RECC Analysis of Ofgem *'Metering for Payment'* Data

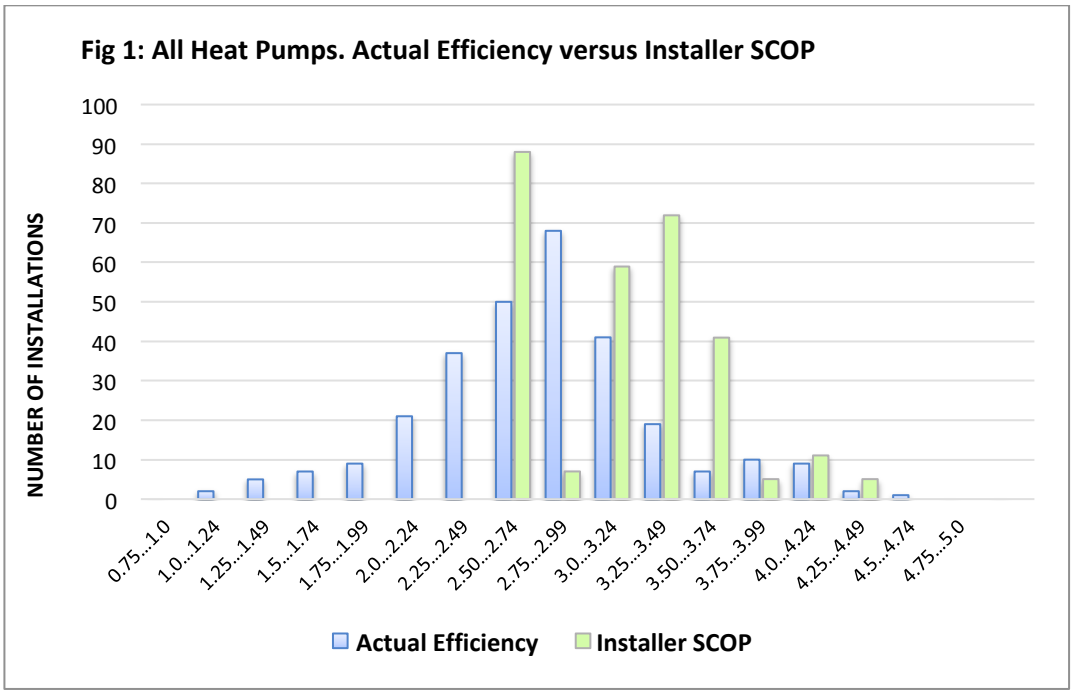
Headline Results and methodology

July 2020

In July 2019 RECC requested from Ofgem information on how the MMSP and Metering for Payment installations are used to monitor the in-situ performance of Domestic RHI-eligible renewable systems. We also asked for the data used to monitor performance. In September 2019 Ofgem provided data for over 2,000 domestic installations subject to Metering for Payment. The dataset includes information for installations carried out from 2015.

RECC has developed a methodology to analyse the data and this paper provides a short summary of our approach used and the headline results obtained. We refer to results using a sample of just over 400 installs; 300 of which were included in the analysis. It is important to note that the information obtained from Ofgem includes the installer provided SCOPs for each install and this has allowed a unique comparison between the actual SPFs achieved and the installer performance forecasts (the SCOP).

Figure 1 provides the frequency distribution for all heat pumps in the sample comparing the actual SPFs achieved by the installations with the installer provided SCOP forecasts. *Figure 1* combines the results for Air Source Heat Pumps (ASHPs) and Ground Source Heat Pumps (GSHPs).



