Introduction

PT. BIMA Green Energi

Presented by:
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(Managing Director)

About

BIMA Corporation was originally established as a secondary business that utilizes the needs of various sectors related to the use of rubber as a means of power transmission belts. The application of power transmission includes a variety of equipments from the start: generator, engine, up to the automotive industry. Optimal management and innovative organization that has pushed BIMA Corporation into a company with a healthy growth, and certainly requires the development of the organization and its capabilities significantly. From here then born other subsidiaries in the areas of business are different in response and answer to the needs that exist in the Indonesian market.

BIMA Green Energi (BGE) is a company that was born as a manifestation of the concern of Bima Corporation for the development of environmentally sound technologies. BGE has vision and commitment in encouraging the industrial era of accelerating the transition towards a more forward saving use of resources currently available and development of alternative resources that is new and renewable energy. This vision will be realized through the use of innovative technology and education that is proportional to the various industrial sectors as well as the components of other nations. BIMA Green Energi will continue to strive to become a leader in the concept of green technology and the use of renewable energy.





Corporate Culture



Bima is committed to energy conservation and technology innovation which makes us at the forefront, not just develop and enlarge the business. More than that, we dedicate ourselves on the usability of our technology to unify and innovate for the culture, as well as the good and welfare of the people around the world.

Vision & Mission

Vision

To be a leading renewable energy technology specialist, for industrial, commercial and residential solutions.

Mission

We provide comprehensive products that are designed to provide energy security and reliability in the face of fuel shortages, overloading and vulnerable power distribution networks.



Our Business

RENEWABLE ENERGY

Renewable energy is energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally)

- Solar Panel : Photovoltaic & Thin Film
- Micro Hydro
- Wind Turbine
- Fuel Cell

GREEN TECHNOLOGY

Green technology is that in which the technology is environmentally friendly and is created and used in a way that conserves natural resources and the environment.

- LED Lighting : Street Lighting, Flood Lighting, Bulb, LED Tube, Highbay and LED Illumination.

BASE TRANSCEIVER STATION (BTS) TOWER PROVIDER

We build BTS tower for telecommunication industry in Indonesia. The electricity of our towers can be supplied from conventional power, but for remote area, we initiate building them with green and renewable energy, that is, solar photovoltaic-powered BTS.

POWER SYSTEM

Deals with the generation, transmission and distribution of electric power as well as the electrical devices connected.

- Battery, Charge Controller, Inverter, Trafo, UPS, etc.





Renewable Energy

Is energy which comes from natural resources such as sunlight, wind, rain, geothermal heat, which are renewable (naturally). The applications will be Solar Panel, Wind Turbine & Micro Hydro.







Green Technology

It is technology which environmentally friendly, created and used in a way that conserves natural resources and environment. Our application for this technology will be LED lighting & Energy Management System.



BTS Tower SIS-SITAC-IMB-CME

We build tower for telecommunication industry in Indonesia. The electricity our towers can be supplied from conventional power, but for remote area we initiate building them with green and renewable energy, that is, photovoltaic-powered BTS and Micro-hydro.



