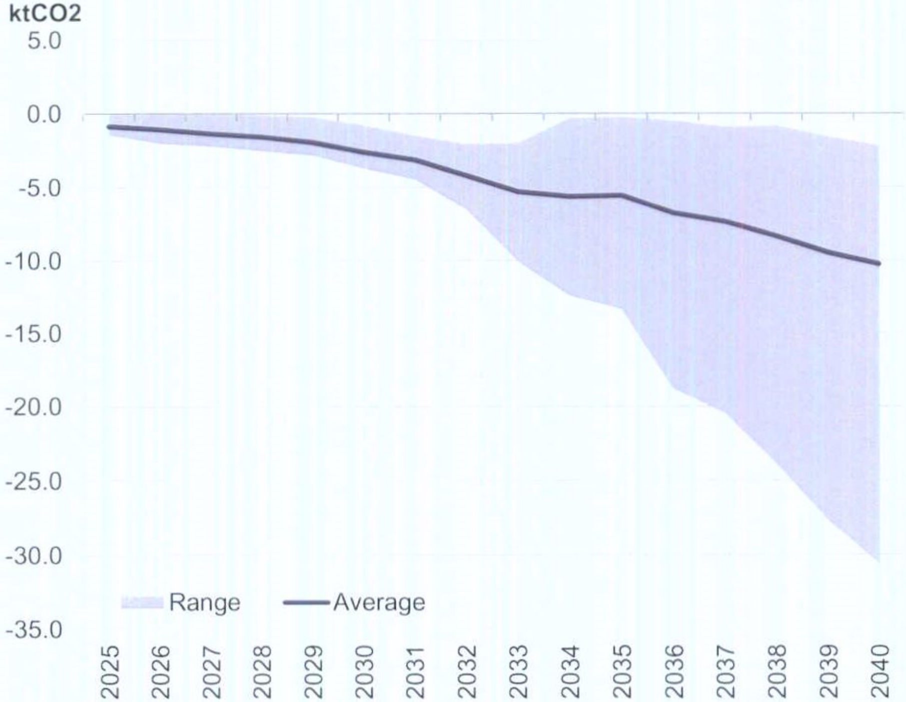
By displacing higher emitting units, the Kilshane GT is expected to provide a small reduction in the level of carbon emissions in the SEM

FIGURE 1 – PROJECTED REDUCTION IN CUMULATIVE CARBON EMISSION IN THE SEM DUE TO THE INCLUSION OF THE KILSHANE GT ($ktCO_2$)



Source: AFRY

COMMENTARY

- The Kilshane GT is expected to reduce carbon emissions on average by $10ktCO_2$ in the SEM by 2040, as shown in Figure 1.
- The reason for this reduction in carbon emissions is because the Kilshane GT is expected to primarily replace higher emitting power plants, in particular oil-fired units.
- That is, it is projected to operate only when there is barely any renewables generation available and when there is high demand; consequently, the Kilshane GT is projected to operate for a limited period of time each year.
- The range shown reflects the annual spread in modelled carbon emission reduction depending on the prevailing weather conditions. We model each future year under five different historic weather patterns, each of which results in a different renewable generation and demand profile accordingly.

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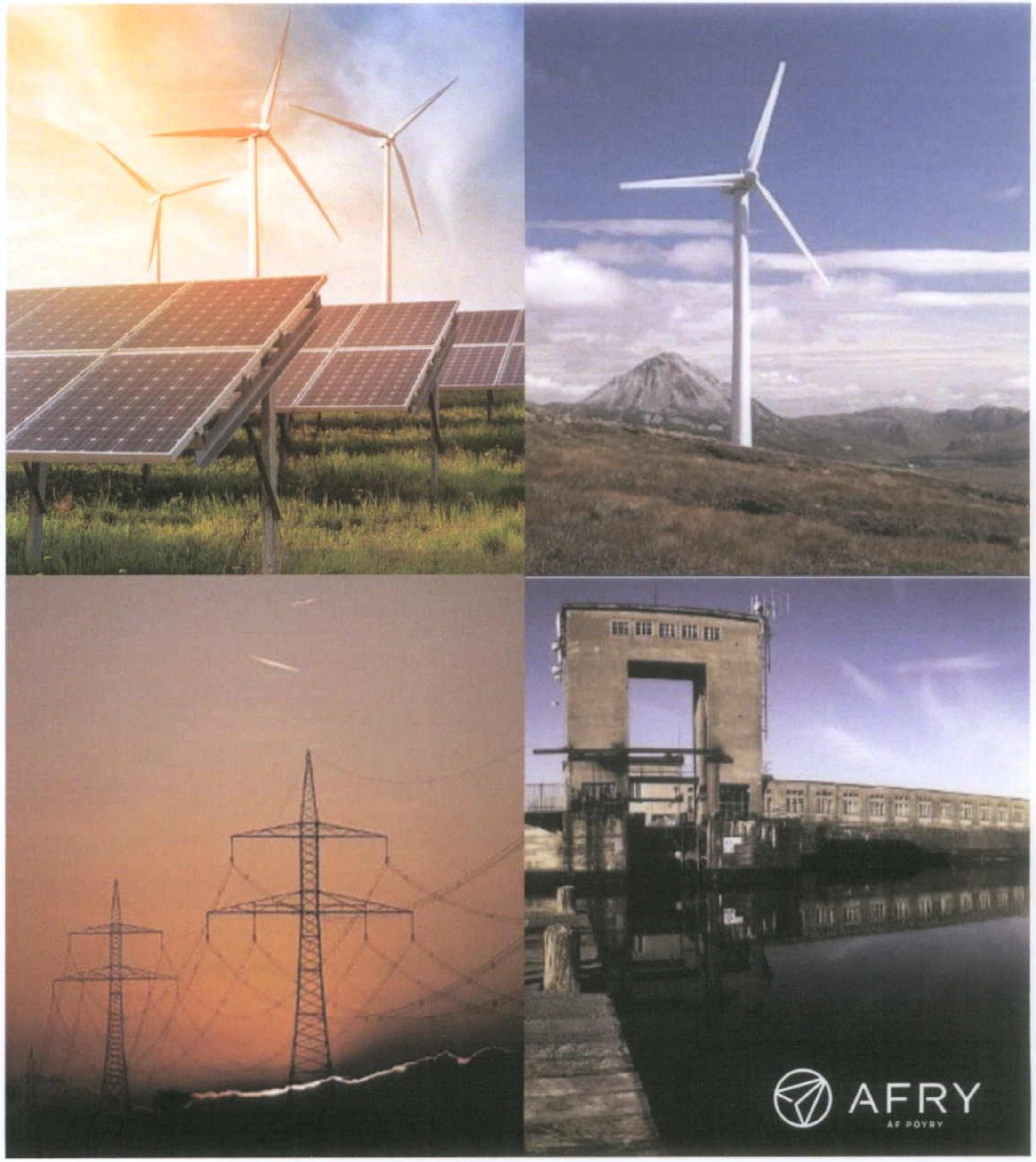

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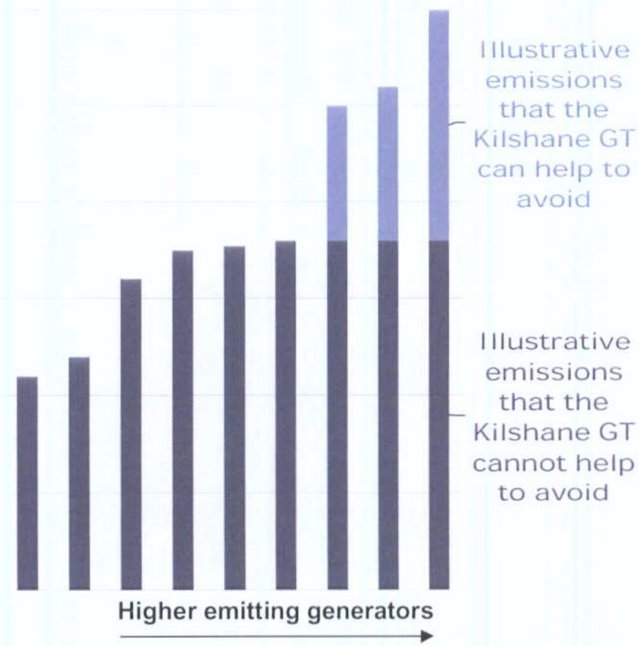
The impact of the Kilshane GT on carbon emissions is considered by comparing a scenario with and without the Kilshane GT

ANALYTIC APPROACH

- The basis of the analysis is to posit a scenario of what the Irish power system would look like:
  - if the Kilshane GT is not built (i.e. the Reference scenario); and
  - how outcomes compare if the Kilshane GT is built (i.e. the Kilshane scenario).
- By keeping all other variables constant, the impact of building the Kilshane GT is isolated.
- Because AFRY's modelling requires plant efficiencies (among other things) and generates an hourly dispatch for each plant, hourly carbon emissions can be calculated by applying known carbon emissions factors to the projected fuel consumption of all thermal plants in the SEM.
- The carbon emission projections can be represented as total cumulative carbon emissions, with differences between the scenarios derived thus.
- To illustrate this, Figure 2 shows carbon intensities for illustrative fuel types in order from lowest emitting to highest emitting and how Kilshane is expected to affect carbon emissions in the SEM.

FIGURE 2 – ILLUSTRATIVE CARBON INTENSITY (tCO_2/MWh)



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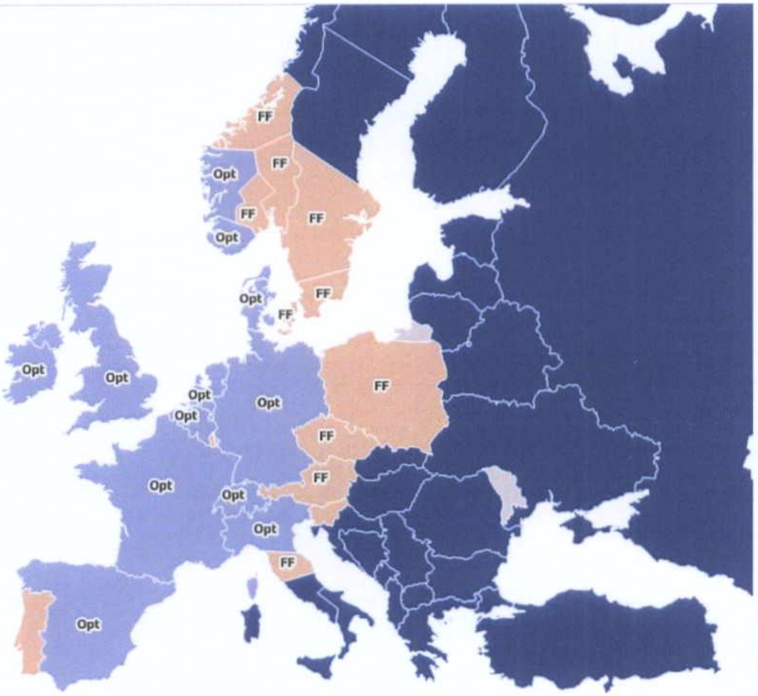
The reference scenario has been constructed covering the SEM, GB, France and surroundings to obtain realistic IC flows of the SEM with GB and France

FIGURE 3 – OPTIMISATION MAP



Notes: Opt = Optimised; FF = Fixed Flows

COMMENTARY

- The reference scenario has been constructed and optimised covering the SEM, GB, France and surrounding markets, as shown in Figure 3. Fixed Flows from AFRY's 2022 Q1 Central scenario have been used to any of the optimised markets. This provides a realistic view for interconnector flows from and to the SEM.
- In order to isolate the impact of the Kilshane GT on carbon emissions in the SEM, the Kilshane scenario is subsequently modelled with the same interconnector flows between the SEM, GB and France as the reference scenario.

