

04

SCENARIO

Islets of Isolation

Νησίδες Μοναξιάς

Resilience is organised locally.

Fragmentation · Local solutions · Low scaling

03

SCENARIO

Market Pioneers

Πρωτοπόροι της Αγοράς

Resilience is accelerated by the market.

Dynamic innovation ecosystems · Individual solutions · Quick adaptation

02

SCENARIO

The Grand Orchestrator

Ο Μεγάλος Ενορχηστρωτής

Resilience is organised centrally.

Planning · Public investment · State coordination

01

SCENARIO

Collaborative Resilience

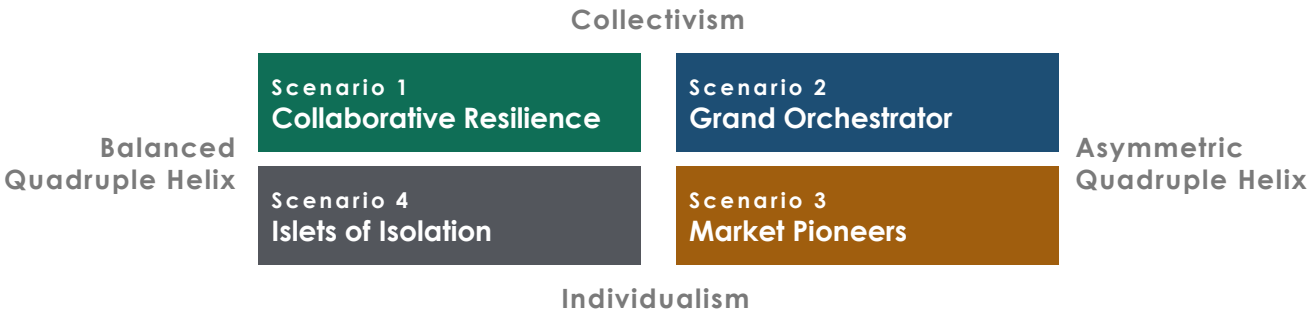
Συν-Ανθεκτικότητα

Resilience is built collectively.

Collaboration · Communities · Open innovation

Interpretation of the four scenarios

Two pillars — the degree of collective action and the balance amongst the stakeholders (state, market, research, society) — define four possible futures for the climate resilience of public infrastructure by 2050.



01 Collaborative Resilience

Συν-Ανθεκτικότητα

Society, public authorities, the research community and the market collaborate to co-create climate resilience solutions. Technology is used collectively, through local partnerships and open innovation.

CENTRAL IDEA

Resilience is built collectively.

TECHNOLOGICAL DIRECTIONS

- Virtual Power Plants (VPP)
- Advanced thermal storage materials
- IoT Networks & Monitoring edge commuting
- Climate education platforms (VR/AR)
- Intelligent Fire Detection with AI
- Emergency communication networks (mesh)
- Agri-PV & closed-type hydroponics

HORIZON

2050

02 The Grand Orchestrator

Ο Μεγάλος Ενορχηστρωτής

Adaptation to climate change is mainly state-driven, through central planning, public investments and centrally driven interventions. Technologies are being applied on a large scale, but the connection with market, society and local innovation may remain limited.

CENTRAL IDEA

Resilience is organised centrally.

TECHNOLOGICAL DIRECTIONS

- Urban digital twins
- Predicting Multi-Hazards with AI/ML
- Rescue robotics & autonomous UAVs
- Resilient 5G/6G networks & network slicing
- Satellite IoT & LEO constellations
- Green hydrogen (PEM electrolysis)
- Large-scale storage (BESS) & demand response

HORIZON

2050

03 Market Pioneers

Πρωτοπόροι της Αγοράς

Innovation is primarily driven by the market, the enterprises and the dynamic innovation ecosystems. Technology adoption is quick and often individual, however, collective resilience needs may remain underfunded.

CENTRAL IDEA

Resilience is accelerated by the market.

TECHNOLOGICAL DIRECTIONS

- Na-ion batteries
- Energy storage & vehicle-to-grid (V2G)
- BIM-based digital building design
- Digital twins & building modelling (BIM)
- AI & robotics waste sorting
- Energy markets and data blockchain
- AI demand forecasting models

HORIZON

2050

04 Islets of Isolation

Νησίδες Μοναξιάς

The response to the impacts of climate change is fragmented, individual and poorly coordinated. Technologies are applied either locally or individually, without a common strategy and without the possibility of substantial scalability. Thus, the risk of solutions which respond in a fragmented way without a long-term effectiveness, increases.

CENTRAL IDEA

Resilience is organised locally.

TECHNOLOGICAL DIRECTIONS

- Collecting water from the atmosphere
- Resilient varieties & biotechnology
- AI models for local drought prediction
- Advanced indoor air purification
- Portable/modular flood protection systems
- Waste-to-energy recovery
- Autonomous off-grid solar & storage systems

HORIZON

2050