The overall *average* actual efficiencies for the heat pumps included in the final analysis was as follows:

All RHI accredited ASHPs: **2.67**

All RHI accredited GSHPs: **3.15**

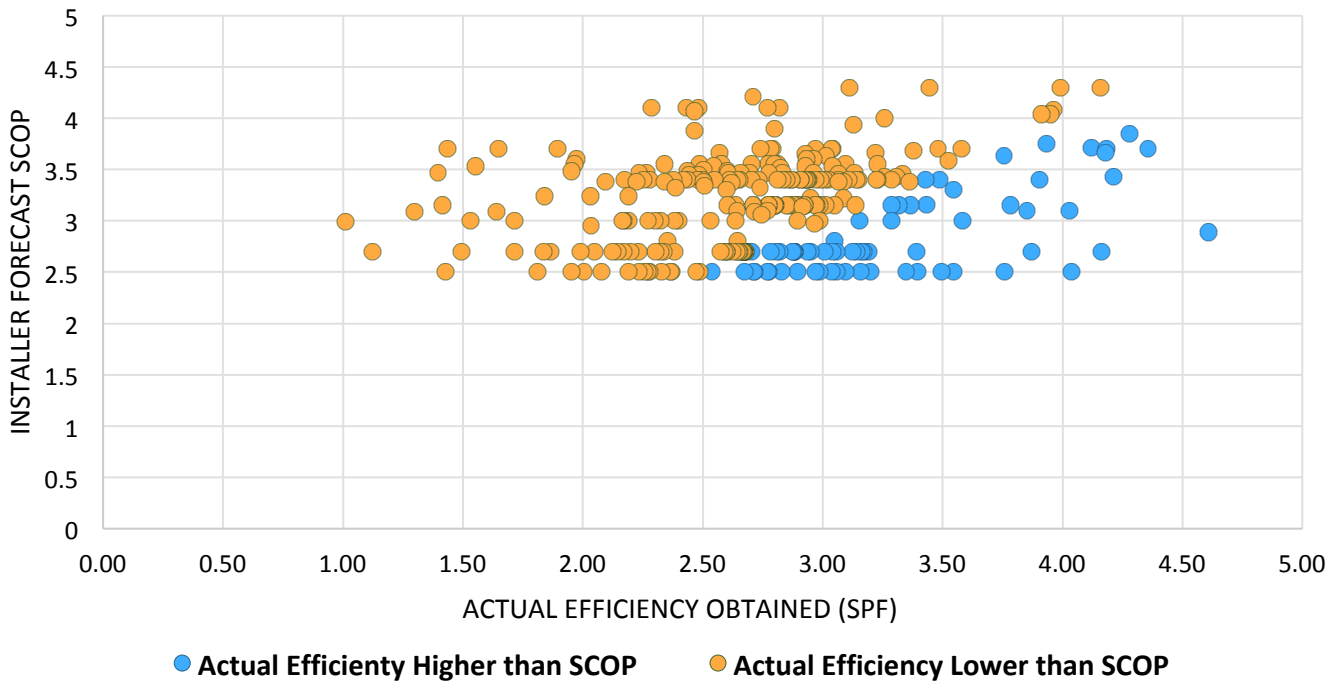
These results are marginally higher than the RHPP field trial results published in March 2017 for the SPFH4 boundary that were 2.4 for ASHPs and 2.8 for GSHPs[1].

Figure 2 plots the installations according to the Actual Efficiencies recorded (horizontal axis) and the Installer SCOP Forecasts (vertical axis).

77% of the installations were found to have an actual efficiency lower than that indicated by the installer SCOP. The orange data points represent those installations. The blue data points show those installations where the actual efficiency was found to be higher than the SCOP forecast.

The SPF 2.5 is widely seen as the minimum benchmark efficiency for heat pumps and a SPF of 2.5 is the technical eligibility requirement for the UK's Renewable Heat Incentive. This explains why there are no Installer SCOP forecasts below 2.5. However, just under **30%** of all installations (85) were found to be performing with an efficiency lower than 2.5.

Figure 2: All Installations. Installer SCOP Forecast versus Actual Efficiency



[1] Lowe, R. et al. (2017) Final report on analysis of heat pump data from the renewable heat premium payment (RHPP) scheme. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/606818/DECC_RHPP_161214_Final_Report_v1-13.pdf

Figures 3 and 4 provide the efficiency distribution comparing the actual SPF with the installer provided SCOP forecasts for ASHPs and GSHPs separately.

