Attachment C

Resource Speakers' Presentation Materials and Handouts

Day 2

Mr. Christian Alvarado

Philippine Bio-Sciences Company Inc.

Optimizing the Conversion of the Organic Fraction of Municipal Solid Waste (OFMSW) to Energy

S. West Stewart, President
Christian Alvarado, Chief Marketing Officer

Philippine Bio-Sciences Co.
A Unit of Asia Biogas Co. Ltd.

PhilBIO

David Donnelly President

Samuel West Stewart President and CEO

David Donnelly Managing Director

Clean Energy Development (Vietnam Rep Office)

Nguyen Nhut Hung
Chief Representative

PT asiaBIOGAS Indonesia

Arif Hasyim Director

Headquartered in Bangkok, Thailand. Currently operates in The Philippines, Indonesia and Vietnam.

Financial Partner

Trading Emissions PLC (TEP)

Investments are focused in assets created by projects under the Kyoto Protocol:

a. **Carbon Emission Reduction (CERs) in the Clean Development Mechanism (CDM)**

b. **Emission Reduction Units (ERUs) in Joint Implementation (JI)**

TEP funds projects that aims to cover the UK Government's official and ministerial air travels.

PhilBIO

AWARDS & RECOGNITION

2008 Asia Pacific Renewable Energy

Company of the Year (Bioenergy)
AsiaBIOGAS Company awarded by Frost et Sullivan

2008 Dangal ng Bayan Award

As most Outstanding Waste-to-Energy Systems Developer in the Philippines

2009 Best Innovative Clean Energy Program

"The Green Lane Project"
Awarded by the Asian Development Bank (ADB)
As United States Agency for International Development (USAID)

ASIA CLEAN ENERGY FORUM

JUNE 17-19 2009 • MANILA, PHILIPPINES

INVESTING IN SOLUTIONS THAT ADDRESS CLIMATE CHANGE AND ENERGY SECURITY

Award

The poster developed by

Phil. Bio-Sciences Co. Inc.
Green Lane Project

was presented during the Clean Energy Marketplace at the Asia Clean Energy Forum on 18 June 2009 in Manila, Philippines. This poster was deemed to be one of the most promising clean energy business idea and was selected for the ***Best Innovative Clean Energy Program*** in the competition.

Peter du Pont, Ph.D.
Contractor, Chief of Party
USAID ECO-Asia Clean Development and Climate Program

Samuel Tumiwa
Senior Energy Specialist
Regional and Sustainable Development Department, Asian Development Bank

Organized and sponsored by

ADB USAID

Co-sponsors

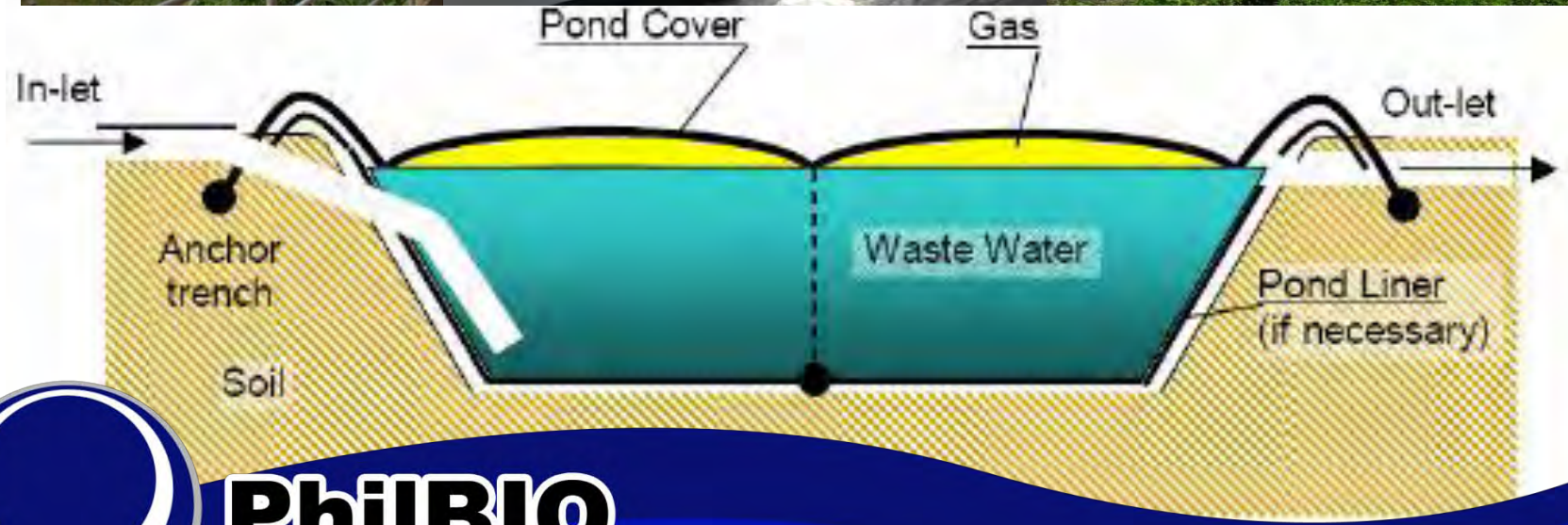
Sida

Organization and logistics by

PhilBIO

The **CIGAR or Covered In-Ground Anaerobic Reactor** provides wastewater treatment coupled with the generation of biogas – a natural fuel that can be used in various applications.

- Combustion for hot water/steam generation, electric power or both.
- Cooking fuel for everyday use.



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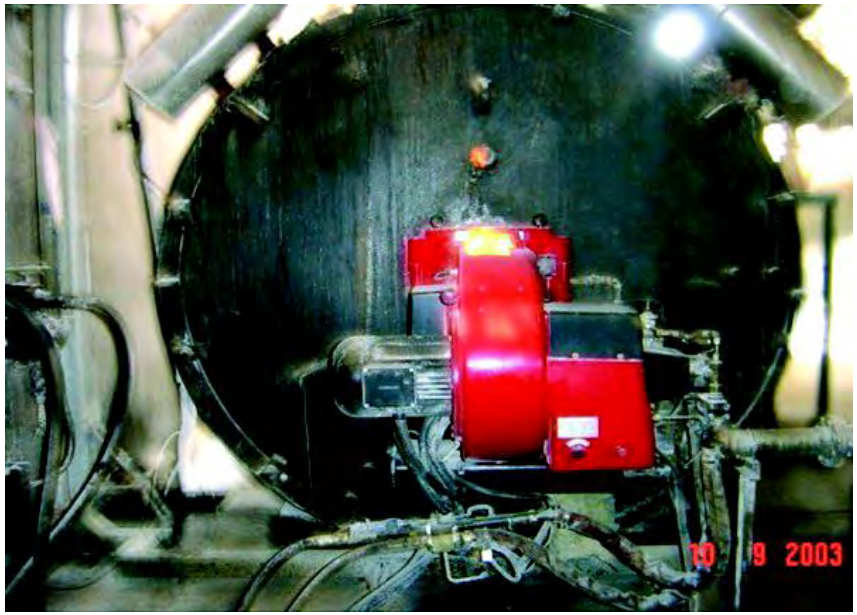
ABC'S KORAT WASTE TO ENERGY INC WORLD'S LARGEST DIGESTER

asiaBIOGAS

ABC Operates Power Plants & Energy Plants



EXAMPLE: KWTE BIOGAS TO ENERGY PLANT
DISPLACES 100% OF FUEL OIL & 3.3 MW OF ELECTRICAL

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Makati Sewage Treatment Plant in Magallanes Village

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Site Visit of Hon. Mayor Jun Bernabe of Parañaque City

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asiaBIOGAS
Asia Biogas Company Ltd.

Largest Installed Base Agri Farms in Phils.

Philippine
Bio-Sciences Co., Inc.
www.philbio.com.ph

Nueva Ecija

Paramount Agri Farm 300 kW

Tarlac

Gaya Lim Farm 75 kW

Superior Farm 75 kW

Sto. Domingo Farm 100 kW

Unirich Farm 100 kW

Goldilion Farm 100 kW

Gold Farm 100 kW

Sentra Farm 100 kW

Everlasting Farm 100 kW

RH Farm 200 kW

Empire Farm 200 kW

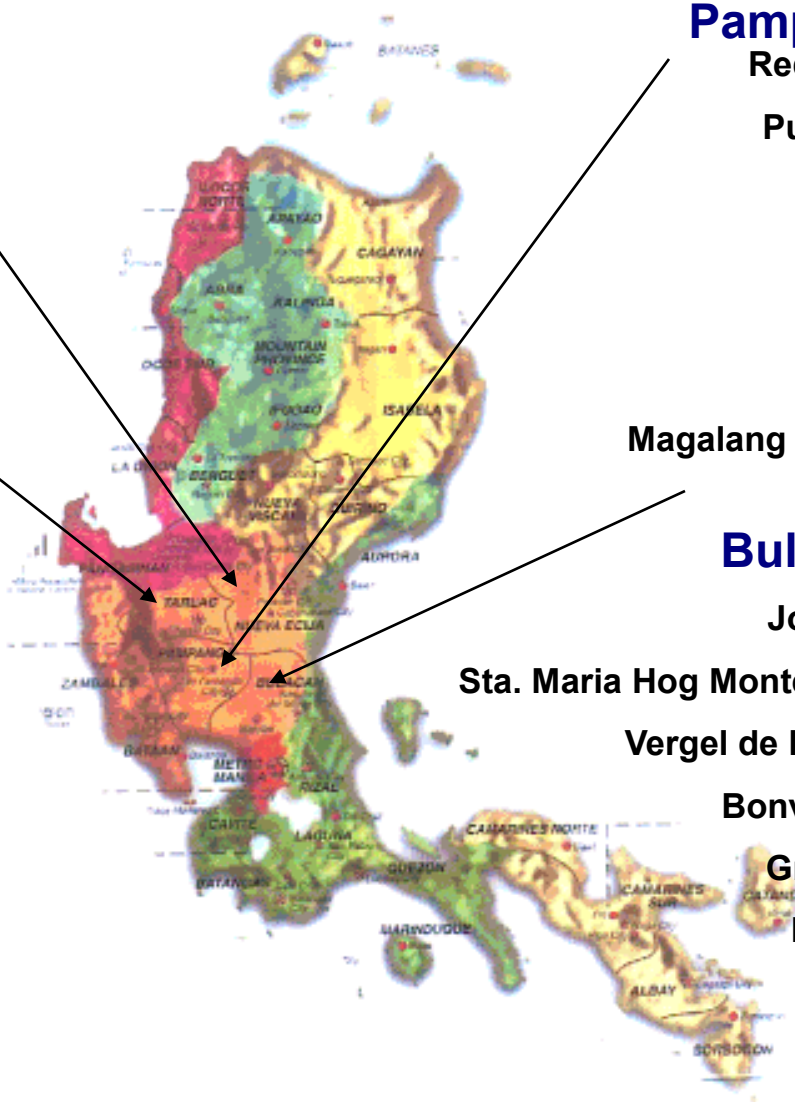
Golden Harvest 100 kW

Greenerland Agro Industrial 100 kW

Sta. Luisita Farm 100 kW

Unifive Farm 100 kW

Boston Ridge Farm 100 kW



Pampanga

Red Dragon I & II 175 kW

Purebreed Farm 100 kW

Eduard Farm 100 kW

GeneCo Farm 100 kW

Purity Farm 100 kW

Allasca Farm 100kW

Magalang Winners Farm 100 kW

Bulacan

Joliza Farm 100 KW

Sta. Maria Hog Monterey Farm 100 KW

Vergel de Dios Farm 100 KW

Bonview Farm 200 KW

Grace Farm 100 KW

Rica Farm 100 KW

URC RF12 1MW

Forestiera Farm

Thailand Vietnam Philippines Indonesia

Universal Robina Corp: Philippines Largest Hog Farm

Dual Cell CIGAR ~ 25,000 m3 CH4
1.1 MW GE Jenbacher Power Plant
48,000 Potential CERs per annum

PhilBIO

"You have to see everything that is going on to determine the right business approach."

- 19th Century French Economist

Frédéric Bastiat

PhilBIO

Cleaning Up a Dump

On January 26, 2001, Republic Act No. 9003 (R.A. 9003) otherwise known as the Ecological Solid Waste Management Act of 2000 was signed into law by the Philippine Government. This law requires all Local Government Units in the country to establish an ecological solid waste management program within their jurisdictions and provides the necessary institutional mechanisms to attain its objectives.

Climate-Friendly Cities Project Collaboration

PhilBIO and GRIPP

PhilBIO

PhilBIO Sciences Inc.

GRIPP

*

PhilBIO

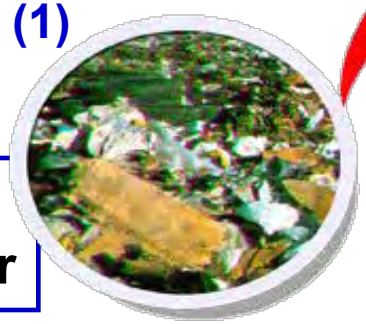
Climate-Friendly

Cities

PhilBIO

Waste in

(1)



800 t/day
150,000 t/yr

Sorting & Anaerobic Digestion

(2)

1. PHILBIO'S waste-to-energy facility in Korat, Thailand.
2. PhilBIO's GE Jenbacher Electric Power facility in Thailand.
3. Commercial fertiliser from anaerobic digestion. Ballarat, Australia

(4)

Electricity Sales

5 MWp, 35 GWh/yr

(3)

Fertiliser Sales

65,000 t/yr

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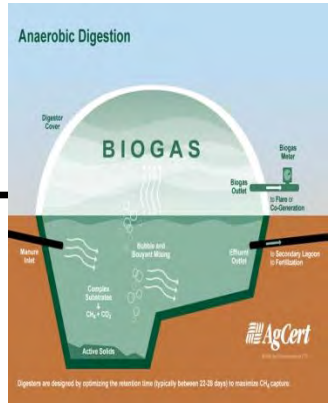
How does this work ?

Primary source

1

2 Types of truck

30 MT (10 wheeler)
10 or 8 MT(6 wheeler)



digester

Secondary source

2

1. Pipeline 1 – No need to pump
2. Pipeline 2 – Confirm if pumping required

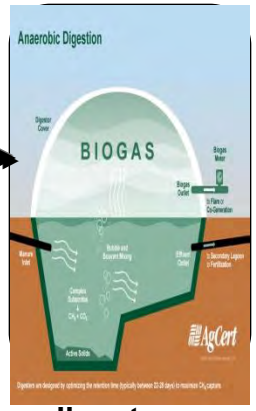
Cost not included in the analysis

1. Pipeline or concrete sewage system (Primary)
2. Pipeline or concrete sewage system (secondary)
3. Waste pond (Based on volume of hogs x 4 days waste)

Solid garbage truck

Waste sorting center

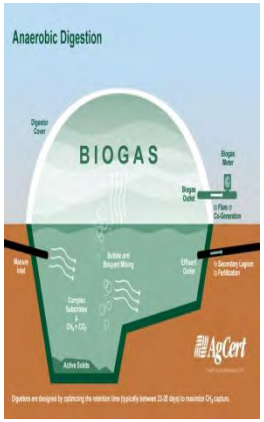
Liquid Lorry



digester

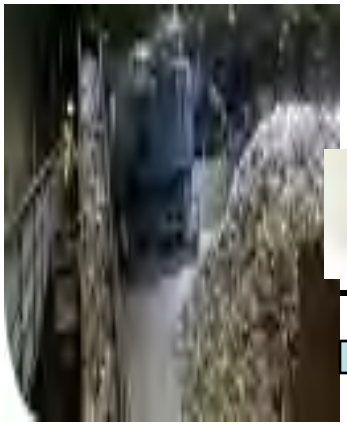
Source Map 1

Liquid Lorry



Source Map 2

Garbage Truck



Waste sorting center

Liquid Lorry

digester

Source Map 3

Project Description

Program 2:
ReSTORE™ Hybrid
Carbon Neutral E Vehicle Programme

PhilBIO

Components

- Mass Transport (electric jeepneys)
- Clean Energy (biogas fuel for electricity)
- Waste Management (anaerobic digestion)

- CIGAR Technology
- FLEX Financing for Biogas Facility
- CDM Documentation and Carbon Credit Sales

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PUERTO PRINCESA AIRPORT
Puerto Princesa, Palawan

PhilBIO

e-tricycle

PhilBIO

e-jeepney

Puerto Princessa

PhilBIO

MOA Signing

Tarlac City

PhilBIO

MOA Signing

"The only thing that will redeem mankind is cooperation."

- 20th Century British Economist

Bertrand Russell

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asiaBIOGAS




Asia Biogas Co. ~ Southeast Asia's largest biogas systems design, build and operate company.

www.asiabiogas.com

www.philbio.com

Mr. Dave Robbins

Philippine Sanitation Alliance

USAID | PHILIPPINES

FROM THE AMERICAN PEOPLE

The Role of Local Governments in Promoting Wastewater Treatment

Slaughterhouses ***Livestock*** ***Septage Treatment***

Local Government Units

LGUs are empowered by the Local Government Code to:

- **Participate actively in the implementation of national programs and projects**
- **Initiate agricultural support services**
- **Deliver services and build facilities related to general hygiene and sanitation**

LGUs are required to:

- **Follow government laws (Clean Water Act, Sanitation Code) for their facilities (slaughterhouses, markets)**
- **Issue building and business permits only to compliant facilities**

Examples of LGU-Owned Facilities

Slaughterhouse – Alaminos City Near Hundred Islands NP in Western Pangasinan

Livestock raising and sales at public markets- Tagum city, Davao del Norte

Potential for Biogas Capture

Some LGU-owned facilities generate high-strength wastewater where biogas systems may be incorporated with wastewater treatment:

- **Slaughterhouses – often use lagoons for treatment**
- **Livestock facilities – manure and other waste can be mix using anaerobic digesters**
- **Septage treatment facilities – LGUs required to implement septage management systems (regular desludging of septic tanks and treatment) by the Clean Water Act if there is no water district. Lagoons often used.**

Potential for Biogas Capture

Slaughterhouses – Zamboanga City Upflow Anaerobic Sludge Blanket filter (UASB) with lagoon

Potential for Biogas Capture

Septage management – Dumaguete City septage lagoons under construction, may add methane sequestration and capture system

Biogas Capture Example

Slaughterhouse – (Animal Products Development Center in Valenzuela City)

Biogas sequestration and reuse system – Chinese dome with anaerobic baffled reactor (ABR) and constructed wetlands designed by BORDA-BNS

Developing Systems and Sharing Information

LGUs can set a good example by properly treating their wastewater first; then sharing information to encourage others:

- Sharing aspects of their publicly-owned wastewater facilities with the private sector
- Providing technical assistance from LGU staff (CENRO, Engineering office)
- Disseminating literature and information with the private sector

Philippine Sanitation Alliance

- To help implement the Clean Water Act
- A 4 year Global Development Assistance project
- Cooperative agreement with AECOM International Development
- Working with LGUs to develop wastewater treatment systems for:
  - Slaughterhouses
  - Public Markets
  - Septage Treatment Facilities
  - Others

PSA Objectives

Protect biodiversity and reduce public health risks by:

- **Promoting the adoption of low-cost sanitation technology (for households, hospitals, hotels/restaurants, slaughterhouses, markets)**
- **Helping package projects and access financing**
- **Promoting sanitation and hygiene**

Compliance Assistance Centers

The Asia Environmental Compliance and Enforcement Network (AECEN), funded by USAID, supporting the Laguna Lake Development Authority (LLDA) to improve compliance at hog farms and slaughterhouses. Visit the CACs online at:

- **http://hogfarmcac.llda.gov.ph/**
- **http://slaughterhouse.cac-phil.org/**

Thank you!

Philippine Sanitation Alliance
AECOM (USAID Grantee)
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168 Salcedo Street
Legaspi Village, Makati City 1229
Philippines
Tel/Fax +(632) 819-0687
Cell: +63921-204-8390
E-mail: drobbins@psa.ph

Dr. Poon Thiengburanathum

Energy Research and Development Institute (ERDI)
Chiang Mai University

Programmatic CDM for Swine Farms Industry in Thailand

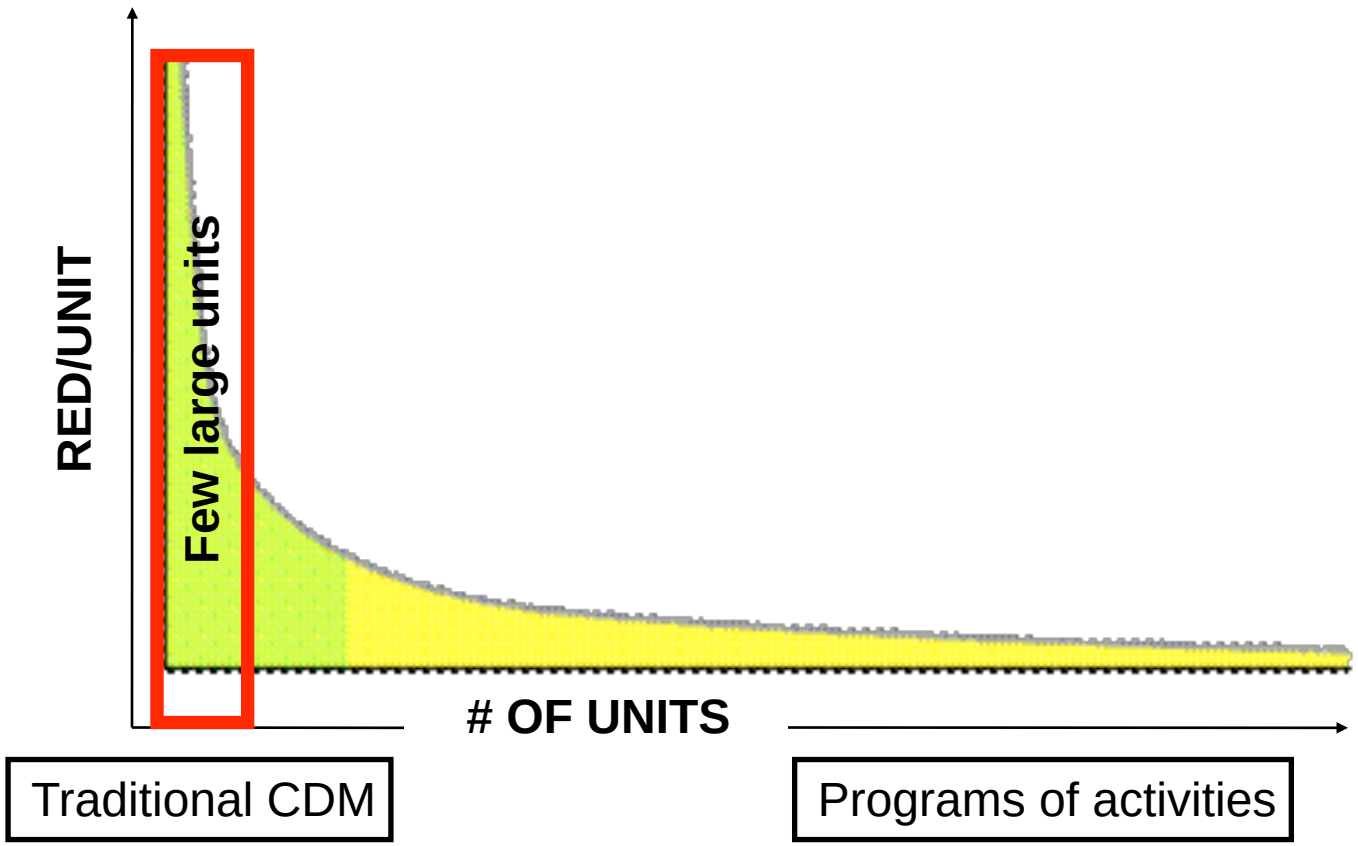
Poon Thiengburanathum, Ph.D..

