

Wastewater Management and CDM for Molasses Based Ethanol Production Plant in the Philippines

Carbon Finance Unit
 The World Bank



Key Points



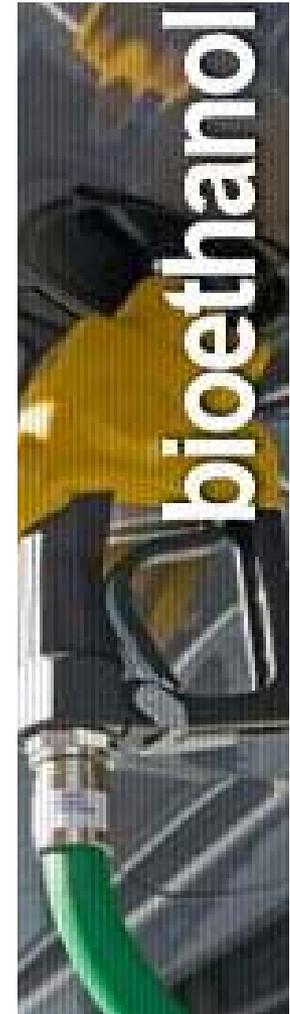
- Partnership between Roxol Bioenergy Corporation and the World Bank with the ERPA signed on Jan 14, 2009
- Renewable energy from methane and biogases replacing heavy fuel oil
- Revision of the ACM 0014 to allow for a “Greenfield” project
- Estimated emission reductions of 68,000 tCO₂e/year for this 100,000 liter/day ethanol plant
- A turn-key contract for both the ethanol plant and the wastewater management system



Roxol Bioenergy Corp



- Roxol Bioenergy Corporation Roxol Bioenergy Corporation is the bioethanol unit of the Roxas Group. A wholly-owned subsidiary of Roxas Holdings, Incorporated, the company recently tapped KBK Chem-Engineering Pvt. Ltd., an India-based firm, for the setting up of a turnkey bioethanol plant in Negros Occidental amounting to about P1 billion.
- The facilities and equipment for RBC's plant include the fermentation and distillation in ethanol production, wastewater treatment, slops concentration, product storage as well as the steam boiler and turbo-generator components. The plant will be built next to Central Azucarera de La Carlota, Inc. (CACI) in La Carlota City, a sugar mill owned by CADP Group Corporation, a subsidiary of RHI.

