PHILIPPINES

Updates on Biomass Energy Utilization

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Challenges / Barriers to Development

- High upfront and technology costs

  Non-competitiveness /Local technology issues

  Non-viable markets

- Inaccessible Financial Packages

  Social Acceptability

Laws Enacted for Development of the Renewable Energy Industry

To address these barriers and accelerate the development of renewable energy resources, the Government promulgated / implemented a bioenergy policy which is governed by 2 landmark Laws:

1. Republic Act 9513: Renewable Energy Act of 2008 and
2. Republic Act 9367 : Biofuels act of 2006

Republic Act 9367

- Known as the Biofuels Act of 2006, was implemented to increase the contribution of biofuels in the country's energy mix thereby reducing its dependence on imported fossil-based fuels, enhance the quality of the environment, and create opportunities for countryside socio-economic development.

- Signed into law on January 12, 2007

- An Act to direct the use of biofuels, establishing for this purpose the Biofuel Program, Appropriating Funds therefore, and for other purposes

Republic Act 9367

Provides fiscal incentives and mandates the use of biofuel blended gasoline and diesel fuels

BIODIESEL

2% biodiesel blend on Feb. 6, 2009

Supply:

- 11 Accredited Producers with annual total capacity of 574.9 million liters
- 4 registered projects undergoing construction with a total annual combined capacity of 292.65 million liters

Feedstock used:

- Coconut oil (current)
- Jatropha (completed pilot study)
- Waste cooking oil, microalgae , rubber seed oil (under study)

BIOETHANOL

10% bioethanol blend to all gasoline on Feb. 6, 2012

Supply:

- 12 accredited Producers with annual total capacity of about 380.5 million liters
- 3 registered projects undergoing construction with a total annual combined capacity of 113 million liters

Feedstock used:

- Sugarcane, molasses (current)
- Sweet sorghum, cassava, macroalgae (completed pilot study)
- Nipa sap, cellulosic materials (under study)

R.A. No. 9513: The Renewable Energy Act of 2008

- Accelerate the development of the country's renewable energy resources by providing fiscal and non-fiscal incentives to private sector investors and equipment manufacturers / suppliers.

Policy Directions

- Accelerate the exploration and development of renewable energy resources

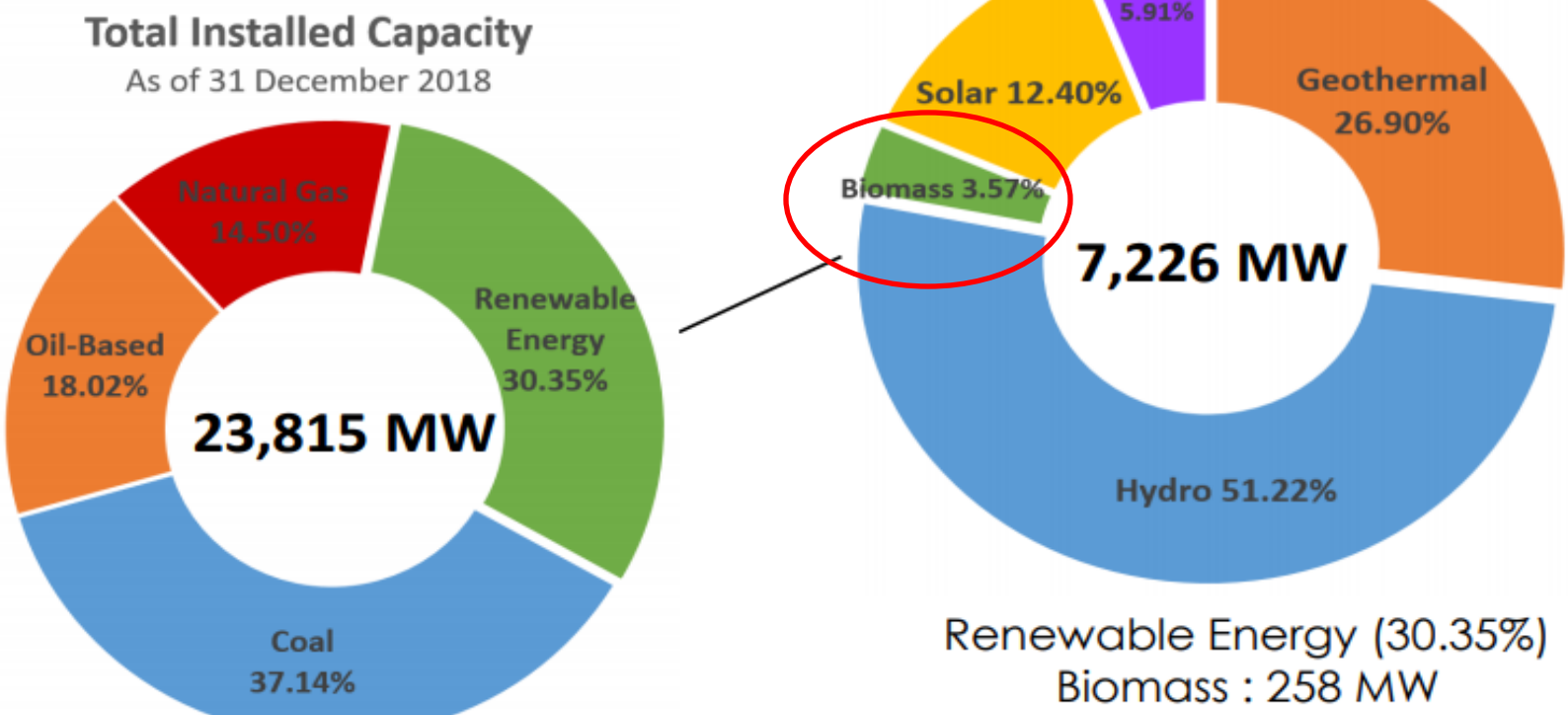
  - achieve energy self-reliance
    - a. to reduce the country's dependence on fossil fuels
    - b. minimize the country's exposure to price fluctuations
  - adoption of clean energy to mitigate climate change
  - promote socio-economic development in rural areas

