

universidade de aveiro



dem

departamento de engenharia mecânica



TEMA Mobilizing Project - Technologies for the Wellbeing

Antonio Bastos, Jorge Bandeira*, Duncan Fagg

[TEMA Centre for Mechanical Technology and Automation](#)



OUTLINE

- Research Unit Presentation
- Research areas
- Strategic plan (18-22) Mobilizing projects (MP)
- Selected examples of research outcomes
- Ongoing internal MP
- Leading European Cooperation and R&D project

The Centre for Mechanical Technology and Automation (TEMA)

WHO WE ARE



132 researchers: **71 Integrated Members** (48 PhD) and **61 Collaborators**, with different backgrounds (mechanical engineering, physics, chemistry, electronics, materials science and engineering, and medicine, mathematics among others).

VISION & MISSION



The **Vision**: to create an integrated research structure with a **unique transversal character**, encompassing different areas of research and empowering its members to make a true change in the world, both from research and technology-transfer standpoints.

The **Mission**: benefiting from a top-level multidisciplinary team, to develop and **provide research competencies** that can be applied to the **technological needs of the Society**.

THE MULTIDISCIPLINARITY IMPACT OF TEMA MEMBERS

@Advanced training

MSc Programmes

**Mechanical
Engineering**

**Sustainable Energy
Systems**

**Industrial Automation
Engineering**

**Engineering and
Product Design**

**Biomedical Materials
and Devices**

PhD Programmes

**Mechanical
Engineering**

**Energy Systems and
Climate Change**

**Nanosciences and
Nanotechnology**

@Research

Applied energy

Simulation software

Advanced mech.
engineering

Nanoengineering

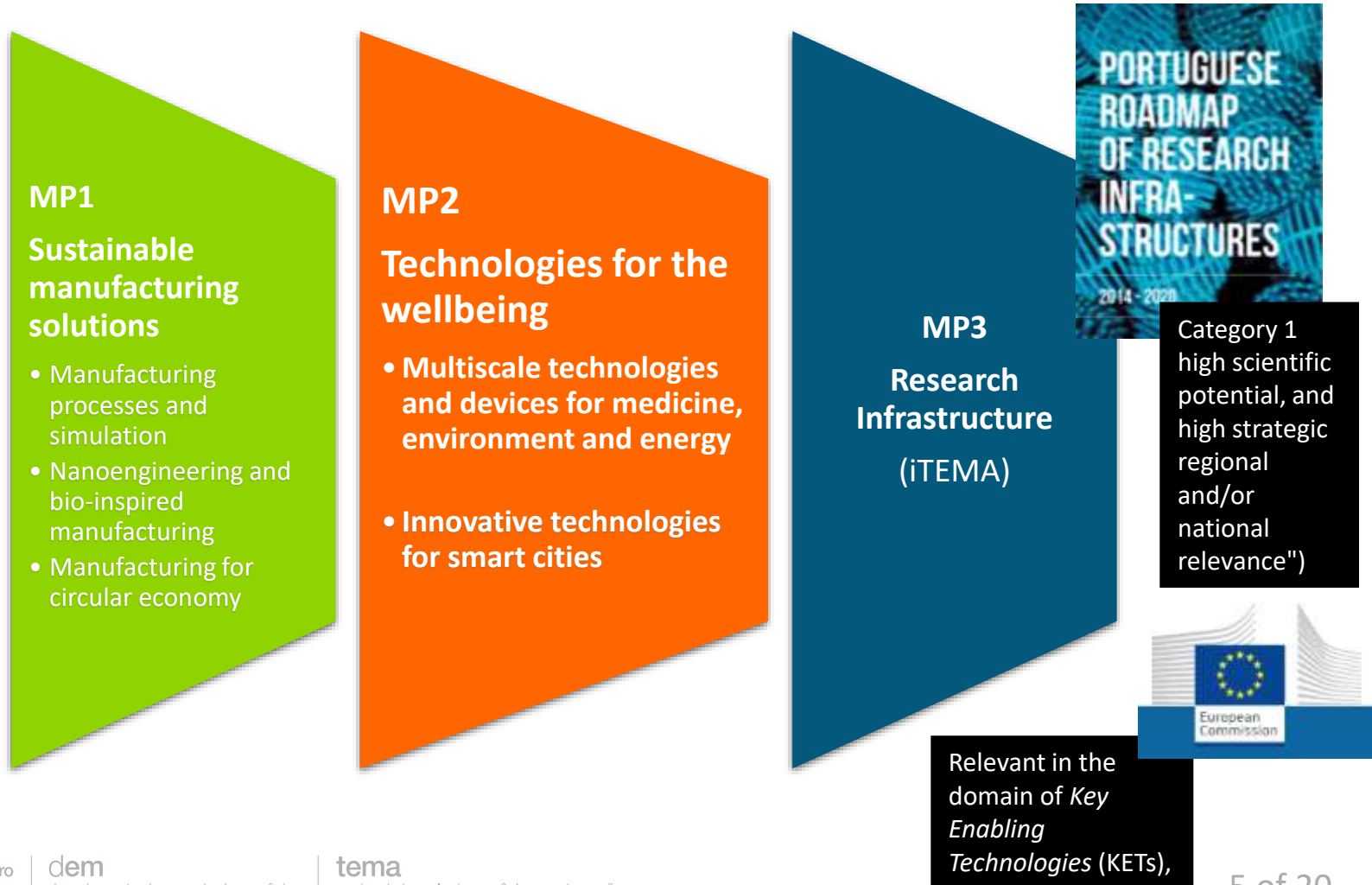
Biomechanics

Transportation
technology

Areas aligned to the international agenda towards equality,
gender balance, diversity, scientific and technological excellence

STRATEGIC PLAN FOR THE FUTURE (TEMA @ 2018-2022)

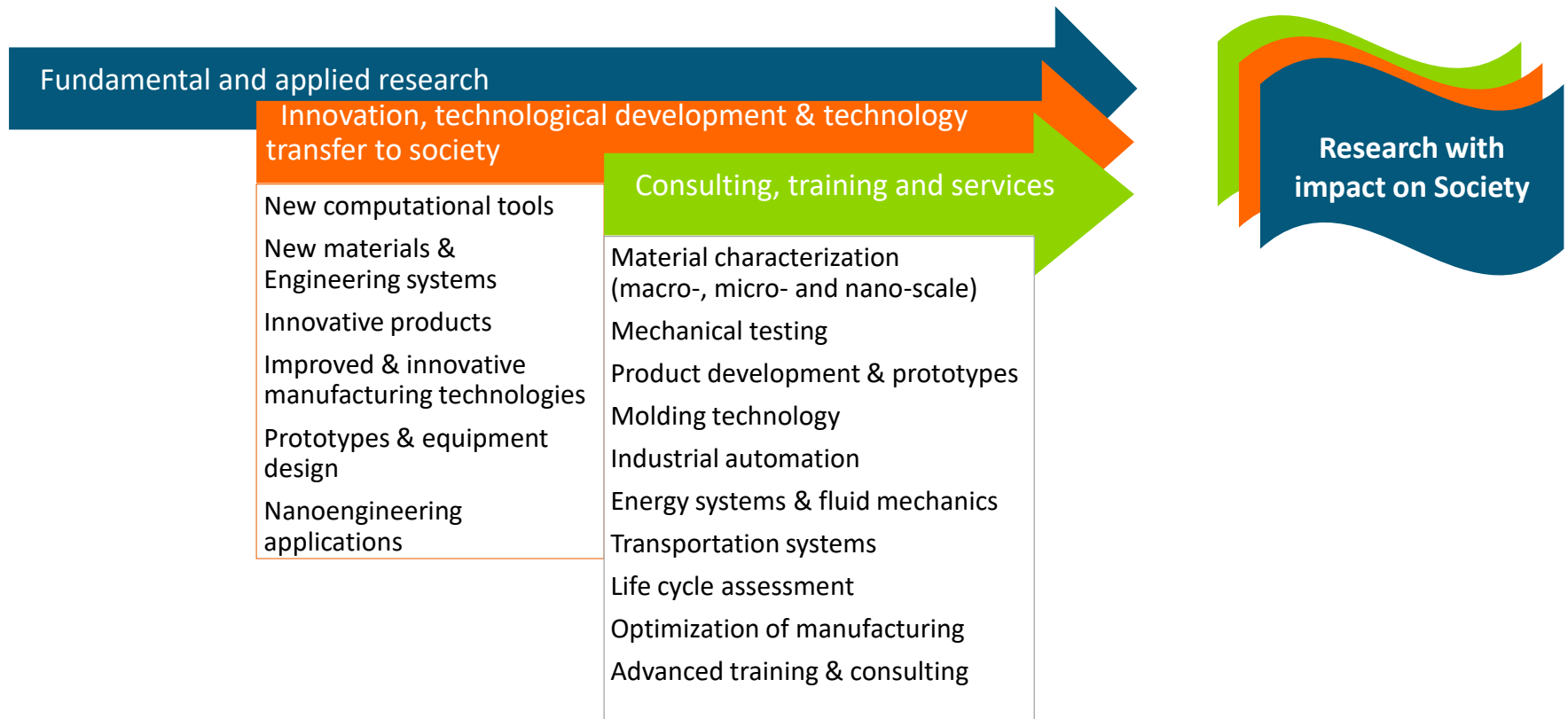
NEW STRUCTURE BASED ON THREE MOBILIZING PROJECTS (MP), ORGANIZED IN RESEARCH PACKAGES (RP)