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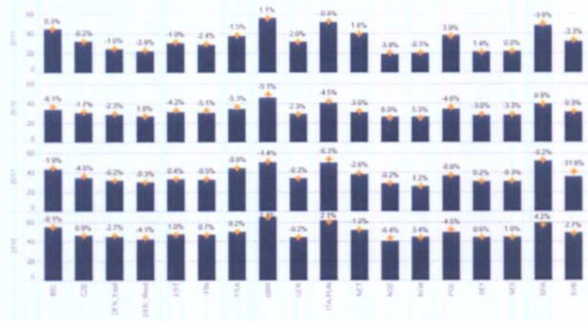
As part of our ongoing, detailed modelling, we continuously monitor market developments and regularly check the accuracy of our models and outputs

NETWORK OF MARKET EXPERTS

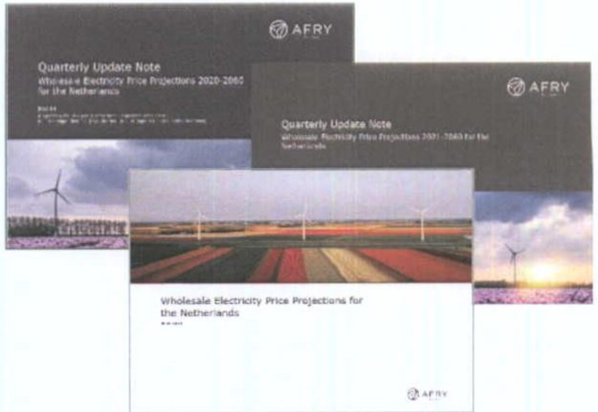
- Each geography is covered by a team of experts that constantly follow market and policy developments.
- Through our relationship with clients, we are able to generate a wealth of information to inform our views of new market trends.
- Delivery of project work (in other areas) helps us finesse our understanding of issues.

MODEL ACCURACY



- Every year we run a full backcast of Europe.
- Compare model outputs to market data on prices, generation, carbon emissions, interconnector flows and capture prices by technology.
- Our modelling provides a highly accurate representation of all European markets, with hourly and annual data showing excellent correlations.

FREQUENT UPDATES



- Our projections are updated up to 4 times a year which enables us to capture significant market developments and their impact on prices.
- Our country experts continuously monitor the market and account for new technologies (hydrogen, batteries, floating wind,...) and demand side management in our modelling.

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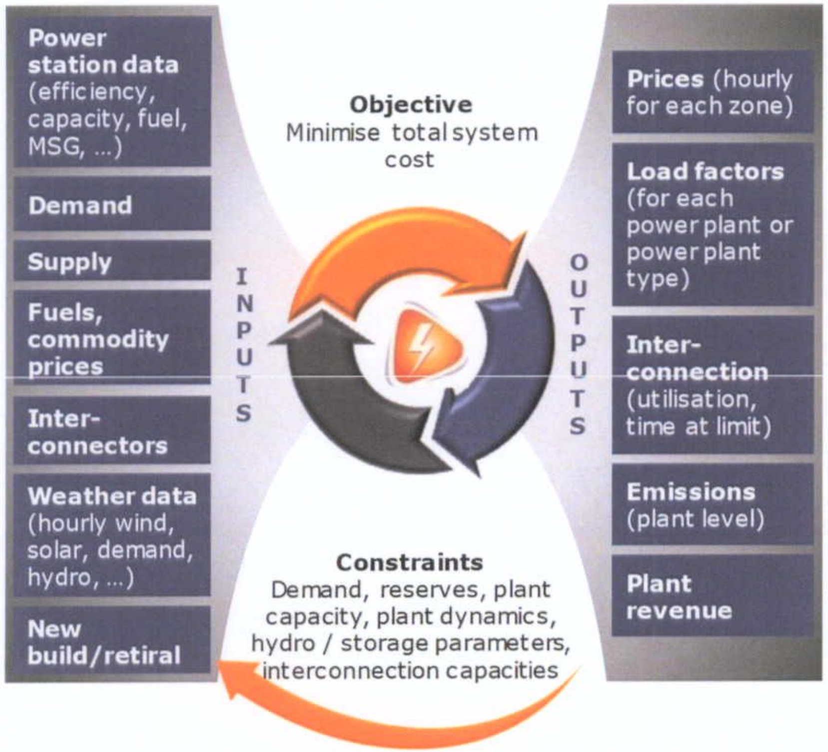
A central piece of our modelling suite is AFRY's established proprietary power market model, which models dispatch and redispatch of European markets

FIGURE 4 – OVERVIEW OF BID3

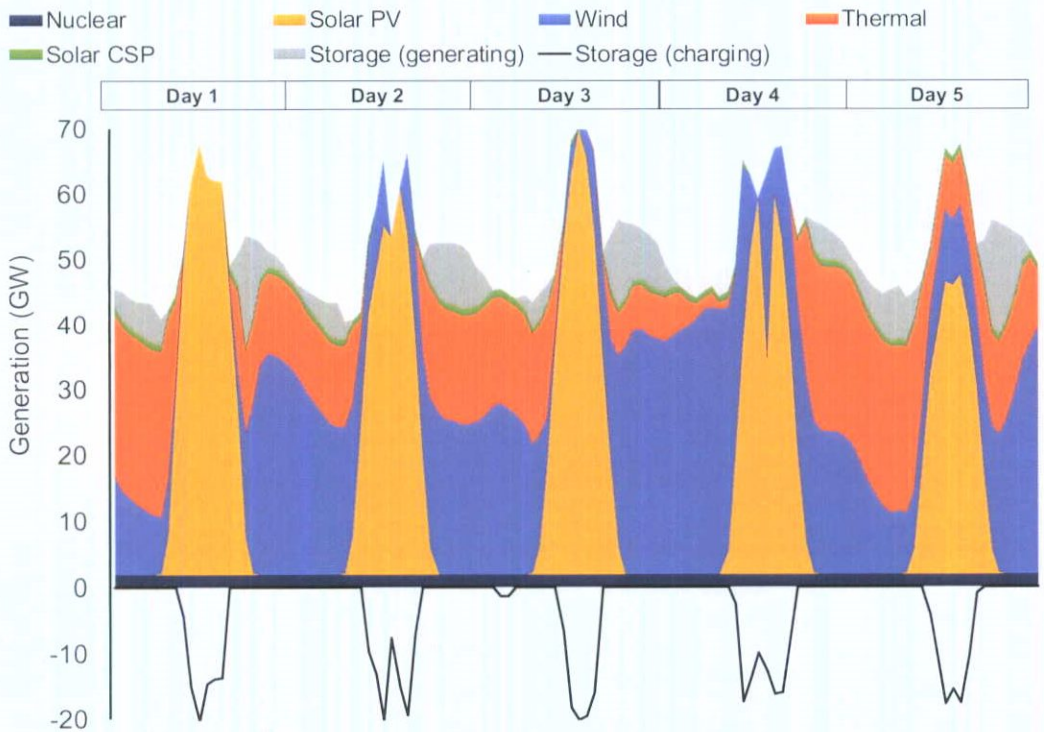


BASICS OF BID3

- BID3 is an optimisation model which minimises the system cost in a year subject to constraints (see Figure 4).
- BID3 models all 8760 hours of the year and accounts for varying renewables, demand-side management, hydro and pumped/battery storage.
- BID3 has the following key plant dynamics:
  - Start-up, Part-loading (no-load), Minimum Stable Generation;
  - Minimum on- and off-times;
  - Temperature dependent start cost;
  - Ramping; and
  - CHP and co-firing.
- It has been specifically designed to address:
  - Intermittency of wind, solar and hydro;
  - Reserve constraints;
  - The Balancing Market; and
  - Capacity expansion (new build and retiral).

Every future years is modelled under five different weather years to reflect the hourly uncertainty due to the weather

FIGURE 5 – EXAMPLE: HOURLY DISPATCH



Source: Hourly dispatch from AFRY's BID3 market model

COMMENTARY

- Every single generator (thermal, renewable, storage) is dispatched hourly in our simulation of the electricity sectors, as visualized in Figure 5.
- Model can show how system operation will become much more challenging as wind and solar will exhibit large variations across the day.
  - In such a scenario, thermal capacity will need to flex around variations in renewable generation.
  - Wind and solar curtailment during periods of high demand is likely.
  - The relative inflexible baseload fleet (due to thermal desalination and nuclear) will bring forward these issues.
- We use the same hourly approach for all electricity markets we model.
- In some markets with projected high levels of renewable penetration, we have found that weather-related risk can be the single largest driver of future asset-value, and it is therefore necessary to model multiple weather years to properly quantify this risk.

BID3 is used on a daily basis by utilities, regulators and TSOs across Europe

uniper	Forward curve modelling and strategic analysis
Statnett	Uses BID3 extensively for interconnector valuation studies, and also to model continental power markets
TRANSNET BW	Use BID3 for market simulations to feed their network modelling system, Integral
ENERGINET.DK	Use BID3 for interconnector studies, grid studies and capacity adequacy studies
drax	Net zero carbon simulations, forward curve modelling and strategic decision making

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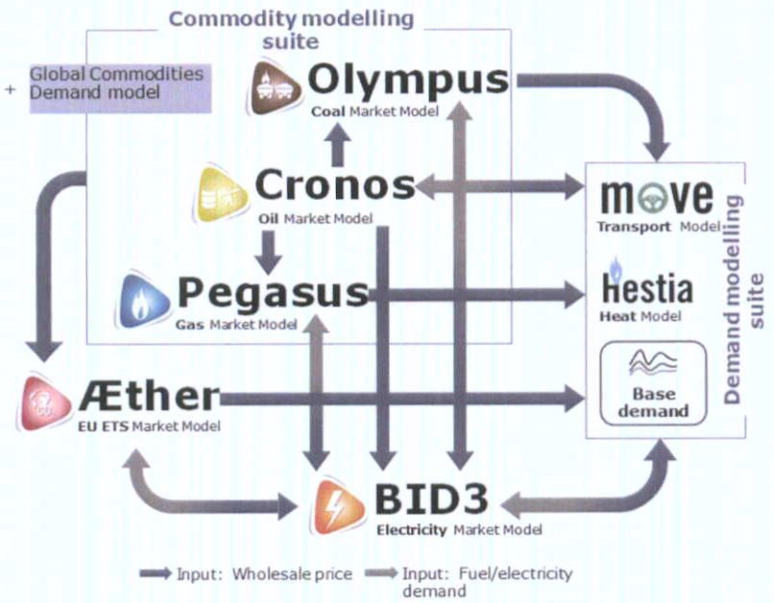
BID3 is also recognised by ENTSO-E as a tool used in the market simulations for the TYNDP assessment framework of cross-border capacity projects

FIGURE 6 – OVERVIEW OF THE AFRY MODELLING ECOSYSTEM



COMMENTARY

- BID3 is recognised by ENTSO-E as a tool used in the market simulations for the TYNDP assessment framework of cross-border capacity projects.
- It allows the optimisation of market dispatch over all of Europe.
- The fundamental modelling is conducted at hourly level.
- Every future years is modelled under five different weather years to reflect the uncertainty due to the weather.
- Our standard AFRY scenarios also account for the cross-sector coupling thanks to our modelling suite of Move and Hestia demand models which quantify the increasing demand for power from the Heat and Transport Sector.
- Our standard AFRY scenarios consider the production of Hydrogen through SMR and electrolysers.

