# Open 5G/6G infrastructures to enable Vertical Experimentation

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FITCE Technology Forum

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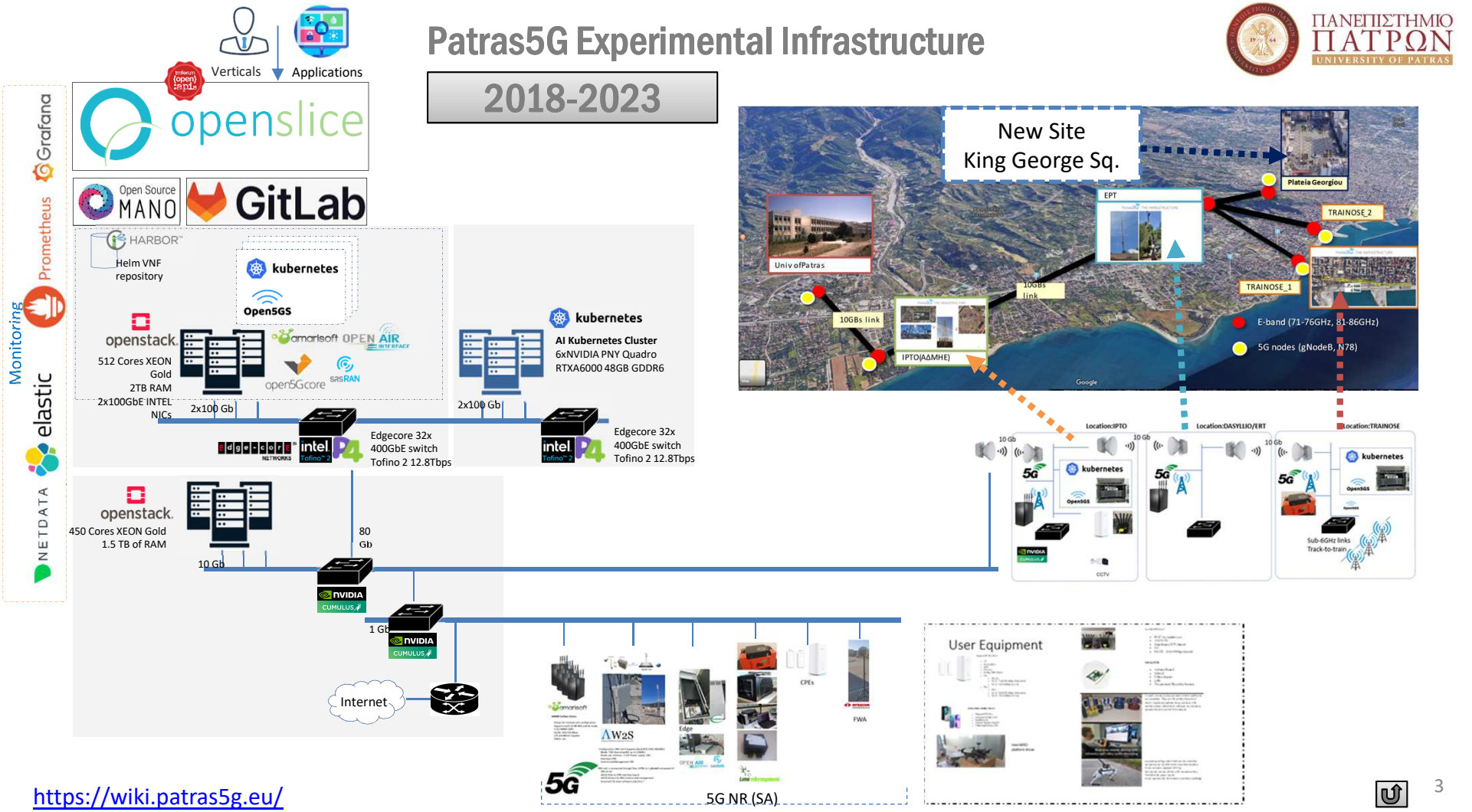
# The 5G/6G Infrastructure
# A playground for Verticals