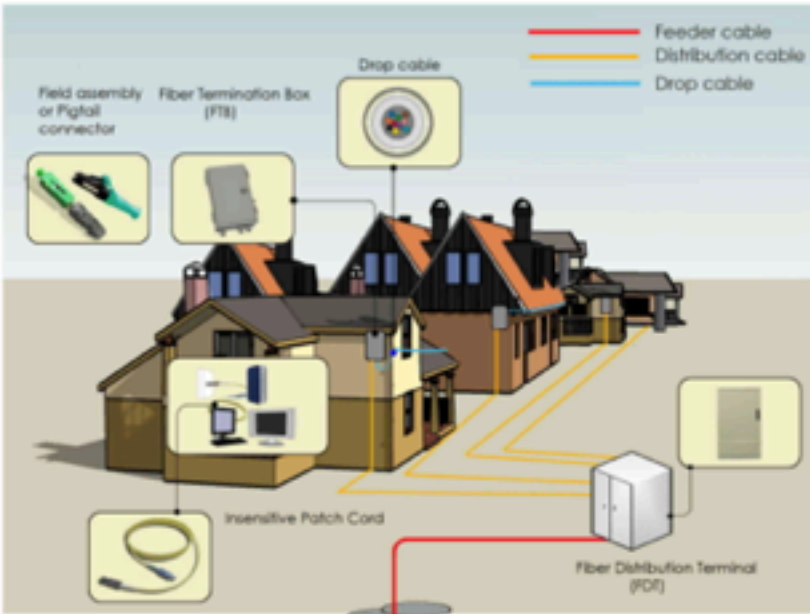
Fiber Optic

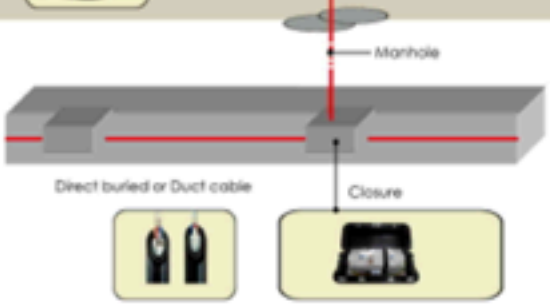
Access Solution

Access Solution

Fiber Distribution Terminal Access

Distribution cables are pulled from Fiber Distribution Terminal to a nearby customer premise

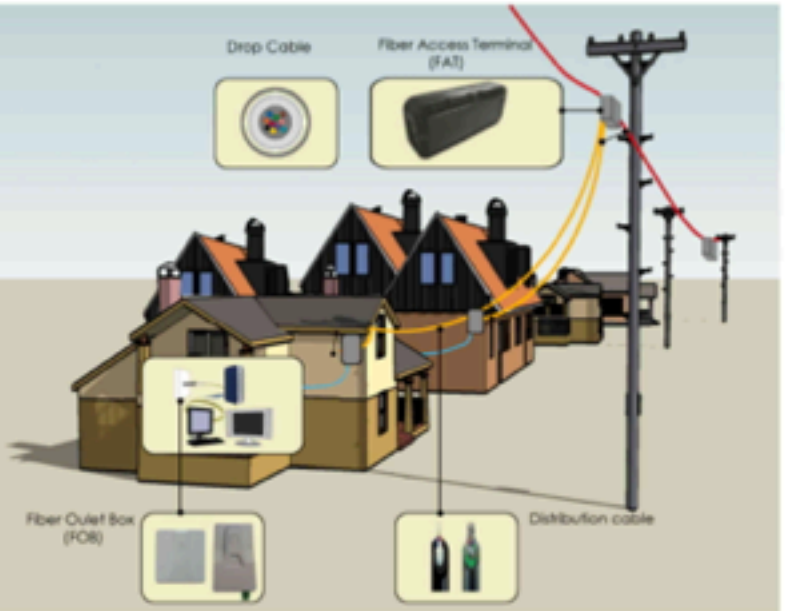




Customer Premise Solution

Fiber Acess Terminal Acess

Distribution cables are pulled from Fiber Access Terminal to a nearby customer premise



Points on Cabling

For customer premise FTTH installation, drop cable is terminated outside the customer premise in a termination cabinet and indoor cable is wired into the premise.

Connectors are used inside the cabinet to ease maintenance when a problem occurs.



Access Solution

Project Reference























PERTAMINA DAY

Pertamina President Director's House 2 KwH (December 2012)



