

Carbon costing

Initial thoughts

Introduction

- ◆ Discuss concepts
- ◆ Carbon vs. Constraint on normal distribution

- ◆ Meeting a target or incremental improvement
- ◆ Time frame – how far can we look forward ?
 - ◆ Data SYS
 - ◆ Contracted - ? Viable projects and closures
- ◆ Project by project
 - ◆ What are the criteria for deciding if they would advance

Costing the benefits

- ◆ Baseline, how much more will connect
 - ◆ What is the improvement of each against baseline
 - ◆ Improvement of socialisation over cost reflective
- ◆ What plant is displaced – abatement factor
 - ◆ Varies with demand
 - ◆ Part loading
 - ◆ Increase in losses
 - ◆ Load factor of renewables – location dependant
- ◆ What & where will the new plant be built
 - ◆ CAP164 covers all plant
- ◆ What can come forward
 - ◆ Local consents
 - ◆ Availability of plant

Costing the benefits (2)

- ◆ CO2 cost of plant?
- ◆ Any impact on level on consumption
 - ◆ i.e. increased price less production
- ◆ New plant

Comparing constraint and carbon

- ◆ Both 'costs' have a number of variables
- ◆ Constraint
 - ◆ Price
 - ◆ Incidence (interactive with volume)
- ◆ Carbon
 - ◆ Price
 - ◆ Carbon abatement (MW for MW)
 - ◆ Interactive with volume (which plant is constrained)
 - ◆ Interactive with incidence (as MW increases)

Normal distribution calculation

- ◆ Constraint

- ◆ Price*Incidence*load factor*period (8760)

- ◆ Range

- ◆ Price - £10/MWh to £80/MWh

- ◆ Incidence – 15% to 40%

- ◆ Carbon

- ◆ Price*abatement*load factor*period (8760)

- ◆ Range

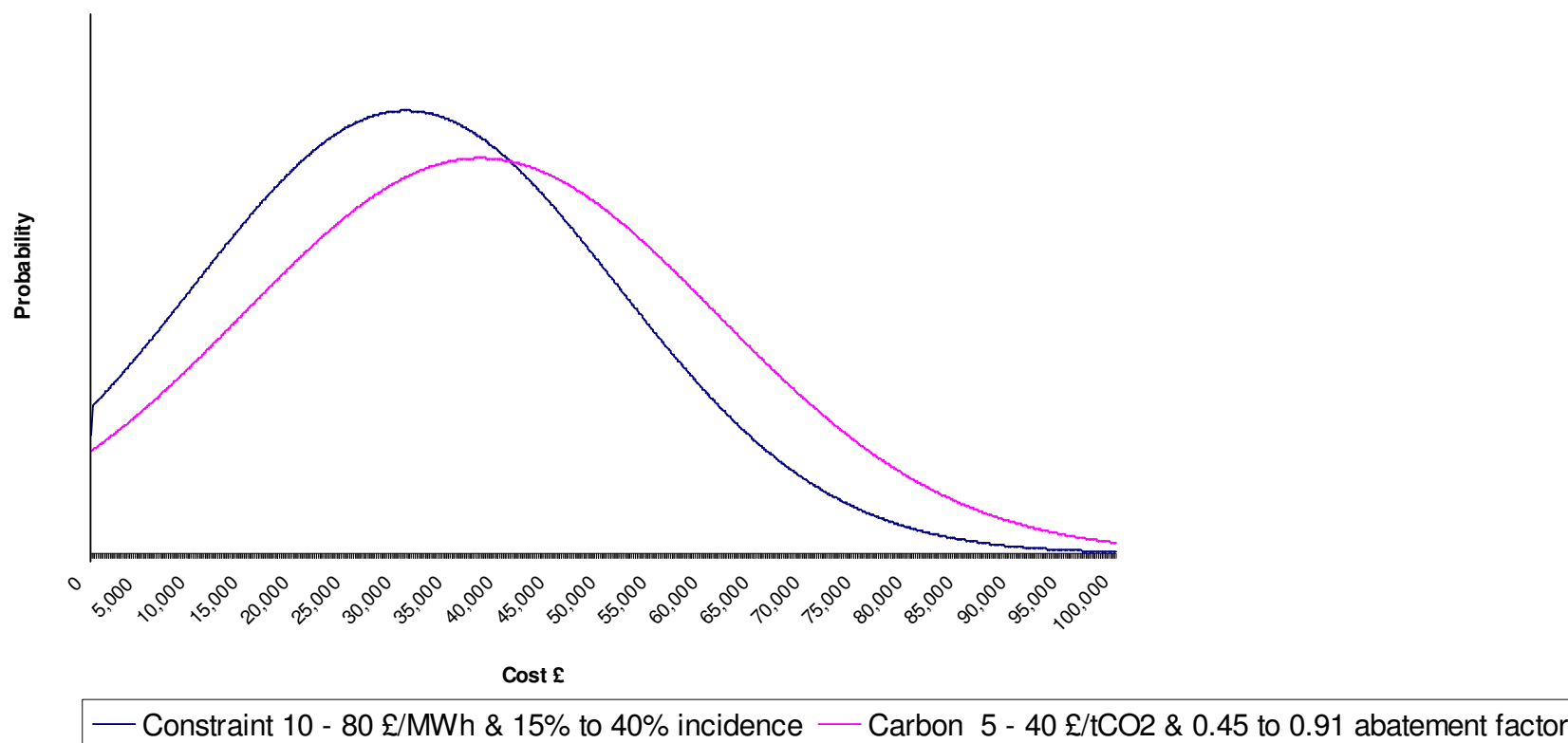
- ◆ Price £5/tCO₂ to £40/ tCO₂

- ◆ Abatement 0.45 to 0.91

- ◆ Create range, convert to normal distribution

Normal distribution result

Normal distribution of Carbon and Constraint Costs



What does it show ?

