

Due Diligence in Bio-Power and CDM projects

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The logo for Renewable COGEN Asia features the word "Renewable" in a green, rounded font with a small sun icon above the 'R'. Below it, "COGEN" is written in a bold, red, sans-serif font, and "Asia" is in a blue, italicized, sans-serif font. A small red wind turbine icon is positioned above the 'G' in "COGEN".

DUE DILIGENCE-PURPOSE

- Lenders
- Equity investors
- Insurance company
- Share buy-back



Due Diligence in Bio-Power Projects

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FUEL AVAILABILITY

- Long term fuel availability
- Daily, seasonal fluctuations
- Fuel competition
- Long term Fuel Purchase Agreement (FPA)

FUEL CHARACTERISTICS

- LHV of fuel
- Moisture content
- Proximate and ultimate analysis
- Seasonal variation in LHV and moisture

PLANT CAPACITY

- Optimum capacity
- Electricity demand
- Present and future situation
- Fuel supply security

POWER OFF-TAKE

- Number of off-takers
- Credit worthiness of off-takers
- Long term Power Purchase Agreement (PPA)
- Indexation (oil price, exchange rate)
- Escalation

SITE SELECTION

- Location, topography, soil strength
- Flood, earthquake risks
- Fuel supply, electricity off-take
- Availability of roads
- Availability of water
- Availability of grid
- Equipment transfer facilities

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TECHNOLOGY

- Proven technology
- Acceptable efficiency
- Acceptable availability
- Environmental compliance
- Project life
- Investment cost

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EQUIPMENT SELECTION

- Efficiency, investment cost, operating cost
- Equipment quality, automation
- Design suitability
- Combustion system
- Equipment type
- Safety margins
- Fuel flexibility

WATER AVAILABILITY

- During summer/drought season
- Historical availability
- Water quality
- River/stream water vs. ground water

EPC CONTRACTOR/EQUIPMENT SUPPLIER

- Track record
- Capability and reliability
- Plant performance
- Guarantees
- Payment terms and conditions
- After sale service
- Market presence
- Financial stability

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CONSTRUCTION CONTRACT

- Payment terms/conditions
- Payment schedules
- Performance guarantees
- Liquidated damages
- Contract law
- Arbitration

FINANCIAL MODELLING

- Gross power, parasitic load, net power
- Annual operating hours
- Fuel and electricity pricing
- Adequate escalations
- Investment cost
- Training and development cost
- Insurance

FINANCIAL MODELLING

- Working capital
- Tax rate
- Discount rate
- Interest, repayment period, grace period
- IRR, NPV
- Sensitivity analysis
- Debt service coverage ratio

EQUITY FINANCING

- Current status of the project
- Credibility of the project developer
- Credibility of other investors
- Commitment from investors
- Completion guarantee
- Equity drawdown

DEBT FINANCING

- Loan terms
- Repayment period
- Grace period
- Interest rate
- Interest during construction
- Debt-service coverage ratio
- Working capital
- Debt drawdown

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PROJECT SCHEDULE

- Practical schedule
- Design
- Manufacturing
- Transportation
- Erection
- Testing and commissioning
- Commercial operation and hand over

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PLANT OPERATION

- Operating team
- Qualification and experience
- Commitment
- Motivation

PLANT MAINTENANCE

- Maintenance team
- Qualification and experience
- Commitment
- Motivation
- Local maintenance companies

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PROJECT MANAGEMENT TEAM

- Experience of project developer
- Experience of consultant
- Experience of other stakeholders

INSURANCE DURING CONSTRUCTION

- Workmen's compensation insurance
- Automobile liability insurance
- Construction plant and equipment insurance
- Construction all risks insurance
- Third party liability insurance
- Marine and other transit insurance

INSURANCE DURING OPERATION

- Fire risks insurance
- Advanced loss of revenue insurance
- Operator's business interruption insurance
- Third party liability insurance
- Workmen's compensation insurance

TRAININGS

- During construction
- During operation
- Class room training
- Training manuals

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SAFETY MEASURE

- Safety standards
- Fire protections
- Occupational health

SWOT ANALYSIS

- Strength
- Weakness
- Opportunity
- Threat

PERFORMANCE GUARANTEE

- Availability guarantee
- Net Power output guarantee
- Completion guarantee
- Heat rate guarantee
- Environmental and noise level guarantee
- Warranty

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RISK MITIGATION MEASURES

- Technology risk
- Long term fuel supply
- Off-take of electricity
- Construction/operation risk
- Cost over-run risk
- Project performance related risk
- Environmental risk
- Force majeure risk

ENVIRONMENTAL DUE DILIGENCE

- Solid waste management
- Liquid waste management
- Pollution controls/limits
- EIA/IEE
- Compliance with local, national and international standards
- Environmental licensing and permits

PUBLIC CONSENTS

- Public acceptance
- Potential protests
- Public interest
- Job creation

LICENSE/PERMITS

- Key licenses/permits
- Timely approvals
- Budget provisions
- Compliance



Due Diligence in CDM Projects

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DUE DILIGENCE IN CDM PROJECTS

- CDM applicability
- Host country approval
- Host country regulations
- Sustainable development criteria
- EIA/IEE
- Environmental impacts

DUE DILIGENCE IN CDM PROJECTS

- Stakeholder selection
- Stakeholder consultation
- Financial additionality
 - Project returns with CER
 - Project returns without CER

DUE DILIGENCE IN CDM PROJECTS

- Technical additionality
- Common practice analysis
- Barrier analysis
- Public funding
- Technology transfer

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DUE DILIGENCE IN CDM PROJECTS

- Source of energy in the absence of the project
- Historical records
- Baseline emissions
- Project emissions
- Leakage

DUE DILIGENCE IN CDM PROJECTS

- Key assumptions
- Grid emission factor
- Diesel/fossil fuel emissions
- CER calculations
- Conservativeness

DUE DILIGENCE IN CDM PROJECTS

- CER: Estimation vs. Practicality
- CER realization
- Comparison of the technology details with the contracts
- Validation
 - Proof of all documents
- Verification
- Risks after 2012
- CER price risk

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- For more details:

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Thank You