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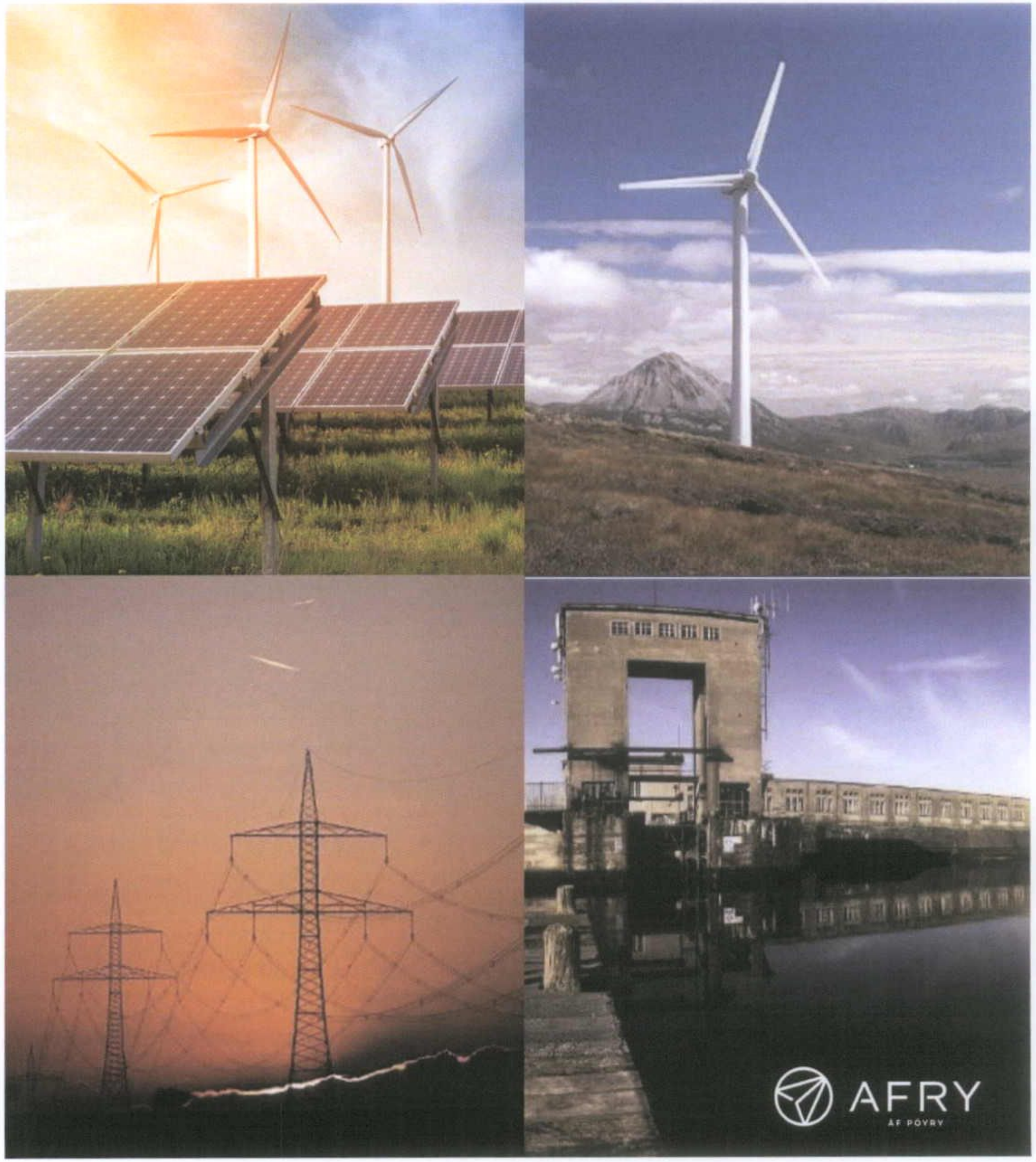
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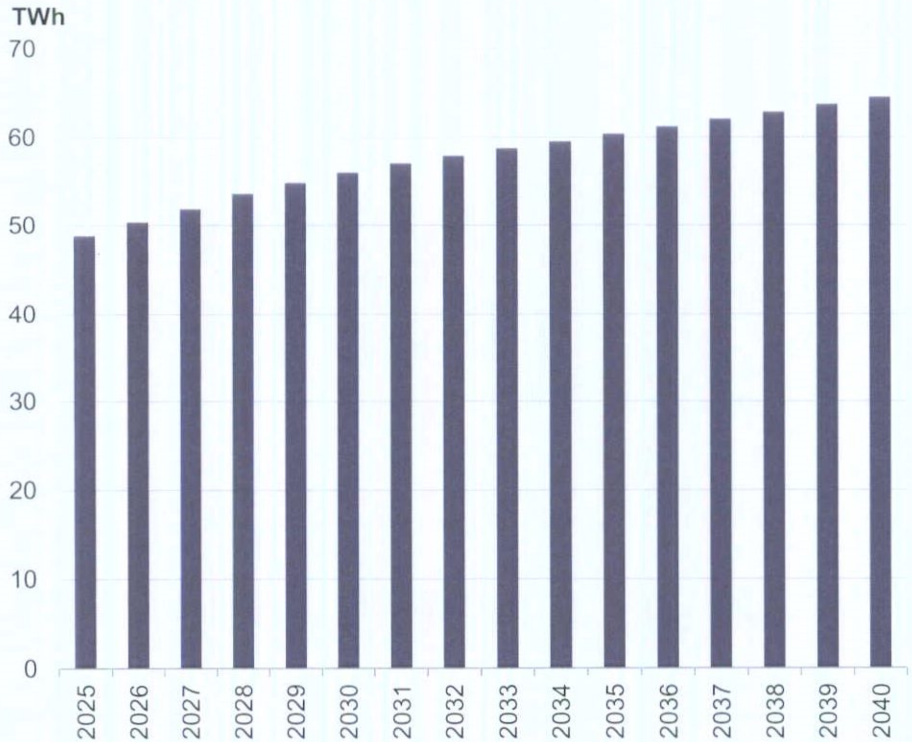
Annual demand has been taken from EirGrid's 2021-30 Generation Capacity Statement and 2019 Tomorrow's Energy Scenarios

FIGURE 7 – ALL-ISLAND ELECTRICITY DEMAND (TWh)



Source: AFRY analysis on EirGrid GCS and TES publications

COMMENTARY

- Demand projections, as shown in Figure 7, are based on EirGrid/SONI's 2021-30 GCS High scenario, which also corresponds to the demand used in the Shaping Our Electricity Future work by EirGrid/SONI.
- In order to obtain a value for demand in 2040, the 2019 Tomorrow Energy Scenarios' Centralized Energy scenario has been used. Given that the GCS High scenario has higher demand than the 2021-2030 demand in the TES scenario, the 2040 value for demand has been adjusted by the spread seen between the GCS and TES.
- Given the prominent role that EVs and air source heat pumps play in AFRY's demand modelling, the demand mix and resulting hourly demand profiles of AFRY's latest (2022 Q1) database have been used.

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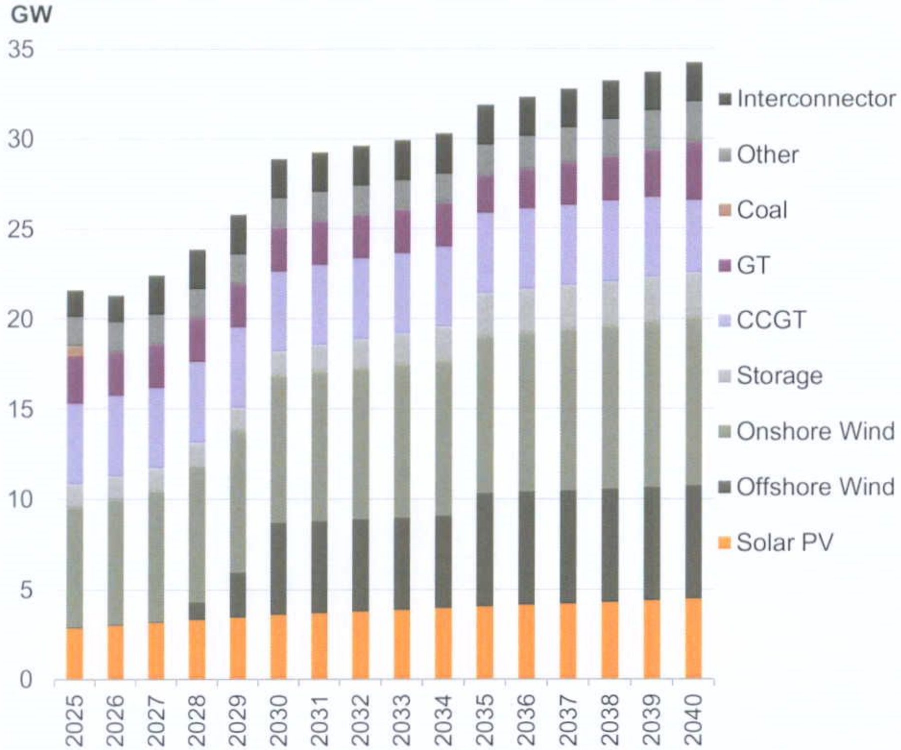
The dominant theme in the capacity mix is the shift from a system dominated by thermal plant to one dominated by renewables

FIGURE 8 – CAPACITY UNDER THE REFERENCE SCENARIO (GW)



