NATIONAL CENTRE FOR SCIENTIFIC RESEARCH "DEMOKRITOS"

Research towards 5G Gigabit Society. The NCSRD view

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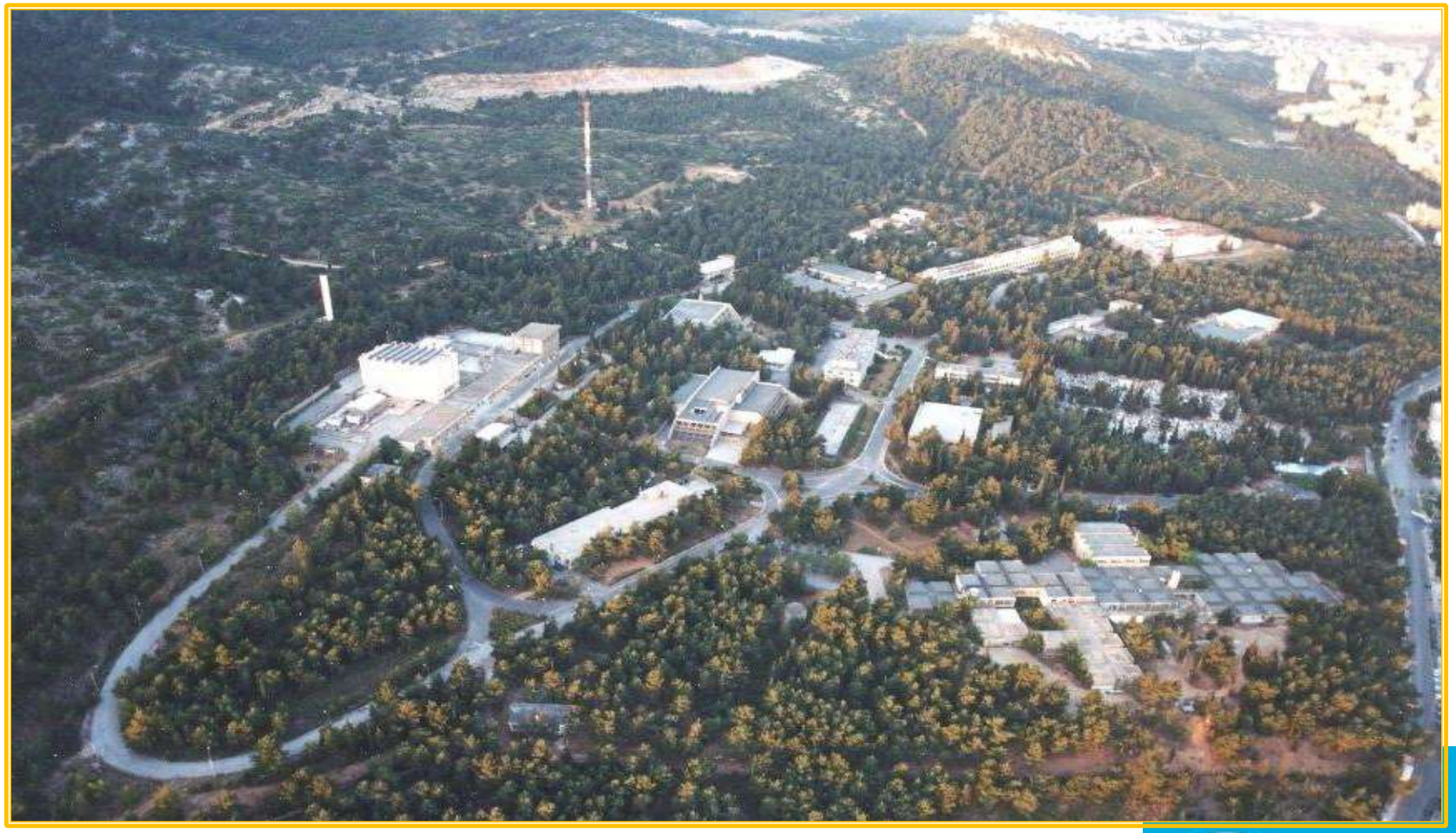
Athens, 12 October 2018



