

# 5G EVE – Greek Site overview

**5G EVE Greek Site – 26 May 2021  
(OTE, NOKIA, ERICSSON, WINGS)**

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(OTE Research Labs)**



This Project has received funding  
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# 5G-EVE Greek Site - Architecture

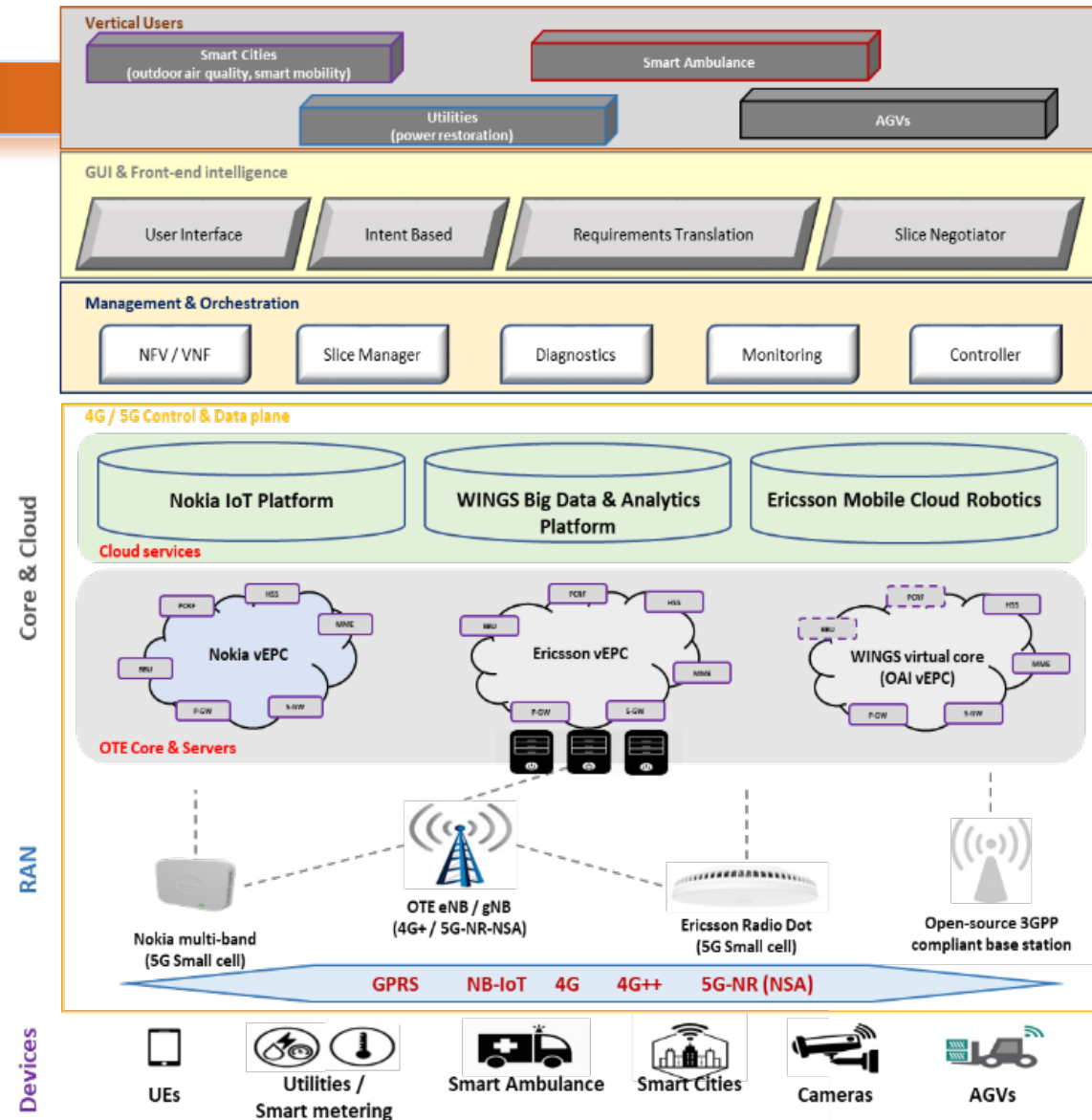
## The architecture and networking of 5G-EVE Greek site

**UC3:** Industry 4.0 functionality with Automated Guided Vehicles (AGVs) (responsible: ERICSSON-GR)

**UC4.2** - Smart Energy: Resolving Outages and Ensuring the Stability of Smart Grids by means of 5G (responsible: WINGS)

