



POLITÉCNICA

UNIVERSIDAD
POLITÉCNICA
DE MADRID

SCIENCE & TECHNOLOGY (S&T) UNIVERSITIES IN DEFENCE & SECURITY (D&S)

BRINGING & BUILDING A NEW PILLAR IN EU

Concept of University

- What is a University in every Member State of EU...??
- What is a European University in the EU...??
- What is the University Public Service..., to be financed and how...??

(Discussion on this issue for another opportunity...)

Mission of (S&T) Universities

1. Innovation («I» together with Companies & Administrations):
 - Solution of new problems with existing knowledge
2. Research («R» together with Companies & Administrations):
 - Solution of new problems with new knowledge (thus generated)
3. Transfer (to Society –Students, Companies, Administrations, etc.):
 - Education
 - Employability
 - Entrepreneurship



Relation of (S&T) Universities with Defence & Security (D&S)

- Origins of a specific University...??
- National & International R&I projects on dual use technologies (both senses)...??
- Create an ecosystem together with Military Forces & companies...??
- Sometimes University Statutes prohibition!!!
- ...D&S means protect our Culture, our Values, our Healthcare system, our Economy, our Education, our R&I virtuous circle



D&S in UPM (eng. Schools' origins)

- Direct contracts of D&S Companies with University:
 - National Cluster of Companies with Army, Navy, Air & Space Force, together with University... chaired by a Full Professor at UPM...?? (<https://www.fundacioncirculo.es/>)
- Participation with companies in national Administration calls for R&I Programmes on D&S
- Participation with companies in EC Programmes (EDF Programme; now MFF/EDF2?)
- Contests won in NATO-DIANA Programme calls (<https://www.diana.nato.int/>):
 - Test Centres (<https://www.diana.nato.int/resources/site1/general/diana-affiliated-network-test-centres.pdf>) to incorporate projects together with Military Forces & companies
 - Accelerators (<https://www.diana.nato.int/resources/site1/general/diana-affiliated-network-accelerator-sites.pdf>) to incorporate projects together with companies



Restricted areas at UPM for (national & international) D&S projects

- *Area building specifications* defined by Ministry of Defence – National Intelligence Centre for D&S Projects development
- *Users' access* only allowed with national habilitation issued by Ministry of Defence – National Intelligence Centre
- *Security Chief* of the University externally appointed by the National Intelligence Centre (Ministry of Defence) with Rector's agreement



Scenarios in D&S

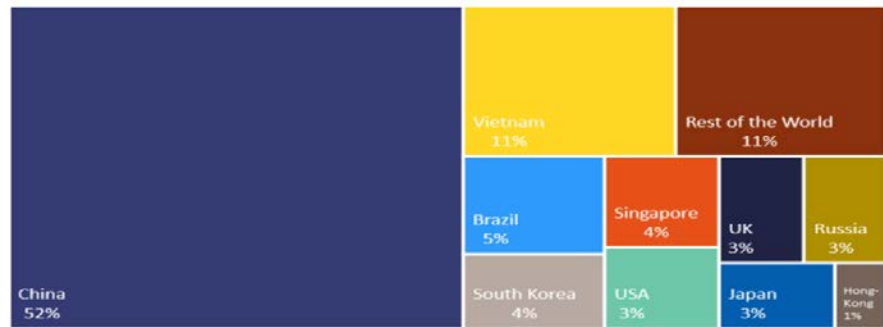
- Earth
- Oceans and Sea
- Air & Space
- Cyberspace
- Social
- Cognitive



Some technological fields & use (see here map of eng. Schools)

- Raw materials
- Energy
- Infrastructures (bridges, roads, etc.)
- Air-space, Naval, & Vehicle technologies
- Telecommunications
- Semiconductors & Electronics
- Quantum communications
- Neurotechnology
- Artificial Intelligence
- Digital Twins
- Food
- Weapons & Electronic war
- Information & management Centres
- Governance in international allied operations

Some examples of EU current situation (not the same for all fields)

