HYP

GREEN HYDROGEN GENERATION TECHNOLOGY

By Buddha Energy Inc

HYP PRODUCTION TECHNOLOGY

=

+

3. Fusing process (know-how)
Aluminum + Alkali

Ready to use green hydrogen powder **(chemically-bound hydrogen)** offers a pollution-free method that doesn't contaminate groundwater, utilizing resources available in every country. **NON Explosive, ready to transport.**

2. Alkali component

Worldwide accessible and reliable component. for the production of HYP.

1. Aluminum Scrap Recycling

Utilizing aluminum scrap, which is cheap and available, significantly improving the environmental situation.

Price per 1 kg of H2 gas is produced - 4,1$

H2 Gas analysis:
- O2 content (%) - 0,4
- H2O content (g/l) - 0,022

HYP - Hydrogen Powder

GREEN INNOVATIONS FOR A SUSTAINABLE FUTURE

BREEAM

- **Project Control and Management**
  We provide Saudi Arabian residents with 100% project control and management.

- **Health and Comfortable Environment**
  No CO2 emissions, cleaning the country from aluminum scrap, oil stains, improving environmental quality for everyone.

- **Water Conservation**
  We conserve water resources unlike the traditional method using electrolyzers.

- **Natural Materials**
  Our technology uses natural materials such as aluminum and alkali.

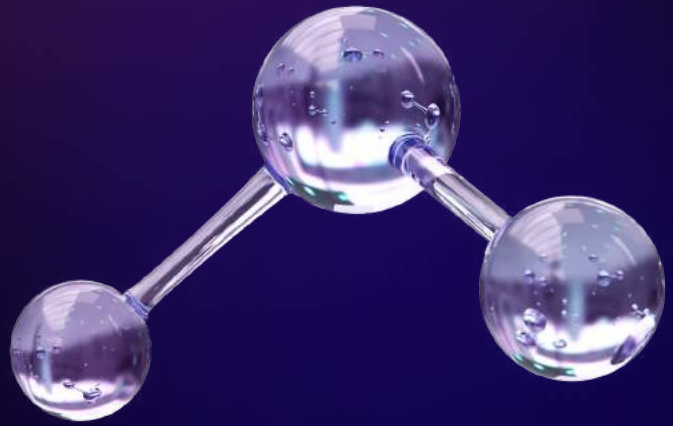
- **No Environmental Pollution. Waste Utilization**
  We use aluminum scrap, thereby cleaning the environment.

LEED

- **Resource Conservation (water, energy, materials)**
  Our project conserves water, energy, and materials for minimal impact on the environment.

- **Energy Efficiency**
  Compared to traditional methods, our project uses energy more efficiently, reducing emissions and enhancing energy conservation.

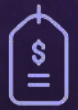
- **Innovation**
  Unmatched



VISION 2030

Green Hydrogen

Our project is based on the production of green hydrogen. We aim to create an environmentally sustainable industry that contributes to reducing dependence on oil resources and improving the environmental situation.



Cost

Our technology ensures minimal implementation and operational costs. We strive for efficient resource use, aligning with the Vision 2030 strategy of developing innovative and economically efficient technologies.

Transportable Technology

Our technology is easily adaptable and can be moved to different regions, allowing for efficient use of renewable resources across the country.

Safety

Our technology enables the production of green hydrogen at low temperatures, making the process safe and efficient.

Production Materials

Our technology is based on the use of readily available and widely distributed materials, making it economically advantageous and accessible.

#vision2030 #carbonfree #netzero #greenconcrete #aluminumrecycling #recycling-technology #decarbonization

GREEN HYDROGEN PRODUCTION: TRADITIONAL TECHNOLOGY CHALLENGES

Implementation requires a pure distiller water production plants. Thus it lead to very high expenses for maintenance of proton exchange membranes. Billions of dollars.

The by-product is CO2, the emissions of which lead to global warming and climate change

A significant amount of energy is needed.

- Traditional energy sources, like coal and gas power plants, lead to carbon emissions.
- The use of nuclear power stations poses a risk of radioactive contamination of the environment (e.g., Fukushima).

