

# IMPROVING THE ENERGY EFFICIENCY OF SEAWATER DESALINATION PLANTS DURING RENOVATION AND UPGRADING

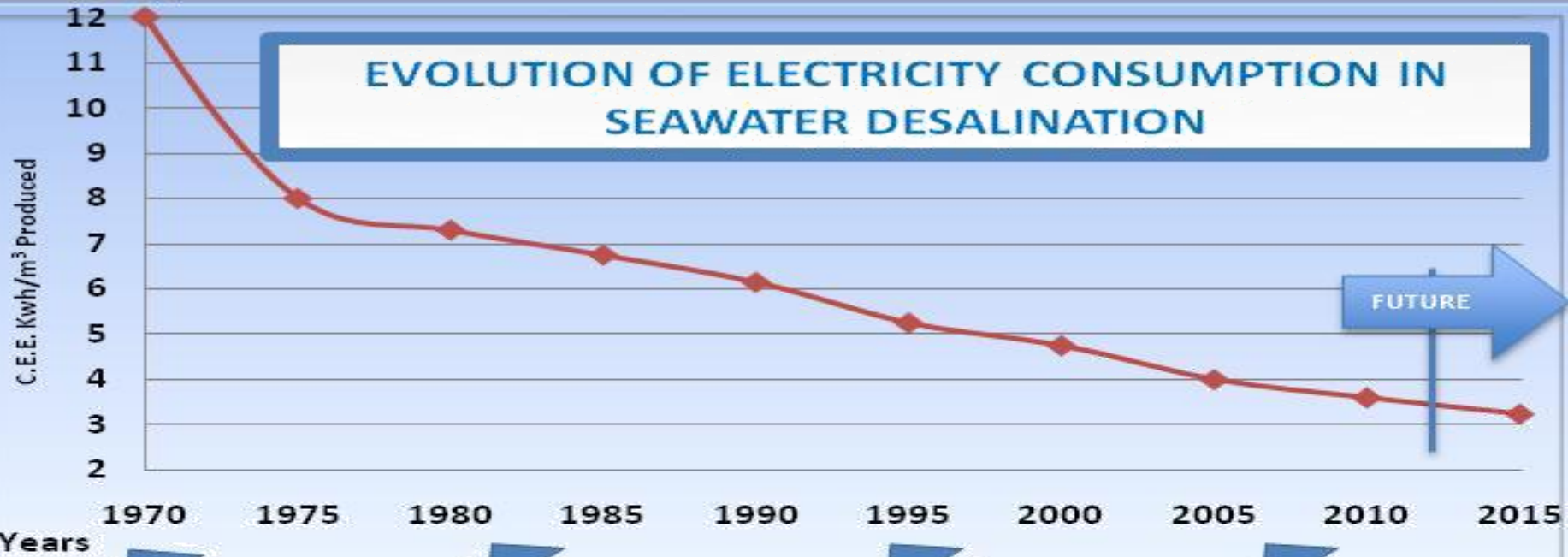
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&

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All desalination processes consume energy.  
Energy has to be generated and this generation has an environmental cost.

### EVOLUTION OF ELECTRICITY CONSUMPTION IN SEAWATER DESALINATION



Evaporation



Reverse pump



Pelton turbine



isobaric chambers

What can we do with old desalination plants?

# ENERGY INITIATIVES IMPLEMENTED



1 - Complete re-design of the process, seeking the lowest energy consumption.



2- Installation of isobaric chambers for energy recovery.

