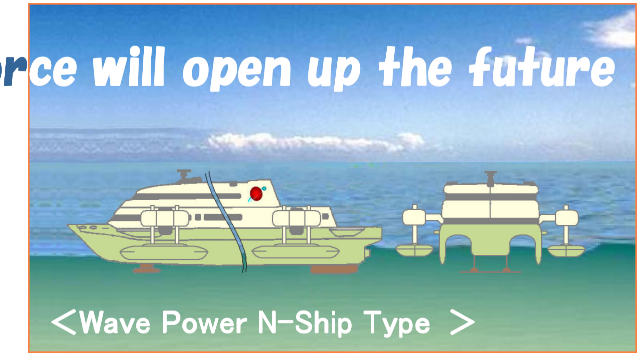
Floating in the ocean plants, "Wave Power N-Ship"

Wave Shock Generation !

Came a new Age of Discovery. Ocean resources / energy are filled for mankind.
Wave power N-ship, it is the world's first vehicles which energy can supply.
N-megafloat, providing power generation and aquaculture industries in the ocean.
Let's go to the wide sea. The great wave power, is open year round.
Furthermore, not harm to the marine transportation and fishing.

Wave force will open up the future



●Business Purpose

(1) Marine transportation, smelting, power generation, ammonia business.
(2) Marine resources projects. (Deep ocean water. Rare metals. etc.)
(3) Comprehensive marine cultured business. (Grains, Fish and Shellfish farming.)

●Owner adaptation.

(1) Public institutions.: Government. Local Government, Fishermen's union, etc.
(2) Companies: Energy companies. Food companies. Agricultural enterprises. Seafood companies. New companies selling electricity. Corporate real estate leasing.

●Approximate reference. * http://www.j-protium.com/

(1) Wave force ship body price: ～300,000 yen / t.
(2) Electricity price: ～6yen/kWh.
(3) Deep ocean water price: ～30 yen / L.

＜N-megafloat / Farm Type＞

❑Design is available for each type of business consultations.
❑Business consulting and introduce the service company.
❑Consultation contact.: info@j-protium.com

***The N-megafloat plays an active part in the business of the deepwater drilling of the Pacific. News!**

The huge deposit of rare earth elements (Rare earth elements) was discovered in the bottom of the sea of the Pacific. The deposits of the estimate reach land 1,000 times. Moreover, the distribution of 2,500 – 6,000 m depth in deep water.
N-type Wave power generation device is to solve the problems of mega-float in the ocean, which enabled the deep sea business of mining and ocean farms.

●Conventional wave force conversion technology suitable for driving force. [Green Ocean Energy Ltd., and Mermaid Ⅱ., Publicly than a document.]

	Depends on the buoyancy ＜Wave Treader＞	Depends on the water ＜Mermaid Ⅱ＞
Operating status		
Conversion device		
	Conversion unit is attached to a floating tower.(yellow part) To convert mechanical motion to vertical motion of the sea. From the principle of leverage, strong force is assured.	Conversion unit is attached to the tip of the ship Dolphin. (red part) Converted to thrust up and down movement of the ship.

*Movement of ocean waves can be seen. (http://www.j-protium.com/business/Strongest_Force_Ocean_eg.ppt)

●Electrical propulsion ship by the wave force.

The total cost of generation for 10 years to realize savings of more than 60%.

＜Simple calculation＞

A cost of facilities of the diesel engine generation, 100,000 yen /kW/1.34HP. 45% of thermal efficiency of the diesel engine.
Price of light oil 87 yen/L. (2011：In Japan) Operation time in kW as 57,000 hours /10 years.
Total cost /kW of the electric propulsion ship by the diesel engine generation,
(87 yen÷4,77kW)×57,600h≒1,0500,000 yen　　1,050,000 yen＋100,000 yen＝1,150,000 yen

Price of the N-type wave power generation device 200,000 yen/kW. Battery system 200,000 yen/kW.
Operation time in kW as 57,600 hours /10 years.
Total cost /kW of the electric propulsion ship by the N-type wave power generation,
0 yen×57,600h = 0 yen　　200,000 yen +200,000yen＋0 yen = 400,000 yen

