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DI RIPRESA E RESILIENZA



# Lo scenario evolutivo delle Telecomunicazioni del Futuro alla luce delle iniziative del PNRR

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Comunicazioni radio per la sicurezza

*La crescente importanza dell'interoperabilità ed integrazione nelle reti mission critical*

Milano, October 23<sup>rd</sup>, 2023

# RESTART

## The RESTART Program

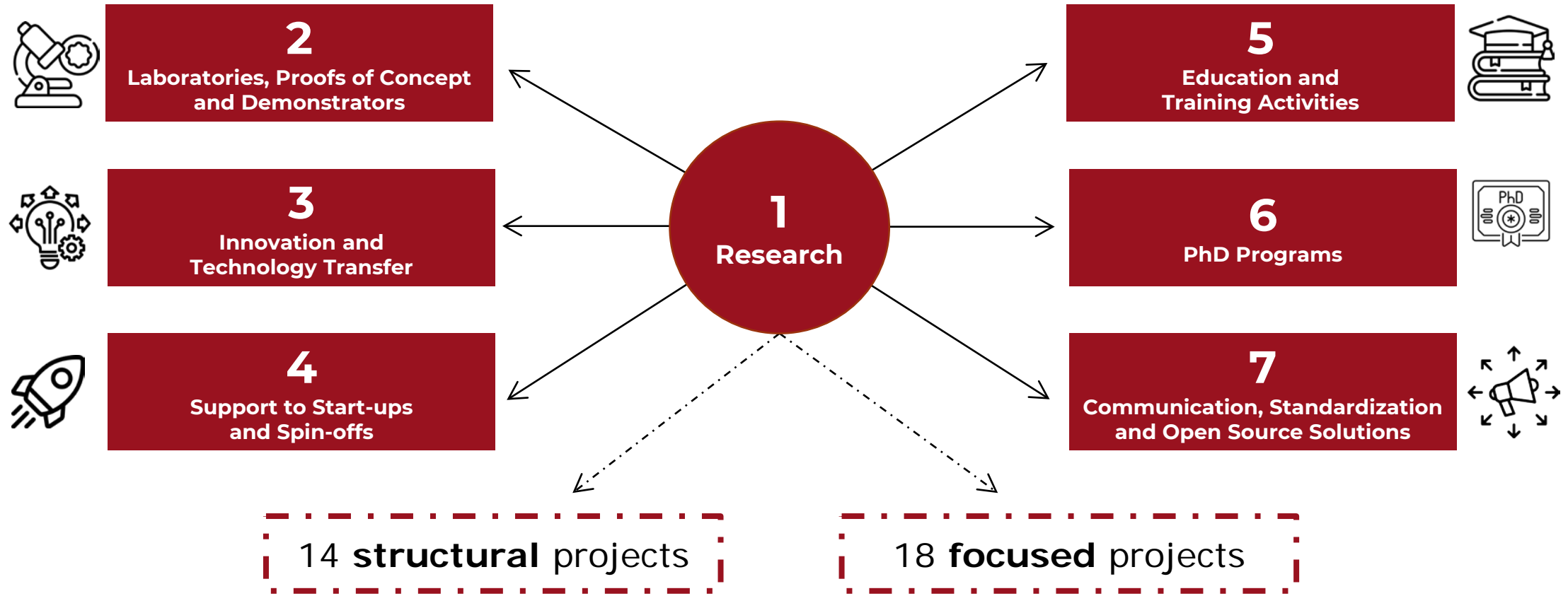
- National Recovery and Resilience Plan (PNRR)
- Hub ("Fondazione RESTART")
- 8 Spokes (admin and coordination centers)
- **25 Partners** (i.e., affiliates)
- Grant: 116M€
- Duration: 1/1/23 → 31/12/25
- Cascade calls: overall budget € 32.427.500