**UC5:** Smart cities applications focused on Connected Ambulance (responsible: NOKIA-GR)

**UC5.2** - Smart City: Safety and Environment (responsible: WINGS)



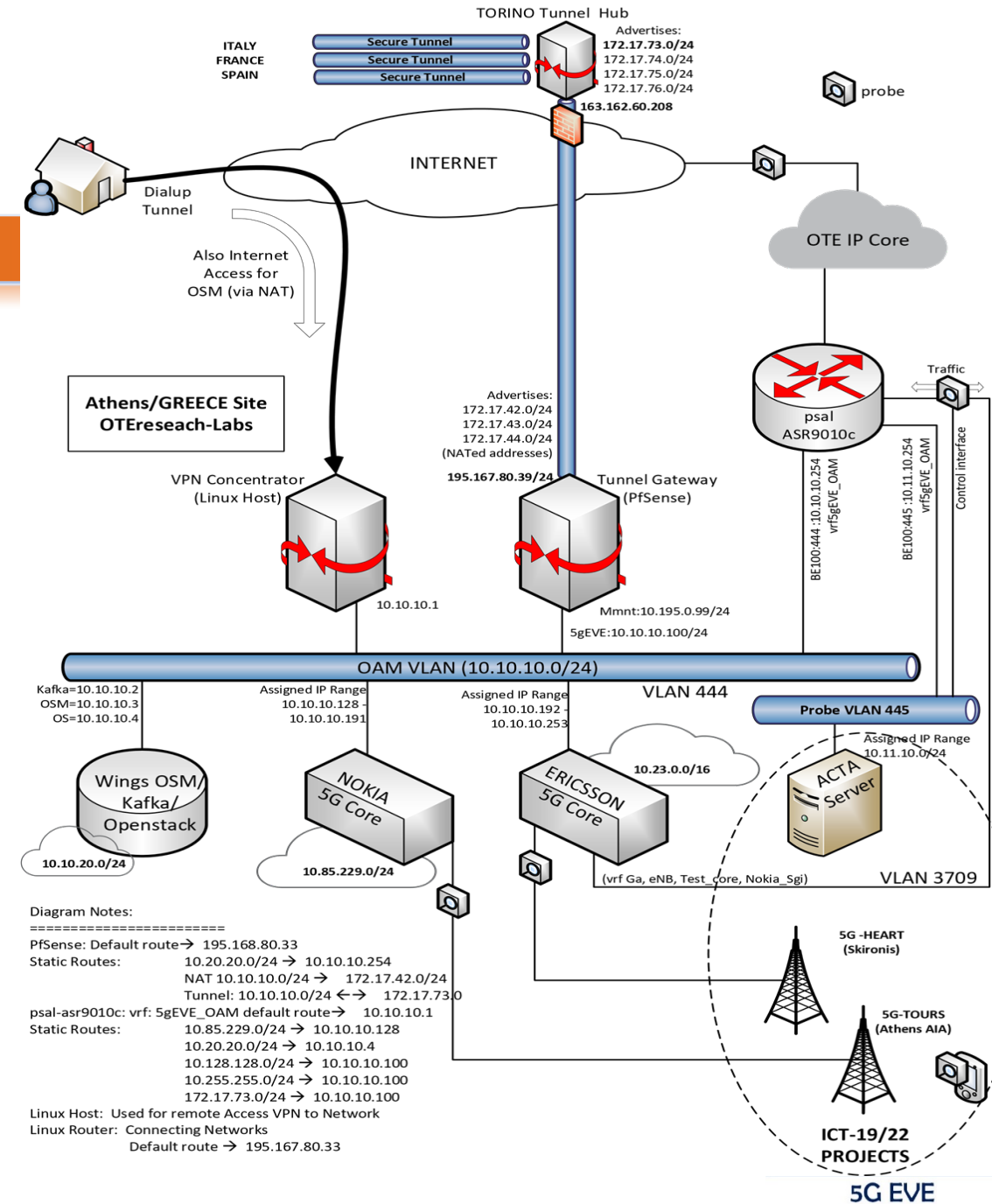
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# Greek Site - Infrastructure

