Financing your wind farm: An overview of the technical due diligence process

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Wind Prospect
Built UK’s No 2 wind farm in 1992
1GW consented
100 wind farms constructed
Overview

• Introduction
  • Definitions
  • Due diligence by project phase

• Preparing for DD
  • Understanding your site
  • Permits
  • Contracts
    • TSA
    • Electrical
    • Civil
  • Warranties
  • Operations

• Q’s
The project is the bank security

In Project Finance the debt is secured against the project itself and serviced entirely from future cash flow through the SPV. This requires a detailed due diligence to identify and mitigate project risk.
Technical due diligence is a key part of the risk analysis method.

**Definition**
Critical evaluation of the technical fitness of an organisation, department or system.

**Benefit**
An improved understanding of risks

**Purpose**
To maximize the probability that risks are identified and mitigated or quantified to enable them to be borne by project finance.
Quantification and mitigation of risks enables the project to obtain finance

- Technical due diligence highlights and mitigates risk where possible by changing the design or contracts in a project.

- Alternatively a monetary amount is recommended to cover the possible risk.

- The project risk is balanced against the project returns in the financial model.
Due diligence by project phase

**Project development**

**Investment schedule**

**Development**

**Phase I**
- Identify principal risks
- Undertake studies
- Address issues in design and contracts
- Recommendations for further work

**Phase II**
- Financial due diligence, identification and mitigation of risks

**Phase III**
- Regular site visits
- Monitor progress and cost control
- Advice Investors on technical issues

**Phase IV**
- Regular site visits
- Monitor progress and cost control
- Analyse operational data
- Advice Investors on technical issues

**Project execution**

**Financing**

**Monitor construction**

**Monitor operation**

**Project operation**

22 – 24 February 2010, ICC, Durban, South Africa  
www.powerindaba.com
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  - Contracts
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    - Electrical
    - Civil
  - Warranties
  - Operations
Preparing for DD

1. Financial Documents, Budgets, Models, Term-sheets

2. Legal – Property, Construction Contracts, PPA, Facility Agreement

3. Technical – Site Studies, Planning Compliance, Grid Connection, PPA, Construction Contracts, Operation contracts
Understand your site

- Wind resource
- Ground
- Climate
- Access
- Environmental situation
  - Proximity to people: noise, shadow flicker, visual
  - Flora/fauna
  - Archaeology
Undertake adequate studies early to save time and costs

- How are sites initially assessed
  - Wind speeds measured on site
  - Stability, topography, and hydrology
  - Access
  - Land use & Location
  - Proximity to dwellings, scenic or protected areas, forestry etc.
  - Grid Availability

- These studies are the basis for the Initial Site Layouts, Land Options, Energy Capture Report, Planning EIA, Grid Connection etc.

- If they are done correctly life is easier, and less expensive, during Due Diligence and Project Construction

Effect on Project Finance → Delay in financing, size of debt
What Sponsors Can do → Undertake adequate studies early to save time and costs
Permits

- Need to be in place....
- Environmental and planning permits (country specific)
- Needed for all aspects of project, not just turbines. Basic EIA for met mast needed in SA.
- Conditions in permits to form part of specification in construction contracts and monitored during construction and operation.
- Equator principles need to be considered if funds provided by multilateral banks.

Effect on Project Finance → Delay in financing
What Sponsors Can do → Permits in place, details in contracts to reflect project reality
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Projects have a web of contracts which need to interact seamlessly with each other.
Key contract interface risks

- Interface Risk
- Who’s at fault for defective installation?
- Who’s at fault for delays? – chain of contractors
- Scope of work
- EPC/wrap

Key Handover Milestones – Delay risk
1) Foundation handover to turbine mfr
2) Electrical handover
3) Cable go live date

Key Design and Installation Interface Risks – Defects Risk
1) Foundation/Turbine connection (both design & installation)
2) Grid code compliance between Electrical system/Turbines
3) Cable handover from manufacturer to cable installer – cable tests

Effect on Project Finance → Size of Contingent Funding for Delays & Cost Overruns
What Sponsors Can do → Minimise interface risk, allow enough bad weather days, employ experienced project manager
Turbine supply agreement should contain

- FIDIC Silver or Yellow Book Form of Contract
  - Enercon, Vestas, Siemens, Nordex
- Bespoke Form of Contract
  - Gamesa, Enercon, GE
- A WTG Contract should contain:
  - Executed Direct Agreement
  - Grid compliance conditions
  - Binding route access study
  - Site suitability/Site data
  - Health and Safety provisions
  - Corporate Guarantee, Performance & Payment Guarantees
  - Suitable liability and insurances
  - Detailed scope of work
Turbine supply agreement DD checks

