EuMaT

European Technology Platform for Advanced Enginnering Materials and Technologies

Identifying synergies between European Technology Platforms

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The Objectives

Overall objective

……the promotion of the leading global position and global competitiveness of the EU technology in the area of Advanced Engineering Materials, as well as promotion of the consolidated and unified R&D and innovation European policy in this area…

….to assure optimum involvement of Industry and other important Stakeholders in establishing European R&D priorities.

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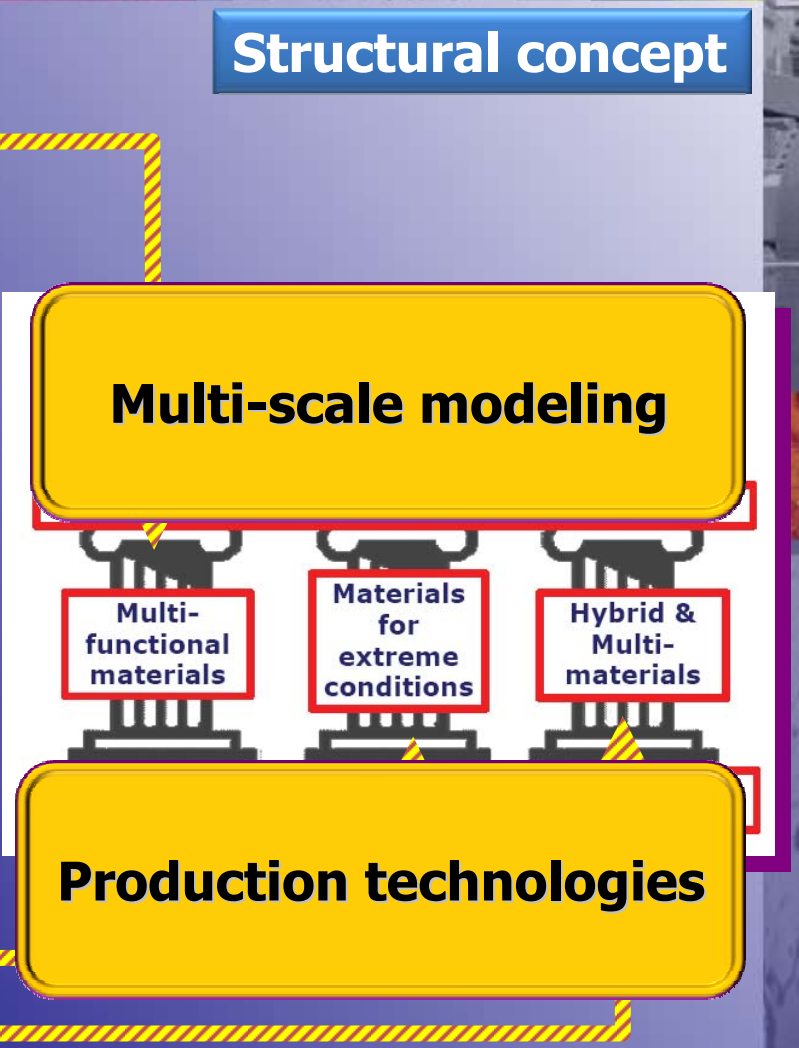
European Technology Platform for Advanced Engineering Materials and Technologies

MULTIFUNCTIONAL
Multifunctional engineering materials with gradient properties

EXTREMAT
Engineering materials for challenging applications and extreme conditions

HYBRID
Multimaterial hybrid systems with advanced materials combined with conventional materials



