Valuing Merchant Power Plants

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Fair Market Value

The amount at which property would change hands between a **willing seller** and a willing buyer when neither is acting under compulsion and when both have reasonable knowledge of the relevant facts.
Valuation Premise

- **Value in Use**
  - Ongoing operation sold with all necessary assets
    - equipment
    - contracts
    - assembled work force
    - goodwill

- **Value in Exchange**
  - Piecemeal liquidation of equipment
  - Assets removed from site, no installation value
  - Intangible asset value typically zero
Due Diligence for Appraising Merchant Power Plants

- **Income Approach**
  - Forecast revenue and expenses
  - Estimate federal and local tax burden
  - Develop appropriate discount rate

- **Market Approach**
  - Ratio analysis of guideline publicly traded companies
  - Compare to selling price of similar units

- **Cost Approach**
  - Replacement cost new
  - Less depreciation
    - Physical, functional, economic
Income Approach

FMV = \sum_{n=1}^{n=t} \frac{Revenue - Fuel Cost - O&M - Taxes - Clean Up Cost}{(1 + r)^n}

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Market Value V. Rate of Return

<table>
<thead>
<tr>
<th>Market Value</th>
<th>Rate of Return</th>
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</thead>
<tbody>
<tr>
<td>$1,000,000</td>
<td>10.00%</td>
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<tr>
<td>$10,000,000</td>
<td>15.00%</td>
</tr>
<tr>
<td>$100,000,000</td>
<td>20.00%</td>
</tr>
<tr>
<td>$1,000,000,000</td>
<td>25.00%</td>
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<tr>
<td>$10,000,000,000</td>
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<td>$100,000,000,000</td>
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<td>$10,000,000,000,000</td>
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Capital Asset Pricing Model

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<table>
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</thead>
<tbody>
<tr>
<td>Risk free rate of return</td>
<td>20-year treasury bonds</td>
<td>6.7%</td>
</tr>
<tr>
<td>Equity risk premium</td>
<td>NYSE return</td>
<td>7.4%</td>
</tr>
<tr>
<td>Beta</td>
<td>Price volatility</td>
<td>1.3</td>
</tr>
<tr>
<td>Excess small company risk premium</td>
<td>Ibbotson Associates</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Equity rate = 6.7 + (7.4 × 1.3) + 2.5 = 18.9%

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Weighted Average Cost of Capital (WACC)

- Equity Rate = 18.9%
- Effective marginal tax rate = 40%
- Reasonable Debt/Equity assumption = 50/50
- High yield bond rate = 9.5%

\[
\text{WACC} = 0.5 \times 9.5 \times (1 - 0.4) + 0.5 \times 18.9 \\
\text{WACC} = 14.8\%
\]
Cost Approach

- Significant physical assets provide barriers to new competition
- Banks generally lend on tangible assets
- Hidden assets may be uncovered
- Liquidation value can minimize downside risk
- Identifies intangible assets
Obsolescence to Consider

- Physical
  - Usually dependent on age of facility and maintenance
- Functional
  - Some areo gas turbines have had problems operating continuously at 100%
- Economic
  - Long term gas prices
  - Future sales at less than full output has significant effect on efficiency
Hidden Assets

- Assumable tax exempt financing
- Air permit in non-attainment area
- Fair market value of land
- Excess buffer land
- Dual fuel capability
- Purchase price may set lower assessment for property taxes
- Complete inventory of maintenance items
- GT turbine lease program
- Redundant pumps/motors