The architecture and networking of 5G-EVE Greek site

- **OTE's Lab** network infrastructure
- **Ericsson 5G NSA** platform is installed and fully functional for the **AGV UC**
- **NOKIA 5G SA** platform is installed and fully functional for **eHealth UC**
- **Wings' IoT platform (Utilities, Environment and Smart Cities UC)** is tested with NOKIA and ERICSSON platform
- **OSM** interconnection with Ericsson & NOKIA's platforms
- Interconnection of Greek site **with IWL** in Turin
- Interconnection of Greek site **with portal** in Spain
- **Kafka Broker** is interconnected with **central Kafka**
- **Performance diagnosis tool** for post-process analytics on the collected metrics and KPIs.
- **Metris/KPIs methodology** has been defined
- **Network and UE metrics are measured**
- **Data shippers** from NOKIA and Ericsson have been developed
- **Test plans, blueprints** for all of the UCs are ready
- **Multi-site UC** interconnection of Greek site with Spanish site (by OTE)
- **First Tests have been run successfully** for Multi-site UC (by WINGS)
- **E2E tests for UCs** have been executed and **metrics have been sent**



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# Greek Site – 5G capabilities

Capabilities	Features	Available	Comments Greek Site (E/// + NOKIA platform)
5G Services	Enhanced MBB (eMBB)	Y	OK in Greek Site (both E/// & NOKIA)
	URLLC (URLLC) Rel-15 Rel-16	Y N	Ok by both E/// + NOKIA
	Massive IoT (mMTC) LTE-M + NB-IoT Rel-16	Y N	Ok by both E/// + NOKIA
5G Architecture Options	Option-1 (Legacy)	Y	Ok by both E/// + NOKIA
	Rel15-GNR + EPC in NSA mode	Y	Ok by both E/// + NOKIA
	Rel15-5GNR + Rel15-5GC in SA mode	Y	ongoing for NOKIA
	Rel16-5GNR + Rel16-5GCore (in NSA & SA modes)	N	
5G Access Features	Flexible Numerology	Y	OK only by E///
	Massive MIMO	N	
	Multi-User MIMO	Y	OK only by NOKIA (4 streams)
	RAN Virtualization	N	
	Latency Reduction Rel-15 Rel-16	Y N	Ok by both E/// + NOKIA

Capabilities	Features	Available	Comments Greek Site (E/// + NOKIA platform)
Core Network	vEPC supporting 5G	Y	Ok by both E/// + NOKIA
	5GC	Y	Ok by E/// (Only NSA) & NOKIA in SA
	CUPS	Y	Y by E/// and NOKIA
	SBA	Y	Y by E/// and NOKIA
	Interworking with LTE	Y	Ok by E/// (Through NSA) + NOKIA
Slicing	Network Slicing (std 5G Services: eMBB, URLLC, mMTC)	Y	Ok by NOKIA and No 5GC slicing by E///
	Service Slicing (cloud orchestration level)	Y	Ok only by NOKIA
	Multi-site Slicing	N	Not in Greek Site
Virtualization	NFVi support	Y	OK only by E///
	SDN control	N	Not in Greek Site
	Vertical Virtualized Application deployment support	Y	OK by both E/// + NOKIA
Edge Computing	3GPP Edge Computing	N	Not in Greek Site
	ETSI MEC	N	Not in Greek Site
Orchestration	VNF, CNF, PNF	Y	Ok in Greek Site (OSM by WINGS, NOKIA)



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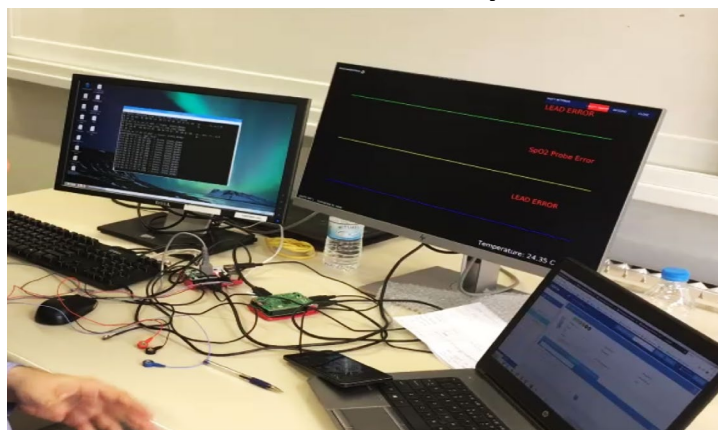
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# Greek Site – 4 UCs/Multisite UC