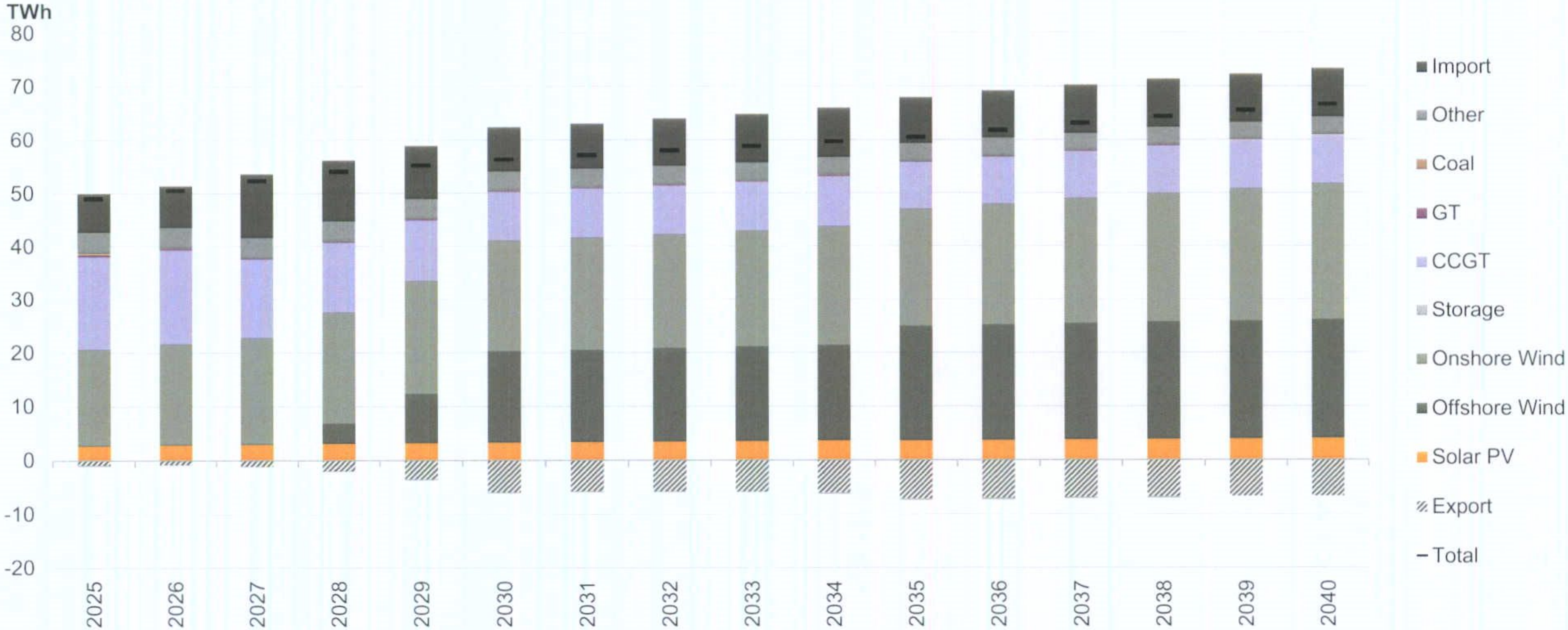
Notes: GT refers to Gas Turbine and CCGT refers to Combined Cycle Gas Turbine.
Source: AFRY analysis and EirGrid/SONI data

COMMENTARY

- The dominant theme is the shift in capacity mix from a system dominated by thermal plant to one dominated by renewables, particularly wind.
  - This assumes similar levels to the renewables capacity assumptions seen in EirGrid/SONI Shaping Our Electricity Future work.
  - However, the solar capacity has been adjusted to reflect the RESS-2 outturn results in its capacity growth trajectory.
  - Post 2030, renewables capacity deployment has been assumed such that the renewables penetration reaches 80% by 2040.
- Alongside the additional renewables capacity and the existing capacity fleet, this study includes:
  - The new Battery Energy Storage Systems and GTs procured under the recent CRM auctions. This means that the basis of this study incorporates the Climate Action Plan's target of 2GW of new flexible GTs.
  - The Greenlink interconnector (by 2025) and the Celtic interconnector (by 2027) in line with EirGrid/SONI Shaping Our Electricity Future work.

The generation mix follows a similar pattern to the capacity mix; a renewables penetration of 77% is reached in 2030 and 81% in 2040

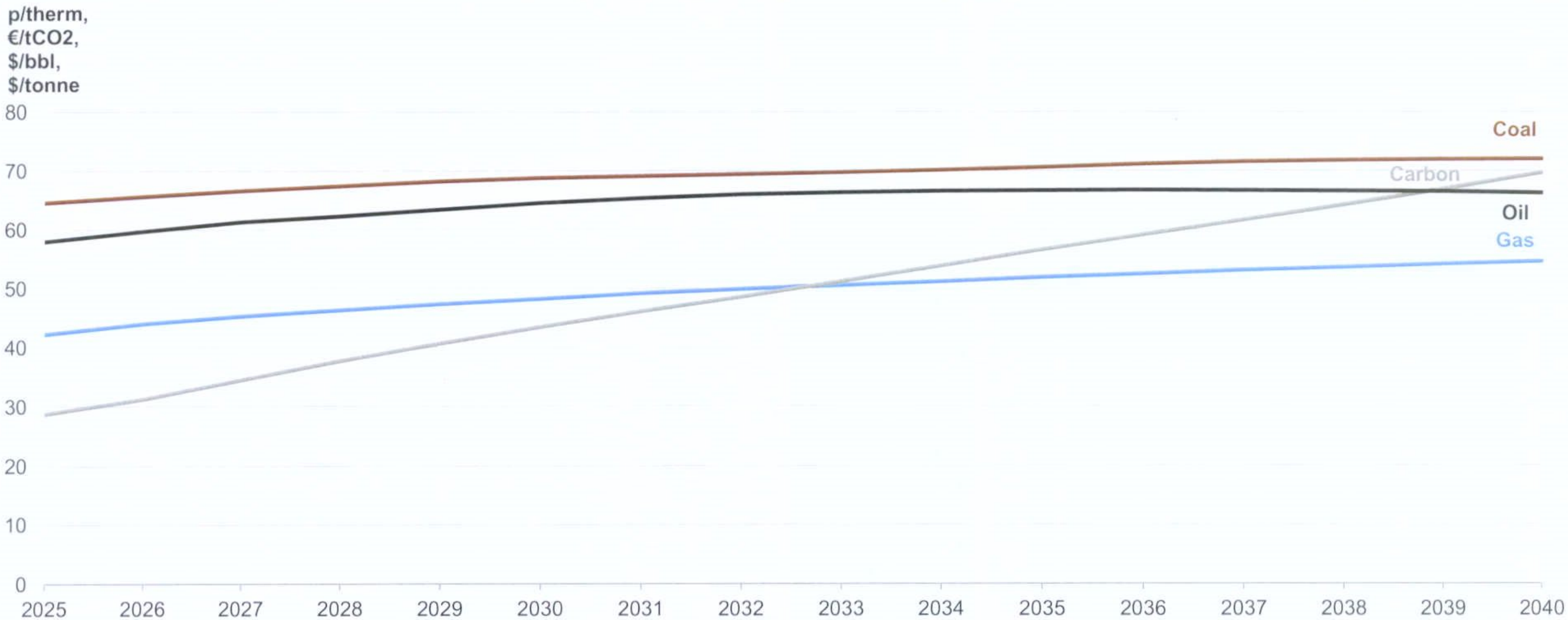
FIGURE 9 – GENERATION MIX OF THE REFERENCE SCENARIO (TWh)



Source: AFRY

We have used consistent, publicly available inputs for key assumptions on underlying fuel and carbon costs

FIGURE 10 – COMMODITY PRICES (p/therm (NBP), €/tCO2 (EU ETS), $/bbl (Brent), $/tonne (ARA CIF), real 2020 money)



Note: Given that EirGrid doesn't publish commodity prices, commodity prices have been taken from National Grid's Central scenario of the 2021 Future Energy Scenarios study.

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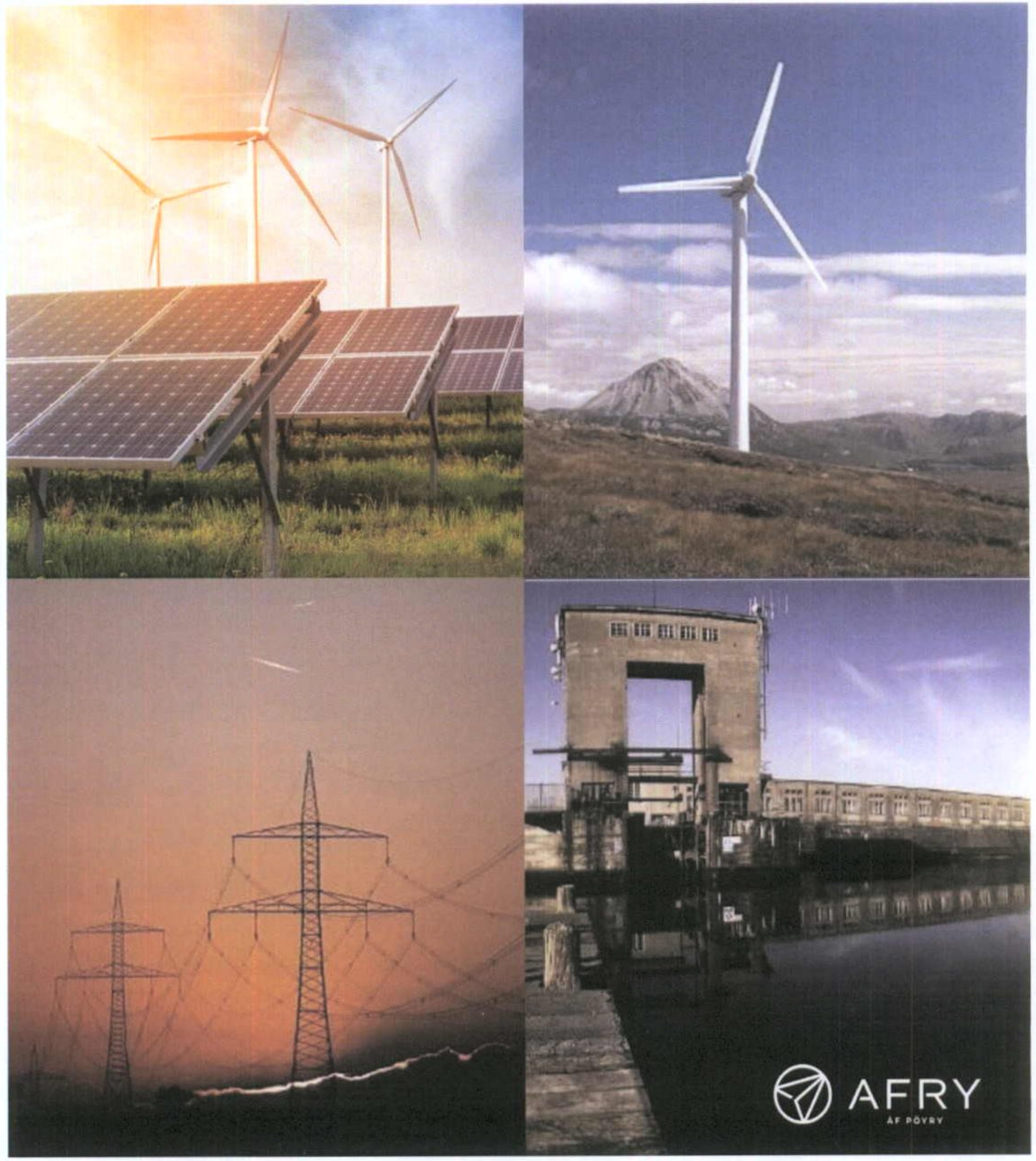
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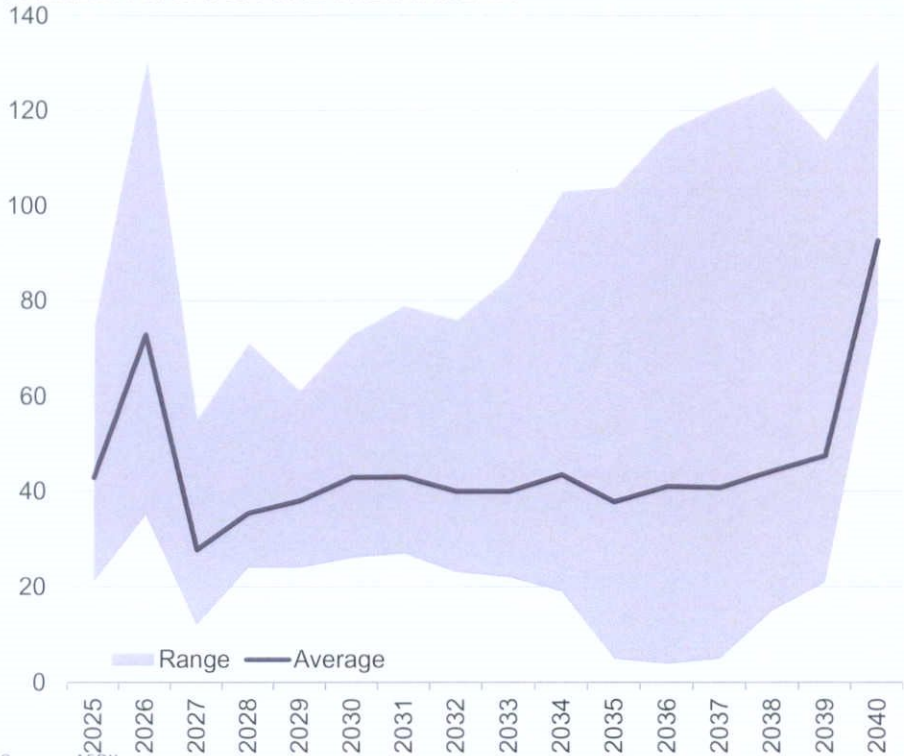
Due to its position in the merit order, the Kilshane GT is expected to operate for a limited number of hours