<b>Università di Roma, Tor Vergata</b>
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<b>Politecnico di Milano</b>
<b>Politecnico di Torino</b>
Scuola Superiore Sant'Anna di Pisa
<b>Università di Bologna</b>
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Consorzio Nazionale Interuniver. per le TLC
Fondazione Ugo Bordoni
Open Fiber
TIM
Vodafone
Wind Tre
Ericsson
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ITALTEL
LEONARDO
Athonet
TIESSE

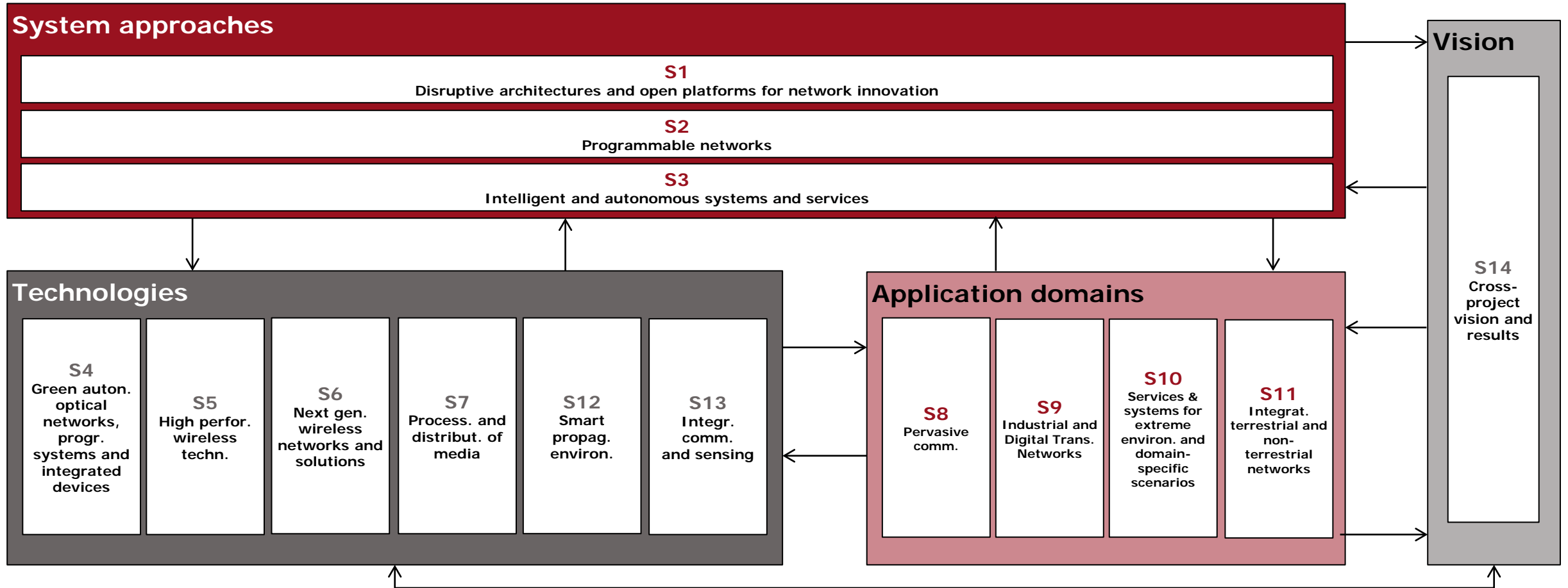
# RESTART

## The RESTART Missions



# RESTART

## The RESTART Projects



# RESTART

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## RESTART Cascade Calls

### 1<sup>st</sup> wave of Cascade Calls

#### **Research Cascade Calls:**

Specific tasks (research, demos, PoC, etc.) integrated in RESTART projects

€ 27.867.500

### 2<sup>nd</sup> wave of Cascade Calls

#### **Cascade Calls for ideas:**

Innovative ideas proposed by start-ups and innovative SMEs

First semester 2024

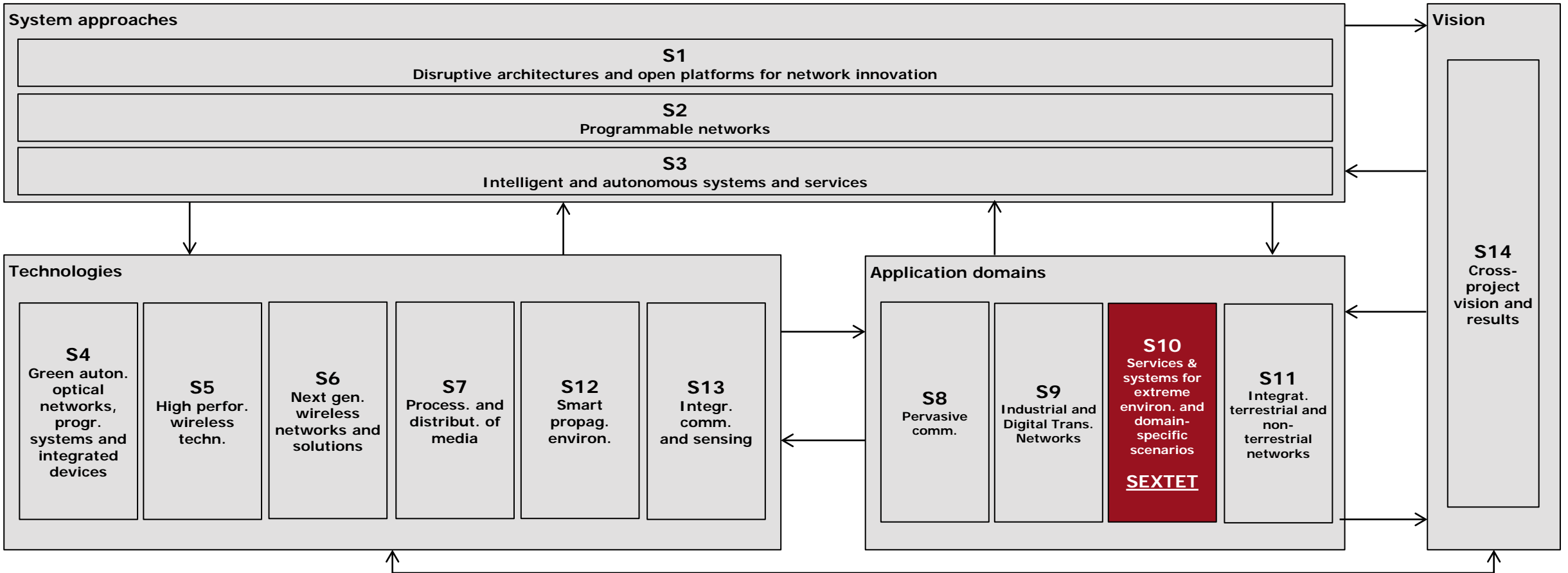
€ 4.560.000

MORE INFORMATION on the CASCADE CALLS:  
<https://www.fondazione-restart.it>



# RESTART

## The RESTART Projects



# S10: SEXTET

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## Services and systems for EXTreme EnvironmenTs and domain-specific scenarios

- This project aims at exploring **new telecommunication solutions** for scenarios that, despite their potentially huge societal and economical impact, are **not suitably supported by current mainstream telecommunication systems** due to their extremely **challenging characteristics**.



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interuniversitario  
per le telecomunicazioni

**Prysmian**  
Group



a Hewlett Packard Enterprise company

# S10: SEXTET

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## Objectives

Goal 1: **Channel models** for RF, acoustic and optical signals in extreme environments.

Goal 2: Develop **devices** for operation in extreme environments.

Goal 3: Design **network architectures** for communication in extreme environments.

Goal 4: New solutions for **energy-efficient** usage of resources in extreme environments.