Structural concept

An Effective vision of the Industrial needs

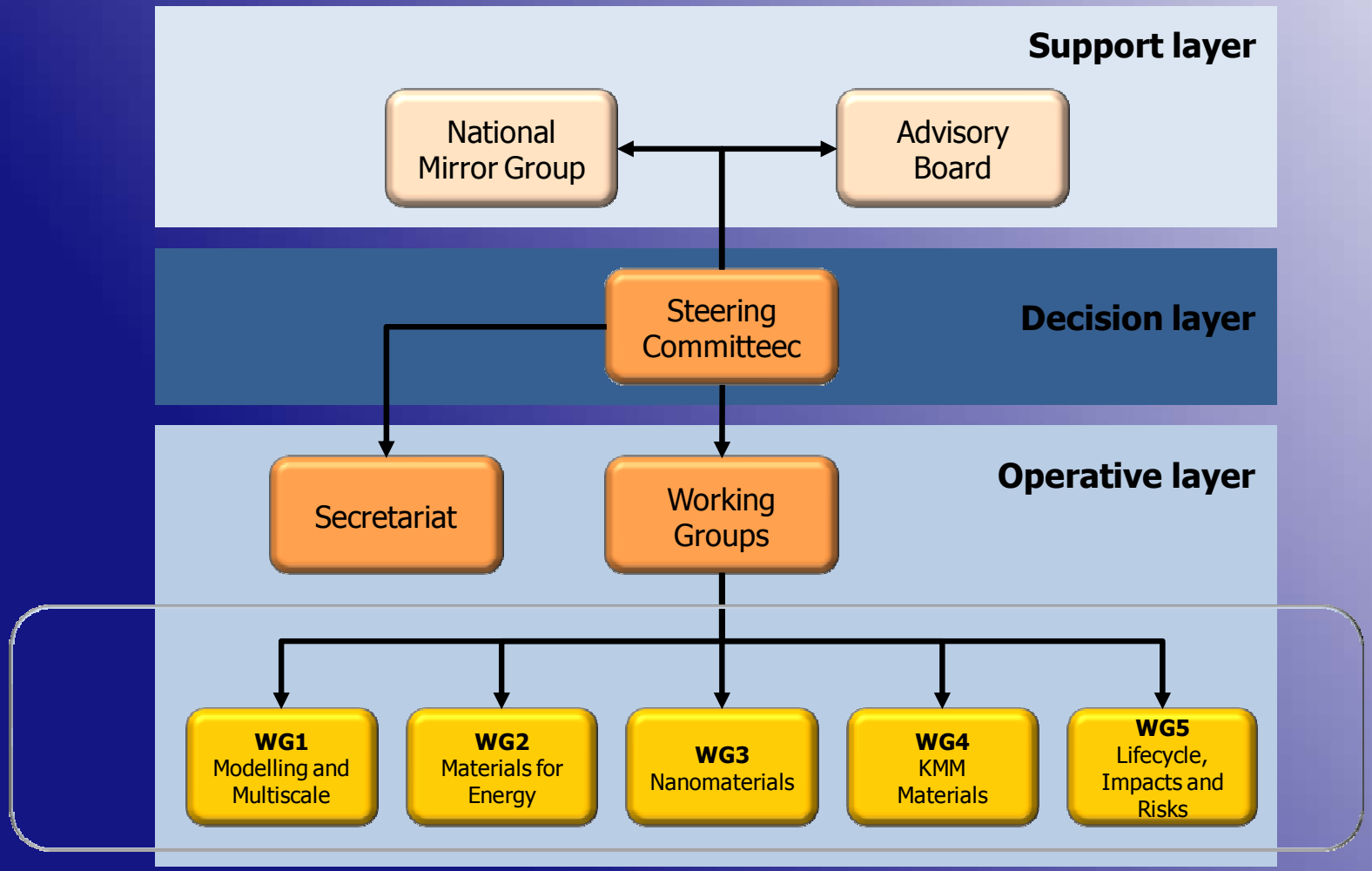
Innovative use of existing materials based on good understanding of applications, material requirements and materials degradations mechanisms

Modification of existing materials to fit better for applications (new grades for existing materials systems, possibly new manufacturing processes)

Development of entirely new materials or materials groups (**nanomaterials**, active/intelligent materials, composites, hybrid and multimaterial structures etc.)