Energy Research and Development Institute, Chiang Mai University

poon@eng.cmu.ac.th

Application of Programme Approach

Source: ESMAP and CFU (2007)



Application of Programme Approach

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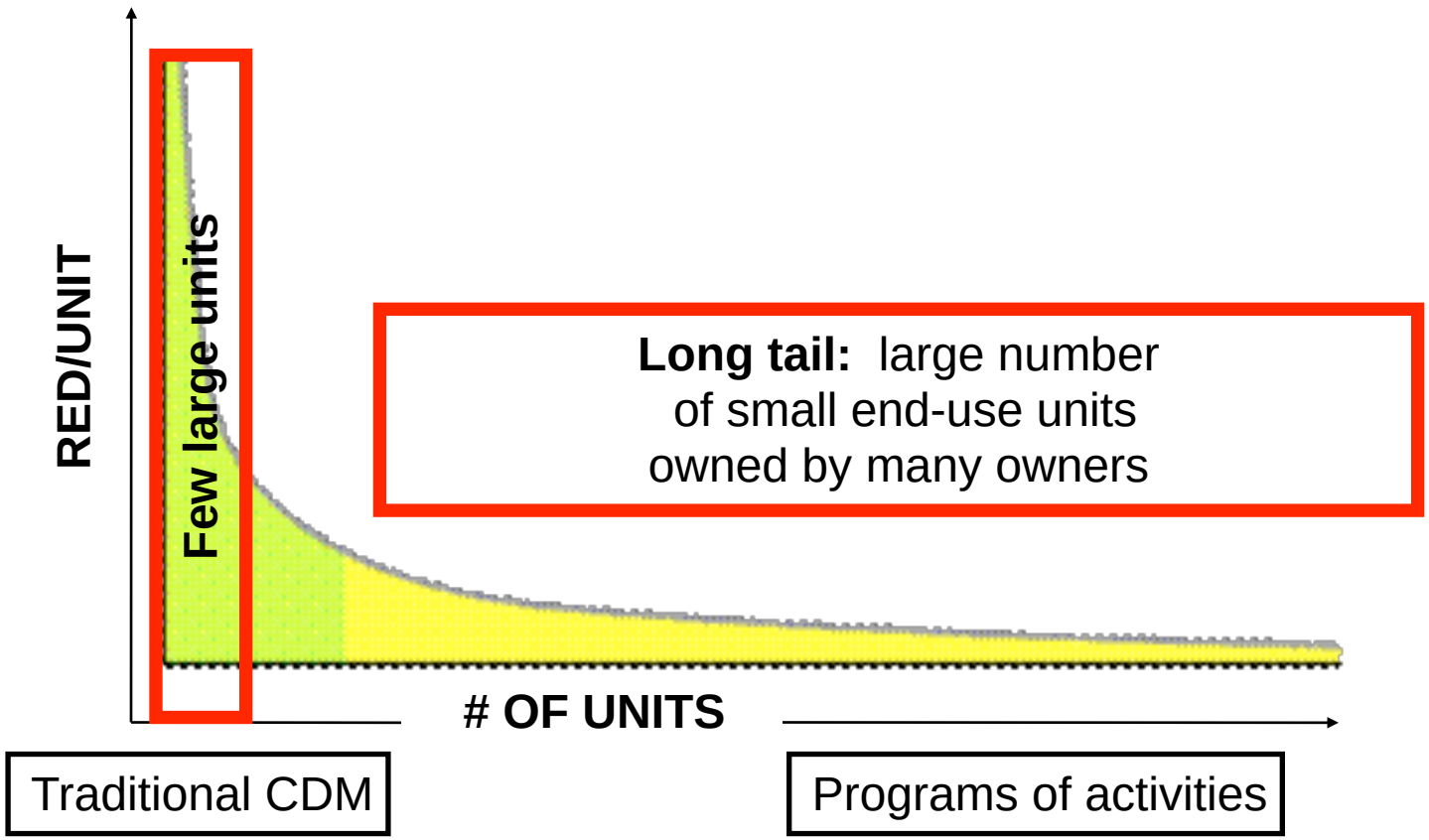
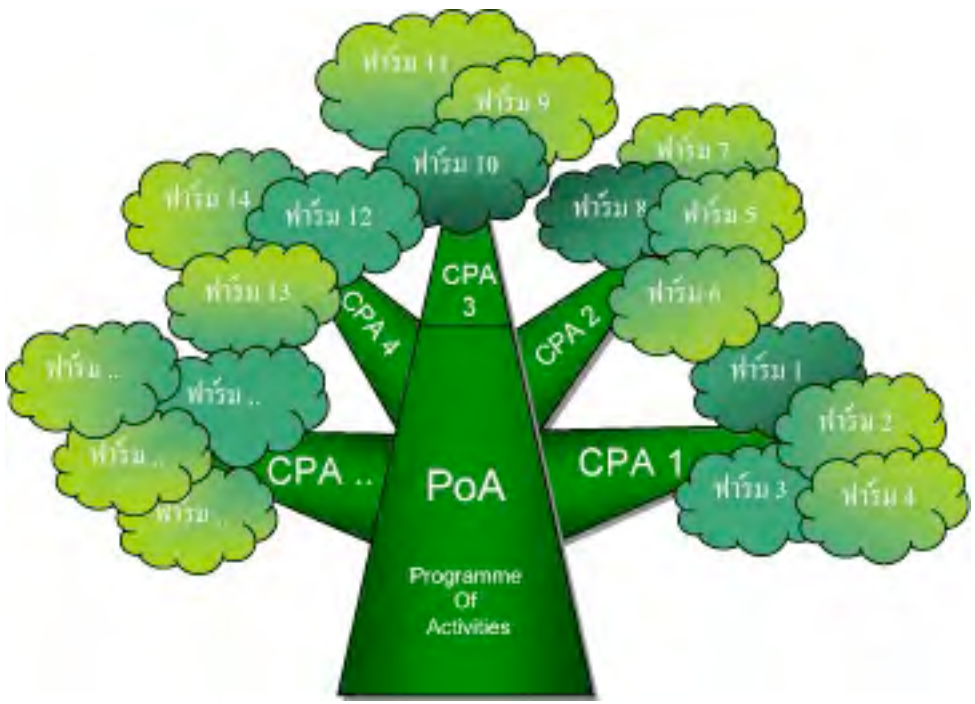
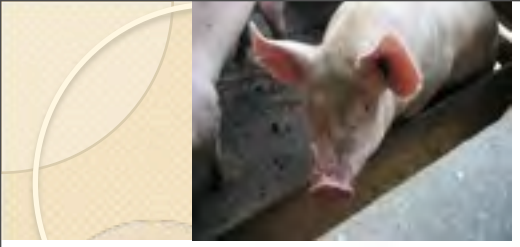


Program of Activity = Tree

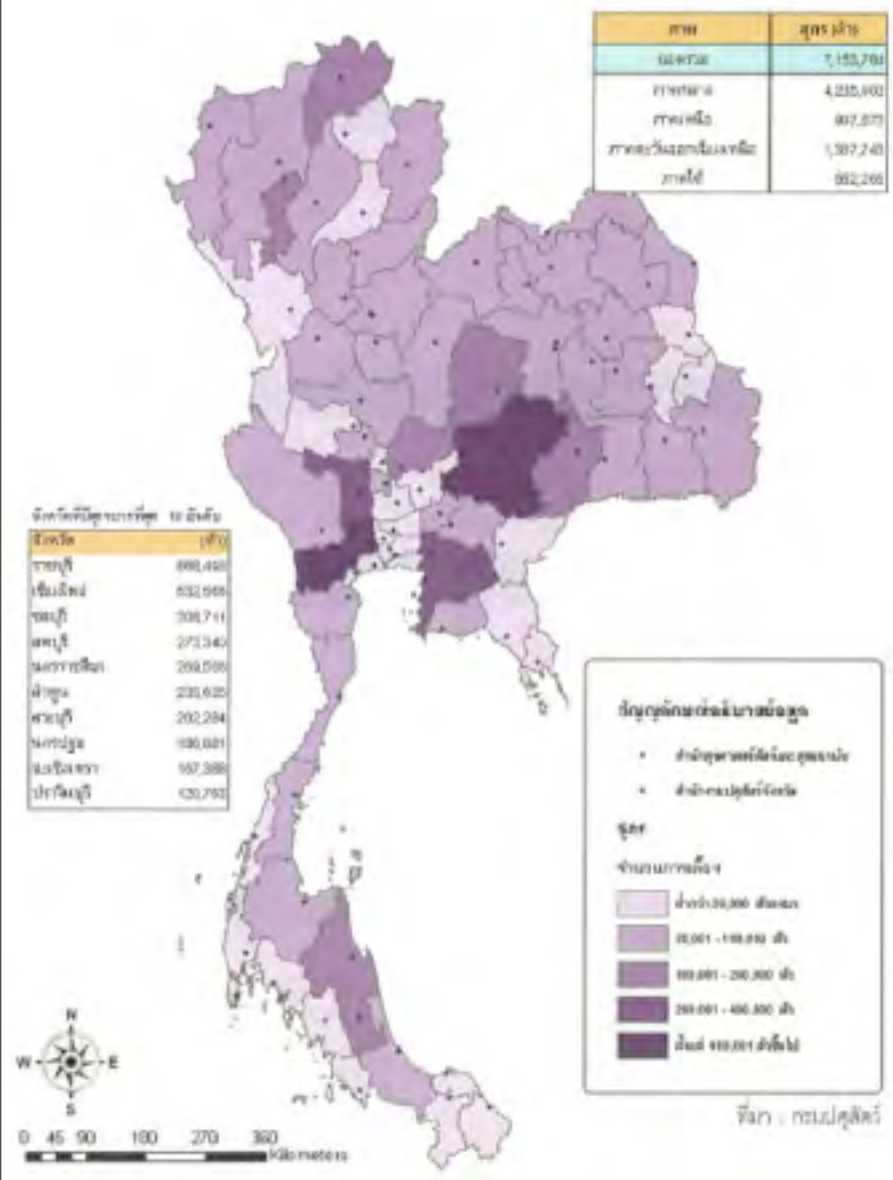
Programmatic CDM (POA)



BACKGROUND



Situation Analysis



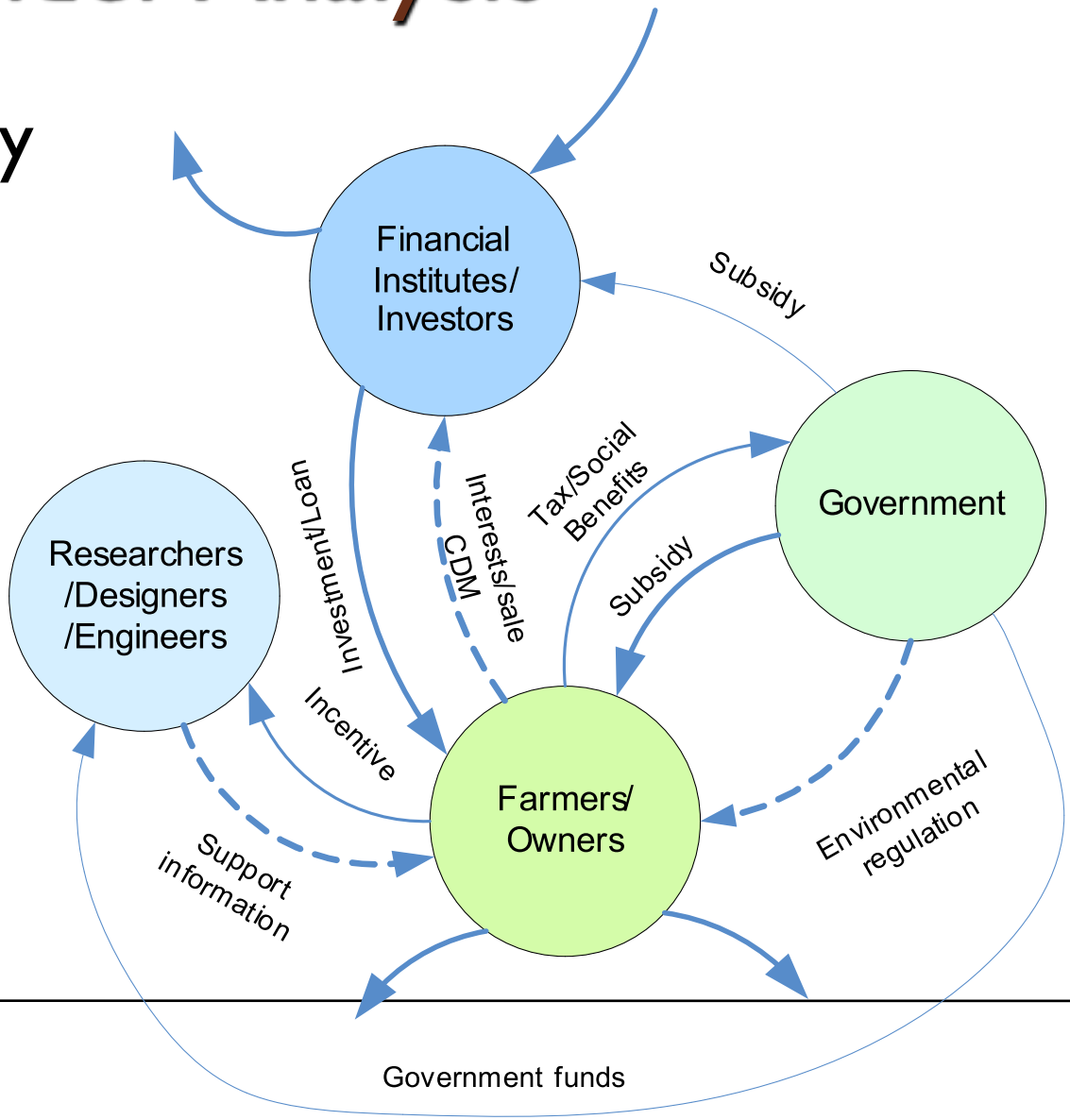
There are 7.15 million swine in Thailand

Farm Size	No. or pigs	No. of Farms	Total Pigs head (million)
Small	50-500	>200,000	3
Medium	500-5,000	1,309	1.36
Large	>5,000	186	2.78

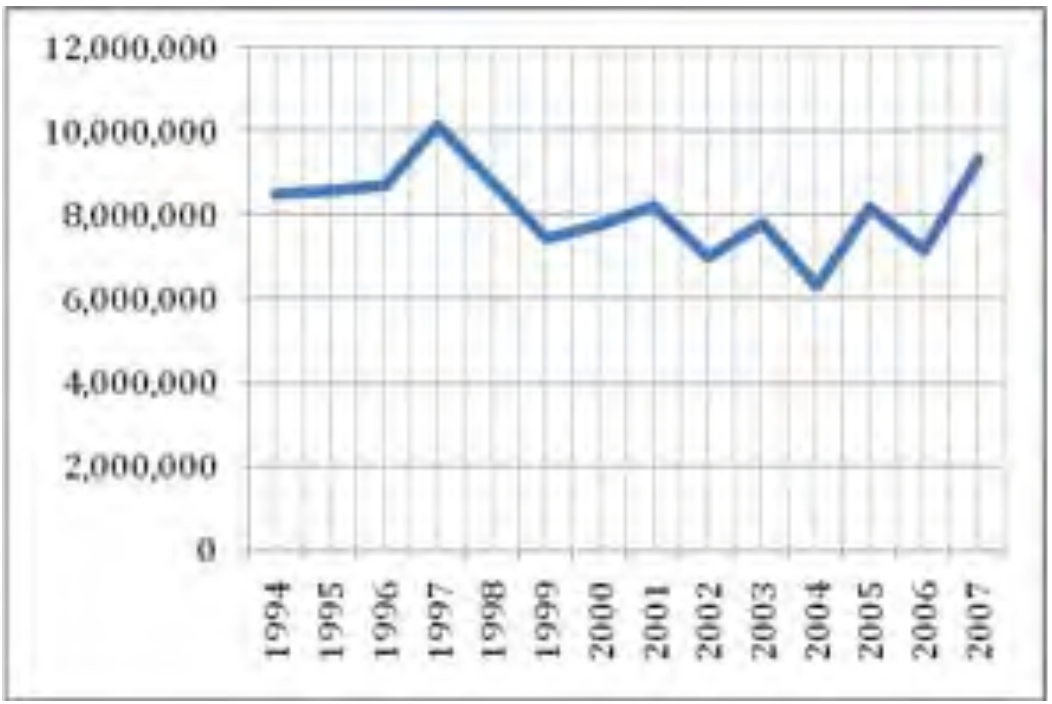
Source: Department Livestock Development, 2006

Stack holder Analysis

- Peculiarity



Scope / Marketing Issues/Analysis



Annual number of swine in Thailand (animals)

Join Funding or Subsidy Issues

- **Small scale > Department of Agricultural Extension (DOAE)**

- **Implemented by DOAE since 1996-2004**
- **Installed 1,655 fixed dome biogas unit**
- **Total digester volume is 75,000 m^3**
- **Government subsidized 45%**

- **Medium-Large farms > Chiang Mai University**

- **The technology modified from an imported prototype in 1984**
- **Installed 150 plants in medium-large swine farms**
- **Channel Digester + UASB, remove 80-90% COD**
- **Government subsidized: Phase I (1995-1998) 47%, Phase II (1997-2003) 33% and Phase III (2002-2008) 18%**

- **Financial : Energy Conservation Fund, Energy Policy and Planning Office (EPPO), Ministry of Energy**

An Attempt of CDM Development to Swine Farms in Thailand

THE PROGRAMMATIC CDM Design

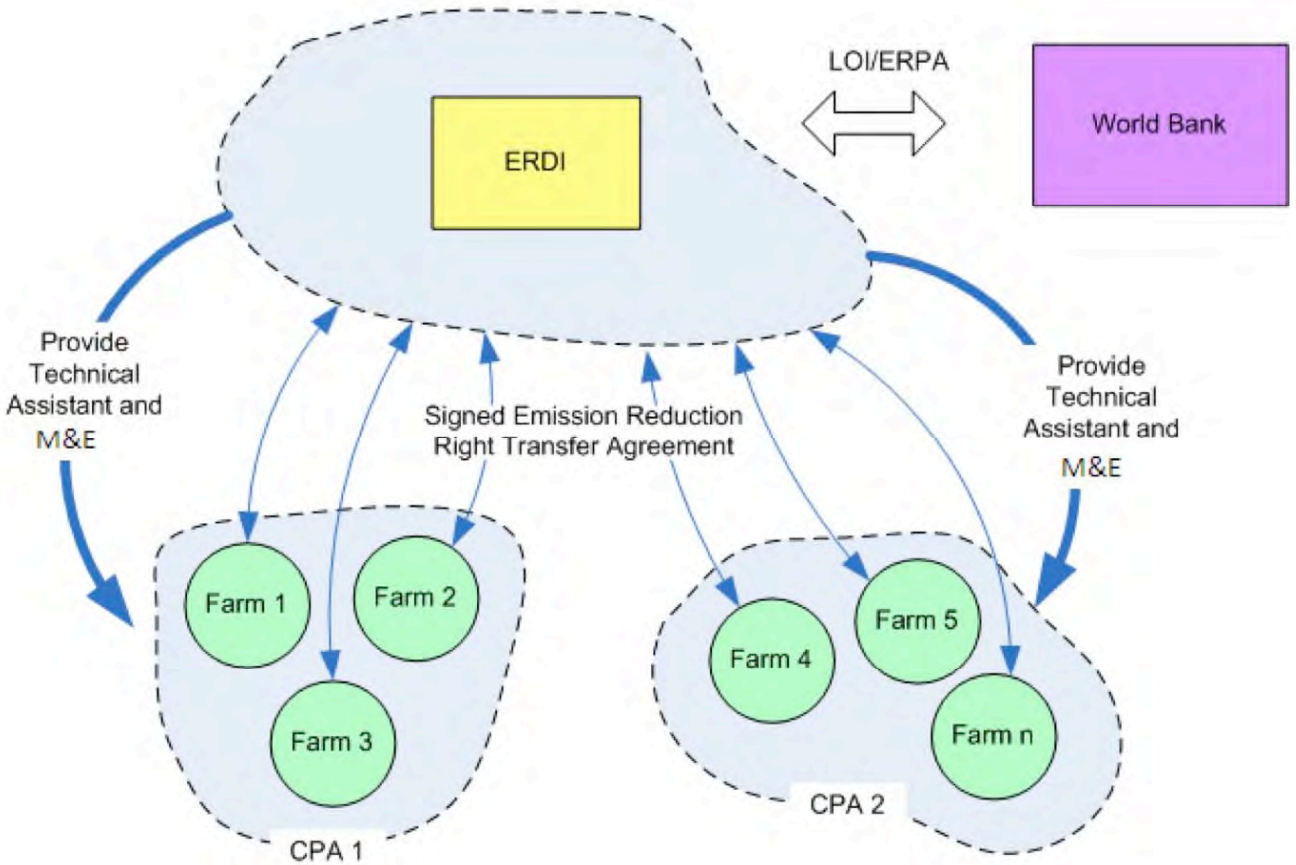
Programmatic CDM for Swine Industry in Thailand

- 28 years – Program Life Span
- At least 200,000 tCO_2e per year
  - 600,000 – 700,000 animals
- Each coherent group (CPA) has a target of annual CERs generation up to 60,000 tCO_2e annually
- At least 6 CPAs

Characteristics of POA

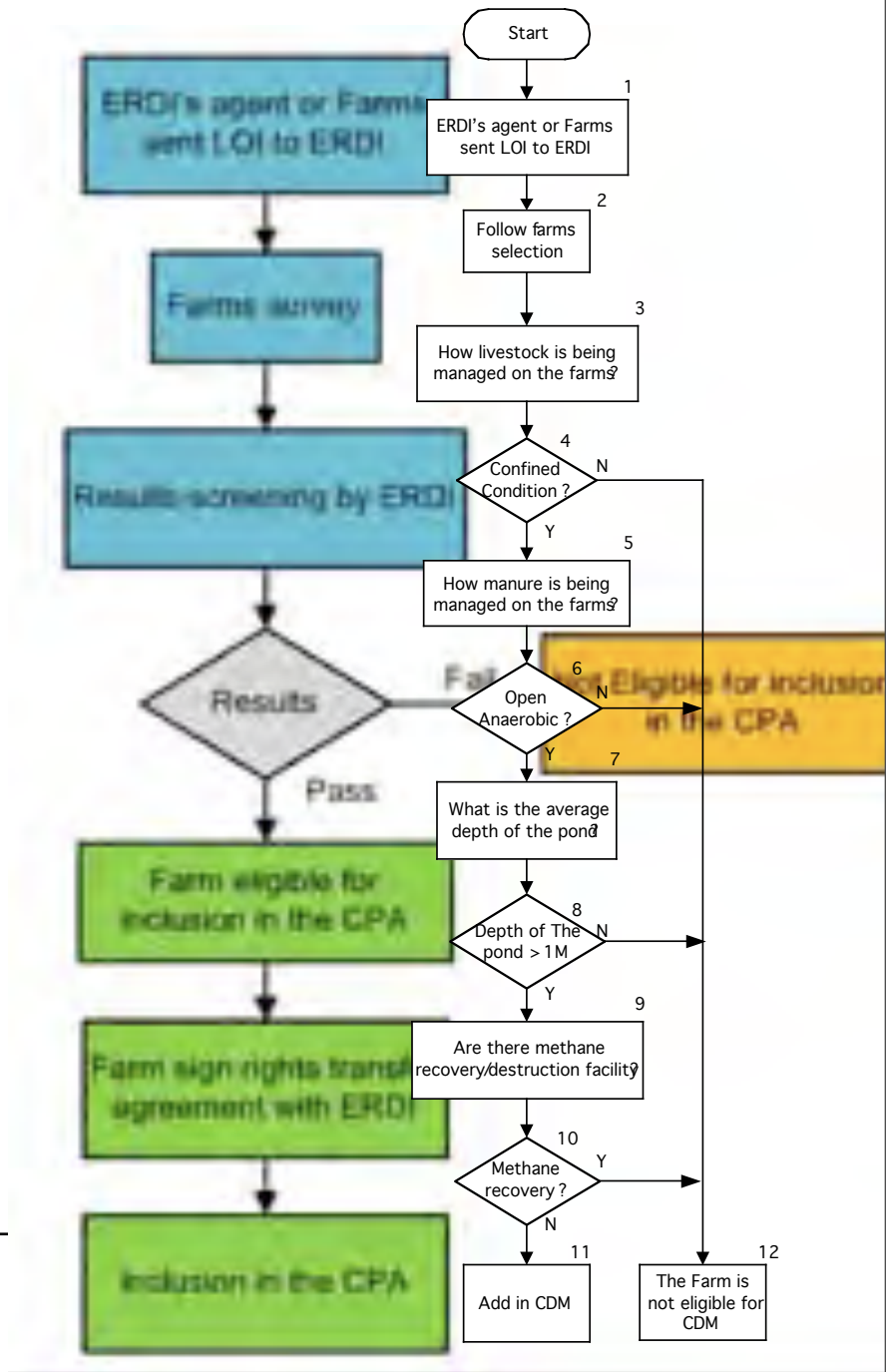
- Using single set of CDM methodologies to declare and mange carbon credits.
- Multiple locations, across countries
- Multiple Project Participants (PP) can join as a coherent group of activities (CPA) over the life-time of the POA
- Each group (CPA) has own crediting period,
- Single technologies and have similar attributes.

Institutional Framework



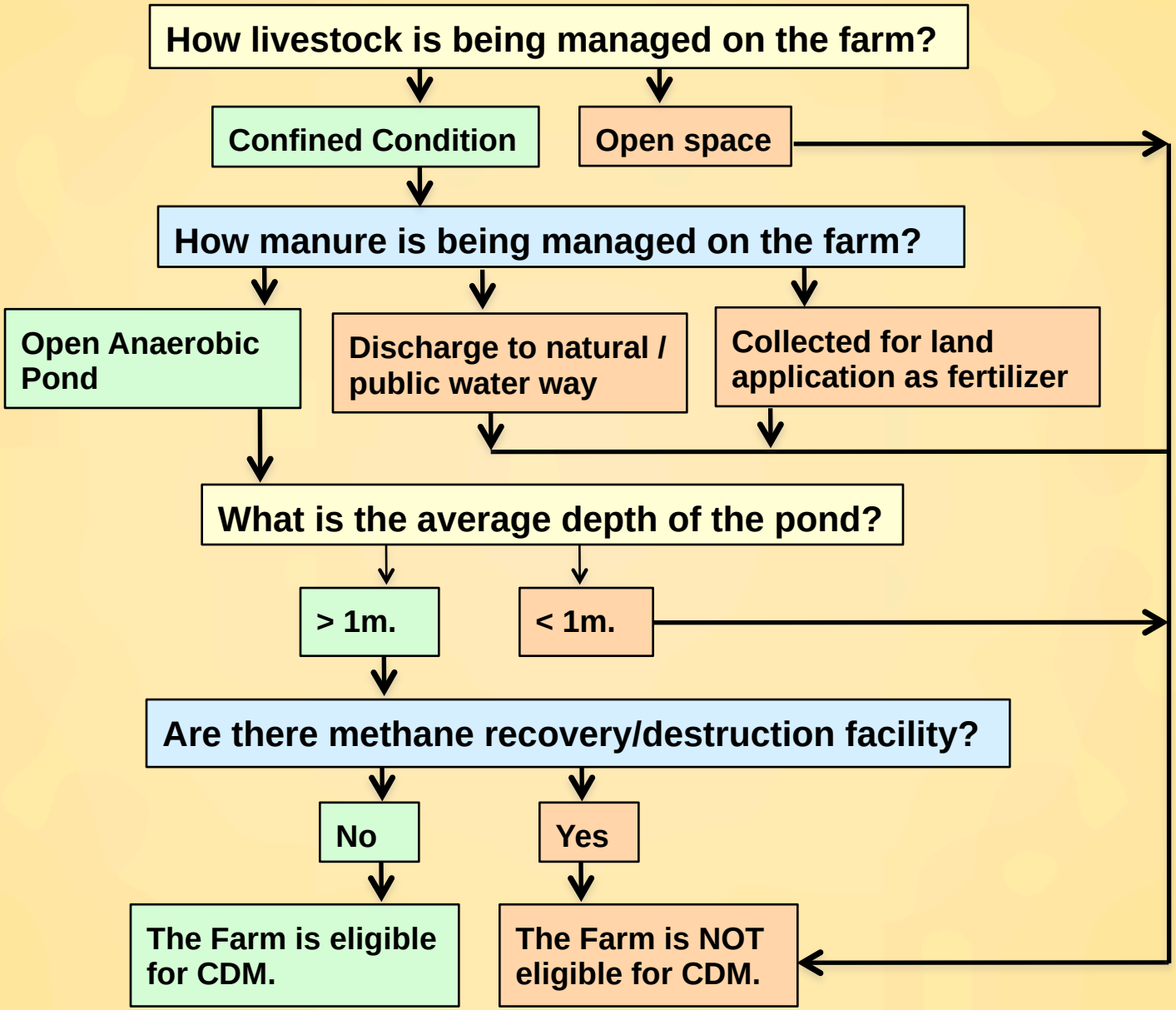
Risk Management Approach

- Class A – Low Risk and High Return
- Class B – Medium Risk and High Return
- Class F – High Risk