Goal 5: Develop **proof-of-concept** demonstrators of the designed solutions

acoustic architectures channel communication demonstrators **design** develop devices energy-efficient  
**environments extreme** models network  
operation optical proof-of-concept resources rf signals **solutions** usage



# S10: SEXTET

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## WP6 – Infrastructureless and resilient networks

- The goal of this WP is to propose **robust standalone networking solutions** able to operate in **extreme conditions**. This objective will be achieved by the design of appropriate low-power network topologies, architectures and protocols.
  - T6.1: Standalone architectures and topology optimization
  - T6.2: Protocol design and optimization for standalone and resilient networks
  - T6.3: Extremely dynamic networks



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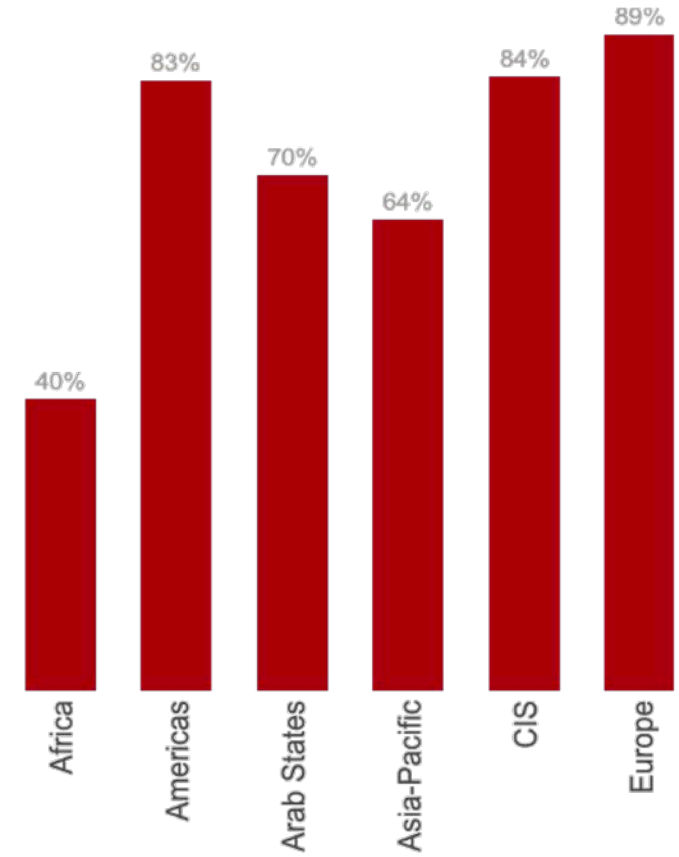
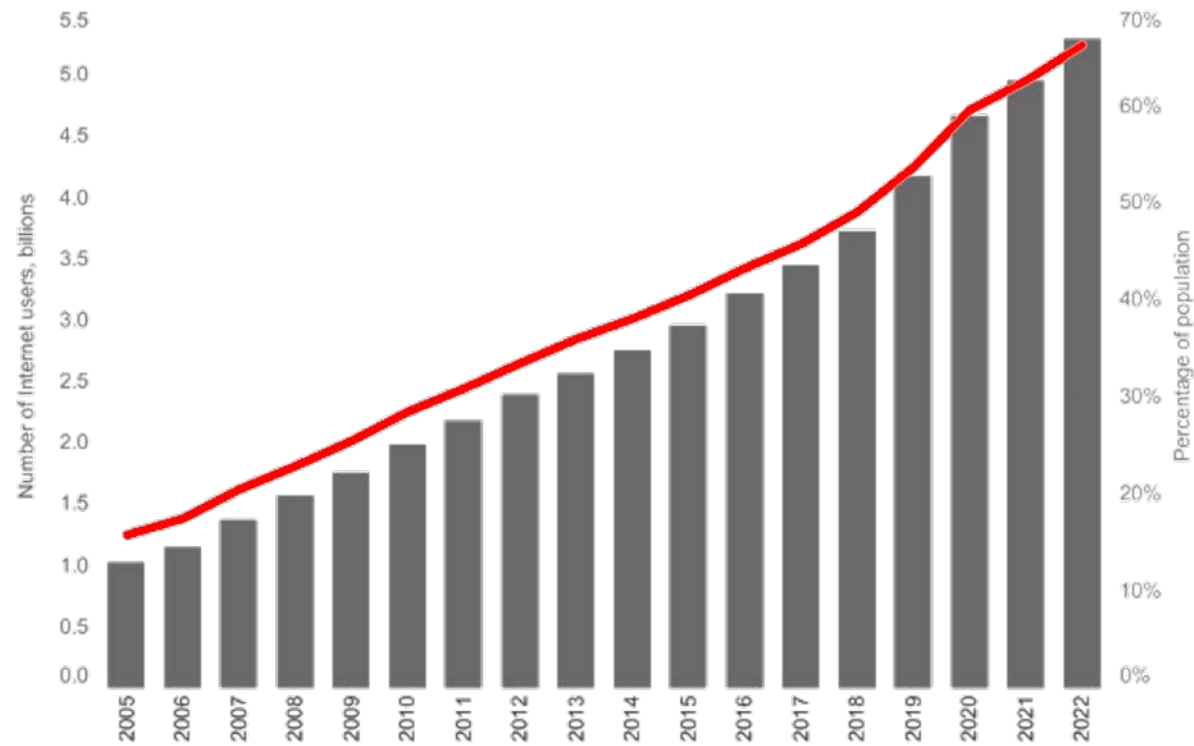


