

Assessing Low Carbon Power Technologies as the Key to Deployment

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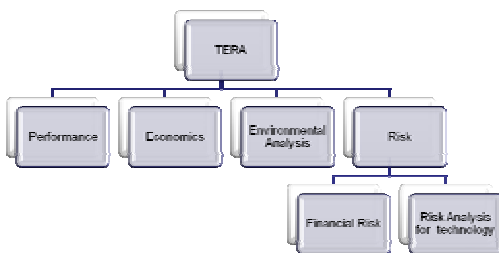


Source: www.sciencedaily.com

In the context of CO₂ emissions reduction, as prescribed by the Kyoto protocol, the application of the TERA to a selection of power plants can provide relevant information for the individuation of low carbon energy systems suitable for near future investments.

The TERA Approach

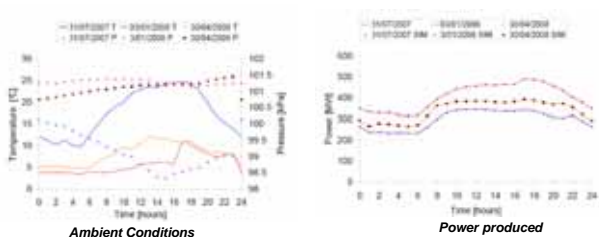
The TERA methodology, under development at Cranfield University, involves a techno-economic environmental risk assessment of the power plant under evaluation.



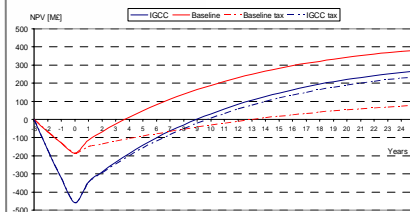
Basic philosophy of TERA

Power Plant Performance Analysis

The core of the TERA is a detailed thermodynamic model of the power plant. The performance of the power plant is assessed in a wide range of operating conditions considering detailed load profiles and seasonal variations of ambient conditions.

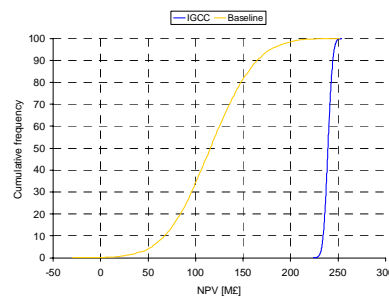


Economic and Financial Risk Analysis



Cumulative discounted cash flows

The economic assessment is performed calculating the following parameters: NPV, PBT, IRR and COE.

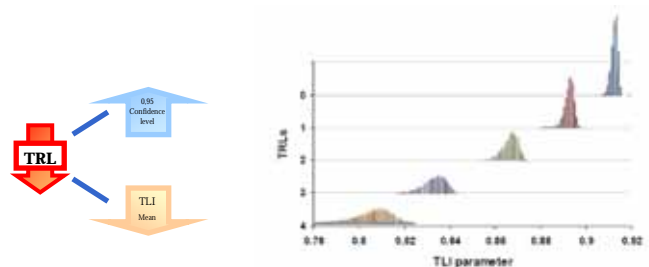


Montecarlo simulation

A Montecarlo analysis is also undertaken in order to provide a measure of the financial risk associated with the investment.

Risk Analysis for Technology

The second level of risk examined is from the perspective of the technologies employed with focus on technological maturity.



Connection between TRL and TLI parameter

Correlation between TRLs and TLI parameter

Future Work & Conclusions

The TERA approach can be used effectively for assessing advanced power generation schemes.

Future work will focus on improving environmental analysis and on applying technology risk analysis in gas turbine multidisciplinary design.