

Project consortium		
1	Technical University of Denmark	DK
2	Commissariat à l'énergie atomique et aux énergies alternatives	FR
3	University of Salerno	IT
4	Institut de Recerca en Energia de Catalunya	ES
5	Institute of Power Engineering	PL
6	ECN part of TNO	NL
7	Foundation for Research and Technology	GR
8	Centre for Research & Technology Hellas	GR
9	Technical Research Centre of Finland	FI
10	École polytechnique fédérale de Lausanne	CH
11	Politecnico di Torino	IT
12	SolydEra	IT
13	Elcogen	EE
14	Sunfire	GE
15	Ceres Power	GB
16	Hexis	CH



European Project: Next Generation Solid Oxide Fuel Cell and Electrolysis Technology

NewSOC Beyond the Project

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Solid oxide technologies (SOC: Solid oxide fuel cells SOFC & Solid oxide electrolysis SOE, reversible fuel cell- electrolysis revSOC) are flexible, sustainable solutions for many sectors, such as stationary, transport, power-to-X, etc. Commercial cells & stacks exist.

The NewSOC project developed the next generations.

- ✓ Improved cells/stacks
- ✓ Cells with higher tolerance towards carbon & sulfur and stability towards redox conditions and cycling operation
- ✓ Cheaper cells/stacks with less toxic organics or materials during manufacture.

NewSOC

- Addressed 12 concepts for cells & stacks
- Succeeded to demonstrate:



for the SOC configuration



- ❖ The improved components were integrated into industrial cell and stack platforms, comprising electrolyte, fuel electrode, and metal supported cell configurations.
- ❖ This successful integration paves the way for higher TRLs beyond the NewSOC project, not restricted to the participating SOC partners
- ❖ The concepts can be exploited individually or in combinations

Improved performance & durability			
Improved Ni/YSZ fuel electrode		✓	
Improved LSCF/CGO air electrode	C	✓	C
Thin film barrier layer		✓	
Improved tolerance			
Sulfur: Ni/CGO infiltrated LSFNT based fuel electrode	✓		C
Carbon: Bi-metallic or tri-metallic modified Ni/GDC fuel electrode	✓		
Redox: Doped lanthanum chromite based fuel electrode	✓		
Reversible operation: Ni/CGO infiltrated LSFNT based and bi/tri-metallic modified Ni/GDC fuel electrode	✓		✓
Reduced cost and toxicity during manufacture			
Co-free LSF based air electrode	C	✓	C
Partial Co substitution in Mn-Co-Cu-O spinel interconnect coatings	C	✓	C
Sealant deposition without toxic solvents	✓	C	C



ES: Electrolyte supported, FES: Fuel electrode supported, MS: Metal supported Demonstrated in NewSOC Expected to be suitable