Future Homes Hub
FHS2025 and Home Energy Model: Advice Note

Overview

The Government is consulting on the Future Homes Standard, the new Home Energy Model (HEM), and the Home Energy Model: Future Homes Standard assessment (HEM:FHS) simultaneously. By definition, the consultation version of HEM:FHS is not yet the final production version and there are some aspects of the new model that will need to be developed and refined following the consultation feedback. This raises some questions, however, for homebuilders and manufacturers about the build specifications to meet the standard in practice.

This note provides advice on how to consider HEM:FHS in responding to the FHS consultation, about how HEM:FHS is expected to develop prior to implementation of the new standard and some actions that are being taken to help model FHS compliance in the HEM:FHS consultation tool. The Future Homes Hub has consulted both the Department of Levelling Up Housing and Communities (DLUHC) and Department for Energy Security and Net Zero (DESNZ) in producing this advice.

We understand that DLUHC will be updating the consultation webpage soon to offer some clarification on these points as well.

Themes

Consultation process - general

These are consultations which are seeking evidence *prior* to decisions being taken and the development of the final form of regulation. The consultation input helps the government refine the final regulations and the tools such as HEM:FHS, so the key is to provide evidence to support any views expressed.

HEM:FHS - general

The HEM:FHS consultation tool is provided primarily to help inform responses to the consultation questions that relate to the tool itself rather than for other uses such as demonstrating compliance across developers house types.

HEM:FHS will evolve following consultation feedback. The HEM:FHS consultation tool does not have a production-ready user interface and the parameters of various aspects of the model are not final.

Unlike previous SAP releases, the HEM consultation states that government is exploring the calculator engine being provided by government, rather than being coded by each energy assessment software company, and being hosted in the cloud with commercially developed user interfaces. This should simplify the pathway to a readily available, and user friendly, tool.

The FHH has requested that the Government provides a timeline for the development of HEM:FHS which will identify key milestones, particularly when a stable version will be available for housebuilders to model and check compliance of their houses and for manufacturers to understand how the HEM:FHS reflects the performance of their products and technologies.

Action: FHH to establish a HEM Liaison Group to be a resource to support the technical development of HEM:FHS as appropriate and to track and report progress to the FHS2025 Implementation Board.

Using the HEM:FHS consultation tool to understand FHS2025 Build costs

Whilst industry often uses the consultation version of the compliance software (SAP/HEM:FHS) to develop an early understanding of the makeup, and therefore projected cost, of a compliant home this approach has always had risks. The consultation version of the HEM:FHS software will be updated following consultation feedback which may change the specification necessary to comply.

In these early stages, costing a home designed using the 'notional' specifications, and with due regards to the minimum product standards, provides a sensible approach. By definition, the notional specification will 'comply' irrespective of any changes made to the HEM:FHS calculation engine[1]. The approach of costing the notional specification should provide the least risk when determining the value of land.

> 'Notional' Home - A hypothetical home of the same type, size and shape as the actual home being designed but using published 'notional' fabric and services specifications to produce the **design targets** that must be met. These are expressed as the energy efficiency (TFEE), emissions (TER) and primary energy (TPER).
>
> The actual dwelling, with the actual technologies and product specifications, needs to **'comply'** with the design targets.
>
> In short, if the actual home uses the notional specification for all elements then the home will comply[1].

Once the final HEM:FHS software is released, then alternative combinations of specification can be considered - replacing products and technologies listed in the notional specification, as desired, in the knowledge that either the notional specification provides the best outcome or the new bespoke combination delivers the same or better performance or lower cost.

HEM:FHS - Heat pumps

The two heat pumps currently included in the HEM:FHS consultation tool are having a significant impact on the ability to model homes that comply. It transpires that the 5kWh and 10kWh units included do not modulate.

Additional heat pump variants at a range of capacities have now been added to the consultation tool. The two dummy heat pump models already present have been adjusted to allow them to modulate their output. Existing projects should be edited and/or re-run to see the updated results.

The performance of the heat pump specification in the notional building relative to heat pumps that are readily available is material in understanding the build implications. This is currently difficult to assess for heat pumps.

Action: FHH and DESNZ to facilitate a small meeting of heat pump and housebuilder representatives with the HEM:FHS technical specialists to explore the notional specification assumed and communicate their conclusions.

FHS – PV

The calculation proposed for the quantity of PV, in FHS Option 1, has resulted in significantly more area of PV than currently required under Part L 2021, despite the underlying 40% of ground floor area remaining. Homebuilders are reporting that certain dwelling types, in particular orientations, have insufficient free roof area to accommodate

[1] Some exceptions apply such as highly glazed homes.

the array. In addition, for homes with large footprints, including bungalows, the peak PV output can be excessive.

Action: homebuilders asked to feedback via the consultation the specific situations that are problematic eg: impact on house typologies, planning, placemaking etc

Action: FHH offer to work with all stakeholders to refine the calculation of PV quantity in the notional home.

HEM:FHS – Data input

The consultation version of HEM:FHS requires the input of circa 300 – 400 parameters, significantly more than the current energy model (SAP) as indicated above. Industry have particularly identified the significant increase in data inputs such as for: windows, pipes, wall makeups by room etc.

The current input requirements of the HEM:FHS assessment reflect those required by the underlying BS EN standards which the model has been based on, and will be adjusted/simplified based on further sensitivity testing and feedback from the consultation. It is recognised that the right balance needs to be struck.

Action: housebuilders are asked to give feedback on difficulties populating the consultation tool inputs in questions 1 and 2 of the HEM: FHS assessment consultation.

HEM:FHS – Errors

HEM is a completely new energy model built from the ground up and based around half hourly energy calculations rather than monthly averages.

The consultation version of HEM:FHS allows different users to feedback on unexpected outcomes and sensitivities across a broad set of house types. Unexpected outcomes can result from HEM:FHS errors, where the building physics or coding is incorrect or, as a result of policy decisions, with the HEM:FHS calculation being correct.

Action: energy modellers to provide ongoing feedback via the web link highlighting potential areas for concern.

FHS Compliant HEM:FHS examples

Whilst the HEM:FHS consultation tool is primarily provided to inform the responses to the HEM:FHS consultation questions, there have also been questions raised on whether homes modelled to the FHS, using the notional specifications, are both compliant and buildable.

A compliant example has been added to the HEM:FHS consultation tool.

FHS Consultation response to Q7 & Q8 - Which option of the dwelling notional building do you prefer & priorities.

Some housebuilders have raised concerns about expressing a preference for Option 1 or Option 2 without being able to caveat the response.
DLUHC advice is: if you support solar but would prefer a reduced amount or would face practical challenges in meeting Option 1, you should:

- Select Option 1 for Question 7 alternatively, not answer Question 7.
- And, in your free text response to Question 8, make suggestions on the amount of solar coverage and explain the challenges, with examples, you would face meeting Option 1.