Total Cost /kW Comparison.　1,150,000yen：400,000yen＝100：35

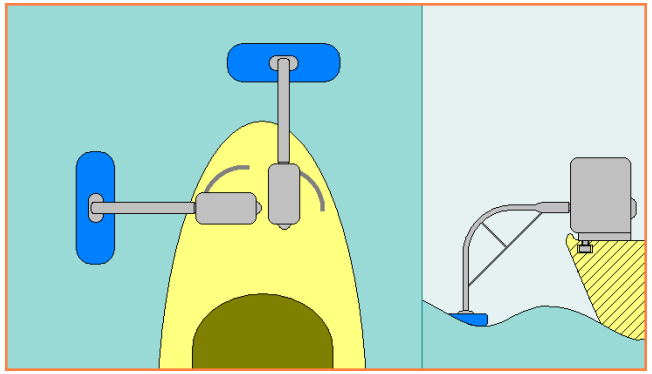
For example, it is price of ship 1,200 million yen when assume it a diesel engine of 2,500kW in the case of chemical tanker 6,000t.
On the other hand, the total cost that can reduce in ten years is 1,875 million yen.　**"Can buy the ship for 7-year fuel charges !"**

Small boat by the wave force electric propulsion.

The merit of the small boat. (Fishing boats / Pleasure boats.)

(1) N-type Wave power generation device can be retrofitted to existing vessels.
(2) When a ship wavering by a low wave less than 1m, receive the energy of waves more than the height of the wave and can convert it into electricity.
(3) Even while traveling can be generated electricity by the controller.
Even if accumulation of electricity disappears, can return to the harbor.
(4) Even if can not be fishing in storm, electricity generates in a port for 24 hours, and can be sold.
(5) By pleasure boat of the long-term anchorage, battery always becomes 100% of charge.
In the case of engine failure at night, the electricity is usable enough.
(In particular, the fishing boats refrigeration equipment, pleasure boats waiting for rescue.)
(6) Even if there is no wave, power generation can be for a while.
(7) Reduction of the CO2 is possible.
(8) There is not the pollution of the sea.

Fishing boat, accumulate electricity during the operation, and commute.



About an income during the rest fishing of "The fishing boat of the electrical propulsion."

12 hours / day , a simple test calculation of a small fishing boat anchoring in the wharf.
When this fishing boat is equipped with " N-type Wave power generation device
" and sells electricity for *31 yen/kWh.
(*Reference example: Scotland, Ireland, Portugal's average purchase price.)

The amount of money that a fishing boat sells per day, 1kWh×31yen×12h=372 yen.
In the year, 372 yen×365day=135,780 yen.
Suppose, for power is 3kW, 3kWh×31yen×12h×365day≒400,000 yen.

This is sales of 3 times really in comparison with a general domestic solar power system (3kW).
This difference is due to the difference in average generation time.

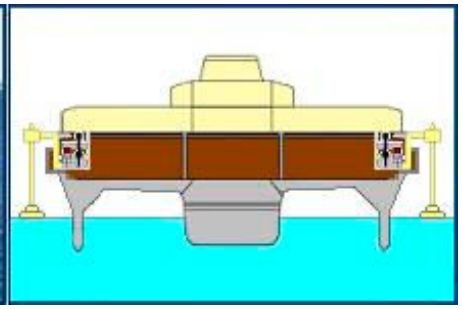
Solar power system	1kW×3.8h×365day= 1,380kWh/year
N-type Wave power generation device	1kW×24h×365day= 8,760kWh/year

Large vessels of the electrical propulsion by the wave force. (A trimaran.)

*The low-speed navigation is suitable for wave power N-ship. In the case of the high-speed navigation, use battery electricity together.

[*Photos:High-speed ferry (This ship is not a wave power ship.) /Austal ship*] [*An ideal trimaran.*]

