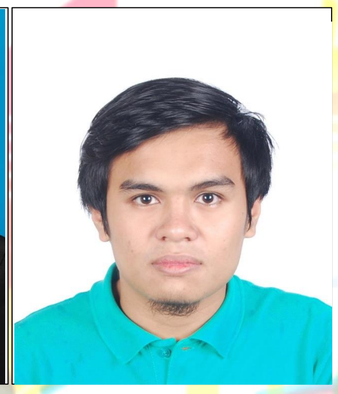
UNIVERSITI KUALA LUMPUR
*Where Knowledge Is Applied*

POLITEKNIK MALAYSIA SULTAN ABDUL HALIM MU'ADZAM SHAH · KEMENTERIAN PENDIDIKAN TINGGI · SOARING UPWARDS · Diiktiraf oleh MALAYSIA BOOK OF RECORDS

# iCompEx'16
PERINGKAT KEBANGSAAN
POLITEKNIK SULTAN ABDUL HALIM MU'ADZAM SHAH
NATIONAL INNOVATION AND INVENTION COMPETITION THROUGH EXHIBITION 2016


# GREEN ELECTRIC GENERATOR BASED ON MHD (MAGNETOHYDRODYNAMIC) PRINCIPLE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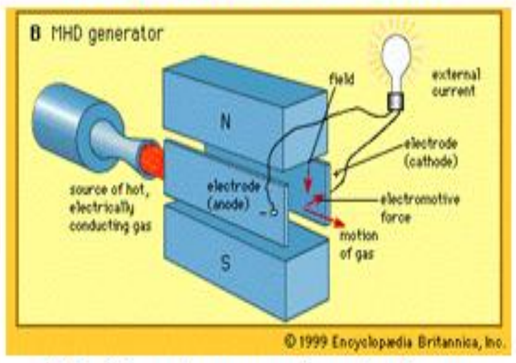
## Product Description
Penerangan Produk

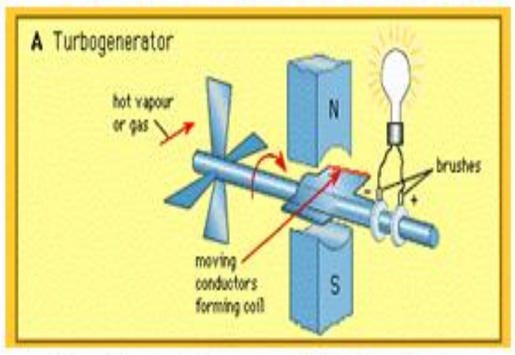
MHD (Magneto-Hydro-Dynamic) Generator is Combination between Magnet (Magneto) and Moving Fluid (Hydro-Dynamic).The electric current will be generate when the magnetic flux is cut. In this MHD Generator, when the sea water pass through the magnetic field the magnetic flux has been cut and the current will be produce.

MHD Power Generator




•No Rotating mechanical part

Conventional Turbine Generator




Use Rotating mechanical part

## Problem & Causes
Masalah & Punca

World need an alternative way to generate the electric power due to high demand of power and high pollution produce by a conventional electric generator that uses petrol or gas as fuel. Beside the conventional electric generator has many disadvantage and this problem can be solve by using MHD Generator

| ADVANTAGE MHD GENERATOR | DISADVANTAGES CONVENTIONAL TURBINE GENERATOR |
|---|---|
| No Mechanical Rotating Component | Use Rotating Component |
| No friction loss, No vibration, No Noise | Generate friction loss, vibration and Noise |
| High efficiency (No loss) | Medium efficiency (friction loss and vibration) |
| Simple Structure (No bearing, No shaft, No Coupler) | Complex Structure (No bearing, No shaft, No Coupler) |
| Low Cost (Construction, Maintenance) | High Cost (Construction, Maintenance) |
| No pollution | Produce environment pollution (Water, air and Noise) |

## Originality & Novelty
Keaslian & Novelti

A) Hot gasses – Install the MHD system on the exhaust system or chimney
- i. Hot Gas from exhaust **AEROPLANE**, **CAR**, **LORRIES** and Motorcycle
- ii. Hot Gas form **CHIMNEY** in industries.
- iii. **INTEGRATED** with the gas or steam turbine, (MHD integrated system) (Salvatore P. Cicconardi, 2013).
- iv. Install on **HVAC** (Heating, Ventilation and Air-conditioning) system.

