

# GREATER LONDON AUTHORITY

## REQUEST FOR ASSISTANT DIRECTOR DECISION – ADD2197

### Title: The case for heat pumps in London's new developments

#### Executive Summary:

Recent research commissioned and published by the GLA as part of the London Plan evidence base has highlighted that the continued decarbonisation of the national electricity grid may increasingly favour the use of heat pumps to meet the London Plan onsite carbon reduction targets. This would significantly impact the existing trend of specifying gas engine Combined Heat Power (CHP) technologies to meet the equivalent carbon target. The research also suggests that this tipping point between technology choice may be triggered by the adoption of 2019 emission factors for carbon reporting.

The GLA wish to establish the effect of adopting 2019 emission factors on the deployment of heat pumps, the cost and carbon impact for various heat pump configurations and impact on London's supply chain, development industry and building users.

#### Decision:

That the Assistant Director of Environment approves expenditure of up to £20,000 for the procurement and appointment of consultants to support the GLA's work in determining whether the supply chain and business case exists in London to allow for the transition to heat pumps. This will inform the decision as to whether we use updated carbon emission factors, or wait until government does this at a national level.

#### AUTHORISING ASSISTANT DIRECTOR/HEAD OF UNIT:

I have reviewed the request and am satisfied it is correct and consistent with the Mayor's plans and priorities.

It has my approval.

**Name:** Patrick Feehily

**Position:** Assistant Director of Environment

**Signature:**



**Date:**

6/2/18

## **PART I - NON-CONFIDENTIAL FACTS AND ADVICE**

### **Decision required – supporting report**

#### **1. Introduction and background**

In recent years, national Building Regulations (last published in 2013) have become increasingly outdated in relation to estimating the carbon emissions associated with buildings, in particular the carbon content of grid supplied electricity. The UK electricity grid has become significantly lower carbon in the four years since Building Regulations were last published. This is as a result of increased gas and reduced coal generation due to their relative fuel prices and rapid increase in renewable energy supply.

Following a consultation in 2016, the Government announced changes to the Standard Assessment Procedure (SAP). SAP is the tool used to measure the energy use and carbon emissions of new homes against the target set in the Building Regulations. A key part of this change will be updates to the emission factors associated with energy use to reflect the continuing decarbonisation of the electricity grid. These changes are likely to have an influence on decisions in selecting energy systems and technologies to meet carbon targets.

In summer 2017 the GLA commissioned Buro Happold to produce a report, “The future role of the London Plan in the delivery of area-wide district heating” to examine the impact of using updated emission factors on the energy systems and technologies that developers would propose in the energy strategies produced as part of planning applications. The report concluded that:

- As the national electricity grid decarbonises, the carbon benefit of gas Combined Heat Power (CHP) (the most commonly proposed technology in energy strategies currently) diminishes as gas becomes more carbon intensive relative to grid electricity
- Using 2019 carbon emission factors, gas engine CHP is expected to provide less carbon savings over its lifetime and, as such, will not sufficiently help London meet its carbon targets.
- Heat pump technologies, which are not currently commonly proposed, show increasingly greater carbon savings with future grid emissions factors and will meet our carbon targets.

In November 2017, the Government responded to the consultation stating that new greenhouse gas emission factors will be included in the next Building Regulations update; however the timeline for this is currently uncertain. In light of this uncertainty, we want to explore whether London can adopt updated emission factors before government to avoid locking in carbon intensive development long-term and support delivery of the Mayor’s aim for London to be zero carbon by 2050. A key part of this is whether London is ready for the shift to new low carbon technologies, in particular heat pumps.

#### **2. Objectives and expected outcomes**

The objective of this work is to establish whether the shift to heat pumps in London is technically and economically viable, whether the supply chain exists to support this shift as well as the impact on consumers’ energy bills. This will involve:

##### Heat pump market review

1. A summary of existing heat pump studies and the effectiveness of delivery programmes (including relevant stakeholder interviews).
2. A review of the existing heat pump market and supply chain in London, its ability to scale and the impact on the existing heating system market for new developments.
3. A review of consumer feedback and design versus operational and economic performance of existing air source, ground source and hybrid heat pump systems in new build developments in an urban setting.

### Impact of heat pump deployment of London Plan developments

4. A review of the carbon<sup>1</sup> impacts of air source, secondary heat source<sup>2</sup> and hybrid heat pumps systems for a number of typical development case studies, considering district heating integrated systems where specified within heat network priority areas.
5. A review of the various costs (capex, opex and local grid reinforcement) and who they fall on (developers, consumers, network operators etc) for air source, secondary heat source<sup>3</sup> and hybrid heat pumps when compared to traditional new build heating systems such as gas engine CHP and gas boilers.
6. Assessment of the impact of rapid heat pump deployment on noise, visual impact and use of refrigerants with a global warming potential.
7. Assessment of likely air quality impacts associated with hybrid systems, when installed in areas exceeding legal limits. Consideration of regulation required to limit any adverse impacts in related areas.