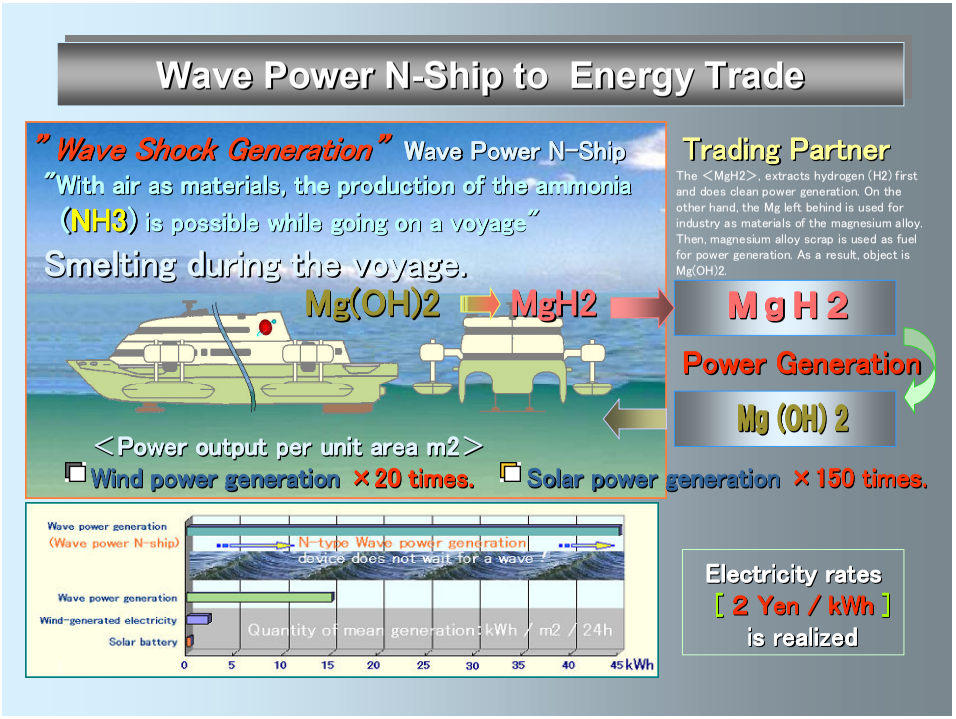




The merit of the large vessels. (A trimaran.)

(1) Because the ship does not affect the wave pattern of both sides, N-type Wave power generation device can function.
(2) Even if it is high waves, stable sailing is possible.
(3) Even while traveling can be generated electricity by the controller. Even if the lack of capacity of the battery, can return to the harbor.

(4) Even if there is no wave, power generation can be for a while.
(5) Reduction of the CO2 is possible.
(6) There is not the pollution of the sea.



●Business of the trade of the renewable energy by the wave power N-ship

[Pacific rim energy design.]

(For economic equalization of the Pacific rim.)

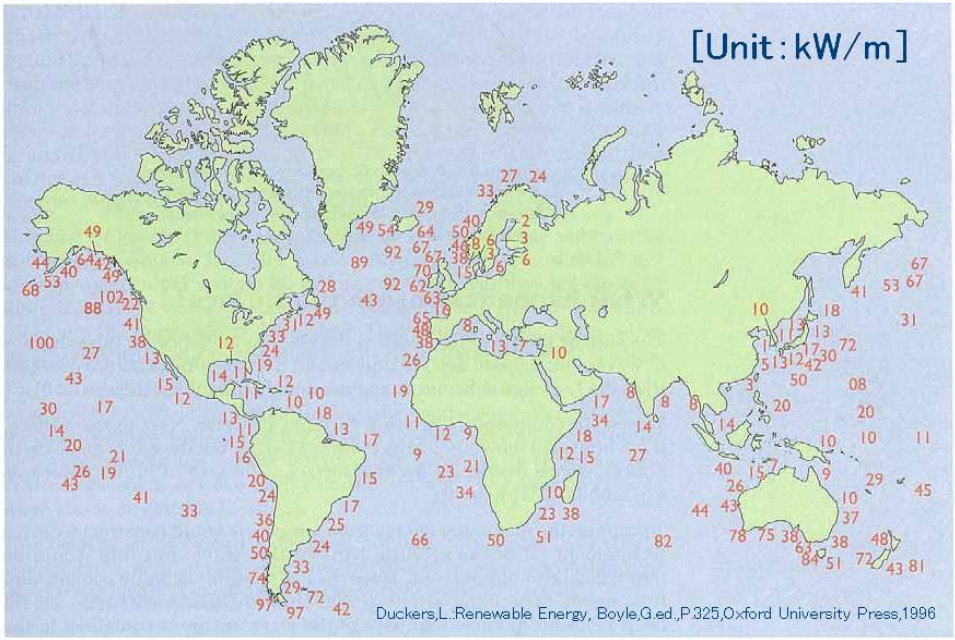
Wave power N-ship, which produces the following resources in sailing. Hydrogen, Nitrogen, Oxygen, Ammonia, Methane-based Fuel, Deep-ocean water, Salt, Chlorine, Sodium, Magnesium, Potassium, Bromine, Lithium.

