

UPM's Direction for North America



POLITÉCNICA

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International Rankings

QS-2018

#1 university in the **engineering** field among **Spanish-speaking** countries

#31 in **architecture**

#46 in civil and structural engineering,
#76 in Engineering and Technology,
#51-100 in Agriculture&Forestry,
Art&Design, Mechanical Engineering, and
Electrical and Electronic Engineering,
#101-150 in Computer Science and
Information Systems

#92 in **graduate employability (2019)**

ARWU-SHANGHAI (2018)

#5 in **civil engineering**
#47 in **aerospace engineering**

#51-75 in Instruments Science & Technology
#76-100 in Transportation Science & Technology
#76-100 in Agricultural Science
#76-100 in Transportation Science & Technology
#101-150 in Mechanical Engineering
#101-150 in Automation & Control
#101-150 in Water Resources
#151-200 in Telecommunication Engineering

Vision



MISSIONS

Mission-Oriented Research & Innovation in the European Union

A problem-solving approach to fuel innovation-led growth

by Mariana MAZZUCATO



Research and Innovation

Figure 1 below illustrates the movement from broad challenges to specific missions.

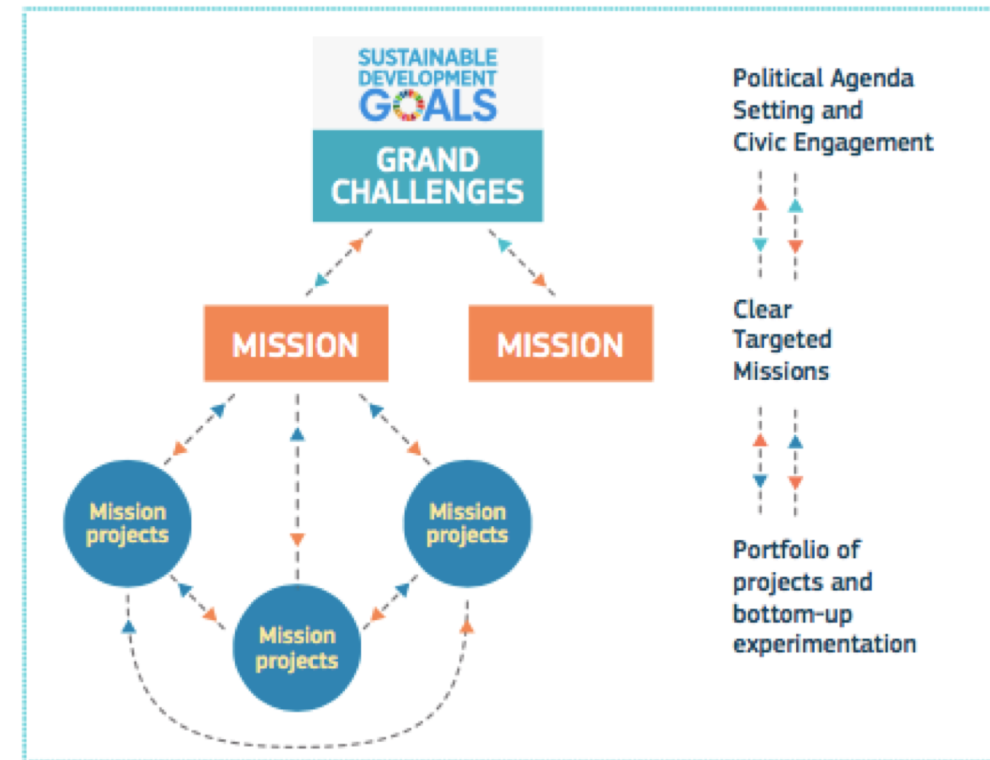
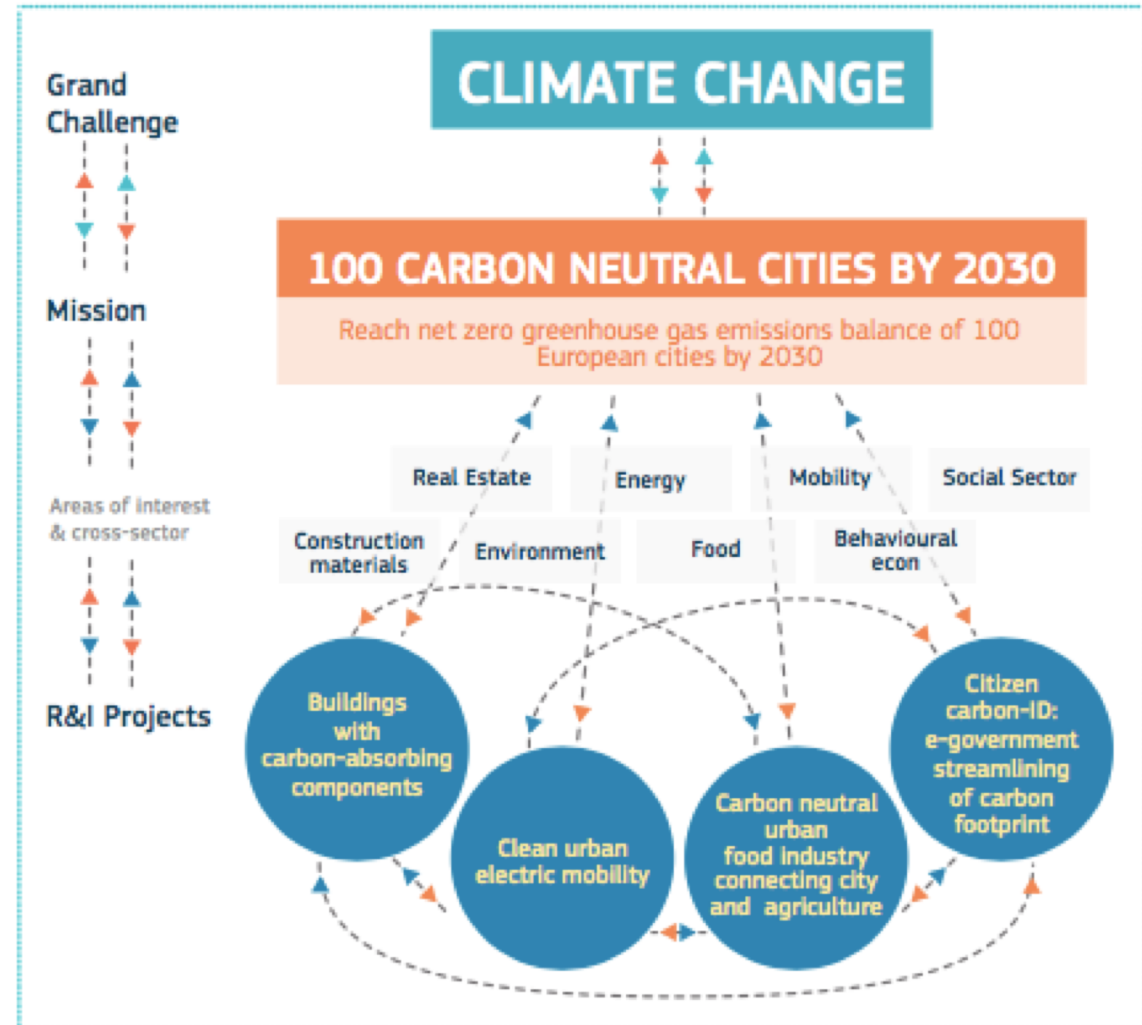


Figure 1. From Challenges to Missions Image: RTD - A.1 based on Mazzucato (2017)