- Increase the utilization of renewable energy by providing fiscal and non fiscal incentives

  - fiscal incentives - Income Tax Holiday and Low Income Tax Rate (Tax Credit on Domestic Capital Equipment); Duty-Free Importation of Equipment and VAT Zero-Rating (Cash Incentive for Missionary Electrification); Reduced Government Share; (Exemption from Universal Charge), Payment of Transmission Charges, Tax Exemption on Carbon Credits

  - **non-fiscal incentives** - Renewable Portfolio Standards (Feed-In-Tariff - FIT System); Net-Metering (Green Energy Option)

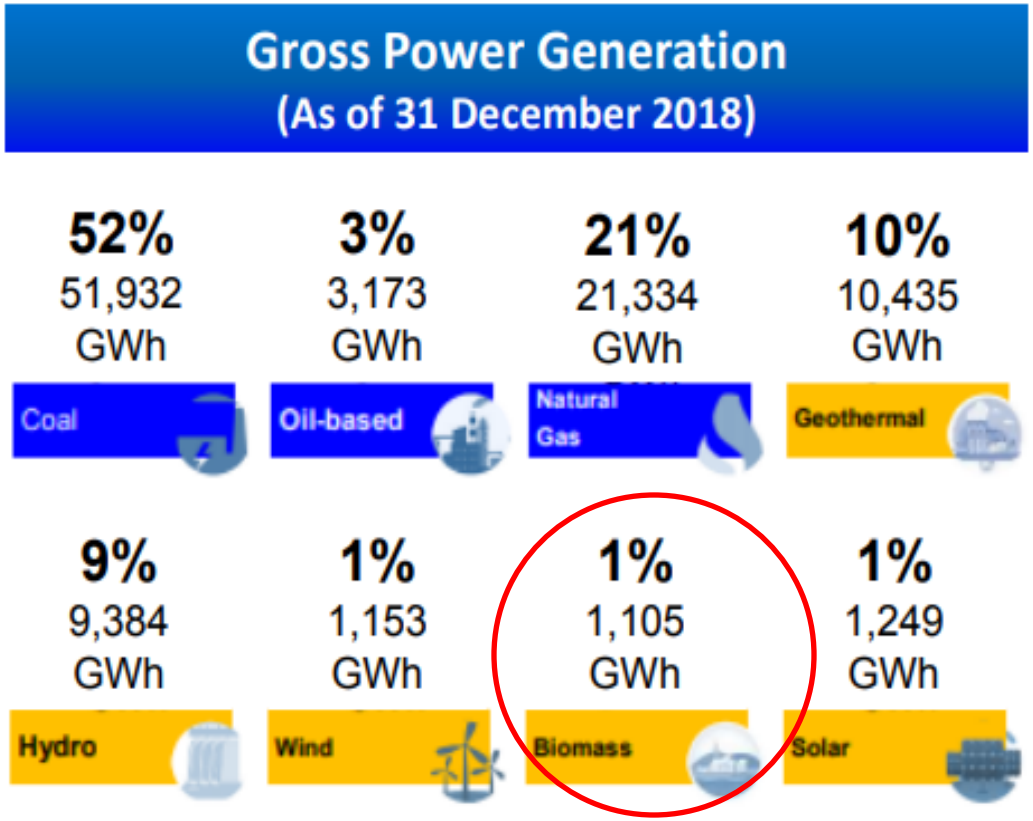
Where We are Now: 2018 Energy Supply



Department of Energy
Empowering the Filipinos

- **Biomass** – complements other sources of alternative energy; would reduce dependence on fossil fuels

