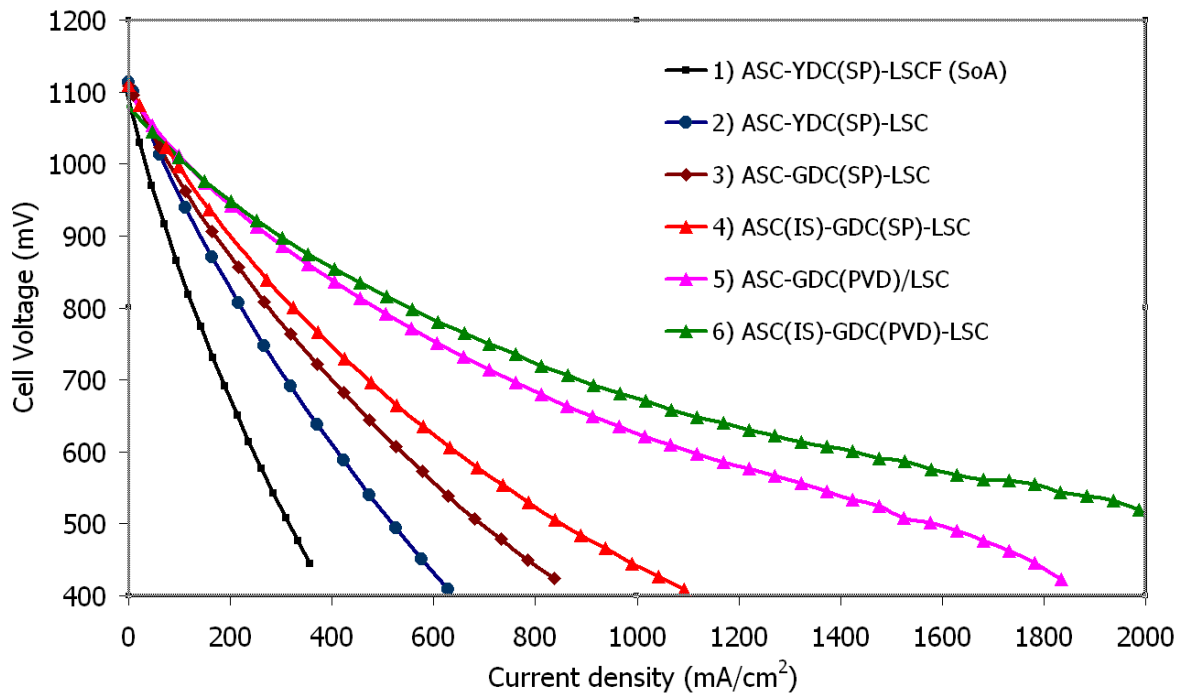


## SOFC600: Cell performance data at 600°C

The graph shows the successive improvement of ECN cell technology in the course of the first two project years. It concerns an anode-supported cell that was optimized for low-temperature operation.

- 1) State-of-the-art cell with an LSCF type cathode at the start of the SOFC600 project
- 2) Integration of the LSC type cathode
- 3) Integration of improved cathode intermediate (barrier) layer
- 4) Integration of an improved anode-substrate
- 5) Integration of an improved manufacturing process for the GDC barrier layer
- 6) All improved components integrated

The cell was manufactured at ECN by tape-casting (anode-substrate) and screen-printing (all other layers), except for the improved barrier layer which was manufactured at FZJ by the PVD process. All improved components were developed within the SOFC600 project, except for the anode-substrate.



The table shows the improvements represented by the area specific cell resistance (ASR) and the current density, both at 0.7 Volt.

### Abbreviations

ASC	Anode-supported cell
YDC	Yttria doped ceria
GDC	Gadolinia doped ceria
SP	Screen-printing
PVD	Physical vapour deposition
ASC(IS)	Anode-supported cell with an Improved (anode) Substrate

Cell type	ASR $\Omega \cdot \text{cm}^2$	$j @ 0.7 \text{ V}$ $\text{A}/\text{cm}^2$
1) ASC-YDC(SP)-LSCF (SoA)	1.73	0.19
2) ASC-YDC(SP)-LSC	1.08	0.31
3) ASC-GDC(SP)-LSC	0.71	0.41
4) ASC(IS)-GDC(SP)-LSC	0.83	0.48
5) ASC-GDC(PVD)/LSC	0.33	0.76
6) ASC(IS)-GDC(PVD)-LSC	0.25	0.92

Cell performance data were measured at  $50 \times 50 \text{ mm}^2$  cells with a cathode area of  $32 \times 32 \text{ mm}^2$ , at low hydrogen and oxidant utilizations, i.e. 28 and 18% at 2A respectively.