TECHNOLOGIES FOR THE WELLBEING

THE MULTIDISCIPLINARITY IMPACT OF TEMA MEMBERS

@Research



THE MULTIDISCIPLINARITY IMPACT OF TEMA MEMBERS

Australia
Bahrain
Belarus
Belgium
Brazil
Canada
Chile
China
Cuba
Czech Republic
Denmark
Egypt
Fiji
France
Germany
Greece
India
Iran
Ireland
Italy
Japan
Latvia



Romania
Lebanon
Lithuania
Luxembourg
Malaysia
Mexico
Morocco
Nepal
New Zealand
Norway
Poland
Portugal
Russian Federation
Saudi Arabia
Slovenia
South Africa
South Korea
Spain
Sweden
Thailand
United Arab Emirates
United Kingdom
United States

TEMA Researchers (IDI) connections expressed in publications (45 countries)



SELECTED EXAMPLES OF RESEARCH OUTCOMES



SELECTED EXAMPLES OF RESEARCH OUTCOMES

Cartilage tissue engineering

**BIOREACTOR CONCEPT TO
BIOMECHANICAL AND BIOCHEMICAL
CHARACTERIZATION OF
ENGINEERED TISSUE CARTILAGE**

Patent number: PT 106827A



Impact on society – smart transport

**CISMOB PROJECT DISTINGUISHED AS
“INSPIRING MOBILITY ACTION” ON EUROPEAN
MOBILITY WEEK - BEST PRACTICE GUIDE 2017.**

**FIRST SUCCESSFUL PILOT ACTION APPROVED BY
INTERREG EUROPE “PLATFORM FOR REAL TIME
INFORMATION SYSTEM FOR PUBLIC
TRANSPORT BASED ON MULTISOURCE DATA”**

**ACTION PLAN FOR POLICY CHANGE (EG. ERDF
OP CENTRO 2020)**



SELECTED EXAMPLES OF RESEARCH OUTCOMES

Renewable energy

Modular facade or covering element with solar energy recovery for water heating, air conditioning and ventilation

Patent: EP3287713



Water remediation

Functionalized graphene based materials for removal heavy metals from contaminated waters.