For example, in the case of approximately 8,400km between Tokyo and San Francisco. The movement factory does a 38-day voyage at an average of 5 knots. Sell the product to the U.S.A., Furthermore, depart for Tokyo and continue producing it.
About business characteristics, anyone understands the thing that is very superior to the conventional system. It does not have fuel and "cost & time" about the transportation.

*Movement of ocean waves can be seen. (http://www.j-protium.com/business/Strongest_Force_Ocean_eg.ppt)
*The image of the route of wave power N-ship is seen. (http://www.j-protium.com/business/eg_pacific_pim.GIF)

It is necessary to endure a surge of 5-7m to get electricity on the ocean. N-type Wave power generation device, even more than 5m waves, destruction of equipment can be controlled.
In addition, a large amount of power "Storage / Transport" should be.
The wave force, bitter-salt (MgCl2) and air is three major elements for realization.

Extensive Distribution of Renewable Energy



＜570 billion kW in untapped wave power : Total power consumption of the world's 1.2 billion kW＞

Wave height [m]	1~2	2~3	3~4	4~5	5~6	6~7	7~8
Estimated wave energy [kW/m2]	10	30	60	100	150	210	280

【Safe transit technology of ocean enormous energy】

(1) Hydrogen-Agent ＜MgH2＞

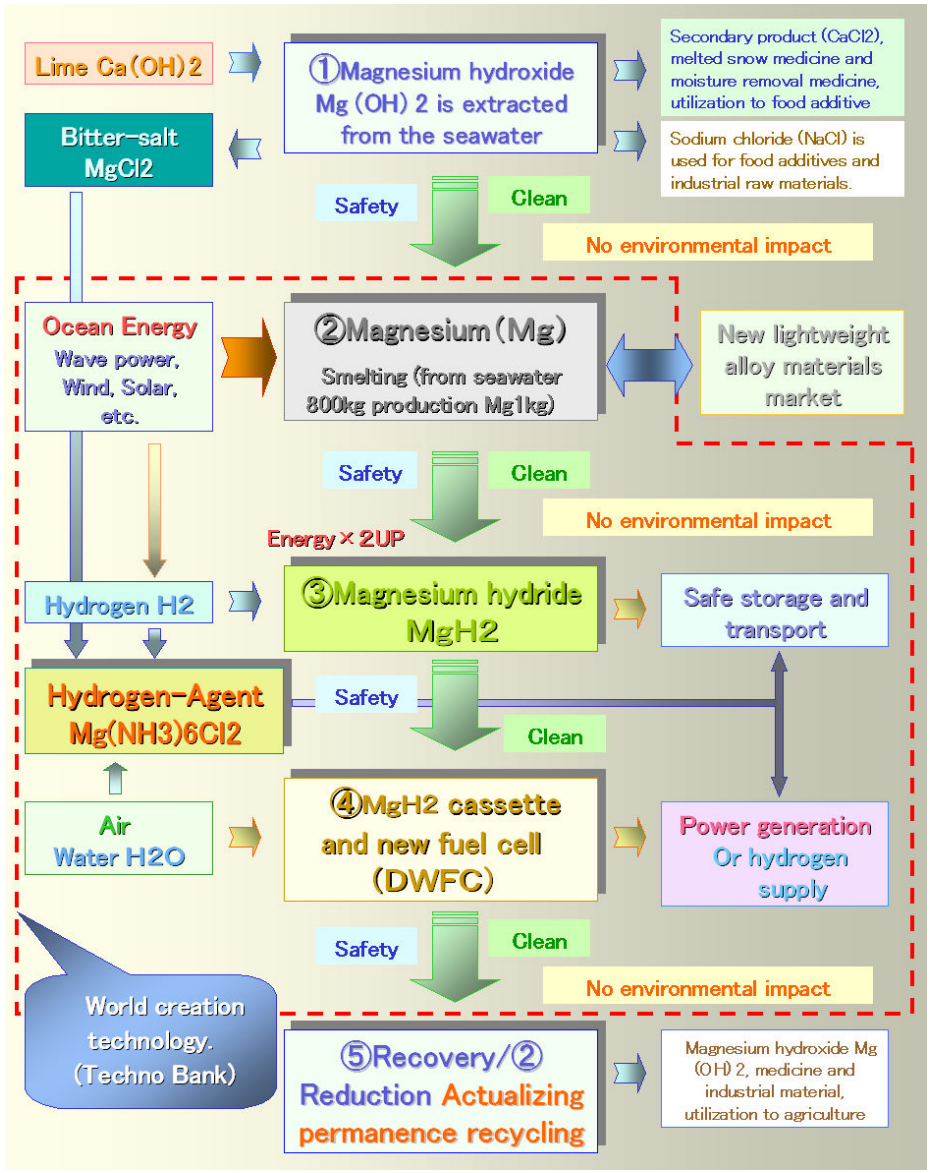
＝ Magnesium ＋ Hydrogen ＝ Safety Technology