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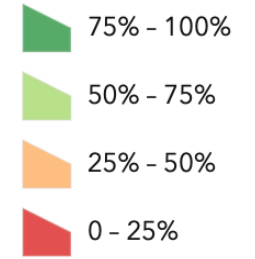
# S10: SEXTET

## Internet penetration rate

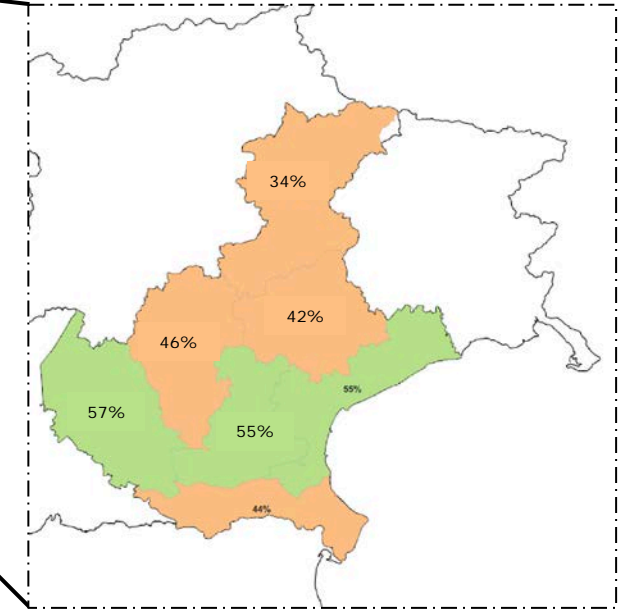