National patent pending:
108.061

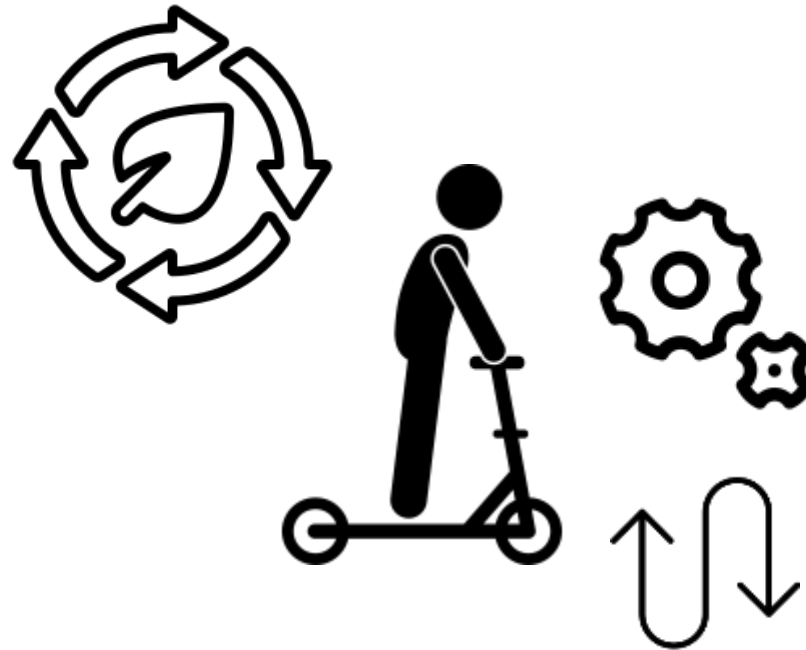




IMPLEMENTING MOBILIZING PROJECTS



MP: Life Cycle Thinking of Active Mobility From the Concept to the Use, under a Mechanical Technology and Automation Perspective





TECHNOLOGIES FOR THE WELLBEING

- To develop a complete life cycle thinking platform for active mobility, including:
 - 1) **the concept of innovative products** to support walking, cycling and other active modes (e.g., scooters);
 - 2) **the manufacturing of these products namely**, the raw materials and the processes used in the design and production of the different components);
 - 3) the use of active modes in the cities, **with the analysis of the user behavior**, as well as his/her interaction with the remaining road traffic elements (including safety issues).

Coordinator Margarida Coelho
(margarida.coelho@ua.pt)





LEADING EUROPEAN CONSORTIUMS



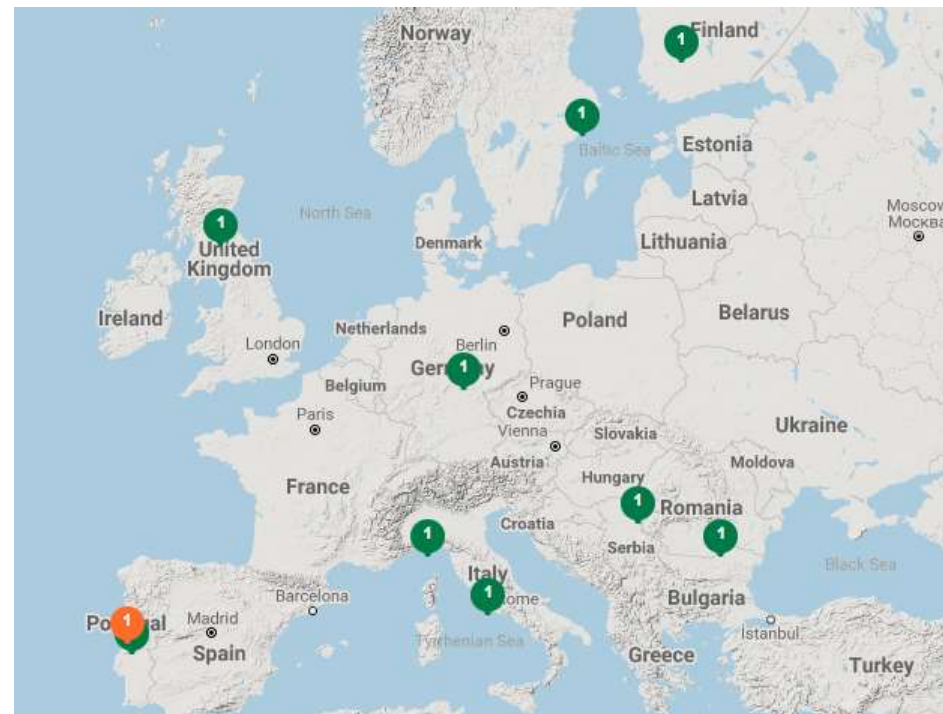


European Union
European Regional
Development Fund

Prioritizing low carbon mobility
services for improving accessibility
of citizens