FIGURE 11 – ANNUAL AVERAGE OPERATIONAL HOUR PROJECTIONS FOR THE KILSHANE GT



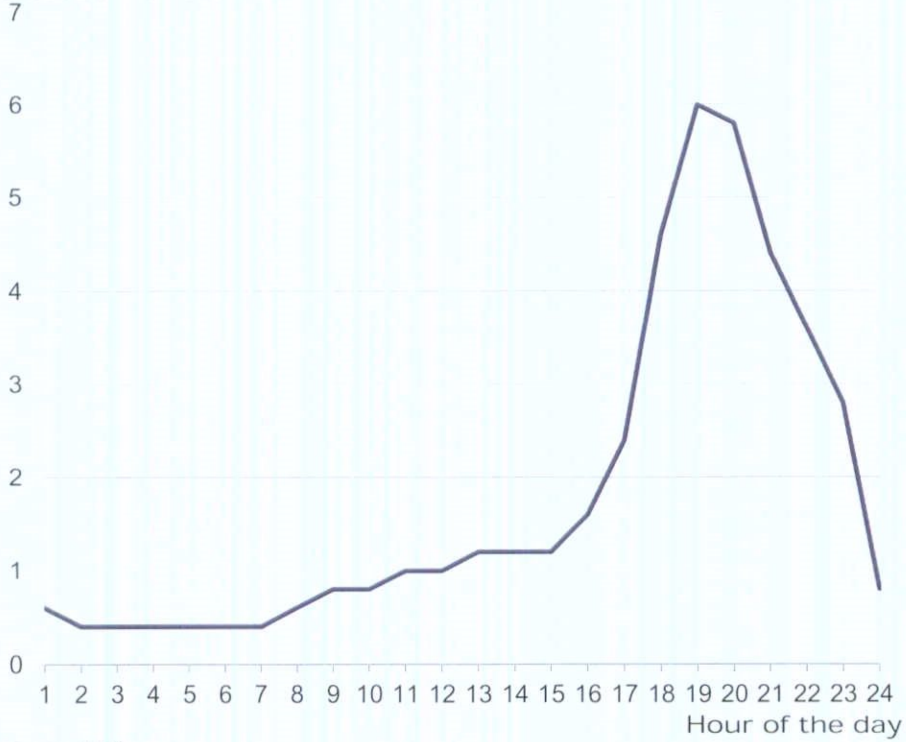
Source: AFRY

COMMENTARY

- The Kilshane GT is not expected to operate much as shown in Figure 11, with the average expected number of operational hours at 46 hours in a year (i.e. c. 0.5% of all hours in a year).
  - Principally, this means it will only operate when renewable penetration is low and demand is high.
- The range around the average reflects that five weather years have been modelled for each future year. This provides greater detail in the variability and impact the GT can have on the market.
  - The five weather years vary by hourly profiles for demand and for intermittent renewables, which have been created via historical backcasts.
  - Under weather years with relatively high demand and low renewables penetration (i.e. with more system tightness), the Kilshane is expected to operate most frequently.
  - Consequently, the Kilshane GT operates almost 8 times more often on average in the tightest weather year (at 95 hours, or 1.1% of all 8760 hours in a year) than in the least tight weather year (at 22 hours, or 0.3% of all 8760 hours in a year).

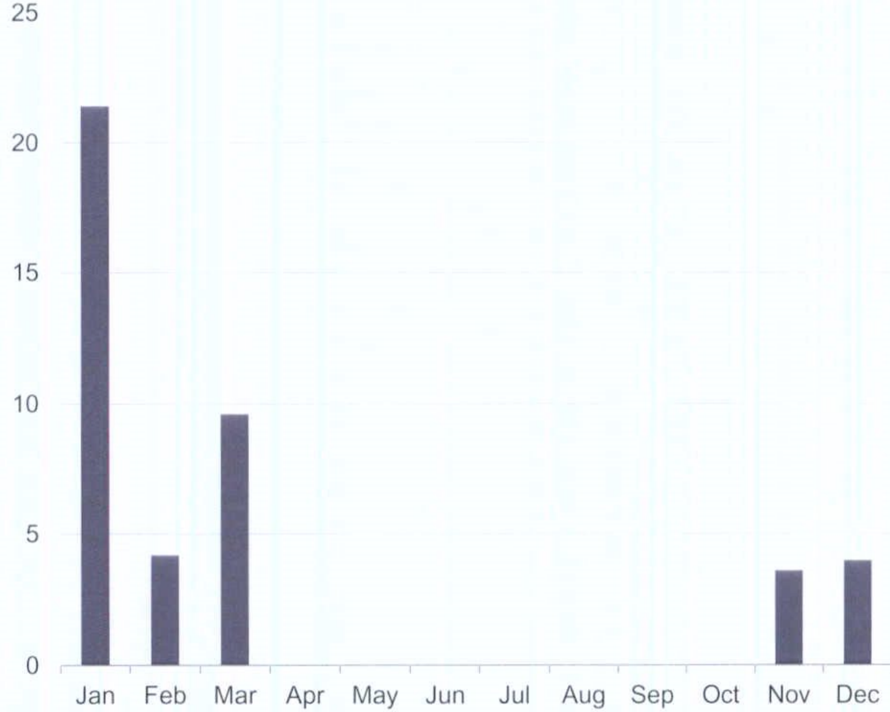
The Kilshane GT is only expected to operate in the tightest periods, which is typically during the evening peak and in the winter (coldest) months

FIGURE 12 – ANNUAL AVERAGE OPERATING HOUR PROJECTIONS BY HOUR OF THE DAY IN 2030



Source: AFRY

FIGURE 13 – ANNUAL AVERAGE OPERATING HOUR PROJECTIONS BY MONTH IN 2030



Source: AFRY

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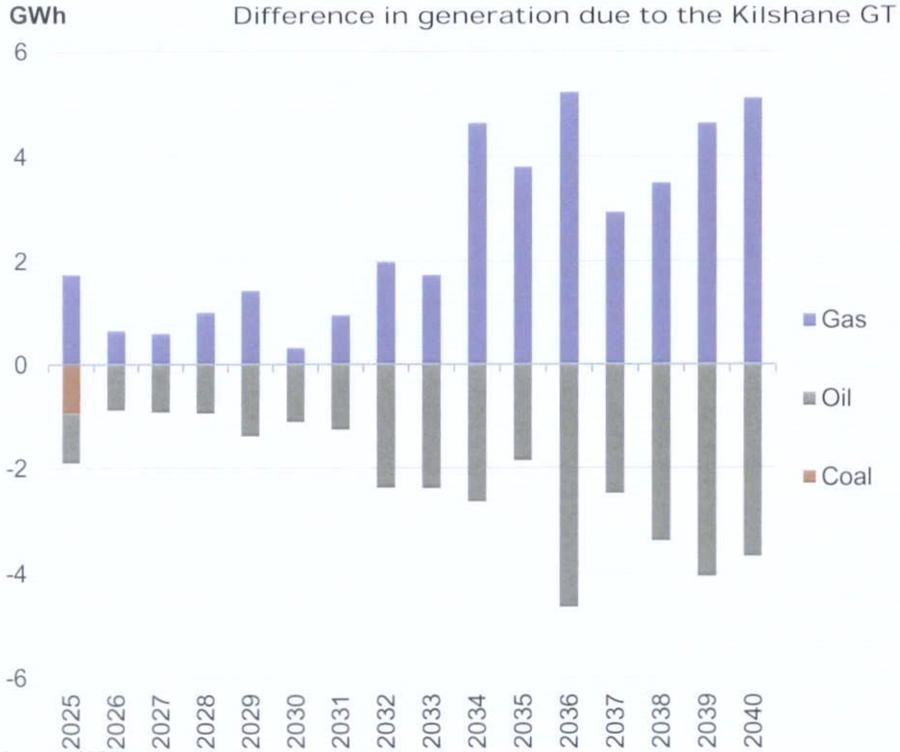
For the limited periods that the Kilshane GT operates, it is expected to displace higher emitting units

FIGURE 14 – DIFFERENCE IN GENERATION DUE TO THE KILSHANE GT (GWh)



Source: AFRY

COMMENTARY

- Figure 14 shows the difference in generation by fuel type, where positive values reflect additional generation due to the inclusion of the Kilshane GT and vice versa for negative values.
- The modelling finds that the operation of the Kilshane GT primarily replaces higher emitting power plants, in particular oil-fired units.
- Note that the net balance is different as other technologies are also slightly affected (i.e. demand-side units, battery energy storage systems and pumped hydroelectric storage), as GTs tend to be more economic for bridging long periods of low renewables generation.