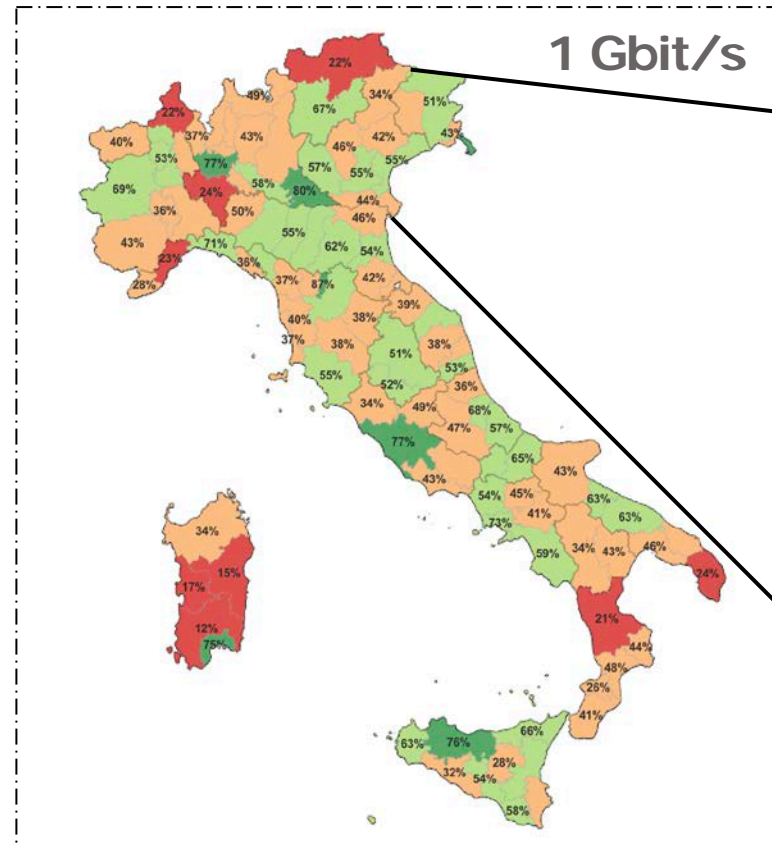
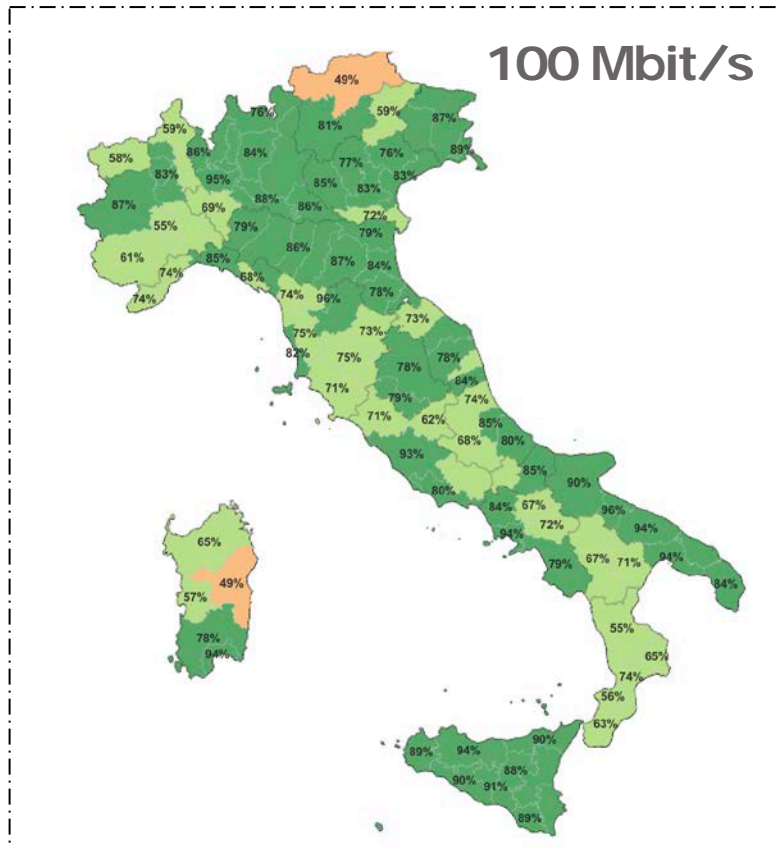


# S10: SEXTET

% of families connected



It's everyone's problem...