Figure 3: ASHP
Efficiency Distribution: Actual versus Installer SCOP

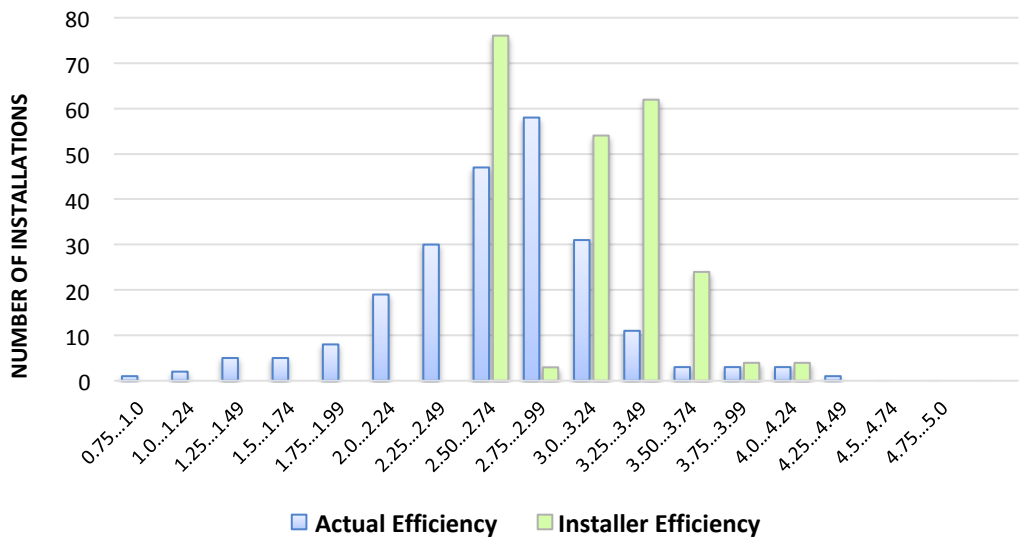
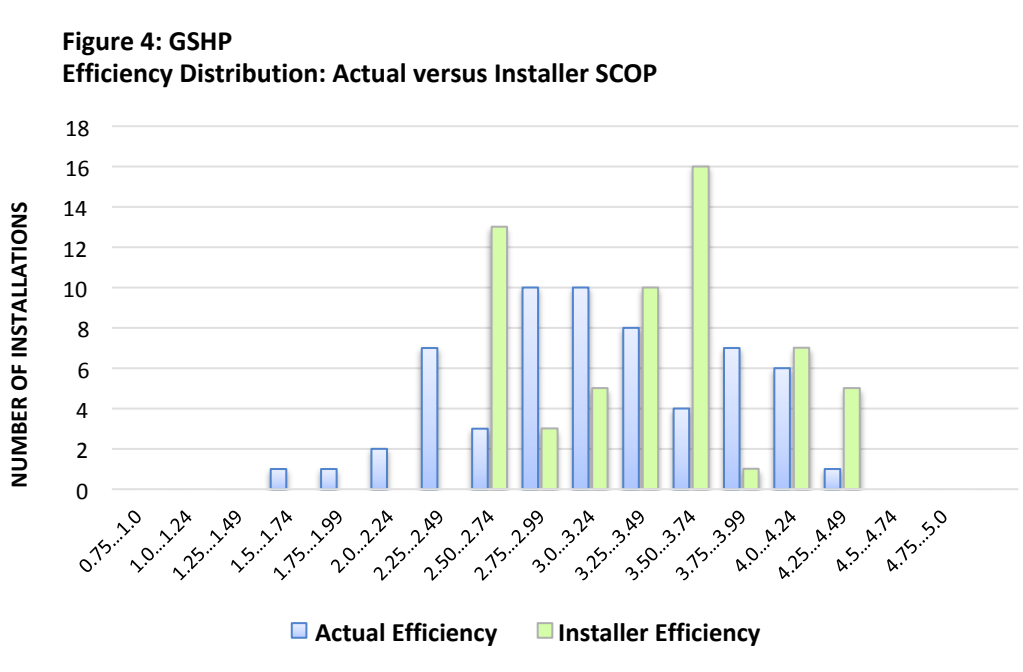


Figure 4: GSHP
Efficiency Distribution: Actual versus Installer SCOP



Figures 4 and 5 illustrate the discrepancies between the installer SCOP technical forecasts and the actual SPFs obtained *for the installations given an installer SCOP of 3.5 or higher*. Overall, there is a very wide disparity between the installer SCOP forecasts shown and actual outcomes.