B) Ocean Energy – Clean Energy that can reduce the environment pollution.
- i. Tidal wave on ocean
- ii. Flow stream on the seabed.
- iii. Moving ship or Small Fishermen Ship.

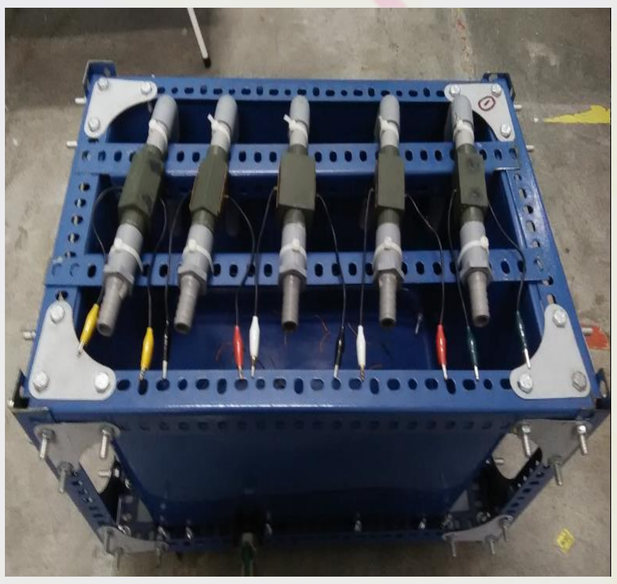
## Eco- Friendly Aspect
Aspek Mesra Alam Sekitar

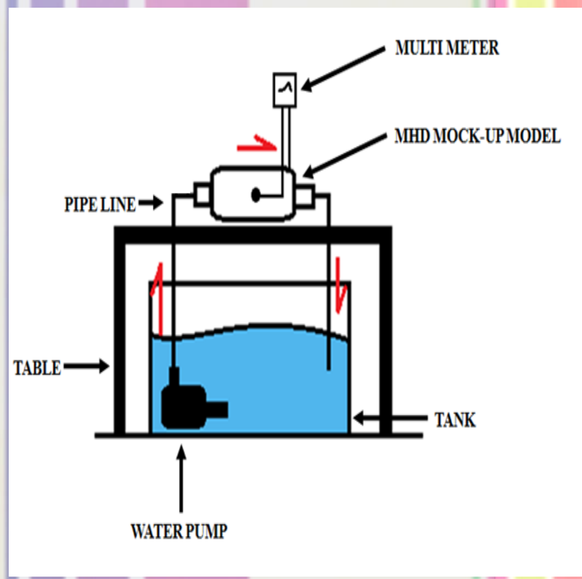
1. Supply free energy to small fishermen (Low maintenance, low cost) – Cost Saving
2. Clean Energy (Save environment) – Replace Conventional power generation
3. Solution to reduce global warming – Replace Conventional power generation
4. High efficiency among the Renewable Energy Method - Cost Saving

| SL: no | METHOD | EFFICIENCY PRESENT | FUTURE |
|---|---|---|---|
| 1. | MHD Power generation (electromagnets) Superconducting magnets | Around 50% ___ | Up to 60% 80% |
| 2. | Thermo-electric power generation | Around 3% | Up to 13% |
| 3. | Thermionic converters | Around 15% | Up to 40% |
| 4. | Photo-voltaic or solar cells | Around 15% | ___ |
| 5. | Fuel cell technologies | Around 50% | Up to 60% |
| 6. | Solar power generation | Around 30% | Up to 50% |
| 7. | Wind power generation | Around 30% | ___ |
| 8. | Geo-thermal power generation | Around 15% | ___ |

## Application & Market Potential
Aplikasi & Potensi Pasaran

1. Generate the Electrical Power for small use of Ship and Fisherman.
2. Replace the conventional generator to produce clean energy (No pollution)
3. Reverse the principle to use as Flow Sensor Measurement (Example : Thermo-Couple become TEC)






INNOVATION AND INVENTION FOR ALL