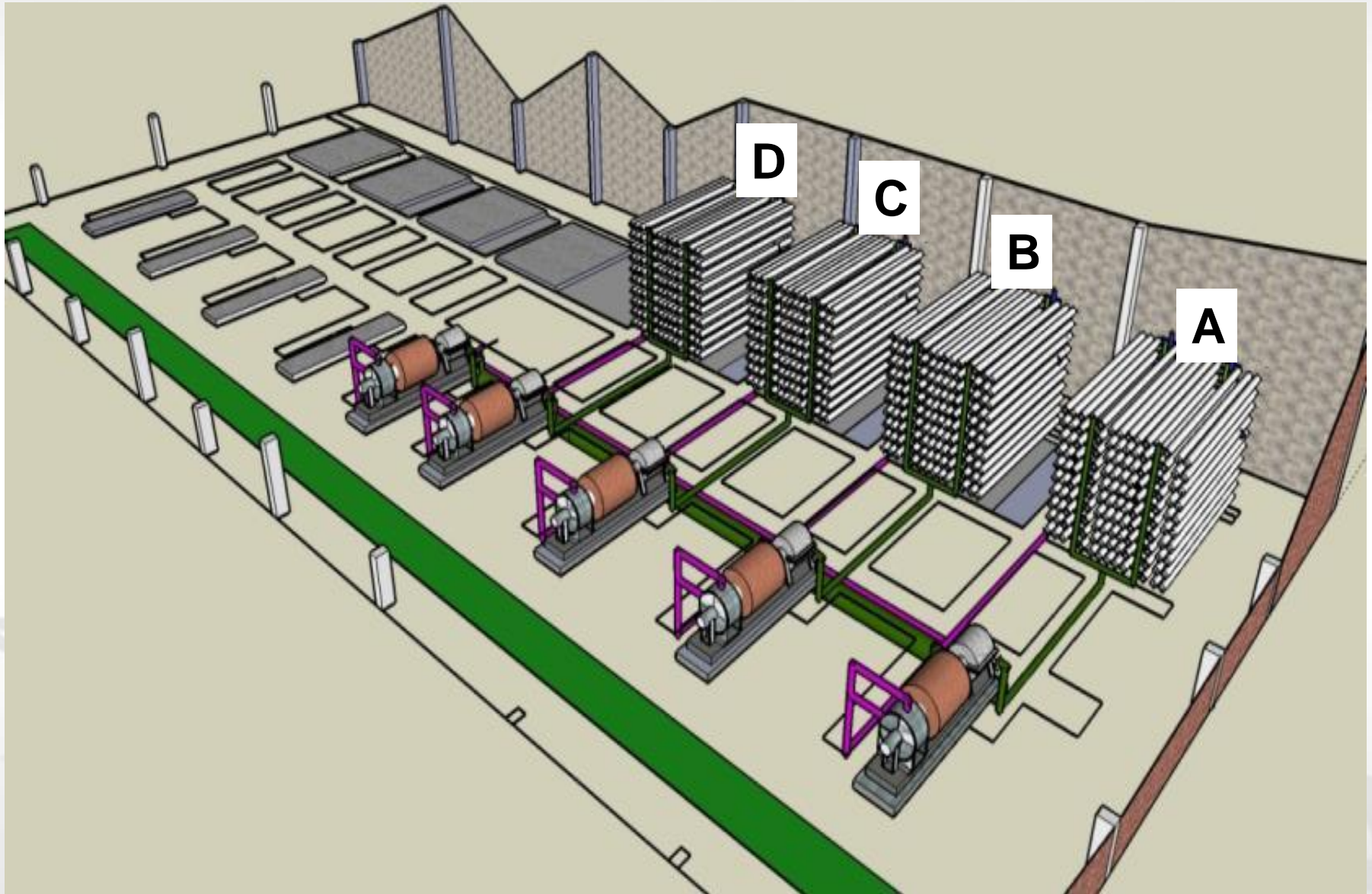


3- Installation of new state of the art RO membranes (lower power consumption).

