

# Continuing the 5G-EVE legacy

- An overview of how 5G-EVE will live on and what experimenters can expect
  - 5G-EVE site features now (France, Italy, Spain, Greece) and planned extensions
  - Use after 5G-EVE (ICT-19,42/52/56)
  - International and Academic Use-Cases



This Project has received funding from the EU H2020 research and innovation programme under Grant Agreement No 815074



5G EVE



## 5G-EVE French site facility status – 5G-EVE and Beyond

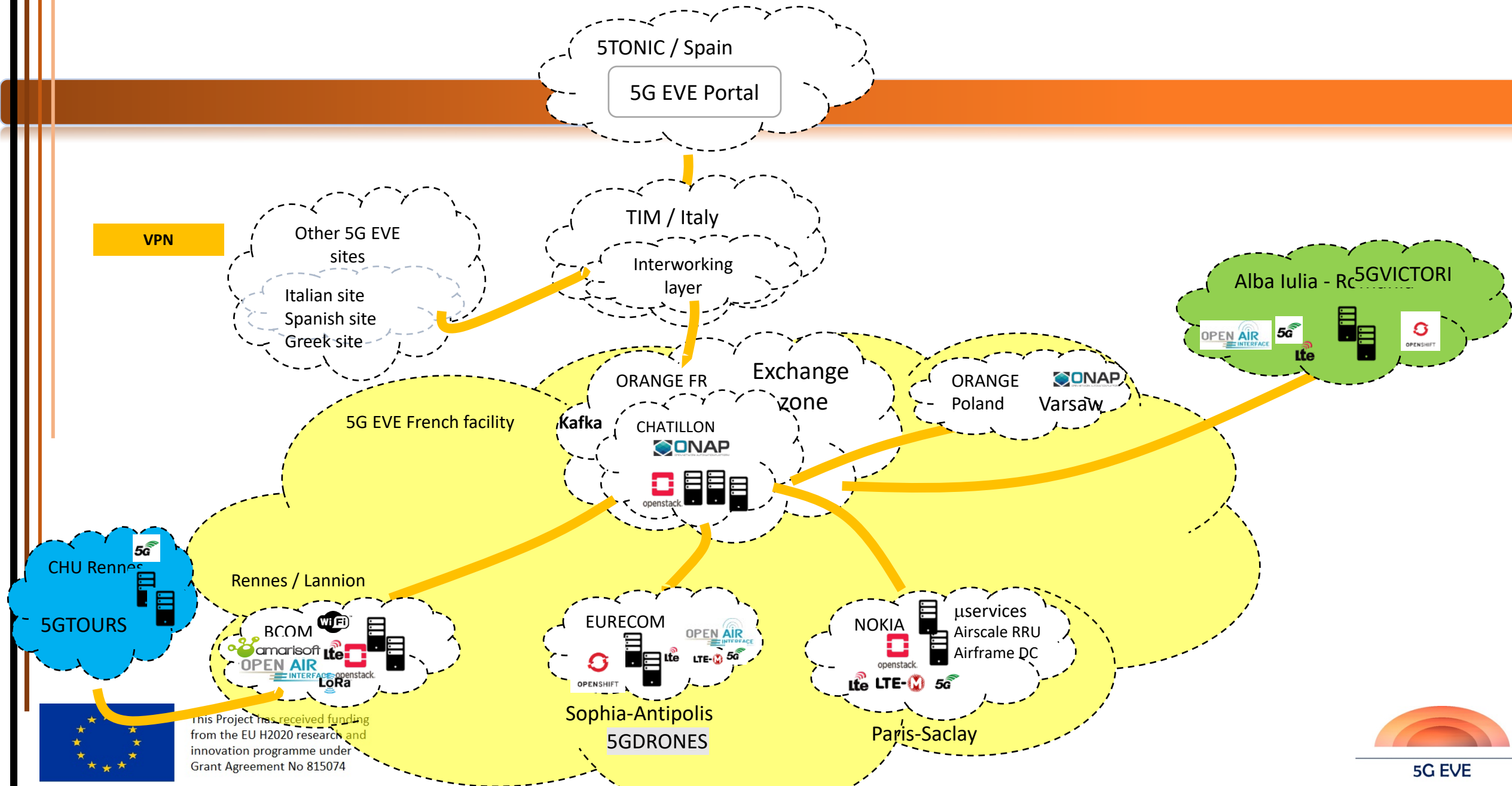


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11th F2F meeting 11<sup>th</sup> of May 2021