Process of Selection

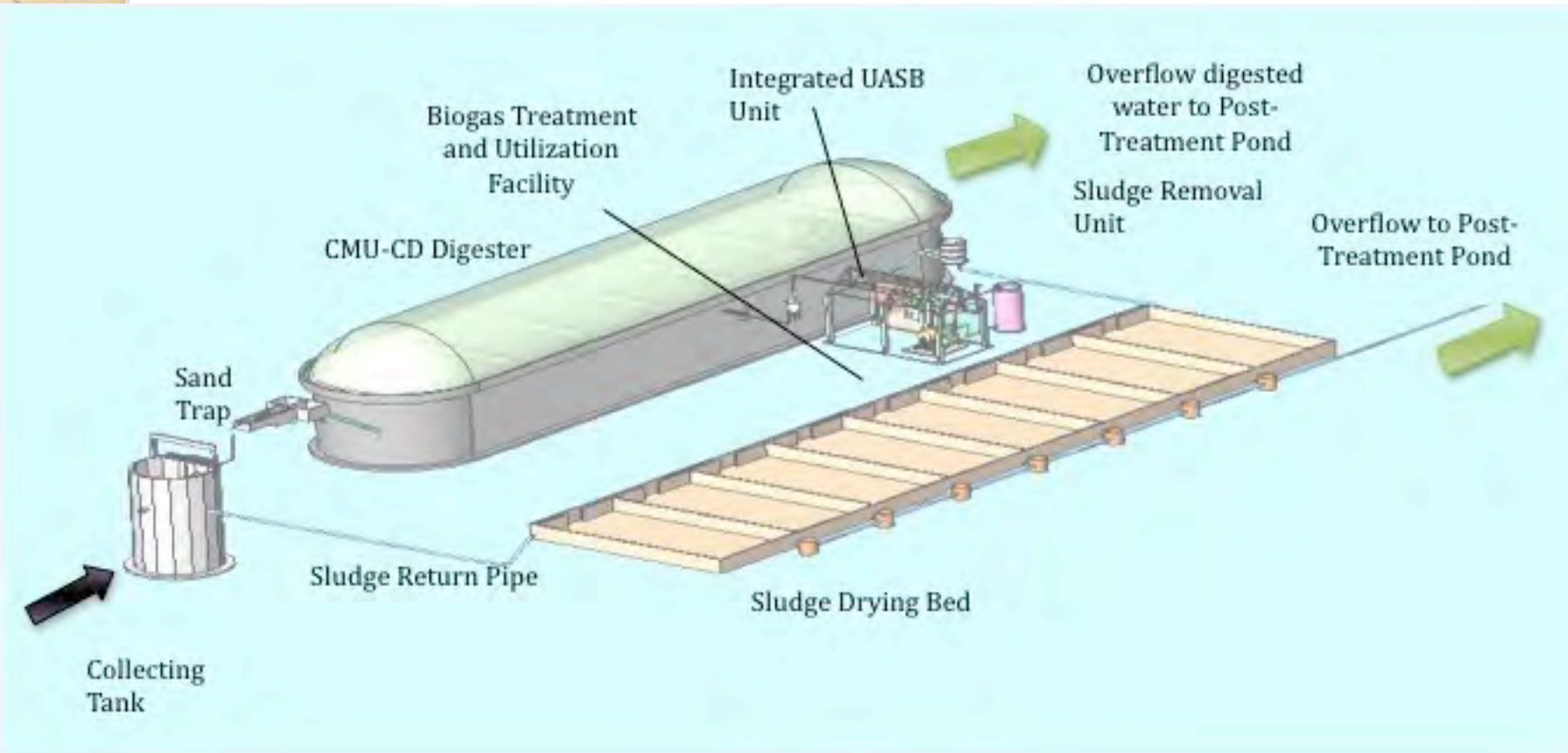
Farm Selection



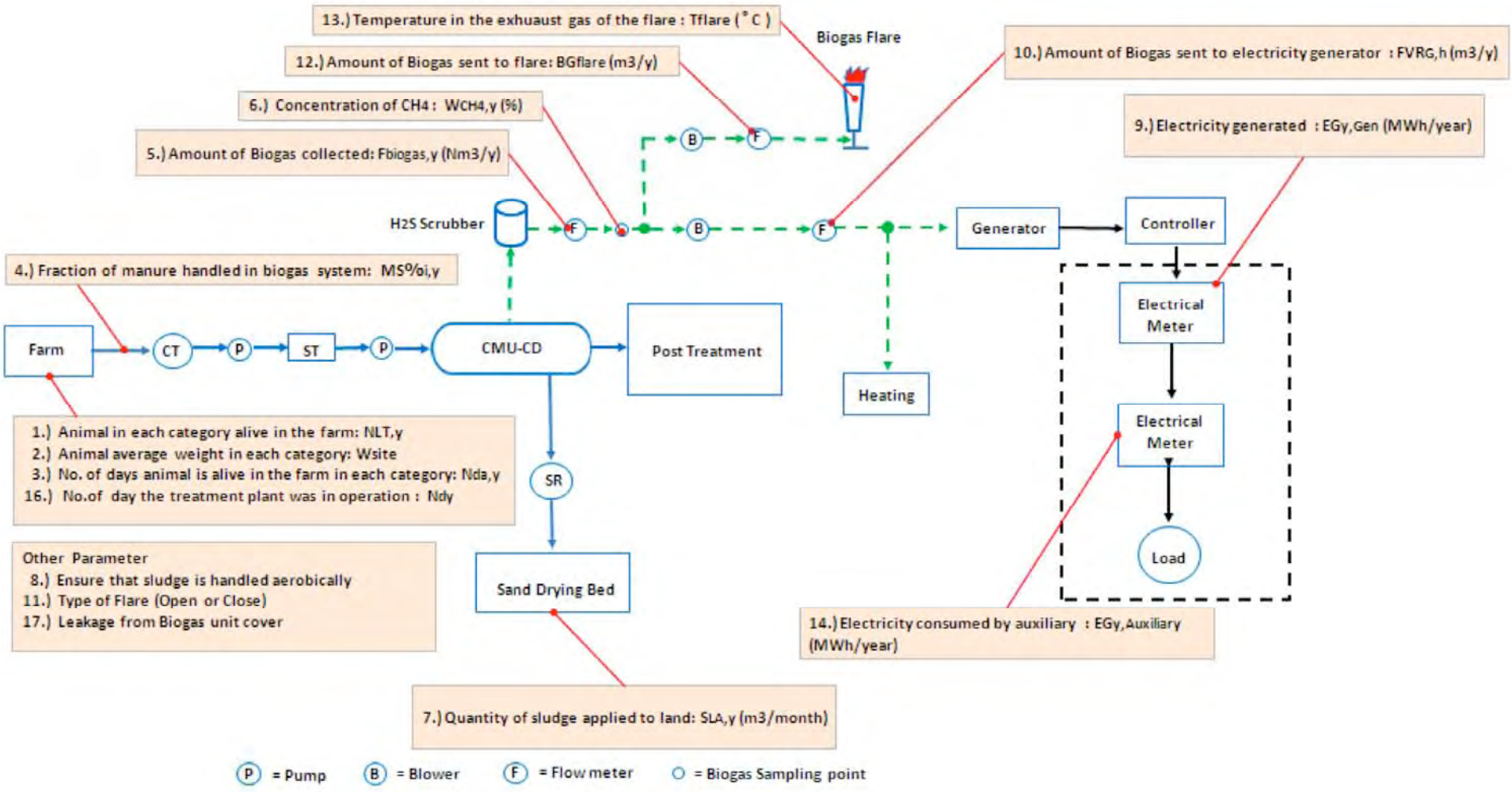
Eligible Criteria

- Open anaerobic pond

Technology Selection



System Diagram for Monitoring



Keys of Success

- Be Clean – Clean Eligibility
- Be Clear – Transparent and Trustful
- Be Communicate – to Fill the gap of differentiation
- Be Commune - One for all and all for one

Keys of Success

Management Concepts

- Risk Identification: Where is the Risk come from (e.g. Technology, Finance, and People)
- Risk Analysis: What is the impacts and probability of the events.
- Risk Reduction: Risk Reduction Strategies and Plans

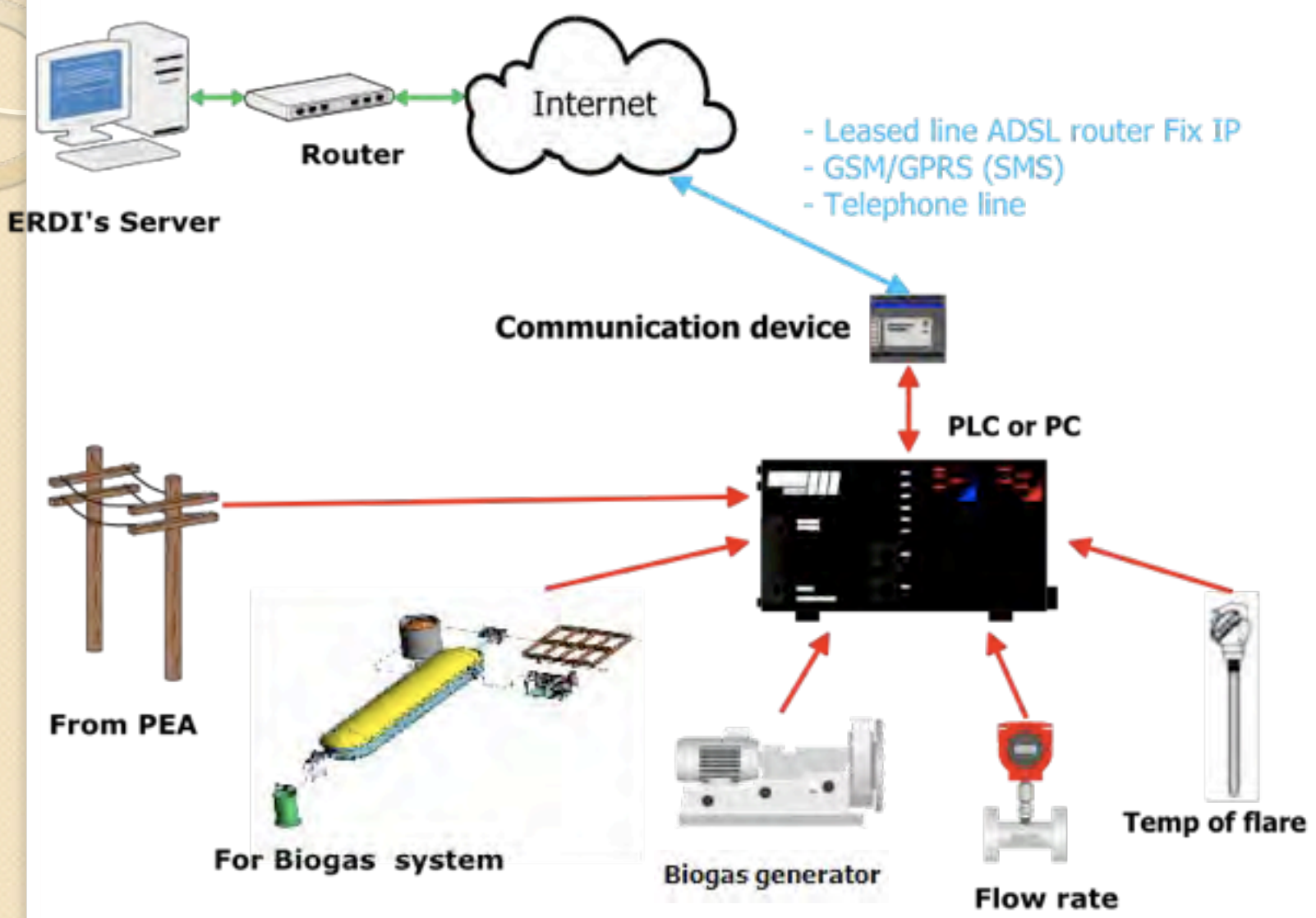
Risk Reduction Strategies

- Standardization
- Enhancing Selecting Process (Categorizing Users)
- 3rd Party Verification and Validation
- Enhance Organization Communication and Problem Solving System
- Retention Fund
- Transparent
- Share Risks among Participants

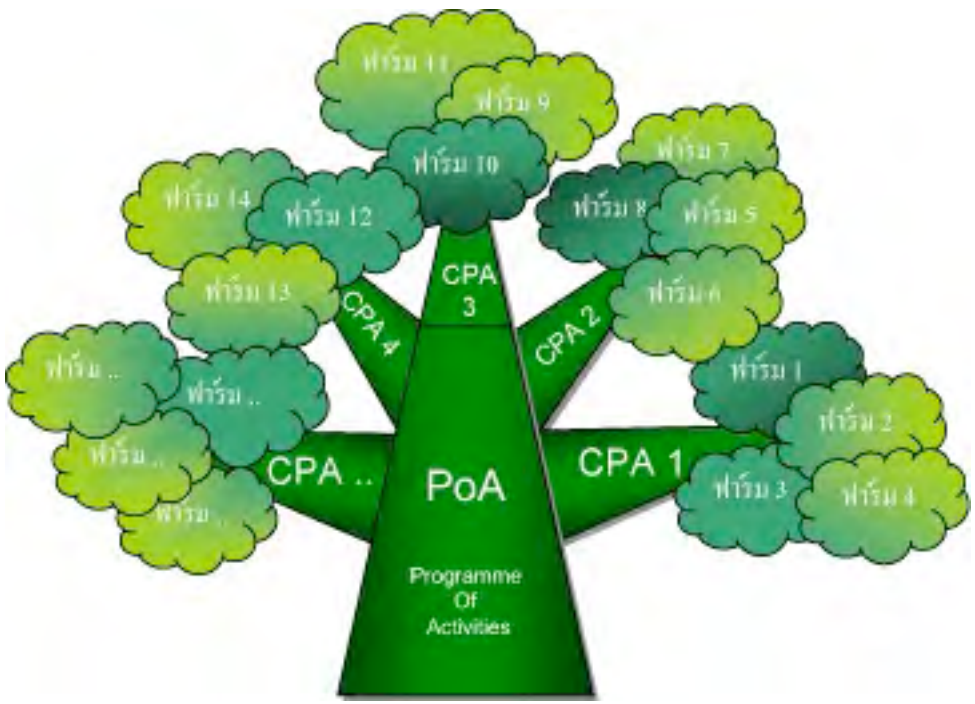
Risk Reduction Strategies

- Standardization
- Enhancing Selecting Process (Categorizing Users)
- 3rd Party Verification and Validation
- Enhance Organization Communication and Problem Solving System
- Retention Fund
- Transparent
- Share Risks among Participants

Online Monitoring Diagram



Programmatic CDM



Mayor Ariel T. Magcalas

Santa Cruz, Laguna

CONFERENCE ON MITIGATING GREENHOUSE GAS EMISSIONS FROM LIVESTOCK ANDAGRO-INDUSTRIAL WASTE

OCTOBER 15-16, 2009

MANILA PENINSULA,MAKATI CITY

DECENTRALIZED WASTEWATER TREATMENT SYSTEM

SANTA CRUZ MUNICIPAL SLAUGHTERHOUSE

BRGY. PALASAN, SANTA CRUZ LAGUNA

Mayor ARIEL T. MAGCALAS

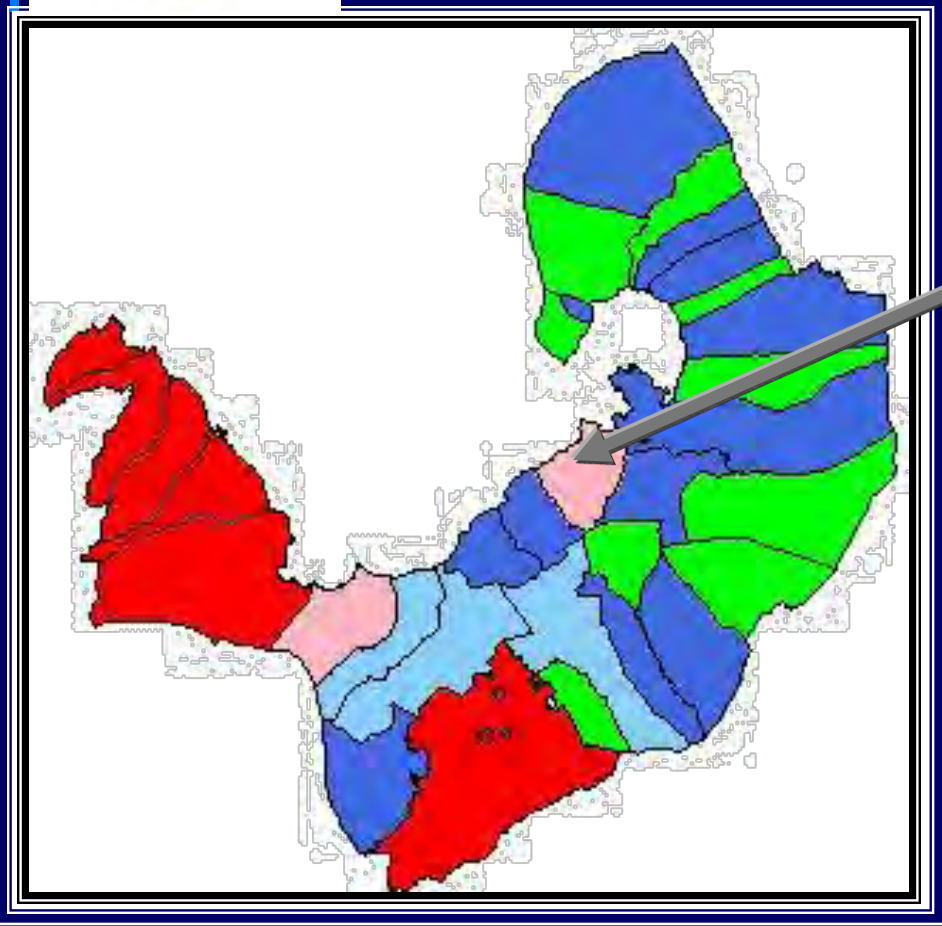
Engr. Ma. Lourdes P. San Miguel

MGSO/MENRO Designate

Engr. Rosaly M. Gutierrez

MPDC

LOCATION MAP



Municipality of
Sta. Cruz

WASTEWATER TREATMENT FACILITY

Objectives:

- **Lessen the pollutant loading of wastewaters that enter the Laguna de Bay**
- **Ensure that the wastewater that is discharged to the environment, using combined aerobic and anaerobic processes, is compliant with national standards**
- **Reduce the user fee payment to LLDA**
- **Limit the organic and solid wastes that enter the wastewater stream through improvements in process handling and innovations in the handling of solid and liquid waste matrices.**
- **Contain waste gases produced and use as fuel**
- **Limit the production of waste sludge**

WASTEWATER TREATMENT FACILITY

The Slaughterhouse can handle:

120 heads of hog/day

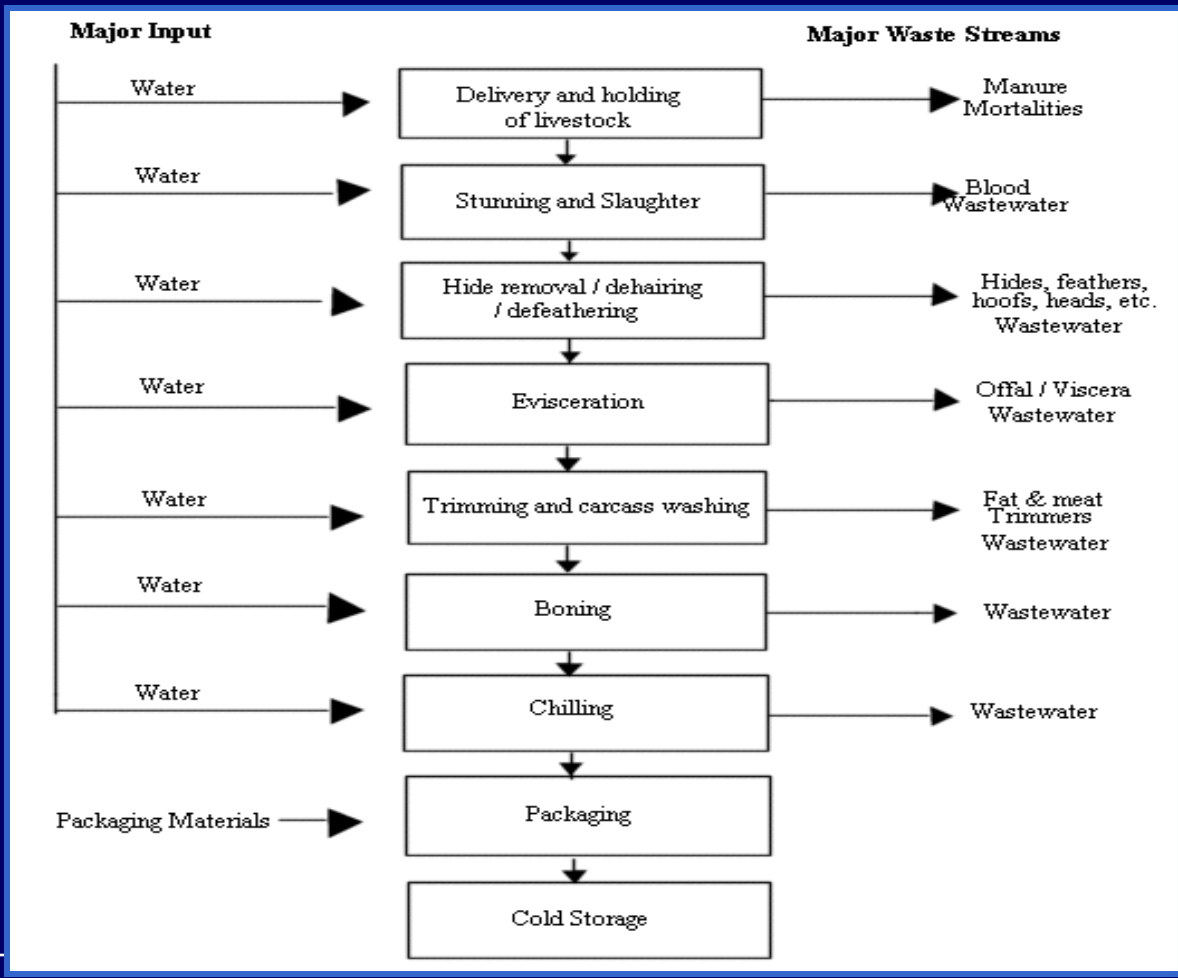
10 heads of cattle/day

Estimated water to be used in the slaughtering process:

264 L of H2O / head (hogs)

132 L of H2O / head (cattle)

Flowchart of major liquid input and output streams



New Municipal Class "AA" Abattoir

Main Slaughterhouse Building

New Municipal Class "AA" Abattoir

- *Lairage or Holding Pen for Hog/Swine and Large Animals*

New Municipal Class "AA" Abattoir

- *Lairage or Holding Pen for Hog/Swine and Large Animals*

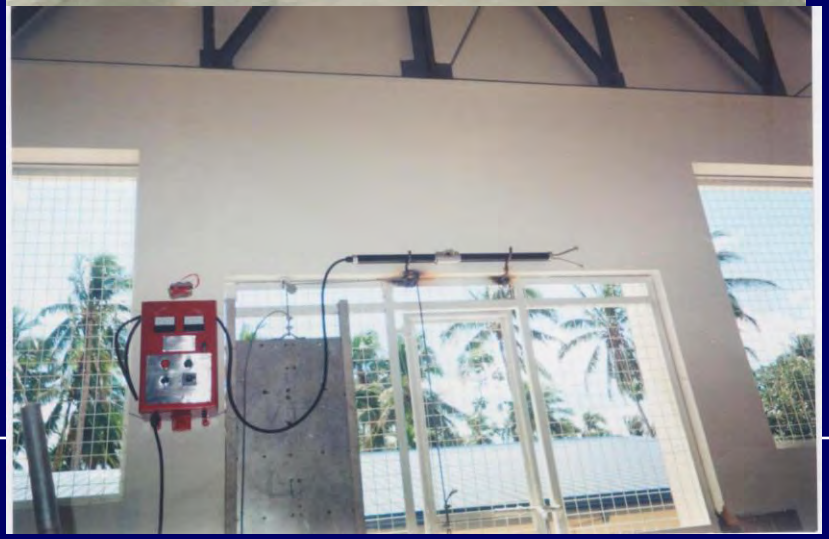
New Municipal Class "AA" Abattoir

- *Butchers' Quarter*

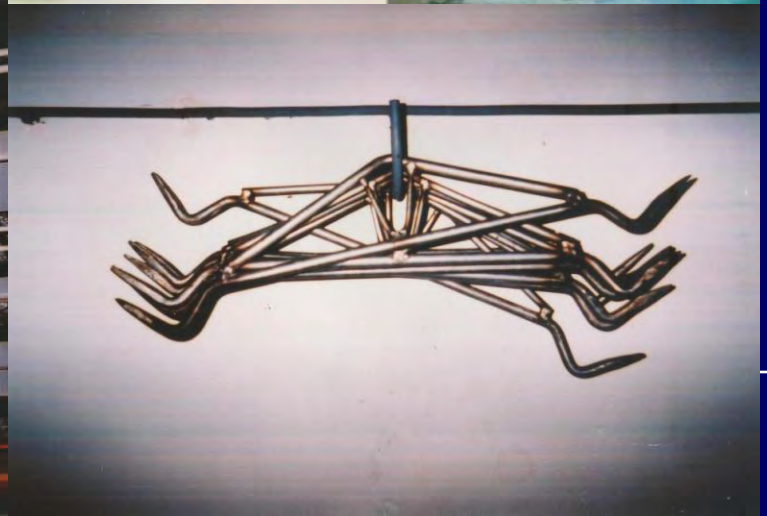
New Municipal Class “AA” Abattoir

- *Butchers’ Quarter*

New Municipal Class "AA" Abattoir



New Municipal Class “AA” Abattoir



New Municipal Class "AA" Abattoir

New Municipal Class "AA" Abattoir

- *Guard House*

New Municipal Class "AA" Abattoir

- *Others Facilities and Equipment*
  - > **Condemnation Pit**
  - > **Two(2) Units Delivery Vans**
  - > **Concrete Fence within the Perimeter Site**

New Municipal Class “AA” Abattoir

- *Wastewater Treatment Facility*

- **Wastewater Treatment** – is a facility that will treat the wastes of the wastewater that will come from the operation of slaughterhouse. A waste management plan is envisioned to take care of all the pertinent waste streams to comply with effluent standards being enforced by LLDA.

WASTEWATER TREATMENT FACILITY

- **Expected Results:**
  - Reduction on water usage and wastewater production by **25% - 41%.**
  - SS, Phosphorus and Sulfur reduction
  - BOD /COD reduction up to 80-90%.

