

## Annex 35: Fuel Cells for Portable Applications

The aim of Annex 35 is an information exchange of the recent status and new developments of portable fuel cell systems. Fuel cells for portable applications means, that the systems are designed to be held by hand during operation, to be transported by one person (portable), to be transported easily from one location to another (transportable) and for transport purposes (light traction). The focus is on all aspects of fuel cell systems starting with the development and manufacture of membrane electrode assemblies (MEAs) right up to system components like electronic converters or gas supply units. Also the setup and the configuration of hybridised systems are topics that will be discussed. A very important topic is also the secure operation and the discussion of codes and standards. Most of the current systems use low temperature fuel cells, specifically direct alcohol fuel cells. However, Annex 35 – Fuel Cells for Portable Applications is open for any type of fuel cell.

Fuel cells for portable applications are early market products, and the first fuel cell systems are already available on the market. The development of portable and small mobile fuel cell systems on the basis of proton exchange membranes started in the mid-1990s. Since 2000, the first companies have started with the development of systems for the consumer market. The functionality of the systems has already been shown and fuel cell systems can be found in the leisure, mobility, industry and defence markets.

The key issue for further development is the reduction of system costs. This will be realised by various approaches, like the development of new materials, cheaper and better manufacturing techniques (increased use of catalyst, cheaper stack and system components) and by greater production run sizes.

The second issue is the improvement of system reliability. State-of-the-art systems often have an insufficient lifetime, and the aim for the next few years is to achieve lifetimes of more than 10,000 hours. Likewise, the efficiency and power density of the systems has to be increased. This will lead to longer operation time, lower heat emissions and reduced CO<sub>2</sub> emissions.

The topics introduced are also reflected in the sub task structure of the Annex 35:

- System analysis and hybridisation;
- System, stack and cell development;
- Codes and standards, safety, fuels and fuels packaging, transportation; and
- Lifetime enhancement.

Within Annex 35 there is the opportunity to get an overview of the recent developments worldwide and the chance to discuss ideas with qualified experts. The experts are from universities, research institutes and industry, and from different countries all over the world, including Austria, Canada, Germany, Italy, Japan, Korea and Sweden.

It is obviously possible to discuss technical issues but also other topics like how to accelerate the market introduction or what can be done to overcome institutional barriers and how to cope with codes and standards can be addressed. In the Executive Committee (ExCo) all the

information from the Annexes will be concentrated and your requests can be addressed to governmental agencies and other institutions or to other implementing agreements.