Breakthrough

EuMaT in pills



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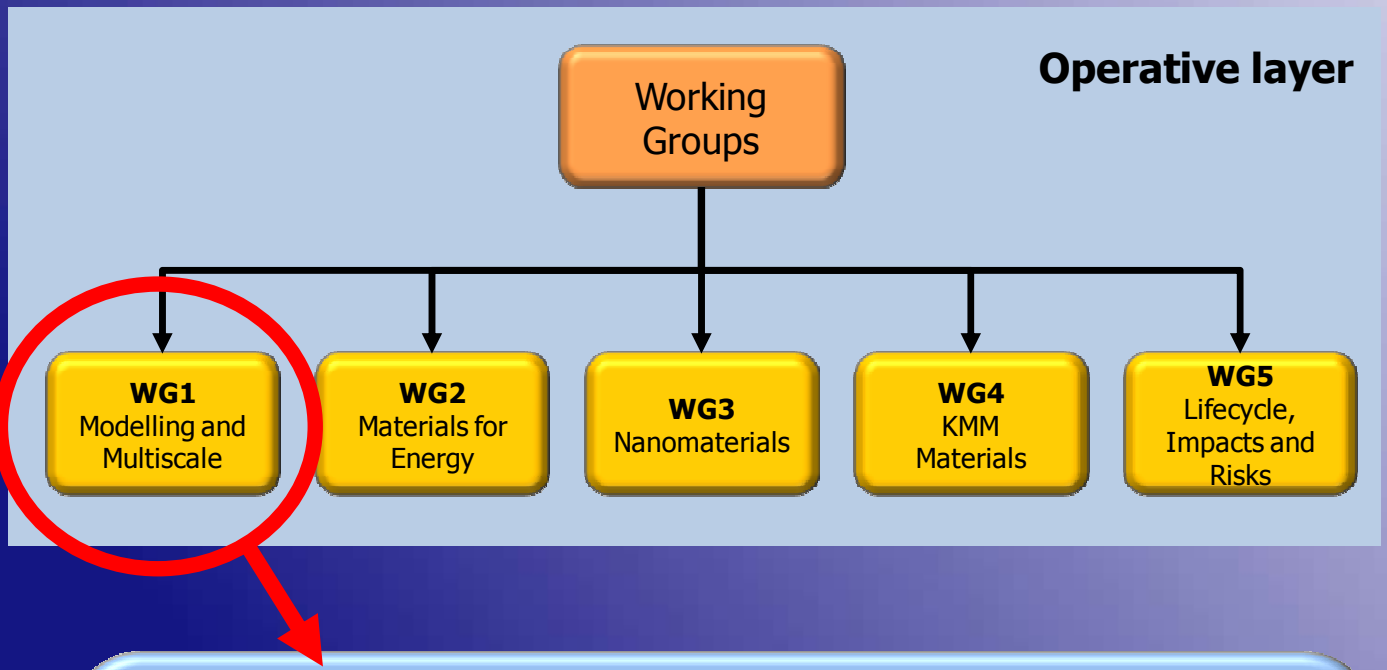

WG1 - Modelling and Multiscale

(chairman: Marco Falzetti)

- Modelling and simulation of materials properties
- Modeling of Manufacturing Processes
- Product Lifecycle Modeling
- Multiscale Modeling and Characterization