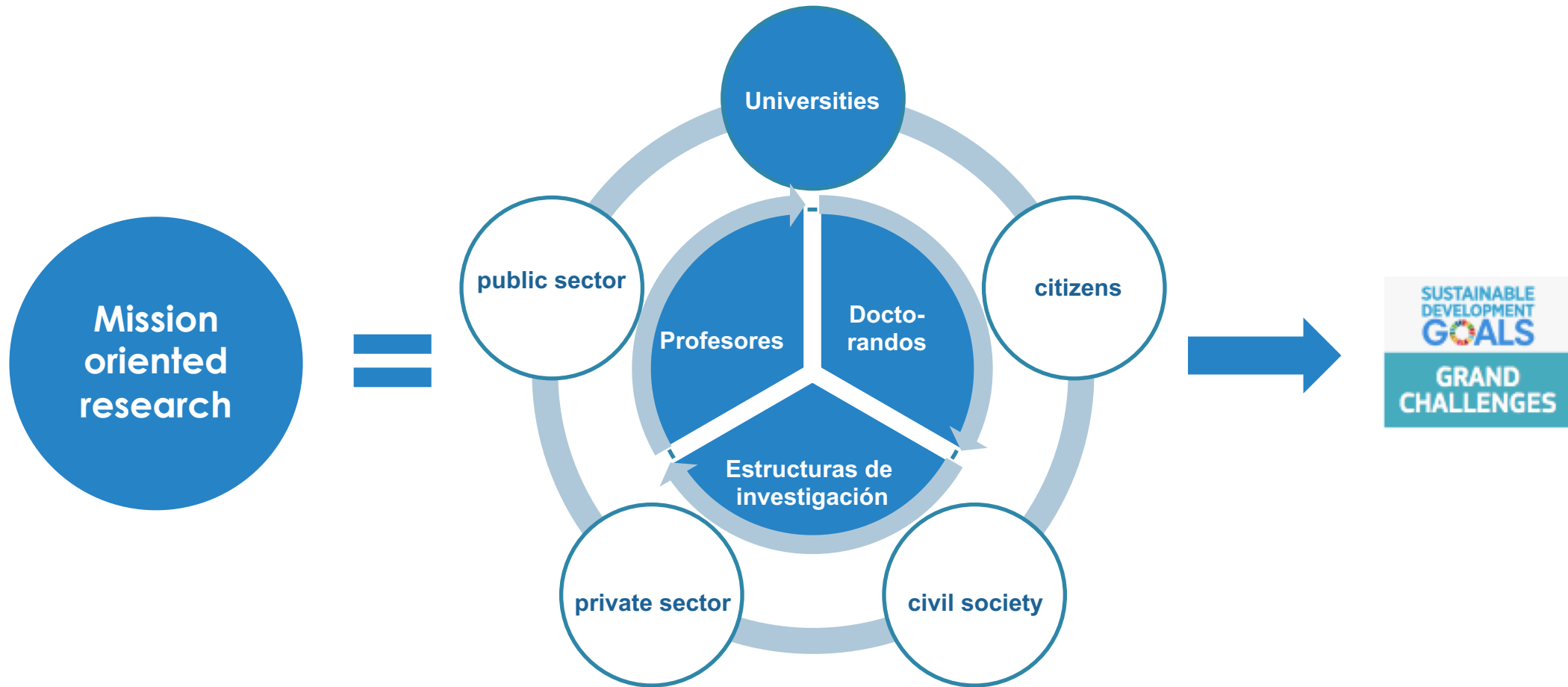
Vision

5 key criteria for the selection of missions at EU level:

- Be bold and **inspirational**, with wide societal relevance
- Be ambitious, but with **realistic** research & innovation actions
- Foster **cross-disciplinary**, cross-sectoral and cross-actor innovation
- Set a **clear direction**: targeted, measurable and time-bound
- Require **multiple, bottom-up solutions**



Vision



Seminarios UPM

UPM research groups contribution to SDGs

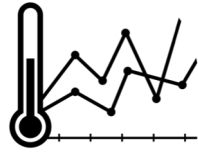


Vision


Global Challenges



Increasing world population (ageing, pandemics, migrations)



Climate Change



Need of basic services (food, water, energy, basic habitability)



