EERA Joint Programme on Advanced Materials and Processes for Energy Applications (AMPEA)
FACTSHEET

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Why a Joint Programme on Advanced Materials and Processes for Energy Applications (AMPEA)?

Implementing a basic science programme for energy is one of the key roles assigned to EERA by the SET-plan. Basic science is often presented as crucial in generating the breakthroughs needed to bring new generations of technologies to the market. The aim of AMPEA is to foster a truly multi-disciplinary approach to develop enabling tools and new concepts for future emerging energy technologies.

JP Advanced Materials and Processes for Energy Applications – vision and objectives

The mission statement of AMPEA has been defined by all participants of the joint programme (JP) and states that it has to develop new horizons for science for energy, visible in Europe at the industrial and political level. Thus, the main objective is to harness and integrate materials science and process innovation for high performance sustainable energy technologies, in order to enhance the long-term competitiveness of European Industry. In order to bridge fundamental and applied research fields, AMPEA works in close coordination with other EERA-JPs, with Universities (European Platform of Universities Engaged in Energy Research – EUA-EPUE) and with the Energy Materials Industrial Research Initiative (EMIRI).

AMPEA is organised to apply the capacity of 3 “tools” sub-programmes (SPs) corresponding to generic research areas to “applications” SPs related to known emerging energy challenges and domains. There are presently 3 identified “applications” namely SPA: artificial

photosynthesis, i.e. the ability to efficiently convert large amounts of solar energy into solar fuels; SPB: materials for extreme operating conditions; SPC: low temperature heat recovery. Other “applications” SPs will be added in the future as they are identified and defined by the AMPEA and more generally by the EERA members.

More information

www.eera-set.eu

JP Advanced Materials and Processes for Energy Applications sub-programmes

Sub-programme 1: New materials

Coordinated by FZ Jülich (DE), deputy: CSIC (ES)

The ambition of this sub-programme is to promote generic materials developments having a potential for high efficiency energy applications. On the one hand, the sub-programme addresses innovative approaches for the synthesis and assembly of materials. On the other hand, it also explores functional materials with promising properties, in particular related to heat, mass and/or charge transport (studied in SP2), catalysis (important for Application A - Artificial Photosynthesis) and it establishes sound strategies to eliminate bottlenecks to the exploitation of these phenomena in energy applications.

Sub-programme 2: Physical modelling

Coordinated by University College London, UKERC (UK), deputy: Université de Lorraine (FR)

This sub-programme on Multiscale Modelling supports and strengthens other technical programmes and technology platforms. The main aim is to develop cross-cutting multiscale modelling tools for energy materials and processes. These tools will then be applied to the study of materials, processes and systems considered as a whole or to their individual components or constitutive behaviours.

Sub-programme 3: Characterisation platforms for materials and devices

Coordinated by FZ Jülich (DE) + deputy ENEA (IT)

Advanced experimental characterisation and analysis platforms are essential for designing, developing and understanding new functional materials for energy applications and for understanding the relevant physico-chemical processes. Development of today and

tomorrow's key experimental techniques is a complex, costly and time-consuming process that requires multidisciplinary skills. This sub-programme has three main objectives:

- A forum (fora) to facilitate large scale technique development (technique aspects, software, science/technique exchange);
- A platform providing users with easy access to the wholesuite of experimental techniques included in this sub-programme;
- A platform for the characterization of energy devices.

Application SP A - Artificial Photosynthesis

Coordinated by Helmholtz Zentrum Berlin (DE), deputy: CEA (FR)

Application SP B - Materials for extreme operating conditions,

Coordinated by VTT (FI), deputy: DLR (DE)

Application SP C – Low temperature heat recovery

Coordinated by Politecnico di Torino (IT), deputy: CNR (IT)