

## Project Overview

This case study outlines the key financial and operational details of a proposed wind farm project with a total capacity of 250 MW. The project involves a Power Purchase Agreement (PPA) with an initial price of \$112.5 per MWh, escalating at 2% per annum. The development cost is estimated at \$10,000,000, while the construction cost is projected to be \$1,500,000. The wind farm is expected to operate for 30 years.

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## Project Timeline

- **Development Period:** 12 months
  - **Start Date:** 01/01/2022
  - **End Date:** 12/31/2022
- **Construction Period:** 24 months
  - **Start Date:** 01/01/2023
  - **End Date:** 12/31/2024
- **Operations Period:** 360 months (30 years)
  - **Start Date:** 01/01/2025
  - **End Date:** 12/31/2054

## Debt Financing

- **Debt Period:** 252 months (21 years)
    - The debt period begins at the start of the operations period and continues for 21 years.
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## Financial Details

- **PPA Price:** \$112.5 per MWh
  - **PPA Escalation:** 2% per annum
  - **Project Development Cost:** \$10,000,000
  - **Construction Cost:** \$1,500,000
  - **Capacity Factor:** 90%
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## Project Phases

1. **Development Phase (01/01/2022 - 12/31/2022)**
  - **Cost:** \$10,000,000

- This phase involves securing permits, conducting feasibility studies, and finalizing the PPA agreement.
  - 2. **Construction Phase (01/01/2023 - 12/31/2024)**
    - **Cost:** \$1,500,000
    - This phase includes the procurement of wind turbines, construction of infrastructure, and grid connection.
  - 3. **Operations Phase (01/01/2025 - 12/31/2054)**
    - **Revenue Generation:** Begins at \$112.5 per MWh with a 2% annual escalation.
    - The wind farm is expected to operate at a capacity factor of 90%, ensuring a high utilization rate and steady revenue stream.
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## Revenue Projections

To estimate the annual revenue, we calculate the energy production and apply the PPA price, including the escalation.

1. **Annual Energy Production:**
  - Total capacity: 250 MW
  - Capacity factor: 90%
  - Hours in a year: 8,760
  - Annual Energy Production =  $250 \text{ MW} * 0.90 * 8,760 \text{ hours} = 1,971,000 \text{ MWh}$
2. **Annual Revenue:**
  - Initial year PPA price: \$112.5 per MWh
  - First year revenue:  $1,971,000 \text{ MWh} * \$112.5 = \$221,737,500$
  - Subsequent years' revenue increases by 2% annually due to PPA escalation.

## Example Calculation for Subsequent Years:

- Year 2 PPA price:  $\$112.5 * (1 + 0.02) = \$114.75 \text{ per MWh}$
- Year 2 revenue:  $1,971,000 \text{ MWh} * \$114.75 = \$226,172,250$

This pattern continues for the 30-year operations period, providing a predictable and increasing revenue stream.

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## Debt Repayment

- The debt repayment period spans 252 months, aligning with the early years of the operations period.

- A detailed debt repayment schedule will be created to ensure alignment with the revenue inflows and maintain project viability.