COUNCIL OF
TAMPERE REGION



Budget: €1,563,660

- Mobility-as-a-Service (MaaS) is a new concept whose main objective is to change the way people travel and pay for mobility services.
- Regional policy instruments: => key role in supporting the introduction of MaaS and ensuring it will contribute to low carbon transport policy-goals, social inclusion and minimum levels of accessibility.
- **Critical assessment of the MaaS opportunities and risks** can better inform policy makers and ensure **that digital disruption occurs to our advantage**

•

The key objective of PriMaaS is to create a knowledge hub to support regions to promote the MaaS concept ensuring that:

- i) mobility solutions are focused **on citizens' needs**,
- ii) **low carbon mobility solutions are good options from the citizen's perspective in terms of comfort and price**

Coordinator Jorge Bandeira (jorgebandeira@ua.pt)

NeuroStimSpinal

A step forward to spinal cord injury repair using innovative stimulated nanoengineered scaffolds



H2020-FETOPEN-2018-2019-2020-01

Grant Agreement: 829060

Budget: €3,518,962.50



Started: 1st April 2019

Duration: 48 month

CONSORTIUM



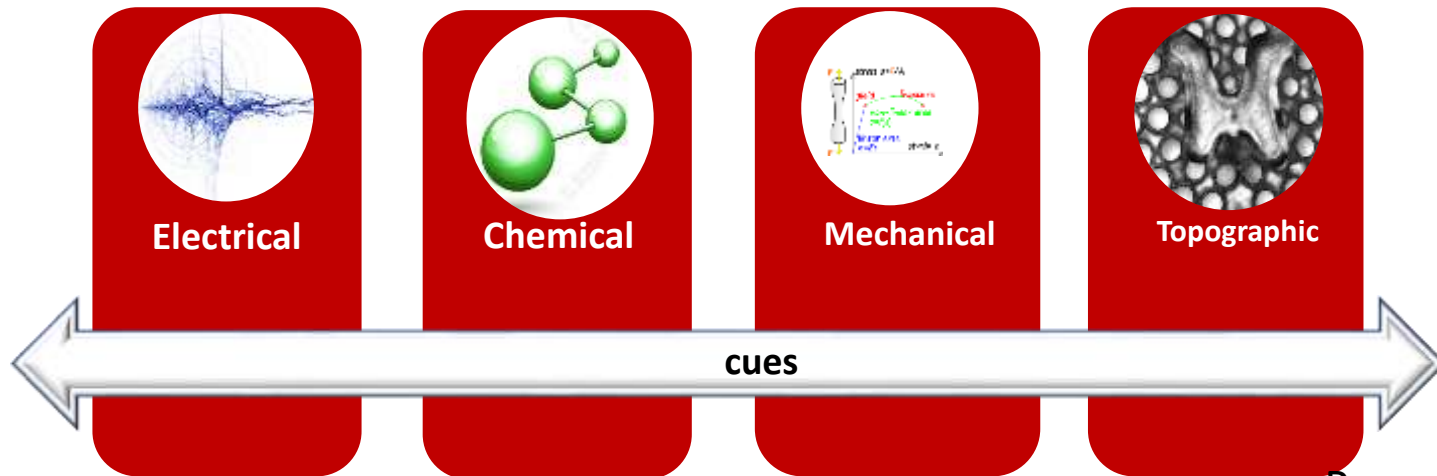
- University of Aveiro (UAVR) (HEI; Portugal)
- Tecnalía (Research Centre, Spain)
- Complutense University of Madrid (UCM) (HEI, Spain)
- Foundation for Research and Technology-Hellas (FORTH) (HEI, Greece)
- Radboud University Medical Center (Radboudumc) (HEI, Netherlands)
- Graphenest (SME, Portugal)
- Stematters (SME, Portugal).





Concept:

Graphene/decellularized matrix based **nanoengineered scaffold** creating a **3D** microenviroment with:



Preserv neural cell
survival and
differentiation

Coordinator Paula Marques (paulam@ua.pt)



Acknowledgment

- UID/EMS/00481/2019-FCT - Fundação para a Ciência e a Tecnologia (FCT);
- CENTRO-01-0145-FEDER-022083 - Centro2020 Regional Operational Programme, under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund.

universidade de aveiro



dem

departamento de engenharia mecânica

Thank you

Jorge Bandeira

Jorgebandeira@ua.pt

Skype jorgeflag