

An underwater photograph of a kelp forest. Tall, brown kelp stalks with long, narrow leaves rise from the bottom. In the center, a large, dense school of small, silvery fish swims. Several larger, darker fish are scattered throughout the scene, swimming in various directions. The water is clear and blue, with light filtering through from above.

MACROALGAE: NEW USES AND
POTENTIALS AS BIOPRODUCTS &
BIOENERGY.

SEAWEED HISTORY:

Since the beginning of time the uses of Seaweed was:

Asian Countries



Traditional food

Occidental Countries



Traditional products

Physiological functions of the seaweed:

SOLAR ENERGY

$H_2O + CO_2 \Rightarrow$ Organic Matter + O_2

Macro algae



BIOPRODUCTS
AND
BIOENERGY

- CROPS
- ANIMALS
- CARS
- MACHINERY

HUMAN BENEFITS



**SINCE 90' THE NEW ERA OF SEAWEED PRODUCTS CHANGE
FROM TRADITIONAL PRODUCTS INTO BIO-PRODUCTS AND AFTER
BIO-ENERGY.**

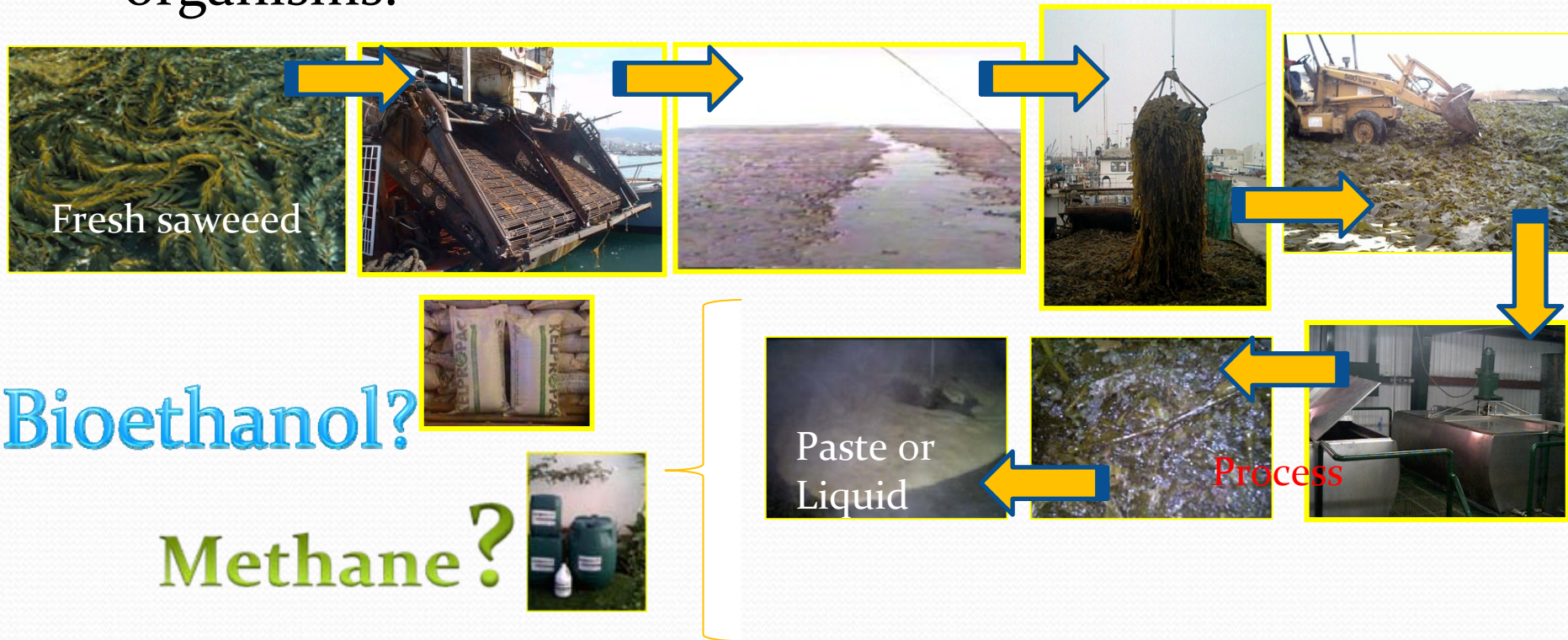
SO.... WHICH ARE ALL THIS BIOPRODUCTS AND BIOENERGY:

BIOPRODUCTS

1. Bio-stimulants and growth promoters for Agriculture uses.
2. Immuno-stimulants for animal feed
3. Natural binder for animal feed
4. Feed additive for animals
5. Source of immuno-products for human like U-Fucoidan, Mannitol and Laminaran (Medicine).

HOW CAN PRODUCE BIOPRODUCTS:

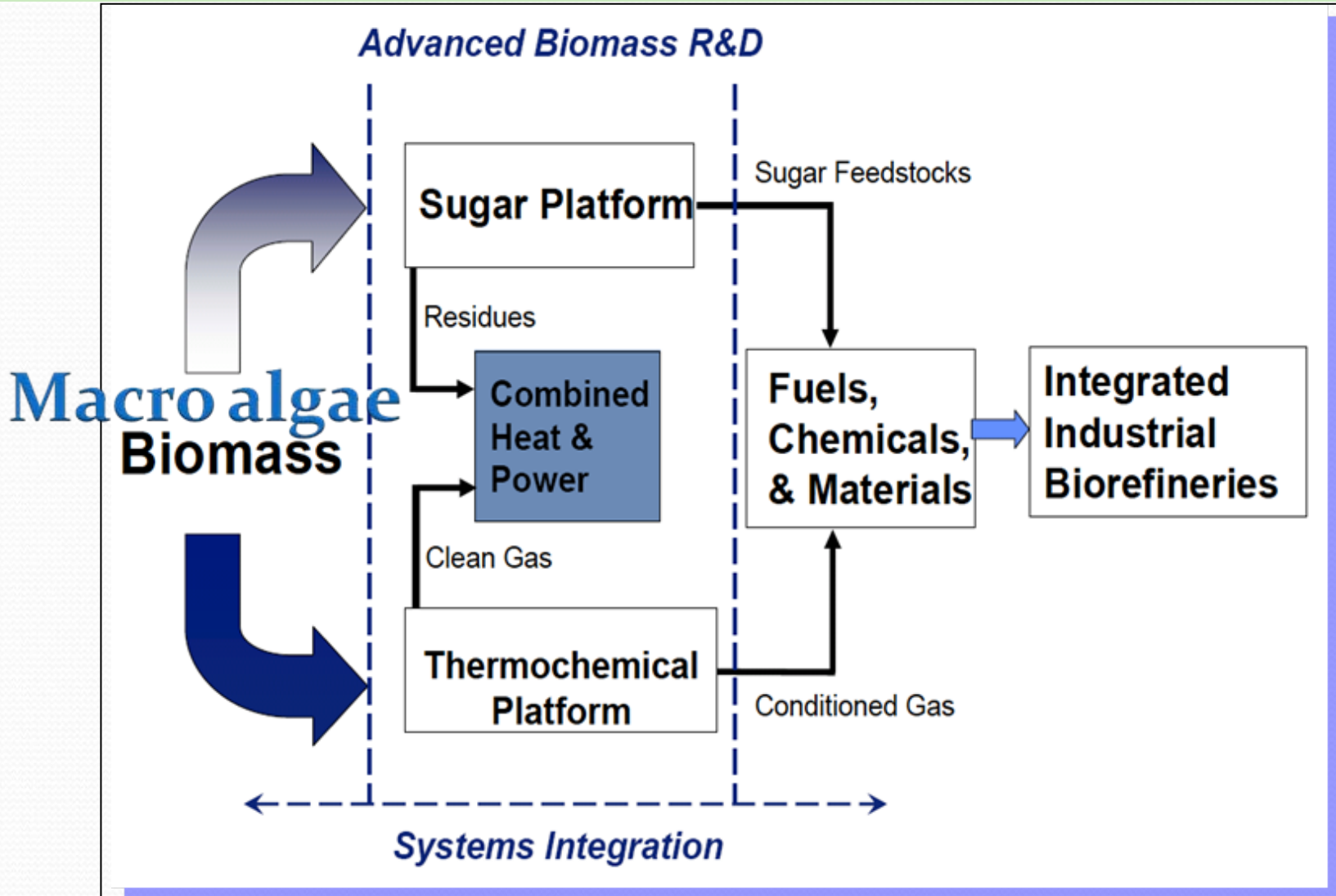
- Consists of an internal transformation of the chemical components within the seaweed **to turn them into available elements** to be easily assimilated by the organisms.



BIOENERGY

- **The First Generation** : Sugarcane (Brazil), Corn (USA)
 - **Competition with food utilization**
 - **Soaring of the grain price**
- **The Second Generation** : Wood or Grass (Leaf and Stem)
 - **Use of gene recombination technology**
- **The Third Generation**
 - : **Cultivated Seaweed and/or Natural Seaweed beds**

Technology Innovation : From Methane Fermentation to Bioethanol Production

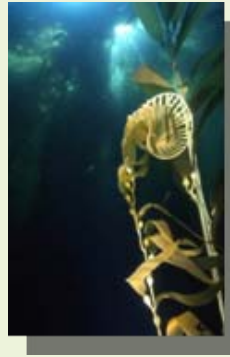


Two Seaweed resources are perfect as Raw Material for 3rd generation.

Brown Seaweed like:

Macrocystis sp.

Macrocystis or Giant Kelp:

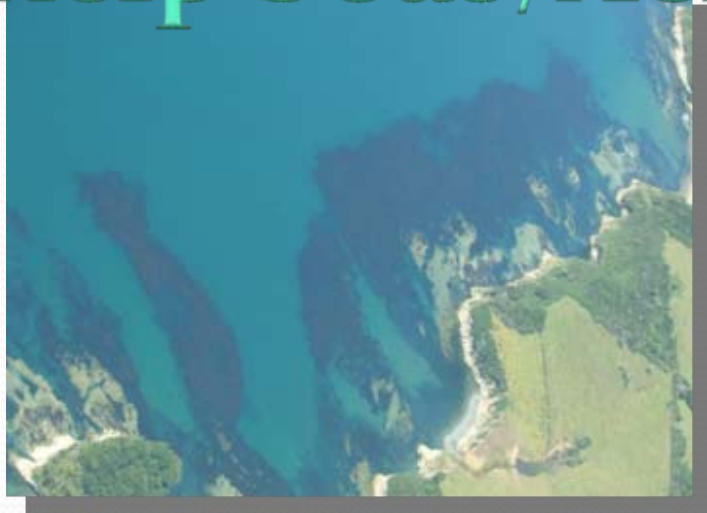


1. High Growth rate, big biomass , easy to harvest and cultivate.
2. Contents a very good chemical composition for many derivated products.
3. Not compete with other seaweed known as edible seaweed.

Kelp forest



Kelp beds/Aerial view



Availability of Biomass:

From USA to Chile: 1.5 millions of wet tons



The Harvest in Baja Mexico



Special harvester boat.