Ref: EMS067

12th January 2017

Client: A2Dominion Development Limited
Development: 156 West End Lane

Subject: Response to further comments for the Energy Strategy

Author: Yannis Papadopoulos
Checker: Mark Hutchison
Approver: Mark Hutchison

INTRODUCTION

Silver produced a revised Energy Statement dated June 2016 to support the full planning application for the 156 West End Lane mixed-use development which included details of the development's proposed energy strategy.

After resubmission of the planning application, A2Dominion Development Limited (A2Dominion) received feedback from the council which included comments and questions regarding the energy strategy proposals. The relevant comments together with Silver's responses are provided in the following section of this document for ease of reference.

This document has been produced as a further Addendum to the submitted Energy Statement aiming to address the council's comments and questions and should be read in conjunction with the Energy Statement, the addendums and other relevant documents.

RESPONSE TO FURTHER COUNCIL COMMENTS

1. The applicant is providing cooling to the private dwellings, despite no evidence of an overheating risk shown in the dynamic overheating analysis. The applicant has stated that by providing efficient cooling systems now they are mitigating against inefficient systems being installed in future when rising temperatures may lead to overheating in the units. However the applicant has not provided evidence of a future years overheating assessment to back this statement up. Because cooling is only provided in some of the units, it's likely is it being proposed to increase marketability of these units. The cooling plant will use energy, will expel heat and will take up plant space on the roof which could be used for solar PV, therefore it is recommended that the applicant considers removing cooling from the proposals, unless a strong argument (and evidence of overheating risk) can be made to retain it. ***Further actions: The applicant should provide further detail on the overheating assessment, particularly future years assessment – for all units. If the assessment demonstrates that there is no risk of overheating, then cooling should be removed.***

Response:
There is no current regulation that requires an overheating assessment with a future weather years' assessment in any of the national, GLA or local policy guides for all units. As such, we believe that we have already effectively addressed the cooling hierarchy as set in London Plan and Planning guidance on preparing energy assessments.

The cooling strategy (or hierarchy) determines of measures that help in reducing the demand for cooling and thus avoid excessive requirements that would result in intensive energy consumption. Thus, it demonstrates, in this case that the present development has been designed to prevent overheating and avoid excessive requirements for cooling.

However, section 1.2.1 Overheating vs cooling demand of the adopted GLA document 'Creating benchmarks for cooling demand in new residential developments' (July 2015) presents the difference between an overheating assessment and the cooling demand.

The energy and carbon emissions associated with meeting this cooling demand are only displayed in the modelling outputs and accounted for in the carbon compliance calculations if an air conditioning unit is specified to meet this demand. Therefore a design could result in a high cooling demand that remains undetected and unaddressed unless the designer specifies air conditioning. This can potentially create problems if air conditioning is not included and resulting in high cooling demands that are likely to go undetected.'

There is no conflict between following the cooling hierarchy and provide cooling. The first point suggests that the provision of comfort cooling will not result in high cooling demands that remain undetected and unaddressed which will later lead to a significant negative impact on the carbon emissions reduction efforts.

The cooling plant will use energy and expel heat, however as the following part of the GLA document 'Creating benchmarks for cooling demand in new residential developments' suggests:

"A study carried out by Day et al in 2009 identified that the London residential sector could be responsible for an extra 100,000 tonnes CO_2 per year by 2030 as a result of active cooling. This forecast could well be exceeded if the current trend for high density and highly glazed luxury developments is set to continue and if climate change and the urban heat island exacerbate external conditions.

The Day study concluded that where possible, mechanical cooling solutions should be avoided or reduced, but that the uncertainty in how climate change will manifest itself may mean that it is better to design in high efficiency cooling solutions now, rather than risk individual (low efficiency) units being installed ad-hoc in response to warming conditions. This is a particular issue in the residential market where ad-hoc retrofit with portable air conditioning units is a higher risk. This view is supported by the findings of the Pathan study, which identified a massive discrepancy in the efficiency of fitted air conditioning systems (centralised or dwelling specific split units installed in new build) and portable units (as can be bought in a department store as an easy retrofit solution). EERs for the former were measured in the range of 5-10, while the latter performed far worse than advertised with an EER of less than 1.

