



**ASEA ONE POWER CORP.**



**Clean Energy is here to stay.**



**12 MW Biomass Power Plant Project  
Aklan, Philippines  
A Social, Economic, Environmental Catalytic Approach  
For Sustainable Development**

July 26, 2012



## Current GHG Emission Scenario in the Philippine Setting

- Prone to the adverse impact of Climate Change as the most vulnerable in the world per UNDP 2004 Global Report on Disaster
  - 2009 – Typhoon Ondoy
  - 2011 – Typhoon Sendong
- Continuous threats
  - Stronger Tropical Cyclones
  - Increasingly Erratic rainfall patterns
  - Drastic rise in sea level
  - Increasing temperature
- Dire consequences
  - Food Security (Undernourished: 37% of population)
  - Water Resources (Waterless municipalities: 34% of population)
  - Human Health (Respiratory ailments: Php7.6 billion/US \$180 million)

**Table: Greenhouse gas inventory, GHG emission per sector (2000) in Gg CO<sub>2</sub> e;**  
*Source: National Framework Strategy on Climate Change 2010-2022.*

<b>Sector</b>	<b>CO<sub>2</sub> , Gg</b>	<b>CH<sub>4</sub> ,Gg</b>	<b>N<sub>2</sub>O, Gg</b>	<b>*CO<sub>2</sub>e Emission, Gg</b>
Energy	62,499.10	304.14	2.52	69,667.24
Industrial Processes	8,604.74	0.24	-	8,609.78
Agriculture	-	1,209.79	37.41	37,002.69
LUCF	(104,040.29)	(46.28)	(0.32)	(105,111.37)
Waste	-	500.67	3.50	11,599.07
<b>Totals</b>	<b>(32,936.45)</b>	<b>1,968.56</b>	<b>43.11</b>	<b>21,767.41</b>

*\*\*LUCF is land use change and forestry*

# Ten Greatest Challenges the World Faces Today

## Global Crisis, Global Solutions

1. Climate Change
2. Communicable diseases
3. Conflicts
4. Access to education
5. Financial instability
6. Government corruption
7. Malnutrition and hunger
8. Migration
9. Sanitation
10. Subsidies and trade barriers