# Patras5G Experimental Infrastructure

**2018-2023**



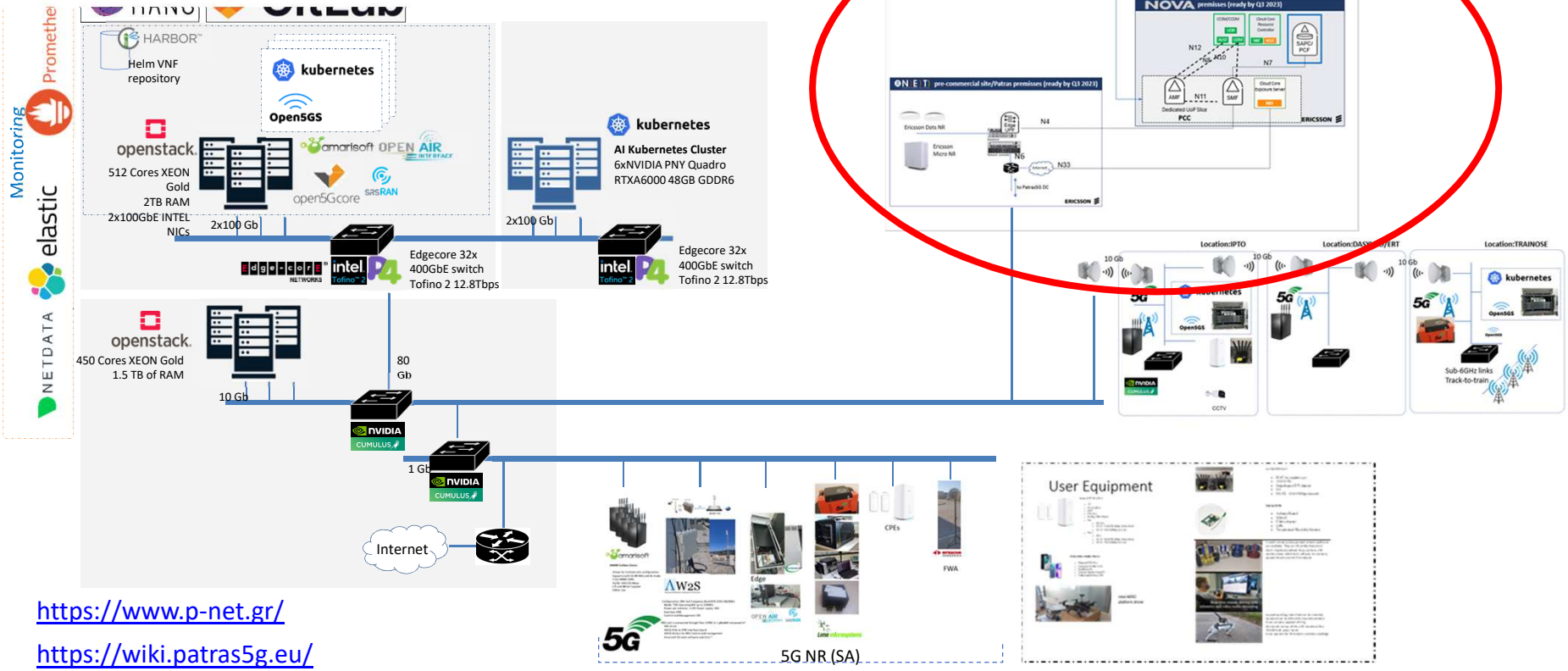

https://wiki.patras5g.eu/

# Patras5G/π-NET Global Infrastructure

## 2024-2028

OpenSlice by ETSI

https://osl.etsi.org/




https://www.p-net.gr/

https://wiki.patras5g.eu/

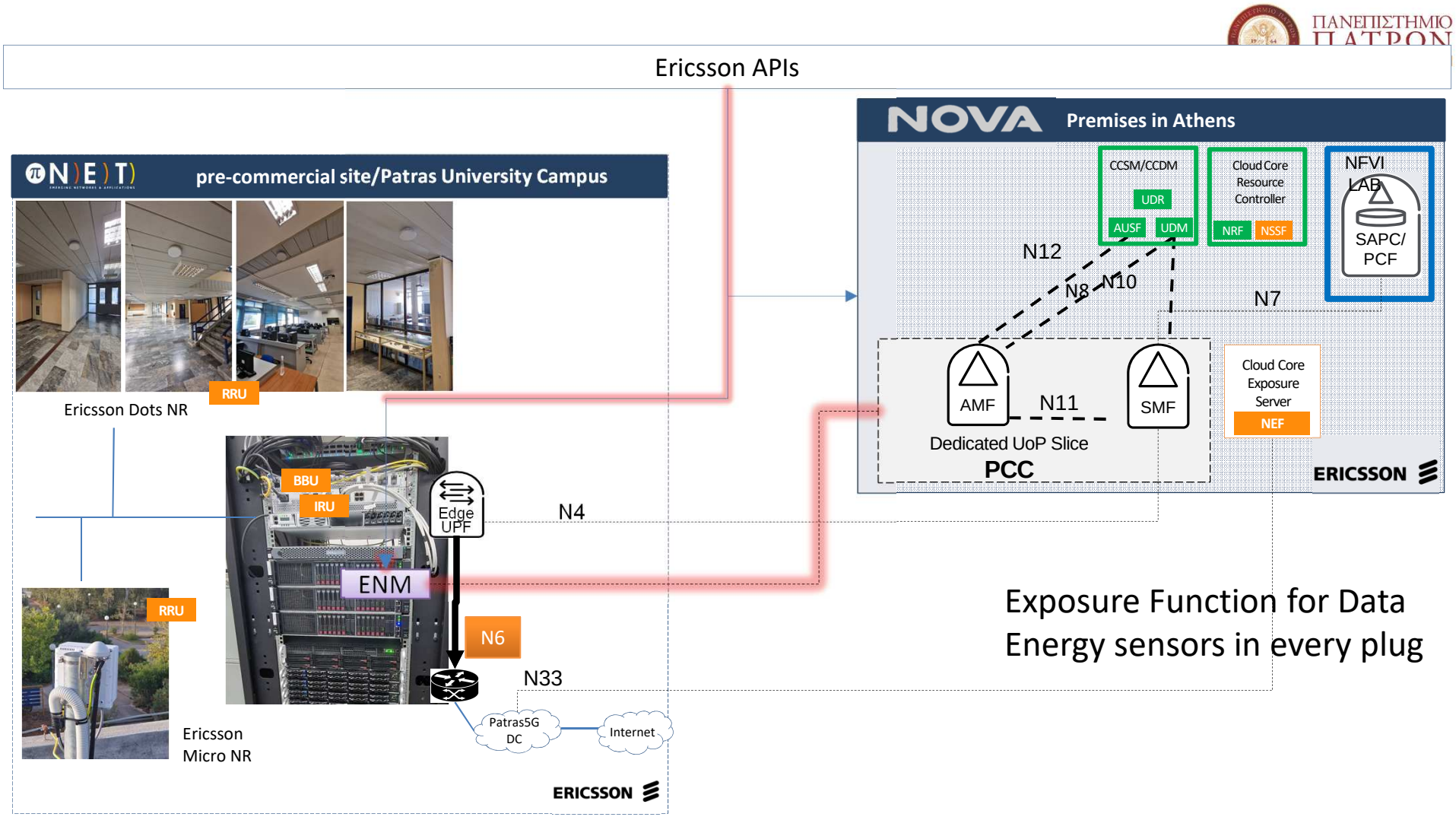
# π-NET ECOSYSTEM OF STAKEHOLDERS

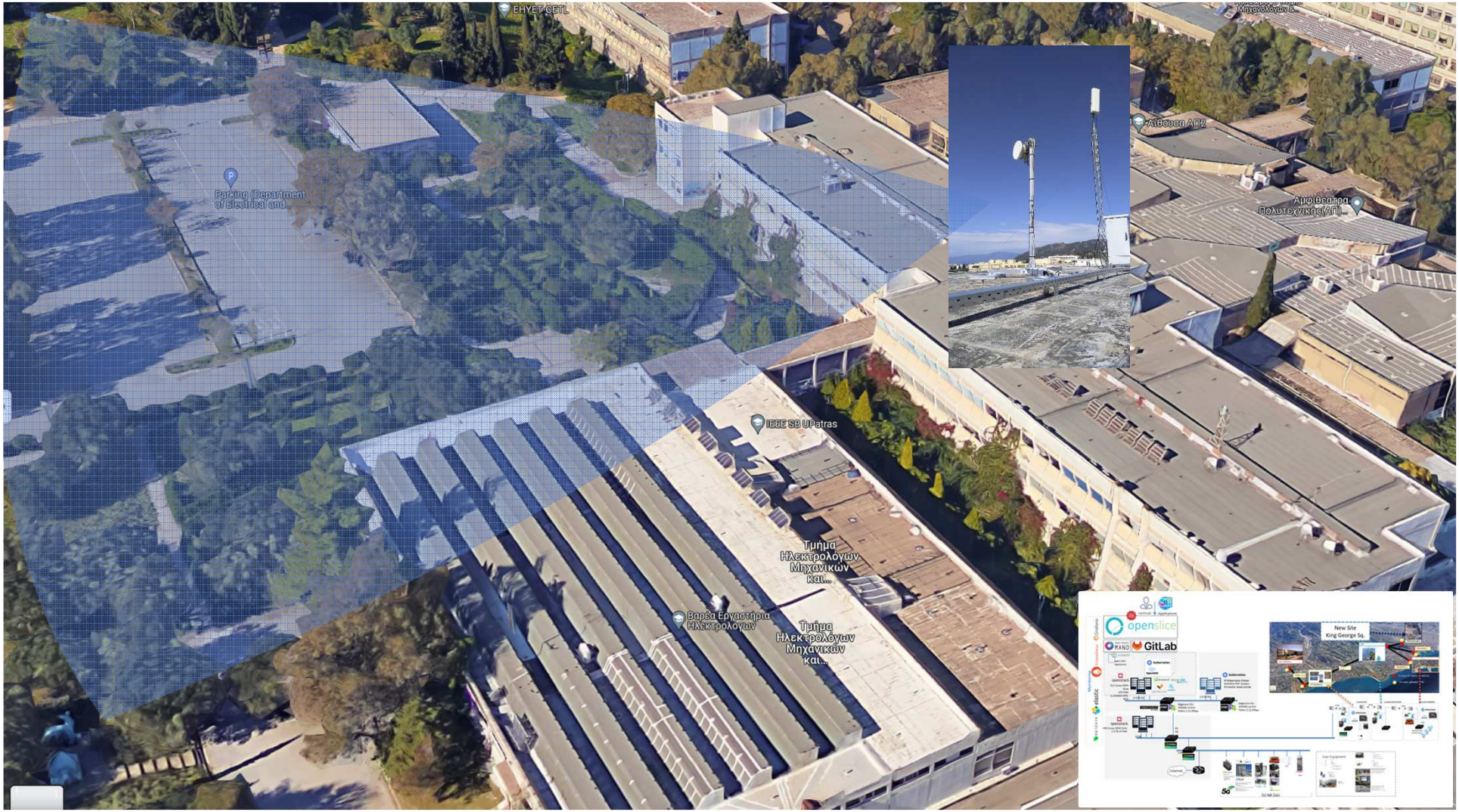