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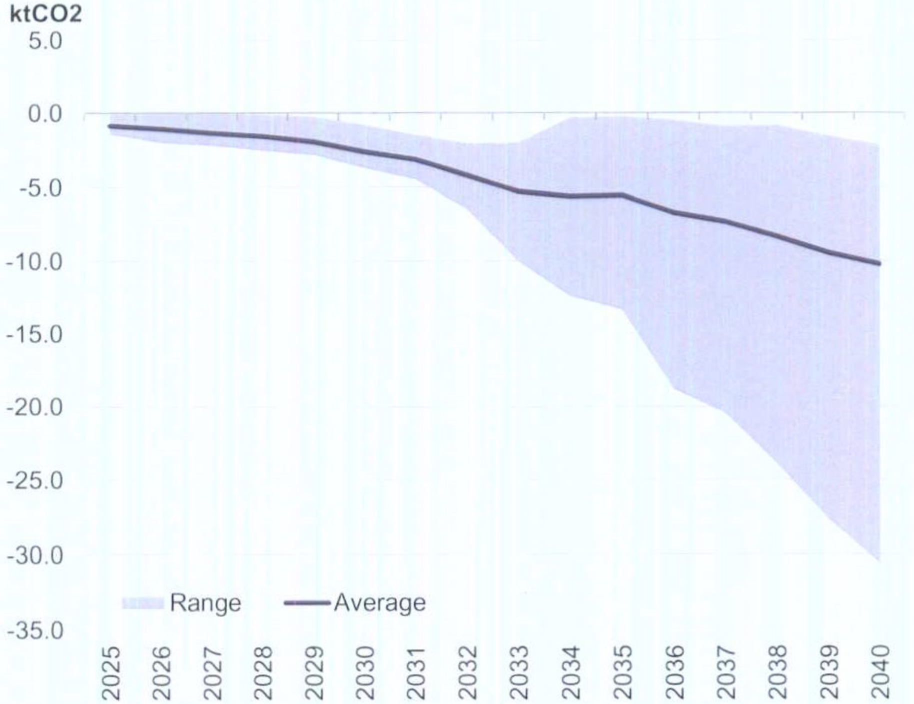
By displacing higher emitting units, the Kilshane GT is expected to provide a small reduction in the level of carbon emissions in the SEM

FIGURE 15 – PROJECTED REDUCTION IN CUMULATIVE CARBON EMISSION IN THE SEM DUE TO THE INCLUSION OF THE KILSHANE GT ($ktCO_2$)



Source: AFRY

COMMENTARY

- The Kilshane GT is expected to reduce carbon emissions on average by $10ktCO_2$ in the SEM by 2040, as shown in Figure 15.
- The reason for this reduction in carbon emissions is because the Kilshane GT is expected to primarily replace higher emitting power plants, in particular oil-fired units.
- That is, it is projected to operate only when there is barely any renewables generation available and when there is high demand; consequently, the Kilshane GT is projected to operate for a limited period of time each year.
- The range shown reflects the annual spread in modelled carbon emission reduction depending on the prevailing weather conditions. We model each future year under five different historic weather patterns, each of which results in a different renewable generation and demand profile accordingly.

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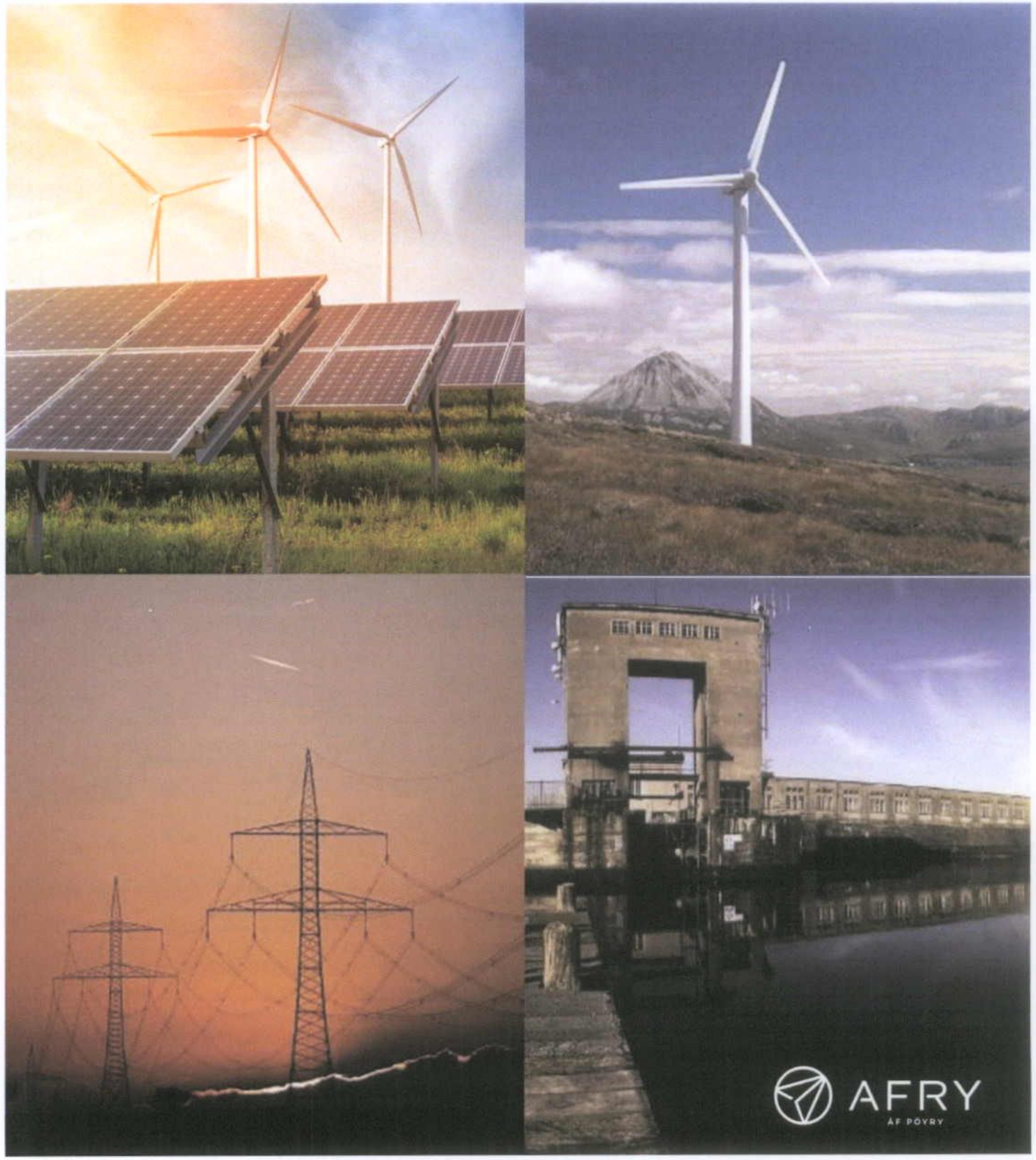

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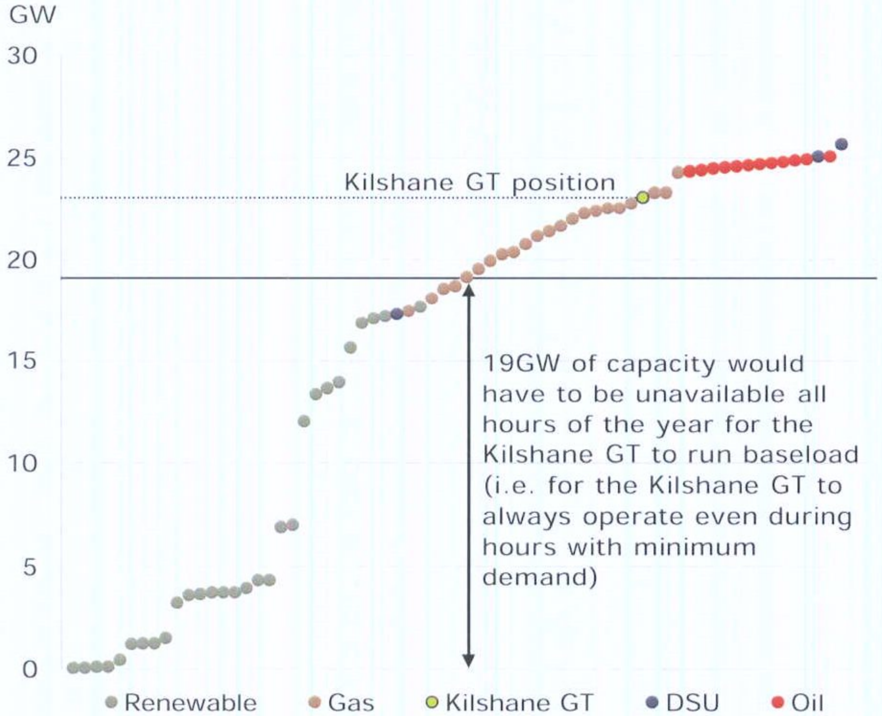
ANNEX

For the Kilshane GT to run at baseload, a very large proportion of the generation capacity would need to be unavailable across the year

FIGURE 16 – AGGREGATED CAPACITY, ORDER BY PLANT BIDDING PRICES IN 2030 (GW)



COMMENTARY

- The Kilshane GT sits near the top of a merit-order based on plant bidding behaviour, determined by fuel type and relative efficiency (and thus emissions intensity).
- Ignoring storage, there is approx. 23GW of other generation capacity that has a more advantageous position, and would thus be expected to generate ahead of the Kilshane GT on an economic dispatch basis as exists in the SEM.
- Minimum demand in 2030 is expected to be approx. 4GW; 19GW of the 23GW generating capacity would therefore have to be unavailable throughout the entire year to result in baseload operations at the Kilshane GT (see solid line in Figure 16).
- This equates to approx. 75% of all installed generation across the market (e.g. all 17.4GW of renewables and further 1.6GW gas-fired generation) being unavailable.