Onsite hydrogen production is not possible.

Transportation issue. Hydrogen rapidly evaporates, losing up to 0.5% of its volume per square meter per day. This necessitates cooling to cryogenic temperatures, which involves high expenses.

Fire and explosion risks
during transportation.

Environmental damage. Industrial electrolyzers operate at a temperature of 800 degrees Celsius, which increases the temperature of the surrounding environment and adversely affects the climate.

Storage.
Expensive storage systems of H2, alongside with capital investment to build necessary storage infrastructure

CURRENT TECHNOLOGIES FOR STORING H2 IN POWDERS ARE KNOWN:

1. Buddha Energy - HYP (aluminium scrap + alkaline component)
2. Electriq - potassium meta barate
3. Deakin - boron nitride
4. EPRO Advance technology (EAT) or porous silicon

The main disadvantage is that the powders are expensive and require saturation with hydrogen, which was produced in advance.

Our technology, in addition to the hydrogen carrier, is itself the source of green hydrogen production.

Our technology allows green hydrogen to be transported seamlessly, delivering exactly the raw material ready for hydrogen production where it is needed, without prior sequestration at the point of production.

Comparing technologies				
	Deakin	EAT	Electriq	Buddha Energy
High cost of raw materials	YES	YES	YES	**NO**
Saturation with produced hydrogen is necessary	YES	YES	YES	**NO**
Storage of H2	YES	YES	YES	**YES**
Storage and source of H2	NO	NO	NO	**YES**
Conditions for release H2	HARD	MEDIUM	MEDIUM	**SIMPLE**
Use of by-products	NO	YES	NO	**YES-YES**

«HYP» PRODUCTION TECHNOLOGY ADVANTAGES:

CARBON FREE
Zero trace comparing to electrolize process.

Efficiency
No need for expensive plants and megawatts of electricity.

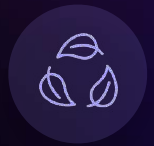
Recycling
Aluminum scrap recycling needed globally + accessible alkaline component = ensuring minimal energy consumption and environmentally friendly production process.

Investment
Does not require the construction of large plants, significantly reducing the necessary investment.

Mobility
Our technology allows for the production of hydrogen directly at the point of use, such as in ports for ships and in fields for agricultural machinery.

Transportation
Hydrogen is delivered in a chemically bound state, eliminating issues with evaporation and the need for cooling.

Safety
Chemically bound hydrogen does not explode from temperatures and impacts.



Environmental Impact
Produced at lower temperatures, reducing harm to the environment.

«HYP» INDUSTRIES OF APPLICATION

HYP — multifunctional hydrogen powder

Construction

HYP mobile plant

OIL

Cement production

Shipping logistic

Power station

Green H2

«HYP» IN OIL INDUSTRY

By adding HYP in the oil well bottom you get benefits, without complex and expensive equipment and the use of aggressive acids

HYP use gives extra ROI up to +95% comparing to tradition method
1 kg = $2.25

Cleansing Oil products with HYP solutions from:

- Cleaning wells (pipelines) from paraffin deposits is much more effective than cleaning with sulfuric acid, since it does not require post-cleaning and more safe in use.

Additionally, cleaning from:

- carbon dioxide
- lower mercaptans
- petroleum acids
- acidic by products

Increasing pressure in the Oil well with HYP

- increase in oil production in existing wells
- cleaning and re-extraction of contaminated pipelines (subject to additional industrial R&D)