TELKOMSEL TOWER
MOROWALI 2012



TELKOMSEL


WHY DO WE
NEED TO SAVE
ENERGY?
Green Energi
bima



PRESIDEN
REPUBLIK INDONESIA

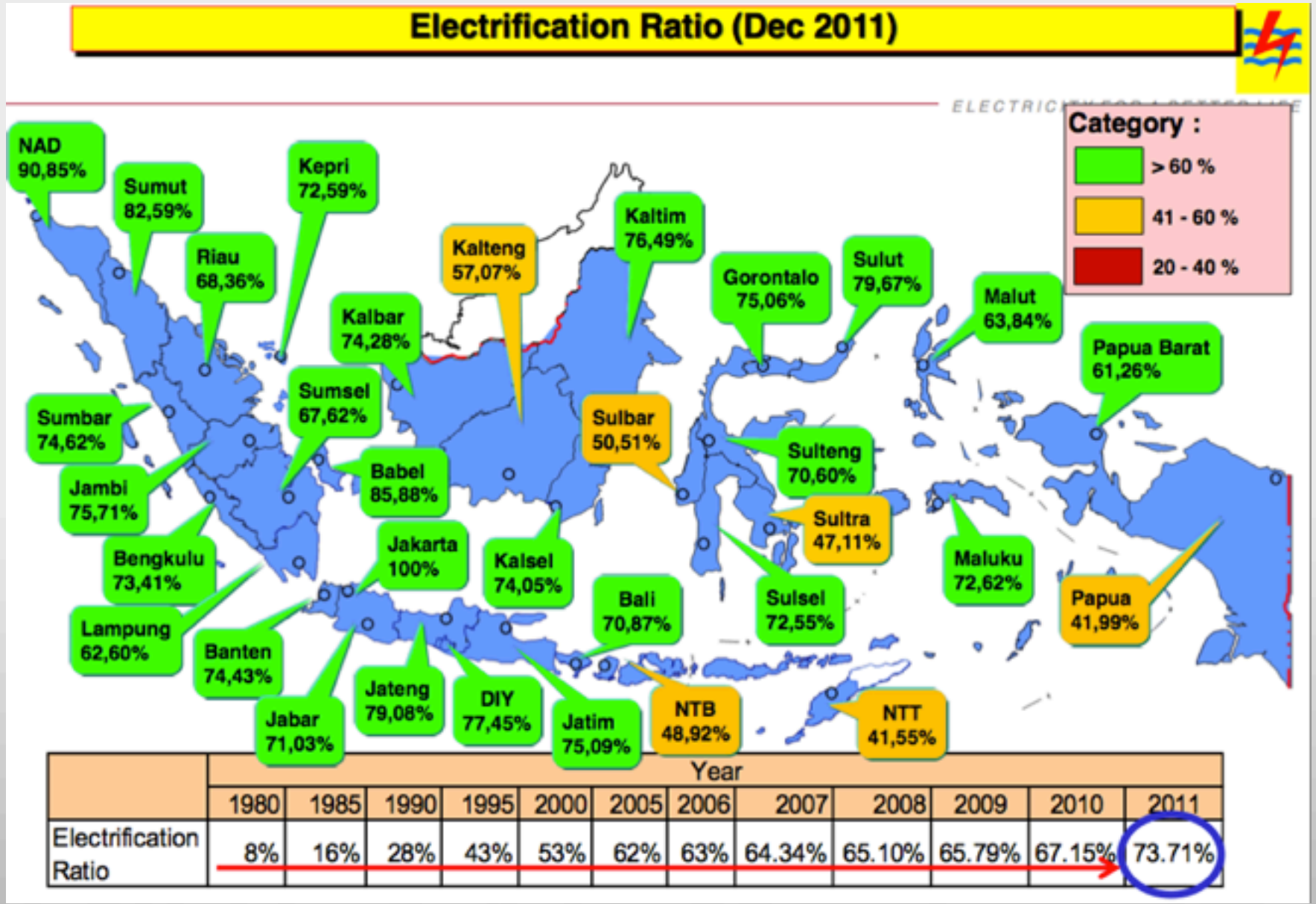
PERATURAN PEMERINTAH REPUBLIK INDONESIA

NOMOR 70 TAHUN 2009

TENTANG