# French Site Facility - Concept



# French site capabilities/features

Capabilities	Features	Available	Planned to
5G Services	Enhanced MBB (eMBB)	Y	
	URLLC (URLLC)		
	Rel-15	Y	
	Rel-16	N	N
	Massive IoT (mMTC)		
	LTE-M + NB-IoT	Y	
	Rel-16	N	N
5G Architecture Options	Option-1 (Legacy)	Y	
	Rel15-GNR + EPC in NSA mode	Y	
	Rel15-5GNR + Rel15-5GC in SA mode	Y	
	Rel16-5GNR + Rel16-5GCore (in NSA & SA modes)	N	N
5G Access Features	Flexible Numerology	N	N
	Massive MIMO	Y	
	Multi-User MIMO	N	N
	RAN Virtualization	Y	
	Latency Reduction		
	Rel-15	Y	
	Rel-16	N	N
Core Network	vEPC supporting 5G	Y	
	5GC	Y	
	CUPS	Y	
	SBA	Y	
	Interworking with LTE	Y	



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# French site capabilities/features

Capabilities	Features	Available	Planned to
Slicing	Network Slicing (std 5G Services: eMBB, URLLC, mMTC)	N	Planned with CORE slicing and with some limitations in RAN slicing
	Service Slicing (cloud orchestration level)	Y	
	Multi-site Slicing	N	N
Virtualization	NFVi support	Y	
	SDN control	Y	
	Vertical Virtualized Application deployment support	Y	
Edge Computing	3GPP Edge Computing	Y	
	ETSI MEC	N	
Orchestration	VNF, CNF, PNF	Y	



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# ICT-19

Close collaboration with:

- 5G TOURS : Partners: b<>com, Nokia, Orange (FR and PL), E-health Use-cases – Reuse from 5G EVE: ONAP, WEF VNF (with new release – R22 already onboarded), Network connectivity
  - HandOver ensured by the presence of several common partners between both projects and same persons involved (Sergio, Sofiane, Laurent ...)
- 5G VICTORI: Partners: Orange (FR, RO), Eurécom, energy use-case – Reuse from 5G EVE: ONAP, OAI, Network connectivity
  - HO ensured by the presence of common partners between both projects and same persons involved (Marius, Rodolphe, Raymond)
- 5G!DRONES: Partners: Eurécom, Orange, Drone Use-case – Reuse from 5G EVE: Eurécom facility
  - HO ensured by Eurécom and Orange



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# ICT42/56/INFRAIA-2020

- **5G-RECORDS** (ICT-42, running until mid-2022)
  - Deployed at EURECOM (Sophia Antipolis)
  - Localized orchestration and experimentation (no 5G-EVE infrastructure beyond Sophia Antipolis)
  - Integration of 3<sup>rd</sup> part Telco CNFs (5GC , RAN CU) on Eurecom infrastructure
  - Use-case 1 : URLLC, TSN for remote real-time high-fidelity audio production
- **AFFORDABLE5G** (ICT-42, running until mid-2022)
  - Deployed at EURECOM (Sophia Antipolis)
  - Localized orchestration and experimentation (no 5G-EVE infrastructure beyond Sophia Antipolis)
  - Low-cost / open-source solutions for 5G
  - Integration of O-RAN RIC elements, CU/DU split, multi-vendor solutions for RAN/Core
- **IntelloT** (ICT-56, running until 2023)
  - Next generation IoT paradigms / convergence between 3GPP and non-3GPP solutions
  - Cyberphysical systems for factories and farming
    - URLLC/TSN for remote control of robotic systems
- **SLICES-RI** –Pan-European Research Infrastructure
  - SLICES = “Scientific LargeScale Infrastructure for Computing/Communication Experimental Studies”
  - SLICES-SC (Starting Community) H2020 running now, more projects to follow
  - Community-driven experimentation in computing/communications



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# And what will happen with the French 5G EVE cluster in the post 5G-EVE era?

The French government has launched several specific projects call to activate one recovery plan.