- Site Suitability
  - Wind speed and turbulence
  - Layout
  - Turbine certification
- Safety and Reliability (Track record for WTG model)
- Grid Compliance
- Tests on completion
- Compliance with Planning Conditions
  - Dimensions
  - Noise
  - Shadow flicker
- Scope of supply
- SCADA provision, access to data

Effect on Project Finance → Delay in financing

What Sponsors Can do → Work with experienced WTG providers, negotiate industry standard contract
Electrical works contract should contain

- FIDIC Yellow Book Form of Contract
- An Electrical Works Contract should contain:
  - Executed Direct Agreement
  - Grid connection agreement
  - Grid compliance conditions
  - Health and Safety provisions
  - Corporate Guarantee, Performance & Payment Guarantees
  - Suitable liability and insurances
  - Clear scope of works and interfaces
  - Overall project programme and co-operation clauses
Electrical contract DD key points

- Contractor experience and health and safety record
- Cable loss guarantee
- Grid compliance
- Design studies
- Scope of supply
- Interfaces!!!

Effect on Project Finance  $\rightarrow$ Greater contingency funds needed

What Sponsors Can do  $\rightarrow$ Adequately develop design and scope, use experienced contractor
Civil works contract should contain

- FIDIC Yellow/Red Book Form of Contract
- ‘Design and Build’ or Build to ‘Employer design’
- A Civil Works Contract should contain:
  - Executed Direct Agreement
  - Health and Safety provisions
  - Ground Risk
  - Testing of Works (incl. Roads)
  - Clear scope of works and interfaces
  - Turbine manufacturer requirements
  - Overall Project programme and co-operation clauses
  - Planning Conditions and Leased Areas
  - Suitable liability and insurances
  - Performance guarantee, retention
Civil contract DD key points

• Site stability
• Contractor experience and safety track record
• Sub-contractor experience eg foundation design.
• Scope of supply
• Interfaces!!!
• Compliance with Planning Conditions
  • Programme restrictions
  • Construction methodology
  • Spoil Disposal

Effect on Project Finance → Greater contingency funds needed
What Sponsors Can do → Adequately develop design and scope, use suitable contractor
Land agreement key points

- Land agreement review
  - Signed?
  - Cost and payment
  - Turbine size
  - Cover site access
  - Rights granted
- Affect turbine location which can impact energy yield, access.
- Land ownership rights

Effect on Project Finance → Delay in financing
What Sponsors Can do → Details in land agreement to reflect final project
Warranties 1

- Defects guarantee
  - TSA, Civil, Electrical
- Electrical losses guarantee
  - Electrical
- Power curve guarantee
  - TSA or O&M contract
- Sound power level guarantee
  - TSA or O&M contract
- And.....

Effect on Project Finance → Greater contingency funds needed
What Sponsors Can do → Assess warranties during contract negotiation.
Warranties 2

- Availability guarantee
  - TSA or O&M contract
  - Be aware of definition
  - Parts and maintenance
  - Availability guarantee only?
  - What’s counted as “available”?
  - Watch out for scheduled maintenance
  - LDs

Effect on Project Finance → Greater contingency funds needed
What Sponsors Can do → Assess warranties during contract negotiation.
Due diligence by project phase

Phase I
Identify principal risks
 Undertake studies
 Address issues in design and contracts
 Recommendations for further work

Phase II
Financial due diligence,
Identification and
mitigation of risks

Phase III
Regular site visits
Monitor progress and cost control
Design reviews
Advice Investors on technical Issues

Phase IV
Regular site visits
Monitor progress and cost control
Analyse operational data
Advice Investors on technical Issues
Operations

- Important to consider operation during preconstruction stage.
  - Location of service provider to wind farm
  - Size of servicing team
Turbine O&M agreement key points

• Start date
• Availability guarantee
• Transparency of maintenance, clear reporting
• Location of service provider to wind farm
• Size of servicing team

Effect on Project Finance → Cash flow, risk of low availability without damages payable
What Sponsors Can do → Negotiate agreement, check provider’s location etc.
Operations management contract should contain

- Provision for management of requirements under other contracts, e.g., Grid connection agreement, PPA.
- Management of turbine operator
- Balance of plant maintenance to WTG spec
- Financial administration of the project
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• Conclusions
Current credit conditions

At a practical level, current credit conditions have resulted in:

• Higher bank margins.
• Lower debt to equity ratios.
• Banks carrying out more comprehensive due diligence (thus increasing transaction costs).
• Projects taking far longer to reach financial close.
therefore... Conclusions

- Undertake all studies early and mitigate risks in design and contracts.
- Ensure all permits and leases are in place and are adequate.
- Use known technology, check suppliers will have maintenance base close to site.
- Robust project contracts, engage bank prior to signing contract.

Effect on Project Finance → Greater likelihood of success
What Sponsors Can do → Follow above steps!
Thank you!