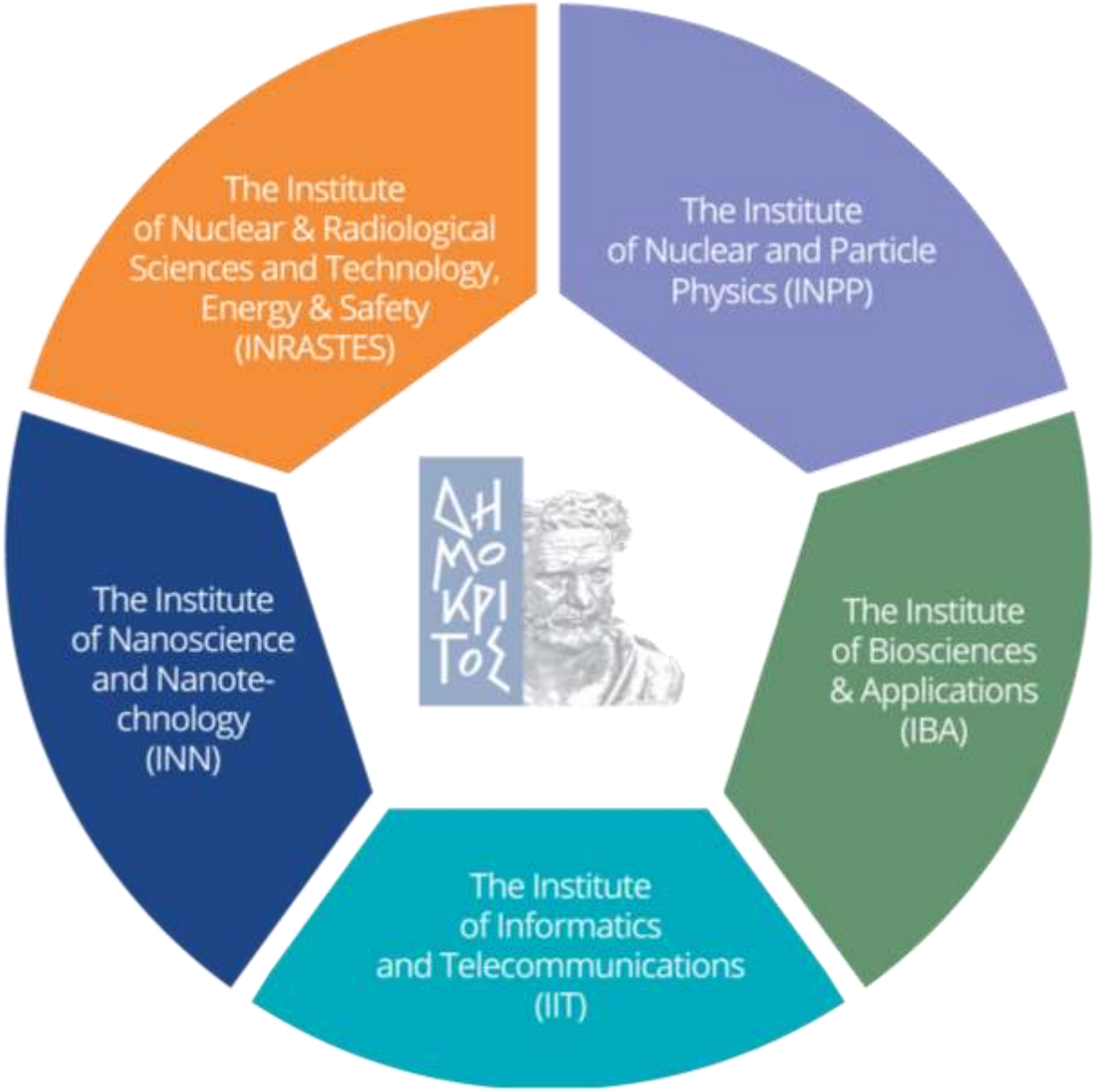
Human Resources

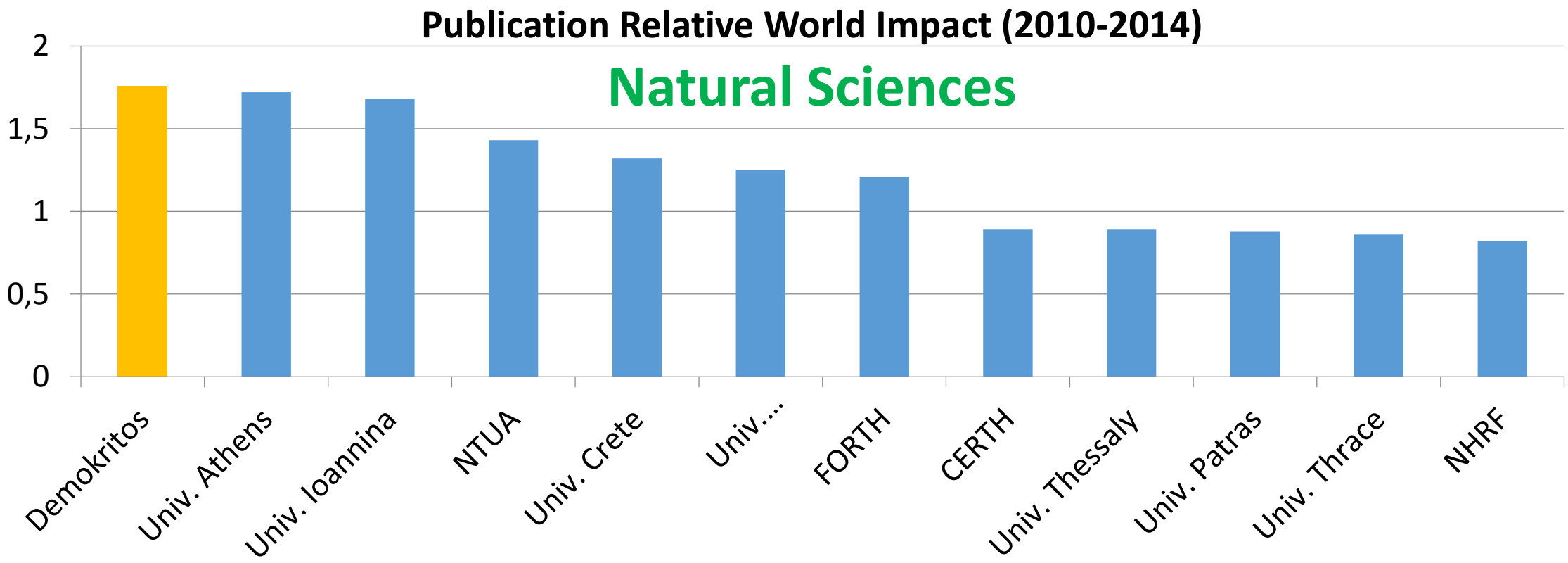
Personnel TOTAL **1.000**

700
Scientific Personnel

300
Administrative
Technical
Support Personnel

The Institutes



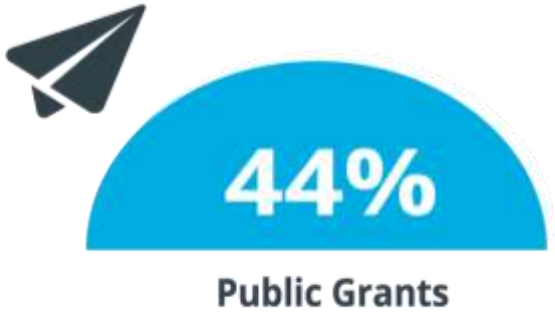

Publication Relative World Impact (2010-2014)
Natural Sciences
2
1,5
1
0,5
0
Demokritos
Univ. Athens
Univ. Ioannina
NTUA
Univ. Crete
Univ....
FORTH
CERTH
Univ. Thessaly
Univ. Patras
Univ. Thrace
NHRF

2013 - 2017

Financial Resources

AVERAGE YEARLY REVENUE

25M€



2018

Financial Resources

AVERAGE YEARLY REVENUE

33,5M€

2018 - 2023
Development Plan

Research Strategy and Infrastructures

www.demokritos.gr

LEFKIPPOS

THE TECHNOLOGY PARK OF ATTICA

TESLA

SCIENOMICS
delivering science

FasmaTECH
SCIENCE + TECHNOLOGY

give

PLEIONE
ENERGY

Future Intelligence
TELECOM ENGINEERING COMPANY

PROT AT ONCE
THE ART IN MULTIPLEXED ASSAYS

nano4chem

plinios

Awapai
Web. Cloud. Mobile.