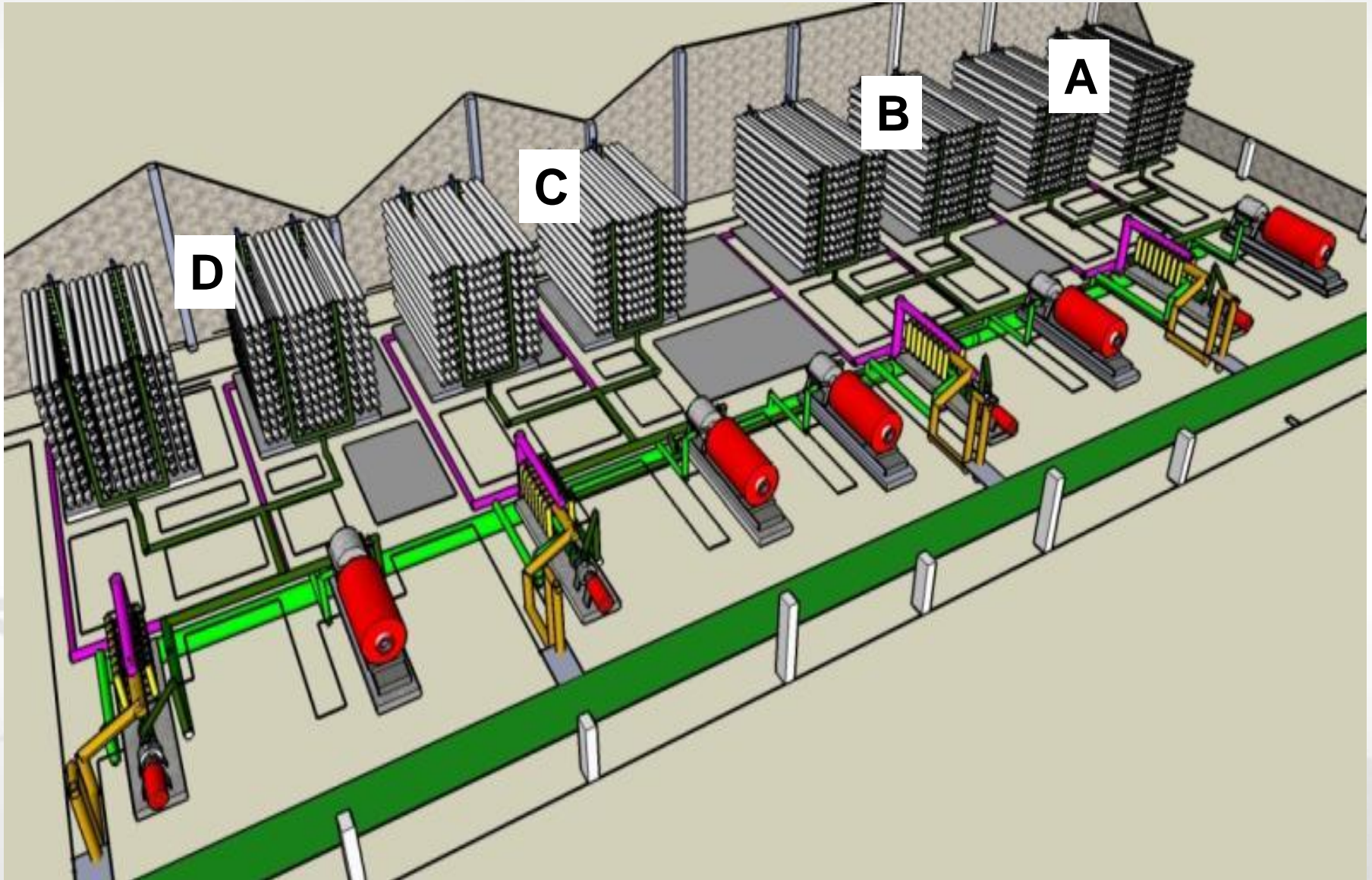


4 - General optimization of the whole process, conducting a comprehensive renovation.

