GREEN TECHNOLOGIES FOR 5/6G SERVICE-BASED ARCHITECTURES

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Summit on Sustainability

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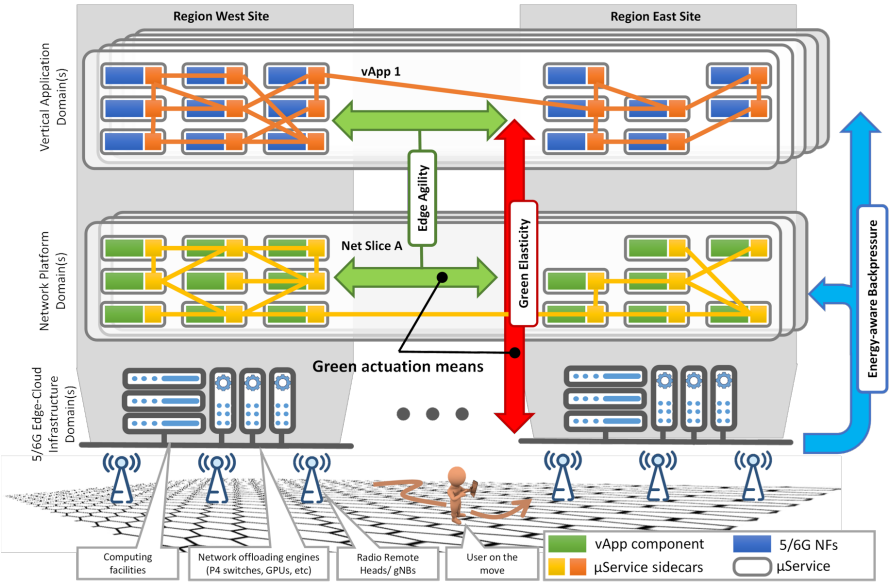
THE 6GREEN PROJECT

- Project grant No.: 101096925
- Period: 2023-2025 (3 Years)
- Call Topic ID: HORIZON-JU-SNS-2022-STREAM-A-01-04
- Project Cost: M€ 6.0
- Project Coordinator: CNIT
  - Coordinating Person: Roberto Bruschi
  - Technical Manager: Chiara Lombardo

#	Participant organisation name	Short Name	Type	Country
1	CONSORZIO NAZIONALE INTERUNIVERSITARIO PER LE TELECOMUNICAZIONI	CNIT	RI	IT
2	ATOS IT SOLUTIONS AND SERVICES IBERIA SL	ATOS	LI	ES
3	ERICSSON TELECOMUNICAZIONI SPA	TEI	LI	IT
4	TELENOR ASA	TNOR	TO	
5	TELEFONICA INVESTIGACION Y DESARROLLO SA	TID	TO	ES
6	TELECOM ITALIA SPA	TIM	TO	IT
7	ORANGE ROMANIA SA	ORO	TO	RO
8	GIOUMPITEK MELETI SCHEDIASMOS YLOPOIISI KAI POLISI ERGON	UBITECH	SME	EL
9	ATHONET SRL	ATH	SME	IT
10	INTERNET INSTITUTE, COMMUNICATIONS SOLUTIONS AND CONSULTING	ININ	SME	
11	OCULAVIS GMBH	OCULAVIS	SME	DE
12	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS	ICCS	RI	EL
13	EURECOM	EURECOM	RI	FR
14	CONSIGLIO NAZIONALE DELLE RICERCHE	CNR	RI	IT
15	SMILE	SMILE	SI	FR

- **Objective**: promote energy efficiency across the whole **5/6G value-chain**, and enable **5/6G networks and vertical applications** to reduce their carbon footprint by a factor of 10 or more by introducing and exploiting the concepts of
  - **Edge agility**
  - **Green agility**
  - **Observability and backpressure**

GROUND-BREAKING INNOVATIONS



- **Edge agility**: smart, fast, and automated horizontal scalability of vApps and slices across the 5/6G edge-cloud continuum. Workload/latency redistribution according to user or infrastructure-driven events and the presence of available **renewable energy sources**. Rapidly "**scale to zero**" **the footprint** of the slice/vertical application in all not used continuum areas, quickly resuming the operating capacity when needed.
- **Green elasticity**: energy-aware hardware-assisted acceleration to NFs and vApps to enable smart vertical scalability across the three domains of 5/6G environments. HW offloading to lower processing latency and reduce consumption by **exploiting standby/low power modes** joint with optimal configurations/deployments.
- **Energy-aware backpressure**: Collection of HW-level energy consumption metrics and **mapping** onto tenants through adaptive AI-driven analytics. Process, infer, and expose this information at both the 5/6G SBA and vApp (and their network slices) levels. **Green SLAs** to promote energy-conscious behaviors.

FEW GENERALIZED TOPICS FOR DISCUSSION

- **Effective** (understandable and evaluable) **and continuous monitoring** of the sustainability performances by mapping of all stakeholders (from the infrastructure providers to the customers).
- **A «full» integration of** (local) **renewable energy sources** considering their peculiarities (e.g., sun not in the night, the wind is not always predictable, …) and availability of the (energy) storage.
- Acting to increase sustainability **using "aggressive" tools** and approaches (e.g., complex A. I. methods or massive actions) **may increase consumption** instead of reducing it if not done with a lot of care.