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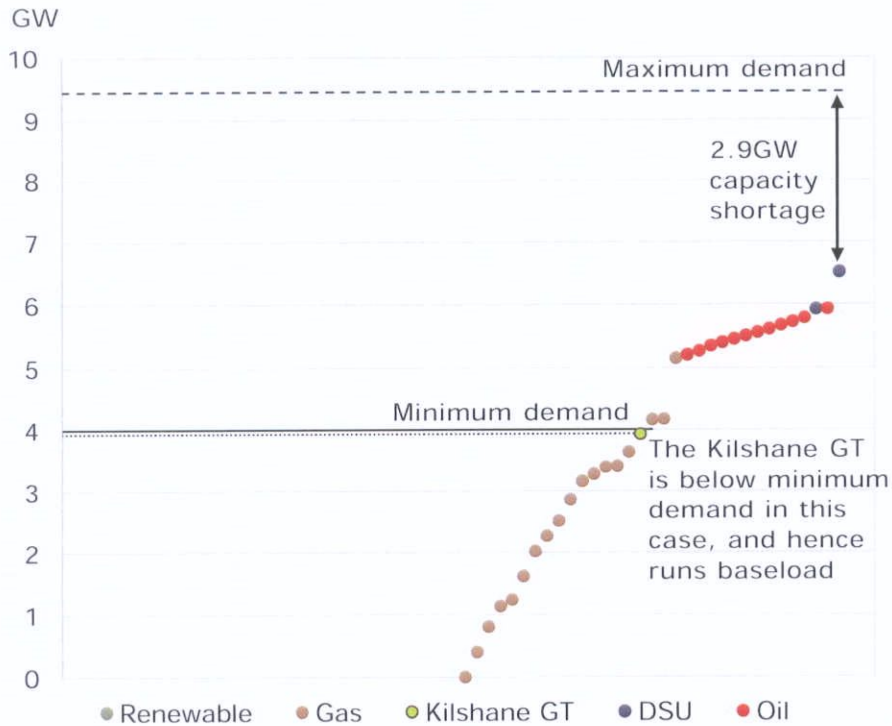
ANNEX

If all 19GW of lowest merit order capacity was removed, remaining capacity could not meet maximum demand and large demand volumes go unserved

FIGURE 17 – AGGREGATED CAPACITY, ORDER BY PLANT BIDDING PRICES IN 2030, WITHOUT 19GW UNAVAILABLE CAPACITY (GW)



COMMENTARY

- The risk of having none of the 19GW lowest merit order capacity available is insignificantly low. In the theoretical event this capacity is all unavailable and the Kilshane GT generates at baseload levels, the remaining installed capacity would not be sufficient to meet demand in the market for large portions of time.
- The horizontal dashed line in Figure 17 indicates the maximum demand expected in 2030, 9.4GW.
- However in the absence of the 19GW of more advantageous merit-order capacity, there would only be approx. 6GW remaining on the system.
- The system would therefore be short by approx. 3GW of capacity at times of maximum demand (i.e. 30% of the maximum demand would go unserved).
- In the highly improbable event that market conditions require the Kilshane GT to run baseload, we would still expect lower carbon emissions in the SEM when the Kilshane GT is included instead of excluded. This follows the same logic as presented in the main part of this report, whereby the Kilshane GT would displace running of higher emitting (lower efficient gas and oil fired) units.

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APPENDIX 9.4

Sensitivity analysis

APPENDIX 9.4: SENSITIVITY ANALYSIS

The sensitivity analysis scenario assessed the impact of a larger diameter stack (7.4 m). The information used in the dispersion model for the normal operations of the gas turbine and the emergency operations of the turbine running on liquid fuel is shown in Table 1. Information on the gas turbine to be used at the power generation facility was provided by the engine supplier. For the purposes of this assessment the facility was assumed to be operating at full load continuously all year round.

Table 1 Process Emission Characteristics Used In The Air Modelling

Parameter	Emission Details		
Process	Normal operations (turbine running on natural gas)	Testing of turbine (liquid fuel mode)	Emergency operations (turbine running on liquid fuel for 100 hours per year)
Stack Location (UTM Zone 29)	677422 E, 5922495 N	677422 E, 5922495 N	677422 E, 5922495 N
Height above Ground (m)	28	28	28
Exit Diameter (m)	7.4	7.4	7.4
Cross-sectional Area (m^2)	35.3	35.3	35.3
Temperature (K)	855.95	837.55	837.55
Max Volume Flow (Nm^3/hr)	2,348,699	2,470,228	2,470,228
Exit Velocity (m/sec actual)	43.5	43.2	43.2
NO_X Conc. (mg/Nm^3)	35	250	250
NO_X Mass Emission (g/s)	22.835	816.815	9.324

NO_2

The NO_2 modelling results are detailed in Table 2. The results indicate that the ambient ground level concentrations are below the relevant air quality standards for NO_2. Emissions from the existing and proposed emission points lead to an ambient NO_2 concentration (including background) which is 37% of the maximum ambient 1-hour limit value (measured as a 99.8th%ile) and 41% of the annual limit value at the worst-case receptor. The locations of the maximum concentrations for NO_2 are close to the boundary of the site with concentrations decreasing with distance from the facility.

In conclusion the results of the sensitivity analysis scenario are in compliance with the relevant ambient air quality limit values at all locations at or beyond the site boundary. This results in a long-term, slight, negative impact to air quality.

Table 2 Dispersion Model Results for Nitrogen Dioxide (NO_2)

Pollutant/ Year	Averaging Period	Process Contribution NO_2 ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Predicted Environmental Concentration NO_2 ($\mu g/m^3$)	Limit Value ($\mu g/m^3$) Note 1	PEC as a % of Limit Value
NO_2 / 2017	Annual Mean	0.2	16	16.2	40	40%
	99.8th%ile of 1-hr means	21.0	32	53.0	200	26%
NO_2 / 2018	Annual Mean	0.4	16	16.4	40	41%
	99.8th%ile of 1-hr means	41.9	32	73.9	200	37%
NO_2 / 2019	Annual Mean	0.1	16	16.1	40	40%
	99.8th%ile of 1-hr means	9.8	32	41.8	200	21%
NO_2 / 2020	Annual Mean	0.2	16	16.2	40	40%
	99.8th%ile of 1-hr means	11.3	32	43.3	200	22%
NO_2 / 2021	Annual Mean	0.3	16	16.3	40	41%
	99.8th%ile of 1-hr means	27.8	32	59.8	200	30%

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC and S.I. 180 of 2011).

APPENDIX 9.5

Plume modelling report

APPENDIX 9.5: THERMAL PLUME MODELLING

INTRODUCTION

This appendix provides an assessment of the potential impact of the plumes associated with the operational phase of the Kilshane gas fired power generation facility on aircraft in the region.

The issue of plume characteristics and the effect on the operation of aviation in the region of the site has been assessed below. An assessment has been undertaken to determine the region surrounding the facility where levels of excess temperature, turbulence (vertical velocity) and reduced oxygen could potentially be encountered. Studies undertaken by the MITRE Corporation(1) and outlined in the user manual for the "Exhaust-Plume-Analyzer" model detail the likely impact of an exhaust plume on aircraft based on a range of parameters / criteria including the thermal buoyancy and temperature of the plume.

The current study is based on detailed site-specific information. The site-specific study, using the Cambridge Environmental Research Consultants (CERC) AMDS-5 model for oxygen, temperature and vertical velocity, allows the actual emission data for the facility to be used as input into the model. In addition, meteorological data for the region, based on three full years of data from Dublin Airport (2019-2021) and building data also forms part of the inputs to the model to allow an accurate representation of the impact of the facility in the surrounding environment.

METHODOLOGY

The parameters of the plume which are most relevant to aviation has been investigated by the Mitre Corporation as part of the development of the "Expanded Model For Determining The Effects Of Vertical Plumes On Aviation Safety" (1). These parameters have been reviewed below.

OXYGEN

The Mitre Corporation report confirms that oxygen levels below 12% are potentially hazardous to aviation(1) and thus the oxygen content of the plume with distance from the stack has been investigated.

In relation to the gas generator, the oxygen content of the plume at stack top will typically be 12.37%.

TEMPERATURE

The Mitre Corporation report confirms that temperatures in excess of 50°C are potentially hazardous to helicopters(1), which has been used as a worst case scenario, and thus the temperature of the plume with distance from the stack has been investigated.

In relation to the gas generator, the temperature of the plume at stack top is 855.95K (583°C).

VERTICAL VELOCITY

High vertical velocities are also a concern when considering aviation/plume interactions as they can lead to increased turbulence in the atmosphere. The literature(2) suggests that the critical level for vertical velocities is 6.1 m/s. Thus, modelling has been undertaken to understand the worst-case vertical velocities of the gas turbine plume with distance from the stacks.

The change in each of these parameters with distance from the stack has been reviewed below. For each of these parameters, three full years of meteorological conditions has been used in the analysis including periods of atmospheric pressure / temperature inversions. Meteorological data for the years 2019-2021 for Dublin Airport have been used in the analysis for all scenarios outlined, with results for the worst case year reported. The ADMS-5 model has the capability to process calm conditions by setting the wind speed to 0.3 m/s and allowing an equal probability for all wind directions. This option has been used in this assessment for both the temperature assessment and the vertical velocity assessment.

The model was also run with a high density receptor grid based on 5m horizontal spacing and 0.5m vertical spacing in the region of the stack top to determine the changes in the parameters above over very short distances. The receptor spacing of 0.5m was selected as the change with vertical distance in oxygen, temperature and vertical velocity from the stack top is rapid and would be difficult to determine with a coarser grid resolution.

PROCESS EMISSIONS

The proposed Kilshane gas fired power generation facility stack was modelled at a height of 28m (~75m OD). The source information for the modelled emission point has been summarised in Table 1.

Table 1 Summary of Source Information

	Stack Location (UTM Zone 29)	Height above Ground (m)	Exit Diameter (m)	Cross-sectional Area (m^2)	Temp-erature (K)	Max Volume Flow (Nm^3/hr)	Exit Velocity (m/sec actual)	NO_X Conc. (mg/ Nm^3)	NO_X Mass Emission (g/s)
Gas turbine	677422 E, 5922495 N	28 (78m OD)	6.7	35.3	855.95	2,348,699	43.5	35	22.8

RESULTS & DISCUSSION

OXYGEN / PLUME INTERACTION

The Mitre Corporation report (MITRE, 2012) confirms that depleted oxygen is generally of greatest concern when considering aviation/plume interactions. The Mitre Corporation report confirms that at an oxygen content below 12% oxygen there is a risk of engine cut-out whilst above this level there is no risk to helicopter engines. Thus, modelling has been undertaken to determine the oxygen percentage of normal operations on natural gas.

The following equation is used to model the % of oxygen in the plume with distance from the stack top. For a given emission concentration of any pollutant e (in $\mu g/m^3$), the oxygen content O (%), is related to the plume concentration c (in $\mu g/m^3$) by the following relationship (13% is the plume oxygen percentage at release for gas generators):

$$c / e = (20.95-O) / (20.95-13)$$

Thus, the calculation can be re-arranged to determine the oxygen content (%) of the plume as a function of distance from the stack top. The re-arranged equation is:

$$O (\%) = 20.95- [(c/e) * (7.65)]$$

AERMOD was thus run to calculate the pollutant concentration and identify the distance from the plume centreline where the 12% oxygen level was exceeded. Modelling was undertaken using Dublin Airport data for 2019-2021. Figure 1 and Figure 2 show the results for the full worst-case year of 2020.