**Other Services**

**Verticals**

**Integrators**
**Software Developers**
**Manufacturers**

**5G Infrastructures**


Ericsson APIs
NOVA
Premises in Athens
CCSM/CCDM
UDR
AUSF
UDM
Cloud Core Resource Controller
NRF
NSSF
NFVI LAB
SAPC/ PCF
N12
N8
N10
N7
AMF
N11
SMF
Cloud Core Exposure Server
NEF
Dedicated UoP Slice
PCC
ERICSSON
pre-commercial site/Patras University Campus
RRU
Ericsson Dots NR
BBU
IRU
Edge UPF
N4
ENM
N6
N33
RRU
Ericsson Micro NR
Patras5G DC
Internet
ERICSSON
Exposure Function for Data
Energy sensors in every plug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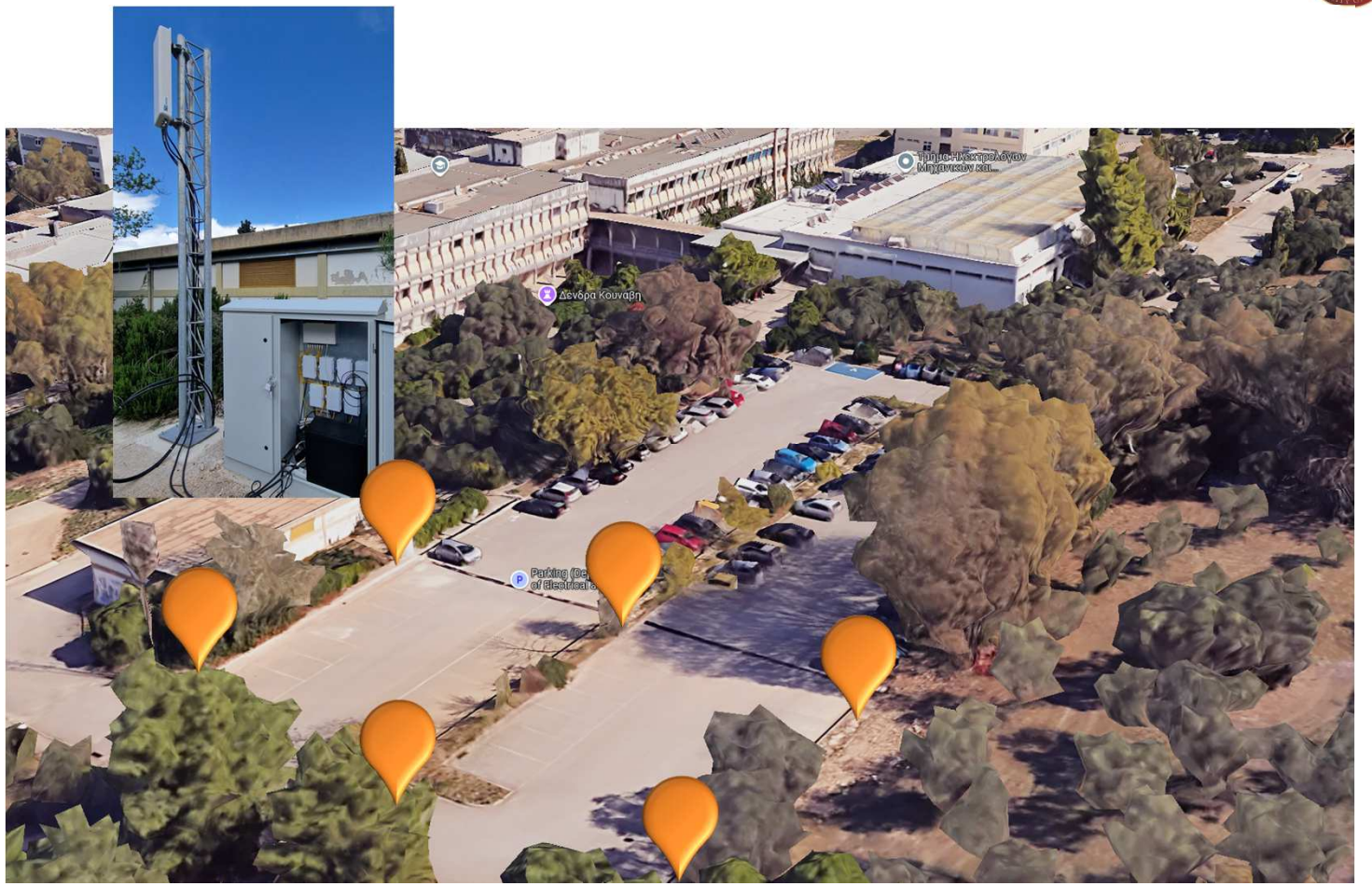
Βαρσα Εργαστήρια Ηλεκτρολόγων
Τμήμα Ηλεκτρολόγων Μηχανικών και...
openslice
GitLab
New Site
King George Sq.

# 5G/6G/MEC/IoT Outdoors Infrastructure

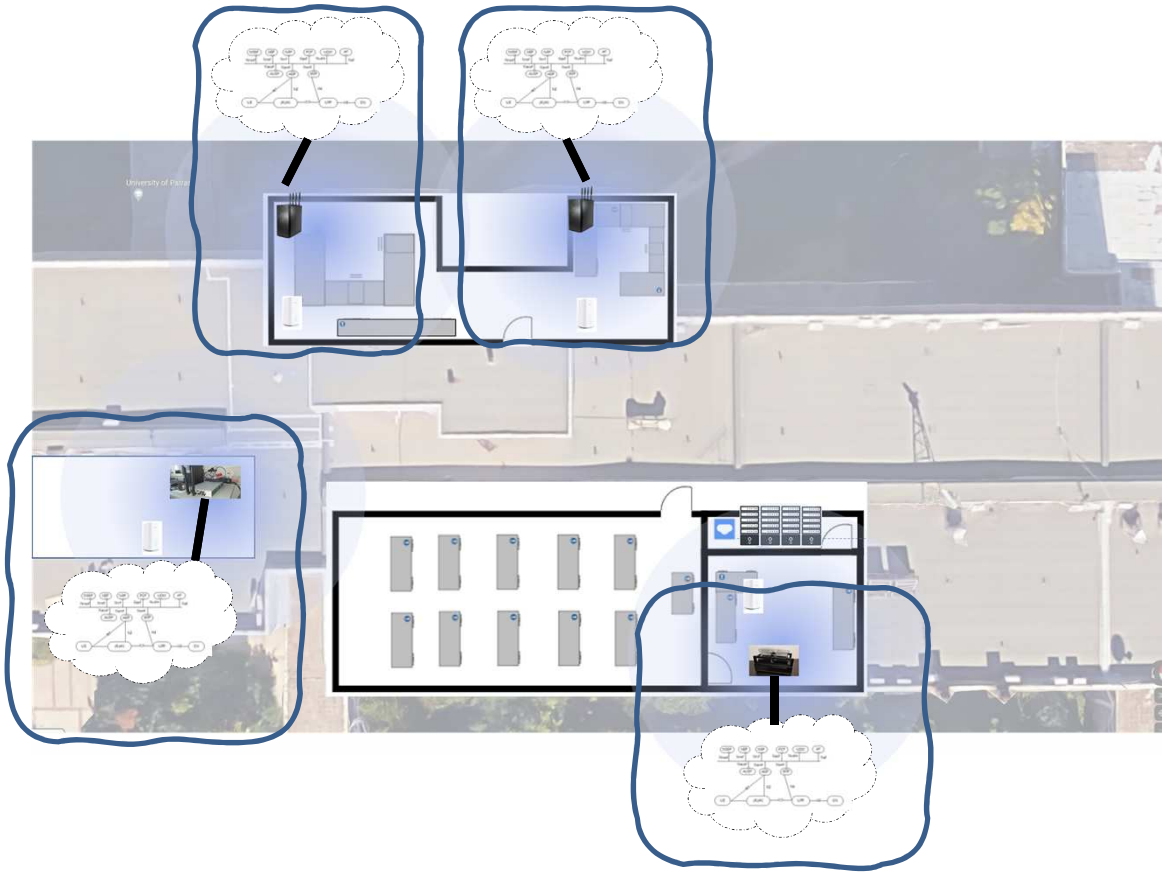
ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ
UNIVERSITY OF PATRAS



ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ
UNIVERSITY OF PATRAS

# Fixed Wireless Access

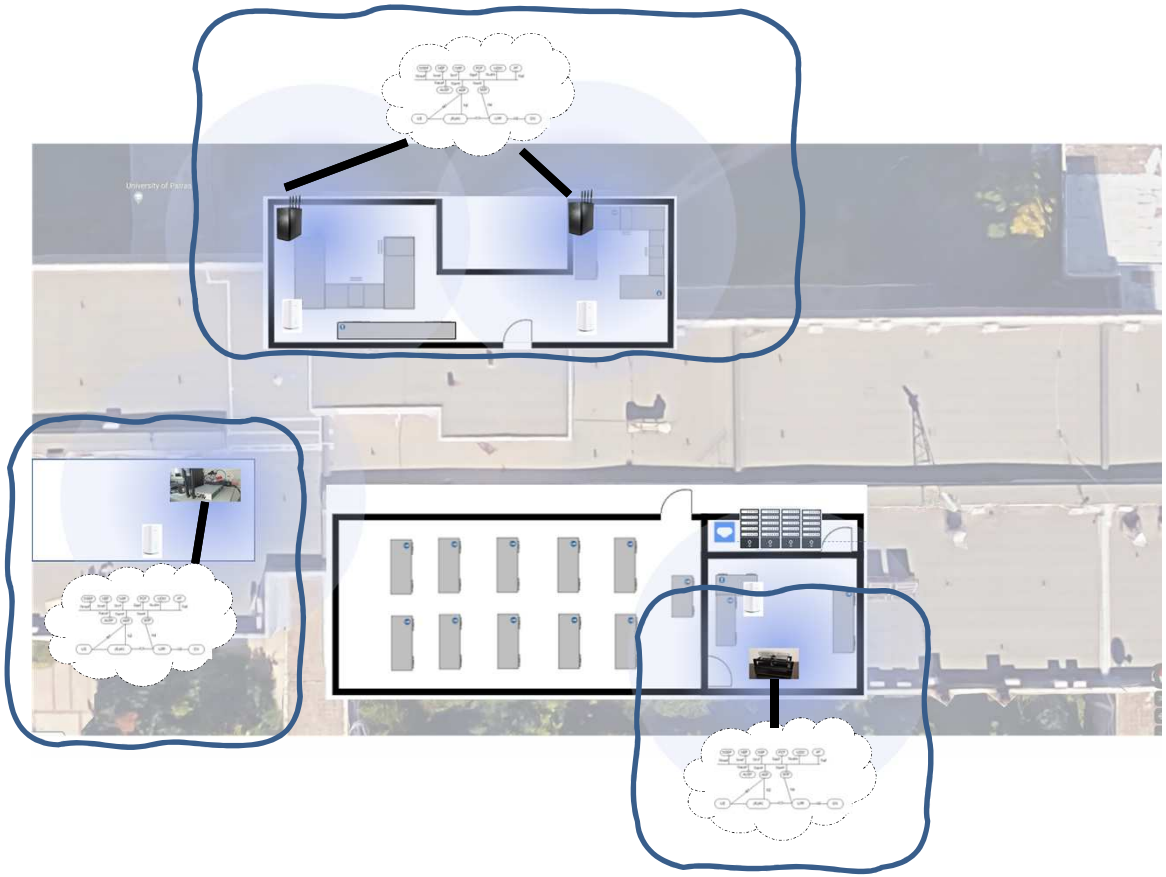

# Self service - 5G Advanced end-to-end network for experimentation



Orchestrate multiple parallel isolated or shared experiments

With dedicated 5G SA Cores on Kubernetes

# Self service - 5G Advanced end-to-end network for experimentation



Orchestrate multiple parallel isolated or shared experiments

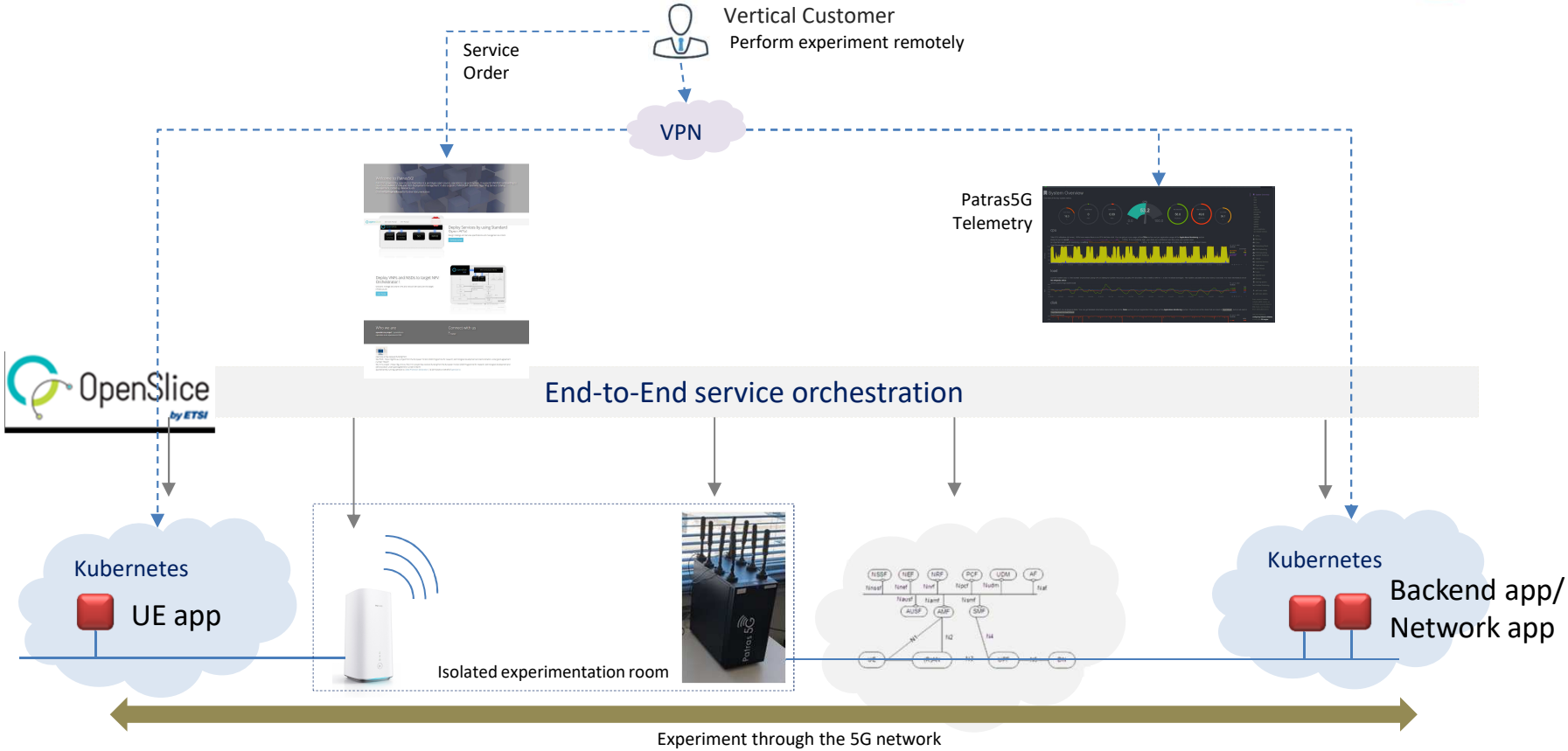