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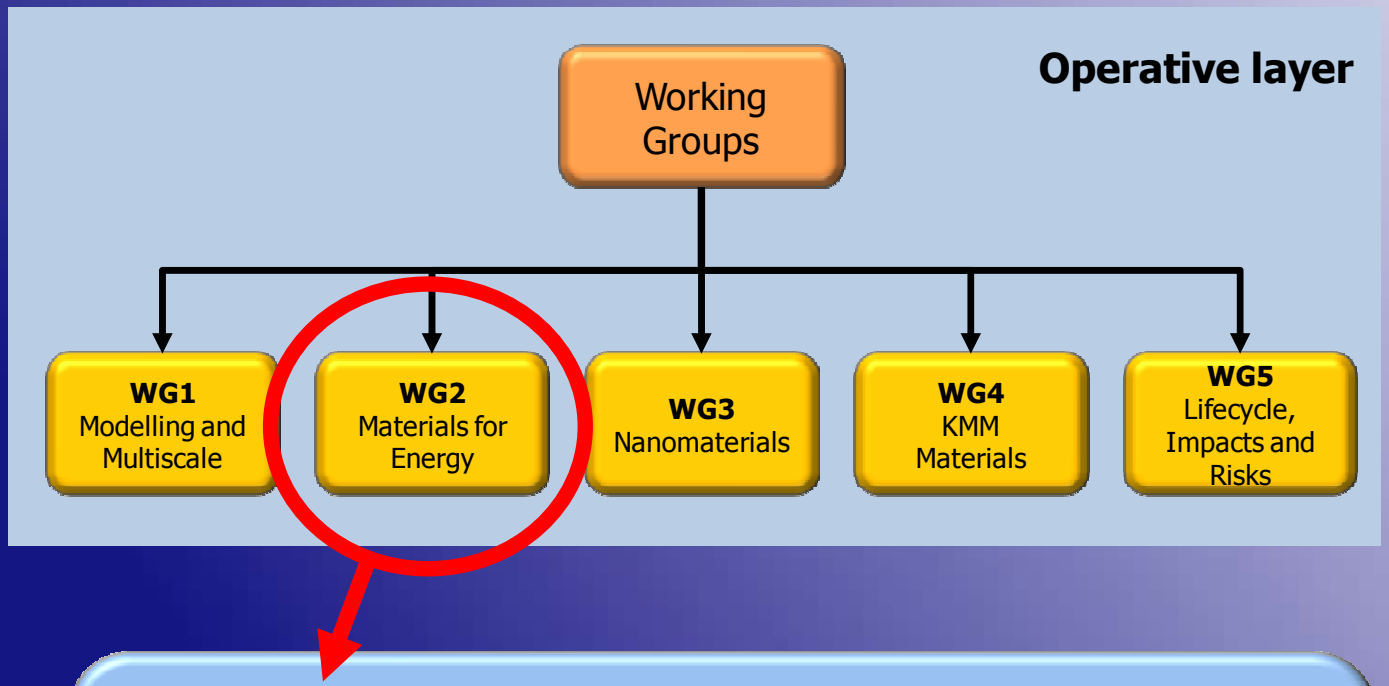

WG2 – Materials for Energy

(chairman: John Oakey)

- Power generation (fossil & renewables)
- Transmission, distribution and storage
- Energy Conservation

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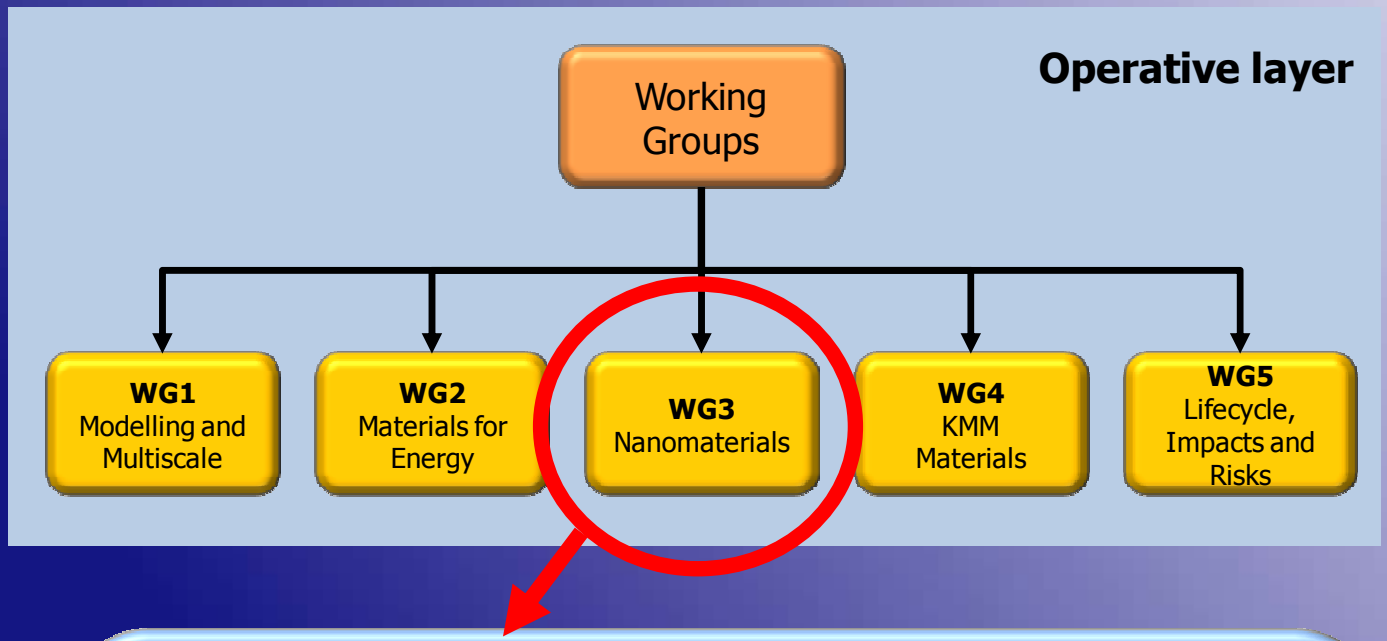