NaNOmetrIEIS

ecoCreta

nanoplasmas

θ metrisis

i-matik

NovAgrica
Biological Products & Solutions

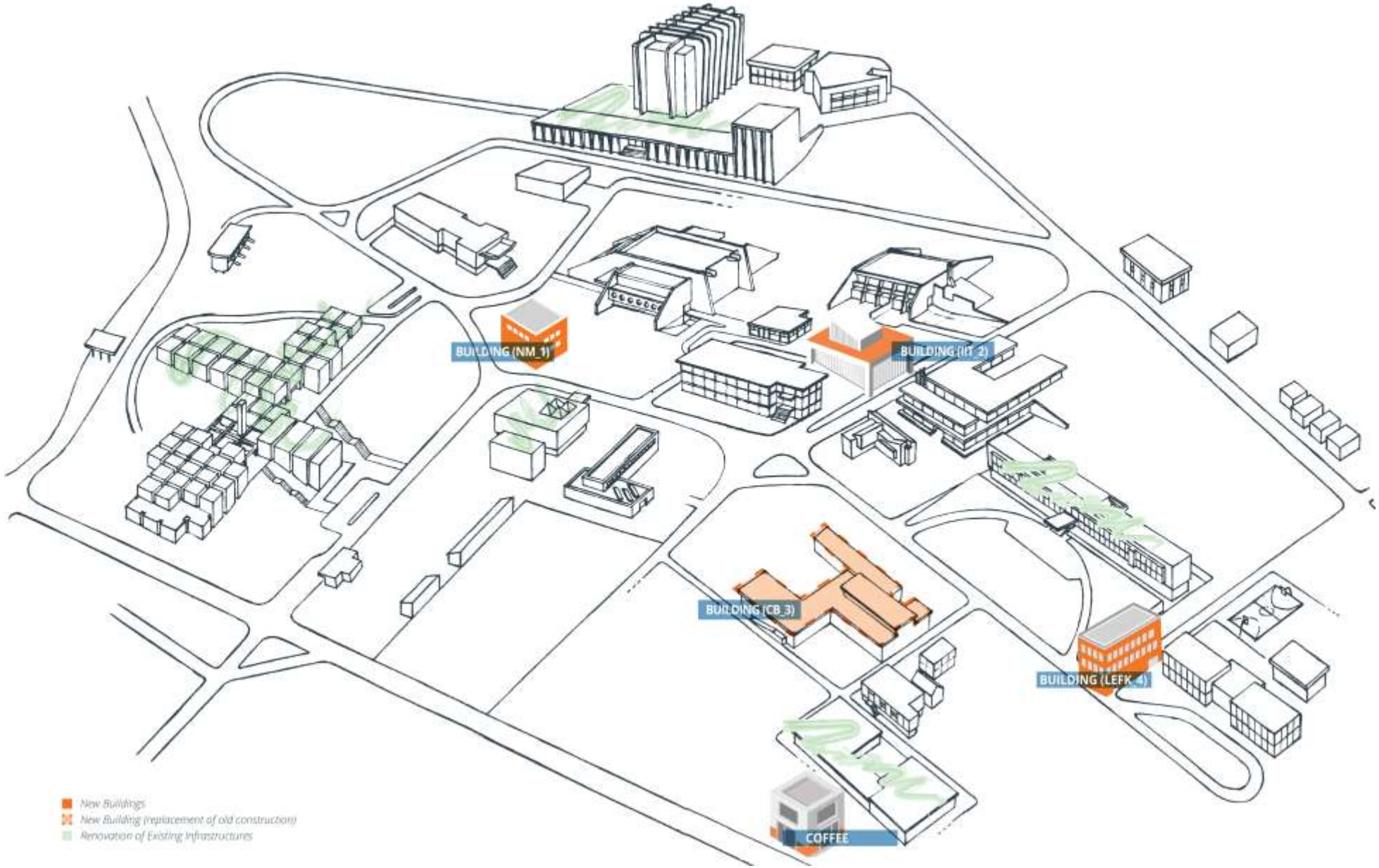
LOGO TECH
INNOVATION & DEVELOPMENT

AMEN
TECHNOLOGIES

INFITHEON
disruptive technologies

AISTHISIS

i-sieve


BUILDING (NM_1)
BUILDING (IIT_2)
BUILDING (CB_3)
BUILDING (LEFK_4)
COFFEE
New Buildings
New Building (replacement of old construction)
Renovation of Existing Infrastructures

- Previous generations 2G/3G/4G of mobile technologies satisfied ***human*** communications :
  - voice
  - Data
  - Internet

- 5G equally aims for ***industrial*** communications to help :
  - digitise the economy and
  - contribute towards global digital transformation.