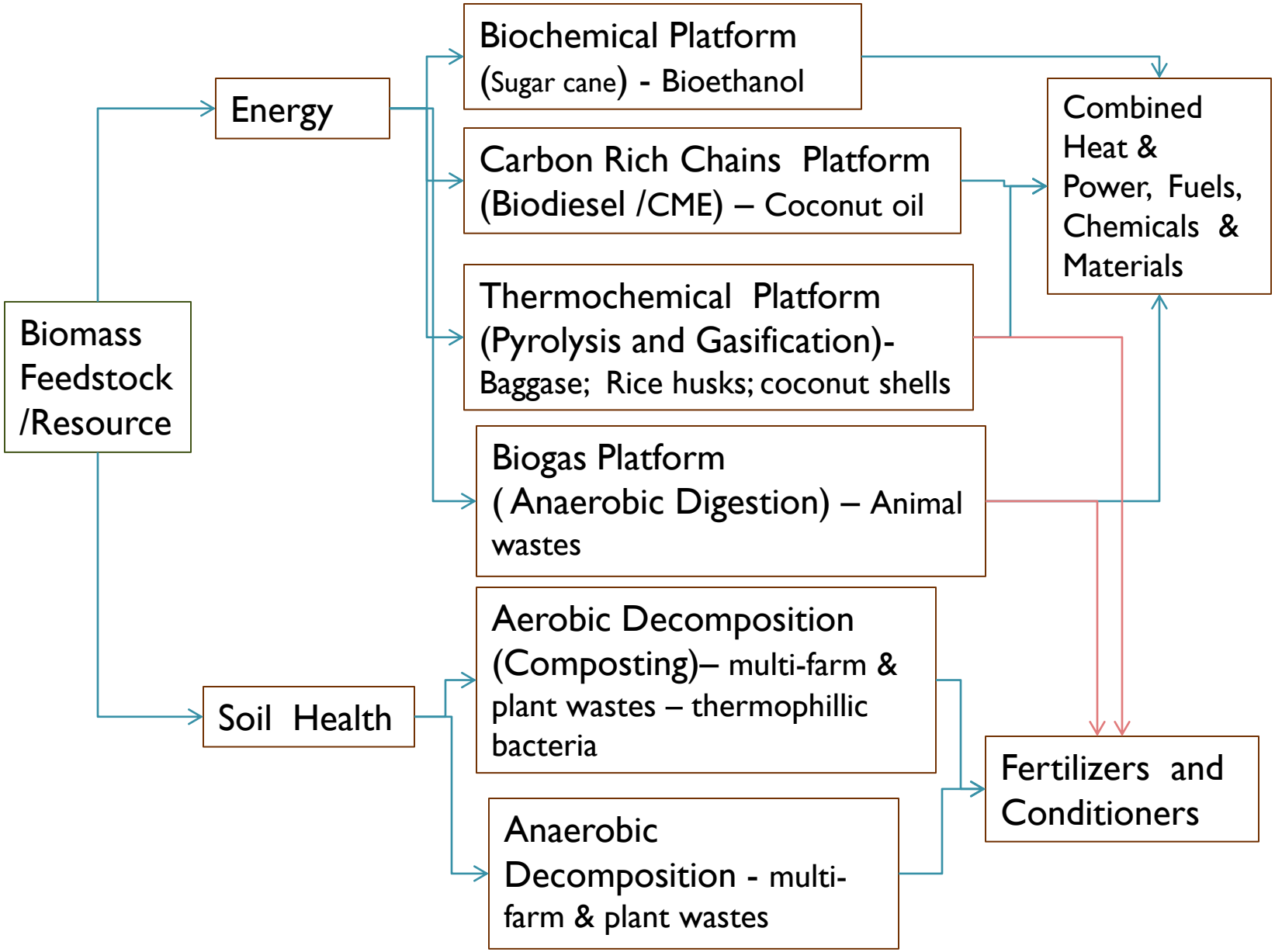
2018 Gross Power Generation



Total Generation: 99,765 GWh

Renewable Energy: 22%

BIOMASS RESOURCES & CONVERSION PLATFORMS



Some Feedstocks

- Bagasse
- Rice Husk
- Napier Grass
- Biogas (Animal Waste/ Distillery Waste)
- Coconut Wastes

  8-64 tons/ha Biomass depending on palm productivity

  Ex. 60 nut/palm/year

  fruit – 6.70;

  spathes and rachis-0.15

  Leaves – 4.60

  Stem – 1.25

  Roots – 1.25

  Total Biomass yield/year= 14.20 tons/ha. - (Estimated at 49 M tons/year)

  Estimated Annual Biomass C, t/ha = biomass yield x 44% = 6.34

  Equivalent Sequestered Biomass CO_2, t/ha = biomass C x 3.72 = 20.58

- Wood Chips
- Municipal Solid Waste
- Multi-Feedstock
- Sugarcane Trash

Investments Required

- Minimum of 1 MegaW Capacity
- Requires Php 100 M (2M USD investment cost)
- Requires 1.5MT/hour biomass (good heating value – appropriate mc and particle size) or 36MT/24 hours
- Present RM cost, e.g., rice hulls = Php 2,300/MT (46 USD)

Biomass Resource Assessment-USAID

Major Island Group	Potential Power Generation	Potential GHG emission reduction (Million tCO2)
Luzon	2,093.7	11.01
Visayas	1,512.7	3.71
Mindanao	843	2.54
Total	4,449.54	17.26

Other Government Initiatives

- Research and Development

  Studies on utilization through the Biofuels Program of the Department of Agriculture thru the Bureau of Agricultural Research:

  - In 2009, UPLB conducted " Feasibility of Bioethanol Production from cellulosic materials in the Philippines (corn stover & rice straw) which revealed that within a contiguous radius of 40 kms, there is an estimated total of 800Million liters per year of cellulosic ethanol from 4 provinces (Nueva Ecija, Pangasinan, Isabela, & Bukidnon)

  - In 2015 conducted Philippine Rice Research Institute (PhilRice) introduced and pilot-tested a machine (continuous rice hull (CtRH) carbonizer) that processes rice hull into biochar which can be used for cooking, baking, sterilizing and heating brooding chicks.

  - The Philippine Coconut Authority conducted pilot commercialization of using cocopeat as bio-organic fertilizer.

  - The University of the Philippines Los Baños implemented a project where corn cobs were utilized as fertilizer. Corn cob is part of the corn ear which comprises about 20-30% of ear weight

- National Convergence Initiative to implement Biomass Renewable Energy Program starting 2012

Development Challenges and Ways Forward

Challenge/Issues	Action Needed
Competiveness	
- Feedstock supply/ sustainability and price	Appropriate /Detailed resource assessment ; investment promotions (competition and government support)
- Availability of Technology	R & D (appropriate technologies); networking/convergence or information sharing or complementation of resources; capacity building
- Consolidation/logistics	Farm to market roads construction; institutionalization of Clustering approach

Thank You . . .

Maraming Salamat . . .

Mabuhay . . .