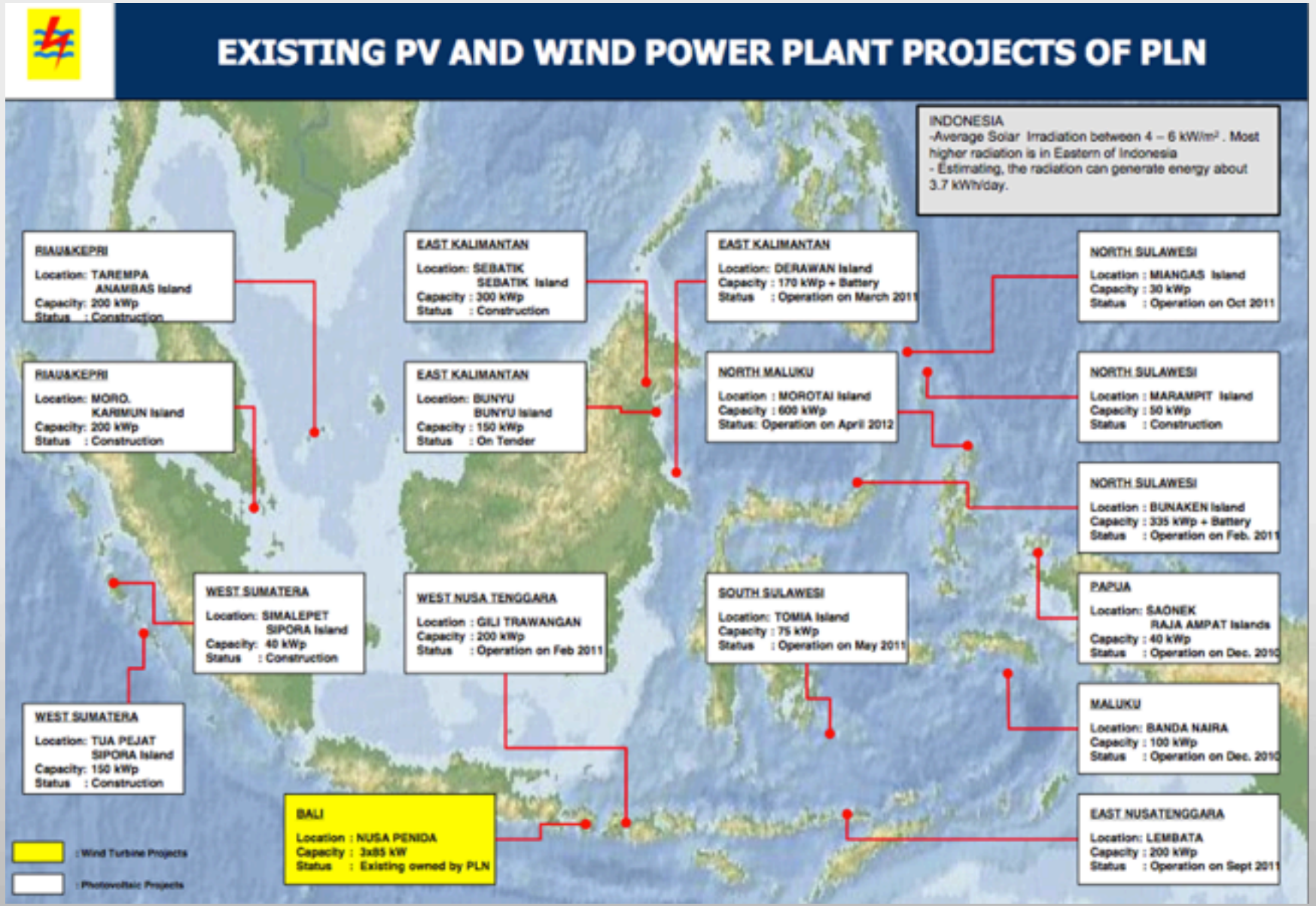
KONSERVASI ENERGI

Electrification Ratio



	Year											
	1980	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011
Electrification Ratio	8%	16%	28%	43%	53%	62%	63%	64.34%	65.10%	65.79%	67.15%	73.71%