Extra Heating with HYP

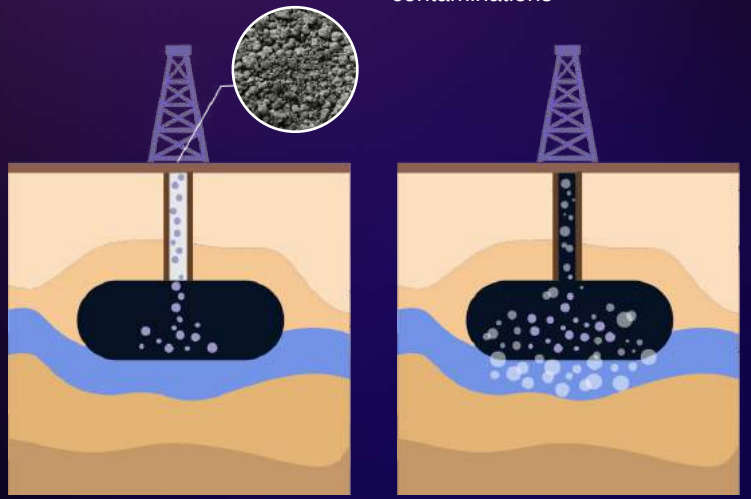
- increasing the volume of oil production per unit time, due to the melting of all types of paraffin deposits.
- release of large amounts of heat and gas in the oil face

Traditional method
1 kg aluminium powder + NaOH = $4.4

1 Add HYP into oil well

2 HYP reacts with water, heats up oil well, adds additional pressure to push oil and make it more liquid

Better cleansing the well from paraffin scrap and contaminations



«HYP» IN CONSTRUCTION INDUSTRY

Green Concrete :

By adding HYP into cement and mixing with water leads to the creation of an ultra-strong concrete mix

Sets faster and gains maximum strength more quickly.

- acceleration of the beginning of cement setting by 20%
- the end of setting is 20% faster compared to CEM

Provides maximum adhesion to metal and glass 4 times higher than regular CEM.

Requires less mixture due to foaming, which increases the mass in volume up to 30% with the same strength.

Ease of use: does not require special constructions or special equipment,
simply add water.

- heating concrete mix by increasing the temperature at the moment of adding water
- reduction in thermal conductivity from 5% to 25%
- increase in corrosion resistance by 13-15%
- the density of concrete with our powder is from 1622 kg/m3 to 500 kg/m3
- additive from 2% to 0.2% in terms of dry mixture
- strength from B20 (M250) to B5 (M75)

COMPARISON OF «PAP2» AND «HYP»

Consumption of PAP2 and additives per 1 m³ of concrete:

- 0.5 kg PAP2 as aluminum powder ($2,2)
- 3 kg sodium hydroxide ($2,9)
- 3 kg sodium sulfate - ($0,3)

Total: 5,4$

Consumption of HYP per 1 m³ of concrete:

- 2 kg HYP ($4,5)
- nothings else is required

Total: $4,5
ROI up to +20%

DISADVANTAGES OF AERATED CONCRETE

- Expensive aluminum powder
- Requires water heating (additional expense).
- Additional agent for removing wax from aluminum powder (additional expense).
- Additional mixing of NaOH (additional expense).
- Complex technological process of mixing.

ADVANTAGES OF HYP

+ Nearly 10 times less aluminum component is required.
+ Simplicity of mixing.
+ No heating required (heating occurs as a result of a chemical reaction after adding water).
+ No additional substances needed (paraffin cleaner, NaOH).

«HYP» IN GREEN H2 INDUSTRY

Logistics Benefit:

Technology is safe to export of green hydrogen to any country, **NON eXplosive**.

$0 expenses comparing to traditionally produced H2 which has to be converted into storable form and release it back.

Green Hydrogen:

- Heavy processing Industry
- Heavy freight transport.
- Long-term energy storage / transportation
- No evaporation

Electricity Production:

- The reaction results in the release of heat, which can either be utilized as heat (to warm or dry something) or converted into electricity using standard steam electric generators.

