

# Designing a Carbon Project - Good Engineering vs. Good Carbon Engineering



# Introduction

## ➤ Construction engineers are trained to:

- Deliver practical solutions
- Comply with specific engineering codes
- Execute build to recognized industry standards
- Use plant and equipment fit for intended purpose
- Maintain workmanship standards
- Comply with HSE regulations
- Adhere to agreed timeline and budget
  
- → GOOD VALUE ENGINEERING

# Introduction

## ➤ The problem in the carbon world:

- Engineers are merely used to construct others' decisions
- Importance of including the engineers from early stage is not well understood
- → Leaving major decisions to non-engineers:
  - “Carbon experts”
  - Traders
  - Bankers, accountants, lawyers, etc.

# Introduction

## ➤ The problem in the carbon world:

- → Leaving major decisions to non-engineers:
    - Early decisions require:
      - Understanding of project's mechanics
      - Knowledge and experience to be able to assess:
        - » Environmental impacts
        - » Social harm
- (2 outputs of poorly engineered works)

# Good Engineering Decisions

- Ability to impact quality of everyday lives
  - Example:
    - Economic, environmental, social upside of remediating air and water polluting dumpsites
    - Bonus of “green” electricity



# Engineering and Carbon: the story so far

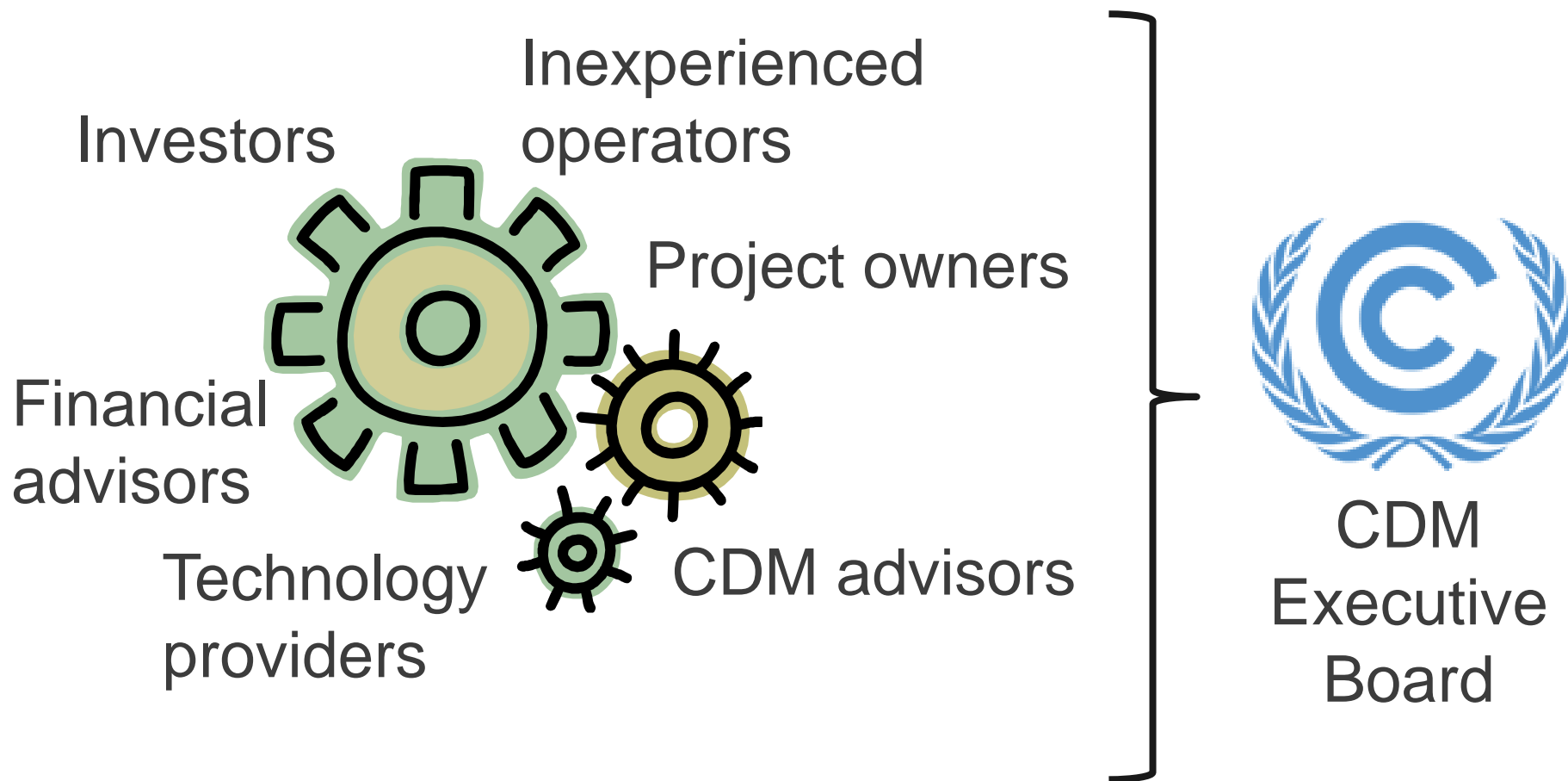
- Project underperformance
  - Construction delays
  - Poor modeling of emission reductions
  - Inadequate monitoring equipment
  - Others...
- → Main reason: developers ignore benefits of early engineer involvement





