

Experience with rice husk fuelled power plant on Thailand

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Outline

- Project Overview
- Experience with rice husk power plant : developer's perspective
- Issues and Concerns


Project Overview

- Project Detail
- Concept and Design
- Environmental Aspect
- Project Participant

Project Overview : Details

- Plant Location : Horkai Sub-District, Bang Mun Nak District, Pichit Province, Lower Northern part
- Capacity: Gross 22 MW, Grid 20 MW
- SPP Firm-type 25 year
- COD : December 21, 2005
- Technology : Suspension – fired technology
- By Product : 1) Rice husk ash
2) Carbon Credit

Project Overview : Concept and Design

- Environment friendly technology
⇒ CDM Project  **CDM Table**
- Single Biomass Based Fuel – Rice Husk
⇒ Sale of Rice Husk Ash
- Corporate social responsibility based
⇒ Public Acceptance
- Small power plant scale
⇒ EPPO Subsidy
- Power generation and grid connected
⇒ Investment promotion

Project Overview : Environment Aspect

- Eliminate CH_4 from the rice husk left to decay and CO_2 from open-air burning
- NO_x and SO_2 emission is minimal
- Particulates and fly ash are captured by 3 cell of ESP
- Wastewater is Zero discharged



Project Overview : Project Participants

- **A.T.Biopower Co.,Ltd.**
- **Chubu Electric Power Co.,Ltd.**
- **Mitsubishi UFJ Securities Co.,Ltd.**
- **Rolls-Royce Power Venture Ltd.**
- **Al tayyar Energy Ltd.**
- **Private Energy Market Fund L.P.**
- **Finnish Fund for Industrial Co.,Ltd.**
- **Flagship Asia Corporation**

Experience with rice husk power plant : developer's perspective

1. Feasibility study and investment
2. Project Development
3. Financing
4. Project Implementation

Feasibility Study

- **Site Selection** => strategic location for rice husk supply  
- **Technology Selection** => more expensive but reliable and can get additional revenue from rice husk ash sales and carbon credit
- **Financial Aspect** => Risk of fuel supply and price is the key
- Rice husk delivered price
 - Feasibility study in 2002: THB 265 + 145 = 410
 - Actual: THB 550 + 250 = 800

Project Development

- Secure combustion Technology: McBurny from the U.S.A
- Secure EPC Contractor: Poyry, former Electrowatt
- CDM development : Develop PDD and get methodology approved – AM0004 (now ACM0006)
- Permit and License : PPA, EPPO subsidy, EIA, construction, electricity concession, BOI etc.
- Public participation
- Over 15 Rice husk supply agreements

Financing

- Payback period 9 years
- Debt financing 55%
- Equity financing 45%, including Subordinated Loan
- Investment: USD 34 million or USD 1.5 million / MW
- EPPO Subsidy for first 5 years at THB 0.169 per kWh
- Project IRR (USD 10 per ton CO₂)

Tax	RH 410 Bt wo CDM	RH 410 Bt w CDM	RH 800 Bt wo CDM	RH 800 Bt w CDM
Before	15.53%	16.75%	10.23%	11.50%
After	14.33%	15.46%	9.16%	10.53%

Project Implementation

- Construction 24 months from Dec 2003 - 2005
- Owner's Engineer by EGAT
- Operation and maintenance by Chubu Electric Power Thailand
- Fuel supply by ATB
- Rice husk ash and carbon credit sales by ATB
- Social Responsibility
 - 1) Social Contract and Funds
 - Community and Environmental Development Fund
 - During construction: THB 1 million
 - During operation 25 yrs: THB 1 million/yr
 - Environmental Guarantee Fund
 - During construction: THB 1 million
 - During operation 25 yrs: THB 5 million (replenishing)
 - 2) Tri-partite committee

Issues and Concerns

- Biomass is renewable, but not unlimited
- Risk of rice husk supply and price remains
- Risk even higher by “Adder” for new projects
- Developers can take manageable risk, but if without proper assessment of fuel supply in approval process, not only rice husk, it becomes unmanageable risk for all developers
- If that happened, developers loose business, government looses RE target, hence, opportunity and stability loss of the Country
- Balance of demand and supply of each fuel to be used in the proposed project site area must be taken into serious consideration by the authorities concerned

Thank You



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