WG3 – Nano-assembled-materials for structural and multifunctional applications

(chairman: Daniele Pullini)

- Multifunctional nano-assembled materials
- Functional packaging materials for MST
- Recyclable high performance nano-composites
- Engineered nanostructured surfaces
- Low cost fabrication of coatings for harsh environments

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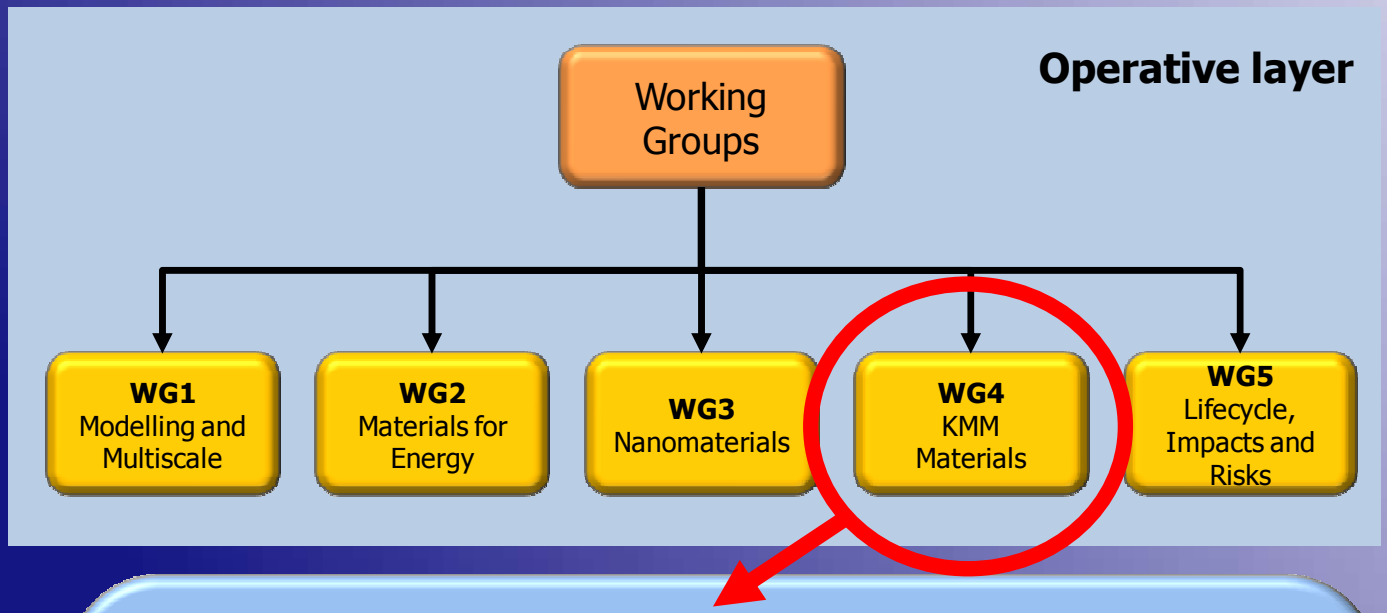

WG4 – Knowledge-based Multifunctional Materials and Materials for Extreme Conditions