With dedicated 5G SA Cores on Kubernetes

… or shared

With various slice types

On premises or remotely

# Self service - 5G Advanced end-to-end network for experimentation



# Patras/π-NET National 5G/6G Infrastructure

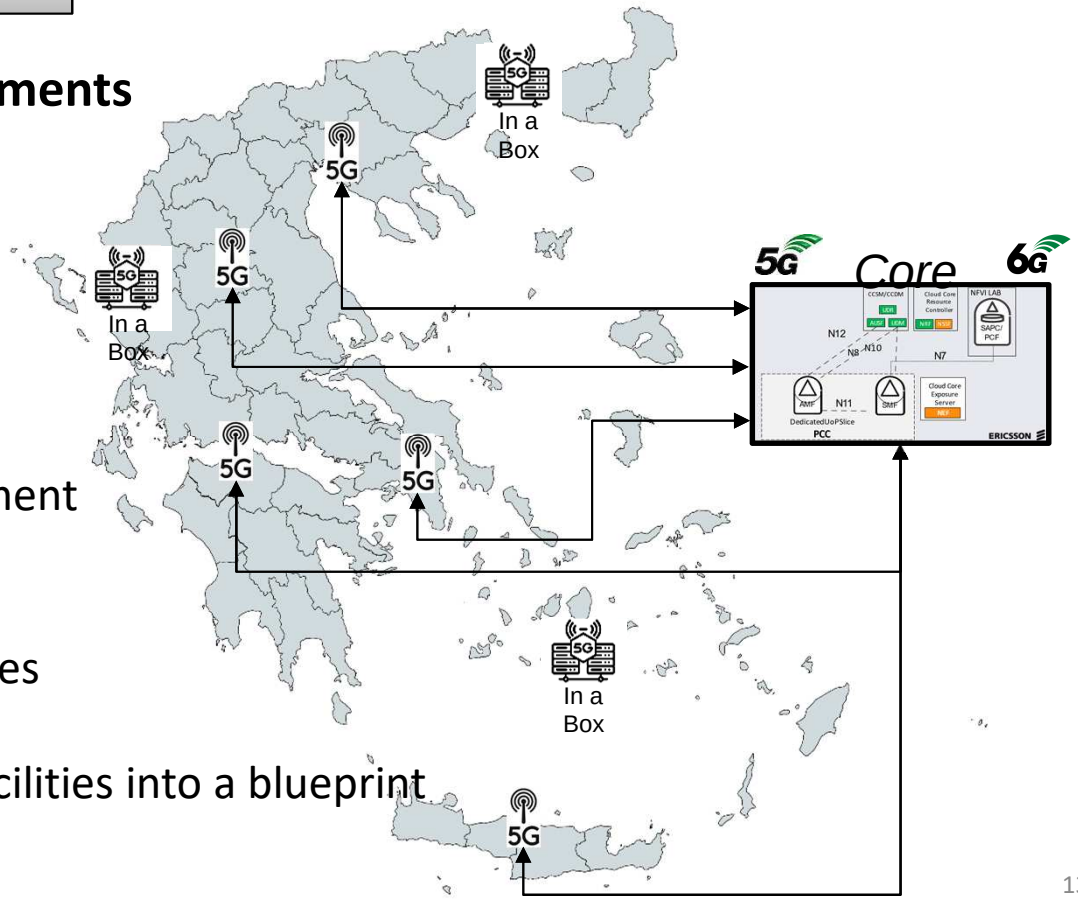
**2024-2028**

## Suitable for 5G+/6G oriented experiments

- Equipment vendors e.g. conformance
- New 5G/6G functionality
- KPI Measurements
- Integration Testing
- E2E Trials
- Small Scale Vertical use cases deployment
- Training