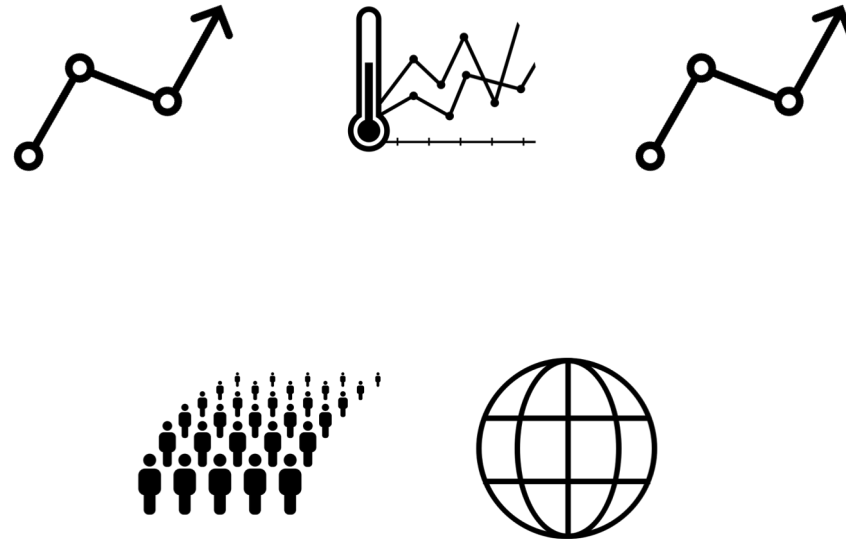
New governance and new social contract



Global Security

Vision

Global Challenges



To **develop** and **accelerate** solutions based on **knowledge, technology and collective intelligence**

Strategic partnerships in USA

PRIVATE COMPANIES

ferrovial

Santander

IBERDROLA



REPSOL

Gestamp

Internships
Summer school

PUBLIC SECTOR

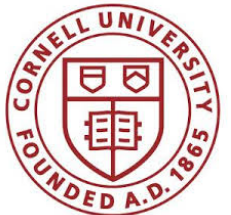
STUDENTS

HARVARD
UNIVERSITY



GEORGE
MASON
UNIVERSITY

Berkeley
UNIVERSITY OF CALIFORNIA



ILLINOIS INSTITUTE
OF TECHNOLOGY

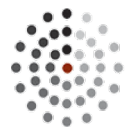
PURDUE
UNIVERSITY



Living Lab
Test bed

Dual programs
Seed Funds
Shared courses
Visits

iMADRID!