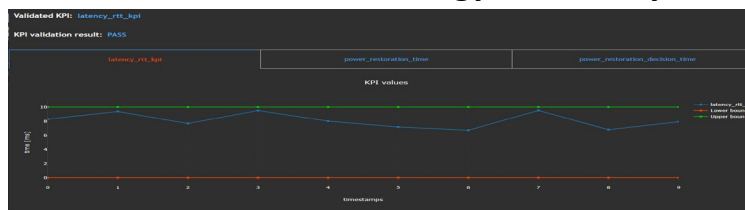
**UC Ericsson - AGV industry 4.0**



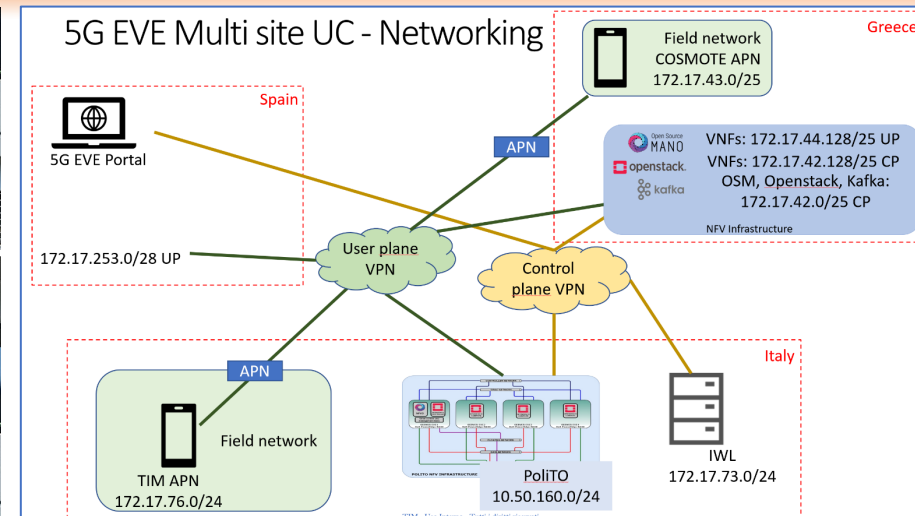
**UC NOKIA GR – eHealth Smart Ambulance**



**UC WINGS - Smart Energy, Smart City**



**WINGS - KPI validation tool**



**Multisite Gaming UC – OTE & WINGS**



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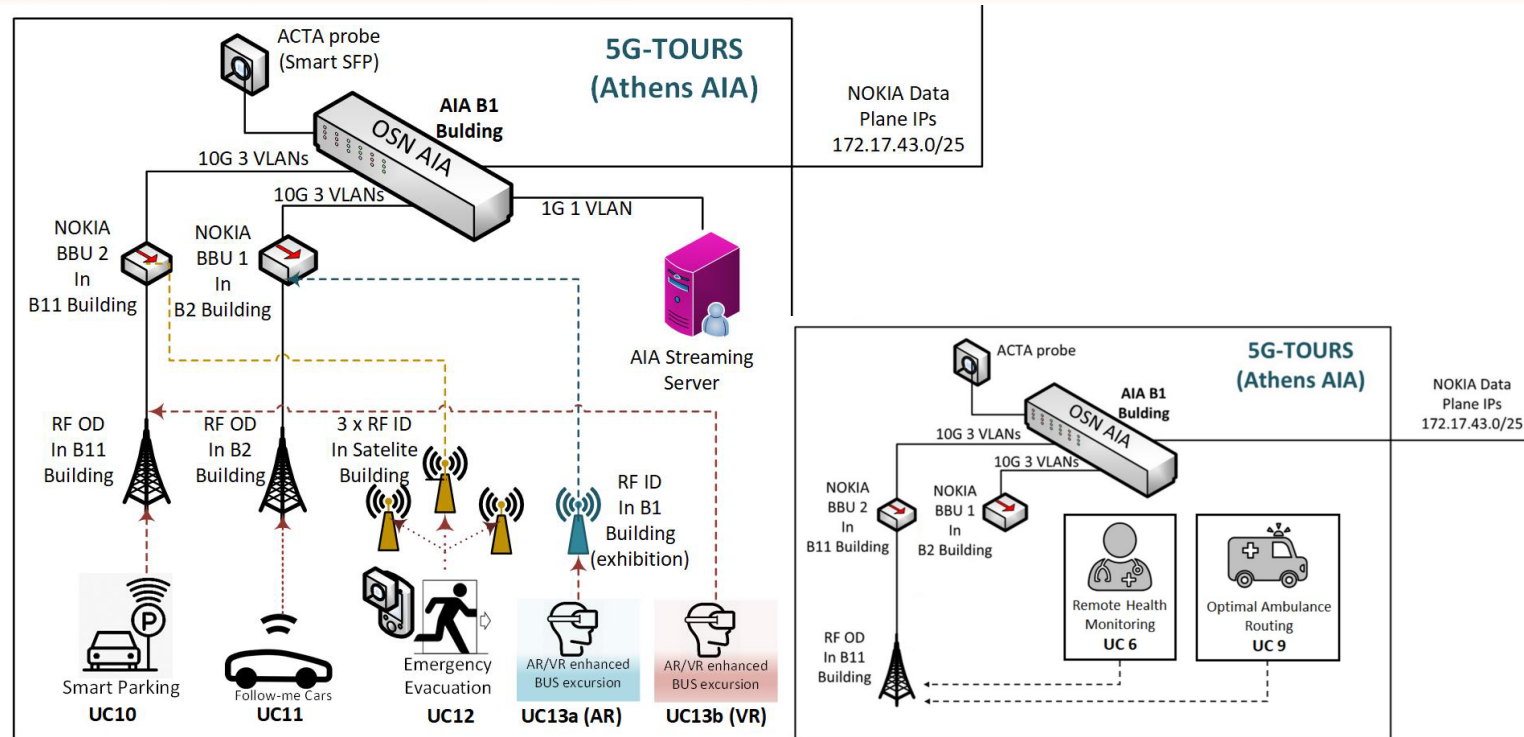
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# Greek Site – ICT19 projects