Two side products

(we collect after adding water and releasing energy out of HYP)

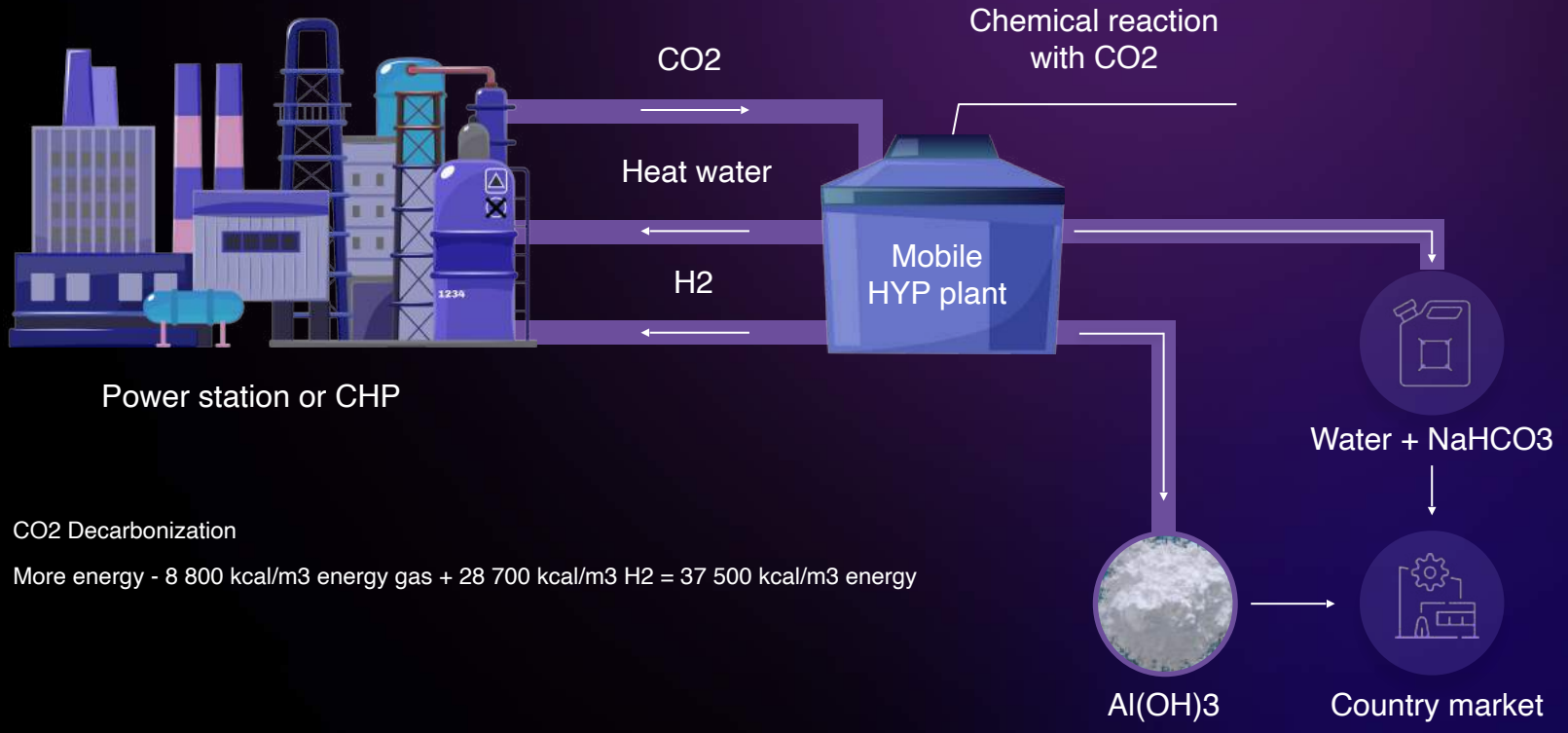
1 Liquid Alkaline:

- Production of Cleaning Agents
- Pharmacy
- Clothing manufacturing
- Metallurgical industry
- Food industry (acidity regulator)

2 Aluminate:

- Catalyst and Sorbent in Chemical Processes
- Accelerator for the setting and hardening of concretes, which is especially relevant in winter.
- Inhibiting additive in aluminate drilling fluids, reacts with minerals to protect and stabilize the well, reduces foaming.
- Coagulant involved in the process of ion-exchange water purification and softening, in the treatment of wastewater and sewage.
- It is used for mordanting fabrics in the textile industry