# Engineering and Carbon: the story so far

- Carbon projects = collection of “moving parts”
  - CDM example:



# Engineering and Carbon: the solution

- Many aspects of carbon project cycle lie outside developer's influence
- → Minimize risk through aspects within control
  - Paying attention to engineering parts at:
    1. Due diligence
    2. Works execution
    3. Operational performance
  - → VALUE ENGINEERING





# Engineering and Carbon: the solution

- Value engineering:
  - Quality oriented
  - Strict due diligence and execution
  - Target economically sound projects
- → Maximize group's experience and stakeholder's value
  - Ensure best applicable standards
  - Maximize cost-benefit relationship
  - Employ proper technology
  - Design proper carbon-coupled monitoring system

# Recommended Approach

## 1. Project idea assessment

2. Call for interest
3. Enquiry document
4. Site walkover
5. Questions & answers
6. Proposal submission
7. Proposal evaluation
8. Value engineering
9. Final decision
10. Project management
11. Project operation

- Initial project idea review
  - Proposed technology
  - Feasibility
  - Capability of generating benefits
  - Economics test
  - Potential risks

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- Search supplier database
- Don't expect one turn-key supplier
- Contact candidates
- Receive expressions of interest

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- Detailed document
  - Guide for suppliers
  - Include all needed tools
    - Project requirements
    - Carbon methodology guidance
    - Site-based information
    - Site visit questionnaire
    - Supplier response templates

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- Invite pre-qualified suppliers
- Encourage questions
- Record all data
- Measure and collect information requested



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- Period for submission of additional questions
- Engineering team addresses questions
- Compilation of Q&A document
- Distribution to all participants



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- Allow time for preparation of proposals
- Proposals should include:
  - Technology
  - Reference projects
  - Detailed CAPEX/OPEX library
  - Suggested approach
  - Timeline

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- Detailed evaluation of submissions
- Request clarifications / corrections
- Target: identify 2-3 finalists
- Criteria:
  - Technology efficiency
  - Cost effectiveness
  - Relevant experience
- Ensure monitoring equipment compatibility with carbon methodology

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- Dig deep into budget
- Target: good technical solution without over-paying

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- Present final offers to project proponent
- Advice on your best choice
- Allow project proponent to:
  - Take final decision
  - Contact winner

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- Get involved in project execution
- Make sure delivery dates are met
- Ensure contract terms are respected
- Support proponent in supervision
  - Industry standards
  - Build performance
  - HSE regulations

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- Visit periodically
- Communicate with operators to ensure proper:
  - Operation
  - Data collection and storage



# Conclusion

- Sound engineering in carbon projects is critical
  - Ensures well-managed carbon process
  - Minimizes under-performance risks
- Engineers need to get involved from early stage

