

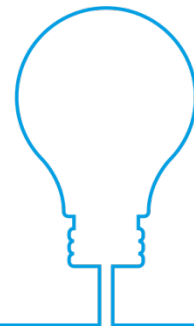


Department for
Business, Energy
& Industrial Strategy

Domestic Hydrogen Appliance Development Innovation SBRI Competition (Hy4Heat Work Package 4)

(An SBRI Competition: TRN: 1575/07/2018)

Phase 2b Guidance Document



April 2020

Department for Business, Energy & Industrial Strategy

SBRI Domestic Hydrogen Appliance Development Innovation Competition (TRN: 1575/07/2018)

The following document (which should be read in conjunction with the original Invitation to Tender) provides guidance on the milestone verification process together with the evidence required to determine whether the Phase 2b development milestones have been met.

All notifications of updates/clarifications to the milestone verification process, evidence required, or contract management procedure will be issued by email.

Contact with the Hy4Heat programme should be to the following email address:

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Yours sincerely,

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1. Introduction

This Phase 2b guidance document sets out the process and assessment criteria for verifying that the Phase 2b milestones of the Domestic Hydrogen Appliance Development Innovation Competition (Hy4Heat - Work Package 4) have been completed to the satisfaction of BEIS prior to payment of the related invoices.

This document is provided further to the Invitation to Tender (ITT) for the SBRI Domestic Hydrogen Appliance Development Innovation Competition and should be considered alongside the ITT.

Phase 2a covered the development of a first prototype (1.0) appliance to be provided for use in demonstration trials.

Phase 2b covers the development of a further prototype (2.0) appliance to achieve full certification.

2. Phase 2b Milestone Verification

The table in Section 2.1 below provides the verification method and evidence required for a contractor to demonstrate that they have met each of the milestones in Phase 2b.

Where additional milestones have been specified in the WP4 phase 2 contract, the deliverables outlined in the original contract are still required and the information in Section 2.1 should be used as a guide for what is required across the relevant phase 2 milestones.

Visits will be carried out by members of the Hy4Heat team at appropriate manufacturers locations. For manufacturers with multiple projects, the Hy4Heat team will look to maximise the value of the visits across the projects as appropriate. Contractors shall notify request of a site visit at least two weeks prior to the visit. The pre-visit documentation must then be submitted at least one week prior to the visit. The quality of the pre-visit documentation will dictate whether the site visit goes ahead.

The dates assigned to milestones in the contract are deadlines and early submissions are welcome.

Any reference to the GAR or Ecodesign regulations should be interpreted as either the current European regulation or the UK equivalent at the time. Unless otherwise stated requirements apply to all types of appliance.

Regarding appliance test and compliance, reference should be made to BS PAS4444 as soon as draft versions become available.

It is fully appreciated that in a rapidly developing sector such as this, manufacturers may adopt different solutions to the matters raised within PAS4444, but it is expected that at each Milestone a short document highlighting both points of agreement and disagreement will be tabled and may be used as basis to provide feedback to the writers of PAS4444.

2.1 Phase 2b Milestones

| Milestone No. | Milestone Description | Verification Method | Verification evidence required | Payment (% of total contract value) |
|---------------|---|---|--|--|
| 7a | Completion of appliance prototype 2.0 design and presentation of one fully boxed example of appliance | <p>Review of the paperwork plus visit* to confirm that all the appliances work as specified.</p> <p>*Visit may be conducted remotely if Covid-19 dictates (see separate Remote Milestone Review Monitoring Guidance).</p> | <ul style="list-style-type: none"> • Provision of one boxed example of appliance prototype 2.0. To include user, installation and maintenance instructions as per the requirements of the GAR. • Short post-production information package to include: <ul style="list-style-type: none"> • Detail of the outcome/findings of the demonstration trials and any subsequent changes made to the design of the appliance in light of this work. <ul style="list-style-type: none"> ○ A suggested report structure can be found in Appendix A. • Evidence including the evidence listed above and test reports must be provided in a written report at least 1 week in advance of a site visit to verify the milestone requirements have been met. Test reports shall include evidence that the appliance: <ul style="list-style-type: none"> ○ Meets the requirements of the Functional Specification as detailed in the Invitation to Tender, including efficiency and emissions, and the contractor’s proposal. ○ Complies with the essential requirements of the GAR. ○ Complies with the requirements of the relevant Ecodesign regulations. | 20% |
| 7b | Final retention for training, guarantee issues and business cases etc. | Document review | <p>Provision of a final report including:</p> <ul style="list-style-type: none"> • Business plan for scaling up manufacture <ul style="list-style-type: none"> ○ Include estimations of the time needed to get to full scale production and how much the appliance would cost (assuming similar scale to natural gas appliances today). | 5% |