«HYP» USE IN THE ENERGY SECTOR



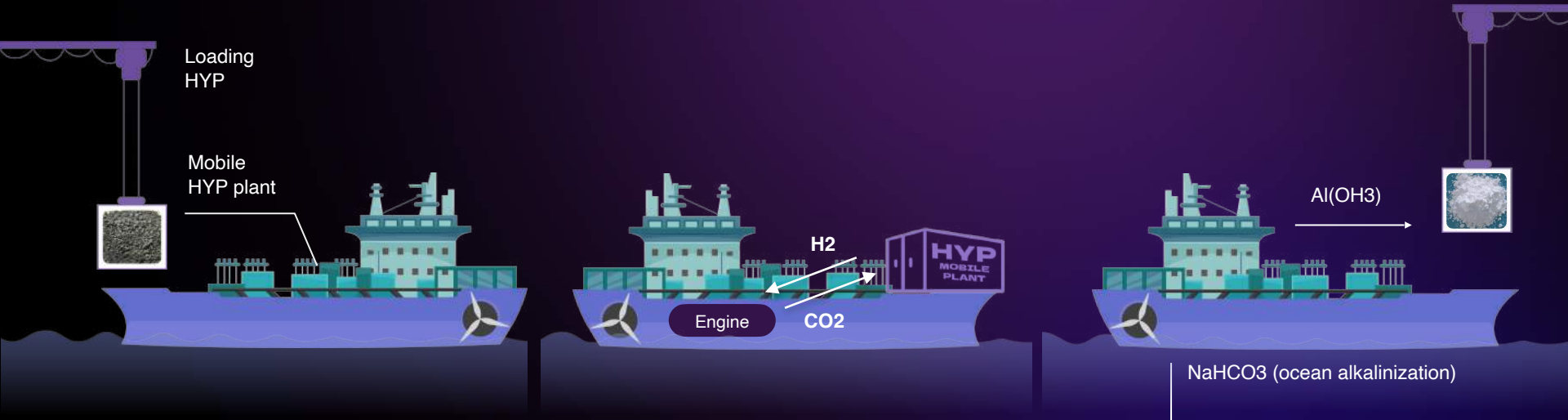
CO2 Decarbonization

More energy - 8 800 kcal/m3 energy gas + 28 700 kcal/m3 H2 = 37 500 kcal/m3 energy

#GreenHydrogen #Decarbonization #CarbonFree #NetZero #decarbonization

«HYP» USE IN INTERNATIONAL MARITIME TRANSPORT

Implementation scheme



1

Loading HYP onto
a ship in the port

2

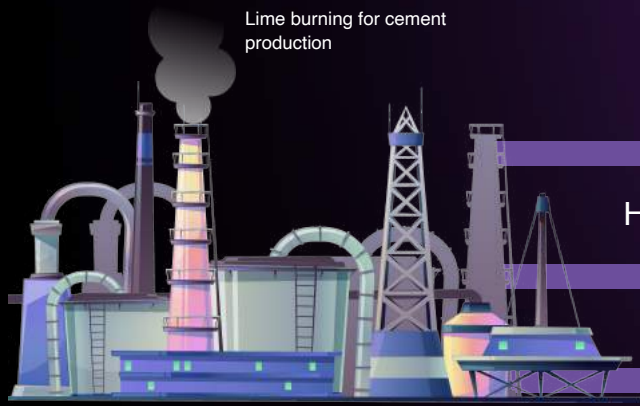
Diesel + H2 = More power
Reduce fuel (5-10%)
Reduce co2
Take CO2 from engines to Mobil plant
and decarbonisation

3

Ocean alkalinization

#GreenHydrogen #Decarbonization #CarbonFree #NetZero #Oceanalkalinization

«HYP» USE IN CEMENT PRODUCTION



Lime burning for cement production

Cement plant

CO2

Heat water

H2

Chemical reaction with CO2

Mobile HYP plant

Water + NaHCO3

Al(OH)3

Country market

CO2 Decarbonization

More H2 = More flame temperature

More flame temperature = More cement strength

Increasing the strength of cement to the M800 grade by increasing the combustion of gas

PLEASE CONTACT US REGARDING PARTNERSHIP AND INVESTMENTS OPPORTUNITIES

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