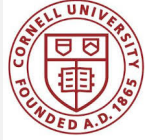







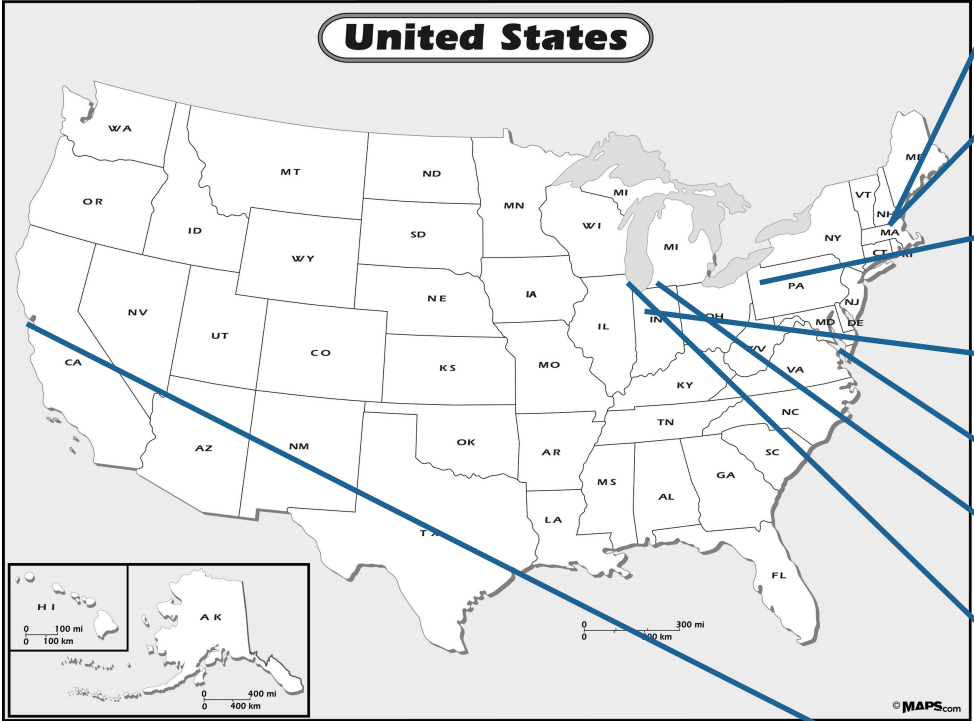
MIT CENTER FOR
COLLECTIVE
INTELLIGENCE

Smith College

FACULTY

Strategic partnerships

| UNIVERSITY | PRIORITIES |
|---|--|
|  | <ul style="list-style-type: none"> • Sustainable cities • Higher education • Design engineering |
|  | <ul style="list-style-type: none"> • City Sciences • Tech-based innovation and entrepreneurship • Biomedicine engineering and genomics • Advance semiconductor devices |
|  | <ul style="list-style-type: none"> • Sustainable transportation • Digital agriculture • Innovation and leadership in emerging markets |
|  | <ul style="list-style-type: none"> • Climate • Nanotech • Engineering for the fourth industrial revolution |
|  | <ul style="list-style-type: none"> • Gov-tech • Public policies for sustainable transformations |
|  | <ul style="list-style-type: none"> • New materials |
|  | <ul style="list-style-type: none"> • Student exchange • Research focus to be defined |
|  | <ul style="list-style-type: none"> • Clean Tech • Architecture • Leadership and engineering |



PRIORITIES

INSTRUMENTS

Materials (with a broad vision including mechanical engineering, nanotech, etc.)

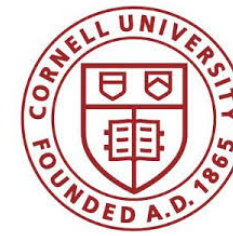
Health (including complex networks, complex systems, and biomedical engineering)

Nuclear Engineering (including security and cybersecurity)

Nexus Food, Energy, Water, and Environment

Transversal topics of Artificial Intelligence, Robotics, and Visualization

- Purdue Faculty to **visit** UPM in June 2019
- **Grants** for PhD and Faculty visits during 2019-2020.
- **Students exchange** on the Aerospace, Chemical Engineering, and Material Science Engineering programs



| PRIORITIES | INSTRUMENTS |
|--|--|
| Sustainable transportation | <ul style="list-style-type: none">• Pair UPM Faculty with Cornell Faculty in each priority to organize online and in-person workshops• UPM Faculty to visit Cornell in summer 2019• Grants for PhD and Faculty visits during 2019-2020. |
| Digital agriculture | |
| Innovation and Leadership in emerging markets | |
| Sustainable Development Goals | |

| PRIORITIES | INSTRUMENTS |
|---|---|
| Energy with specific focus on power grids | <ul style="list-style-type: none">• TFM program for UPM students at IIT• IIT Faculty to visit UPM in May 2019• Grants for PhD and Faculty visits during 2019-2020.• Decatech UPM International Summer School |
| Living labs both infrastructure-oriented and community-oriented | |
| Sustainable cities and communities | |
| Health with specific focus on brain | |

Examples of current collaborations

| TARGET | PROGRAM |
|---------------------|--------------------------|
| Undergrad. students | Internships in Madrid |
| | Shared courses |
| | Summer program |
| Graduate students | PhD. Research stays |
| | Visiting students |
| | Double-degree agreements |
| | Joint program |
| Faculty | Visiting scholars |
| | Seed Fund |
| | Applied research program |

Dinámica 1 (20 min)

Escribe en un post-it tu línea de investigación.

