

## Reduce normative barriers for safe implementation of the hydrogen technologies: HYPER project

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The universally recognised need to curb greenhouse gas emissions and secure a cheap and environmentally friendly supply of energy is a major economic and social driver that can be met by hydrogen and fuel cell technologies. The Installation Permitting Guidance (IPG) for Hydrogen and Fuel Cell Stationary Applications (HYPER) project is aimed at developing for small stationary hydrogen and fuel cell systems a fast track approval of safety and procedural issues, by providing a comprehensive agreed installation permitting process for developers, design engineers, manufacturers, installers and authorities having jurisdiction across the European Union.

The IPG will seek to:

- Provide a structured analysis of all documents relevant to permitting of hydrogen and fuel cells systems from relevant regulations, codes and standards used in Europe and around the world.
- Document best practice for the installation of different generic types of hydrogen and fuel cell systems with net electrical output of up to 10 kWel, using examples from industrial partners with experience of installing hydrogen fuel cells.
- Through carrying out CFD modelling and experiments provide guidance on issues not properly dealt with in existing guidance documents.
- Provide the basis for harmonised permitting guidance.

An example of a poorly understood safety issue related to hydrogen fuel cells is a jet release from the high pressure hydrogen storage module. Figure 1 shows an ignited jet release viewed with a standard video and an thermal imaging camera. Through experiments and modelling the hazards and mitigation techniques associated with high pressure releases of hydrogen will be better understood to provide pre-normative data as a basis for new guidance.