- ◆ For some assumptions constraint are more expensive.....

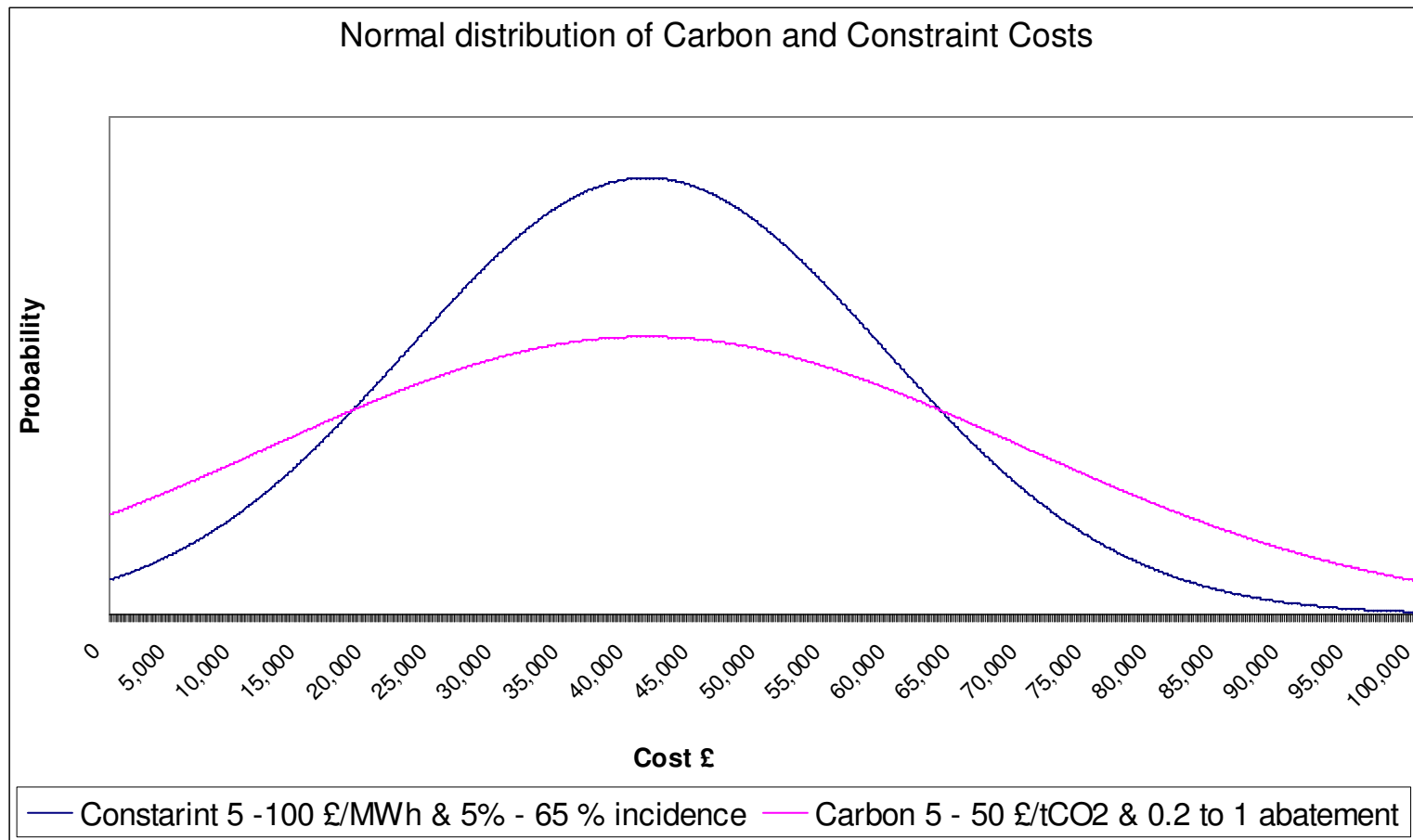
Issues

- ◆ Incidence & price of constraints varies significantly by zone
- ◆ Abatement varies greatly by demand (what plant is being displaced)
- ◆ Cost of part loading
 - ◆ Impact on abatement
 - ◆ Impact on SO costs

Wider ranges

- ◆ Constraint cost
 - ◆ Price from £5/MWh to £100/MWh
 - ◆ Incidence from 5% to 65%

Wider ranges



Conclusion

- ◆ Assumptions
 - ◆ Need to firm up
 - ◆ Other variables
 - ◆ Zonal analysis
- ◆ Are the variable normal distribution or on/off?
- ◆ To justify socialisation - How much additional plant will come forward with connect and manage over the cost reflective models?