(chairman: Michal Basista)

- Functionally graded materials and functional multilayers
- Intermetallics and Composites (MMC, CMC, …)
- Self-passivating protection materials
- Functional permeation barrier materials
- Hhybrid materials
- Surface functionalisation for extreme conditions

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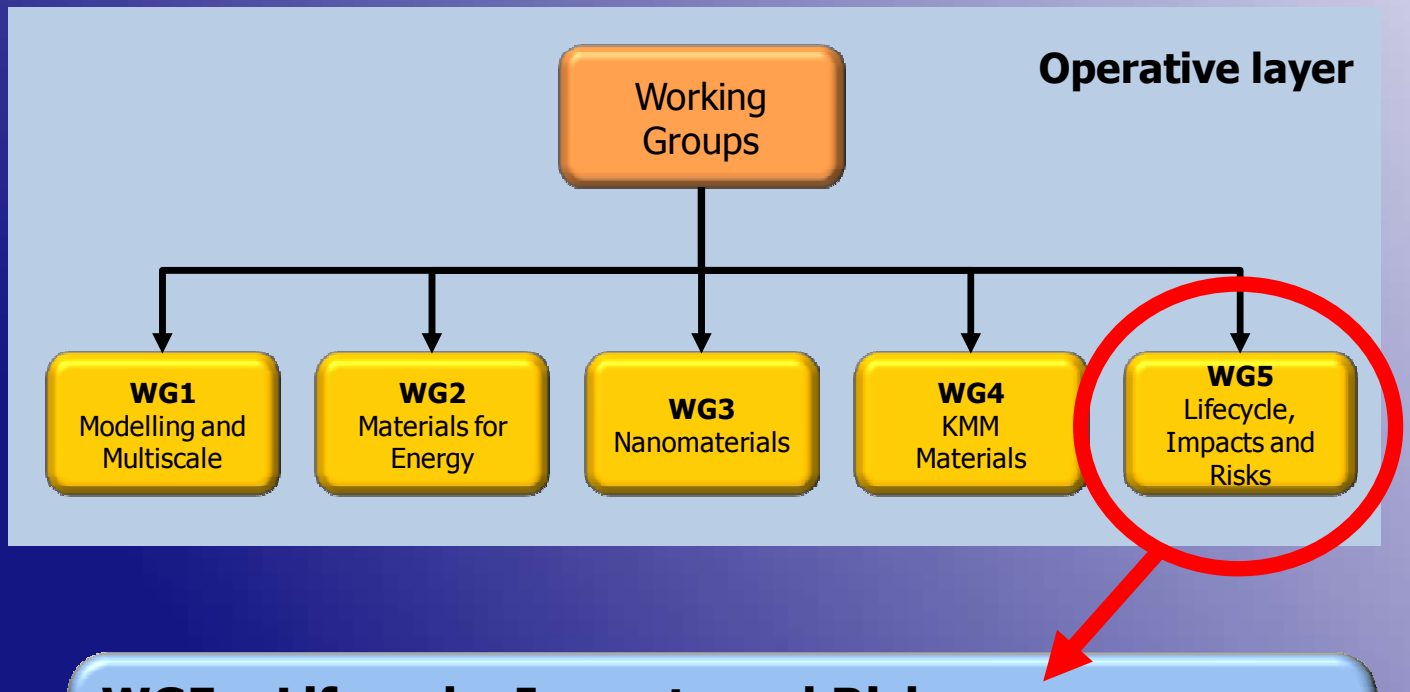

WG5 – Lifecycle, Impacts and Risks
(chairman: Alexandar Jovanovic)