## Business-As-Usual (BAU) Scenario

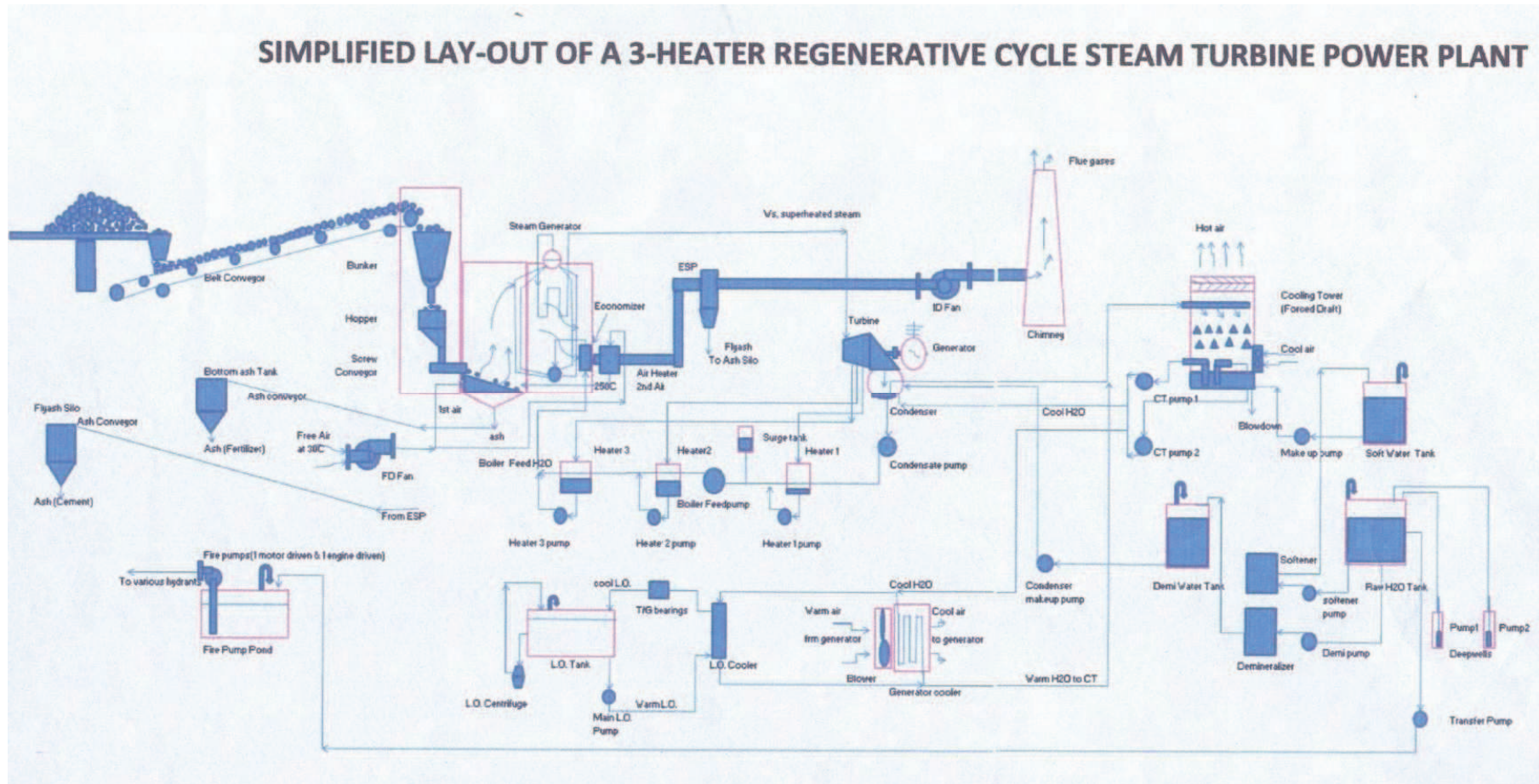
- Continuous reliance on coal for power generation. Private Sector Committed Power Plant Generation at 638 MW of which 600 MW will be from Coal Power Plant and 38 MW from Renewable Energy
- Coal as “Environmental Enemy No.1 (The Economist, July 6, 2002 issue)
- Coal production will likely peak in the year 2035 (Gregson Vaux, “The Peak in U.S. Coal Production, From the Wilderness, May 27, 2004).
- Global Carbon-Dioxide Emissions
  - Coal – 45%
  - Oil – 35%
  - Others – 20%

# Philippine Climate Change Commission National Climate Change Action Plan (NCCAP) 2011-2018

- Sustainable Renewable Energy
  - RE Law
  - IRR
  - Off-grid, decentralized, community based RE system
- Climate change has become one of the greatest challenges to human development. The most important government campaign of the 21<sup>st</sup> Century, that unless mitigated it would have serious negative consequences for the country's sustainable development.



# 1 x 12 MW Steam Turbine Biomass Power Plant



Type of Biomass Plant - Combustion  
Carbon-Neutral Biomass Power Plant



## Environmentally Direct Combustion Biomass Technology

- Holistic Boiler Performance, Reliability
- Pollution Control Devices
  - Installation of Electrostatic Precipitator
  - Fly Ash collected by cyclones and bag filters
  - Bottom Ash to be distributed for free to Rice Farmers to be used as soil conditioner
- Strict Compliance to Philippine Environmental Laws on Emission and Noise
- Designed according to ASME Standards



# Performance Guarantee of Biomass Power Plant

- Compliance to Philippine Environmental Laws:

## 1. Emission

The average emission content in the flue gas leaving the electrostatic precipitator will not exceed the following averages:

Particulate matter (dust)	<150 mg/Nm <sup>3</sup>
Nitrogen Oxide calculated as NO <sup>2</sup>	<500 mg/Nm <sup>3</sup>
Sulphur Dioxide or SO <sup>2</sup>	<700 mg/Nm <sup>3</sup>
CO	<250 mg/Nm <sup>3</sup>

## 2. Noise

The noise level 10 meters from the plant boundary should not exceed:

At Night – Time	75 dB (A)
At Day – Time	85 dB (A)