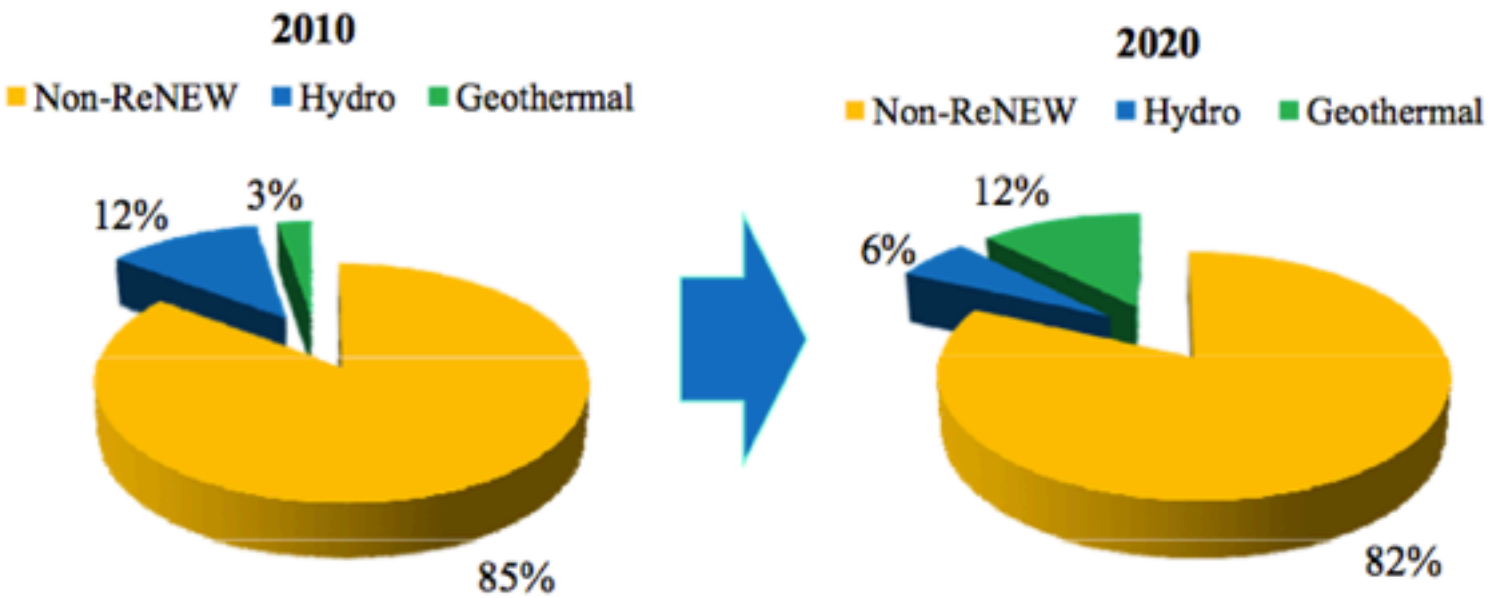
PV & WT Power Plant



Renewable Energy Roadmap

RENEWABLE ENERGY MIX ROADMAP

Electricity for a Better Life



- **The development of Green Energy Power Plants is part of PLN scenario for securing the electricity supply for the country which as a whole will require huge financing capability.**
- **18 % green energy mix will improve National Average Grid Emission Factor from 0.778 kgCO_2/kWh in 2011 to 0.756 kgCO2/kWh in 2020.**

Meanwhile, We Also Have Rivers!!!

