

## The Delaying Influence of Degradation on the Divestment of Gas Turbines for Associated Gas Utilisation: Part 1

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**Abstract :** An important feature of the exploitation of associated gas as fuel for gas turbine engines is a declining supply. So when exploiting this resource, the divestment of prime movers is very important as the fuel supply diminishes with time. This paper explores the influence of engine degradation on the timing of divestments. Hypothetical but realistic gas turbine engines were modelled with Turbomatch, the Cranfield University gas turbine performance simulation tool. The results were deployed in three degradation scenarios within the TERA (Techno-economic and environmental risk analysis) framework to develop economic models. An optimisation with Genetic Algorithms was carried out to maximize the economic benefit. The results show that degradation will have a significant impact. It will delay the divestment of power plants, while they are running less efficiently. Over a 20 year investment, a decrease of \$0.11bn, \$0.26bn and \$0.45bn (billion US dollars) were observed for the three degradation scenarios as against the clean case.

**Keywords :** economic return, flared associated gas, net present value, optimization

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