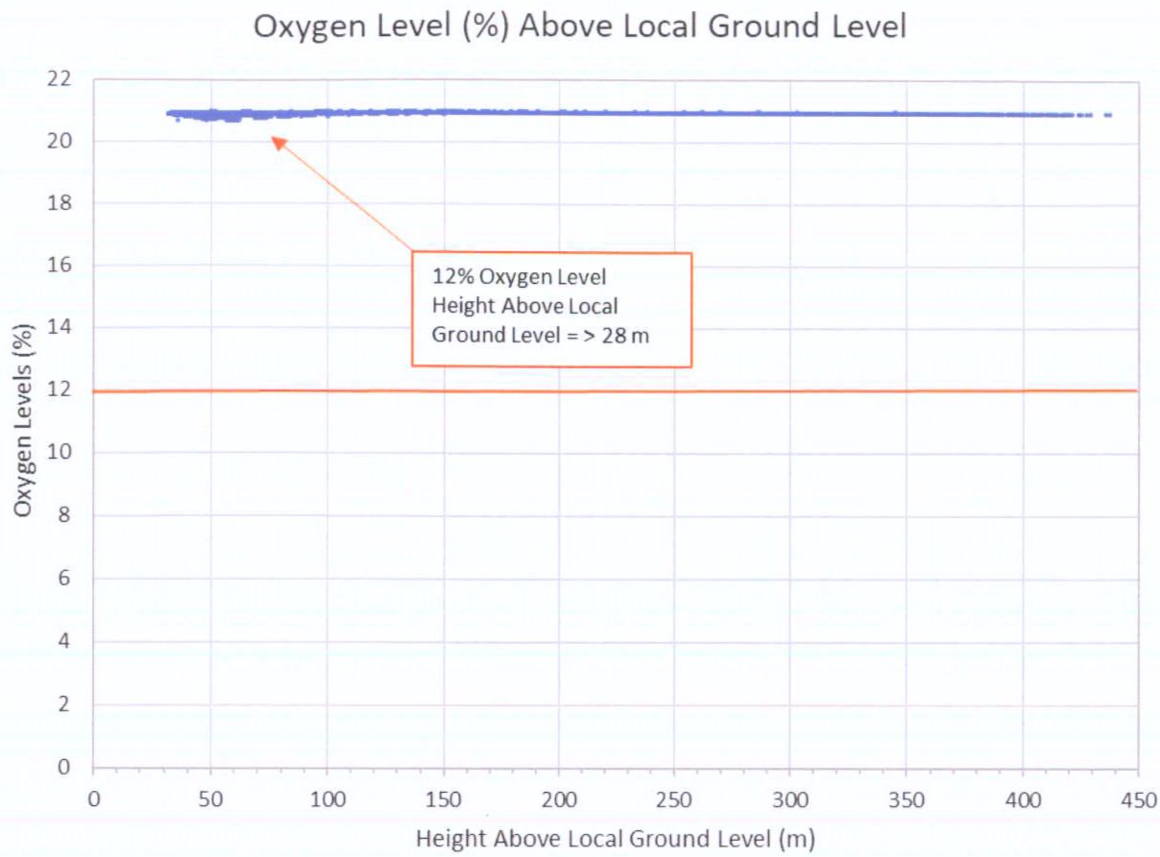

Figure 1 **Oxygen Content Of The Plume (%) With Distance Above Ground Level**

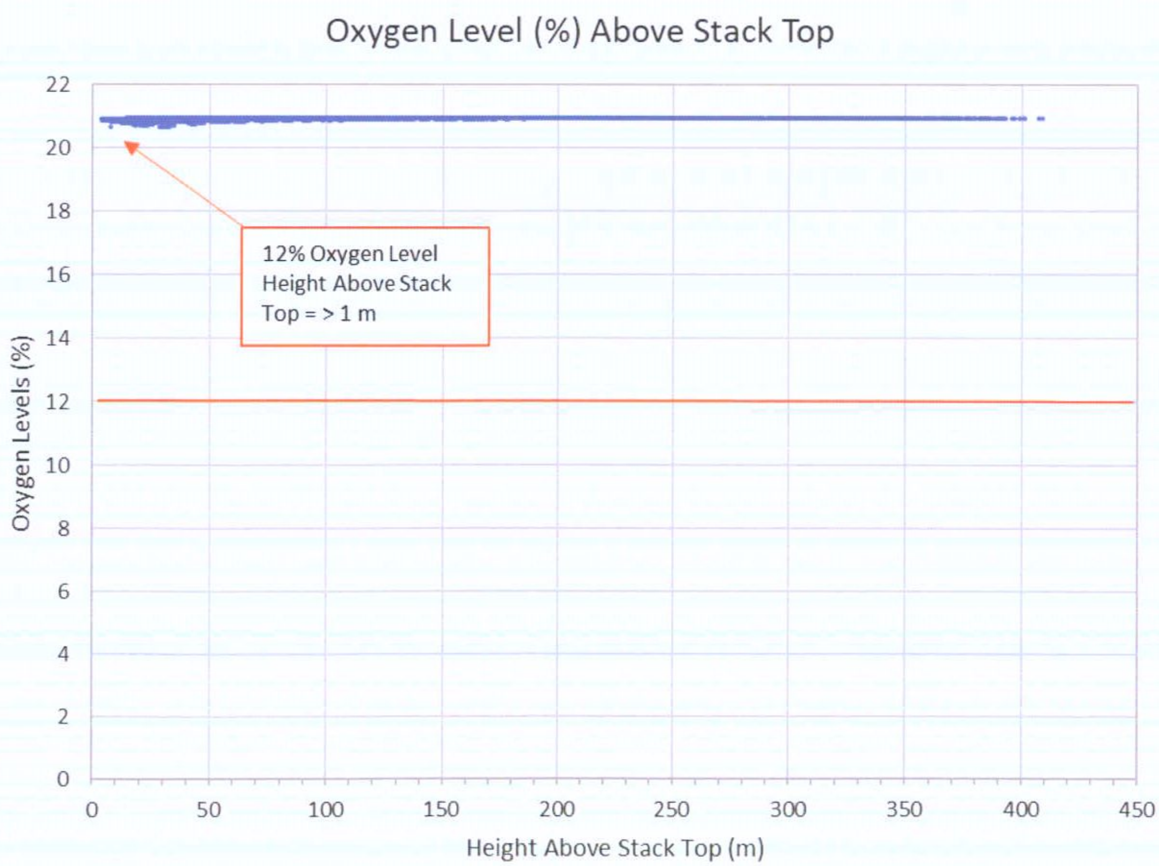

Figure 2 **Oxygen Content Of The Plume (%) With Distance From Stack Top**

The modelling results confirm that within a distance of < 1 m from the stack top (< 28 m above local ground level) the oxygen content of the stacks plume will be 12% or greater. This analysis is based on every hour of the worst case year 2020 and includes all meteorological conditions including pressure/temperature inversions.

TEMPERATURE / PLUME INTERACTIONS

Temperatures in excess of 50°C are potentially hazardous to aviation and thus the decrease in the initial temperature of stack plumes (583°C) with distance from the stack has been investigated. Modelling of the temperature of the plume with distance from the stack has been undertaken using the CERC ADMS-5 model for every hour of the year based on Dublin Airport 2019-2021 meteorological data. The model has a specific temperature module which can, as part of the model output, give the temperature of the plume centreline with distance from the stack top. The results are outlined below in Figure 3 and Figure 4 for the worst case year of 2020.

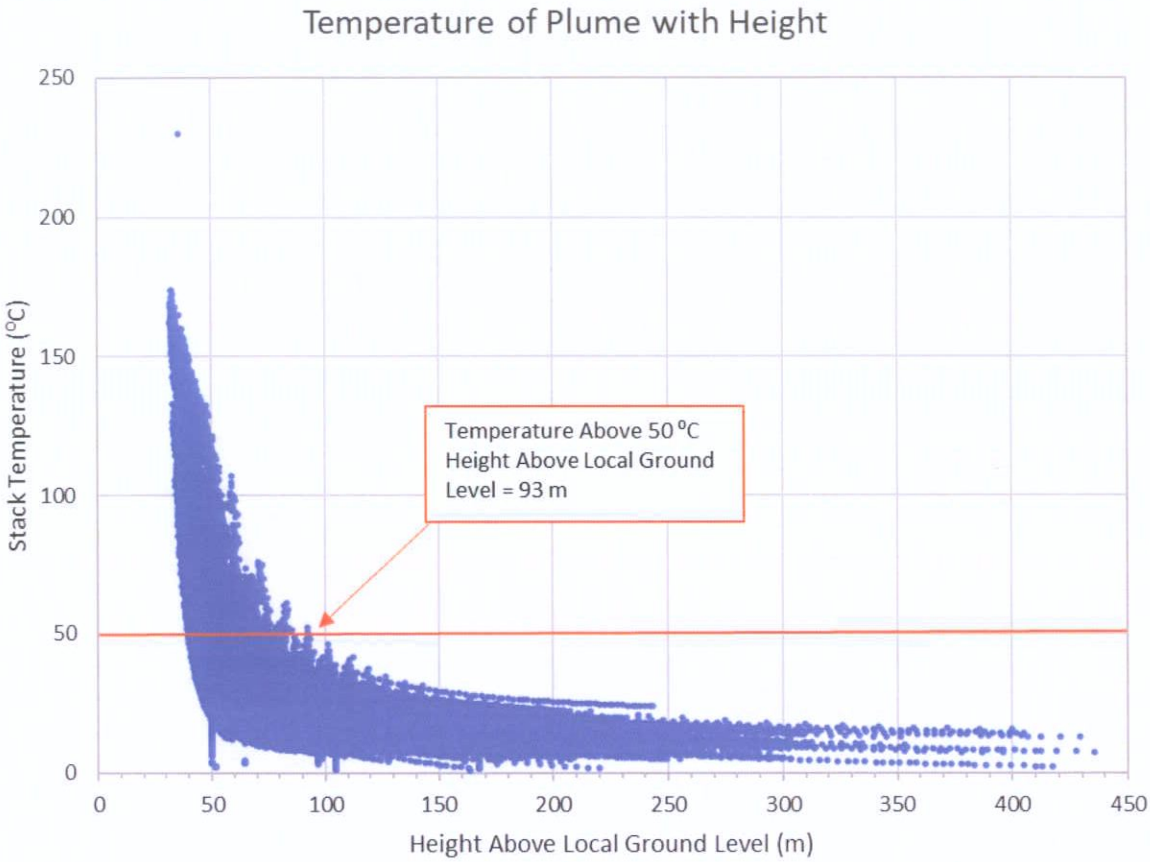

Figure 3 Temperature Of The Plume (°C) With Distance Above Ground Level