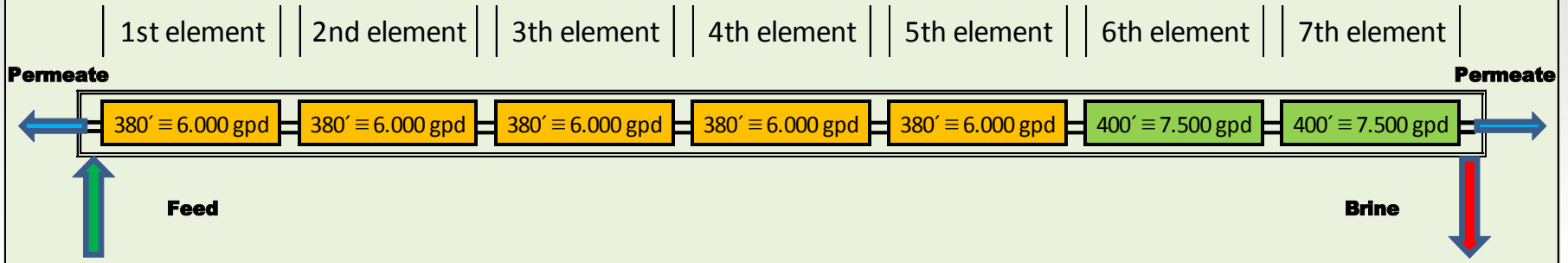
# BEFORE BEING RENOVATED



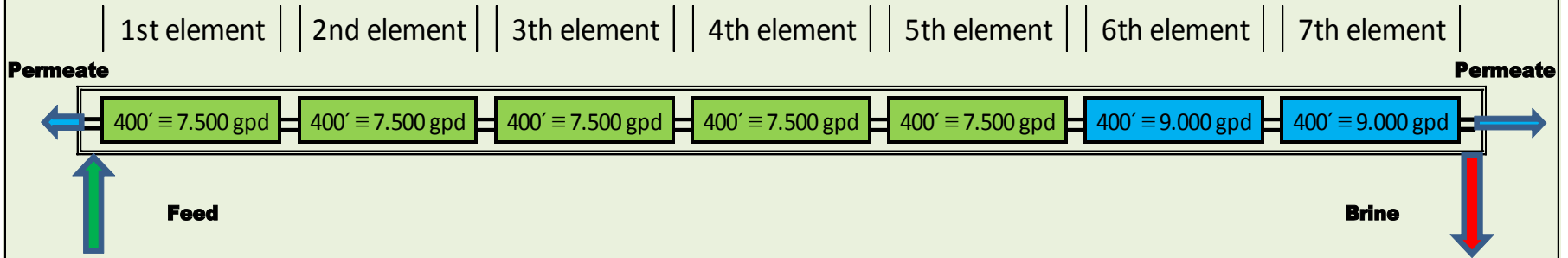
# AFTER RENOVATION



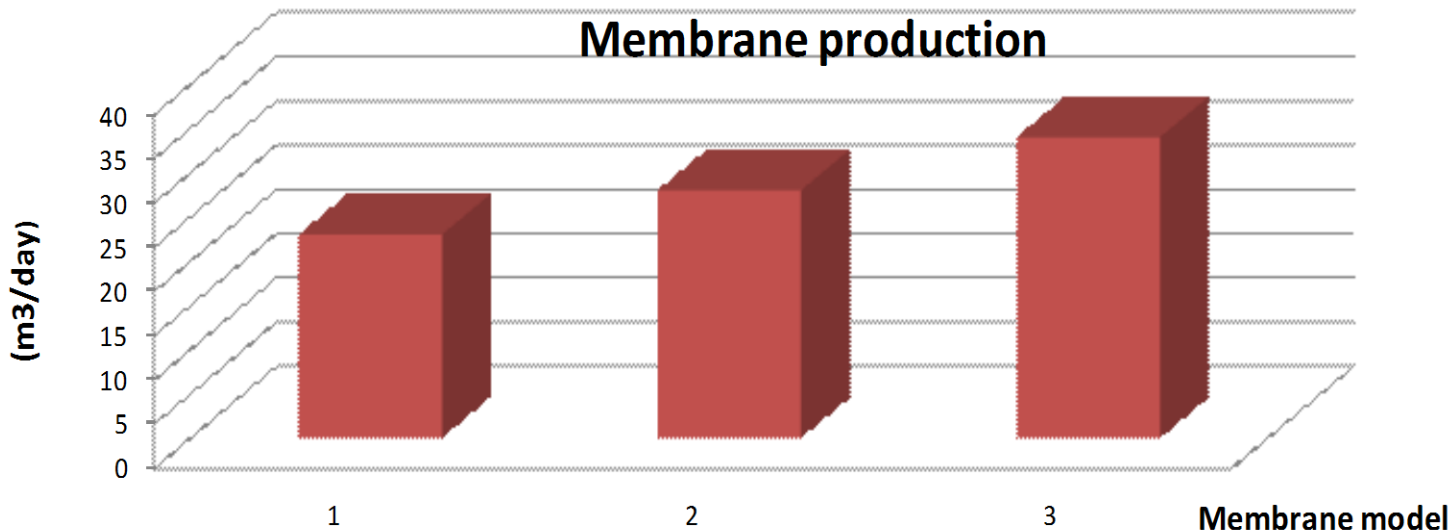
## EXISTENTES RO RACK. NEW MEMBRANE CONFIGURATION PER PRESSURE VESSEL



## NEW RO RACK. MEMBRANE CONFIGURATION PER PRESSURE VESSEL



## Membrane