Just launched - Under construction

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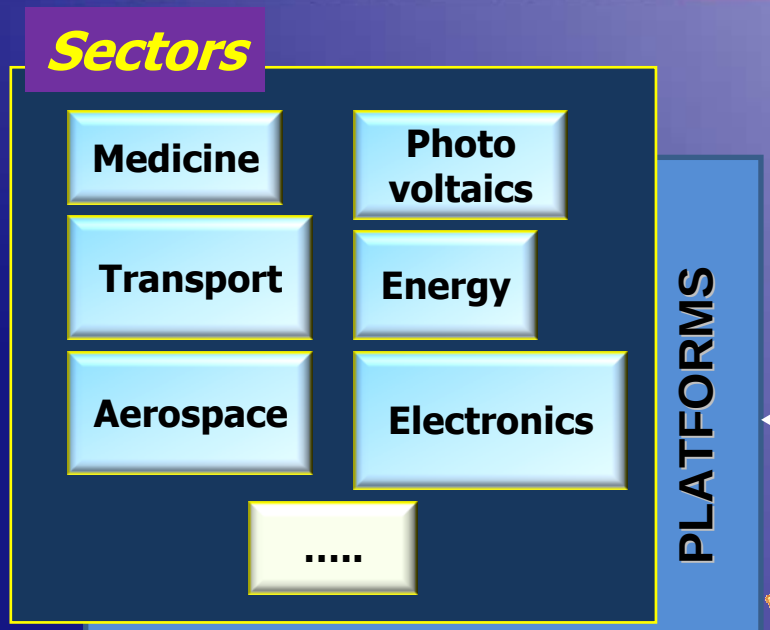

PLATFORMS

SRA

Bidirectional dialogue

Underpinning & cross-cutting

EuMaT

SRA

EuMaT shall both ensure sharing of best practices, and avoid duplication across sectors/TPs on Material R&D

Prioritising enabling and advanced solutions for materials technologies

EuMat – H2-FC JU Interaction

Common Interests

o Materials technologies and their application in all types of energy system are priority areas for EuMat – this activity is focused through the Energy Materials Working Group

o Materials technologies (both functional and structural) are priority underpinning activities within H2-FC JU

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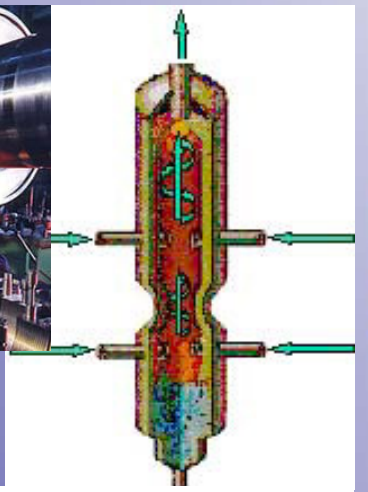
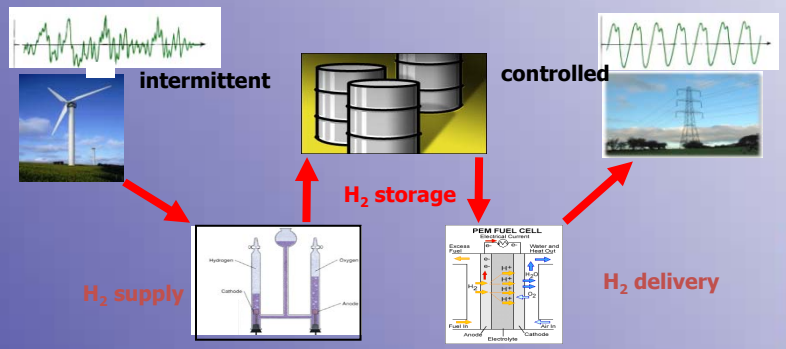
Materials Challenges I

