

# Assessment

March 2022

# Assessment Question

- Look at the CCGT power station model we created
- Assume that the capex and opex calculations remain the same
- Change the following assumptions:
  - Capacity – 1000MW
  - Gas price is \$3.00/mmbtu
  - Electricity price is US\$60/MWh
  - Load factor is 80%
  - Carbon price is US\$40/tonne
  - Corporate Tax is 20%
  - Efficiency is 54%, Capex is \$978/KW, Opex is \$11/KW Fixed and \$3.5/Kwh variable. Construction time is 3 years, project life is 20 years
- For the WACC assume that the debt:equity split is 50:50, change the interest rate to 4% and the equity return to 12%



1. What is the WACC for the project?
2. What is the NPV of the project, and what is the IRR? What is the payback period?
3. What is the breakeven electricity price for the project?
4. What is the breakeven gas price for the model?
5. Questions on sensitivity
  - a) What happens if the gas price doubles?
  - b) What electricity price is needed for the project to breakeven if the load factor falls to 20% (assume gas price of US\$2.00/mmbtu again)
  - c) If the carbon price triples, what electricity price is needed to allow the project to breakeven (load factor back to 80%)?
  - d) If the load factor falls to 10% what capacity payment would you ask for (carbon price back to \$40)?



6. In one or two paragraphs (c.300 words), describe the key features of the investment and whether you would recommend it to your management
  - a) Provide a brief overview of the project
  - b) Highlight the key economic results
  - c) Discuss the sensitivities and risks
  - d) Try to create one graph to demonstrate a key point
- Please send me your model so I can see your workings
- Please write answers in a Word or Pages document and use graphs where appropriate



## 8. Look at the shale gas model

- What is the breakeven gas price?
- What is the most important of the sensitivities other than the gas price?
- What is the payback period?
- At what WACC does the  $NPV=0$ ? (original assumptions)

## 9. Is there an optimal gas price at which both the power plant and the gas field can make good returns?

- In one paragraph describe your thoughts

