

Case Study

Kiwa's Dynamic Heat Loss Test Rig

Kiwa's Dynamic Heat Loss Test Rig allows appliances including heat pumps, hybrid heat pumps, gas, oil and MicroCHP boiler packages to be evaluated under "real life" dynamic heat loads. It is also possible to incorporate ancillary appliances such as flue gas heat recovery devices or novel control systems. The rig provides a consistent way of testing comparable appliances under identical environmental conditions.

The Challenge

Conducting meaningful comparative testing of domestic heating appliances and heat loss scenarios has traditionally relied on extensive field trials; it has previously been done using matched pair houses i.e. running simultaneous tests in two identical houses with the same specification, orientation and environmental conditions.

The results of comparative testing can be invaluable to legislators, network operators and manufacturers. However the matched pair houses test approach is expensive, time consuming and inflexible. Ensuring suitable weather conditions for example can be problematic. Even seemingly minor differences in specification can have implications for the accuracy of the tests.

The Solution

Kiwa has developed models (derived from real data) for houses that simulate the thermal characteristics of the house and heating system.

The system uses a combination of simulation and "hardware-in-the-loop" to provide a flexible test regime. A huge quantity of accurate 5-minute data across many 24 hour periods enabled the development of simulation models.

The Outcome

Clients to date have included government departments and NGOs, boiler manufacturers and gas network operators.

The results of dynamic heat loss rig testing have been used to:

- Inform government strategy. It has also supported network modelling for utilities, e.g. providing insight into how different energy strategies would influence gas/electricity distribution.
- Develop the next generation of SAP standards.
- Prove the legitimacy (or otherwise) of manufacturers claims about appliances.

Contracting Client:
Various

Location:
Cheltenham, UK

Sector:
Energy

Key Elements:

- ✓ Simulations based on real life data
- ✓ Complex data analysis
- ✓ Detailed report issued in plain English



The Dynamic Heat Loss Rig was used in the Real-Time Networks project run by SGN, which won Energy Award's 'Energy Data Collection and Analysis Project of the Year' award in 2019.