The threat of additional carbon emissions as well as the potential health implications of overheating in homes highlight the need to better understand how to design buildings to help reduce the risk of overheating. This report intends to help GLA assess developer response to the cooling hierarchy and take a more informed view about the extent to which passive measures can address the issue, and also if and when active cooling may be a necessary element of the cooling strategy."

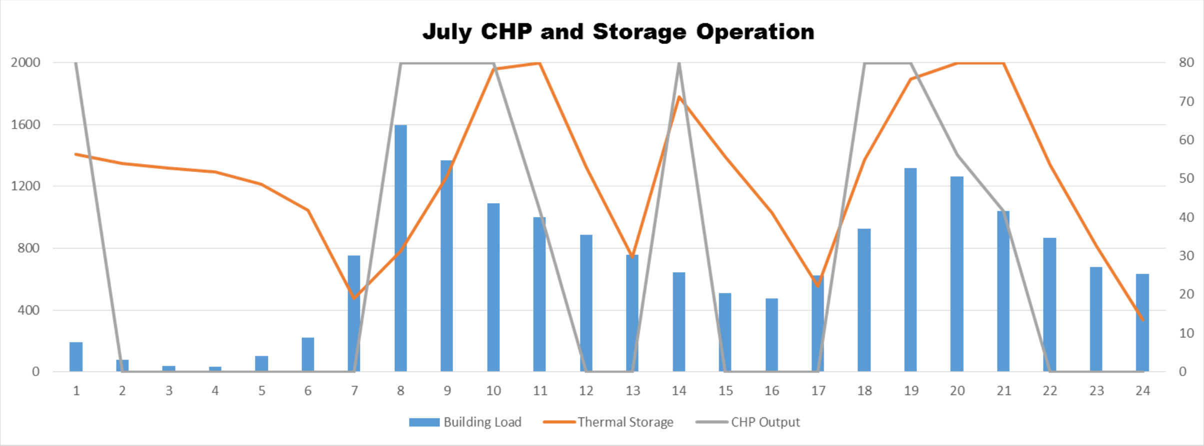
In relation to the space taken at roof level that could be used for solar PV, the cooling plant can be installed on a roof with significant over shading where PV panels even if installed will fail to generate power without the necessary sun coverage.

2. CHP is proposed which provides the majority of the site-wide carbon savings. This suitability of CHP for a relatively small site has been questioned by the Council and the GLA, and the developer has subsequently provided further information. There is high level of fluctuation during the summer months which is not considered to be optimal for operation. The applicant has said this is because of the interaction between the CHP meter reader and the thermal store (when the thermal storage is full the CHP slows down as the storage can meet the demand). There are multiple stop-starts of the CHP system throughout the June design day – the applicant should confirm that this type of operation is technically feasible for the development. ***Further actions: There are multiple stop-starts of the CHP system throughout the June design day – the applicant should confirm that this type of operation is technically feasible for the development.***

Response:
Please find below our response from the 11th November 2016 Addendum where the starts-stops of the assumed CHP engine (one engine assumed at this stage) have been reduced. This operation is reasonable and technically feasible, as there is the preconception from CHP suppliers that if the starts-stops during a day are less than 15 and the CHP unit functions for more than 30 minutes each time, this operation is reasonable and technically feasible. The relative mail correspondence with a CHP supplier is presented in Appendix A.

11th November 2016
There has been some further adjustment to the CHP controls in our model that resulted in a more normalised CHP operation profile during the summer months, as depicted in figure A1. During the summer design day we now have three clear periods of CHP operation and decreased fluctuation. Thus, this more steady profile is regarded as optimised for the CHP installation.

Figure A1 – Summer Design Day CHP, thermal storage and backup boiler output



Appendix A - Technically feasible starts and stops in a CHP Unit

Yannis Papadopoulos

From:	Beata Blachut <Beata.Blachut@sav-systems.com>
Sent:	12 January 2017 12:02
To:	Yannis Papadopoulos
Cc:	Ian Stripp; Ryan Grant
Subject:	RE: Technically feasible starts and stops in a CHP Unit

Hello Yannis,

Thank you for your e-mail and phone call.