WASTEWATER TREATMENT FACILITY

- DEWATS (Decentralized Wastewater Treatment Systems) – technology that uses a combination of Anaerobic and Aerobic wastewater treatment processes. It uses:

  Four **anaerobic process** modules:

  (1) Biogas Digester

  (2) Settling Tank

  (3) Baffled Reactor

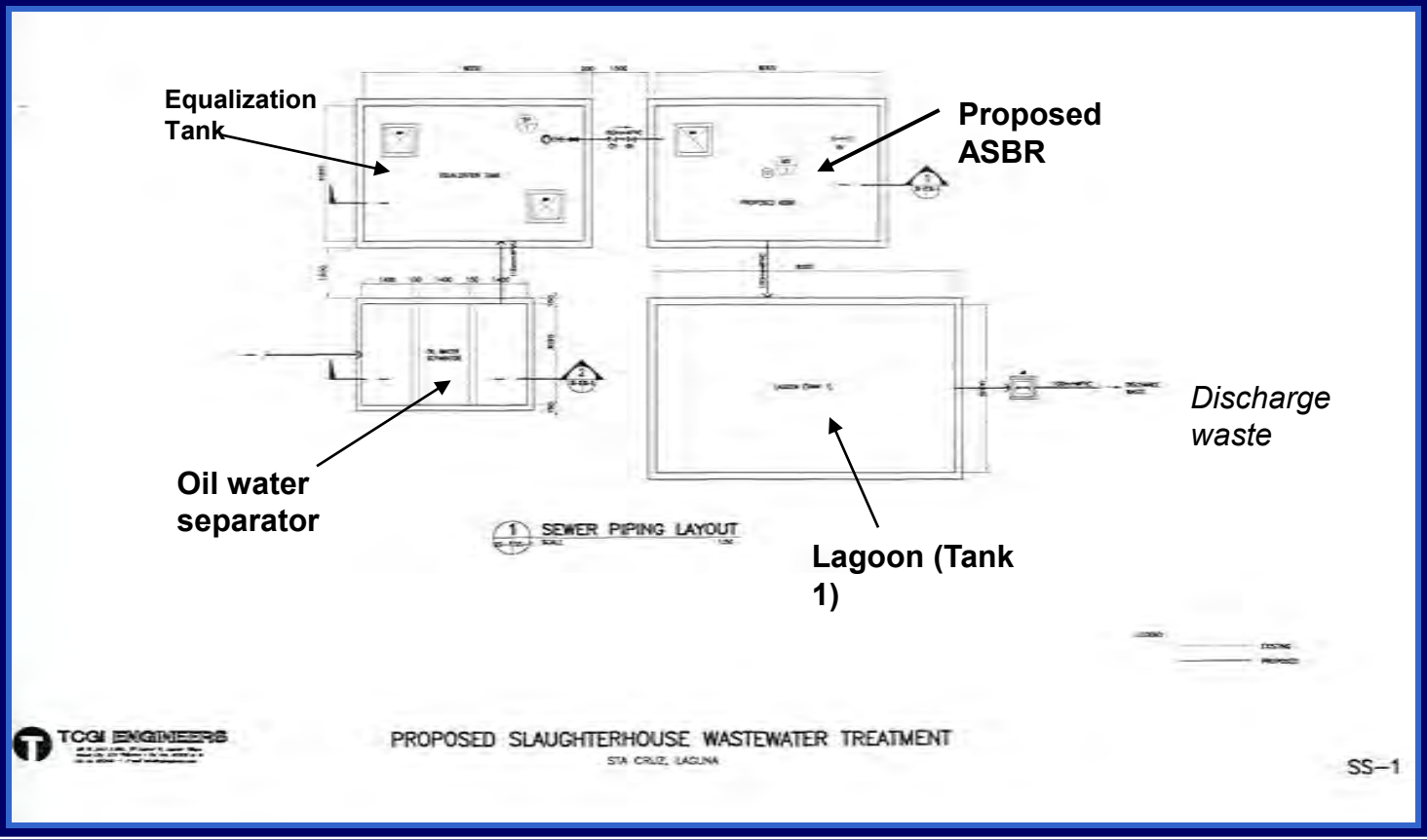
  (4) Anaerobic Filter ; and

  Two **aerobic process**:

  (1) Planted Gravel Filter

  (2) Polishing/Indicator Pond

WASTEWATER TREATMENT FACILITY



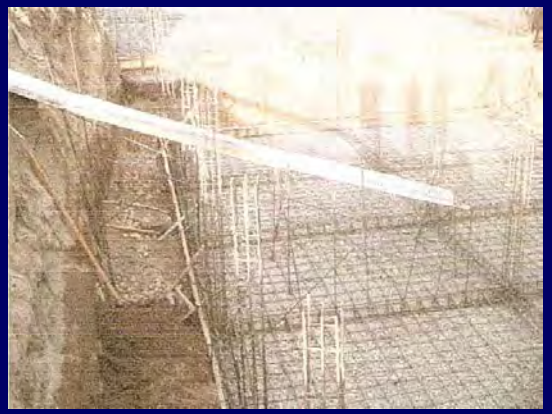
PICTURES TAKEN DURING CONSTRUCTION OF SANTA CRUZ WASTE WATER TREATMENT

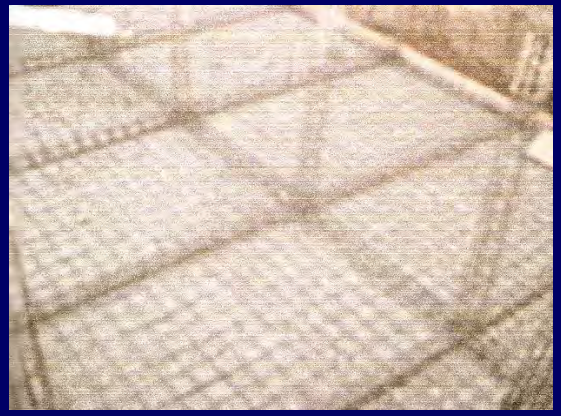
EXCAVATION

SITE PREPARATION AND LAY - OUT

GRAVEL BEDDING

**Date Covered (April 9 - 15, 2008)



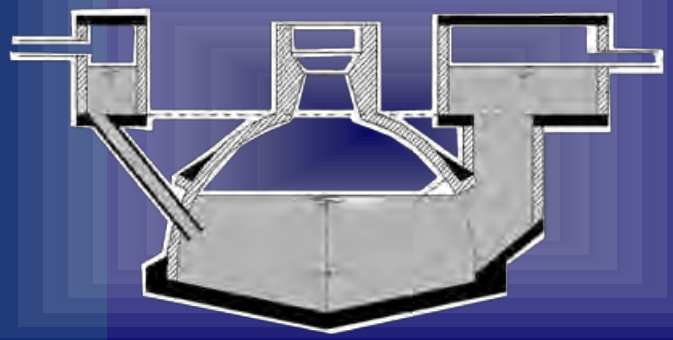


FORMS AND REHABS INSTALLATION

**Date April 16 – 27, 2008

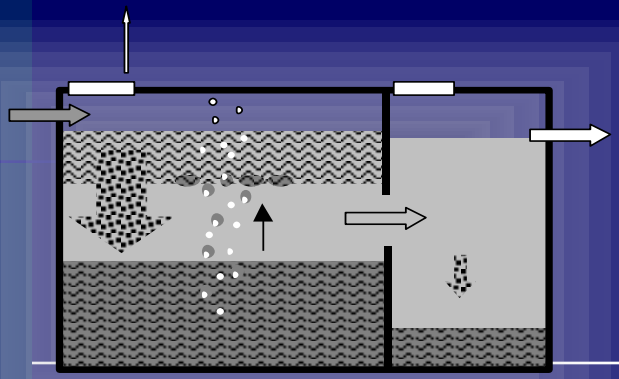
WASTEWATER TREATMENT FACILITY

DEWATS Technology cont...



Biogas Digester

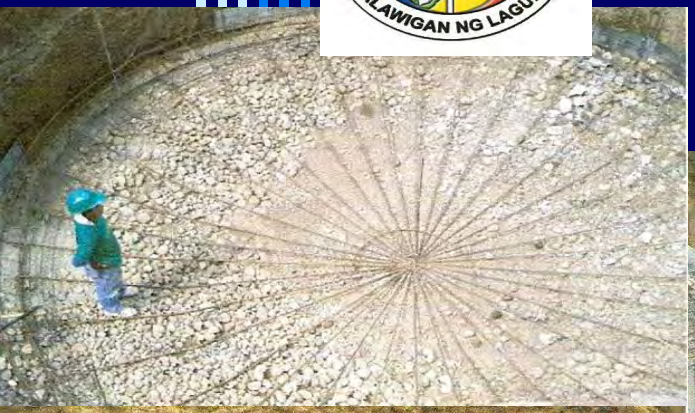
- Air-tight plastered fixed dome plant
- Used as separate settling/ digestion unit for wastewater with high organic load
- Source for renewable energy through biogas generation



Septic Tank

- Simple two chamber system
- Used as settling unit and for sludge stabilization

Biogas Digester



FORMS, REHABS INSTALLATION AND CONCRETE POURING IN PGF AND ABR

**Date Covered (April 28 – 30, 2008)

REBARS INSTALLATION @ BIOGAS, CHB LAYING @ PGF & ABR

**Date Covered (April 30 – May 6, 2008)

WASTEWATER TREATMENT FACILITY

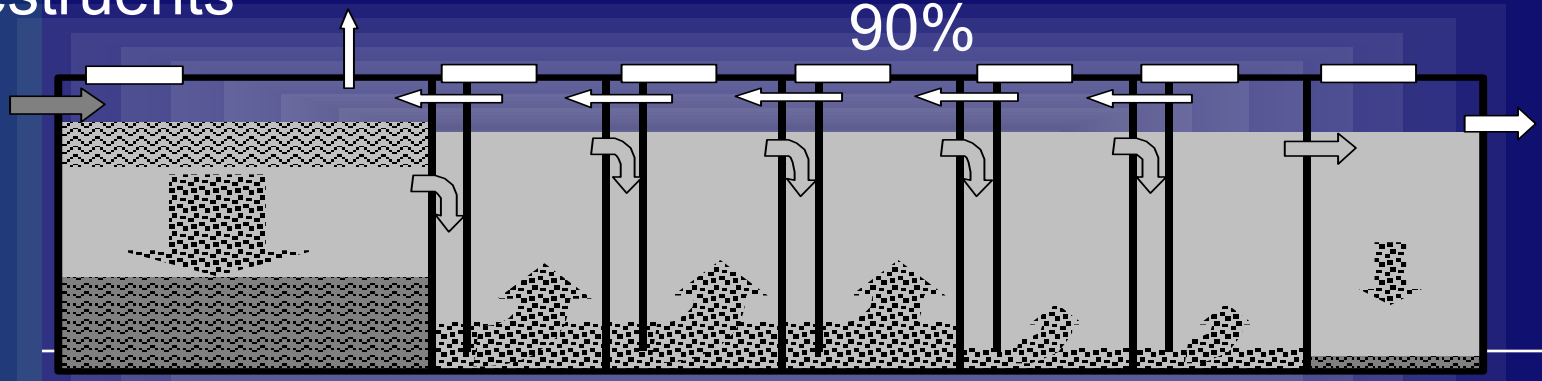
Baffled Up-flow Reactor

- Wastewater inflow directed to pass through activated sludge in each compartment - pollutants are decomposed through intensified contact with destruents

Integrated settler prevents coarse solids to enter the baffled section

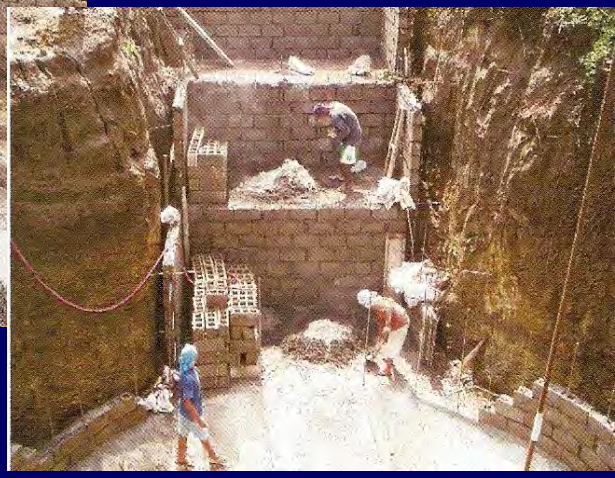
Low space requirement through underground construction

COD/ BOD reduction up to 90%



CONCRETE POURED @ BIOGAS, CHB LAYING @ ABR AND PGF

** Date Covered (May 7, 2008)



CHB LAYING PGF, ABR AND BIOGAS

** Date Covered (May 20, 2008)

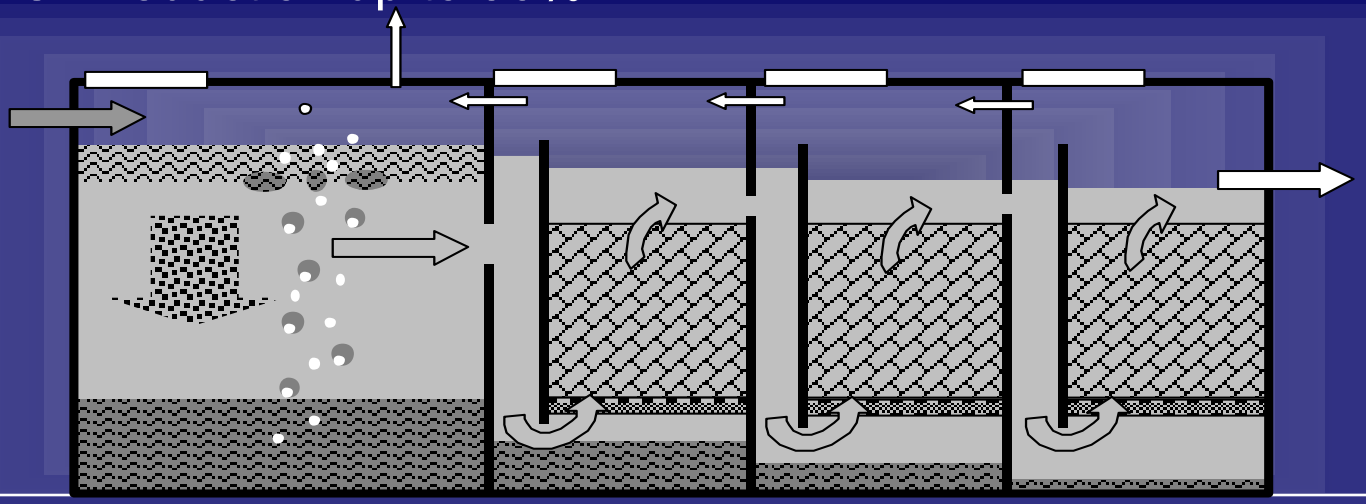
WASTEWATER TREATMENT FACILITY

Anaerobic Filter

- Wastewater flow passes through fixed bed, which is inhabited by organisms, who decompose the wastewater pollutants.
- COD/ BOD reduction up to 90%

Integrate settler prevents coarse solids to enter baffled section

Low space requirement through underground construction



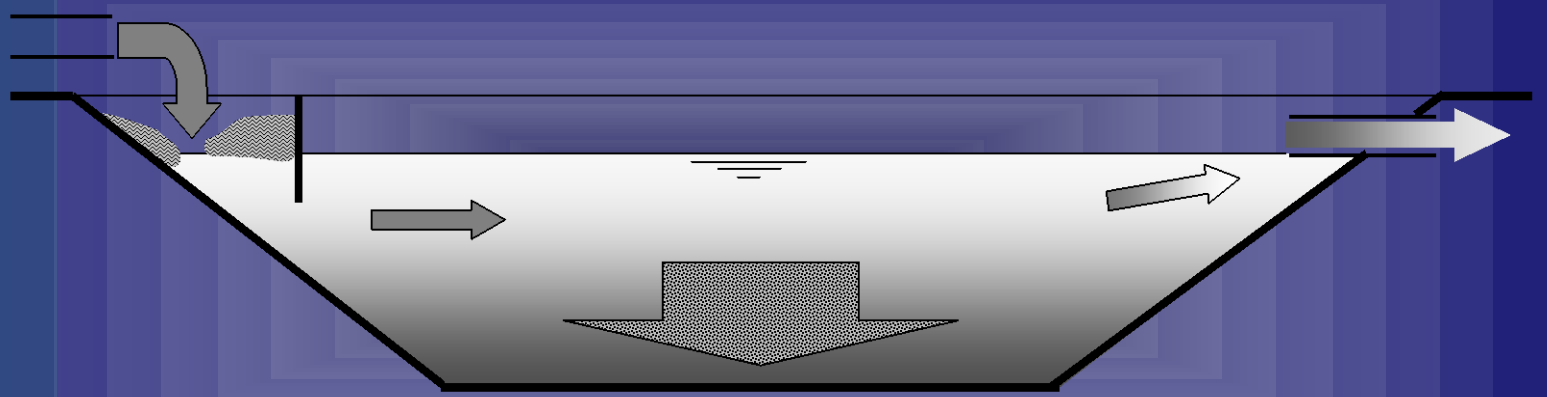
WASTEWATER TREATMENT FACILITY

Aerobic Ponds

- Advanced treatment and further reduction of organic load through increased oxygen supply
- Simple construction

High reduction of pathogenic germs through UV radiation

Spatial requirement can be compensated through pleasant landscaping

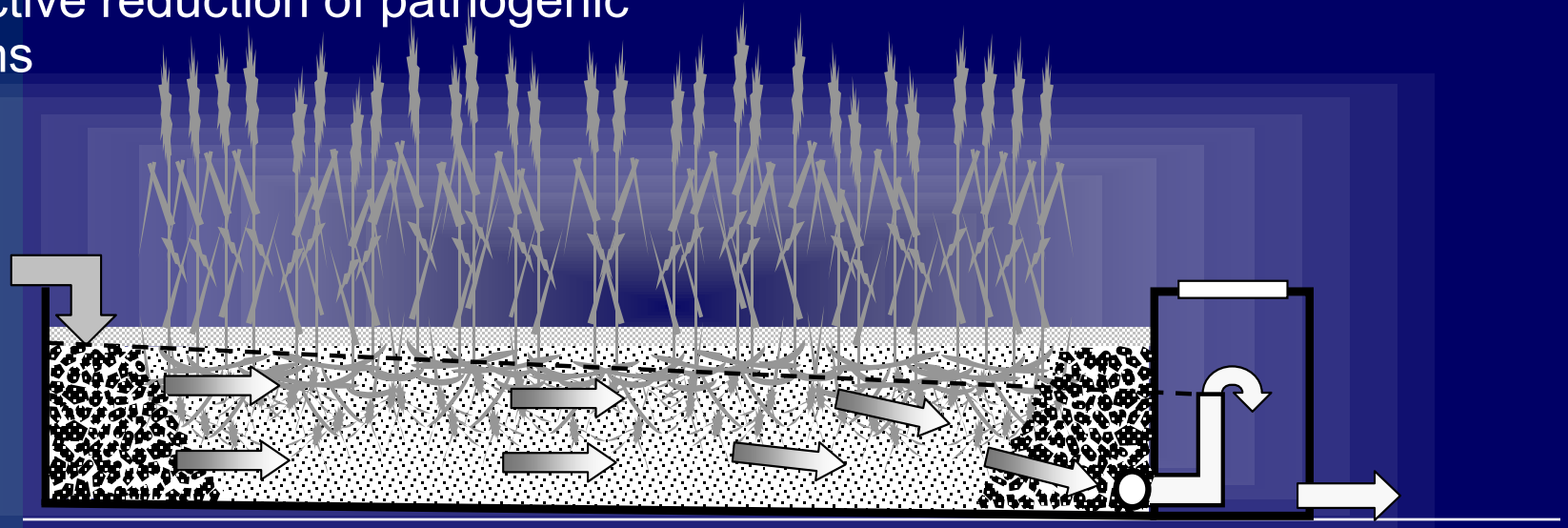


Wastewater Treatment Facility

WASTEWATER TREATMENT FACILITY

- Partly aerobic / anoxic fixed bed system for pre-treated wastewater
- Effective composition of filter bed allows reduction of phosphate up to 80%
- Effective reduction of pathogenic germs

- Advanced treatment and further reduction of organic load through increased oxygen supply
- Odour free operation through underground flow
- Spatial requirement can be compensated through pleasant landscaping



WASTEWATER TREATMENT FACILITY

- **Carbon Finance Opportunities**
  - > reduce the emissions of methane, a greenhouse gas
  - > the treating of 7.78 tons of BOD/year will be equivalent to PhP 16,122.68 a year
  - > the sub-project may be eligible for about PhP307,945.82 spread over 15 years and this may be used for the following:
    - * Payment of Operation & Maintenance Costs
    - * New Environmental Projects
    - * Repayment of Loans

MARAMING SALAMAT…..
THANK YOU VERY MUCH….

MAYOR ARIEL T. MAGCALAS
Municipality of Santa Cruz, Laguna

Paper presented by:
Engr. Ma. Lourdes P. San Miguel
Municipal General Services Officer/
Municipal Environment and Natural
Resources Officer – Designate
MGSO Escolapia Building Santa Cruz, Laguna
Tel No:0495010250

Mr. Prakash Lamichhane

Biogas Sector Partnership – Nepal
(BSP-Nepal)

Presentation on Biogas Technology & Biogas Support Programme (BSP)

"Sanitation for Dignity and Health"

Conference on Mitigating Greenhouse Gas Emissions from Livestock and Agro-Industrial Waste

Biogas from animal and human excreta Sanitation beyond Toilets

BSP is Funded/Assisted Mainly by:

AEPC/GoN SNV/DGIS KfW

Implemented by:
Biogas Sector Partnership – Nepal
(BSP-Nepal)

Presentation by
Prakash Lamichhane
Manager

BSP-Nepal

Oct 16, 2009

Nepal full of wonders!!!!!

Biogas for Better Life and Better Sanitation!

Benefits of Biogas & Bio-Slurry (1)

- Clean energy for cooking and lighting
- Clean indoor environment, clean utensils, reduce open defecation etc.
- Reduced drudgery - time and energy saving.
- Saving in kerosene purchase.
- Saving in firewood, agro-waste and dung.
- Improved health, improved children's education, self-esteem, etc.

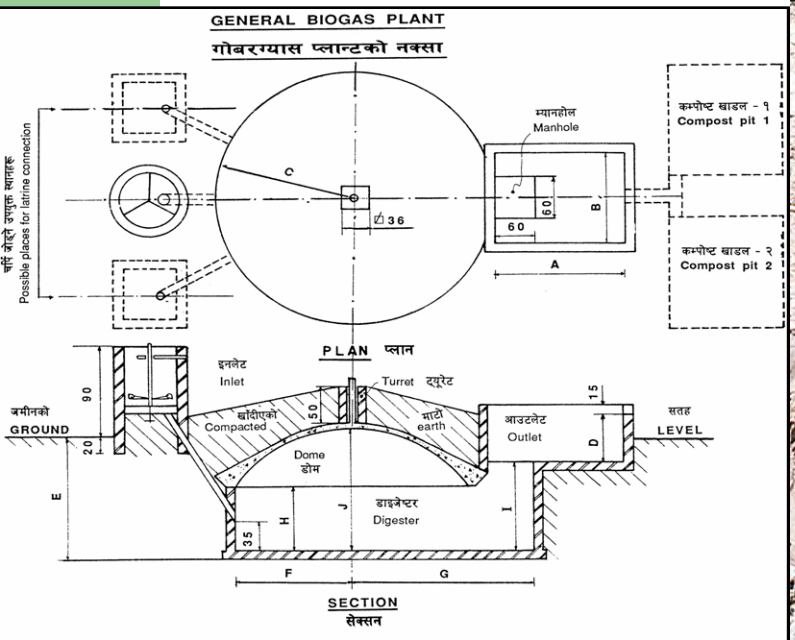
Introduction of Biogas Technology

- Any organic material when subject to anaerobic fermentation (in absence of oxygen), produces a gas called “biogas”.
  - Biogas produced from cattle dung consists of around 60-70% methane.
- Actually, biogas production takes place naturally. The technology helps improve production, collection and use of it productively.
- Biogas can be used as an energy source for any purpose from cooking to electricity generation.

Biogas Plant Design in Nepal (1)

- Biogas Plant (GGC 2047 Design)

Plant Drawing

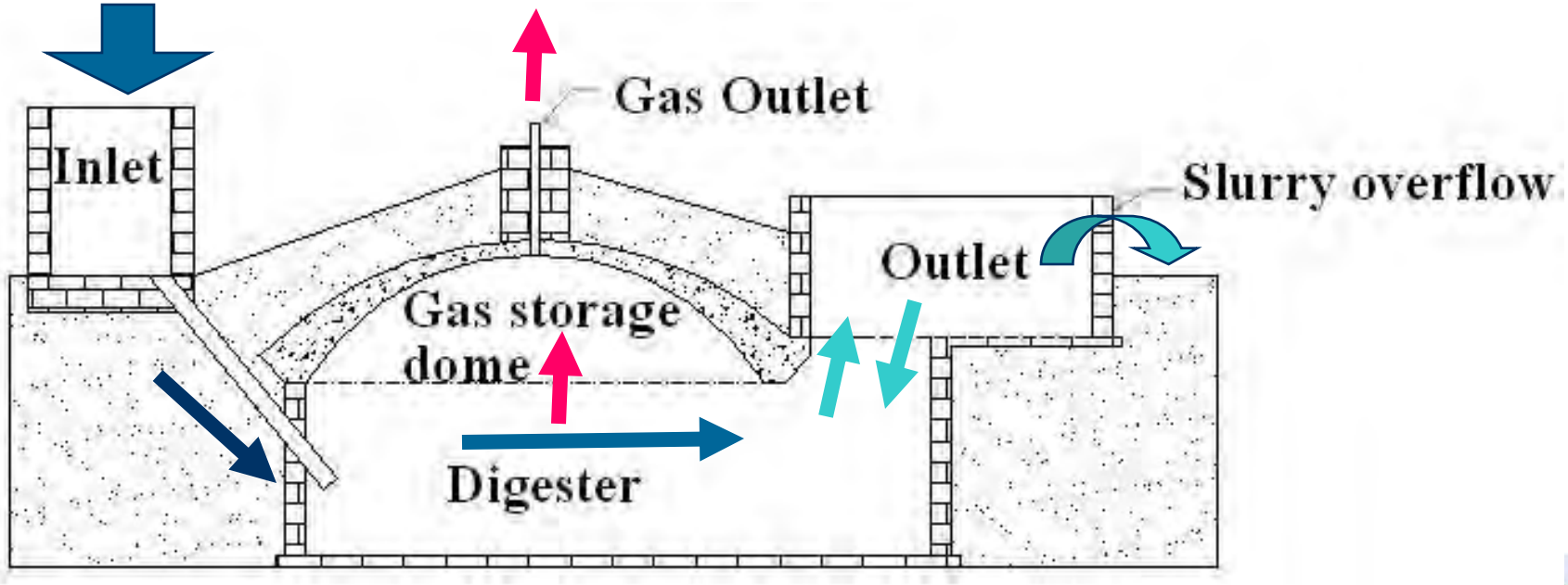


Plant construction almost final.

Plant in operation

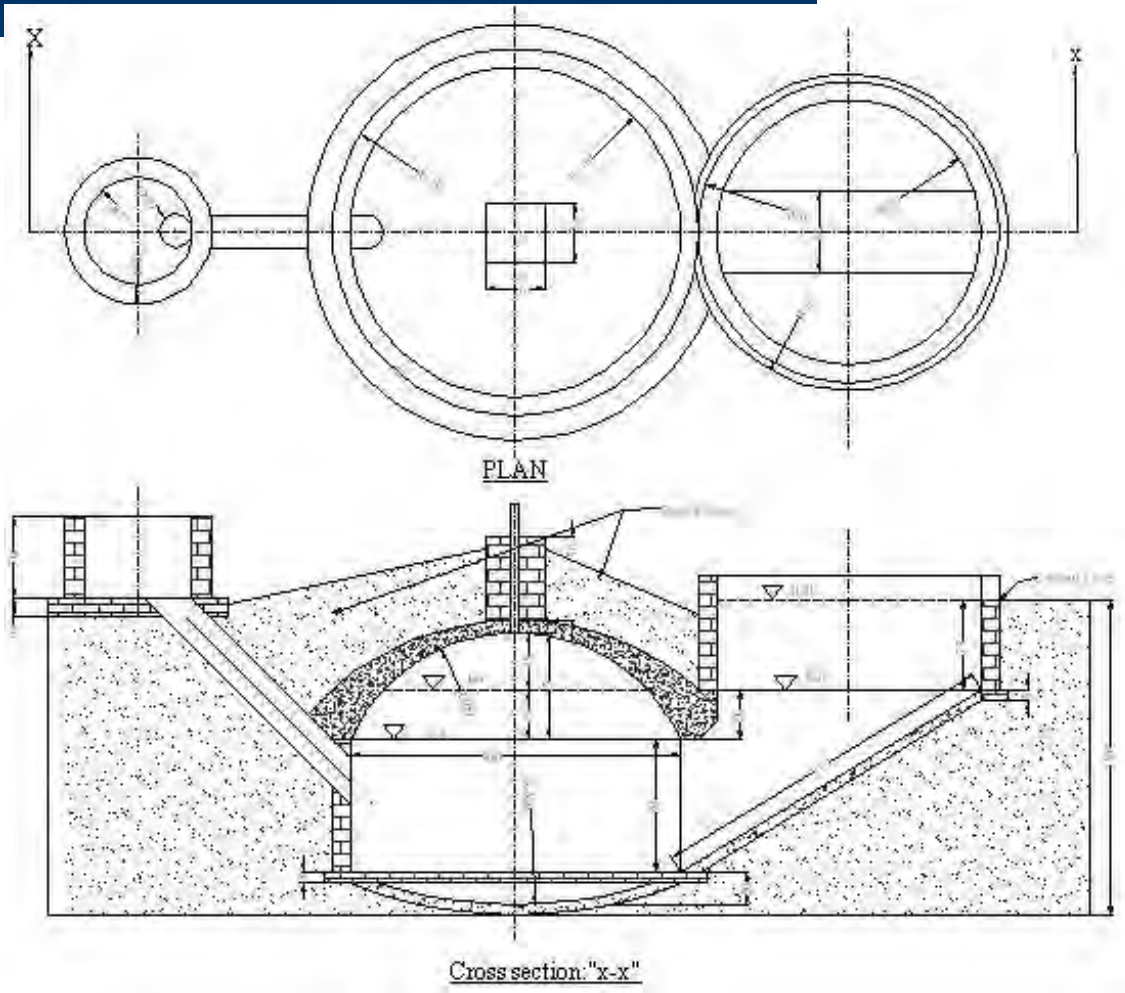
Biogas Plant Design in Nepal (2)

- A Sectional View of Biogas Digester Showing Feed Inlet, Gas Outlet and Slurry Overflow.



