

Kam Wing Vincent LO Supervised by Professor Sue Grimes

Department of Civil and Environmental Engineering, Imperial College London

Introduction

Landfill operation and process control is complicated by the fact that fuel quantity and quality varies significantly over time, and indeed as a result of diversion of wastes from landfill sites, gas collection rates are now in decline at the vast majority of the sites in the UK. There is a need to assess the performance of existing plant and equipment and plan for future changes as gas yields continue to decline.

Performance of different types of engines

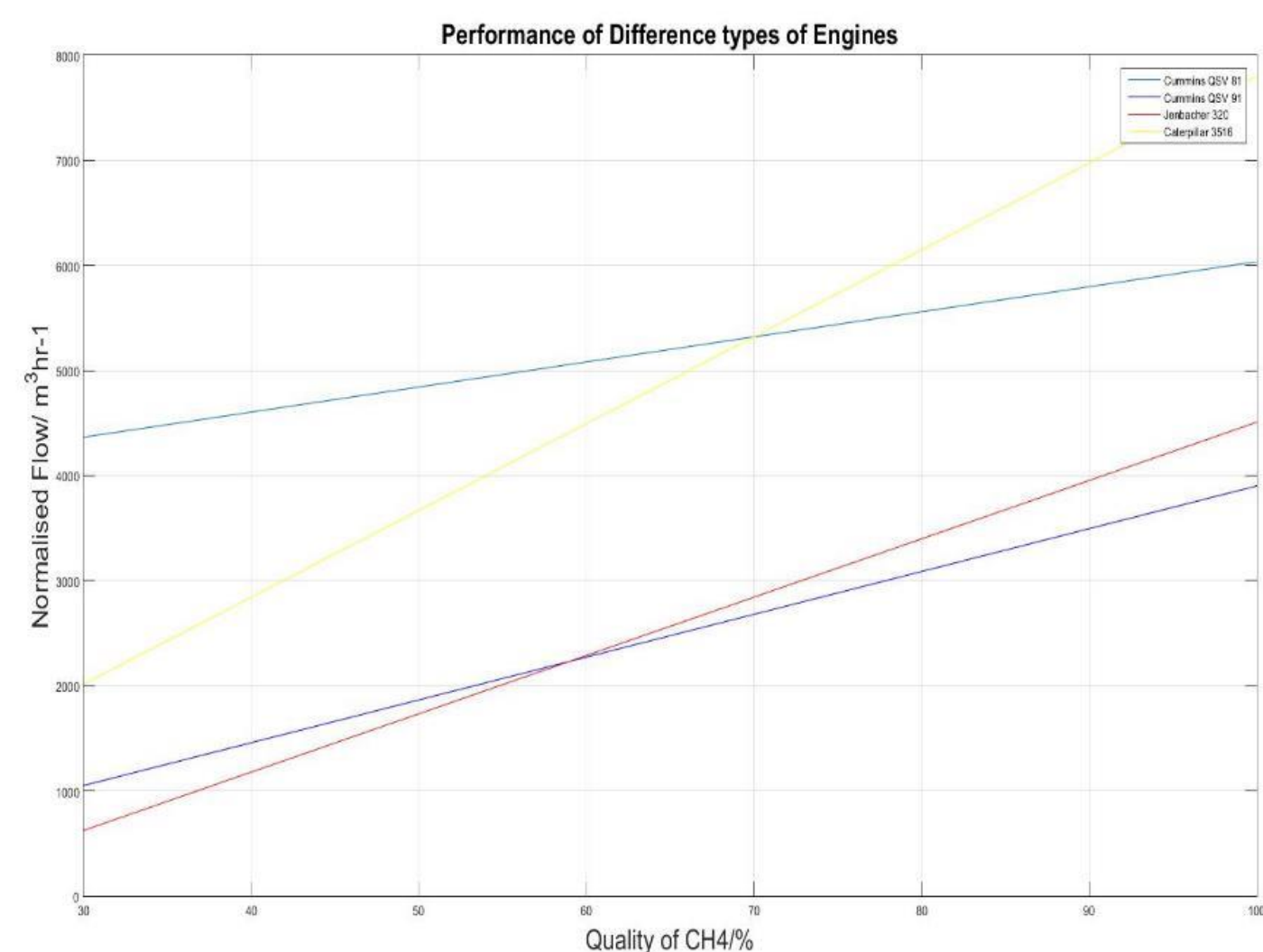


Figure 1: Normalised Flow vs Quality of Methane

Engine Type	Engine Load /kW
Cummins QSV91	1750
Cummins QSV81	1570
Caterpillar 3516	1115
Jenbacher 320	1067
Jenbacher 312	637
Jenbacher 216	486

Table 1: Engine Loads of different Engines

Gas Generation Forecast

The predicted gas generation is derived from a baseline forecast model based on the historical gas extraction data. The actual gas generation data is reviewed retrospectively so that the forecast curves are closer to the actual site performance.