- Linked with other EU national initiatives

- Transform the Patras/π-NET 5G/6G facilities into a blueprint



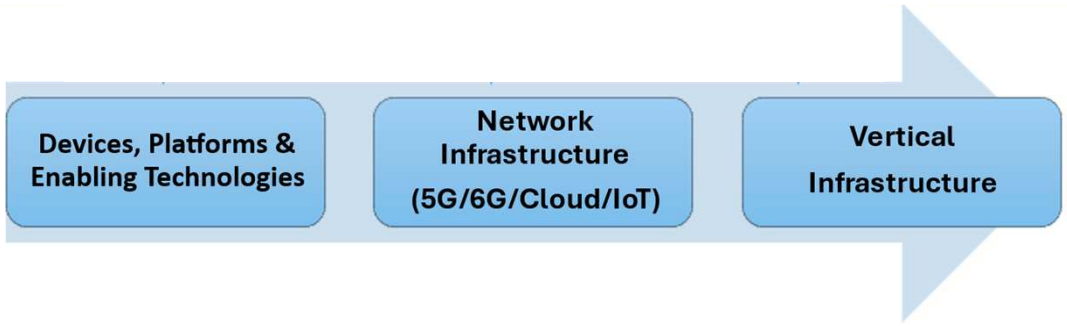
IS THIS ENOUGH?

ENTER THE VERTICALS

# THE REAL INCUBATORS FOR INNOVATION

# From 5G/6G Infrastructure to Verticals

- Filling the gap between 5G/6G and Verticals
- Start Building Vertical Infrastructures as playgrounds
- Integrate 5G/6G and other technologies with Vertical devices/applications
- Work as a Quadruple Helix Ecosystem
- Considerations for environmental, social and economic impact (KVIs)



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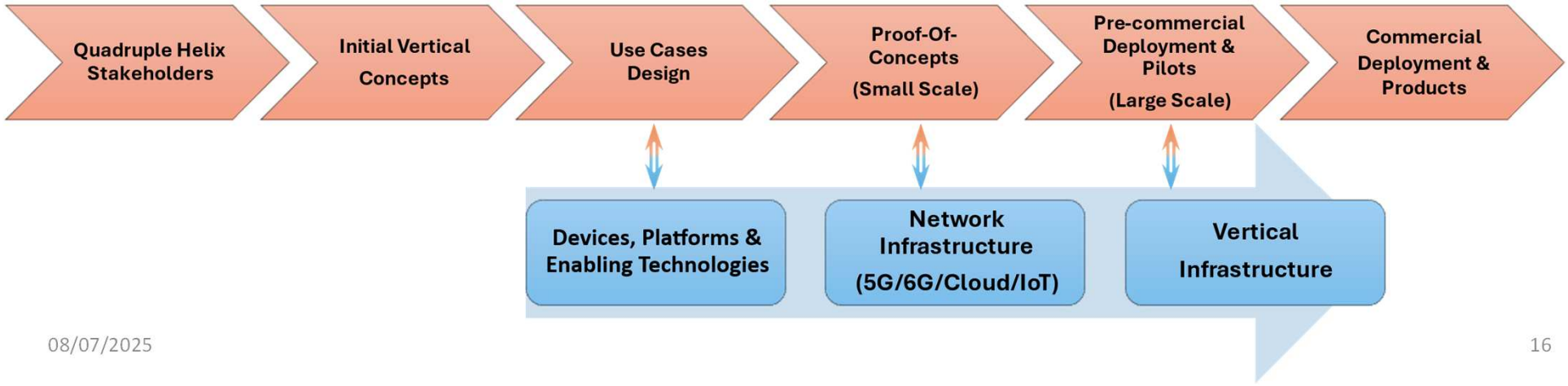
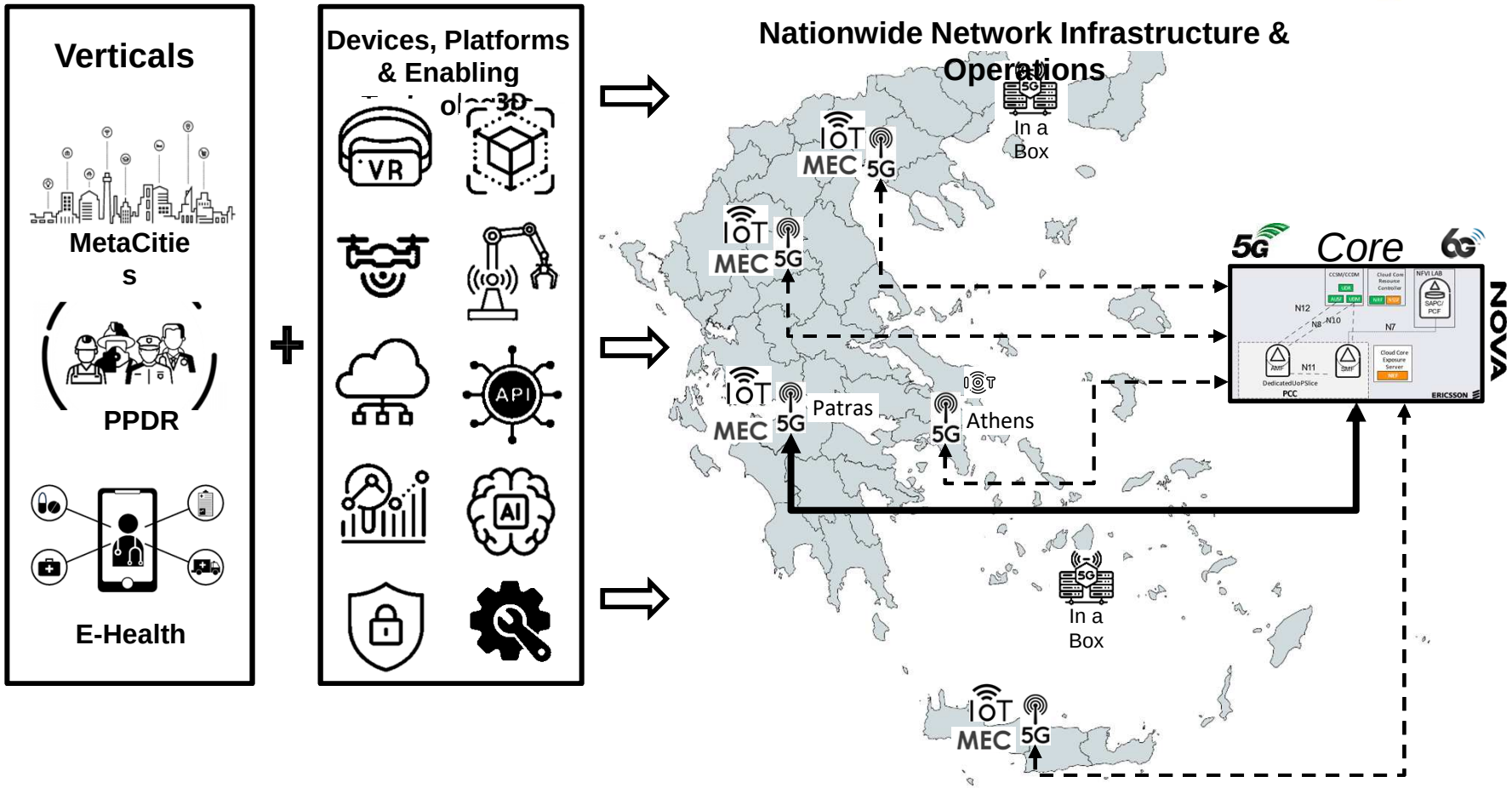