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| | | | <ul style="list-style-type: none"> • Details of the gas conversion process for your appliance in the context of a local network conversion. – what changes to the appliance are needed, what are the direct parts and labour costs involved, and how long would this take. • Intellectual property exploitation • Training plan for installers, including details of bespoke product training requirements in addition to ACS conversion training. • Potential costs to consumer with regard to a hydrogen transition. • Potential further product developments following the end of the Hy4heat programme. • Where a dual fuel, hydrogen ready or adaptable appliance has not been produced, detail should be included as to how further product development could provide these capabilities, including likely cost, implications on performance and time to convert. • Where a dual fuel, hydrogen ready or adaptable appliance has been produced, would a ‘hydrogen only’ appliance, that did not require the capability to run on natural gas, have any advantage over what has currently been developed? (e.g. efficiency, NOx, size, etc.) <p>A final report must be provided for each contract. A suggested report template can be found in Appendix B. Contractors are requested to submit at least one draft report during Phase 2b, prior to milestone 7b, to allow a round of comments and revisions before final submissions (it is acknowledged that this report will include omissions and redactions as it is work in progress).</p> | |
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3. ITT Competition Timetable

| Phase 2a – Prototype Development 1.0 | |
|--------------------------------------|-------------------------|
| Phase 2a Start / Finish | May 2019 – March 2020 |
| Phase 2b – Prototype 2.0 | |
| Phase 2b Start / Finish | April 2020 – March 2021 |

Contractors will be expected to meet the milestones listed in section 2 by the deadlines specified in their Phase 1 reports unless otherwise agreed during Phase 2a development.

Appendix A – Suggested 7a Report Structures

1. Detail of the outcome/findings of the demonstration trials and any subsequent changes made to the design of the appliance in light of this work.
 - a. Introduction (description of involvement in demonstration trials – number of events, time in operation, etc.)
 - b. Findings
 - i. Feedback received from consumers and industry experts during demonstration trials – positive & negative
 - ii. Performance – details of key performance parameters recorded during trials
 - iii. Issues found – logistical, installation and commissioning, appliance failures, costs, safety, anticipated lifespan etc.
 - iv. Lessons learnt – what would you have done differently
 - c. Outcomes
 - i. Changes made to appliance design following trial findings
 - d. PAS4444 feedback (see Section 2 of this Guidance Note)
 - e. Conclusions

Appendix B – Suggested 7b Report Structure

1. Executive Summary
2. Introduction
 - a. Brief description of appliance and the development process
 - b. Final comparisons to natural gas appliances (e.g. efficiency (including condensing function for boilers), estimate of working efficiency, NOx, size, etc.)

3. Business Plan

Specific points to be covered include:

- a. Following a decision to progress conversion of the UK gas network to hydrogen, how would your business respond to meet the increase in demand for hydrogen appliances?
- b. How long would it take to fully scale up manufacture to a level comparable to natural gas appliances today? How many appliances can be produced at maximum production?
- c. What would be the cost difference between hydrogen appliances and natural gas appliances if manufactured at scale
- d. What other appliances would you explore in a hydrogen-only future, and what challenges and opportunities do these present?

4. Intellectual property

Specific points to be covered include:

- a. What arising IP has been identified and documented by the project?
- b. What is the status of the IP? How is it protected? How will it be disseminated?
- c. What are your plans to commercially exploit the IP over the next 3 years - capital and / or revenue generation?

5. Appliance future

Specific points to be covered include:

- a. Potential further product developments following the end of the Hy4heat programme.
- b. Where a dual fuel, hydrogen ready or adaptable appliance has not been produced, detail should be included as to how further product development could provide these capabilities, including likely cost, implications on performance and time to convert.
- c. In a future where only hydrogen appliances are needed, would a 'hydrogen only' appliance have any advantage over a dual fuel, hydrogen ready or adaptable appliance (e.g. efficiency, NOx, size, appliance cost etc.)

- d. Where a dual fuel, hydrogen ready or adaptable appliance has been produced, how would the overall lifespan of the product be impacted by its initial use with natural gas? For example, for a dual fuel appliance with a nominal lifespan of 10 years, what would the lifespan be after running on natural gas for 5 years, following the conversion process to run on hydrogen?

6. Conversion Process

Specific points to be covered include:

- a. Details of the gas conversion process for your appliance in the context of a local network conversion. – what changes to the appliance are needed, what are the direct parts and labour costs involved, and how long would this take.
- b. Training plan for installers - Would specific product knowledge courses be expected, and what crossover would these have with current Natural Gas courses? Provide details of such training plans and courses, including plans for scaling up to the training requirements for the demonstration trial, and from there to commercial rollout.
- c. Potential costs to consumer with regard a hydrogen transition

7. PAS4444 feedback (see Section 2 of this Guidance Note)

8. Conclusions