Figure 4: ASHP - All Installer SCOPs above 3.5

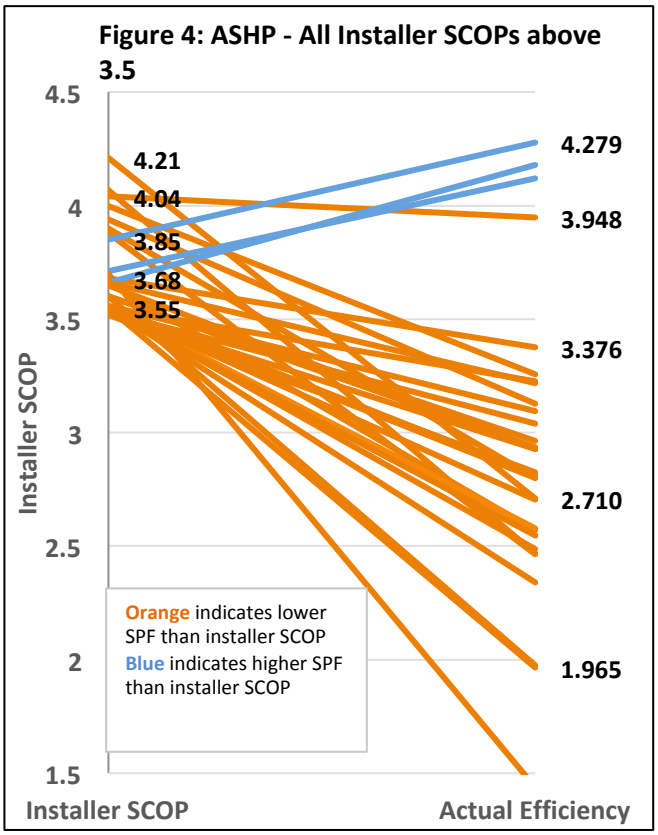