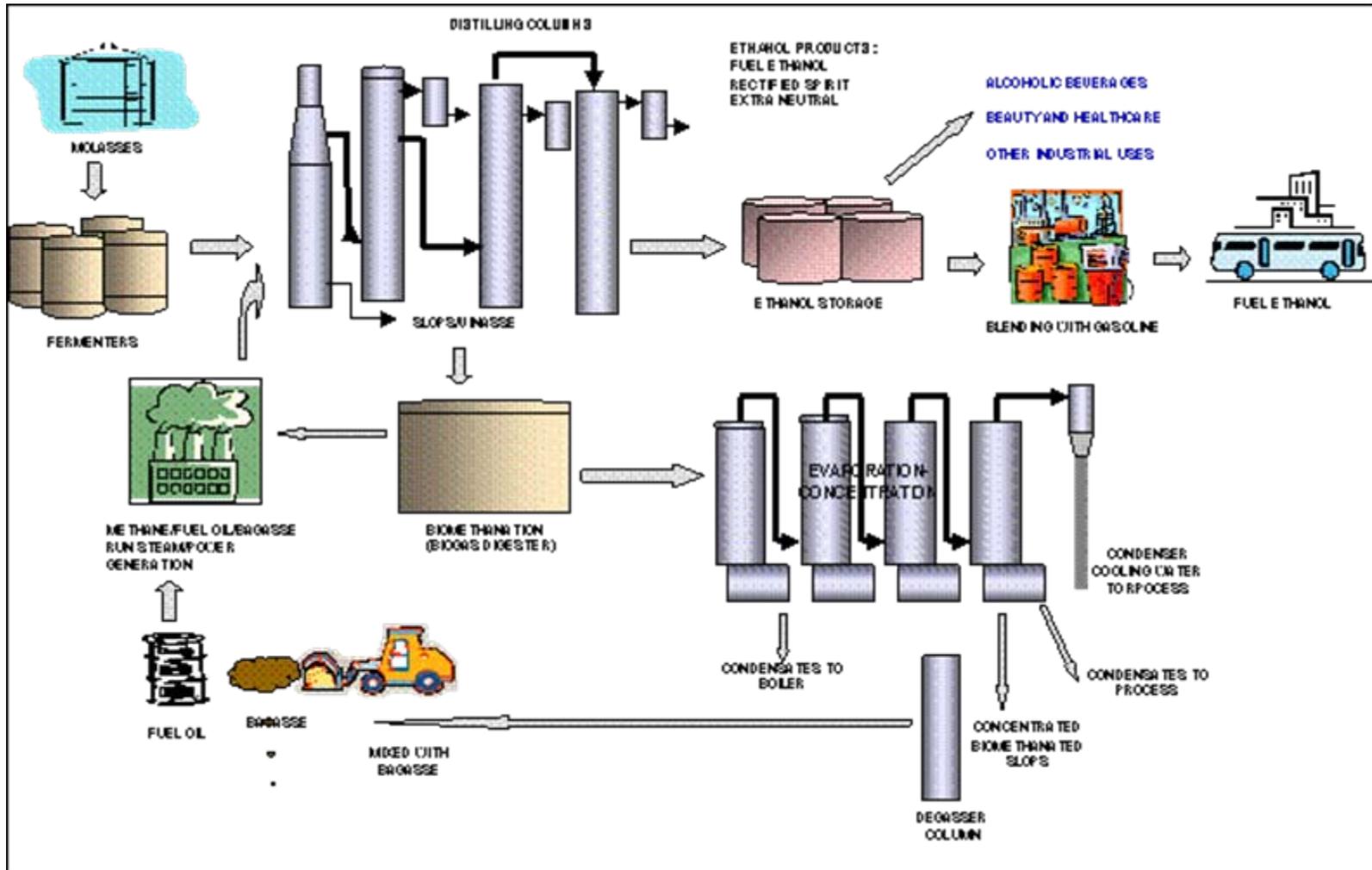


ACM 0014 Applicability Scenarios

“Mitigation of greenhouse gas emissions from treatment of industrial wastewater”

Scenario	Description of the baseline situation	Description of the project activity
1	The wastewater is not treated, but directed to open lagoons that have clearly anaerobic conditions.	The wastewater is treated in a new anaerobic digester. The biogas extracted from the anaerobic digester is flared and / or used to generate electricity and / or heat. The residual from the anaerobic digester after treatment is directed to open lagoons or is treated under clearly aerobic conditions (e.g. dewatering and land application).
2	The wastewater is treated in a wastewater treatment plant. Sludge is generated from primary and / or secondary settlers. The sludge is directed to sludge pit(s) that have clearly anaerobic conditions.	The wastewater is treated in the same wastewater treatment plant as in the baseline situation. The sludge from primary and / or secondary settler is treated in one or both of the following ways: (a) The sludge is treated in a new anaerobic digester. The biogas extracted from the anaerobic digester is flared and / or used to generate electricity and / or heat. The residual from the anaerobic digester after treatment is directed to open lagoons or is treated under clearly aerobic conditions (e.g. dewatering and land application). (b) The sludge is treated under clearly aerobic conditions (e.g. dewatering and land application).

Roxol Ethanol Production and Wastewater Management System



Sources of Emission Reductions

1. Methane avoidance: by using anaerobic digestion system to capture methane
2. Displacement of Fossil Fuel used in the Ethanol production process:
 - By using the methane from the wastewater treatment system to replace Heavy Fuel Oil (HFO)
 - By mixing the vinasse with bagasse to replace HFO
3. Displacement of Electricity from the Grid: using the methane and the vinasses/bagasses mixture to power the steam turbine (4 MW) for internal use

Community Development Carbon Fund



- The CDCF provides carbon finance to projects in poorer areas of the developing world that combine community development with investment in clean energy.



Community Benefits



- The unique feature of CDCF projects has always been their community development aspect.
- In its fourth year of operations, the CDCF has developed stricter criteria for assessing community benefits, reviewing community benefit plans, ensuring that communities are consulted and participate in defining benefits and verifying that such benefits are in fact delivered to communities before payment is made to the project developer.

Roxol Community Benefit Plan

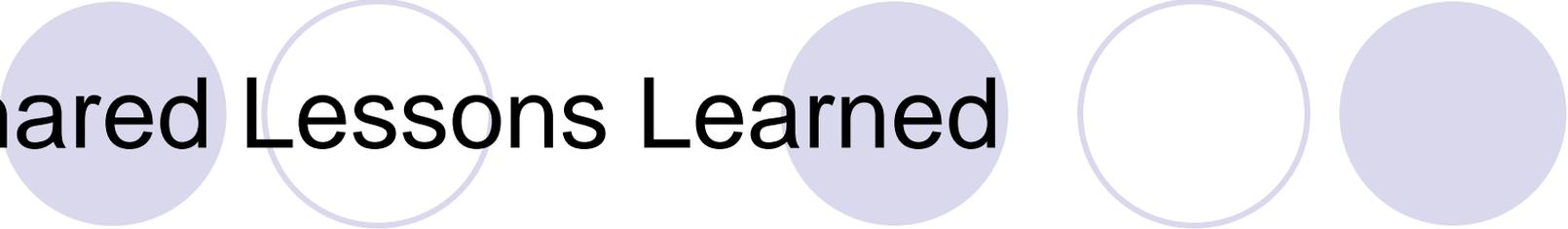


Roxas Gargallo
Foundation, Inc.