The expected outcome is an evidence base that will be used to inform our decision on whether to use updated emission factors in the planning process (through a revised Energy Guidance document). This will influence the decisions developers take to meet our carbon targets, better reflecting real-world emissions and supporting our carbon targets.

### **3. Equality comments**

The evaluation process will be conducted to ensure that submissions are evaluated fairly to select the offer that provides the relevant experience and offers value for money.

### **4. Other considerations**

#### a) Key risks and issues

<b>Risk/issue</b>	<b>Mitigating actions</b>
1. Insufficient evidence to support the move to use new emission factors resulting in criticism from industry for continuing to use outdated emission factors.	<ul style="list-style-type: none"><li>• Supplement this consultancy work with stakeholder engagement activities with developers, boroughs, NGOs to support the evidence base and the final decision on whether new emission factors are used.</li><li>• Continued engagement with government on the importance of updating emission factors within Building Regulations.</li><li>• If current emission factors are maintained, clear communications with industry on the reasons why to be set out.</li></ul>

<sup>1</sup> Carbon assessments should be limited to the consideration of Building Regulation compliance under the adoption of 2019 carbon emissions factors. Assessments should be compared against a more traditional approach to meeting London Plan onsite carbon targets.

<sup>2</sup> Secondary heat includes waste heat from other environmental sources (e.g. ground and water) as well as waste heat from commercial processes. Although the impact of utilising secondary heat on improving system performance should be acknowledged, a detailed consideration of all secondary heat sources is not required as part of this study.

<p>2. Evidence base supports the move to using updated emission factors but this creates confusion in industry as it diverges from national approach.</p>	<ul style="list-style-type: none"> <li>• Clear communications strategy produced, with user-friendly guidance explaining the methodology to be used</li> <li>• An implementation period allowing time for industry to adjust.</li> </ul>
<p>3. Evidence base supports the move to using updated emission factors but boroughs lack resource to implement the changes.</p>	<ul style="list-style-type: none"> <li>• Additional training workshops for boroughs to explain the methodology.</li> <li>• Clear guidance produced.</li> </ul>

b) This works links the Mayor's Environment Strategy, new draft London Plan energy policies and the ambition for London to be zero carbon by 2050.

## 5. Financial comments

Assistant Director's approval is sought for expenditure up to £20,000 for the procurement and appointment of consultants to support the GLA's work in determining whether the supply chain and business case exists in London to allow for the transition to heat pumps. This will be funded from Environment's 2017-18 Supply Chain budget and is expected to be delivered by the end of 2017-18.

## 6. Planned delivery approach and next steps

Activity	Timeline
Release invitation to tender / Award contract	February 2018
Inception meeting	February 2018
Draft report	March 2018
Review meeting	March 2018
Final deliverables	April 2018

**Appendices and supporting papers: None**

**Public access to information**

Information in this form (Part 1) is subject to the Freedom of Information Act 2000 (FOI Act) and will be made available on the GLA website within one working day of approval.

If immediate publication risks compromising the implementation of the decision (for example, to complete a procurement process), it can be deferred until a specific date. Deferral periods should be kept to the shortest length strictly necessary.

**Note:** This form (Part 1) will either be published within one working day after approval or on the defer date.

**Part 1 Deferral:**

**Is the publication of Part 1 of this approval to be deferred? YES**

If YES, for what reason: Until the procurement process has been completed.

Until what date: 28 February 2018.

**Part 2 Confidentiality:** Only the facts or advice considered to be exempt from disclosure under the FOI Act should be in the separate Part 2 form, together with the legal rationale for non-publication.

**Is there a part 2 form – NO**

**ORIGINATING OFFICER DECLARATION:**

**Drafting officer:**

Rachel Cary has drafted this report in accordance with GLA procedures and confirms that the Finance and –if relevant- Legal teams have commented on this proposal as required, and this decision reflects their comments.

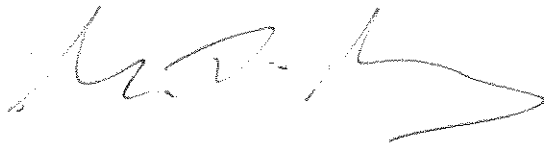
**Corporate Investment Board:**

The Corporate Investment Board reviewed this proposal on 5 February 2018.

**HEAD OF FINANCE AND GOVERNANCE:**

I confirm that financial and legal implications have been appropriately considered in the preparation of this report.

**Signature:**



**Date:**

05-02-18