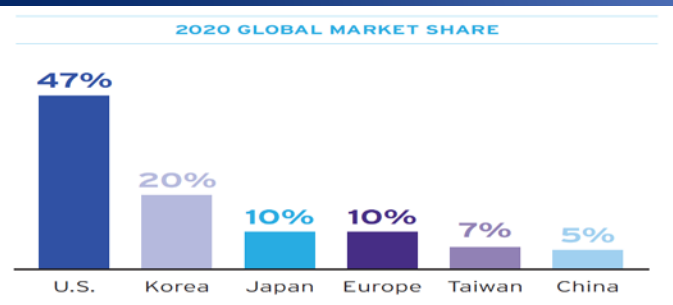


Source: European Commission 2021
Provenience of 137 critical products for EU

Company	Market share	Country
TSMC	54%	Taiwan 🇹🇼
Samsung	17%	South Korea 🇰🇷
UMC	7%	Taiwan 🇹🇼
GlobalFoundries	7%	U.S. 🇺🇸
SMIC	5%	China 🇨🇳
HH Grace	1%	China 🇨🇳
PSMC	1%	Taiwan 🇹🇼
VIS	1%	Taiwan 🇹🇼
DB HiTek	1%	China 🇨🇳
Tower Semiconductor	1%	Israel 🇮🇱
Other firms	5%	N/A

Source: <https://morfema.press/tecnologia/las-10-principales-empresas-de-semiconductores-por-cuota-de-mercado-y-la-escasez-del-2021/>
Top semiconductor foundries worldwide in 2021

Source: SIA, 2021
State of the U.S. Semiconductor Industry



EU Sovereignty vs Strategic Autonomy

- In this scenario:
 - Is it possible to reach EU technological sovereignty??
 - Is there any EU Member State technologically sovereign??
- What about a EU being (https://oa.upm.es/76650/1/AF_GONZALO_LEON_Relevancia.pdf)??:
 - Neither technologically sovereign nor technologically dependent
 - Focalized on some emergent technologies allowing a status of strategic autonomy in alliance with 3rd parties «trusted» worldwide countries?
 - Up to what extent is it possible to distribute this technological focalization within the EU among its Member States?
 - How can we solve other problems, such as the raw materials issue?



Is here a new EU pillar to build...??

1. Each pillar of the EU construction has been created by Member States ceding portions of their sovereignty
2. **It must be ensured that any transfer of sovereignty must produce compensations that are much greater than that transfer of sovereignty.**
3. This has been the case since the creation of the European Coal and Steel Community in 1951.
4. Thus, we now have the European Parliament, the European Commission, the European Court of Justice, the European Central Bank, the European Currency (Euro), the Schengen area,..., and now perhaps also European universities (*this last issue might be a subject for another discussion*).
5. **Are we in front of building a new EU pillar..., say the EU D&S pillar...??**
6. Who are the actors? **What is the role of S&T Universities willing to participate?** See said [Mission of \(S&T\) Universities](#) on this document
7. What happens with the participation (non-participation) of **every Member State in this... and in the previous EU pillars...??**



Conclusions

- There should be a new EU pillar under definition: the D&S pillar; meanwhile, university EU pillar is still under definition
- The S&T Universities are relevant actors when involved in R&I (& its [transfer](#)) on D&S technologies; as well in case based on their origins
- S&T Universities should be involved in the definition of EU R&I Programmes for D&S (as well as on defining its [transfer](#)), together with companies & administrations, since already fully participating together with companies & administrations
- EU Member States should commit to 1) define & 2) fully participate... ..in the development of this D&S new pillar..., and previous EU building pillars
- A number of reflections have been given in this document for the construction of the said new EU pillar in the current circumstances

Final statement

- Engineers made a reality in the 20th century what Jules Verne wrote in his books during the 19th century
- Engineers are making a reality in the 21st century what movies screenwriters wrote for their films in the 20th century
- S&T Universities are there to provide –together with companies- at least 10 years in advance new technologies to solve forecoming problems and to provide engineers able to manage those always new technologies, thus being necessary actors towards either a technological sovereignty or a strategic autonomy scenario