# Various Sources of Feedstock Biomass



Rice Husk



Rice Straw



Coconut Leafwood



Wood Chips



Sugarcane Waste

*Note: Over 60 Long-Term Exclusive Sales Contracts signed with Rice Millers and Rice Farmers' Cooperatives ensuring sustainability of feedstock supply.*

# Sustainable Development Benefits Description (SDBD)

## A High Positive Correlation Between Renewable Energy Development and Climate Change Mitigation



### A. Benefit to be Host Community

US \$20,000 per year

US \$400,000 for the next 20 years

6,000 Hectares of Rice Farms or 15% of the Total Hectares Involved

### B. Job Generation

120 Technical and Support Personnel

100,000 Households Multiplier Effect

### C. Entrepreneurial Empowerment

US \$1.2 M Total Purchases of Agricultural Wastes and Forest Residues per year

US \$24.0 M for the next 20 years

### D. Entrepreneurial Empowerment

US \$1.0 M Voting Stock Offering to the Rice Farmers



#### E. Fossil Fuel Displacement

10,300 Barrels of Oil Equivalent per year  
206,000 for the next 20 years

Equivalent to:

US \$1,100,000 per year Forex Savings per year  
US \$22,000,000 for the next 20 years

#### F. CO<sub>2</sub> equivalent being prevented from being emitted in the environment

40,000 tons per year  
8,000,000 tons for the next 20 years

Equivalent to:

Planting more than a million trees each year  
Taking off 7,600 cars from the road each year  
Taking off 152,000 cars for the next 20 years

#### G. Proper waste segregation

To make sure waste materials are not dumped into the creek, to avoid massive floods especially during rainy season

#### H. Other Benefits

1. Reinforce Implementation of Environmental Related Legislation
2. Promote Health Conditions of Affected Constituents
3. Preservations of Eco-Tourism and Eco-Productivity
4. Reversing the growing threat on Asia's Coral Triangle Reefs

## Major Determinants for a Successful RE Development as a Climate Change Mitigating Factor

1. Sustainability of Feedstock
2. Mature/Proven Technology – Experienced EPC Contractor
3. Competent Management
4. Potential for Profitability
5. Exit Strategies
6. Support of the Local Stakeholders/LGU
7. Triple Bottom Line Impact (TBLI)
  - Social (S)
  - Economic (E)
  - Environmental (E)

A Paradigm Shift



# Barriers to RE Deployment

## A. Administrative – Related Barriers

1. High number of authorities involved
2. Lack of coordination between different authorities
3. Low awareness of benefits from RE Development on local and regional authority level
4. Complexity/duration of obtaining permits

## B. Technical Barriers

1. Grid access not guaranteed
2. Grid connection cost

## C. Socio-cultural Barriers

1. Prevalence of vested interest
2. Land tenure issues
3. Perception of unrealistically high cost
4. Lack of awareness of social and/or environmental impacts of non-renewable energy sources

## D. Financing Barriers

1. Loans
2. Equity



**ASEA One Power Corporation**  
**and**  
**CTI Private Financing Advisory Network**

**Chronological Sequence of CTI PFAN Activities**  
**Participated by AOPC**

<b>Date</b>	<b>Venue</b>	<b>Event</b>
1. March 4, 2009	Singapore	Asia Forum for Clean Energy Financing – Business Plan Competition
2. June 15, 2009	Manila, Philippines	1 <sup>st</sup> PFAN Philippines Clean Energy Investor Forum
3. October 21, 2009	Beijing, China	China Clean Energy Investor Forum
4. November 26, 2009	Manila, Philippines	Policy Regulatory Roundtable A Case Study of Implementing A Biomass Power Plant in the Philippines
5. March 4, 2010	Bangkok, Thailand	Asia Forum for Clean Energy Financing
6. March 23-24, 2010	Manila, Philippines	Media Workshop on Clean Energy
7. May 20-21, 2010	Manila, Philippines	Clean Energy Capacity Building For Financial Institutions in the Philippines
8. June 21, 2010	Manila, Philippines	Philippines Clean Energy Investor Forum
9. November 16, 2010	Manila, Philippines	Clean Energy Investor Deal Flow Session



**Planning for Survival**  
**The War Against**  
**Climate Change and Global Warming**  
**Everybody's Concern.....**

**Thank you.**



**12 MW Biomass Power Plant in Banga, Aklan**