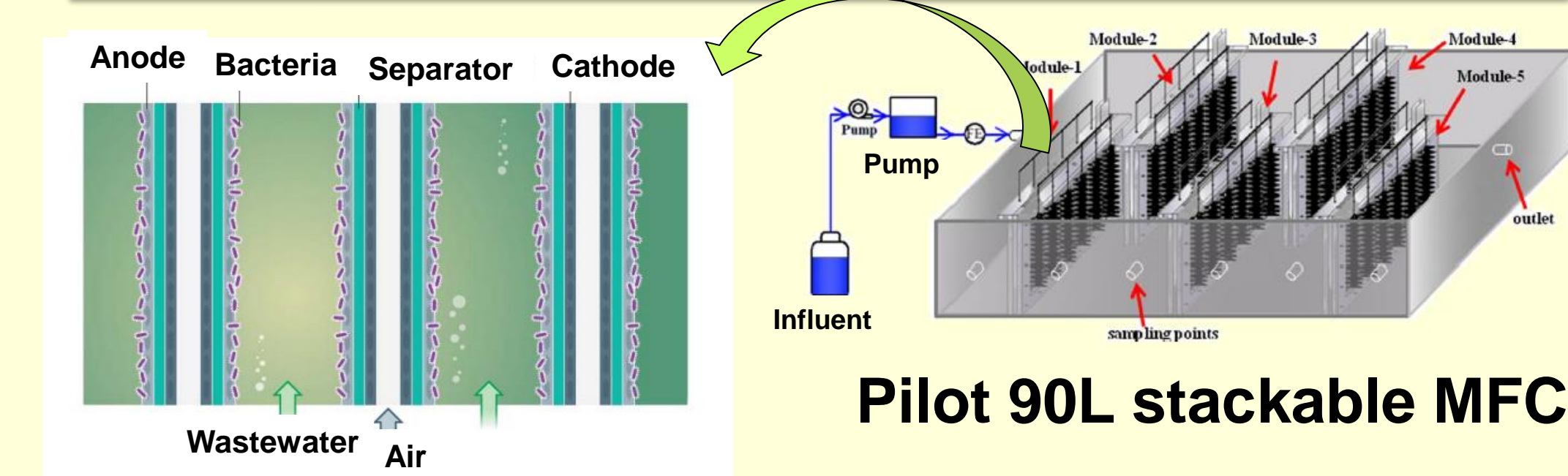


## How do Bacteria Produce power ?

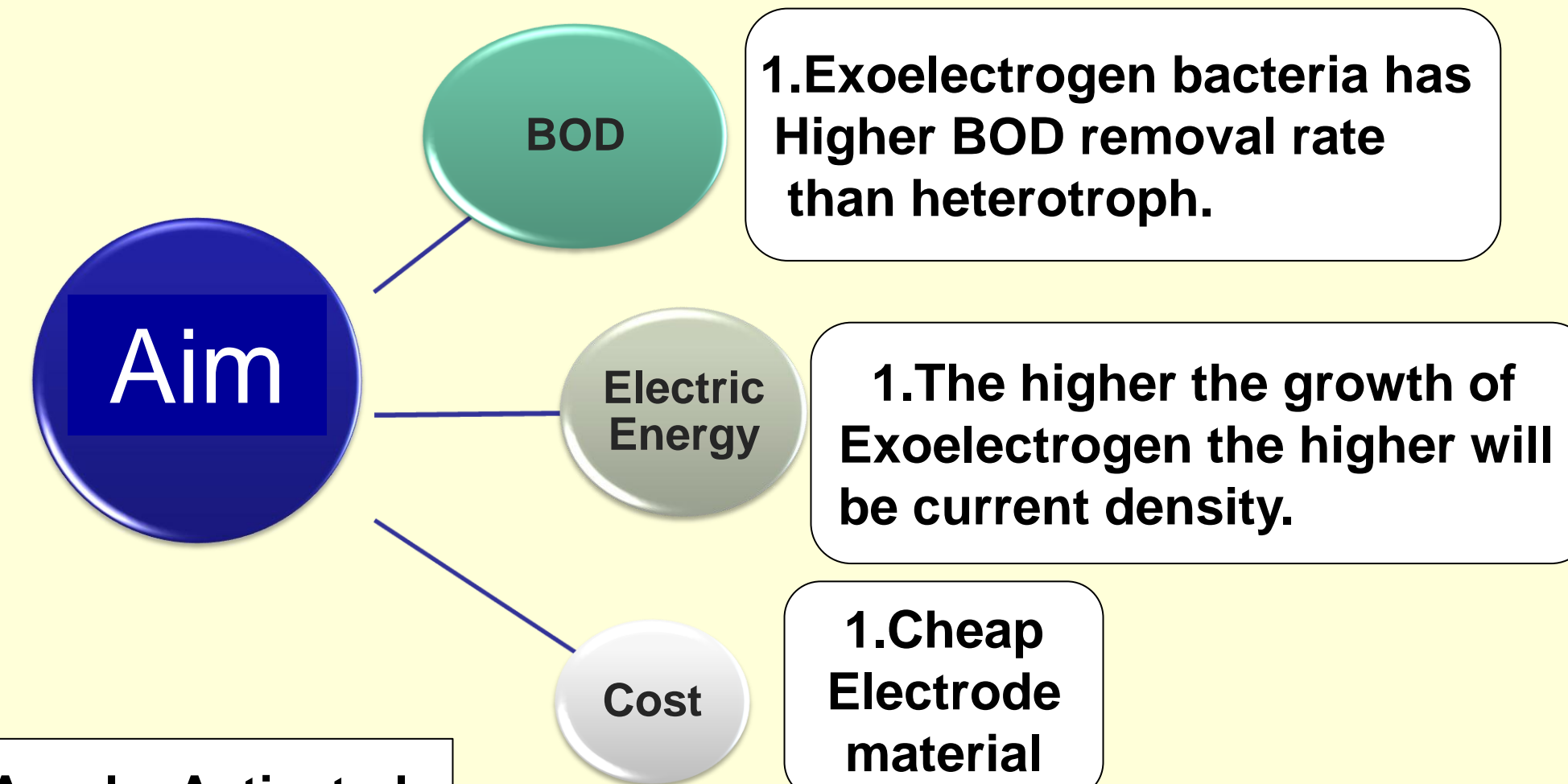


- **Exoelectrogen:** Microbes that can transfer electron to outside the cell .
- **Nanowires** produced by Bacteria.