＝ Hydrogen content is the weight ratio, **7.6 wt%**

(2) Hydrogen-Agent ＜Mg(NH3)6Cl2＞

＝ Bitter-salt ＋ Ammonia ＝ Safety Technology

＝ Hydrogen content is the weight ratio, **9.1 wt%**

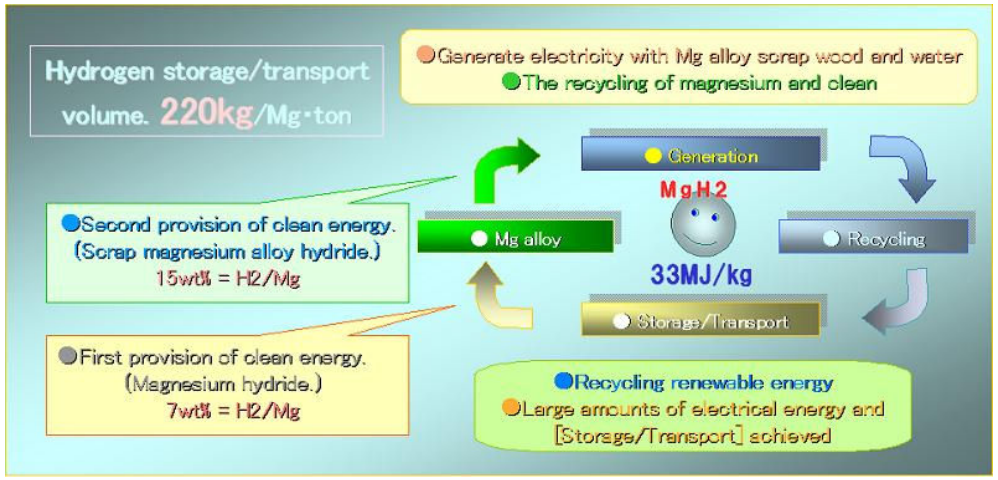


(1) Overview of the business: The wave power ship takes over thing <Mg(OH)2> from the country of the partner as a result of generation. And while the voyage, the marine renewable energy, to convert the <Mg(OH)2> ➢ <MgH2>. The conversion thing <MgH2> sells it to the country of the partner.

The right image shows circulation recycling of the magnesium. The duties of the wave power N-ship are recycling and storage / transportation,.

The ＜MgH2＞ purchase country extracts hydrogen (H2) first and does clean power generation. On the other hand, the Mg left behind is used for industry as materials of the magnesium alloy. Then, magnesium alloy scrap is used as fuel for power generation. As a result, object is Mg(OH)2. This work, shown a repeated forever.

This is a sustainable energy industry.



The wave power N-ship can do the production of the ammonia (NH3) with air as materials while going on a voyage. The carbon dioxide (CO2) in the air is 0.04% contained. Material to carbon dioxide and hydrogen, the methane-based fuel (CnH(2n+2)) can be produced easily.

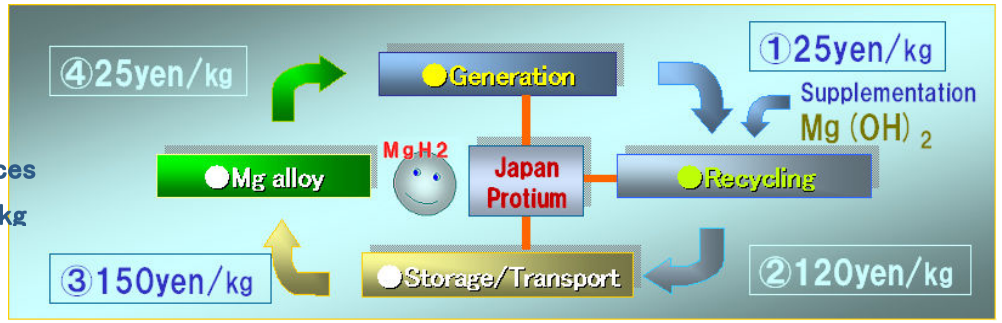
(2) Power generation fuel is free: The fuel price for power generation gives an explanation becoming free of charge about the right image in power generation using scrap of the magnesium alloy.