## 5G Tours

### Athens International Airport Extension site

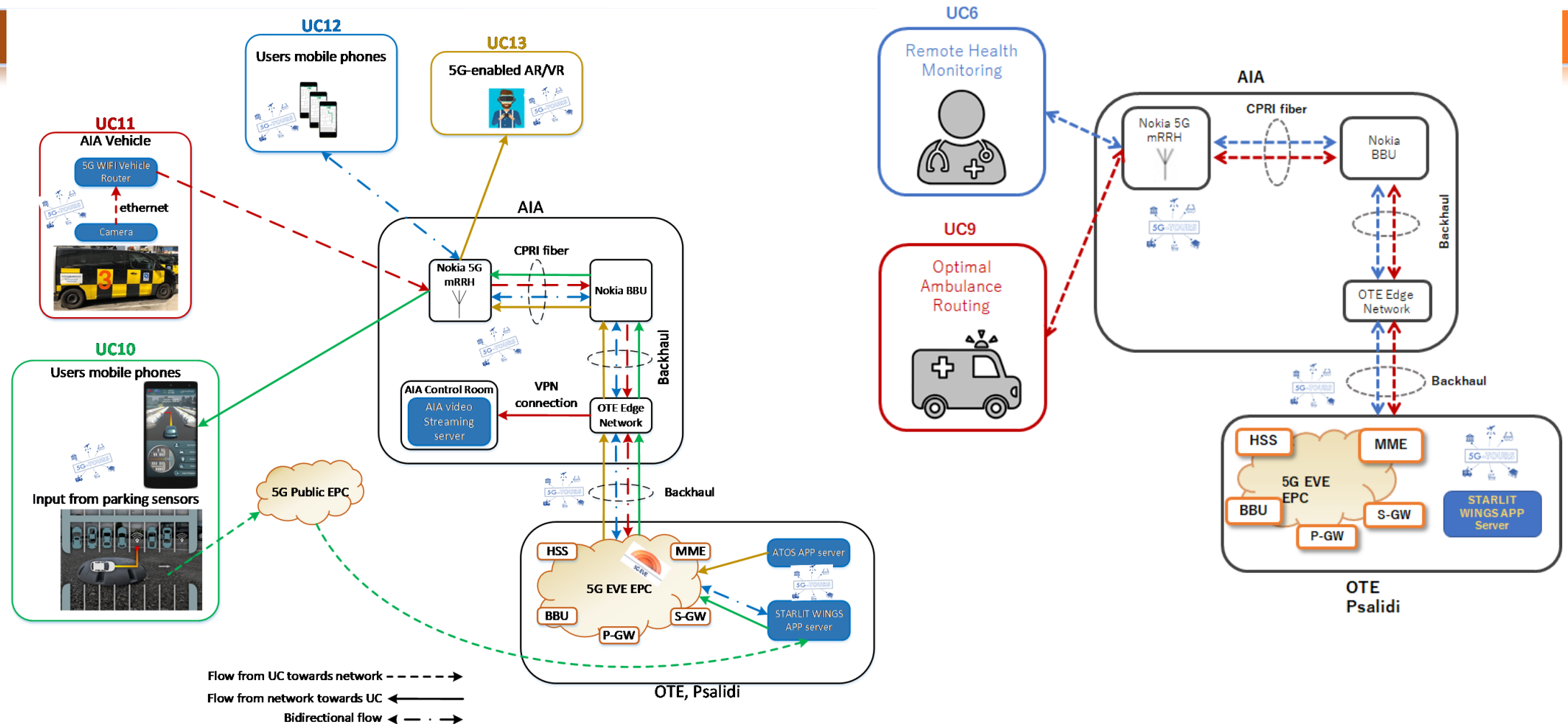
- ✓ Extension of Greek Site
- ✓ Only NOKIA's platform will be used
- ✓ 2 outdoor + 4 indoor installed antennas
- ✓ 2 installed BBUs
- ✓ Installed probes for KPI measurements
- ✓ Installed Streaming server
- ✓ 10GBps line interconnection with OTE Labs
- ✓ UCs interconnection with 5G core
- ✓ UE equipment
- ✓ AI Enhanced MANO, Performance diagnosis and Real time KPI measurements
- **6 UCs** (*Smart Parking, Ground-based vehicles, Airport Evacuation, AR/VR student bus excursion, Remote Health Monitoring, Optimal Ambulance Routing*)