Preparation Kit at PSI workshop

SMART HYDRO POWER INSTALLATION
SADAP, KALIMANTAN – INDONESIA

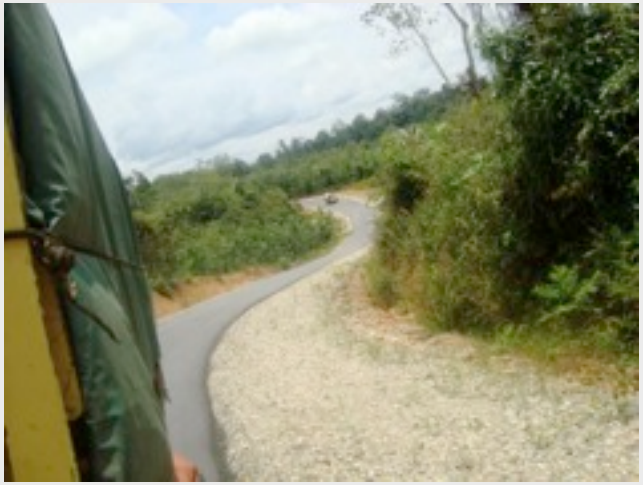


Container Loading and Shipping





Trucking and unloading









Panel shuttle housing





1st Cage Installation











SHP INSTALLATION







SHP on EMBALOH River






Kinetic Hydropower

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5. Cost Effective Technology
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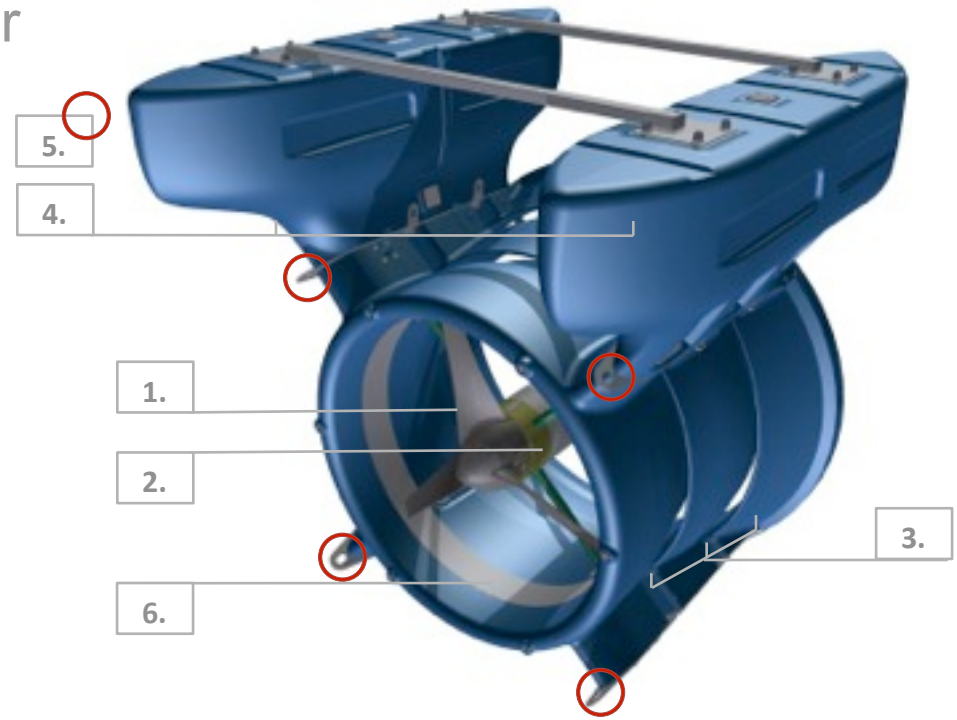
Kinetic Hydropower

- The energy possessed by a body because of its motion
- The amount of energy depends on the mass and the velocity of the moving body
- Kinetic turbines create energy from flowing water with no head requirement



Turbine Overview

1. 3 fiberglass- reinforced rotor blades (Apoxy)
2. Underwater generator
3. Diffusor (HDPE*)
4. Floats
5. 4 anchor points
6. Stabilizing ring