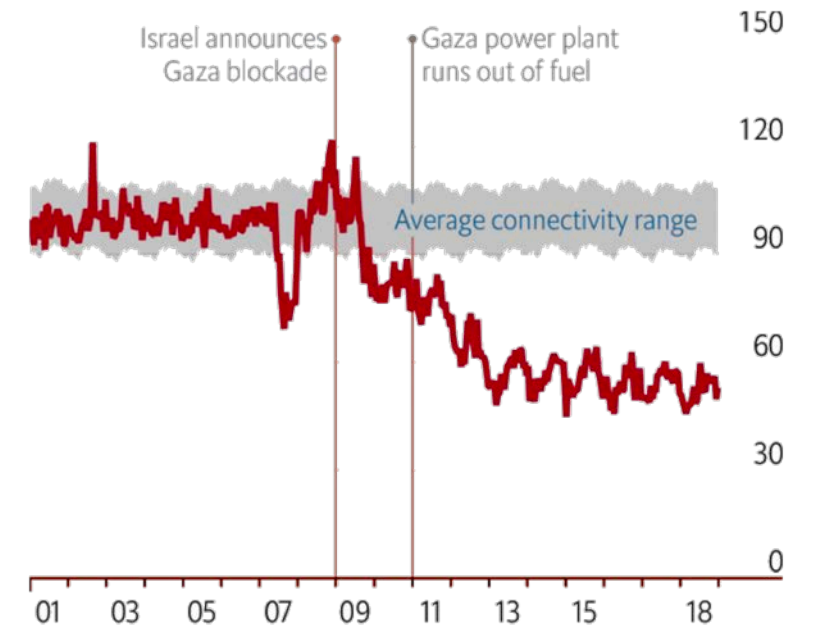
# S10: SEXTET

## Public safety

### Ukraine, Feb. 23rd, 2022

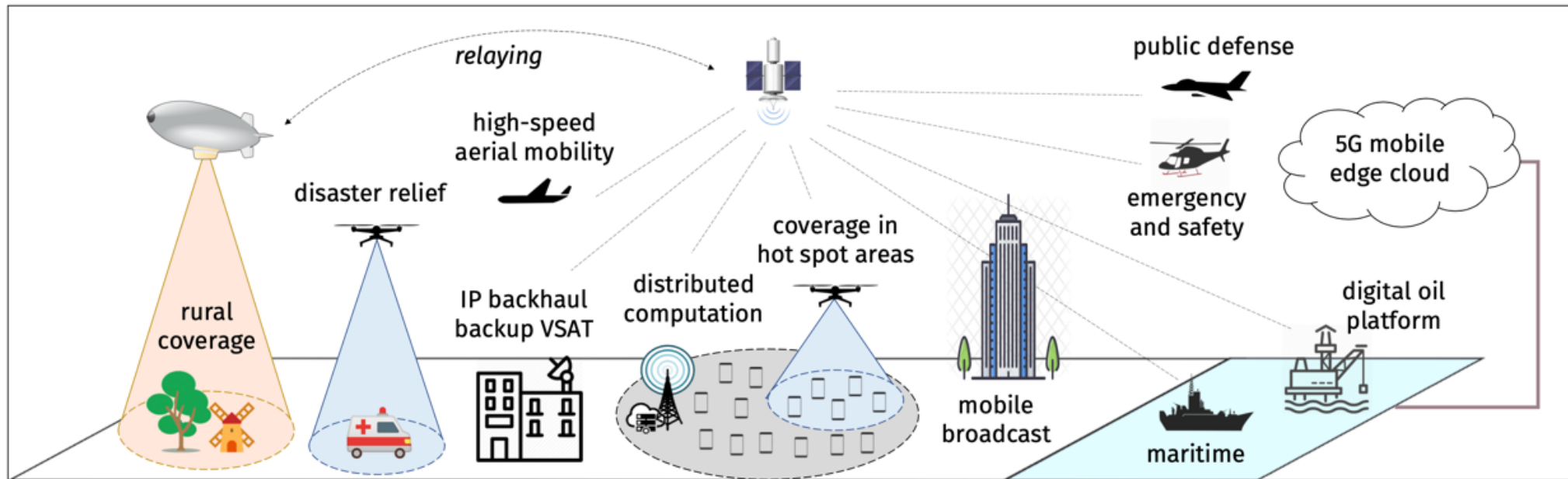


### Gaza, Oct. 2023





# NON-TERRESTRIAL NETWORKS



# S10: SEXTET

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Use cases and technologies

## NON-TERRESTRIAL NETWORKS

NTNs for  
**Communication**



NTNs for  
**Smart Cities**



NTNs for  
**Computation**



# Conclusions

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- Plenty of **things to do**...
- ...and plenty of **opportunities** for students, researchers, industries, investors

<https://www.fondazione-restart.it>



RESearch and innovation on future Telecommunications systems and networks, to make Italy more smART



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