# 5G Enabled Vertical Experimental Infrastructures

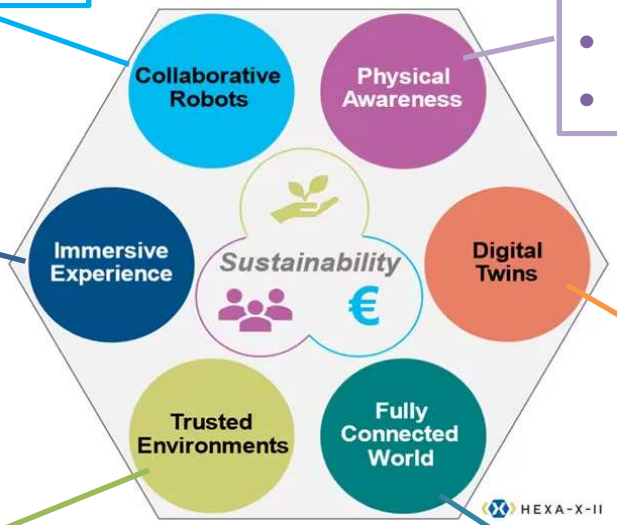


# 5G/6G Use Case Topics projected into Health Vertical

Autonomous Mobile Agents

- Massive Communication and ISAC
- RedCap for portable medical devices
- Smart Home Connected
- Advanced driver monitoring

Mental Health – Remote Emotional Stimulation Therapy




- Diabetic Foot management
- Dental Twin
- Cardiac radioablation

- European Health Data Slice
- Next Generation Telemedicine

- Emergency and Disaster Medicine
- Cognitive Health

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Autonomous Mobile Agents

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- Smart Home Connected

Menta
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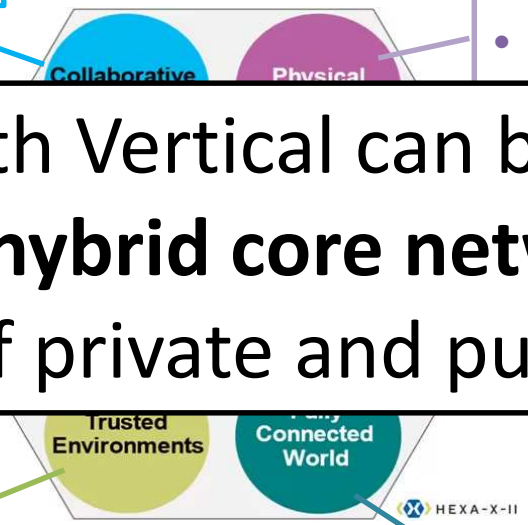


The Health Vertical can be shaped as a **hybrid core network** consisting of private and public components

- European Health Data Slice
- Next Generation Telemedicine

- Emergency and Disaster Medicine
- Cognitive Health

# The Vision

- Jointly build a Nation-wide, Research, Innovation and Development environment
- Driven by smart networks and services, oriented towards Vertical Industries.
- Engaging all the relevant stakeholders of the quadruple helix
- Exploit local/regional competences and know-how
- Aiming at advancing knowledge economy  and pave the way towards a knowledge society .

# Tribute to the Team

- 5 Faculty Members Collaborating Together
  - Spyros Denazis (Associate Professor) → Programmable Networks
  - Odysseas Koufopavlou (Professor – Department Chair) → Security + Hardware Design
  - Alexis Birbas (Professor) → Microelectronics
  - Ioannis Tomkos (Professor) → Optical Networks
  - Tania Politi (Assistant Professor at University of Peloponesse) → Optical Networks
- 8+ Senior Researchers
- 10+ Junior Researchers/Developers
- 10+ PhD Students
- Large number diploma thesis undergraduate students
- … and we are getting more

# THANK YOU!

## ΕΥΧΑΡΙΣΤΩ!

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