* maximum power point tracking

Turbine Specification

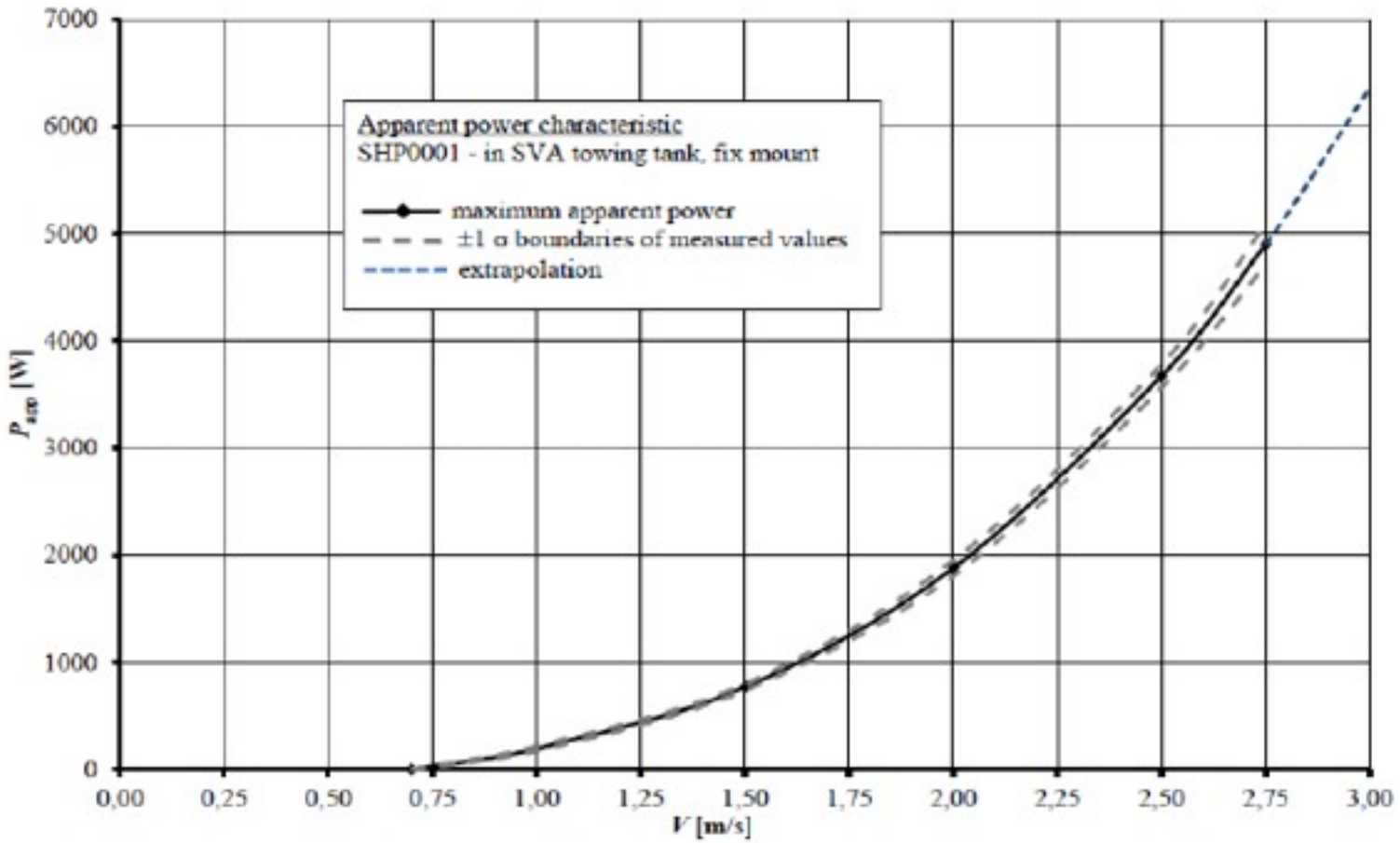
Nominal output:	5.0 kW at 2.75 m/s
River speed:	No add. output >2.75 m/s
Dimensions (LxWxH):	1850x1740x1970 mm
Rotor diameter:	⌀1000 mm
Rotor speed:	90-230 rpm (closed circuit)
Weight:	360kg (incl. floats)

Site Requirements

- **Min. river depth:** 1.8 m
- **Min. river wide:** 2 m
- **Operational range:**
  1.0 m/s minimum
- **Nominal output:** 2.75 m/s
- **Injection point:** max 500 meters distance from turbine



Generator power curve



Third party tested (SVA Potsdam) under controlled conditions. Curve does not account for electrical losses. Results in natural rivers or canals may vary from above .

Cost Effective Technology

- No special infrastructure necessary
- Base-load capability requiring little battery
- Low installation costs
- Low operation costs
- Scaleable from a singular turbine to hundreds



Environmentally Friendly



- No changes to river bed
- Slow turning generator (fish friendly)
- Replacing diesel thereby reducing CO_2 emissions
- Minimal audible disturbance
- Minimal space requirement
- Removable at any time

Market Segments



- Decentralized electrification
- Agriculture / irrigation canals
- Hybrid (grid connected / micro-grid application)
- Temporary supply
- Expansion of existing hydropower stations (i.e. in outflow canals, etc.)