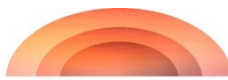
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# Greek Site – ICT19 projects - 5G Tours

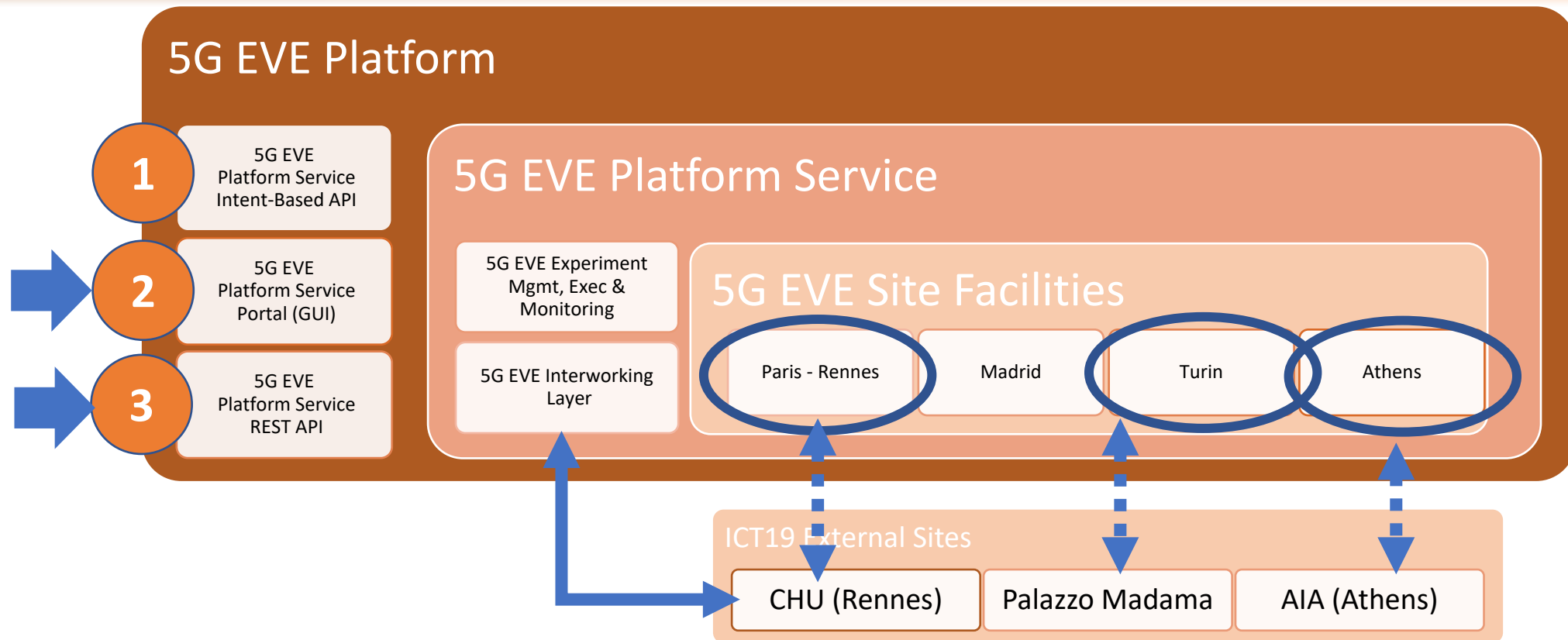


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# 5G-TOURS



- 5G EVE Portal GUI for designing and managing experiments
- 5G EVE interworking layer for enabling technical validation campaigns at 5G EVE sites and additional ICT-19 sites