## Application in Wastewater treatment plant



Pilot 90L stackable MFC

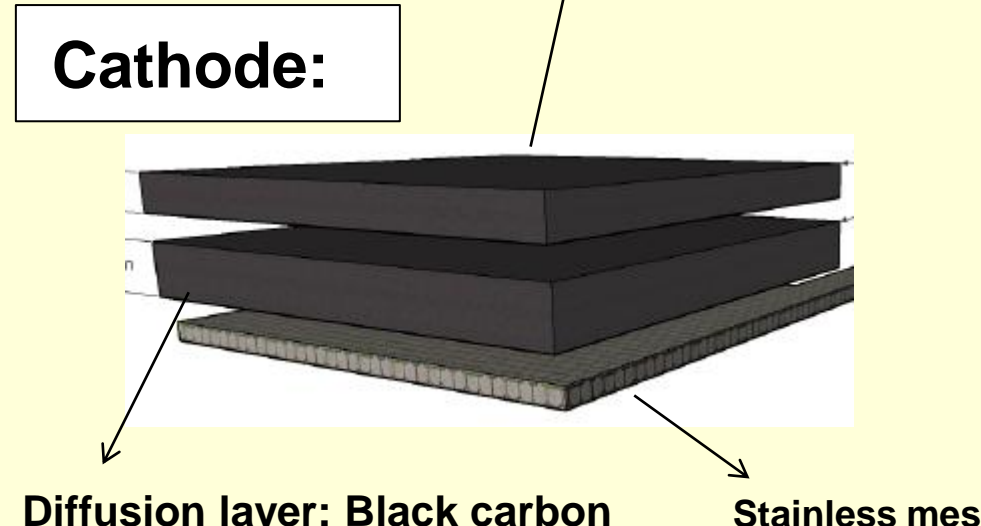


Anode: Activated Carbon Foam



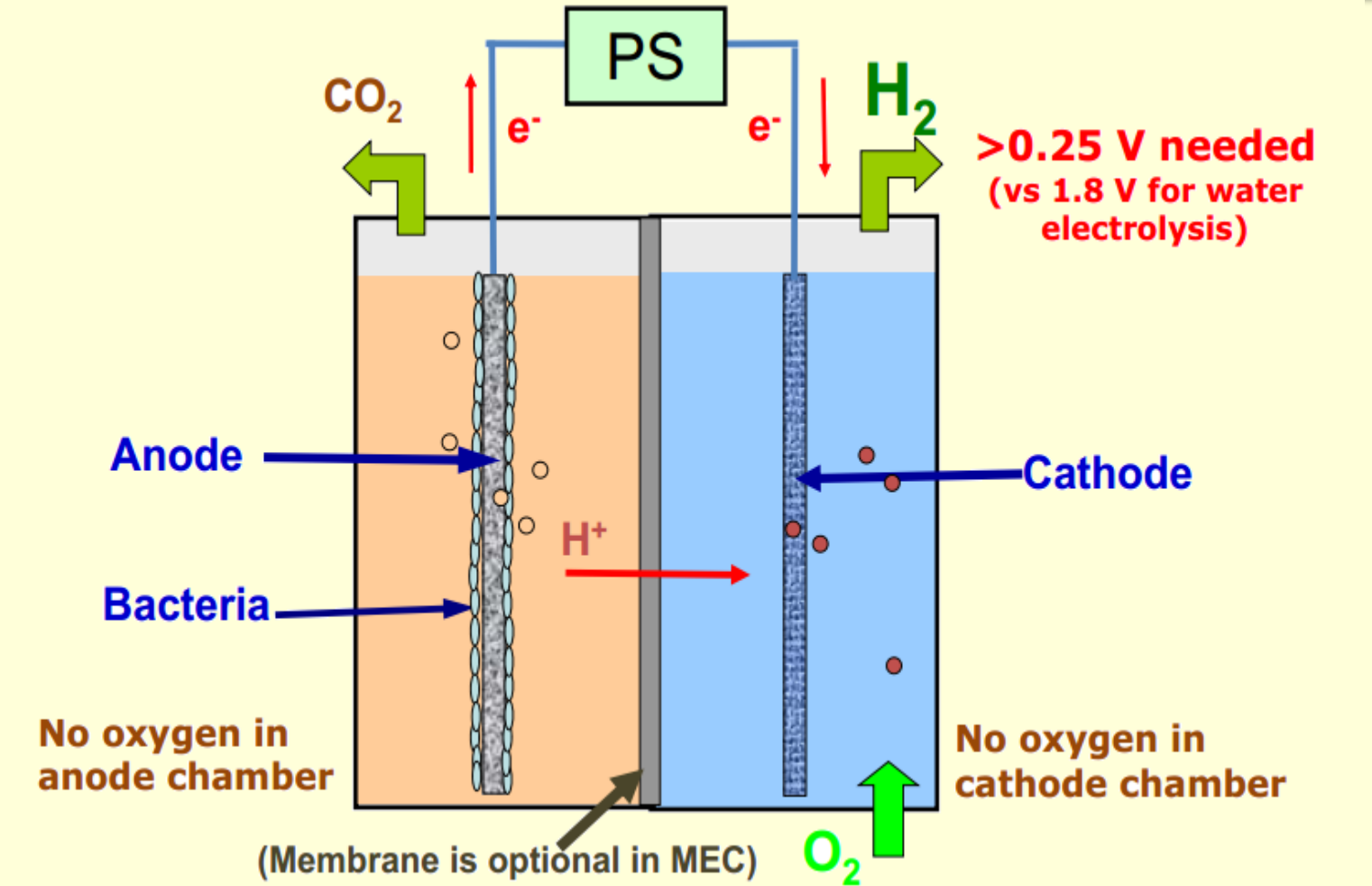
- Electrically conductive
- Porosity : 96.5%
- Pores/cm: 24

