1. **Publishable summary**

Summary description of project context and objectives

SOFC stacks are currently being developed for automotive applications such as APU, for portable devices and possibly in the near future also vehicle propulsion. They supply electrical efficiencies of up to 60% with hydrogen and methane fuel. Due to the requirements of mobile and portable applications only lightweight SOFC stacks with low weight and short start-up times will be employed for these markets. Start-up times for vehicles of most kinds (road and rail vehicles, even aircraft and ships) are short compared to those for power generation. The same applies to portable devices which are expected to be operational within very short time intervals. The requirements for thermal cycling in lightweight stacks are therefore high. For stationary applications rapid start-up will also be an advantage since the SOFC system can be operated in accordance with the electrical and thermal loads of the customer. Lightweight SOFC stacks therefore need to display excellent thermo-mechanical properties to allow both rapid start-up and thermal cycling without degradation of sealings and contacts. High quality standards in manufacturing are necessary in order to minimise production tolerances and ensure the required robustness of the lightweight SOFC stacks. As many automated precision assembly processes as possible have to be implemented in an approach of parallel improvement of quality and lowering of manufacturing cost. The MMLCR=SOFC project addresses a design solution that uses thin sheet metal to decrease cost and weight of materials. The design allows for low-cost mass manufacturing of stack components, and automated quality assurance and assembly.