

Annex C

Discussion of Proposed Permissive Path from Fort Road

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An access point from Fort Road to the north-west corner of the Exchange Common Land will be provided. This will comprise a footbridge from the highway verge across the drainage ditch to the field and a fenced path along the edge of the field to the Exchange Common Land. It will improve public access from West Tilbury to both the Exchange Common Land and to Parsonage Common. The footbridge location will be opposite the existing Common Land along the north-eastern edge of West Tilbury and will connect with Fort Road Common, better linking the various areas of access land around West Tilbury for recreational use.

Access to Walton Common is currently taken from Parsonage Common across the railway line. Access to the Exchange Common Land from Parsonage Common will be provided and will improve the position over the current access by removing the need to cross the railway line. The opportunity to further enhance connectivity by providing a link to Fort Road has been identified and discussed with the landowner and stakeholders. An access from Fort Road will, however, only be an enhancement if it is used responsibly, is not misused or facilitates anti-social behaviour and remains in a safe and useable condition.

The Applicant would not intend to purchase the land for the footbridge and path where that can be avoided, or to establish a right of way. The route from Fort Road to the Exchange Common Land will be a permissive footpath. The Applicant continues to seek to provide this through contractual agreement with the landowner; however, it has been included within the scope of compulsory acquisition as a precautionary measure.

The reason for this is that access land and farm land in and around the landowner's local holdings has been subject to longstanding anti-social behaviour including fly-tipping, fly-grazing and vandalism of farm assets. Examples of fly-tipping at accesses off Cooper Shaw Road are shown below.

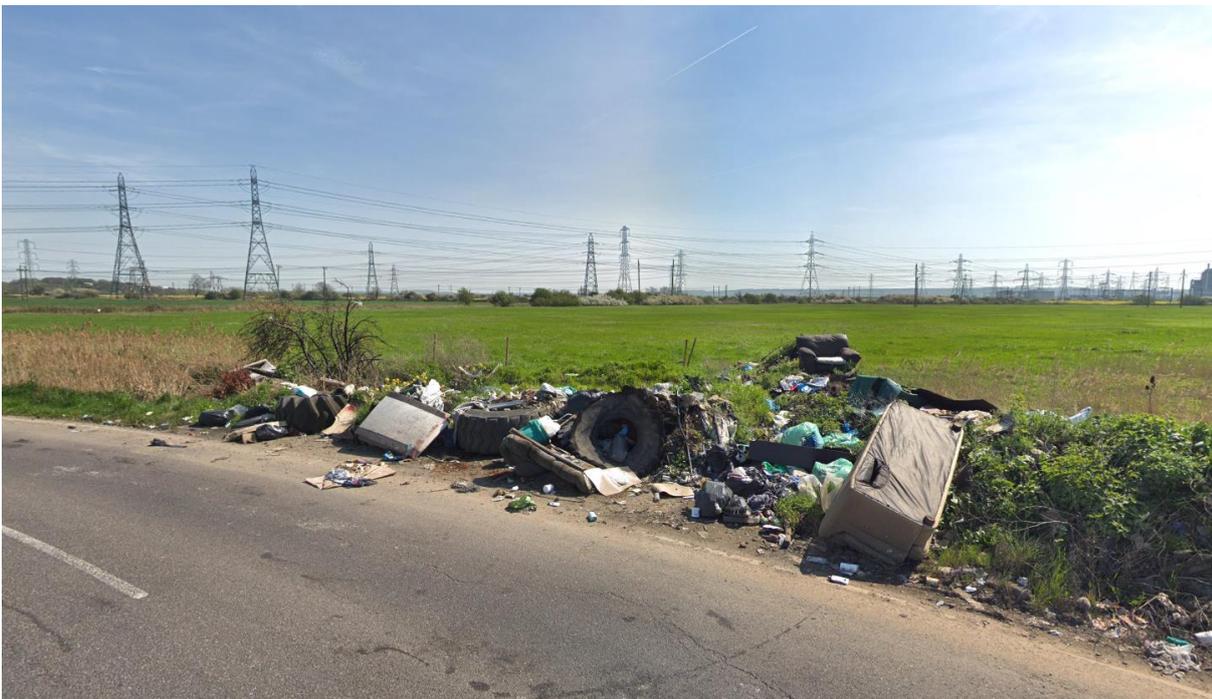




Photo dates 2018. Photos © Google and RPS.