- The 5G-EVE French partners have proposed the 5G EVE French facility to be one of the main 5G platform to be used to promote the vertical industries in France
  - During this 3 years project, we plan to improve the capabilities of the platform, still based on infrastructure virtualization, deploy new private network infra to operate vertical use-cases (industry 4.0, e-health ...)
  - Integration of O-RAN interfaces and support of 3<sup>rd</sup> party solutions
- The work carried out during 5G EVE (all French Sites), will be enhanced and extended in this context



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# International Interactions

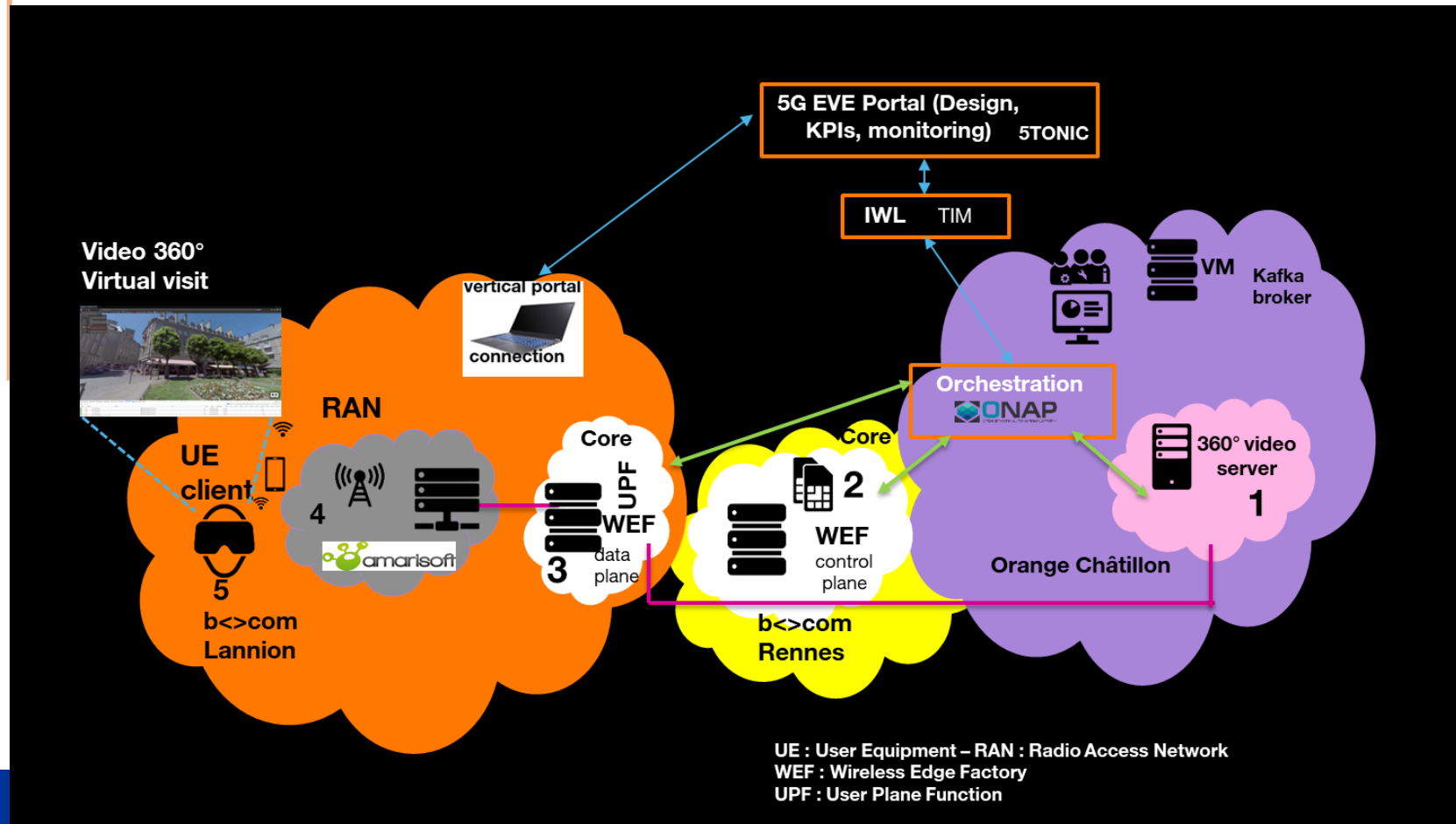
- A subset of the French network (Sophia Antipolis) will continue to promote the 5G-EVE infrastructure in Linux Foundation projects and other open-source initiatives
  - Continued integration with Magma Foundation for PoC and testing of evolving 5G telco functions
  - Uses in O-RAN PoC context
  - ONAP evolution and testing using 5G-EVE open-source components
- Tighter interactions with USA NSF Platforms for Advanced Wireless Research
  - Continued Integration with testing methodologies and software mutualization



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# V360° UC multi-site deployment



VSB, NSD, composite NSD dev.