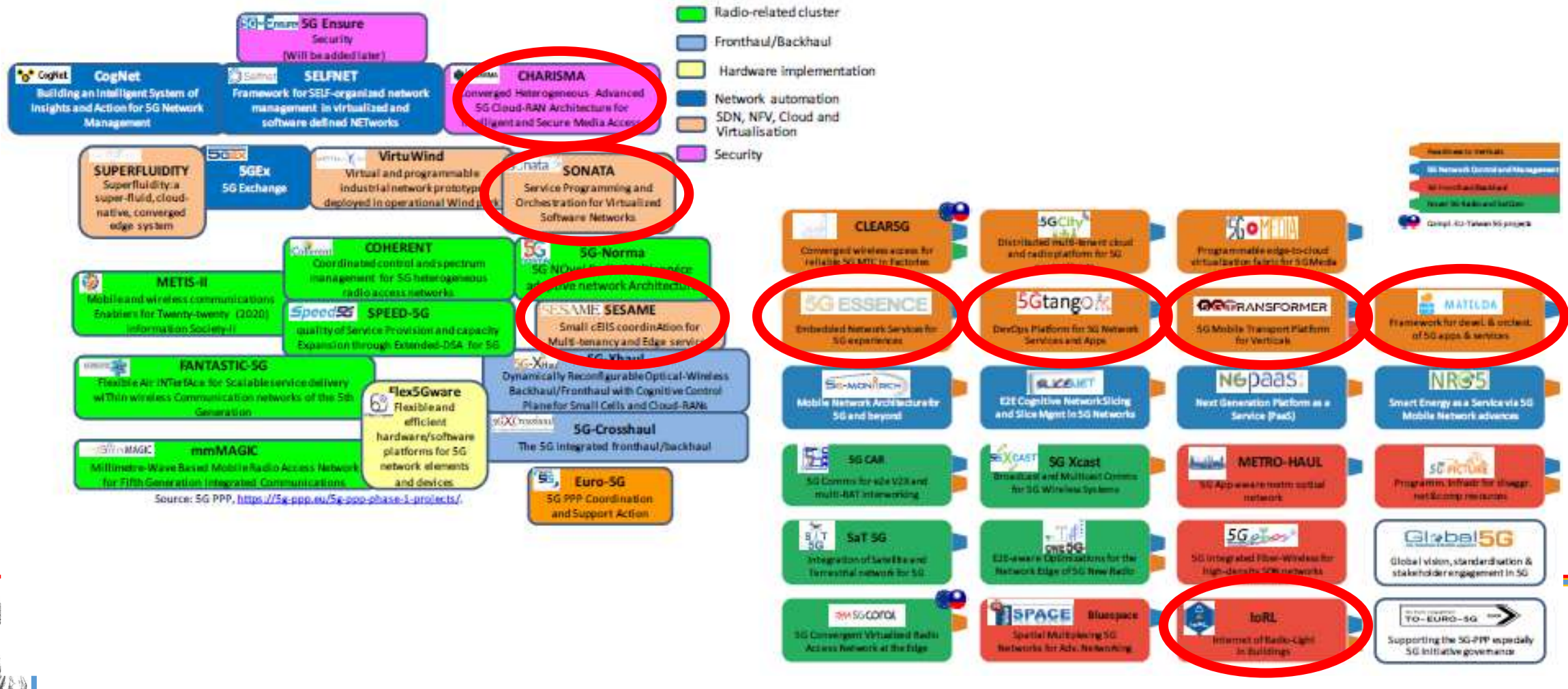
Vertical sectors to be benefited :

In this view, EU has launched 5G-PPP framework to support this transition. 5G-PPP anticipates for three phases