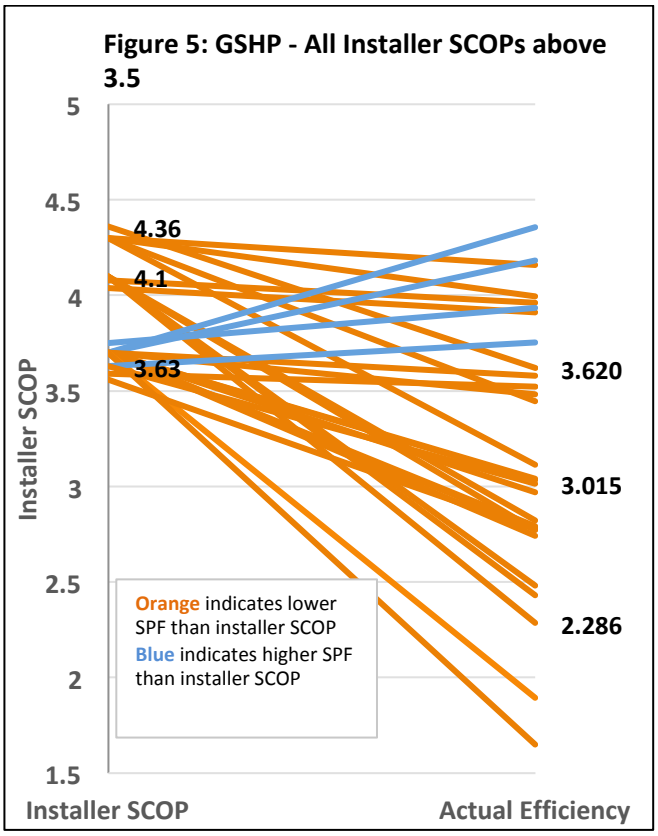
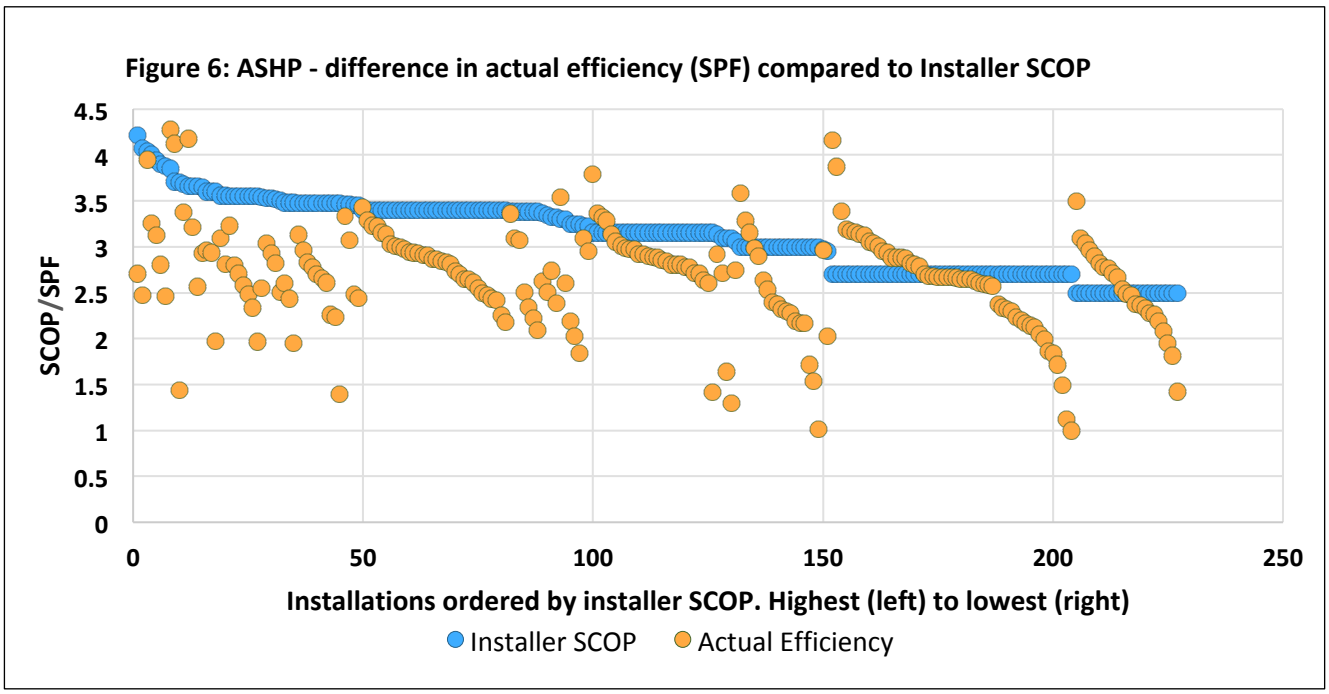
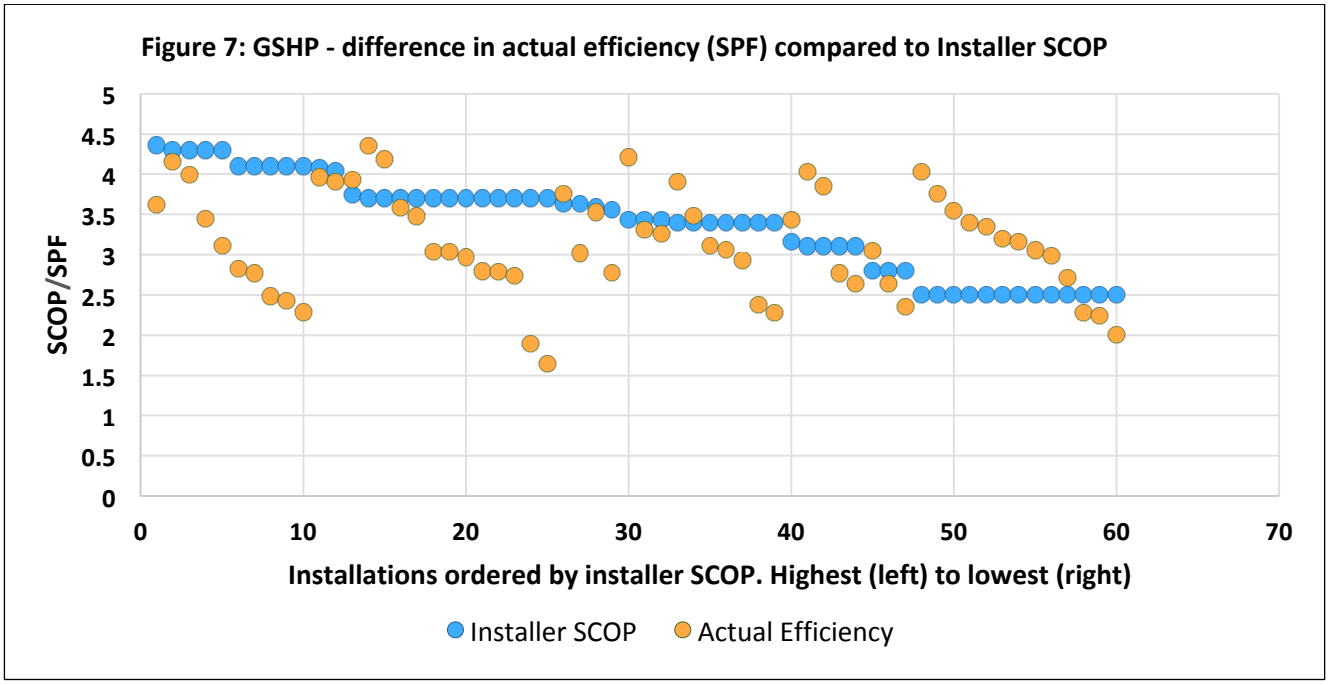