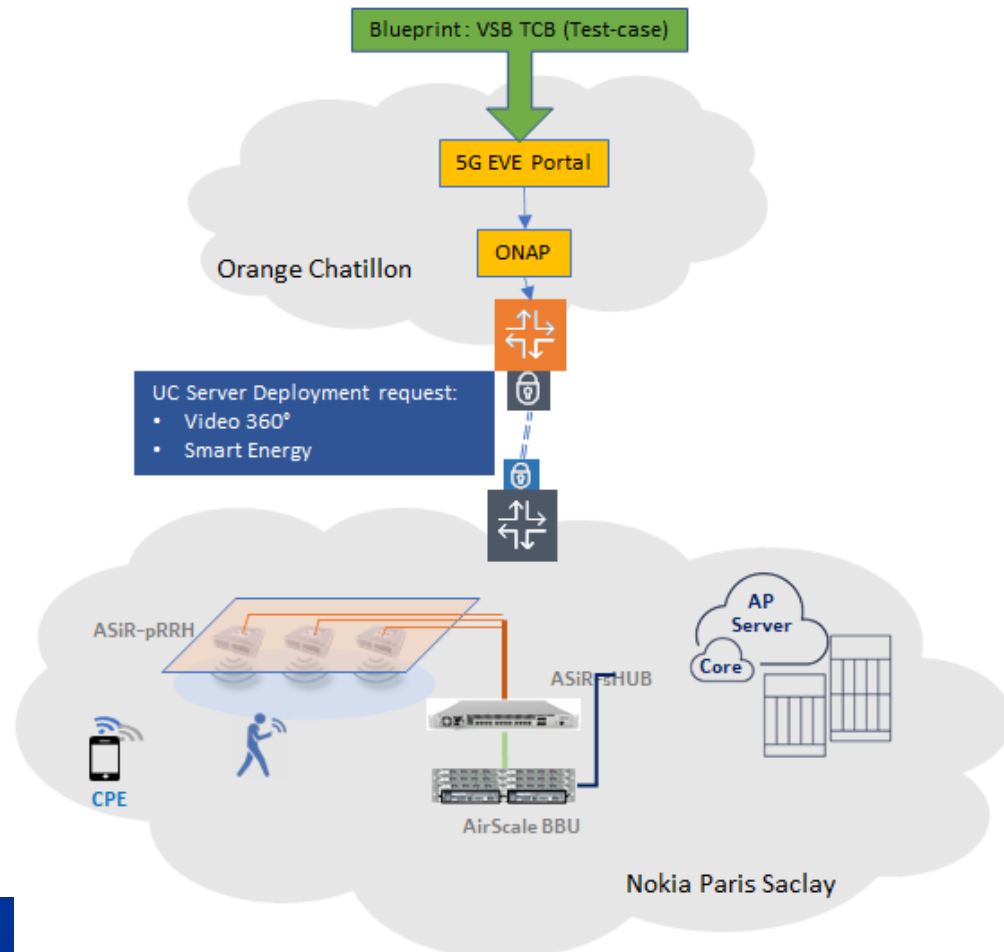
VNFs: Video Server, WEF\_CP, WEF\_DP

Script for RAN connection to the WEF\_DP

New Kafka solution for metrics collection (Sofiane presentation tomorrow)

Quasi-finalized -> Need one more integration meeting

# EDF Smart Energy Use-case



- 5G platform has been set-up in Nokia Paris-Saclay lab.
  - Nokia 5G Cloud Native core
  - 4G/5G Nokia RAN equipment's supporting both NSA and SA modes
  - A virtual L2 virtual switch supporting Goose protocol to connect the Distributed Energy Resources (DERs)
  - Monitoring service to retrieve the targeted metrics and KPIs
- All these service can be instantiated via the 5G EVE portal :
  - ONAP VNF packages containing heat templates and blueprint files to be able to launch the different services from 5G EVE Portal have been provided
- Performance tests have been conducted and validated in NSA mode and KPIs measurements have demonstrated the benefits brought by 5G; the performance tests with SA mode is planned

# 5G EVE

THANK YOU



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