

# CDM Projects in the Sugar Industry



Ve dau khi da mat em roi? Ve dau khi bao nhieu mo mong gio da vo tan... Ve dau toi biet di

## AXIS

Environment Services



GRUE & HORNSTRUP



# Who are Grue & Hornstrup and AXIS?



- G&H is a 26 year old Danish engineering consultancy company with a AAA financial rating (D&B)
- AXIS is a Pakistani consultancy company specializing in opportunities in the environment and energy sectors, and technology transfer
- G&H has been active internationally since 1990, and started CDM/JI project efforts with the Danish Governments first projects in 2001
- AXIS management possess over 15 years of business experience in Pakistan



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# Carbon Market Experience



- Investigation of 70 potential CDM/JI projects for development, and 60 for procurement of Carbon Credits
- Completion of sets 11 PDDs/BSs/MPs
- Developed and supporting operational CDM/JI projects at 10 locations
- Supporting over 30 new CDM/JI projects worldwide
- Have full project life-cycle experience
- Assisted in contracting over 7 million tCO<sub>2</sub>e (12 ERPAs)
- Providing services to procure over 10 million tCO<sub>2</sub>e



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# Carbon Procurement

G&H assists Compliance and Governmental programs in Carbon Credit Procurement on the worldwide market by:



- Identification and screening of projects
- Project portfolio structuring
- Marketing of carbon credit programs
- Project and portfolio due diligence and risk assessment
- Contracting, negotiations and purchasing



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# Project Development and Implementation



- Initial project screening and identification
- Preparation of documentation PDD/BS/MP
- Development of new baseline- and monitoring methodologies
- Assistance in obtaining project approvals
- Obtain, evaluate, and negotiate offers for Carbon Credit trading
- Project engineering
- Project supervision and management



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# Project Post-Implementation

## Maximizing performance and returns

- Project performance assessment
- Monitoring review & enhancement
- Technical review & enhancement
- Monitoring and technical training
- Verification assistance
- Commercial and trading assistance



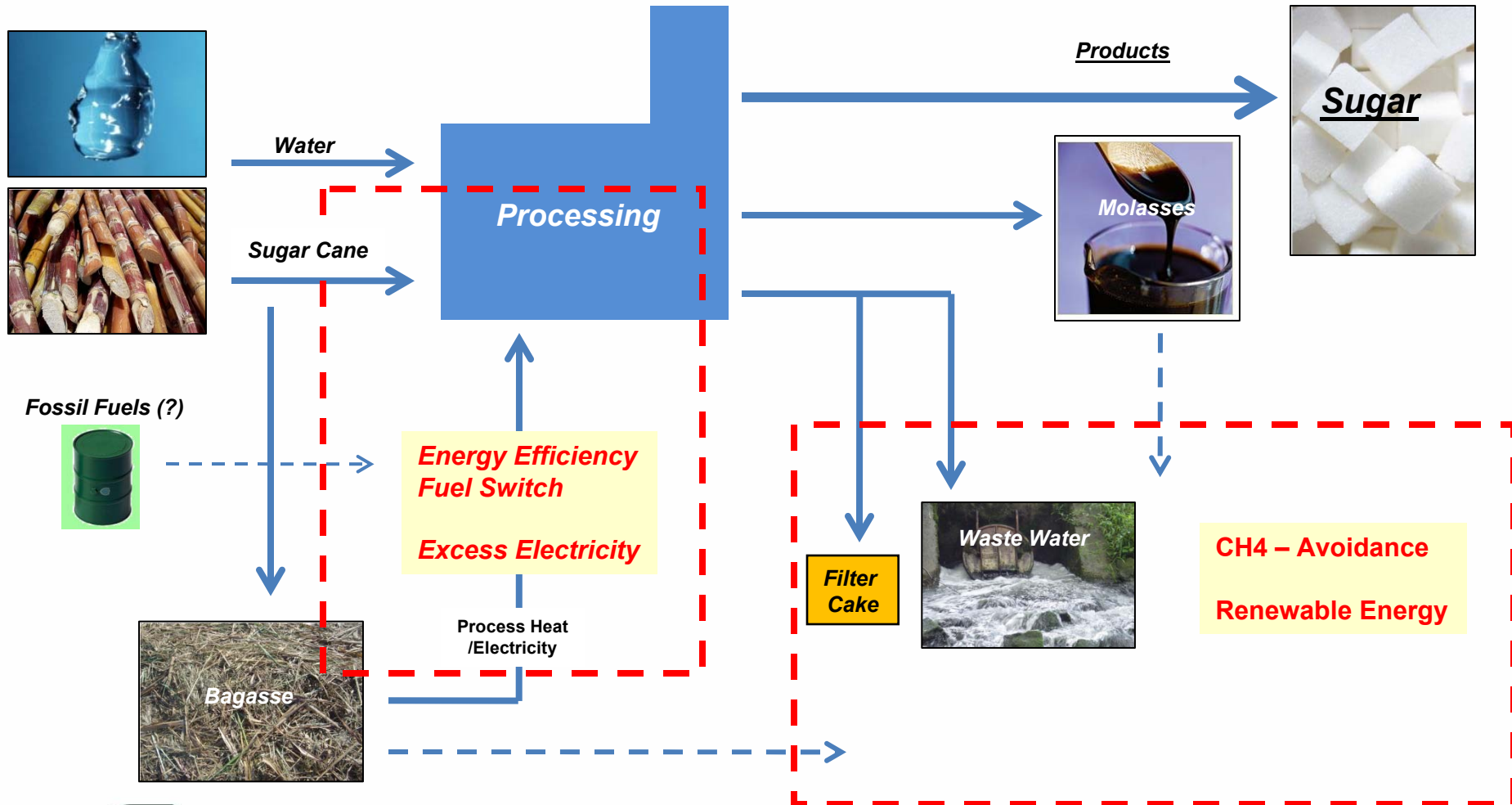
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# CDM Projects in the Sugar Industry