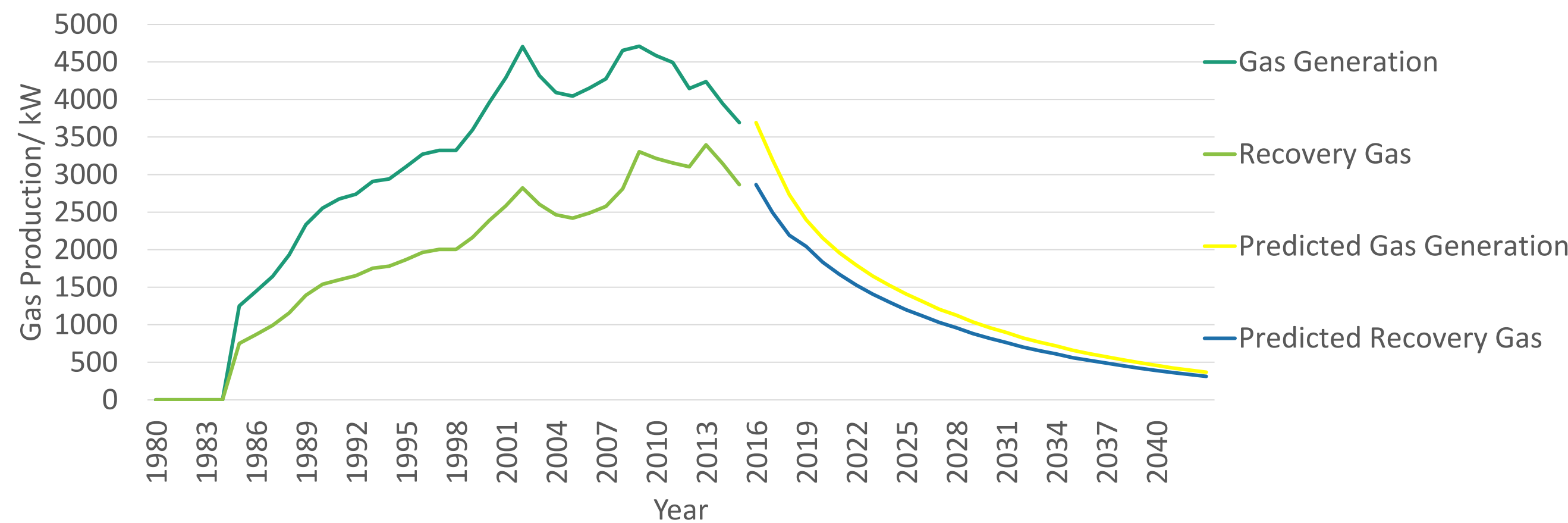


Figure 2: Landfill Gas Generation Forecast based on Viridor Data 2016

Relocation of Gas Engines

- The minimum engines' capacity should exceed the predicted gas generation
- Preferable to employ the engines which were previously installed on the site
- At least 1 engine is operating and its capacity should be sufficient to meet the landfill gas supply
- The maximum number of the gas engine is fixed
- It is assumed that capacities of different engines do not vary in time

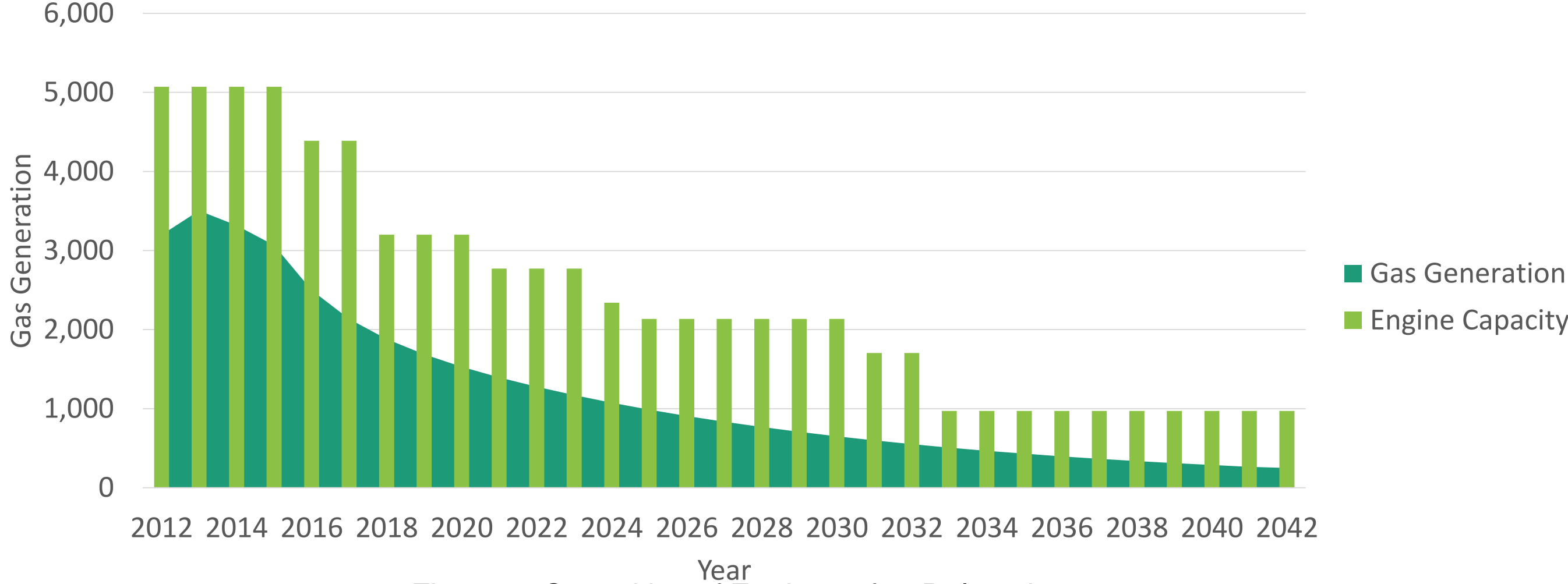


Figure 3: Capacities of Engines after Relocation

Conclusions

- Adequate gas collection system relocation would result in considerable reductions in expenditure
- System relocation is always constrained by site limitations, availability of engines, economy and legal requirements
- A thorough understanding of the performance of mechanical components is required before relocating the gas collection system
- Accurate predictions on the gas production is of great importance to landfill gas management
- Landfill features influencing the gas generation forecast must be identified before performing gas generation forecast

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