

***An Approach  
to Bio Coal Production  
from Macro Algae***

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# Previous Projects

## CAPWA (FP7)

Capture of evaporated water with novel membranes



## NanoGLOWA (FP6):

Membranes were developed with the aim to increase CO<sub>2</sub> concentration



# Cultivation of Marine Microalgae

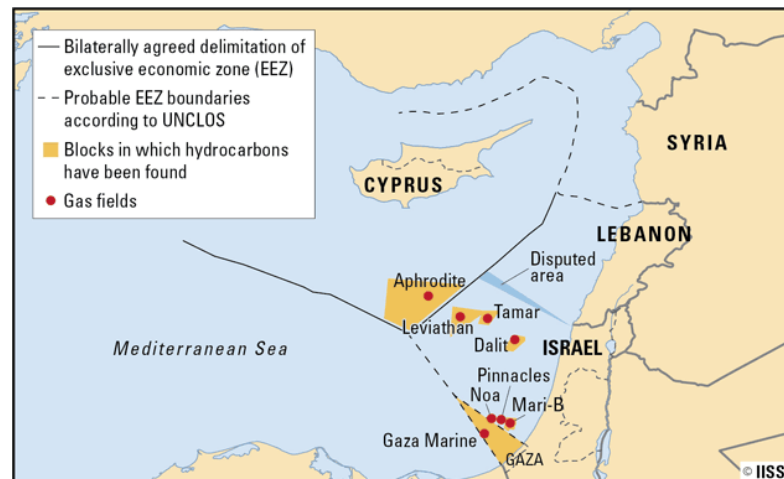
Cultivation of microalgae with intensive CO<sub>2</sub> enrichment by stack gases is an efficient way for both conversion of solar energy into useful biomass and mitigation of power stations carbon emissions.

In order to increase the cultivation efficiency one has to provide maximal exposure of the algae to the sunlight (done by mixing) and has to use the fossil fuel fired power stations fuel gases as the CO<sub>2</sub> source.



# Why Macro Algae

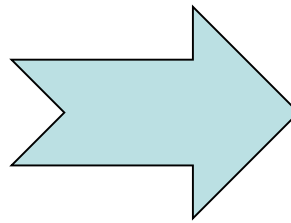
- Cultivation of bio mass for green energy generation in Israel is restricted by scarce land resources.
- A real opportunity for this can be provided only by the sea.
- Bio mass, namely macro algae, can be cultivated in huge quantity in the open sea.





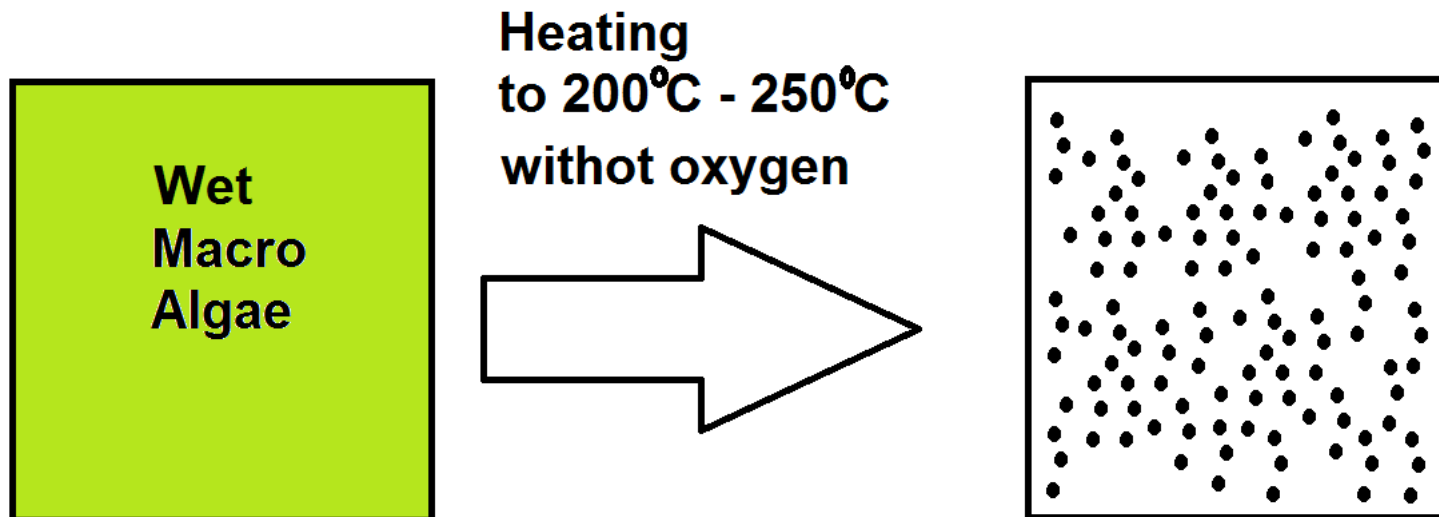
# Macro Algae into Fuel

- **Recent developments demonstrated feasibility of the above biomass conversion into various fuels**
- **We consider the most effective is production of bio-coal by using process of hydrothermal carbonization (HTC)**



# HTC

- **Hydrothermal carbonization (HTC) is a process similar to peat or coal formation**
- **However, while the natural process of peat or coal formation takes place for long period of time, HTC process takes a day**

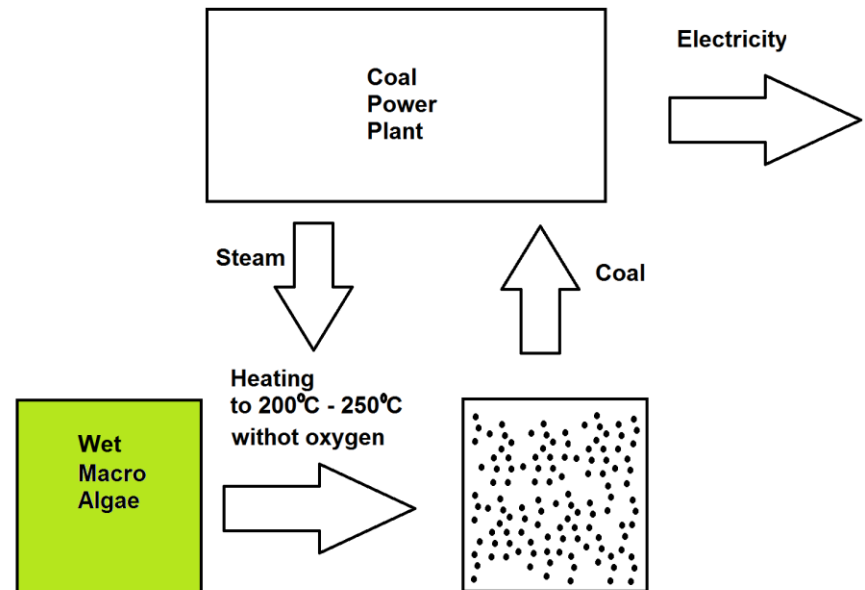


## HTC

- **HTC requires wet starting material. At the end of the process, the final carbon can easily be filtered off the reaction solution.**
- **Significant improvement in fuel quality is observed resulting in an increase in energy density (up to 25MJ/kg), which is comparable to that of a low rank coal and decrease of ash content.**

# HTC and coal fired power plant

- The bio-coal produced by HTC, unlike raw biomass can be directly fired in the coal power station for generation of green power
- On the other hand, low parameters steam from the power station can be used in the HTC process
- 1 million ton of bio-coal per year can be fired in IEC facilities





***THANK YOU!***

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