Power plants, cars, planes, equivalent to power generation.

＊ power generation fuel bill basically does not occur. (Licensing business.)

Power generation fuel cost ＝ The price of magnesium alloy － Magnesium alloy scrap purchase price

(3) The income and expenditure of the smelting business of the magnesium:



Mg alloy prices
800yen/kg

For more information, ▼ please visit here 7P.
http://www.j-protium.com/business/eg_renewable_energy_trade.pdf

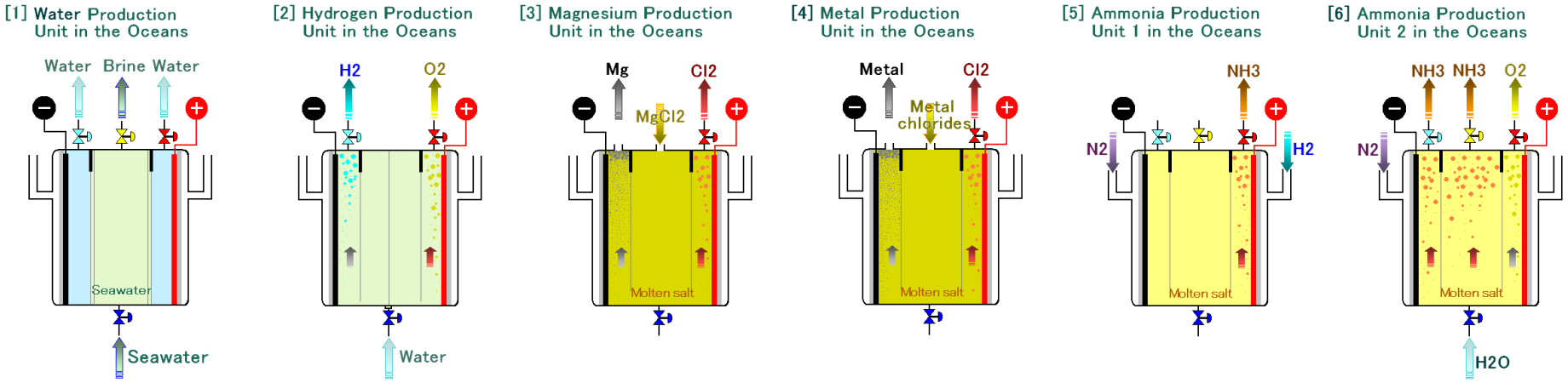
●Storage / transportation technology for ocean energy.　(Multi-purpose device mounted on the wave power N-ship)

We have developed "Multi-purpose molten salt/ electrolysis" to the vessels are equipped with wave power N-ship. Technology is based in 1980. The main resources which wave power N-ship produces during a voyage are as follows. Hydrogen, Nitrogen, Oxygen, Ammonia, Methane-based Fuel, Deep-ocean water, Salt, Chlorine, Sodium, Magnesium, Potassium, Bromine, Lithium.

The wave power N-ship can do the production of the ammonia (NH3) with air as materials while going on a voyage. Providing inexpensive ammonia is produced by low-cost electricity and seawater. In addition, efficient plant operations as well by moving.

The ammonia is the material which is essential for industry. In addition, the content of the hydrogen (H2) is reviewed as clean fuel by 17.8wt%. Clean the grounds, if the use of hydrogen is only to produce nitrogen and water.

By the way, the content of the hydrogen is alcohol 12.6wt%, natural gas 25wt%. These, CO2 is generated.



●Ammonia and the expanding global market problems

Ammonia, by natural gas producing countries, now **150 million tons / year** production has. Hydrogen is the raw material, obtained by decomposition of natural gas. Transportation will be transported by tanker dedicated refrigeration equipment. The main market is the breakdown of ammonia, 80% fertilizer, plastics, textiles and 20% are. In particular, as an nitrogenous ingredient in fertilizer, because there is no alternative, is important.