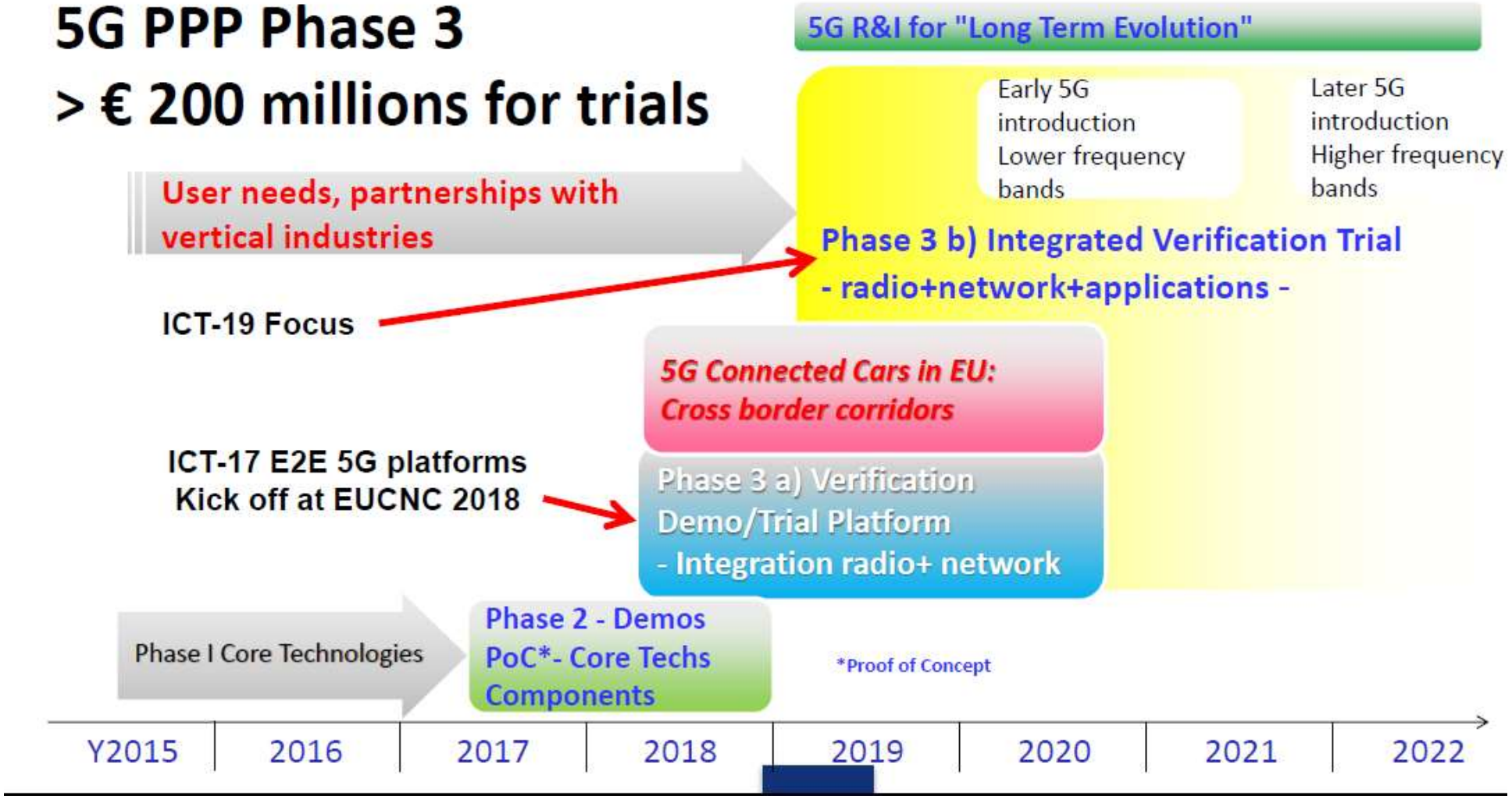
NCSR DEMOKRITOS is actively involved in all three phases