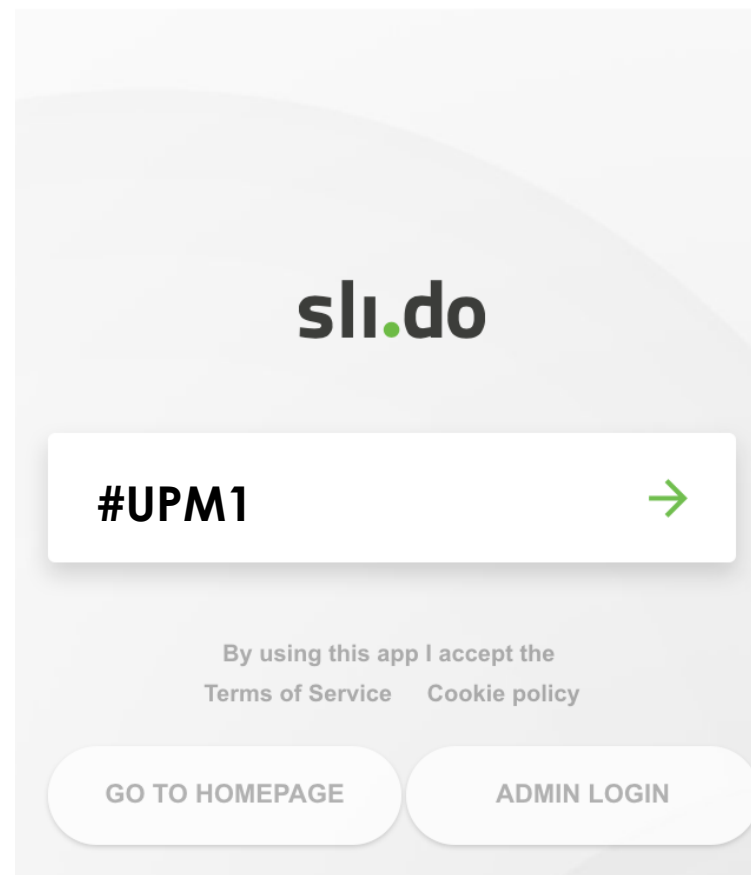
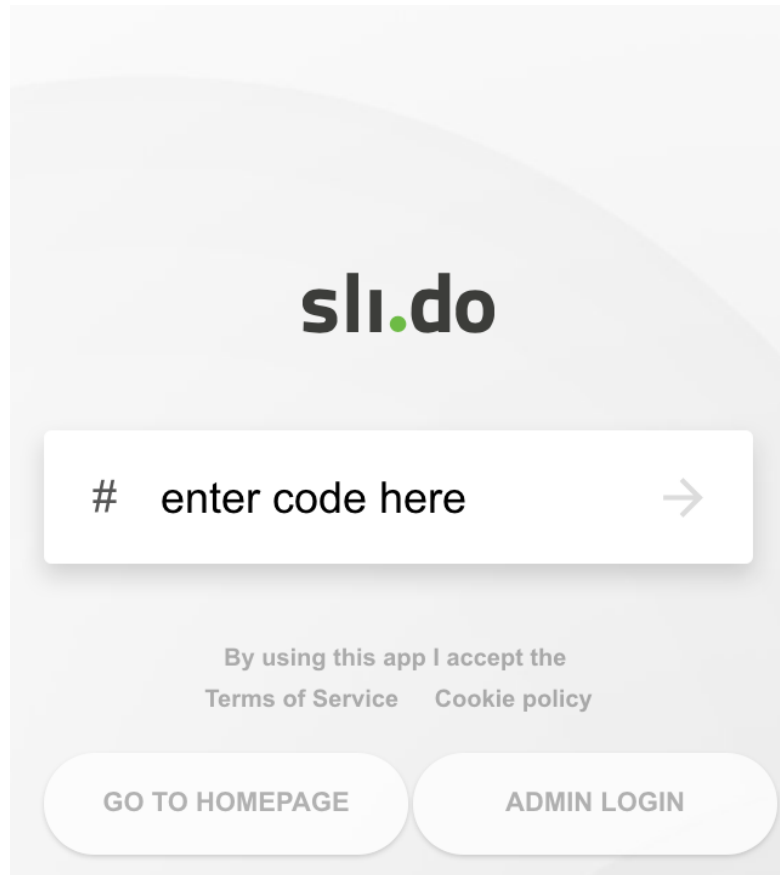
Colócalo en aquellas temáticas en las que consideres que podrías colaborar.

Dinámica 2.1: Micro-Debate (20 min)

- De las alternativas que se han presentado antes, ¿qué ideas te atraen más?
- ¿Cómo contribuirías a los distintos instrumentos? ¿Se te ocurren otros instrumentos?

Dinámica 2.2: Encuesta sli.do (10 min)

¿En qué instrumentos te gustaría participar?





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**INTERNATIONAL
CAMPUS OF
EXCELLENCE**