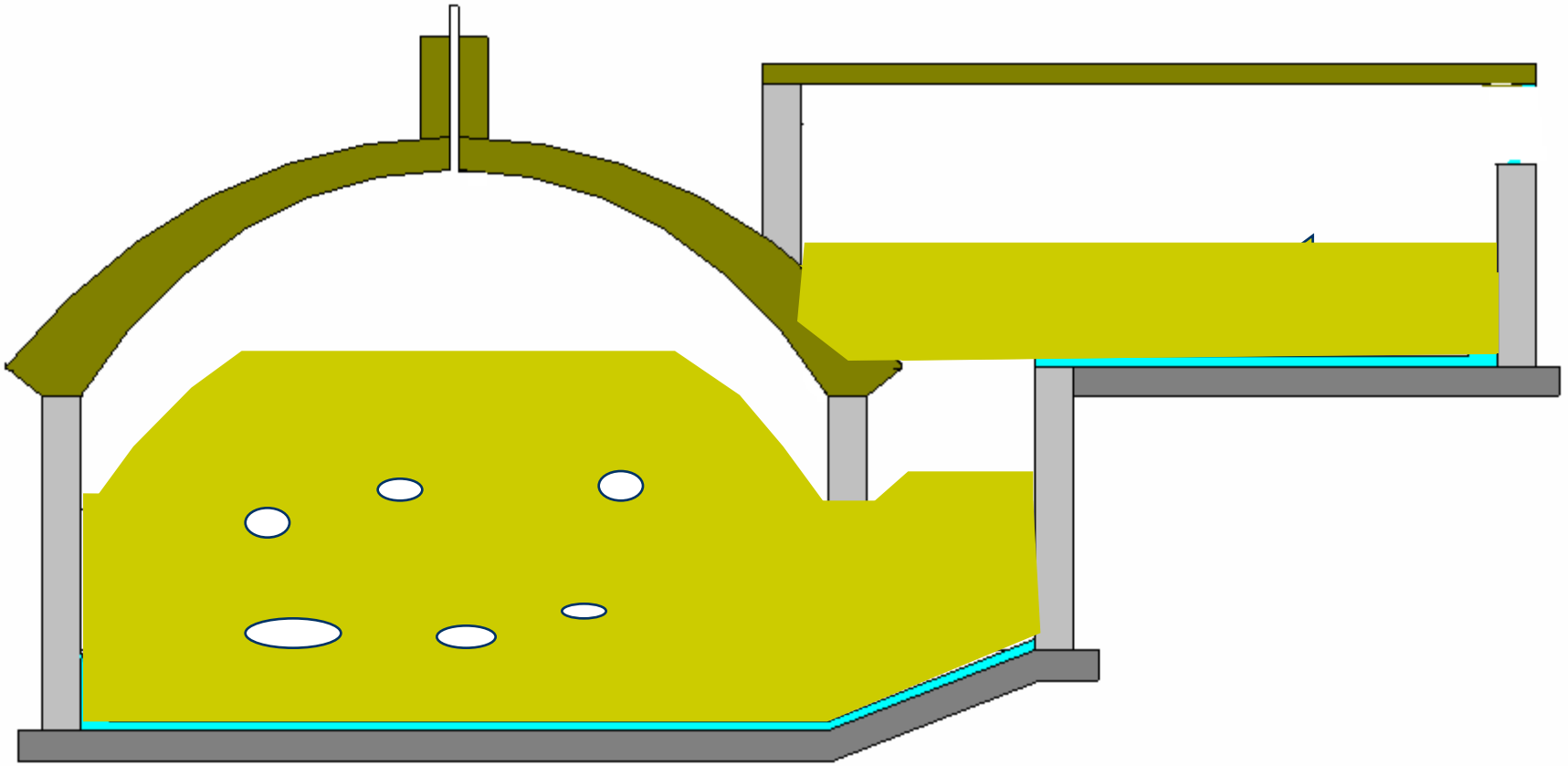
Biogas Plant Design in Nepal (3)

- Modification in GGC 2047 Design
- Currently under Piloting to Avoid Existing Problems of Sedimentation, Difficulty in Multiple Feed, etc.
- Piloting of New Designs for Pig Waste, etc. underway.

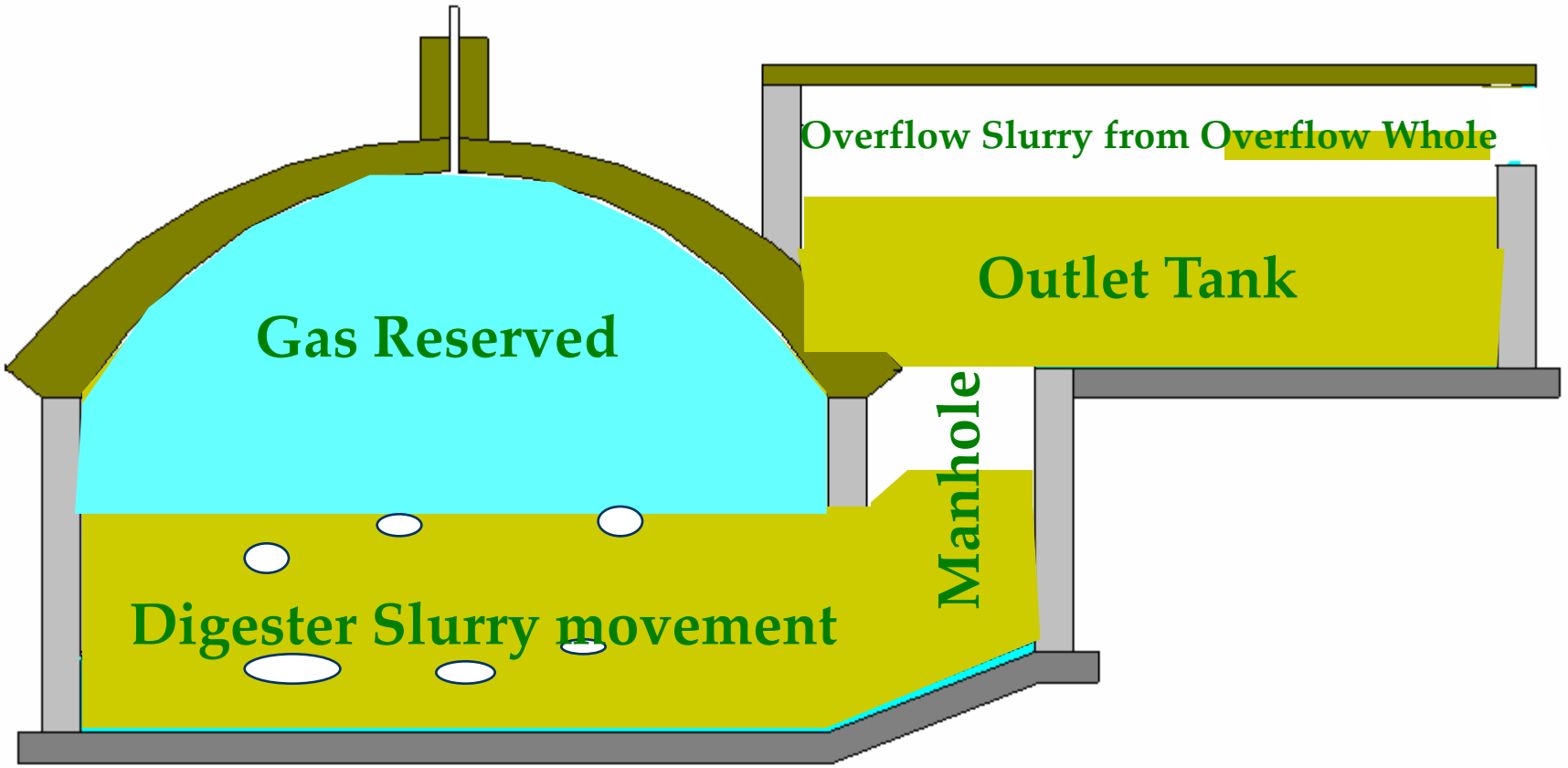


Scrapping tools

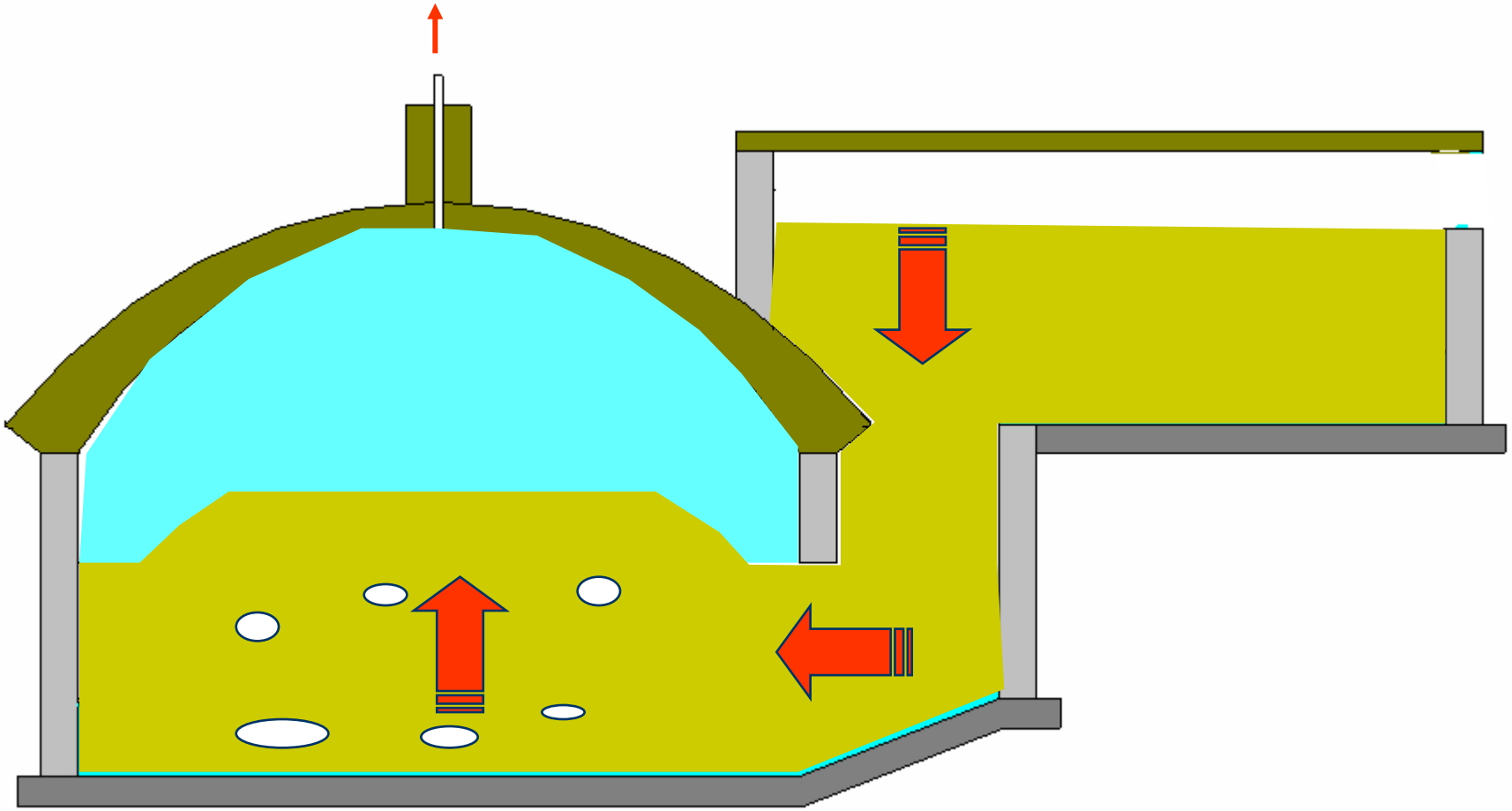
Functioning system of biogas reactor.



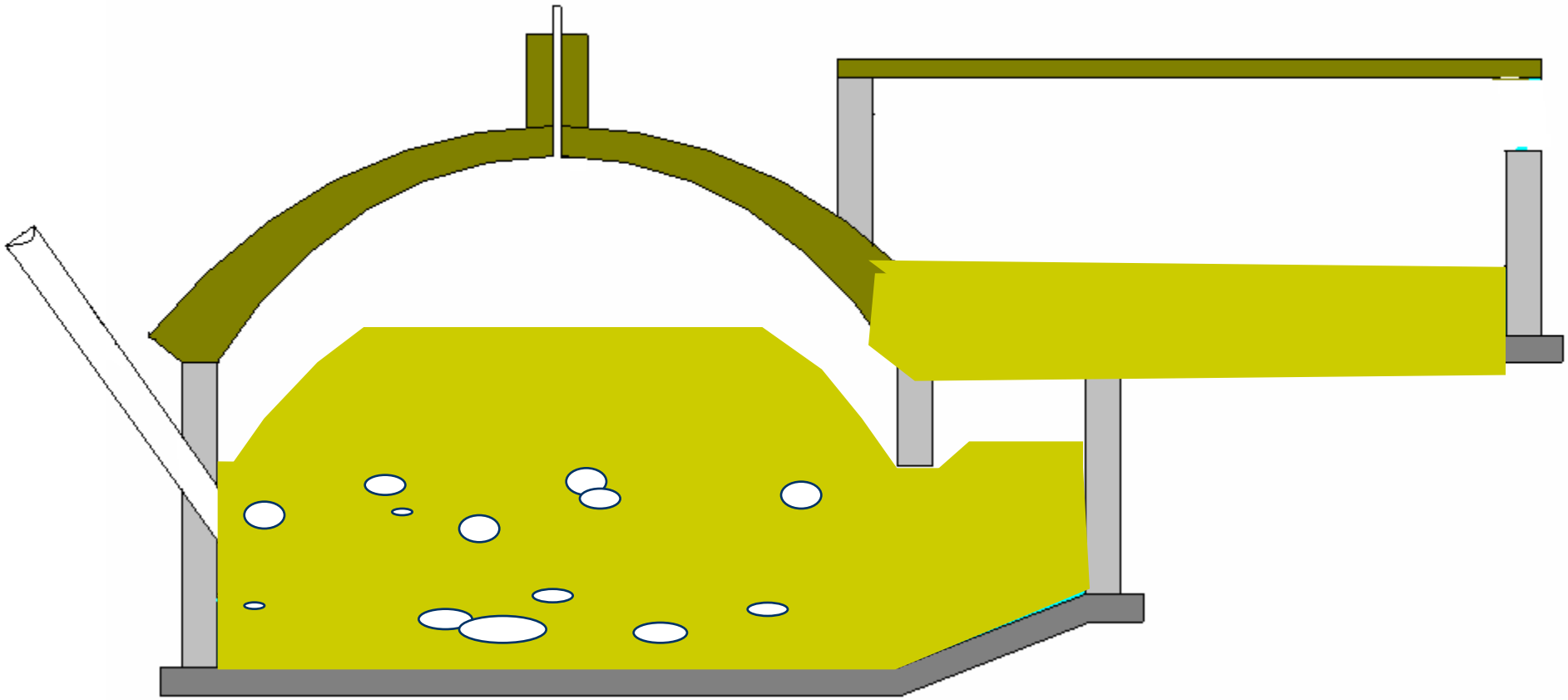
Gas Reserved mechanism on the Hydraulic Pressure

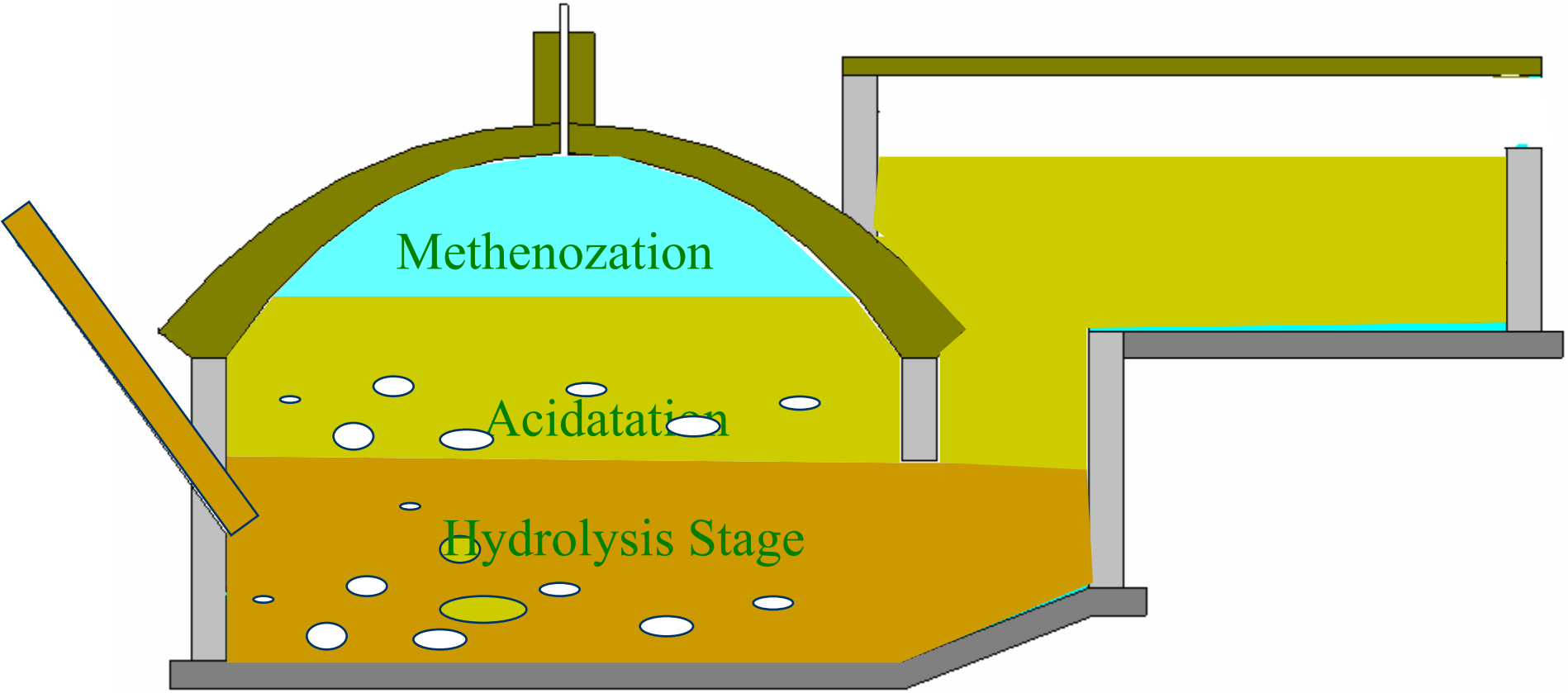


Reserved Gas will be Supply pressure Developed by Hydraulic Pressure



Gas Fermentation on Daily feeding Organic Materials





Gas Fermentation stage

Plant Size, No. of Cattle, Gas Production, etc.

Plant Size, m^3	Daily Dung Feed, kg *(@6-7.5 kg Dung/ m^3 Plant Size)**	No. of Cow Required *(@12 kg Dung/Cow)*	Daily Water Feed, (litres)	Daily Gas Produced, Litres *(@40 litres /kg Dung)*	Daily Stove Burning Hours *(@400 Lit/Hr)*	*No. of Family*	*Initial dung feeding kg*
4	24~30	2~3	24~30	960	2:24	4-6	2,025
6	36~45	3~4	36~45	1,440	3:36	6-8	2,900
8	48~60	4~5	48~60	1,920	4:48	8-10	3,930
10	60~75	5~6	60~75	2,400	6:00	10-15	4,490

Daily 10 Kg Dung Feeding = 1 Hour of Stove Burning.

Case study 1:Biogas Plant in Cold climate

- Construction work at an altitude 2700 M.
- We successfully installed at an altitude of 3850 meter

Case study 1:Biogas Plant in Cold climate (Contd….)

- Dome Concreting

Case study 1:Biogas Plant in Cold climate (Contd….)

- Heap Composting

- Does this Plant work??

Case study 1:Biogas Plant in Cold climate (Contd….)

- Highest snow fall record in last 25 years

Case study 1:Biogas Plant in Cold climate (Contd….)

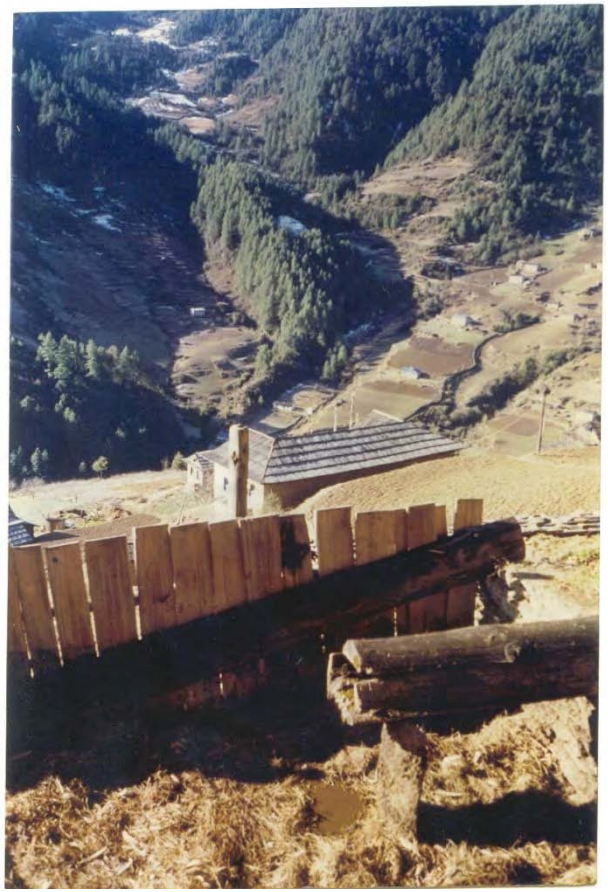
- Temperature recording
- (-3 to -4)degree

Case study 1:Biogas Plant in Cold climate (Contd….)

- Cooking in biogas stove
- For Lighting

Case study 1:Biogas Plant in Cold climate (Contd….)

- Slurry overflow
- Indication of smooth operation of biogas plant



Case study 1:Biogas Plant in Cold climate (Contd….)

- Well managed compost pits

Case study 1:Biogas Plant in Cold climate (Contd….)

- Only Technology is not sufficient proper care should be taken

Case study 1: Changing Scenario!!!!!

Nutrient recovery from urine

Case Study 2: Community Biogas Plant

- For the first time in the history of BSP, community biogas plants are being piloted.
- 40 M^3 in Hatilet, Mahottari
- Initiation and inspiration to build toilet.

Case Study 3: Biogas Plants in school Vajra Academy

Case Study 4: Biogas Plants in Jail (Prison)

Case Study 5: Biogas Plants in Army Barrack

Improved Sanitation

Case Study 6: Biogas Plants in Maoists Cantonment

Case Study 6: Biogas Plants in Maoists Cantonment Contd…..

Case Study 7: Sunga Wastewater Treatment Plant, Thimi

Case Study 8: Dhulikhel Municipality

Case Study 9:Pig Manure Feeding Biogas Plant

Reality……

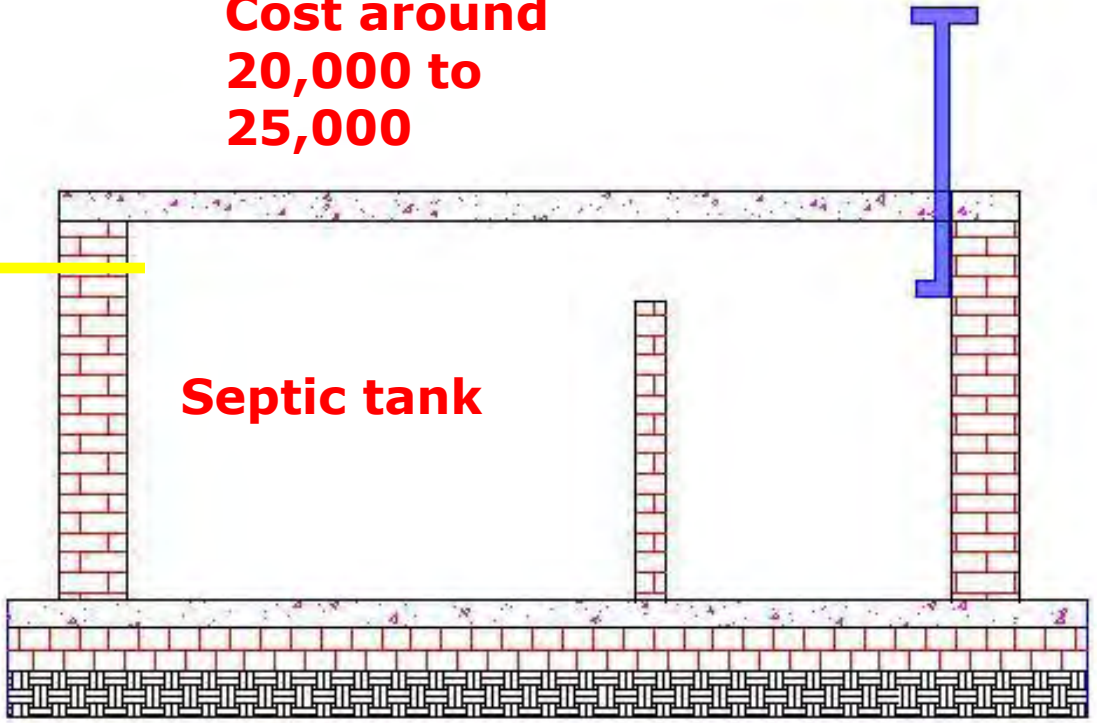

ल है, मदनबहादुर,
मैले सिधै बारीमा मल
हालिदिएँ ।
यसो गरे कसो होला ?
धत् नकच्चरो....
यहाँ मतचर्पीमा दिसा गरे त
लाज पनि बच्छे, मल पनि हुने ।
धोखा दिनेलाई के भन्नु र खै ?