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# Project Approaches: CH4 avoidance / Renewable Energy

Existing treatment of waste water and organics leads to CH4 emissions released to the atmosphere (GWP=21):

- Anaerobic Lagoons
- Landfilling of Organic Wastes

Emission Reductions (ER) through:

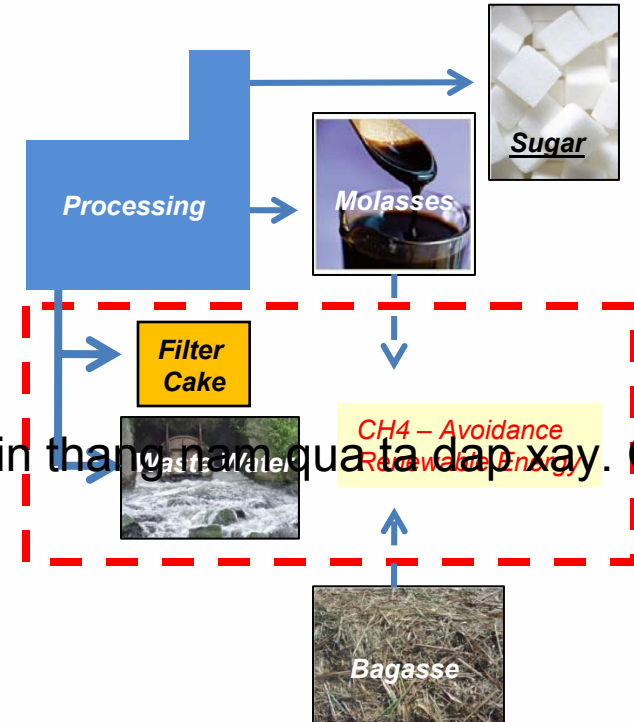
- Capture and destruction of CH4
- Electricity/Energy Generation
- Avoidance of CH4

Project Examples:

**Biogas Plant (Electricity/CHP)**

**Aeration Treatment**

**Composting**



open em, tra lai em loi yeu thuong em dem, tra lai em niem tin thang nam qua ta dap xay. Gi

**Potential ER strongly depend on existing treatment practise, COD levels, and legal requirements!**



# Project Approaches: Energy Efficiency / Fuel Switch

Fossil fuel utilization for energy production (heat and/or electricity) can be reduced and/or substituted:

- Reduction through efficiency measures (new boilers, different technology, etc)
- Replacing fossil fuel with excess bagasse or other biomass
- Excess electricity generation based on bagasse/biomass feeding to local grid

Emission Reductions (ER) through:

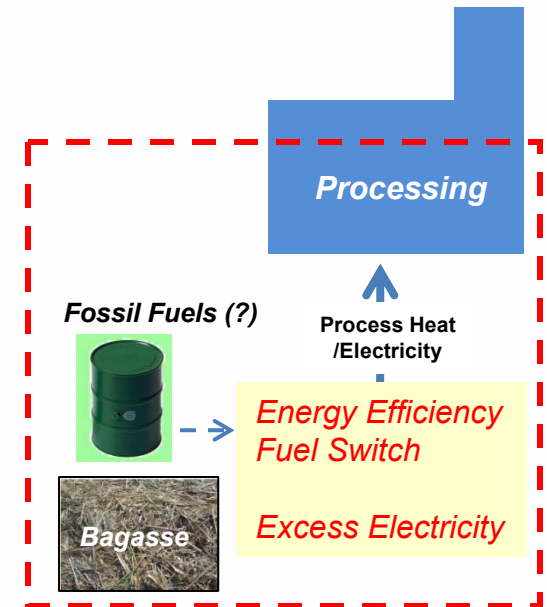
- Direct avoidance of fossil fuel oxidation
- Replacement of grid electricity (grid emission factor)

Project Examples:

**Thermal energy efficiency improvement**

**Bagasse based co-generation**

**Fuel Switch (and capacity extension)**



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# Project Examples: Bagasse based co-generation

Project Activity → ER through:

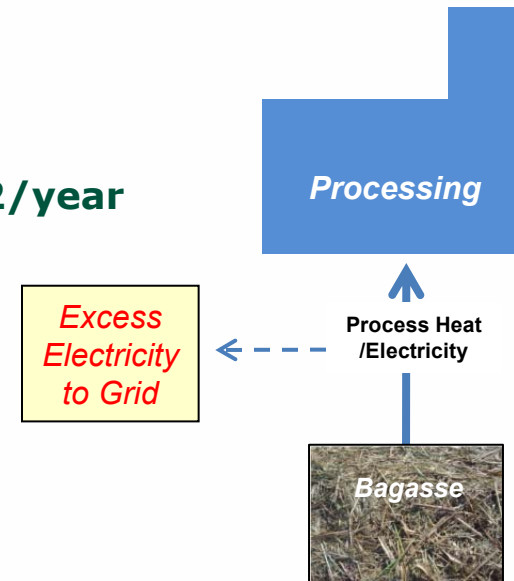
Satus: registered

“New Boiler for Bagasse utilization and back pressure turbine, both with extended Capacity, are introduced and grid electricity will be replaced!”

Assumed Electricity to the grid: 67.262 MWh

Grid factor: 0.896 tCO<sub>2</sub>/MWh

Estimated ER: **app. 60,000 tCO<sub>2</sub>/year**



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# Project Examples: Avoidance of CH4 & energy generation

Status: under validation

*"Advanced waste water management at Rajburi Sugar & Ethanol Plant"*

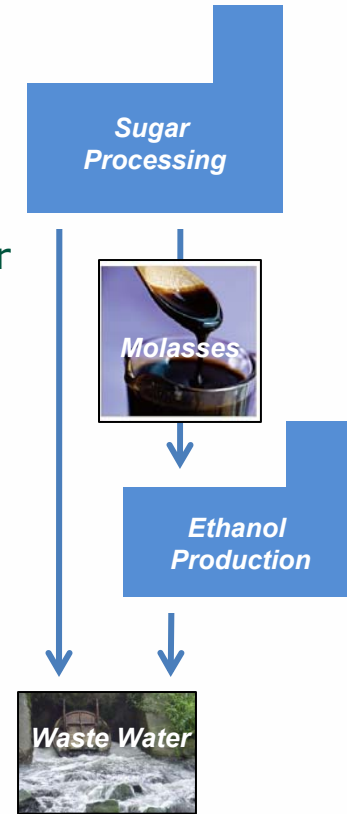
Project Activity → ER through:

"Replacement of open anaerobic lagoon system for treatment of wastewater from sugar and ethanol production facility by closed biogas digesters and generation of process heat"

Waste Water from

Sugar Plant:	1000 m <sup>3</sup> /day (Jan – March)
Ethanol Plant:	860 – 2010 m <sup>3</sup> /day
COD level:	85,000 – 150,000 mg/ltr.

Estimated ER: **app. 100,000 tCO<sub>2</sub>e/year**



**CH<sub>4</sub> – Avoidance  
Electricity Generation**



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# Project Examples: Fuels switch and excess electricity

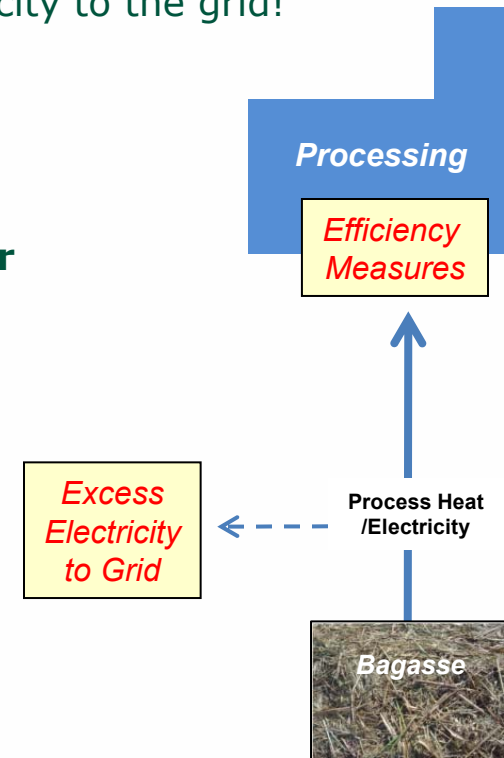
Project Activity → ER through:

Status: under validation

"Reduction of fuel oil consumption by new boiler and turbine system, efficiency measures within steam cycle and generation of excess electricity to the grid!"

Estimated ER:

**100,000 tCO<sub>2</sub>/year**



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# Project Overview in the Sugar Industry

## **40 registered projects using bagasse co-generation**

- Methodologies: 5 Methodologies
- Emission Reductions: 2,000 – 90,000 tCO<sub>2</sub>/yr

## **Ca. 130 projects in validation stage, also mainly bagasse co-generation, few energy efficiency and methane avoidance (with power generation)!**

- Methodologies: 11 Methodologies
- Emission Reductions: ca. 2,000 – 300,000 tCO<sub>2</sub>e/yr



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# Thank You

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