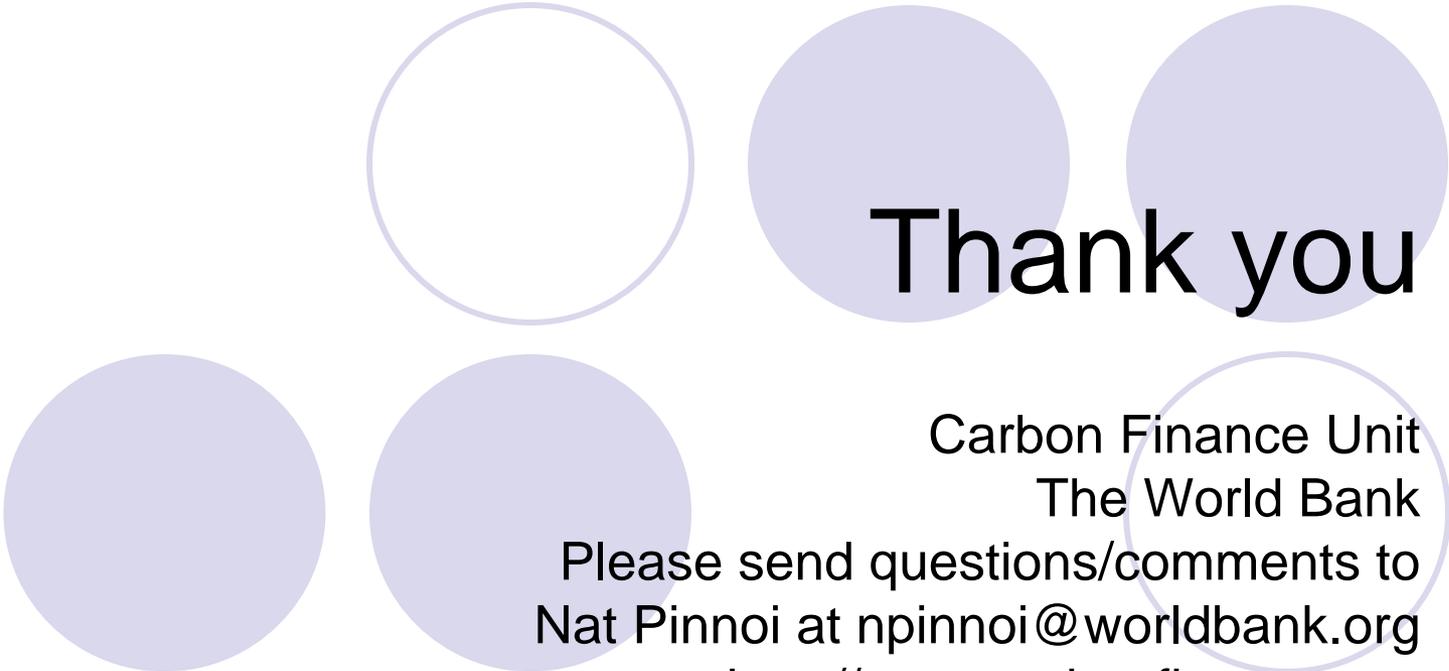
- This CDCF project will provide additional Community Benefits to 832 households where more than 40% of the population lives under US\$2 per day.
- Developing under close consultation with the target communities, the Community Benefit Plan (CBP) includes:
 - (i) community organizing, focusing on the formation and strengthening of people's organization and/or cooperatives;
 - (ii) livelihood and entrepreneurial support through a micro-lending scheme for various productive activities;
 - (iii) health services in the form of quarterly medical outreach to communities and assistance in obtaining health insurance; and
 - (iv) education services such as vocational skills training for out-of-school youths, scholarship grants, a reading program and rehabilitation of the existing pre-school/day care center.





Shared Lessons Learned

- Ensure baseline conditions especially for a greenfield project
- Ensure compliance with environment and social safeguard of the Philippines and the World Bank
- Professionally designed and implemented waste treatment system to optimize the biogas generation
- Stakeholder consultation and participation in the design of the community benefit package



Thank you

Carbon Finance Unit
The World Bank

Please send questions/comments to
Nat Pinnoi at npinnoi@worldbank.org
<http://www.carbonfinance.org>