



THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

A RECOGNIZED INDEPENDENT CENTRE OF THE UNIVERSITY OF OXFORD



Assessment Practice

April 2021

The Economics of Energy Corporations (2)

Homework Question

- Look at the CCGT power station model we created
- Assume that opex and capex calculations remain the same
- Change the following assumptions:
 - Capacity – 800MW
 - Gas price is \$2.50/mmbtu
 - Electricity price is €55/MWh
 - Utilisation/Load factor is 90%
 - Carbon price is €50/tonne
 - Corporate Tax is 20%
 - Efficiency is 54%
- For the WACC assume that the debt:equity split is 65:35, change the interest rate to 4.5% and the Beta to 0.8



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. In one paragraph and using one graph, describe the key features of the investment and whether you would recommend it to your management
 1. Remember to mention some other key assumptions



- Questions on sensitivity
 - What happens if the gas price doubles?
 - What electricity price is needed for the project to breakeven if the load factor falls to 20% (assume gas price of US\$2.50/mmbtu again)
 - If the carbon price doubles, what electricity price is needed to allow the project to breakeven (load factor back to 90%)?
 - If the load factor falls to 10% what capacity payment would you ask for (carbon price back to \$50/t)?
- Look at the shale gas model. What adjustments would you make to either or both models to allow the shale gas field and the power plant to work together profitably?
- 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