Figure 5: GSHP - All Installer SCOPs above 3.5



Figures 6 and 7 show that there is little correlation between the installer SCOP forecasts and actual SPFs obtained. Overall, a proportion of the lowest (most cautious) SCOP forecasts tend to *underestimate* actual SPFs obtained while a large majority of other SCOP predictions *overestimate* likely performance. The installations with the highest SCOP forecasts do not appear to perform significantly better than the others.





Methodology

RECC developed a multi-step Excel process to examine the OFGEM dataset. The process can be summarised as follows:

1 – one in every 5 installations was identified in the original Ofgem dataset. A proportion of those were removed to obtain a sample size of 400. Those removed were selected from the start of the dataset in order to weight the overall sample towards those more recently installed.

2 – unique identifiers were given to all installation meters and the data was cleaned using conditional formatting to identify anomalies and data errors such as dropping values or values that exceeded previous values by a specified amount. Other anomalies and inconsistencies were examined individually.

3 – the data was split between electricity consumption and heat generation.

4 – robust values were obtained for consumption/generation by identifying the first (minimum) values for both consumption and generation for each installation and subtracting those first meter readings from subsequent values.

5 – pivot tables were then used to obtain total consumption/generation figures for each install (by combining values provided for multiple meters).

6 – data was then recombined and checked to verify alignment.

7 – after alignment was confirmed a final pivot table was used to allow filtering by technology and RHI status. The top 1.5% most efficient and least efficient installations were eliminated from each filtered analysis.

Installations were removed from the original sample or from the final analysis where:

- only one or two consumption/generation values were available;
- where there was no or very little viable data;
- where Ofgem indicated the RHI status of the installation as ‘cancelled’.

The final analysis includes data from just over 300 installations.