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HEATHFIELD POWER STATION

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Section 1. Introduction

In April 2019 Teignbridge District Council unanimously declared a climate emergency, so it essential that everything possible is done to ensure that greenhouse gas emissions are reduced, and certainly not increased.

An application for a gas-fired power station at Heathfield has now been received, and the planning officers have recommended approval based on the applicant's statement. However, the applicant's statement puts the application in an unduly favourable light, which I will outline in the rest of this document.

Policy S7 as now amended to align with the government's commitment to reduce emissions to net zero by 2050 states that a 48% reduction on 2009 levels is required by 2033.

The planning officer's report states that the determination that the application was compliant with policy S7 was "finely balanced", so had the correct statistics been used it is reasonable to assume that the balance might have swung the other way.

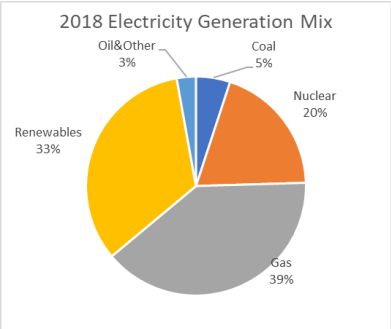
Section 2. Statements derived from energy generation statistics

The applicant's statement states some statistics published by BEIS which give an unbalanced view of the application. We believe that this misleading presentation of the facts is materially relevant because of the fine balance of this application.

2.1 Proportion of renewables in the generation mix

The applicant states in section 3.4 "*The applicant's agent has advised that according to the Department for Business, Energy and Industrial Strategy (BEIS) UK Energy Statistics in 2018, a record 52.8% of electricity was generated from renewable resources*." This statement is incorrect the figures given by BEIS for 2018[i] are:

Coal	5%
Gas	39.4%
Nuclear	19.5%
Renewables	33.3%
Oil & Other	2.8%



The applicant has included nuclear in with renewables in this statement.

As the argument put is about intermittence it is very misleading to include nuclear with renewables, because nuclear supplies a steady base load, which can not be turned on or off at short notice.

2.2 Reliance on fossil fuels

The applicant goes on to say "*However, this means that the UK is still heavily reliant on old inefficient and carbon intensive forms of electricity generation such as coal power.*"

This is again misleading as the proportion of coal in the mix for 2018 was only 5%, for 2017 this was 6.7%, coal use for power generation dropped substantially since 2014.

2.3 Gas is the problem not the solution

Figures for emissions for the different fuels used in electricity generation can be derived by multiplying the electricity generated by an emissions factor and dividing by the efficiency of the plant. Emissions factors for coal and natural gas for 2018 are in the table below[ii]:

Fuel	$kgCO_2e/kWh$	$kgCO_2/kWh$	$kgCH_4/kWh$	N_2O/kWh
Coal (Electricity Generation)	0.3275	0.32552	0.00009	0.00189
Gas	0.2303	0.22999	0.00016	0.00015

Ignoring plant efficiency (which will make emissions worse), applying these factors to gas and coal emissions percentages, coal emits 15.38% and gas emits 84.62%. So burning gas is by far the highest cause of emissions in electricity generation, in order to further improve emissions from electricity generation, we now need to reduce both the gas and coal content. Small gas-fired plant also tend to be less efficient than larger plant.

Given that gas is now the largest contributor to emissions it cannot be considered a low carbon source.

Western Power Distribution have identified Newton Abbot as an area where flexibility is needed, however, the prices paid for electricity under these contracts does not justify building plant for the purpose, these contracts are only viable for turning down demand, or supplementary to the business case for some other scheme. It is unlikely that this plant would be financially viable based on these payments alone, therefore we suspect that it will have to run for longer than just peak periods, probably 50% of the time and potentially up to 80%.

As there is limited capacity to connect generation to the network, this gas plant will prevent new renewable generation in the Heathfield area. Such renewable generation is eminently viable and would deliver TDC's S7 strategy.

As this peaking gas plant prevents new renewable generation in the Heathfield area it does not support the roll-out of low carbon or renewable technologies.

2.4 National Planning Framework (NPPF)

The officer's report reference paragraph 148 "*the planning system should support the transition to a low carbon future in a changing climate and support renewable and low carbon energy and associated infrastructure*"

As gas isn't low carbon this doesn't apply.

Paragraph 154 is also referenced: "*when determining planning applications for renewable and low carbon development, local planning authorities should not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions.*"

As gas isn't low carbon this doesn't apply.

2.5 National Policy Statement for Energy (EN-1)

This was written in 2011 when the only viable storage systems were pumped hydro schemes, and renewables had not developed to their current level. In recent years a number of means of storage have been developed which are largely independent of geography. In addition, recent developments in wind turbine technology mean that generation at lower wind speeds is now possible, so shortfalls

in supply are less likely. Modelling for the Centre for Alternative Technology's Zero Carbon Britain report[iii] demonstrates this.