I can confirm that three CHP starts in 24h period are perfectly OK. A few starts per 24h are fine for LoadTracker CHP. This can be a likely scenario on numerous sites out of the heating season.

As mentioned on the phone yesterday CHP control system is trying to avoid engine short cycling which is defined by manufacturer as stop/start every 20-30 min. Such frequent starts would have negative influence on engine lifespan.

I trust this answers your question. Please do not hesitate to get back in touch should you need more info.

Kind Regards,

Beata Blachut
Technical Manager – LoadTracker CHP

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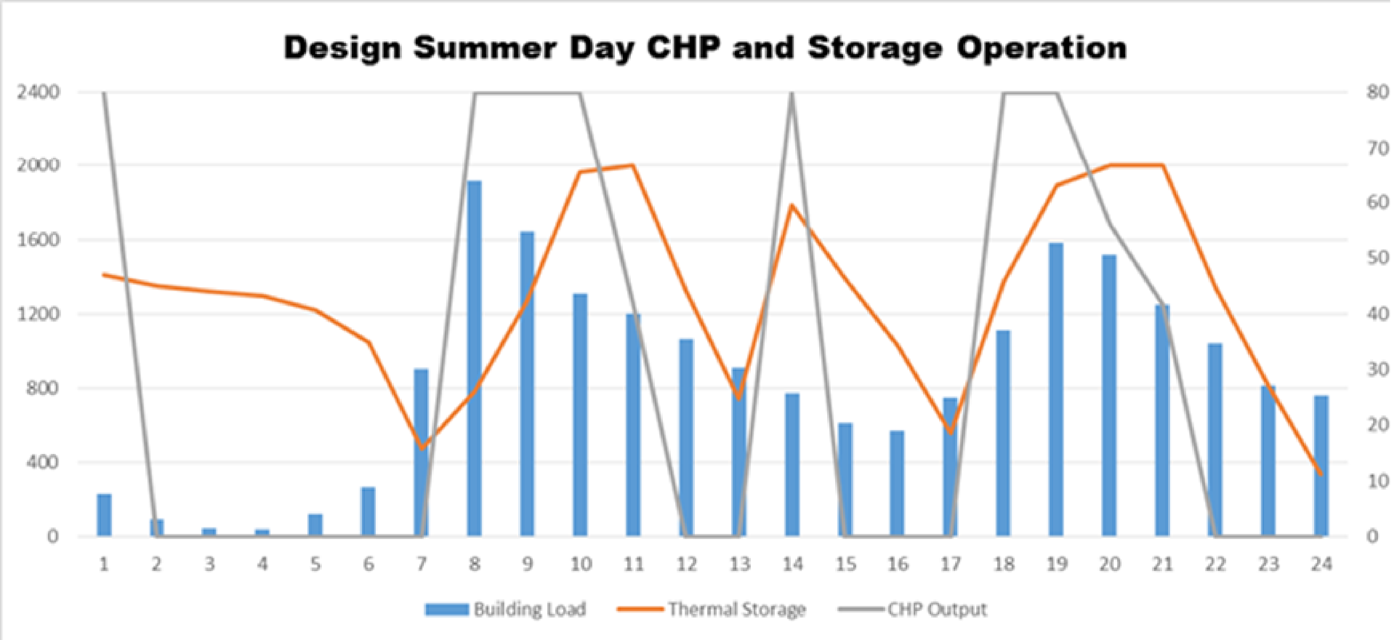
From: Yannis Papadopoulos [mailto:Yannis.Papadopoulos@silverdcc.com]
Sent: 11 January 2017 17:53
To: Beata Blachut <Beata.Blachut@sav-systems.com>
Subject: Technically feasible starts and stops in a CHP Unit

Hi Beata,

Thank you for your time and help over the phone earlier on.

As discussed I would like to query about the technically feasible starts and stops for a CHP unit during a 24-hour period.

In our case the development will need to include a CHP thermal output of 80 kW, which will possibly be served by 2 CHP units of 40 kWth.
The following summer design day thermal load chart shows that the CHP unit together with the thermal storage will operate as indicated below. (assumption: one CHP unit serves the total load)



Do you consider the depicted starts and stops of the CHP engine to be technically feasible?

Thank you again for your help. A prompt response would be much appreciated.

Kind Regards,
Yannis

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