production

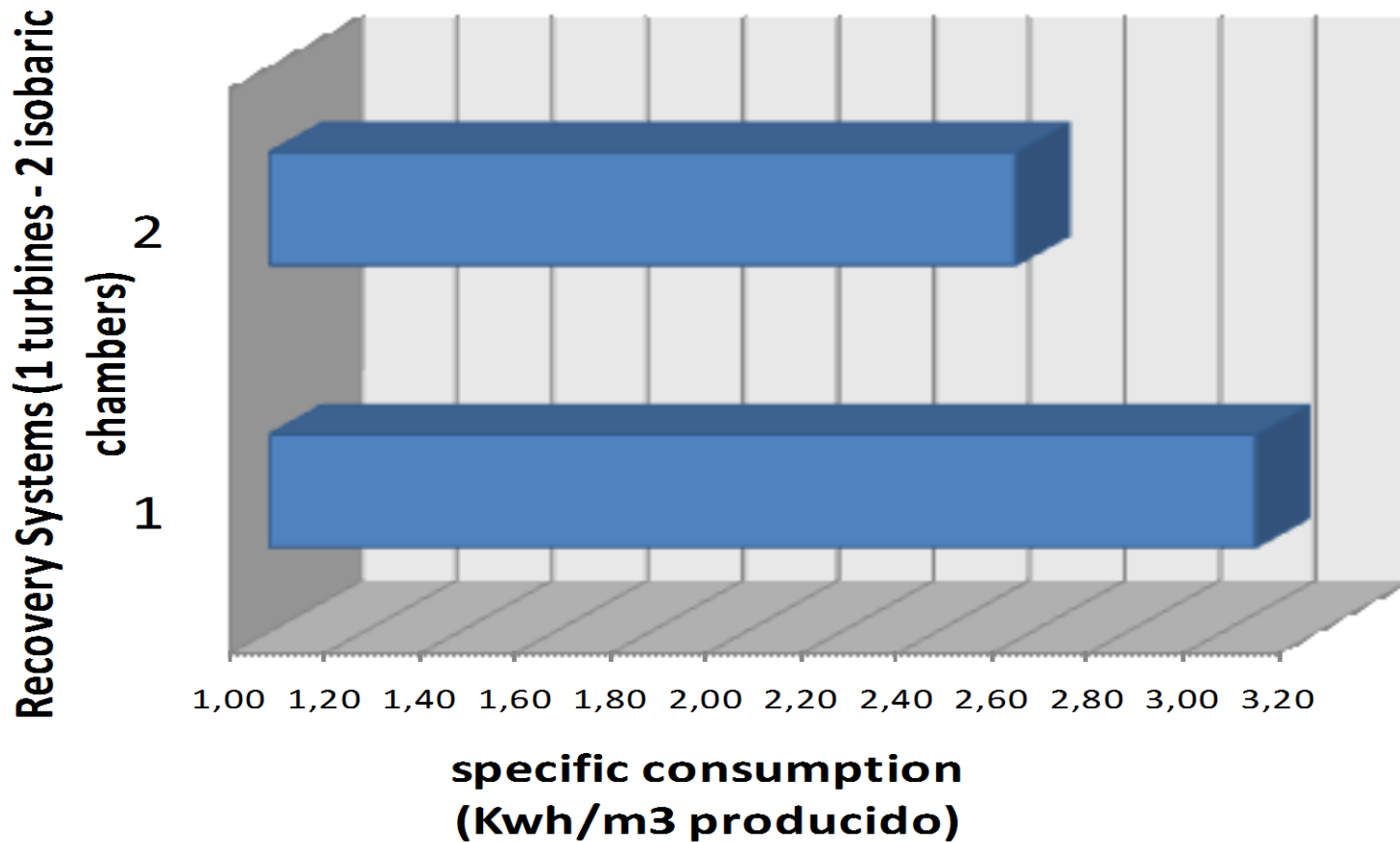


1 380' ≅ 6.000 gpd

2 400' ≅ 7.500 gpd

3 400' ≅ 9.000 gpd

## COMPARISON OF ELECTRICITY CONSUMPTION



This resulted in a decrease of 0.503 kWh/m<sup>3</sup> water produced in energy consumption. At standard operation, this amounts to 10,110,300 kWh/year