Materials Common House – A network of organizations to promoting material research with a view of its industrial relevance

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Aim of the HORIZON 2020 MATCH Project

The Alliance for Materials (A4M) aims to

▪ Create a strong, sustainable network open for all European Materials players – the Materials Common House

▪ Create a partnership to promote the integration of concerted and strategic challenges of national, regional and European needs in advanced materials

**A4M:** six European Technology Platforms EuMaT, Suschem, Manufuture, FTC, ESTEP, SMR, and EMIRI (Energy Materials Industrial Research Initiative) and two materials science and research organisations FEMS and E-MRS
WHY?

The importance of Advanced Materials to economy has been recognised by private and governmental organisations, when Advanced Materials were identified to have large impact on Global Megatrends and Societal Challenges.

On the other hand FRAGMENTATION of sectors related to materials research and development was never so apparent.
Importance of Materials to the Economy

Advanced manufacturing and materials, biotechnology and nanotechnologies (including nanomaterials) are at the heart of game-changing products (2014)

Advanced Materials was identified as one of its Eight Great Technologies.*
- Example: 15% of UK GDP being dependant on materials.

Advanced materials market has the potential to grow more than 10 times over the next decade. (2017)

Advanced materials research will continue to play important role in the future because of their enabling and cross-cutting character. (funded in the EU by €13.557 billion) – (2016)
Materials related Roadmaps

European Tooling Roadmap 2014-2020

The European roadmap for graphene science and technology

http://toolingplatform.manufuturenet.eu/tooling-technology-roadmap

About 20 ETPs related with materials plus materials roadmaps from private and governmental organisations
Materials in a Challenging Environment
Intensively used Elements and the drivers behind

- Cast Iron, Copper, Zink
- Alloyed Steel
- Light Metals Alloys
- Superalloys
- Semiconductor Materials
- Light-Emitting Diode

Technology Steps and increasing Variety in Materials

Number of intensively used Elements

Green Energy, Smart Mobility, Wellbeing, Security

Adapted after Achzet / Reller, 2011 and presented at Yukomat 2016 by M. Hofmann-Amtenbrink
Increase in challenges: energy, pollution, health, security, reuse
dynamic vehicle

Mix of advanced materials: Ceramics, carbon, graphene, magnesium, polymers, composites, biobased materials, smart materials, nanomaterials, semiconductor material

Steel, copper, aluminum alloys

Steel, copper, aluminum alloys, ceramics, magnesium, polymers, composites

Steel and copper alloys

Next Generation
E-Mobile with a Human-Machine-Interface
Budd-e sensors already perceive people as they approach the vehicle
Economic Cycles (after Kondratiev)

- **1st Cycle**: 1785 - 1845
  - 1st Industrial revolution
    - Steam engine

- **2nd Cycle**: 1845 - 1900
  - 2nd Industrial revolution
    - Railway

- **3rd Cycle**: 1900 - 1950
  - 3rd Industrial revolution
    - Electrotechnology
    - Chemical Industry
    - Automotive Industry

- **4th Cycle**: 1950 - 1990
  - 4th Industrial Innovations
    - Petrochemistry
    - Electronic Computer
    - Aerospace Industry
    - Robotics

- **5th Cycle**: 1990 - 2030
  - 5th/6th Industrial Innovations
    - Information Technology
    - Micro & Nanotechnology
    - Advanced & Smart Materials

- **6th Cycle**: >2030
  - Renewable Energy
  - Circular Economy
  - Gene Technology
  - Big Data
  - Bionics

**Level of Innovation**

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Research in Europe
Overcome bottlenecks in application by materials R&D

Data from the EU Project MATCH/Partner CEA Liten
MATCH Approach
Reduce Fragmentation
Increase Commonalities

Assessment of materials R&D: MATCH regional, national and EU Database and Expert Workshops

WP 5 and 6

WP7
Recommendations for more effective material stakeholders networking in Europe

WP5
Sustainable Sector Technical Group facilitating the coordination activities across the Union

WP2
Strategic surveillance tool for emerging and disruptive trends in materials.
NEED for A4M „Sector Technical Group“ of Experts

Materials technology enables to go forward, but needs feedback from within the STG’s of sectors.

Societal challenges act as fuel to the system, putting in needs towards the STG’s.

Materials science and - engineering enables solving the issues to the STG’s, while STG’s feeds back the solutions.

As societal needs continuously develop, new needs (fuel) in be fed to the system

Materials science and engineering act as the engine for innovation and development.
Activities:

• **Identify** the perspective of advanced, smart and „classic“ materials (materials for the future generation of industrial innovation)

• **Assess** influences of basic and precompetitive materials research and development on the various industrial sectors and markets.

• **Facilitating communication** and **offering a dialogue platform**.

• **Transform** expert information about materials along the value chain into valuable and meaningful insights for business, politics and science.

• **Consolidate** STG by a Seminar / Workshop in November 2017 in Lausanne, CH
The MATCH project (http://www.match-a4m.eu/) is coordinated by Italian Centro Sviluppo Materiali and the whole consortium consists of 18 partners from nine countries representing the six related European Technology Platforms and several major European material research organisations. The project started in January 2015 and will continue for 30 months until June 2017. This project has received funding from the European Union’s Horizon 2020 research and innovation programme under Grant Agreement No 646031.