Activated layer: 70% Platinum on vulcan carbon

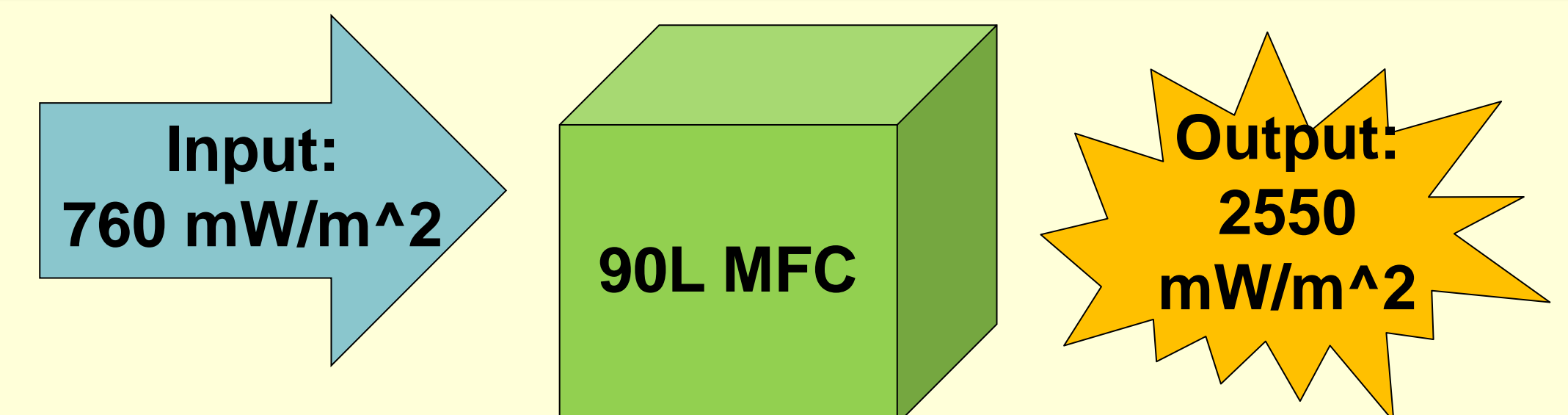


Diffusion layer: Black carbon Stainless mesh

## Bio-fuel from wastewater



## Approximate Cost Estimation



Cost per  $\text{mW/m}^2 = 8.55 \text{ USD} = 720 \text{ BDT}$  per month

**Maintenance cost:**

Cost to operate a MFC =  $(8.55 \times 760) = 6500 \text{ USD} = 5,20,000 \text{ BDT}$

**Income:**

Revenue for the production of electricity =  $(8.55 \times 2550) \text{ USD} = 21,780 \text{ USD} = 17,42,400 \text{ BDT}$

## Reference

1. Fabio Cameli. *Microbial Fuel Cell For Wastewater Treatment*. (2016)
2. Mostafa Rahimnejad, Arash Adhami, Soheil Darvari, Alireza Zirepour, *Microbial fuel cell as new technology for bioelectricity generation: A review* (2015)
3. <http://www.engr.psu.edu/ce/enve/logan/>