NCSR DEMOKRITOS participation in Phase 1 & 2

- PPP Phase 1 & Phase 2 Projects



5G PPP Phase 3
> € 200 millions for trials



Three projects were selected for funding

NCSRD Project Manager in 5GENESIS

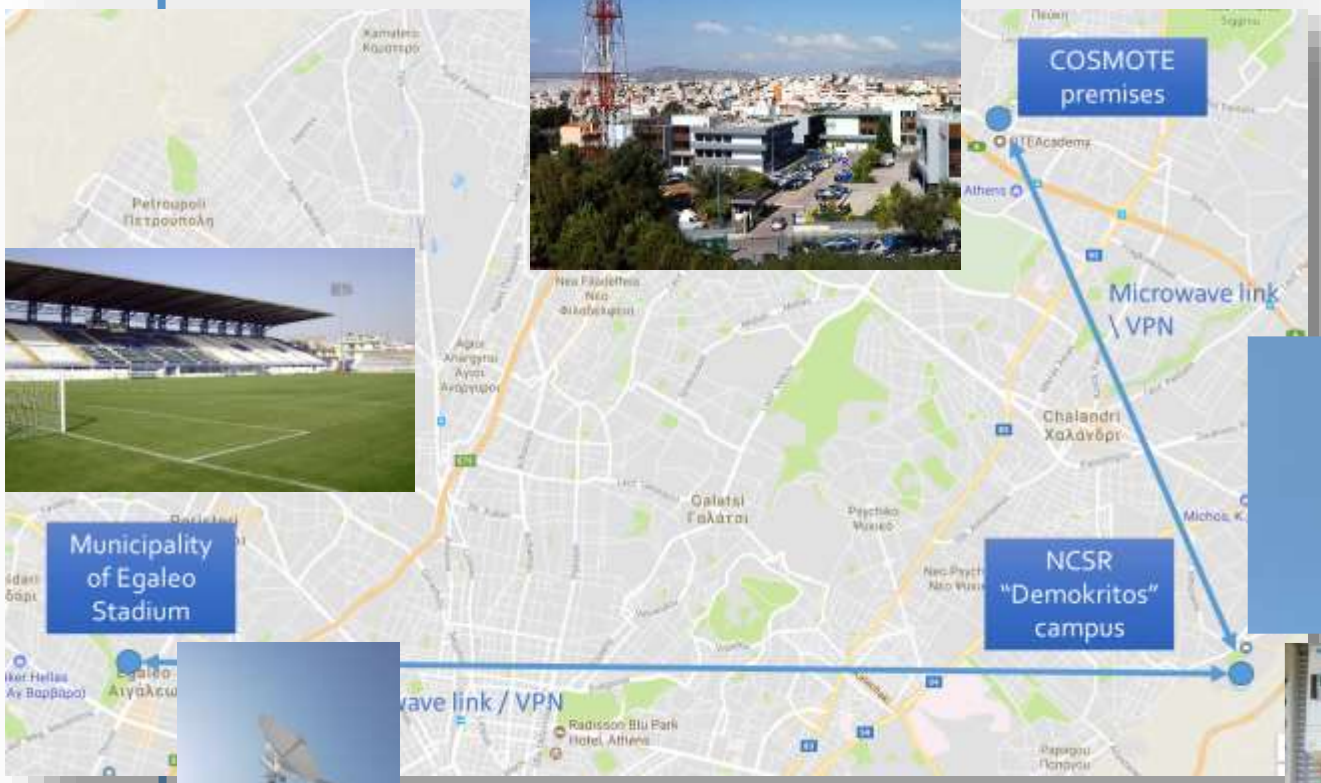
5GENESIS 5G platforms

- The Athens Platform
- The Malaga Platform
- The Limassol Platform
- The Surrey Platform
- The Berlin Platform

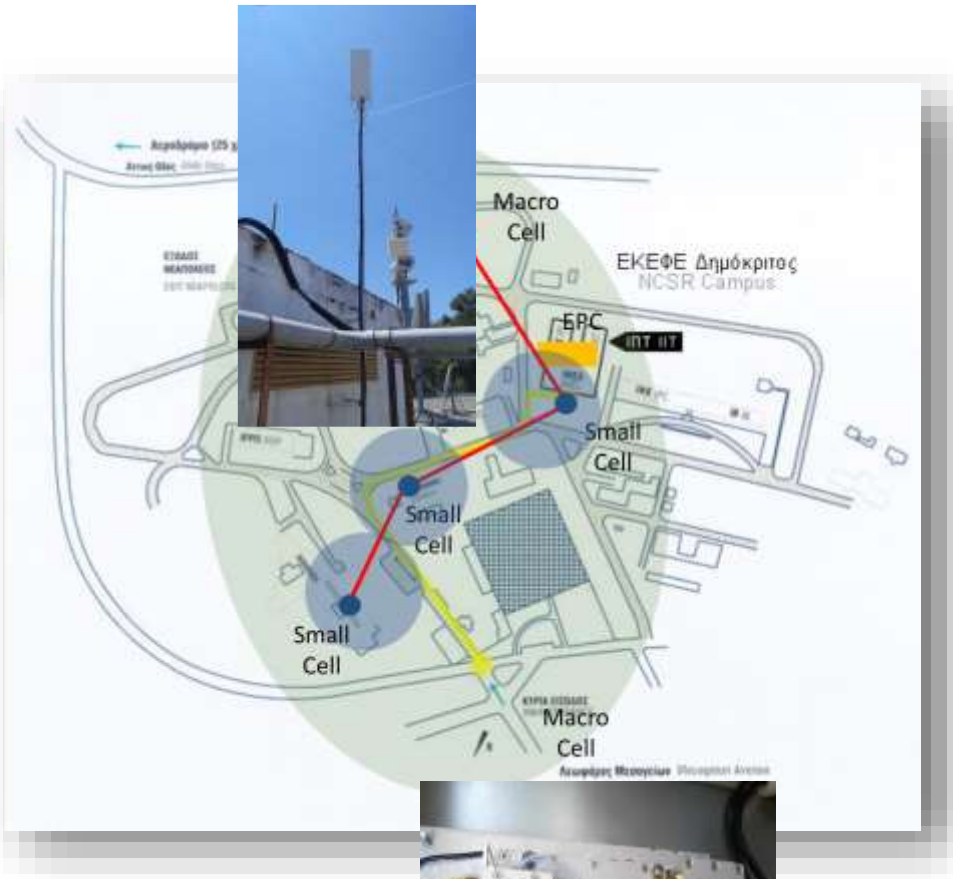
The objective is to :