Existing Practice

Greenhouse gases

Is this justice?

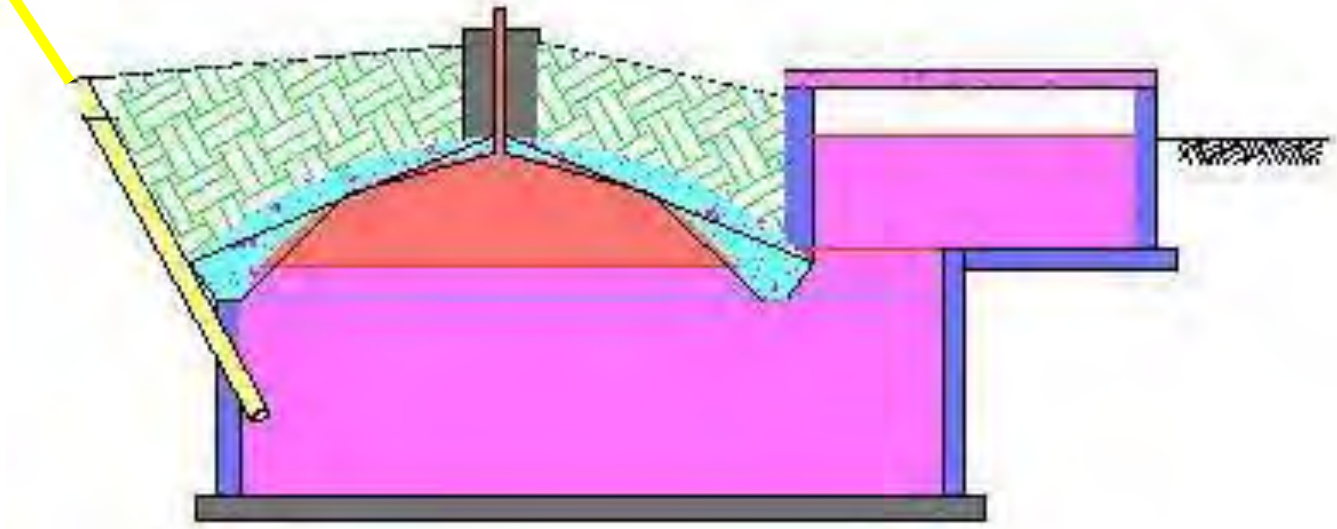
Cost around 20,000 to 25,000



Why not to adopt toilet attached biogas technology???

Appropriate changes for social and economic benefit

Cost around 24,000 to 30,000



Construction Materials Required(1)

Plant Size M^3	Cement bags(@50Kg\ Bag	Stone,M^3(or Bricks in number)	Gravel in No. of C-Bags	Sand in No. of C-Bags	Paint in liters
4	11-12	3.5(1,200)	30	60	1
6	13-14	4.5(1,400)	35	70	1
8	16-18	6.5(1,700)	40	80	1.5
10	19-21	8.0(2,000)	50	90	2

Construction Materials Required (2)

- Iron Rod(8mm) =15-16Kg
- Mixer =1 piece
- Intel Pipe =4 metres
- Half Inch GI Pipe =4 metres
- HPDE Pipe(20mm) = 12 metres
- Dome Gas Pipe = 1 piece
- Main Gas Valve = 1 piece
- Water drain = 1 piece
- Gas Tap = 1 piece
- Rubber Hose Pipe = 1 metre
- Gas Stove = 1-2 pieces
- Lamps as necessary
- Nipple(1/2”X6”) = 1 piece
- Socket(1/2”) = 2 pieces
- Elbow(1/2”) = 2 pieces
- Tee (1/2”) = 1 piece
- Brass Union = 3 pieces
- Teflon Tape(10mm) =2 pieces

Total Plant Cost, Subsidy & User's Contribution

Plant Size, Cubic Metre	District Category	Total Price (Rs.), as per FY 08/09 Quotation	Subsidy (Rs.)	Percentage of Subsidy	Users' Contribution (Rs.)	Remarks
4	Terai	32,825	9,700	29.55%	23,125	The additional subsidy for LPD in Non-Remote Districts and for the poor, dalit, etc. not included.
	Hill	36,519	12,700	34.78%	23,819	
	Remote Hill	40,223	19,400	48.23%	20,823	
6	Terai	38,432	9,700	25.24%	28,732	
	Hill	42,673	12,700	29.76%	29,973	
	Remote Hill	46,894	19,400	41.37%	27,494	
8	Terai	44,765	9,000	20.10%	35,765	
	Hill	50,205	12,000	23.90%	38,205	
	Remote Hill	55,194	18,700	33.88%	36,494	

User's Contribution in Kinds & Cash

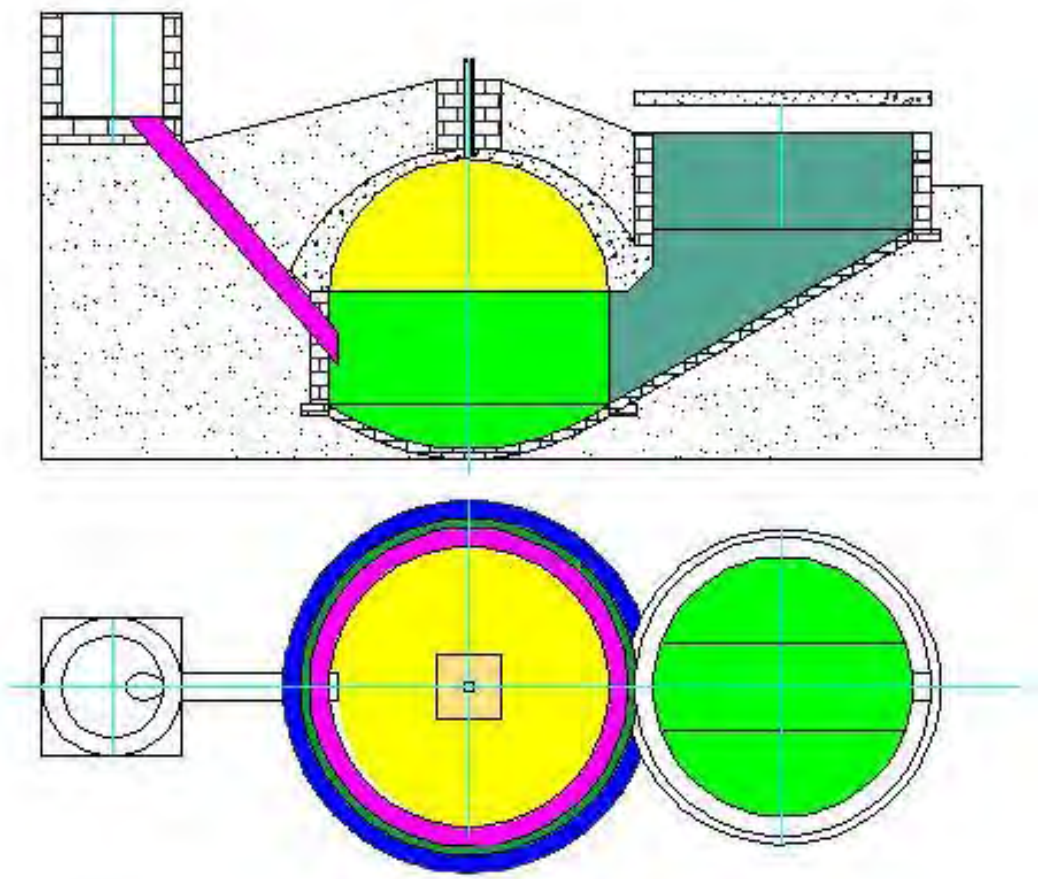
Plant Size, Cubic Metre	District Category	Total Price (Rs.), as per FY 08/09 Quotation	User's Total Contribution (Rs.) A	Cosf of Cement & Rod (Rs.)	Cost of Gravel & Sand (Rs.) B	Cost of Unskilled Labour (Rs.) C	User's Kind Contribution (Rs.) B + C	User's Cash Contribution (Rs.) A - B - C
4	Terai	32,825	23,125	7,394	3,435	2,678	6,113	17,012
	Hill	36,519	23,819	8,976	4,425	2,678	7,103	16,716
	Remote Hill	40,223	20,823	10,356	4,185	2,678	6,863	13,960
6	Terai	38,432	28,732	8,587	4,008	3,570	7,578	21,154
	Hill	42,673	29,973	10,167	5,163	3,570	8,733	21,240
	Remote Hill	46,894	27,494	11,757	6,248	3,570	9,818	17,676
8	Terai	44,765	35,765	10,288	4,580	4,106	8,686	27,079
	Hill	50,205	38,205	12,671	5,900	4,106	10,006	28,199
	Remote Hill	55,194	36,494	14,689	7,140	4,106	11,246	25,248

- It is assumed that, local materials i.e. gravel and sand are collected by the user and counted as kind contribution.

Biogas is not Expensive!

Plant Size, Cubic Metre	Total Cost (Rs.)	Susbidy	User's Kind Contribution (Rs.)	User's Cash Contribution (Rs.)	Estimated Loan Required (Rs.)	Payback Period (Years)	Interest Rate (%)	Equal Monthly Instalment (Rs)	Daily Litres of Milk @Rs 26/Litre	Monthly Litres of Kerosene @Rs 60/Litre
4	32,825 - 40,223	9,700 - 18,700	11,513 - 12,263	13,960 - 17,012	12,000	2	10	554	0.71	9.23
							13	571	0.73	9.51
							16	588	0.75	9.79
						5	10	255	0.33	4.25
							13	273	0.35	4.55
							16	292	0.37	4.86
6	38,423 - 46,894	6,500 - 12,500	13,878 - 16,118	17,676 - 21,240	15,000	2	10	692	0.96	11.54
							13	713	0.99	11.89
							16	734	1.02	12.24
						5	10	319	0.44	5.31
							13	341	0.47	5.69
							16	365	0.51	6.08
8	44,765 - 55,194	6,000 - 12000	16,336 - 18,896	25,248 - 28,199	22,000	2	10	1,015	1.41	16.92
							13	1,046	1.45	17.43
							16	1,077	1.50	17.95
						5	10	467	0.65	7.79
							13	501	0.70	8.34
							16	535	0.74	8.92

Latest Development



2 Cubic Meter Biogas Plants for Urban and semi urban areas

Let's work together in making our world cleaner, greener and a better place for our future generation…

Thank You!!!!!

Mr. Jo Rex Camba

Philippine Bio-Sciences Company Inc.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

PhilBIO's Experience in Clean Development Mechanism (CDM) Project Implementation

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TIFF (Uncompressed) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

OUTLINE

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

- Core Competencies
- CDM Projects
- Our Experience
- Recommendation

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TIFF (Uncompressed) decompressor
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Core Competence

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TIFF (Uncompressed) decompressor
are needed to see this picture.

- **Capacity Building and Hands-On Trainings**
  - Local trainings e.g., DNA
  - International trainings e.g., TEP and EEA FM
- **“CDM Knowledge Center” for AsiaBIOGAS**
  - Thailand, Indonesia, Vietnam and Malaysia
- **Integrated CDM Project Management**
  - Project Origination
  - Project Development
  - Project Financing
  - Project Monitoring

QuickTime™ and a
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are needed to see this picture.

CDM Engagements

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

- **PhilBIO is one of the pioneers of CDM in the Philippines**
  - Rocky Farm - PhilBIO's first biogas project developed in 1999
    - Used as one of the case studies in the CDM Capacity Building in the Philippines
- PhilBIO was instrumental in the development of at least **20 biogas projects** even before the entry of Kyoto Protocol into force**.**
- PhilBIO further developed at least **47 biogas projects.**
- PhilBIO demonstrated the feasibility of **waste-to-energy concept for landfills** particularly in **Payatas**, Quezon City and **Inayawan** in Cebu City.

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

CDM Engagements

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

- **Animal/Livestock Operations**
  - More than **50** completed and operational anaerobic digesters with over 8MW installed generator set capacity
- **Industrial Applications**
  - Distilleries
  - Ethanol Production
  - Food Processing
  - Cassava Processing
  - Palm Oil Processing
  - Food & Beverage Processing Plant
- **Municipal Waste Management**
  - Cebu City Landfill Gas and WTE Project - 6MW potential
  - Makati South Sewage Treatment Plant Upgrade with 300 kW On-Site Power

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

CDM Engagements

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- Thailand
  - Instrumental in the development of the CDM Methodology for Large-Scale Wastewater Treatment
  - PDD Development of ABC's biogas project
  - Development of new baseline methodology for cassava filter cakes
- Malaysia
  - GHG Assessment from POME
- Vietnam
  - GHG Assessment from tapioca and hog farms
- Indonesia
  - PDD development for wastewater treatment from dairy farms

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CDM Expertise

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Methane Recovery Projects
(Livestock and Industrial)

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CDM Expertise

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Grid Power Displacement

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CDM PORFOLIO

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- **43 CDM Projects** from the Philippines
  - PhilBIO's contribution: **65% or 28 projects**
  - Total tCO2e managed: **150,000** tCO2e annually

Gold Farm October 2006	Chonas December 2007	Golden Harvest Farm June 2009
Joliza Farm October 2006	Sunjin December 2007	Grace Farm June 2009
Uni Rich Farm October 2006	Makati South STP June 2008	Filbrid Farm june 2009
Gaya Farm October 2006	ACME Farm April 2009	SIDC Farm June 2009
Paramount Farm January 2007	Lanatan Farm April 2009	Bonview Farm June 2009
D&C Farm August 2007	Rocky Farm April 2009	Cathay Farm 1 June 2009
Bondoc Farm September 2007	Coral Farm June 2009	Cathay Farm 2 June 2009
Superior Farm September 2007	Sta. Luisita Farm June 2009	Asian Livestock June 2009
Goldi Lim Farm December 2007	Liberty Agro Farm June 2009	Enviroprime Farm June 2009
		Unifive Farm September 2009

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LEARNINGS

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- **CDM Project Origination**
  - **CDM is made a core ingredient in PhilBIO's integrated project development**
    - Engineering (Design and Construction)
    - Technology (CIGAR, ABR)
    - Finance (BOT, BOO, JV)
    - CDM (CDM Project Cycle)
    - Operation & Maintenance
  - **CDM Team capitalizes on the strong network of Hog Farmers across the country**
    - 500 sow level and above
  - CDM Team now caters other CDM eligible activities such as biomass projects, energy efficiency projects, fuel switch projects, etc.
  - **New challenge in Project Financing**
    - CERs numbers and CER buyers

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LEARNINGS

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- **Letters of Approval from the Philippine DNA**
  - **Completeness of DNA Application Package**
    - Thoroughness of the PDD
    - Up to date supporting documents e.g., ECC, Permits
    - Respond TEC Review issues
  - **Sustainable Development Benefits**
    - Quantified
    - Sustainable
    - Over and above the usual CSR

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LEARNINGS

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- **Validation**
  - **Choice of the DOE**
    - How much
    - How fast
  - **Technical Review of the Project**
    - Completeness check e.g., PDD, spreadsheets, supporting documents
    - Validation Protocol e.g., CDM Modalities and Procedures, Approved CDM Methodology versus PDD
  - **Our experience:**
    - Validation Process took > 6 months

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LEARNINGS

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- **Executive Board Review**
  - **Reasons for the Request for Review**
    - Minor Correction
    - Clarification
  - **Major Issue**
    - None related to “additionality”
    - Grid CEF
      - Operational Margin Calculation
        - » Why Coal is not considered “must-run” in the Philippines?
      - Build Margin Calculation
        - » Why fuel consumption was not used in the calculation?
      - In the absence of the country CEF, we generate our own CEF values based on available public data
  - **Recommendation:**
    - Official grid CEF for the Philippines

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LEARNINGS

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- **CDM Registration**
  - 5,500+ projects in the CDM pipeline
  - 1,800+ registered projects
  - EB getting stricter
  - Suspension of DOEs
  - Very low approval rate

  - **Our experience:**
    - On the average, it took us over a year to get the projects registered

LEARNINGS

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- **Monitoring and Verification**
  - Implement the Monitoring Plan properly based on the approved MP and CDM Monitoring and Verification Manual
  - Research and Development is crucial
  - Collecting the right data
    - Monitoring Equipment - Calibration
    - Reliability of the data
    - Transfer of data
    - Data Protection

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LEARNINGS

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- **Verification**
  - **Choice of DOE**
    - How much
    - How fast
  - **When to conduct verification**
    - How many CERs will be validated?
    - Bottomline: Cost effectiveness
  - **Our experience:**
    - By end of 2010
    - By end of 2012

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LOOKING FORWARD

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- **How we view Post 2012 regime**
  - Copenhagen Meeting
    - Deal or No Deal versus Seal the Deal
  - There will be an orchestra of carbon markets

- **What kind of Post 2012 CDM**
  - **More reformed CDM. Scaled up CDM**
    - Build on CDM core strengths, Learn from its weaknesses
    - Sectoral/Programmatic/Sector-No-Loose Target types
    - Targets approach rather than baseline approach
    - Simplified procedure
    - Streamlined approval process
    - Equal geographical distribution
    - Reduced transaction cost

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QuickTime™ and a
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Let's Seal the Deal in Copenhagen!

Jo Rex Camba
Philippine Bio Sciences Company, Inc.
www.philbio.com.ph
jorex.camba@philbio.com.ph
(632) – 632-0277 loc. 117

Ms. Mila J. Jude

SEEDLinks Philippines, Inc.

Conference on Mitigating Greenhouse Gas Emissions from Livestock and Agro- Industrial Waste

(15-16 October 2009)

Mindanao Grains' Corn Cob-Fired Dryers in 3 Corn Post-Harvest Facilities

Mila J. Jude

Chief Technical Officer
SEEDLinks Philippines, Inc.

mila_jude@seedlinksphilippines.net


1. Ilocos Norte
2. Kalinga Apayao
3. Cagayan
4. Ilocos Sur
5. Abra
6. Mountain Province (Baguio)
7. Ifugao
8. Isabela
9. La Union
10. Benguet
11. Nueva Viscaya
12. Quirino
13. Pangasinan
14. Tarlac
15. Nueva Ecija
16. Aurora
17. Zambales
18. Pampanga
19. Bulacan
20. Bataan
21. Metro Manila (NCR)
22. Rizal
23. Cavite
24. Laguna
25. Batangas
26. Quezon
27. Camarines Norte
28. Camarines Sur
29. Catanduanes
30. Albay
31. Sorsogon
32. Occidental Mindoro
33. Oriental Mindoro
34. Marinduque
35. Romblon
36. Masbate
37. Northern Samar
38. Eastern Samar
39. Western Samar
40. Palawan
41. Antique
42. Aklan (Boracay)
43. Capiz
44. Iloilo
45. Negros Occidental
46. Negros Oriental
47. Cebu
48. Bohol
49. Leyte
50. Southern Leyte
Batanes Islands
Metro Manila
51. Surigao del Norte
52. Agusan del Norte
53. Surigao del Sur
54. Zamboanga del Norte
55. Misamis Occidental
56. Zamboanga del Sur
57. Lanao del Norte
58. Misamis Oriental
59. Agusan del Sur
60. Lanao del Sur
61. Bukidnon
62. Davao del Norte
63. Davao Oriental
64. Maguindanao
65. North Cotabato
66. Davao del Sur
67. Sultan Kudarat
68. South Cotabato
69. Basilan
70. Sulu
71. Tawi-Tawi
Philippine Travel Destinations Guide
http://www.philsite.net

The CDM Project

The greenhouse gas (GHG) emission reduction will come from the replacement of the use of diesel with corn cobs, as fuel for the corn drier.

Emission reduction = **45,000** tons CO2eq./year

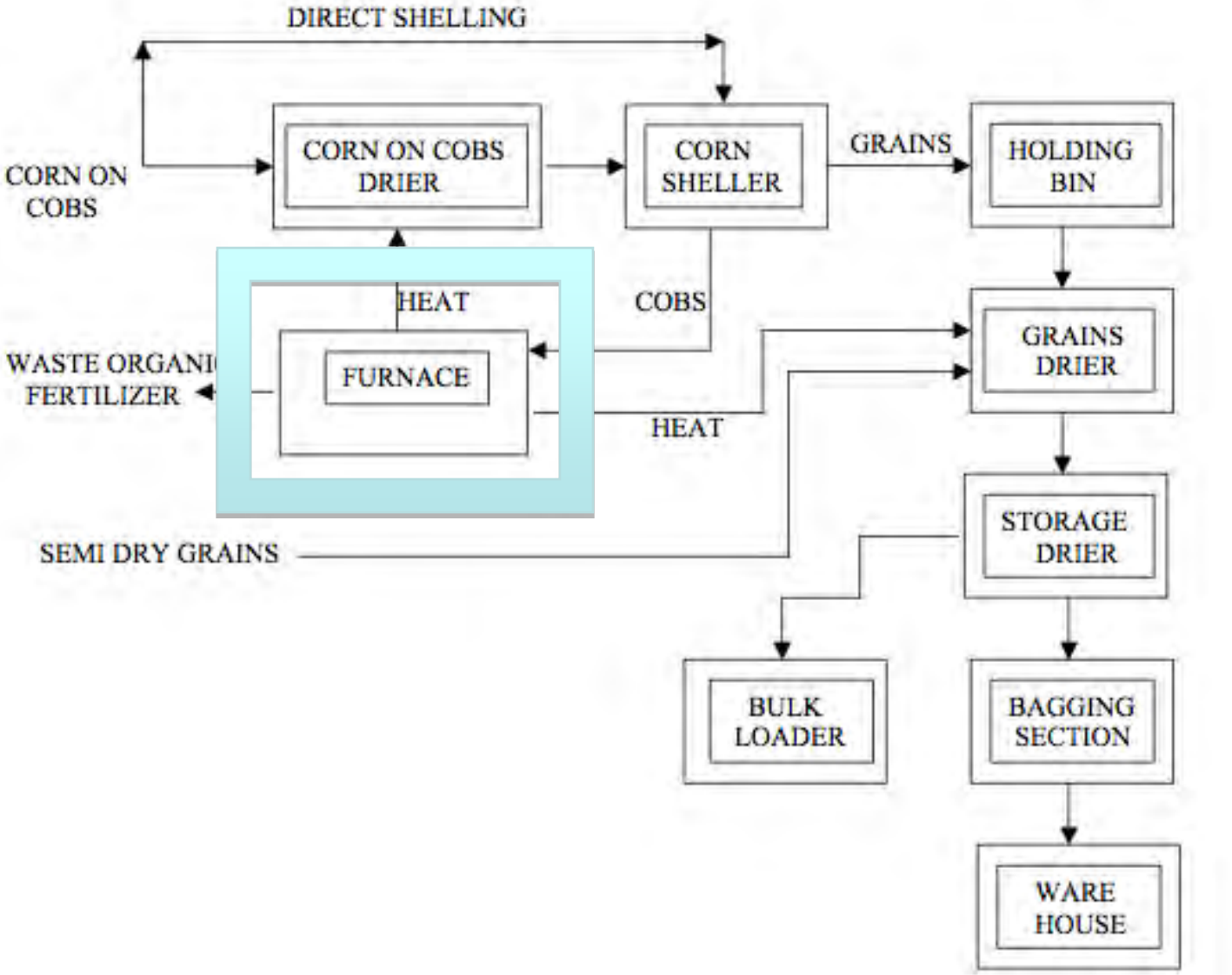
The emission reduction will come from:

1)Replacement of diesel with corn cobs

2)Methane avoidance from corn cobs stockpile

Locations:Bukidnon (Mindanao) and Isabela (Luzon)

PROCESS FLOW AGLAYAN, MALAYBALAY, BUKIDNON



Corn Cobs Dumped in Mindanao Grains PHF-Bukidnon

A project of

Mindanao Grain Processing Co., Inc.

Sayre Highway, Aglayan
Malaybalay City, Bukidnon

Reina Mercedes Postharvest Facilities

Building the Grains Super Highway of Luzon…

From our Corn Farmers in Isabela to our Livestock Farms all over the Country

Isabela Mindanao Grains PHF after Pepeng

Corn Drying without the Post-Harvest Facility

Isabela's main dryer: drying under the sun
on Maharlika Highway

Food Security

Not just achieving Self-Sufficiency, but also meeting the Proper Quality Standards for Food and Feed Safety

- 14% Moisture Content Max.
- 20ppb Aflatoxin Max.
- 5% Damage Max.

Mr. Rod Bioco (right), of Mindanao Grains checking the quality of the corn kernels. DA Sec. Arthur Yap is at the left

Social Justice

Giving our farmers the opportunity to earn a decent living from planting corn with fair price and quality service

Global Competitiveness *and* Commitment to the Environment

Harnessing Biomass Heat and Power from corn cobs to give better prices for our corn farmers and competitive prices for our livestock and poultry industries

VS

Corn cob fuel to generate heat and power for Mechanical Dryers

Power Substation

Inclined Bed Corn-on-cob Dryers

Mechanical Grain Dryers

Isabela Operations:

Nappaccu Pequeño, Reina Mercedes

Coverage

20,000 has., 50km radius around Brgy. Nappaccu Pequeño, Reina Mercedes

Capacity

2,000mt per day

Volume

200,000mt per year

Beneficiaries

10,000 Corn Farming Families

Bukidnon Operations:

1. Aglayan, Malaybalay City
2. Poblacion, Don Carlos

CORN-ON-COB DRYERS (mt/day) - Dried grains basis	210	
GRAIN DRYERS (mt/day) - Dried grains basis	540	
SHELLING CAPACITY (mt/day) -	960	
DRY STORAGE CAPACITY (mt)	8,000	
WET STORAGE CAPACITY (mt)	800	
BAGGED STORAGE CAPACITY (mt)	6,000	
MAIN DRAG CONVEYER CAP. (mt/hr)	100	
MAIN BUCKET ELEVATOR CAP. (mt/hr)	100	
BAGGING LINE (mt/day)	400	

Thank You

Mr. Chin Kiang Mun

TUV SUD PSB Philippines Inc.

PSB Philippines

PSB Philippines

Choose certainty.
Add value.