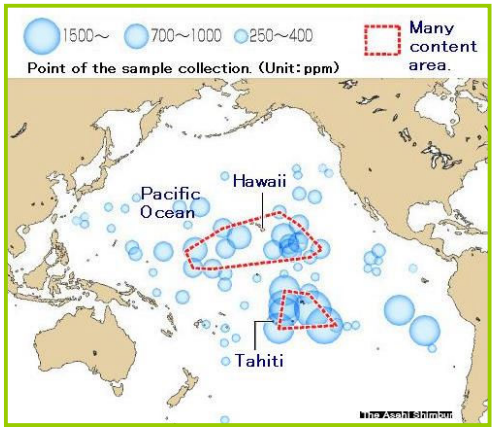
For renewable energy use, ammonia is active. (Currently, ammonia is not consumed as fuel.) The ammonia takes an important role as means of the storage / transportation of the hydrogen.

The practical use of the system of solid oxide form fuel cell "SOFC" which made ammonia direct fuel has already unfolded.

Going forward, toward the era of food shortages, to expand markets and increase the amount of ammonia in agricultural production.
The problem of the drying up of the natural gas surfaces sometime soon.

● The megafloat plays an active part in the business of the deep-sea mining of the Pacific.

Mega-Float, a technique to reduce the elastic response is important.
N-type Wave power generation device, as a vanishing wave crest, then converted into electricity by absorbing wave energy. This rational technique is indispensable for the ocean energy era.
N-type Wave power generation device is to solve the problems of mega-float in the ocean, which enabled the deep sea business of mining and ocean farms.



Three walls of deep-sea mining operations.

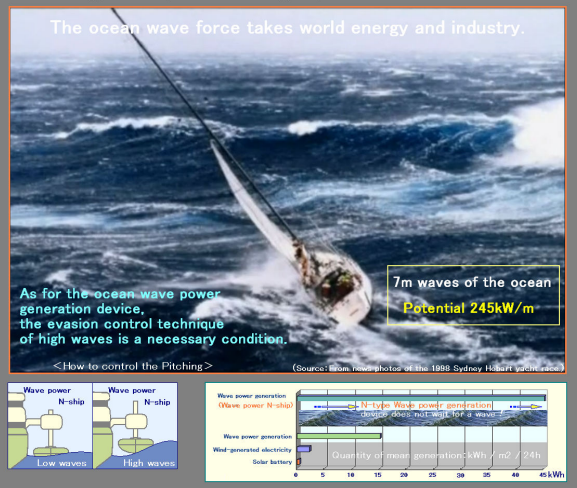
①A mooring equipment is not usable. ＜Stationary position is difficult＞
②There is not stable big power supply equipment. Expensive fuel is necessary. ＜It does not function as a factory＞
③Direct ocean disposal of drilling mud that is impossible.
＜The extinction of the sea life＞

The deposits of the estimate reach land **1,000 times**.
Moreover, the distribution of 2,500 – 6,000 m depth in deep water.
Mega-Float in the deep sea, the "N-type Wave power generation device" is essential.
The N-megafloat supplies electricity by wave power generation. In addition, long-term work is possible at the position that was decided in the deep sea. In other words energy cost is free "Floating Factory".

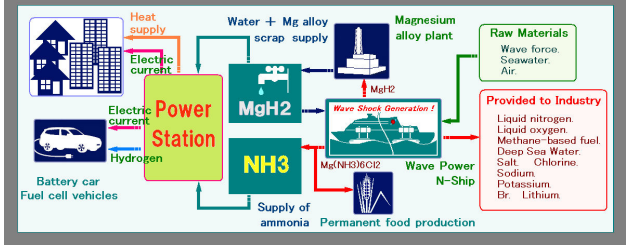
＊ Project Concept

It is excellent for ocean wave power generation is in a mixed waves of multiple wavelengths.

The total amount of wave energy available, more than 500 times for the world's total electricity consumption.
The energy density is the strongest, too.



Wave power ship is a manufacturer to procure all the raw materials floating in the ocean.



The electricity or hydrogen by this wave force becomes the extremely important element in the deep sea mining business.
Drilling mud is not discarded directly into the sea. It is cloudy and the sea with mud, is to kill the sea creatures.
We are using enough electricity or hydrogen to make building materials(blocks, sand) with hard baked mud disposal.
Also, it sunken to the seabed or riverbed, serves as a water purification material.