- Validate core 5G technologies and architectures in the context of specific vertical use cases and deployment scenarios and for differentiated performance requirements
- Draw viable business models for innovative digital use cases across multiple sectors
- Contribute towards standardisation bodies
- Validate relevant KPIs linked to specific vertical sectors

The Athens platform extends in three points of presence, one of which is within the NCSRD campus



Fiber link
EPC
Small Cell
Macro Cell



5G technologies developed in NCSR DEMOKRITOS, to be useful for the industry

Among the various R&D fields in 5G, and through its participation in the above 5G projects, NCSRD contributes in :

- Unified infrastructure for networking, computing and storage resources
- MEC (Mobile Edge Computing)
- Small cells
- Network service Orchestration
- Automated DevOps process
- Slicing
- Broadcasting

Outcomes of NCSR DEMOKRITOS research in 5G for the industry (1/3)

- **The integration of networking, computing and storage resources into one programmable and unified infrastructure, easily managed by a MANO entity.**
  - This is useful for network operators due to :
    - cost reduction through human task automation and hardware optimization
    - optimized and more dynamic usage of all distributed resources
    - convergence of fixed, mobile and broadcast services.
    - Exploitation of slicing for providing almost real-time dynamic and isolated slices for each customer according to its requirements

Outcomes of NCSR DEMOKRITOS research in 5G for the industry (2/3)

- The small cell architecture in combination with slicing can form a neutral infrastructure that can be installed by any entity (e.g. on lamp posts by a municipality) and offered to any provider (even to existing network providers) for a specific time slot (e.g. a municipal festival or football game), to increase the capacity in the area and offer specific services with specific requirements.

Outcomes of NCSR DEMOKRITOS research in 5G for the industry (3/3)

- A market place for network function developers and through the DevOps process and automated instantiation towards a new market for SMEs specialized in software
- Slicing with specific QoS requirements to be used by first responders, in case of crisis
- Convergence of NOs and broadcasters (not unicast) towards a live broadcasting environment with efficient backhaul and spectrum usage

Long term plans of NCSRD in 5G (1/2)

- Participate/contribute in research and development efforts towards 5G and get know-how
- Contribute to standardization bodies and other fora
- Develop/enhance a large scale platform supporting some of the 5G features
- Demonstrate the capabilities and KPIs of the platform
- Organize large scale events (like in the municipal stadium of Egaleo), to demonstrate the capabilities and features of 5G (TBD)

Long term plans of NCSRD in 5G (2/2)

- Make the 5G platform available to any interested organization, (state, NOs, broadcasters, industry, companies in Technological park)
- Notify NOs (COSMOTE, VODAFONE, WIND)
- Notify Telecommunications & Post Commission – (EETT) & Ministry for Digital Policy, Telecommunications and Media of Greece

Expected reactions

- Proposal to EETT for a National effort towards 5G and not individual actions
- NCSRD to consultant the ministry in the development/deployment plans for 5G
- Invite NCSRD in the forthcoming plans for 5G commercial implementation

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