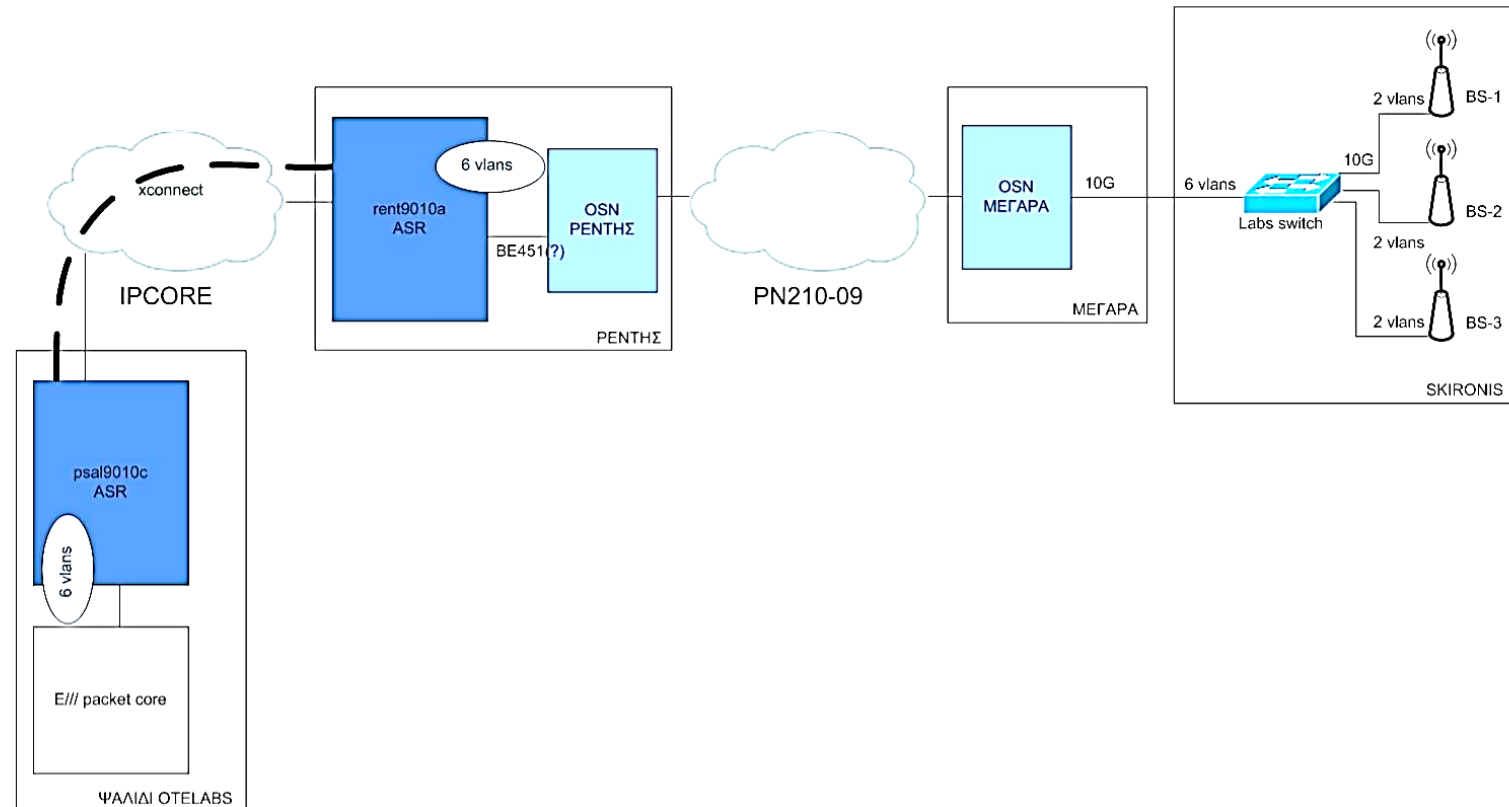


# Greek Site – ICT19 projects

## 5G-Heart

### Skironis Extension site (Megara)

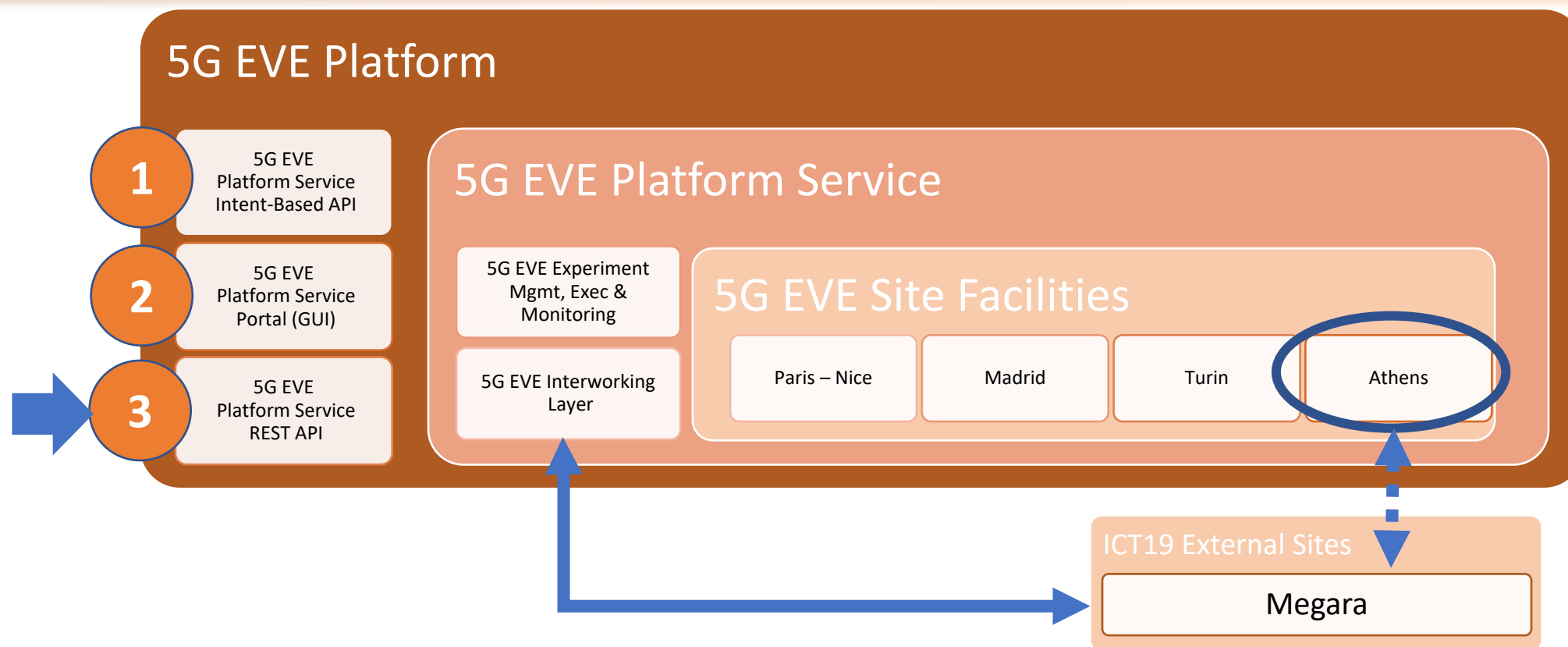
- ✓ Extension of Greek Site infrastructure with antennas, cables, BBUS by Ericsson and OTE for supporting the **Aquaculture UC** at Skironis site in Megara.
- ✓ Ericsson's platform is used.
- ✓ 10GBps line interconnection with OTE's Labs (5G-EVE platform)
- ✓ UCs interconnection with 5G core
- ✓ UE equipment



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5G EVE



- 5G EVE Greek sites infrastructure in Megara (Skironis)
- 5G EVE REST APIs for controlling and consuming metrics and KPIs

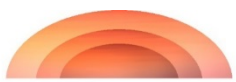
# Greek Site - sustainability

## Plans after 5G EVE for maintaining Greek Site facility

- ✓ **For the needs of 5G-Tours** the Greek Site 5G infrastructure will remain up and running till the end of the project, since **OTE** as Site manager, **NOKIA-GR** as 5G provider and **WINGS** (OSM, Kafka), participate to the project.
- ✓ **For the needs of 5G-Heart** the Greek Site 5G infrastructure will remain up and running till the end of the project, since **OTE** as Site manager, **ERICSSON** as 5G provider and **WINGS** (OSM, Kafka), participate to the project.



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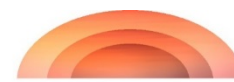
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# Greek Site – overall status

***Thank you!***



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