The quote from EN-1 ends:

"*As a result, the more renewable generating capacity we have the more generation capacity we will require overall, to provide back-up at times when the availability of intermittent renewable sources is low. If fossil fuel plant remains the most cost-effective means of providing such back-up, particularly at short notice, it is* ***possible*** *that even when the UK's electricity supply is almost entirely decarbonised we may still need fossil fuel power stations for short periods when renewable output is too low to meet demand, for example when there is little wind.*"

This is a prediction about future technology and needs to be viewed in light of current and imminent technology.

As this is a general statement it is not justification on its own, it needs to be demonstrated in this specific case that this plant is justified to deal with the specific problem of short periods when renewable output is too low to meet demand without running at other times.

2.6 National Policy Statement for Energy (EN-2)

This relates to fossil fuels.

Paragraph 1.5.1 of EN-2 states "*This NPS is made under the Planning Act 2008, which applies in England and Wales to applications for fossil fuel generating stations with over 50 MW generating capacity*."

The application is for a 2.5MW generating station so this policy does not apply.

2.7 Climate Change Committee (CCC)

Section 3.19 of the officer's report quotes the May 2019 report of the CCC[iv] : "*The UK's contribution to stopping global warming' (May 2019) details that electricity systems need to match electricity supply to demand in real-time. It notes that as more weather-dependent sources of electricity supply come online, matching supply to demand can become more challenging. The report states further that given important roles for electrification in both transport and heat, electricity demand will rise in most areas. Solutions that enhance system flexibility (e.g. smart charging of vehicles and hybrid heat pumps), will be important in ensuring that demand peaks are manageable and enabling maximum use of renewable generation. As such, many networks will need to be upgraded in a timely manner and future-proofed to limit costs and enable rapid uptake of electric vehicles and heat pumps.*"

This statement covers the need for flexibility, but does not support that this is done by using fossil fuels.

A search of the CCC report returns only one reference to peak demand, which is on page 182 in the section on infrastructure.

Section 3. Why will there be additional electricity demand?

Increased electricity demand arises from the need to decarbonise:

- Transport, specifically the move towards electric vehicles, with sales of new Petrol and Diesel vehicles now planned for 2035, and discussion of bringing even this date forward.
- Home Heating. The Future Homes Standard will by 2025 not allow natural gas boilers for heating new houses from 2025.

Installing electric heating, ideally heat pumps, and then generating the electricity to drive these from a gas fired power station would defeat the objects of the exercise.

Section 4. What problem are we trying to solve with gas?

The stated purpose of a gas peaking station is to cover periods of low renewable generation, these periods can be classified as follows:

- Very short interruptions in generation due to things like passing clouds and so on, variability in wind speed. (These are probably only a few minutes).
- Longer periods when there is neither wind or sun. These might be one or two days at a time.
- Regular peak periods, when generation and supply don't match on a predictable regular cycle.
- Voltage and Frequency response, which are caused by fluctuating supply or demand.

There are alternative solutions that are already in use or can be rolled out today to meet each of these situations that don't involve burning any fossil fuels:

- Demand balancing and turndown
- Storage batteries – currently Lithium-ion[v]
- Reflow batteries[vi]
- Cryogenic storage[vii]
- Bio-fuels
- Electrolysis to convert surplus solar into hydrogen

Currently gas is less costly, so some of these newer technologies are not being installed as fast as is necessary to further decarbonise. As capacity for grid connection is finite, gas installations are preventing these other technologies from developing to the point where they are cost effective.

4.1 Very short interruptions in generation

These typically occur with solar energy because during the day the sun is obscured, say by cloud, these drops in output are short and can be met best by storage at the generation site to buffer supply to the grid, this means that for a short period of time the grid can draw more from the generation site than its current generation. It is unlikely that a gas station would be able to respond to these situations effectively, as the drops in generation from solar can be for a few seconds only. This kind of interruption is currently dealt with by the National Grid as part of its routine operations.

4.2 Longer periods with neither wind or sun

These are currently routinely managed by the National Grid large-scale backup power plants. Longer term these larger storage facilities can be replaced with reflow batteries or cryogenic storage.

4.3 Regular peaks

Over the daily cycle enough generation is needed to meet the aggregate demand over the cycle, and steps need to be taken to shift demand. This is addressed by Distribution System Operators (e.g. WPD) through their current peak balancing tenders.

This demand shift can either be by turning off demands that are not time critical at peak times, examples being supermarkets turning down refrigeration, not charging cars during the peak. Consumers can demand shift by installing storage batteries, particularly in conjunction with domestic PV.

Regular peaks can also be handled by storage and surplus renewables, rather than fossil fuels.

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[i] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791297/Press_Notice_March_2019.pdf

[ii] https://www.greenelement.co.uk/wp-content/uploads/2018/06/Conversion_Factors_2018.xls

[iii] https://www.cat.org.uk/info-resources/zero-carbon-britain/research-reports/zero-carbon-britain-rising-to-the-climate-emergency/

[iv] https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf

[v] https://www.tesla.com/en_GB/blog/introducing-megapack-utility-scale-energy-storage

[vi] http://redtenergy.com/customers/energy_infrastructure_projects/

[vii] https://www.highviewpower.com/news_announcement/highview-power-to-develop-multiple-cryogenic-energy-storage-facilities-in-the-uk-and-to-build-europes-largest-storage-system/