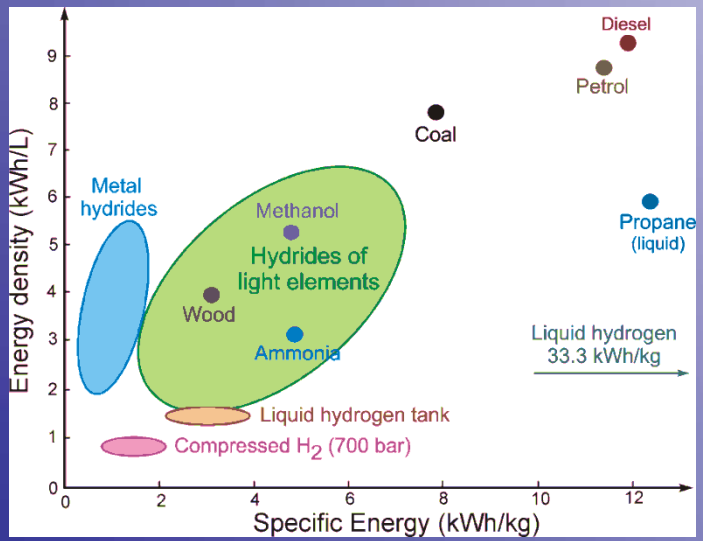
- **Hydrogen Production:** including gasification of fossil and renewable feedstocks, CO_2 separation and transport, electrolysers, H_2 separation technologies, etc.
- **Hydrogen Transport and Storage:** storage materials options
- **Hydrogen use in Gas Turbines:** impact on gas turbine design, operation and materials, new gas turbine – FC combined cycles
- **Hydrogen use in Fuel Cells**: functional (membranes, poison resistance, etc.) and structural (ducting, interconnects, corrosion resistance, etc) parts,



Materials Challenges II

- New materials – particularly for H_2 storage and H_2 sensors
- Catalysts for reduced cost H_2 production
- Membranes and separation media to reduce the cost of meeting the hydrogen purity requirements of fuel cells, and other applications.
- Advanced instrumentation and characterisation techniques.
- Modelling of the interaction of H_2 with materials, embrittlement, and electron transfer processes in solids to enhance photocatalysts and photoelectrochemical processes





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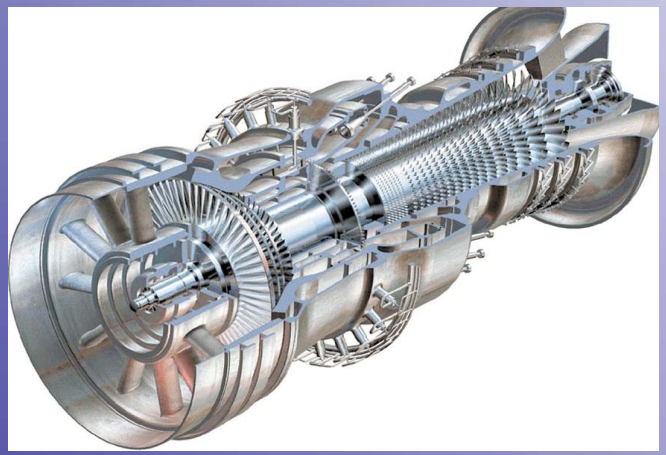
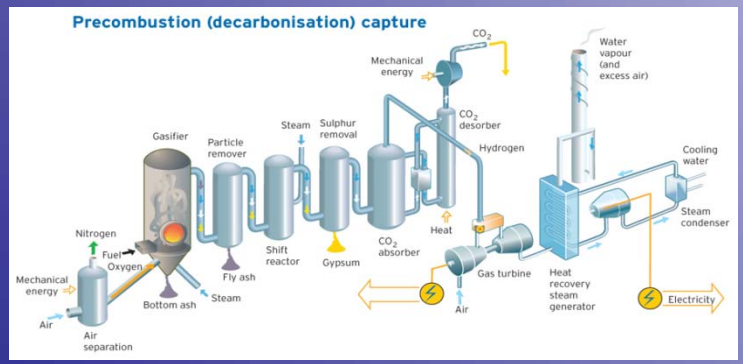
EuMat Energy Materials Priorities

- Scale-up & efficient processes providing low cost products
- Understanding of failure mechanisms and durability issues
- Fabrication techniques and manufacturing consistency
- Inspection techniques to ensure the supply of high quality components
- New and improved existing materials - increased conductivity for cell and stack components
- Environmentally stable materials
- Life cycle considerations

Industrial gas turbine





Fuel Cells and Hydrogen JU General Assembly
Brussels, 27 October 2009

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EuMat – H2-FC JU Opportunities

- Clear opportunities to collaborate on defining research priorities and implementation strategies
- Joint workshops on the materials technology requirements
- Development of research projects
- Consistency of approach and message to EC and national bodies
- Etc.

Thank you for your attention