CDM EXPERIENCE IN THE PHILIPPINES
Conference on Mitigating Greenhouse Gas Emission from Livestock and Agro-Industrial Waste

16 October 2009, The Peninsula Manila

Corporate Overview

PSB Philippines

- ✓ Provider of technical services relating to product quality, safety testing and compliance, management system certification, training and engineering consultation
- ✓ Founded 140 years ago in Mannheim, Germany
- ✓ Approximately 13,000 employees located in 281 subsidiaries and associated companies operating in 44 countries worldwide

Our International Presence

PSB Philippines

AMERICAS

Argentina
Brazil
Canada
Chile
Mexico
USA

EUROPE / AFRICA

Austria
Belgium
Czech Republic
Denmark
France
Germany
Hungary
Italy
Netherlands
Poland
Romania
Russia
Serbia
Slovakia
Slovenia
South Africa
Spain
Switzerland
Turkey
UK

ASIA-PACIFIC

Bangladesh
China
Hong Kong
India
Indonesia
Japan
Korea
Malaysia
Philippines
Qatar
Singapore
Sri Lanka
Taiwan
Thailand
UAE
Vietnam

TÜV SÜD + subsidiaries

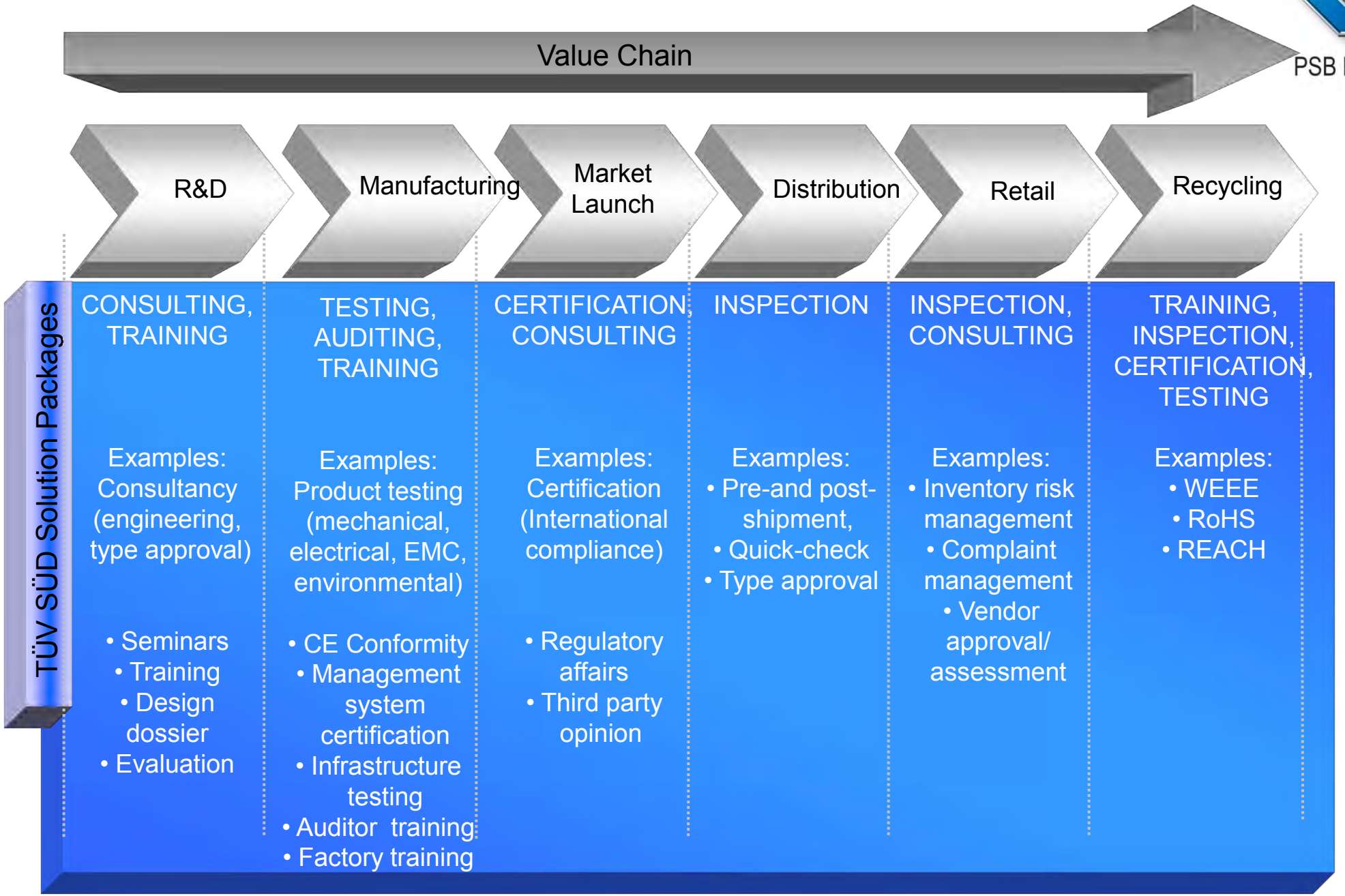
AMERICAS:
Headquarters
TÜV SÜD America Inc.
Danvers, Massachusetts

EUROPE:
Headquarters
TÜV SÜD AG
80686 Munich, Germany

ASIA:
Headquarters
TÜV SÜD Asia Pacific Pte. Ltd.
Singapore

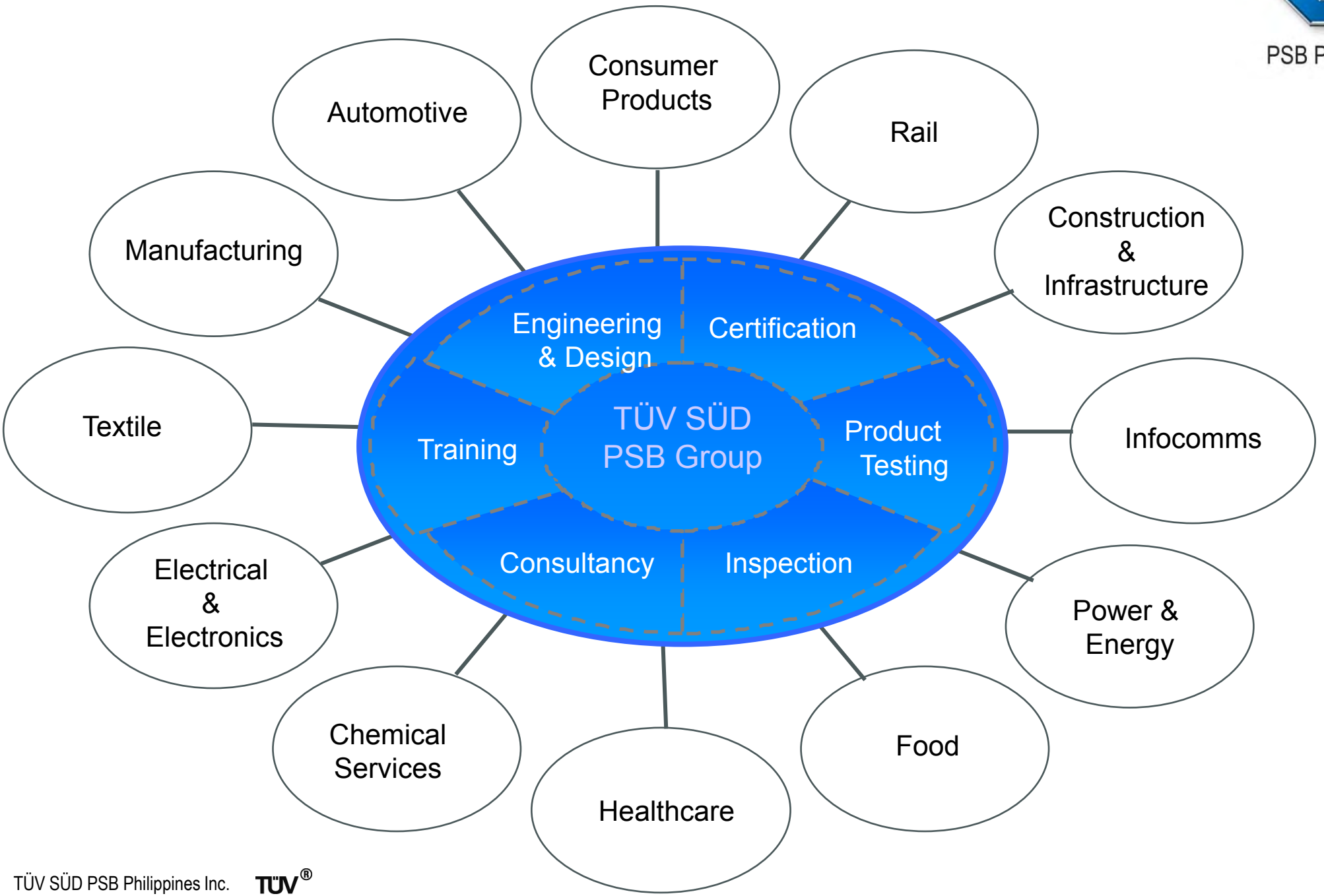
TÜV SÜD PSB Service Portfolio

PSB Philippines



TÜV SÜD PSB Services and Sectors

PSB Philippines



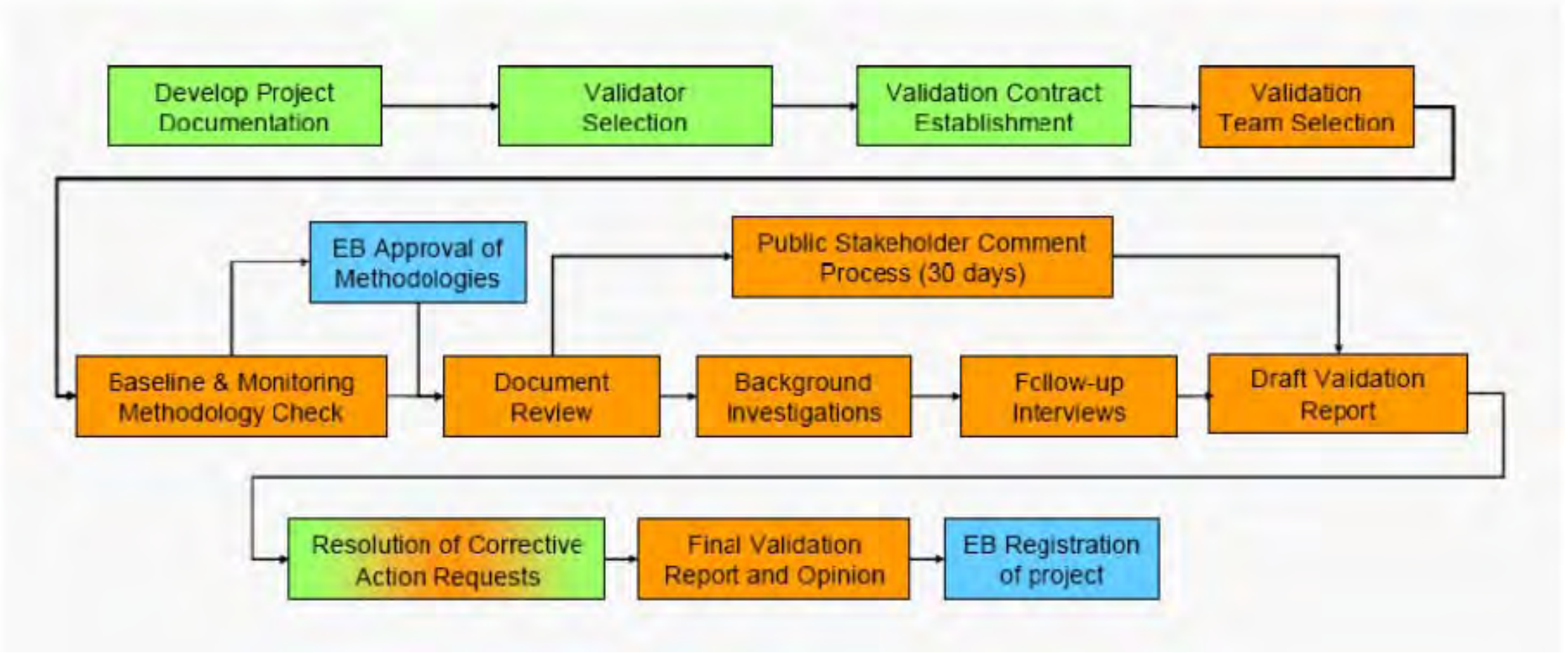
Local Country Experience

PSB Philippines

Project	Status	Registration Date	Est. Reductions (m^3)
Waste Management Project: Avoidance of methane production from biomass decay through composting	Registered	**3/16/2008**	**6,058**
Biomass boiler project in the Philippines	Registered	**3/15/2008**	**18,529**
Biogas to Energy Project- 1	Validation	**n/a**	**13,660**
Biogas to Energy Project - 2	Validation	**n/a**	**43,714**
Secondary catalytic reduction of N2O emissions	Validation	**n/a**	**29,474**
Community Waste Management Project: Avoidance of methane production from biomass decay through composting	Validation	**n/a**	**8,901**
Watershed Rehabilitation Project – 2	Validation	**n/a**	**4,205**
Envirofit Tricycle-taxi Retrofit Program	Validation	**n/a**	**7,708**
Watershed Rehabilitation Project - 1	Validation	**n/a**	**10,072**
Swine feeding operations methane capture and combustion from improved animal waste management system	Withdrawn	**n/a**	**45,620**
Controlled Disposal Facility Biogas Emission Reduction Project	2nd Monitoring Period	**2/1/2008**	**116,339**

The Validation Process

PSB Philippines



Proponent UNFCCC TUV SUD

The Validation Process

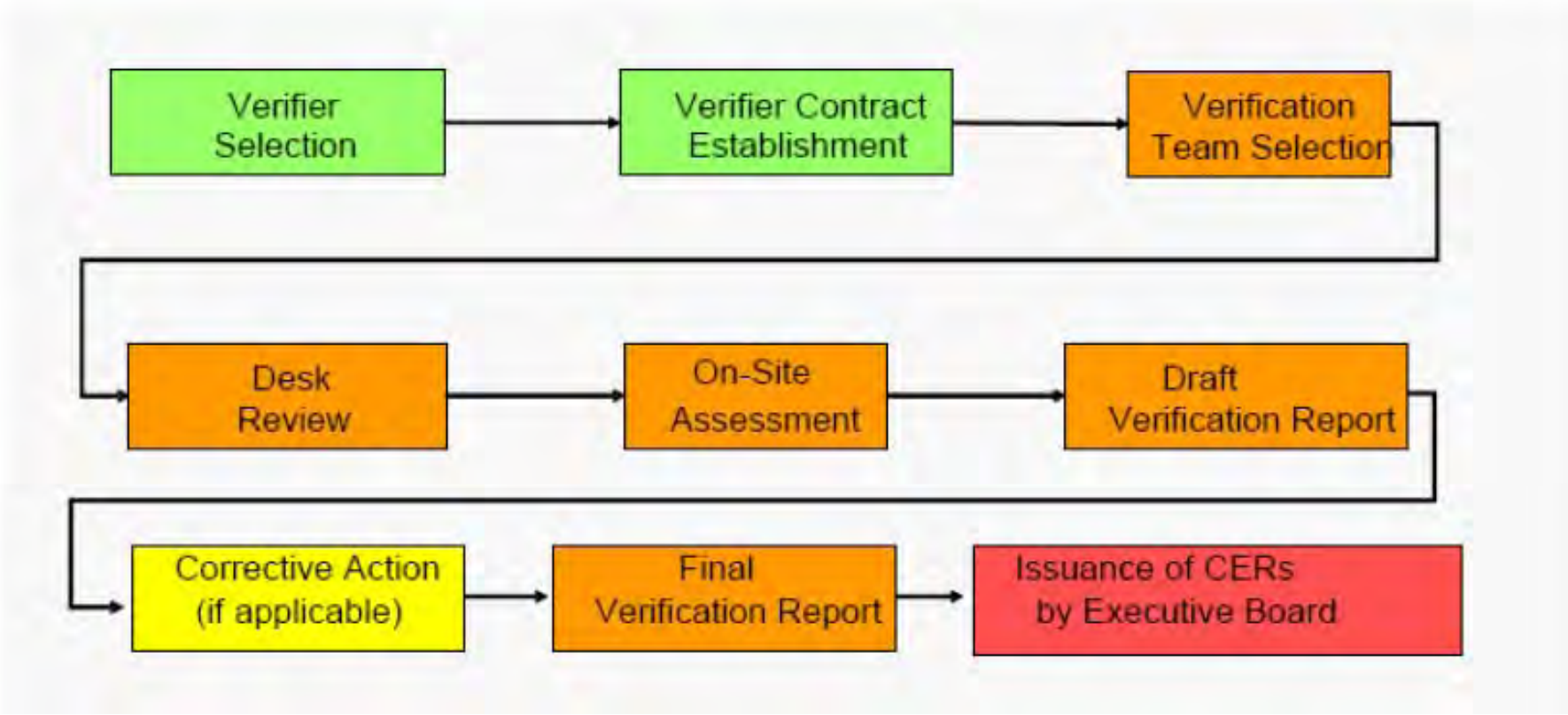
PSB Philippines

Step	Task Description	TÜV SÜD	Client	UNFCCC bodies	Time requirement
Step 0	Submission of documents		X		
	Completeness check	X			Within 10 business days
	Corrections if necessary		X		
	Upload to UNFCCC	X			Within 5 business days
	Approval of methodology			X	
Step 1	Submission of documents until an agreed start date		X		
	Start of the 30 day Global stakeholder process	X		X	Within 5 business days
	Completeness Check of documents	X			Within 4 business days
	Reporting on Step 1	X			1 business day
	Revisions if necessary		X		
Step 2	a. Desk Review b. Audit preparation c. Onsite audit and interviews	X X X		X	Within 20 business days 1 to 3 business days
	Completed validation protocol	X			Within 15 business days
	Clarifications and corrections if necessary		X		
	Validation Report, Review by CB	X			Within 20 business days
	Submission of letter(s) of approval		X		
Step 3	Final Revision of Validation Report if necessary	X			Within 9 business days
	Request for registration	X			1 business day

NOTE: Subject to change based on actual agreed proposal and project circumstances

The Verification Process

PSB Philippines



Proponent

UNFCCC

TUV SUD

The Verification Process

PSB Philippines

Package (Step)	Task Description	TÜV SÜD	Client	Time requirement for TÜV SÜD
Step 1	Submission of documents		X	
	Initial Document Review	X		Within 2 weeks
	Reporting on Step 1	X		1 work day
	Revisions if necessary		X	
Step 2	Advanced verification process a. Making Monitoring Report publicly available b. Document Review c. Interviews d. On-Site mission	X X X		4 weeks
	Draft Verification report	X		5 work days
	Resolution of clarification and correction requests, if necessary		X	
	Final Verification Report	X		5 work days
Step 3	Issuance of a certification decision	X		3 work days
	Making reports publicly available / Request for the issuance of CERs	X		2 work day

NOTE: Subject to change based on actual agreed proposal and project circumstances

PSB Philippines

Thank you very much for your attention

www.tuv-sud-psb.ph

Ms. Mia Jarumayan

Penwood Corporation

Penwood Energy: Corporate Identity and Capabilities

- A professional project development and management group composed of experts with actual experience in Biofuels and Renewable Energy.
- Specializes in bioethanol , solar, wind, and biomass-based power generation projects

Penwood Energy: Project Development Expertise

- Project conceptualization
- Feasibility study preparation and detailed risk identification and analysis
- Technical design and engineering
- Acquisition of government permits and licenses, public relations, information dissemination
- Commercial contracts design and negotiations
- Financial structuring and advisory

PENWOOD

Insights

- CDM landscape has changed but the need for environmentally sound projects remain.
- A lot of “green” funds are available.
- Need for good, expert advise/support.
- Don’t be boxed in, options abound.

Mr. John Morton

The World Bank

The Philippines for post – 2012

- Scaling up GHG reductions
- Making it easier for the many small projects in the country to participate in carbon finance.
- Enhancing technology transfer
- Enhancing sustainable development impacts

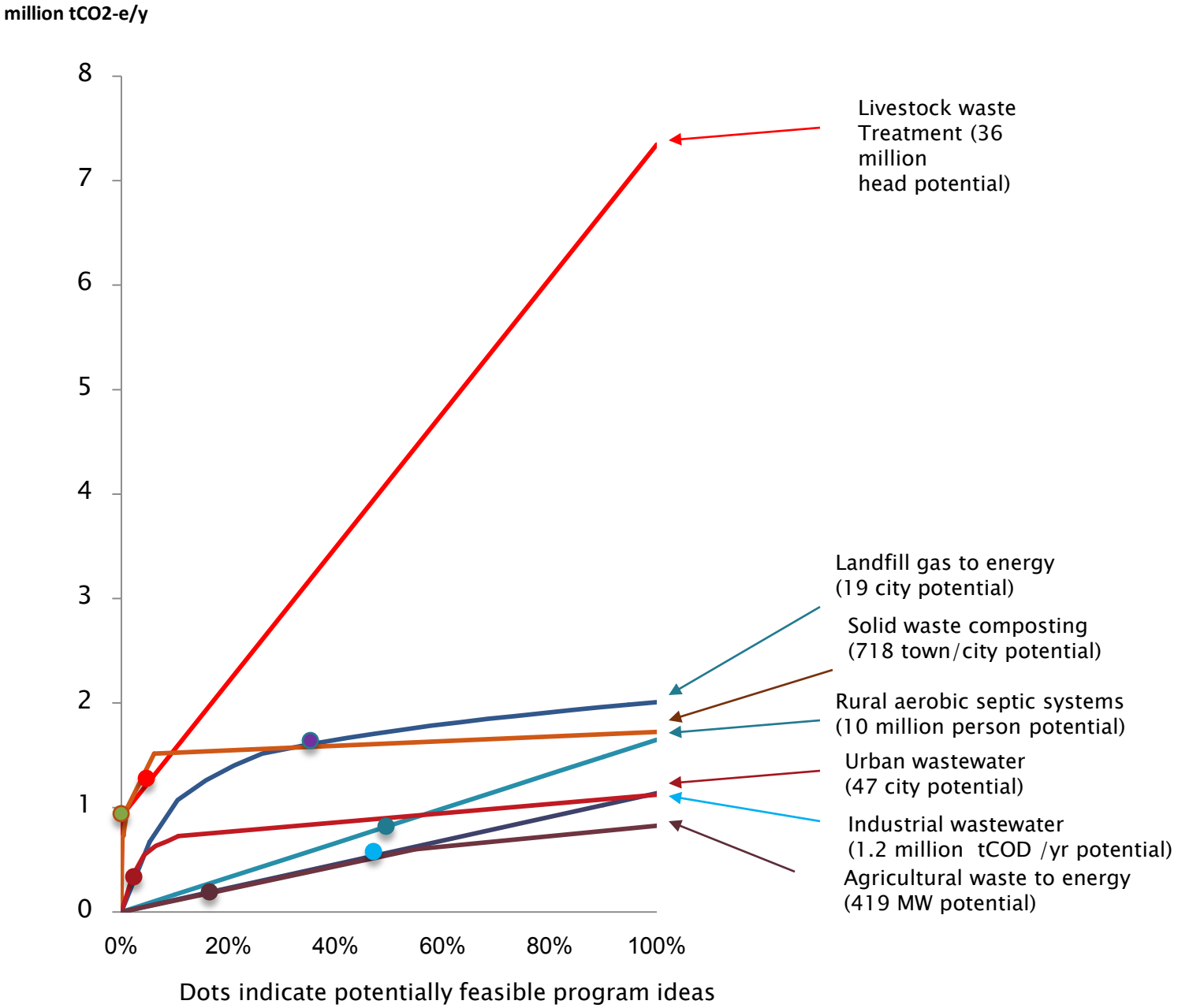
Scaling up GHGs

- What sectors and technologies can be effectively targeted—for anaerobic digestion we know the basics
  - ie Potential by sub-sector;

How is it implemented?
What part of the sector can be viably be targeted;
Working off current experience;
What is the implementation mechanism;
Who is placed to aggregate;

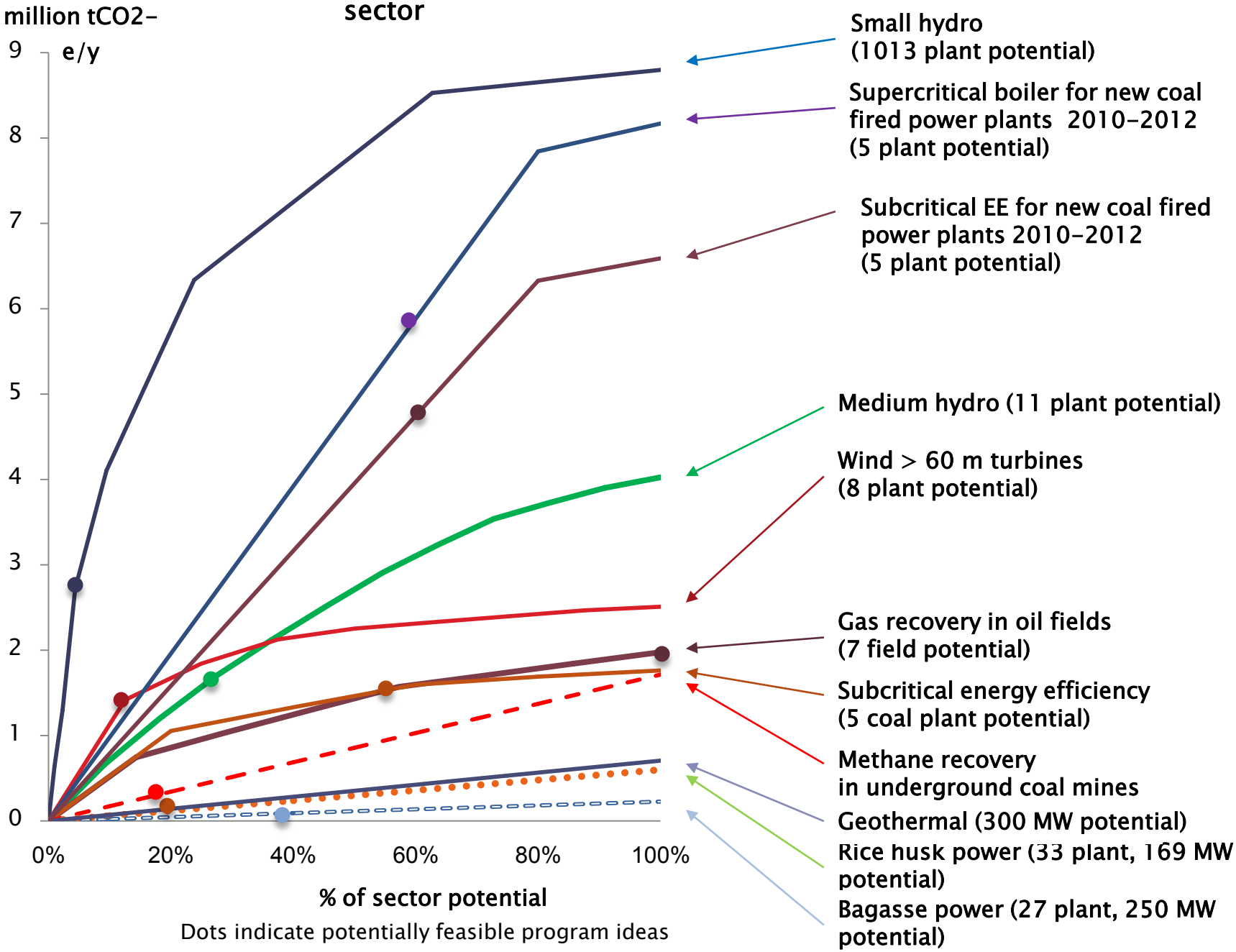
VIETNAM WASTE SECTOR

Emission reductions from different interventions in waste management sector



VIETNAM ENERGY SECT

Emission reductions from different interventions in energy sector



Dots indicate potentially feasible program ideas

Building on existing experience

- Technology providers;
- CDM project developers;
- Industry and farm in-house capacity
- Government agencies;
- Universities;
- Banks;
- NGOs;

What is the Implementation Mechanism

PoAs

More effective bundling

More systematic project by project

Other ways- voluntary market, evolving approaches for Kyoto.

Who is placed to be a coordinating entity for POAs?

Are you ready?

- Staffing: Work and persistence.
- Managing dual responsibilities
  - To projects
  - To buyers
- Matching mandates or business models with CDM goals.
- Making the business model work. What is your niche and relationship to clients.
- Coping with CDM regulatory framework – in house or through other party.