There is considered to be a credible risk that similar anti-social or criminal activity could occur at the proposed footbridge and path, or in the Exchange Common Land and adjacent farmland, facilitated by the access created from Fort Road. This could cause unacceptable liabilities to the landowner, environmental

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damage to the Exchange Common Land, interference with the legitimate use of the common or risk to public safety if the footbridge is damaged. The option of remedying such problems by removing this access route is therefore required by the landowner, which would not be possible were a permanent right of way to be established.

In the event of significant or sustained misuse of the permissive path or the Exchange Common Land, such as fly-tipping, fly-grazing or vandalism to the footbridge, remedy may include temporarily or permanently withdrawing permission to use the path, and the footbridge may be physically removed. In this circumstance, access to the Exchange Common Land would remain via Parsonage Common.

Under the agreement referenced above, the permissive path would be provided for a minimum of 18 months. After that time, permission would only be withdrawn in consultation with Thurrock Council. The trigger for this withdrawal would occur in circumstances where:

- a) Two incidents of alleged criminal or anti-social behaviour including theft, vandalism, fly-grazing and fly-tipping or use of the common land for illegal activity related to or reasonably believed by the landowners to have been facilitated by the Fort Road access are reported to the police or other appropriate authority including Thurrock Council in any two-year period, or
- b) the footbridge is removed, destroyed or rendered unsafe or unusable by vandalism or misuse and, having been repaired or replaced once, is again damaged, destroyed or removed, or
- c) the landowner incurs expenditure in addressing anti-social behaviour related to or reasonably believed by the landowners to have been facilitated by the Fort Road access on two or more occasions (including the costs of removing fly-tipped material, remediating contamination caused by illegal disposal of waste, and taking court action to remedy illegal action such as evicting trespassers or illegal encampments).

Annex D

The Applicant's Analysis of the Need Case

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Prepared by: Andrew Troup

Date: February 2020

NEED FOR FLEXIBILITY AND BACK-UP GENERATION (February 2020)

As the UK deploys more renewable capacity in the form of wind and solar, the need for firm but flexible generating capacity to balance this intermittency will grow as will the need to ensure the electricity system is secure. Conventional forms of generation cannot easily start, stop, or modulate output in line with the minute by minute fluctuations of the weather.

Medium speed, high-efficiency gas engines of the type proposed at Thurrock Power represent one of the lowest carbon forms of firm (reliable) flexible (responsive) generation able to meet the requirements of the low carbon electricity system. This new class of plant is likely to displace the equivalent capacity of less efficient, less flexible and higher-carbon incumbent generators currently operating on the network. These include older CCGTs, high speed gas engines, coal in the short term (until 2024) and interconnectors (to date an unreliable source of flexibility). While pumped hydro is essentially zero carbon, it can only make a very modest duration-limited contribution to back-up supply due to the limited number of sites available in the UK.

The battery storage component of the Flexible Generation Plant will provide frequency support to the Grid which is of high value in stabilising the operation of the electricity grid in the face of unexpected transients such as the events in August 2019, which led to widespread power cuts and rail transport disruption¹. It can also provide very fast response power (<1 sec, though only for relatively short durations)

In National Grid's Future Energy Scenarios Report 2019 (NGFES2019²) it recognises that over the next 30 years *"Under the '2 Degrees' scenario (required to significantly decarbonise) gas fired generation will decrease but it will take on more of a peaking role, load factors will decrease and plant will increasingly be reliant on the **selling of flexible services to remain competitive**"* (Applicant's emphasis, page 116).

Need for more generation in total to support renewables

The need for more generation in total will increase as the UK pursues a path towards electrification of transport and heating. NGFES2019 predicts that peak demand remains at today's level at c. 50GW under most scenarios until 2025 and then rises to between 61 and 73GW by 2035 and 66-80GW by 2045 (Fig 2, page 48). The need for more back-up generation will also increase as the Government pursues further ambitious deployment of renewables.

