# Mass-manufacturing and quality assurance solutions in SOFC value chain in FCH JU projects qSOFC and INNO-SOFC

## Cells

**Targets**
- Reduce cell manufacturing cost to 400 €/kW at production volume of 10 MW/year
- Increase production yield in all parts of stack manufacturing value chain to above 95% by automation and quality assurance

**Methods**
- Automated machine vision inspection system to detect faults during cell manufacturing
- Optimization of the cell manufacturing for high-speed manufacturing

**Results**
- Higher and more homogeneous cell quality
- Higher yield and lower scrap rate throughout production

![Example of a 3D defect detection and classification by the automated machine vision system in qSOFC](Machine vision rig developed by HaikuTech)

## Interconnects

**Targets**
- Interconnect manufacturing yield of 95%
- Development and validation of relevant quality assurance procedures in the interconnect manufacturing process

**Methods**
- Failure mode and effect analysis (FMEA) of interconnect manufacturing process
- Automated laser-scanning of interconnect geometries
- Integrated leak tightness measurement system to check interconnect welds/brazes

**Results**
- Improved quality of interconnects
- Reduced scrap rate

![Example of stack assembly robot](A fully automated assembly and testing line)

## Stacks

**Targets**
- Streamline stack manufacturing process and cut cost by increasing yield and lowering OPEX and CAPEX related to manufacturing infrastructure
- Manufacture stacks for 60 kW INNO-SOFC system

**Methods**
- Testing and analysis of three different manufacturing and conditioning procedures using 30 stacks
- Statistical analysis of data

**Results**
- Optimized stack assembly and conditioning processes identified
- Potential cost-reductions corresponding to each process identified

![Manufacturing process at Elcogen](INNO-SOFC stack)

## Systems

**Targets**
- System electrical efficiency 60%
- System total efficiency 85%
- High emphasis on cost reduction, 4000 € / kW system cost

**Methods**
- Effective collaboration throughout the value chain enables optimization of the whole system and its components. Key components are specifically designed and optimized for this system.

**Results**
- System conceptual design ready, exceeds project targets
- System design enables significant reduction in parts count and assembly time

![Convion system](Use cases of Convion C50 SOFC)

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**Contact Information**

**qSOFC**
- Markus Rautanen
  - Phone: +358 40 538 7552
  - Email: Markus.Rautanen@vtt.fi
- www.qSOFC.eu

**INNO-SOFC**
- Olli Himanen
  - Phone: +358 40 352 6298
  - Email: Olli.Himanen@vtt.fi
- www.innosofc.eu