Impressions: Industrial Applications





Impressions: Decentralized Electrification





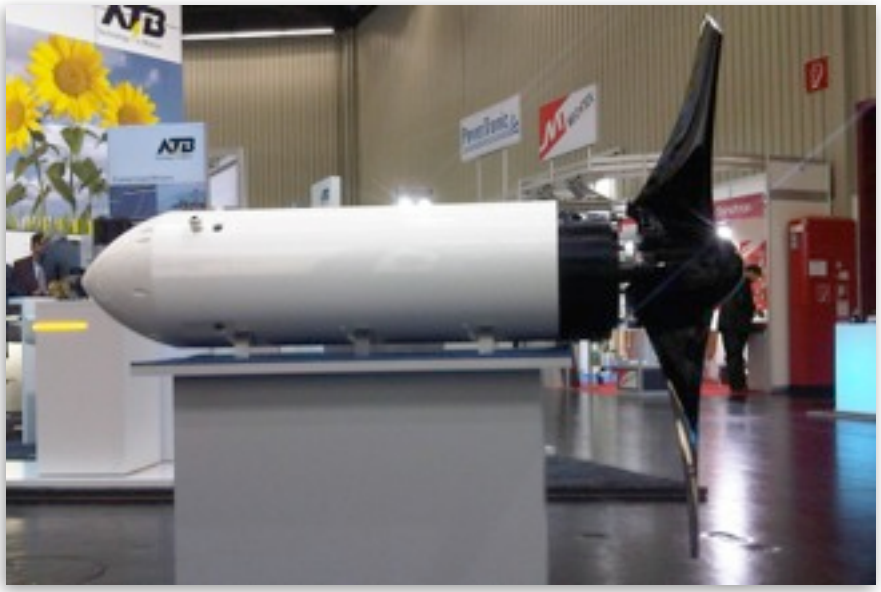
The System

- A turbine which creates energy from kinetic hydropower
- Can be used in grid-connected, hybrid or off-grid systems
- Synchronization to the existing network is possible



Underwater Generator

- Permanent magnet synchronous generator (5 kW)
- 3-phase AC power / slow RPM (90-230) closed circuit
- Horizontal axis (waterproof + water cooled)
- Cut in speed 0.7 m/s
- Voltage range 70 - 600V, (dependent on river velocity)



Energy Management

- Converts into stabile 3-Phase
- Using MPPT controllers to secure power curve
- 230-240V, 50 Hz / 110-127V, 60 Hz, or direct current 96V
- Using only authorized technologies for electrical installations



* maximum power point tracking

Anchorage

Dependent On:

- Hydrological characteristics (for ex. Riverbed type: rock, sand, etc.)
- Ship traffic/kayak/tourism
- Amount/type of flotsam/ debris
- Width and depth variation of river

Anchor Options:

- Weighted anchor (concrete, or stones → different forms)
- Steel cable
- Danforth „ship“ anchor
- Ground screw

Scope of Delivery

1. Permanent magnet, AC generator
2. Diffusor (three pieces)
3. Three blade rotor
4. Diffusor, Rotor and Generator (swimming turbine) are delivered assembled
5. Steel anchoring cable 12mm (20m)
6. Wearing parts are designed for 10 year usage
7. Rectifier/Inverter system (Specify voltage and frequency)
9. User manual (English or German)
10. Ex works delivery preferred, FOB/CIF possible. Transport arrangement upon request.

Additional Services





- Anchorage for turbine
- Debris protection for turbine
- Local permit
- 24 Volt DC power supply (grid-connection only)
- Additional installation costs
- Battery bank for off-grid application

Conclusions on Greener Telecommunication Tower

☑ FINANCIALLY: CAPEX (Fast BEP); OPEX (Low Maintenance); Business Model (Financial Institutions).

☑ TECHNICALLY: Technology Designs (Low Powered Devices); Power Source (Power Generator Types); Power Management System (Behavior); Storage System (Battery); Geography (Site Profile & Community Issues).

☑ POLICY: Tax Incentives Program (Tax Holiday/Special Rate); Local Content Regulation (TKDN); EP Vs PPA; Stakeholders Transparency (Government, Manufacturers, System Integrators, End-users, etc); National Roadmap (Green Strategic Policy).

☑ COMPETITION: Technology Innovations; Effective Project Management Practices.



Green Energi
bima