NGFES2019 states in relation to Great Britain's electricity capacity that;

*"In all scenarios overall capacity grows, but this is particularly noticeable in 'Two Degrees' and 'Community Renewables (these being the 2 scenarios required to meet Net Zero by 2050, page 16).'**where installed generation more than doubles by 2050.** The proportion of renewable capacity also grows in every scenario, but much more quickly in the 2050 compliant scenarios. These developments are interrelated; Two Degrees and Community Renewables both have a higher proportion of renewable*

¹ https://www.ofgem.gov.uk/system/files/docs/2019/09/eso_technical_report_-_final.pdf

² <http://fes.nationalgrid.com/fes-document/>



*generation, and much of this capacity is intermittent, only producing electricity when weather conditions are favourable. **This means more generation capacity has to be built to meet overall energy requirements and times of high demand, particularly winter.***" (page 114).

It is the applicant's view that even at today's level of electricity demand, it is simply not feasible to both balance this intermittency and make the electricity system secure without back-up gas generation. It is needed to keep the lights on. The imbalance in renewables could not be met now with batteries (high capital cost and short duration), pumped hydro (limited overall capacity), by controlling demand (which is practically limited in scale), by interconnectors (reliant on other countries' generation) or by any combination of these; indeed, it would never realistically be able to do so and certainly would not be able to do so if demand increases.

Outlook for existing plant and new build

There are many factors that determine the makeup of electricity generating capacity in the UK. Policy and economics are the most important and the uncertainty on both makes it difficult to predict outcomes. Since the legislation was passed in 2019 setting a binding requirement for national greenhouse gas emissions to be net zero in 2050, there is, however, a strong policy intent that will play an increasingly important role.

Set out below is a view on the future for the principal incumbent energy generation types and then in the section that follows a view is given on new build prospects.

1. **Coal** – 9 GW of existing coal plant (currently only about 3GW is in regular use) is expected to close by 2025 or potentially earlier following the Government's latest consultation (4th Feb 2020³).
2. **Diesel generators** – these are no longer economically viable.
3. **Smaller gas engine generators** (<2MW) have become increasingly marginal to run with the loss of embedded benefits, loss of triads, lower efficiency and possible additional cost to control NOx emissions for MCPD by 2025.
4. **Legacy nuclear fleet** – it is expected that all but one of the existing plant (representing 87% of generating capacity) will be decommissioned in the next 10 years. (World Nuclear Association).
5. **CCGT's** – Of the 30GW of installed capacity, 10GW will have reached 30 years old in the next seven years. There is currently no legal requirement for this plant to decommission in the future. The decision to do so would be an entirely commercial one for the asset owner, factoring in the increased costs of maintaining and repairing ageing turbine plant in a more volatile energy market. CCGT's are generally designed to run as baseload or at the very least on 8-12 hour 'runs' but struggle to do this with increasing amounts of renewable generation on the electricity system. As an example, in January and the first half of February 2020, the newest CCGT's have had a load factor of 38% and the remainder a load factor of 23%. CCGT's also face a potential headwind with changes to the transmission charging regime and lower Capacity Market (CM) clearing prices; these are the 2 sources of revenue that typically help to cover a plant's fixed O&M costs. An option for CCGT owners is to operate the plant in 'open cycle' (OCGT) which shortens the period from start-up to generation and reduces the O&M

³ <https://www.gov.uk/government/news/end-of-coal-power-to-be-brought-forward-in-drive-towards-net-zero>

costs but at a loss of efficiency and increased CO₂ emissions as the combined cycle benefits are lost.

6. **OCGT's** – There is currently 3GW of installed capacity. These plants are better suited to a volatile market and a need for flexibility. They are, though, 13-14% less efficient than medium speed gas engines and have slower start-up times.

In summary, there may well be a substantial reduction in existing generating capacity and a risk that existing CCGTs, if remaining open, will be pushed into inefficient and high-emission operating modes in order to be commercially viable in a market increasingly dominated with intermittent generation.

New Build

Since January 2013, two CCGT plants have been built: one at West Burton and the other at Carrington in 2016. A further plant, Keadby 2, began construction in 2019. With uncertain trading conditions, a lack of forward visibility on running hours, low clearing CM prices and changes to the transmission charging regime, the investment case for a new CCGT is challenging.