Technology transfer and sustainable development

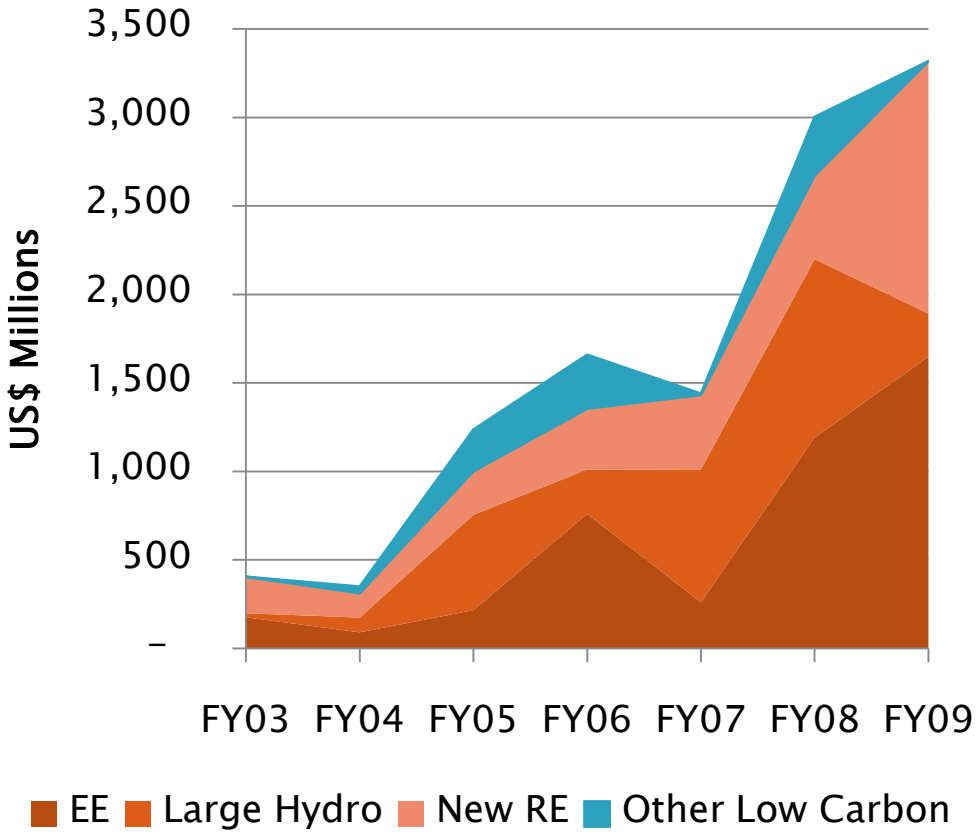
- Getting the small scale users- what are the models and in-roads, who is the champion and where is the financing.

- Getting the technology in- affordability, variety of options and ability to make informed decisions.

What can you expect out of the World Bank

- Investment financing – National, regional and local programs;
- Catalyzing private commercial financing in the sector;
- Innovative CDM financing;
- Empowering the institutions and businesses.

Leveraging World Bank Lending to Promote Low Carbon Growth



Mobilizing Finance
Carbon Investment Funds

Clean Technology Fund (CTF)
± $5 billion

Finance scaled-up demonstration, deployment, and transfer of **low carbon technologies**

Strategic Climate Fund (SCF)
±$1 billion

Targeted programs with dedicated funding to pilot new approaches with potential for scaling up

- **Pilot Program for Climate Resilience**: Mainstream climate resilience into core development planning
- **Forest Investment Program**: Reduce emissions from deforestation and forest degradation
- **Scaling Up Renewable Energy** in Low Income Countries

Innovative CDM Financing

Forest Carbon Partnership Facility (FCPF)

"Pioneering solutions for REDD"

Carbon Partnership Facility (CPF)

"Larger scale and longer term"

Technical Assistance

Developing capacity to systematically bring the CDM market to the Philippines

-A supportive and empowering role;
- Institution and business building.

Japan Climate Change Initiative Grants
- Support to LLDA on development of their program.

IFC technical assistance on sustainable financing
- Support to commercial banks.

Carbon Finance Assist:
-Support to GFIs on PoAs
-Support to Cities in PoAs;

CTF and CPF
-Have capacity building aspects

Mr. Joe Tuyor Sr.

The World Bank, Manila

Methane Reduction Programs in Livestock and Agro-industrial Waste Sector

Possible PoAs on Wastewater Treatment

- Pig waste (61,509 MT CH4/year) – Land Bank
- Distillery (16,158 MT CH4/year)
- Slaughterhouse (426 MT CH4/year) + domestic liquid waste?
- Dessicated coconut processing (3,472 MT CH4/year)

Issues

- Do we have the managing and coordinating entity?
- Do we have projects to kick start the PoAs?
- Carbon finance instrument to be mobilized for the PoA? CPF?

Mr. Kurt Roos

US Environmental Protection Agency (USEPA)

Methane to Markets

The Methane to Markets Partnership: Country Support in the Livestock and Agro-industrial Waste Sector

Kurt Roos
Team Leader, Agricultural Methane Programs
U.S. Environmental Protection Agency

Methane to Markets Partnership

The *Methane to Markets Partnership (M_2M)* is an international initiative that advances cost-effective methane recovery and use as a clean energy source with the goal of reducing global methane emissions, a greenhouse gas, while also enhancing economic development, increase renewable energy, and provide other environmental benefits.

The Partnership acts as a mechanism to bring together interested parties from governments, development banks, and the private sector to facilitate methane project development around the world. The Partnership currently focuses on four sectors and includes Livestock and Agro-industrial Waste.

Sub-Committee Activities

Meet two times year

- Country Inventories and Implementation plans
- Country Implementation Status
  - US assists in implementation

Work in Progress

- Development of an *International Standard for Anaerobic Digester Evaluation*

Subcommittee currently considering expanding partnership to include:

- Wastewater
- Rice Agriculture
- Enteric (Ruminant Emissions)

Next Sub-committee meeting March 2010 New Delhi

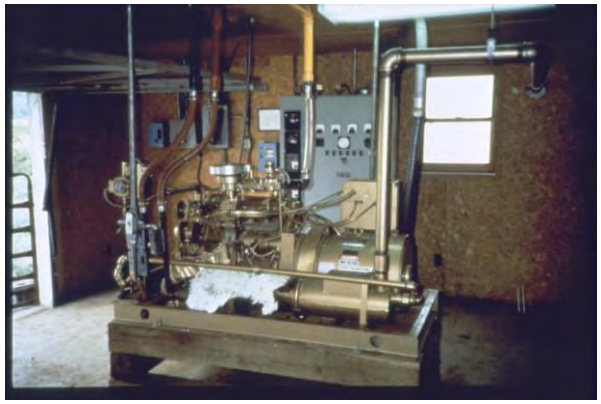
Digesters Around the World

Methane to Markets

Digesters Around the World

Gas Use Options

Methane to Markets



More Gas Use Options

International Strategic Plan

Key Issue: Each country presents its own unique set of cultural, institutional, and technical barriers to gas recovery from livestock and food processing wastes.

Strategy – Implement a series of developmental steps that 1) create awareness; 2) build capacity; and 3) create market supply and demand

Step 1: Identify market and prioritize opportunities

- Country Resource Assessments

Step 2: Identify appropriate technologies

- Climate, material affordability, cost, labor skill set

Step 3: Demonstrate commercial projects and develop technical capacity thru training

Step 4: Develop capacity in technical and policy areas

- Standards, certification, financial/energy incentives, cost share, regulatory, voluntary

Step 5: Expand on success thru extension

- local, national, and inter-regional exchange, workshops, conferences, study tours

Objectives of a Resource Assessment

Methane to Markets

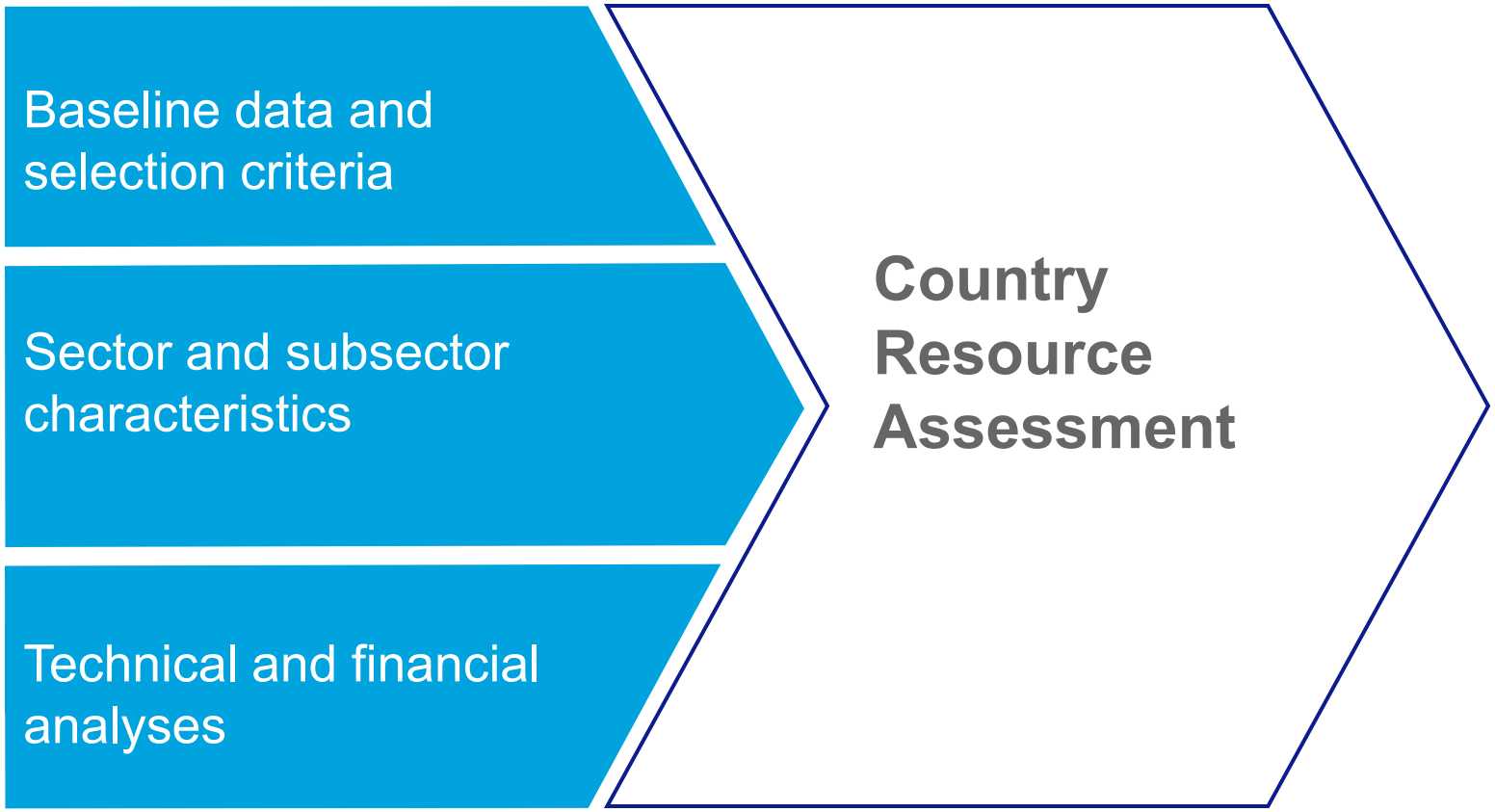
- Identify and characterize the potential for methane emission reduction;
- Assess country market opportunities;
- Identify location of opportunities;
- Prioritize opportunities.

Assessments provide a basis for a country specific emission reduction strategy and implementation plan

Elements of a Resource Assessment

Methane to Markets

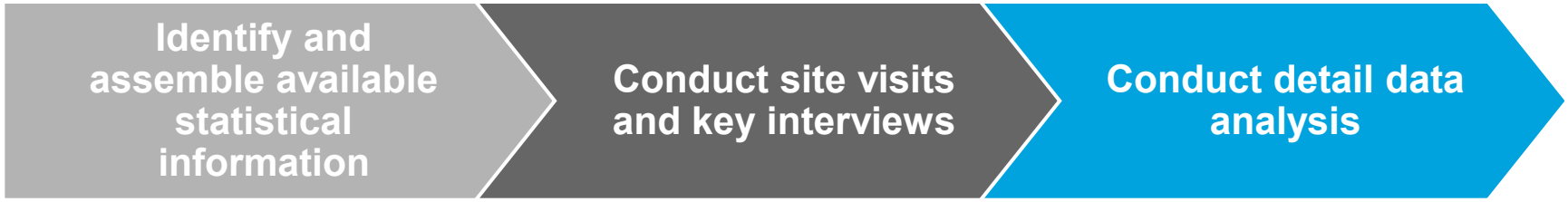
Resource assessments contain three main elements



Developing a Resource Assessment

Methane to Markets

Resource assessments are developed in a step-by-step approach.



- Country profiles
- Global databases and publications (e.g., FAO)
- Country reports on livestock and agro-industry
- Multilateral banks studies (e.g., WB, IADB, ADB)

- Based on major sectors identified
- Representative sites
- Key players from each sector
- Associations (national and regional)

- Based on insights and information from key players
- Industry-specific databases and publications
- Sector-specific information from key government institutions

Overview: Philippine Opportunities

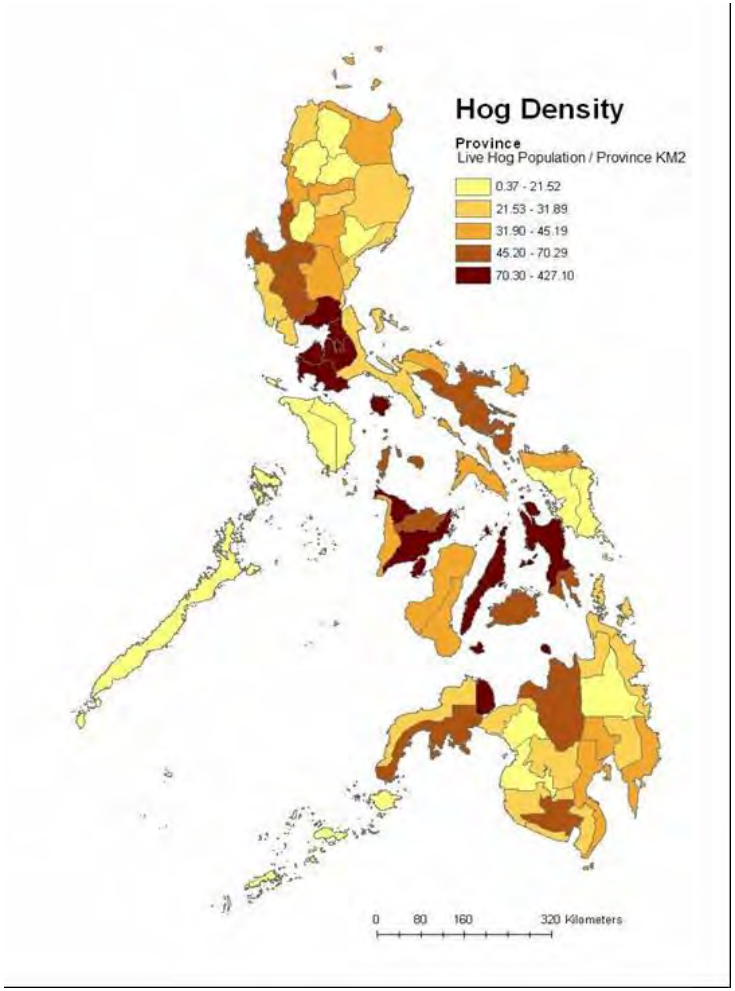
Swine Raising

Alcohol Distilleries

Desiccated Coconut

Slaughterhouse

Swine Raising



Size of farms	# of hogs	Waste management
COMMERCIAL		
Small	21 to 999 heads	46% - Lagoon 40%- Settling Ponds
Medium	1000 to 9,999 heads	62%- Lagoon 7%- Biogas
Large	10,000 heads of more	65%- Lagoon 9%- Biogas
BACKYARD	20 heads or less	20%- Lagoon 20%- Open Pit 13% Septic Tank
As of 2002-2003		

Alcohol Distilleries

12 Distilleries

BOD – 32,000 to 51,200 mg/li

COD – no data available

DISTILLERIES (LUZON)	Production Capacity (Million liters/year)
ALKO DISTILLERIES, INC Bo. Baritao, Manaog, Pangasinan	2.1
CENTRAL AZUCARERA DE TARLAC San Miguel, Tarlac, Tarlac	18.0
FAR EAST ALCOHOL CORP. Alahuli, Apalit, Pampanga	3.0
ABSOLUT CHEMICALS INC. Bo. Malurahatan, Lian, Batangas	12.0
BALAYAN DISTILLERY Balayan, Batangas	22.0
CONSOLIDATED DISTILLERS OF THE FAR EAST Brgy. Lumbangan, Nasugbu, Batangas	7.5
DYZUM DISTILLERY Bo. Baldeo, Lian, Batangas	15.0

DISTILLERIES (VISAYAS)	Production Capacity (Million liters/year)
LEYTE AGRI-CORP. Ormoc City, Leyte	11.0
INTERNATIONAL PHARMACEUTICALS INC. Juan Luna Ave., Mabolo, Cebu City	6.0
ASIAN ALCOHOL CORP. Bo. Canjusa, Pulupandan, Negros Occidental	45.0
DESTILLERIA BAGO, INC Bago. Negros Occidental	90.0
KOOLL DISTILLERY Talisay, Negros Occidental	12.0

Desiccated Coconut

11 DCN plants

BOD – 6,000 to 10,000 mg/li

COD – 17,000 tp 20,000 mg/li

DESICCATORS (LUZON)	Production Capacity (MTPY)
PETER PAUL PHILIPPINE CORP Candelaria, Quezon	24,480
PRIMEX COC PRODUCTS INC. Candelaria, Quezon	19,040
PACIFIC ROYAL BASIC FOO INC Candelaria, Quezon	13,600
SUPERSTAR COCONUT PRODS INC. Candelaria, Quezon	10,880
FRANKLIN BAKER CO. OF THE PHILS San Pablo City, Laguna	16,592
TROPICANA FOOD PRODUCTS San Pablo City, Laguna	2,720

DESICCATORS (MINDANAO)	Production Capacity (MTPY)
CELEBES COCONUT CORP Butuan City Agusan del Norte	4,325
FIESTA BRANDS INC. Medina, Misamis Oriental	20,400
SUPERSTAR COCONUT PRODS INC Davao City, Davao del Norte	6,800
FRANKLIN BAKER CO. OF THE PHILS Sta. Cruz, Davao del Sur	16,048
COCO DAVAO, INC Sta. Cruz, Davao del Sur	12,240

Slaughterhouse Industry

1,100 slaughterhouses

Only 11% accredited by NMIS

BOD – 2,500 mg/li

COD – no data available

Region III

1.517 million swine/ year

15% of total

NCR

1.544 million swine/ year

16% of total

Region IV-A

1.789 million swine/ year

18% of total

Estimated Emissions Reduction

Industry/ Sector	Geographical Coverage	Carbon Emission Reduction (MT CO_2e /year)	Emission Reduction From Fossil Fuel Replacement (MT CO_2e /year)	Total Emission Reduction (MT CO_2e /year)
Swine Farming	Regions III, IV-A, VI	1,541,000	247,500	1,788,500
Alcohol Distillery	Nationwide	478,000	84,000	562,000
Coconut processing	Region IV, X, XI	162,500	28,500	191,000
Slaughterhouse	Nationwide	10,500	1,800	12,300
Total		2,192,000	361,800	2,553,800

(1) Assuming 50% reduction in carbn emissions and CO_2 purchases at $5 mt = 250,000,000 pesos/year

(2) If only 50% of Standing Pig Population developed it would equal ~14 MW of power (122 million kWh/year) and provide almost 500 million pesos/year in energy revenue at 4 peso/kWh

Resource Assessments - Status

Completed

- Argentina
- Philippines
- Thailand
- Colombia

Almost Complete

- Vietnam

Underway

- Mexico
- India
- Korea

Starting

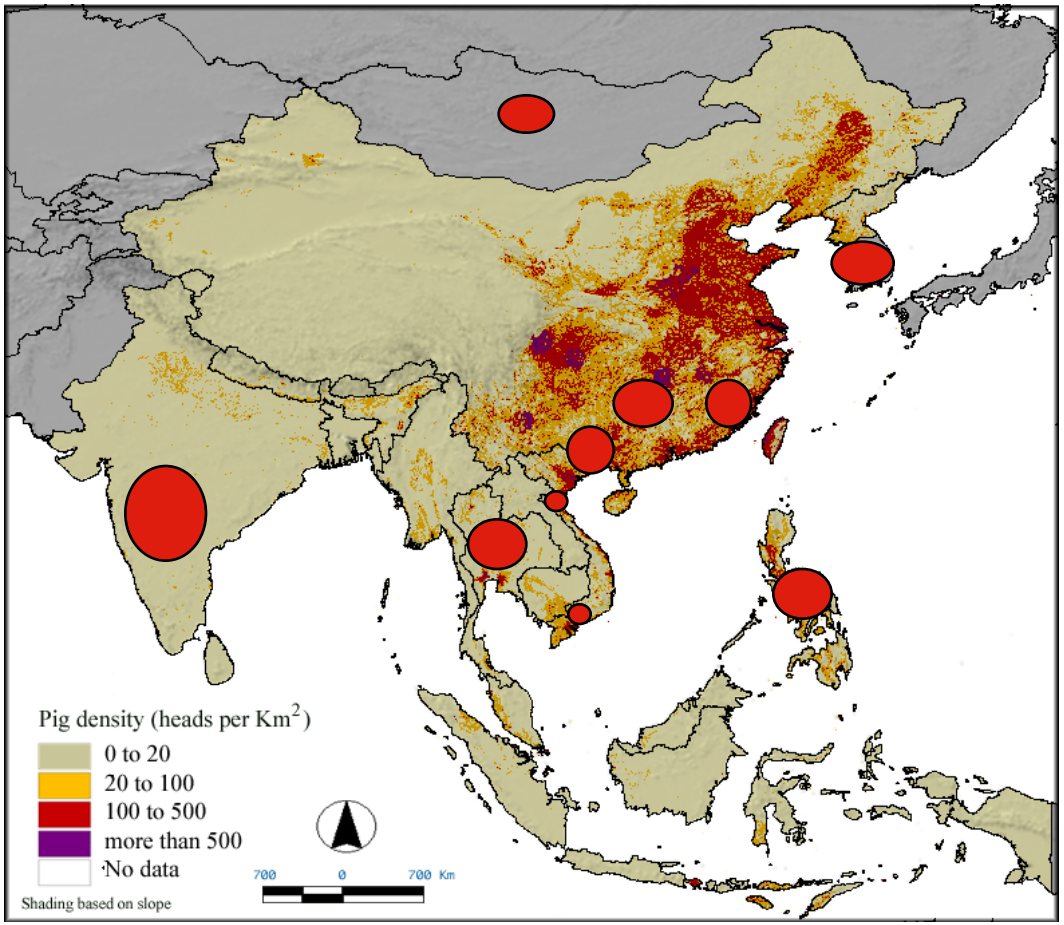
- Brazil
- Ecuador
- China
- Ukraine

Overview: M_2M Asia

Asia accounts for ~50% of worlds standing pig population

M_2M active in:

- *Korea*
- *China (LWMEA)*
- *Philippines (WB & M_2M)*
- *Thailand (LWMEA)*
- *Vietnam (LWMEA)*
- *India*
- *Mongolia*



Denotes project activity

Map courtesy of Dr. Pierre Gerber (FAO)

M_2M Partnership Program

- Since inception the M_2M program has supported the World Bank in a number of livestock waste programs:
  - A. Thailand, China (Guangzhou, Shanghai and Changsa) Vietnam, and Philippines
  - B. Direct technical assistance in developing various program components
    - a) Technology and Demonstration
    - b) Program Monitoring and measurement, and
    - c) Technical replication and sustainability

- M2M has also provided direct technical assistance to countries:
  - A. Information Exchange: On the spot and ongoing follow up
  - B. Hands-on-technical-training
    - a. Thailand, Mexico, and China (Changsa)
  - C. Broader dissemination of information
    - a) Local, regional, and international conferences/workshops
    - b) Model for other M_2M countries to develop their implementation plan

M_2M Partnership (cont)

- The partnership has provided critical funding related to the development and implementation of country methane reduction plans
  1) National Anaerobic Digester Standards Development
  2) Digester developer and installer certification programs
  3) Demonstration cost share; and
  4) Workshop/Conferences
- Participating countries have used this program as a foundation for forwarding their approach to pollution control, greenhouse gas reduction, and renewable energy development

- The M_2M Partnership Program has been an example of a successful win-win strategy for solving environmental problems in the Livestock sector

Next Steps

1. Continue working with World Bank, Land Bank, Private Sector and Philippine Government to develop projects and expand project base across Livestock and Agro-industrial sectors
    - DOST developing a training program aimed at developing a project pipeline at local level
2. Strengthen program to ensure verifiable and sustainable projects
    - National technical standards,
    - Certification programs,
    - Measurement and evaluation
    - Explore how to deliver a rural development component

    - social responsibility
3. Develop capacity and awareness as needed
    - Technology demonstration and training
    - Workshops and extension events

Mr. Gerry Parco

The World Bank, Manila

Potential Projects
for
Program of Activities

Objectives of the Conference

- Introduce the new roll-out mechanism ofCDM.
  - Post Kyoto
  - PoA
- Invite Methane Generators
- Short-list of potential first projects

Slaughterhouses

1. Alabel, Sarangani Province
2. Bay, Laguna
3. Calamba, Laguna
4. Cavite State Univ. - AREC
5. DOST Calabarzon
6. Laoag City
7. Las Pinas City
8. Lipa City
9. Lucban, Quezon
10. Munoz, Nueva Ecija
11. Navotas City
12. San Fernando, La Union
13. San Fernando, Pampanga
14. San Juan Slaughterhouse
15. Sorsogon City
16. Surigao City
17. Tacloban City
18. University of Eastern Phils (UEP-AREC)

Methane Capture / Closed Dumpsite

1. Alabel, Sarangani Province
2. Bay, Laguna
3. Land Bank (San Mateo)
4. Laoag City
5. Las Pinas City
6. Lipa City
7. Lucban, Quezon
8. Munoz, Nueva Ecija
9. San Fernando, Pampanga
10. Sorsogon City
11. Sultan Kudarat Polytechnic State College (SKPSC-AREC)
12. Surigao City
13. Tacloban City
14. University of Eastern Phils (UEP-AREC)

Piggeries

- Bay, Laguna
- DOST Calabarzon
- Land Bank (San Mateo)
- Laoag City
- Las Pinas City
- Lipa City
- Munoz, Nueva Ecija
- Navotas City
- San Fernando, La Union
- University of Eastern Phils (UEP-AREC)
- Visayas State University

Alcohol Distillery

- Isabel Alcogas
- Central Azucarera de Tarlac

Dessicated Coconut

- Agrifuels Corp.

Main Players

- Methane Generators
  - Slaughterhouses
  - Piggeries
  - Agro-industrial Wastes
- Coordinating Entity
  - Consolidator
- Philippine Government
- PoA Developers

Change and Innovation

- Importance of Early Adaptors
- Support Early Adaptors