RWE's decision to put its CCGT DCO proposal ('Tilbury Energy Centre') on hold at Tilbury is an example of the challenging investment position. There is estimated to be some 11 GW of consented CCGT's that could be waiting for an award of a long-term CM contract (at a significantly higher clearing price than the highest historic clearing prices) to make an investment case for the consent to be implemented. To date no new build CCGT's have cleared under the CMA.

There is 2.1 GW of consented but un-built OCGT capacity [that is in a similar position].

There are identified nuclear projects being actively progressed at Sizewell B and Bradwell with Wylfa awaiting consent but currently on hold. In addition, Moorside and Oldbury are identified but are not actively being progressed. Hinkley Point C is not expected to commission until 2025 at the earliest and is heavily subsidised; the CPI indexed Contract for Difference (CfD) is currently at c. £110/MWh for Hinkley Point C while the average wholesale electricity price is currently less than £32/MWh. The cost to the consumer of making up this difference would be the same as paying Thurrock Power a £140m/year subsidy for 3,000 operating hours. The cost of CCUS or decarbonisation with hydrogen would be substantially less.

According to National Grid's 'Connecting for a smarter Future' report⁴ there is currently 4.4GW of operational interconnection capacity and a further 4 GW under construction. NG's analysis shows that '*there is significant consumer benefit from at least a further 9.5GW of interconnectors*'. There is increased uncertainty with interconnectors following the UK's departure from the EU. There is also an inherent risk relying too heavily on other countries' power generation.

⁴ <https://www.nationalgrid.com/document/118641/download>



Government policy and decarbonisation

The National Policy Statement for Energy (EN-1) states at paragraph 3.6.1 that *'fossil fuel power stations play a vital role in providing reliable and flexible electricity supplies.'*

This policy was set in 2011 at a time when decarbonisation was established as a policy objective by Government – paragraph 3.6.2 notes *"the important role that gas will continue to play in the electricity sector, noting the vital flexibility it provides in supporting the increasing amount of low carbon generation and its role in maintaining security of supply"*.

This continues to be fundamentally true at present but in view of the net zero goal and shift in the national debate, the applicant is not blind to future energy policy developments to deliver zero carbon. This will clearly be a key point in the emerging Energy White Paper (to which the applicant has submitted evidence on flexible generation). The applicant anticipates that should the White Paper be published over the course of this DCO programme, the emerging energy policy will therefore naturally reflect the aim to decarbonise fully by 2050 but continue to support the important role of flexible gas in the transition.

As the Statement of Case argues, it will be impossible to achieve decarbonisation of the electricity system without a further substantial investment in renewables. It is a fact that the intermittency of this renewable generation will dictate that the energy system has a highly flexible, firm and reliable way of 'keeping the lights on' and that in time generation capacity will also expand to help cope with the greater demands that the country puts on the system to electrify transport and heating.

Flexible gas can play a critical role over the next 30 years to the point of full decarbonisation. The efficiency and efficacy of the medium speed engines in this proposal means that it is almost as efficient as a traditional baseload CCGT but it can be used relatively sparingly and turned off and on when needed. Its versatility is such that it will often sit at the top of the merit order when the market imbalance appears and will help the UK lower costs and avoid using more polluting generators to meet the demand. It will mean that the UK can be more confident about its increasing reliance on renewables. It uses fossil fuel in a 'reliable and flexible' way; a vital role today if the country is to realistically decarbonise.

Carbon reduction of Thurrock Flexible Generation Plant

The applicant is actively pursuing a decarbonisation strategy for the plant. It is anticipated that the engines deployed will be ready to take a 20% by volume mix of hydrogen and natural gas.

It is with this vision that the applicant believes there is a practical and ultimately commercially viable route for the Flexible Generation Plant to support further decarbonisation through its readiness to use hydrogen fuel: a readiness that is not matched by many of the incumbent generation technologies that have been referenced in this paper. At the UK and international level, the benefits of hydrogen in decarbonising heating and particularly transport are also increasingly being recognised as one of the most effective methods of decarbonisation.