International Innovation Network for the Development of
Cost- and Environmentally Efficient Seasonal Thermal Energy Storages

INTERSTORES

A journey in seasonal thermal energy storage applications

Dr. Abdulrahman Dahash,

Dr. Christoph Bott,

Prof. Peter Bayer

Funded by the European Union

Motivation
Challenges in sTES

Space availability

Thermal losses

Integration into existing energy systems

Regulatory frameworks

Environmental compatibility

Reliability

High investment costs/economy

Special construction methods

Funded by the European Union

Dahash et al. (2021). Techno-economic and exergy analysis of tank and pit thermal energy storage for renewables district heating systems. RENE, 180.

INTERSTORES

- Call: *Demonstration of innovative, large-scale, seasonal heat and/or cooling storage technologies for decarbonisation and security of supply*
  - HORIZON-CL5-2023-D3-01-14

- Start date:
  January 2024
- Duration
  48 months
- Budget
  11 million €

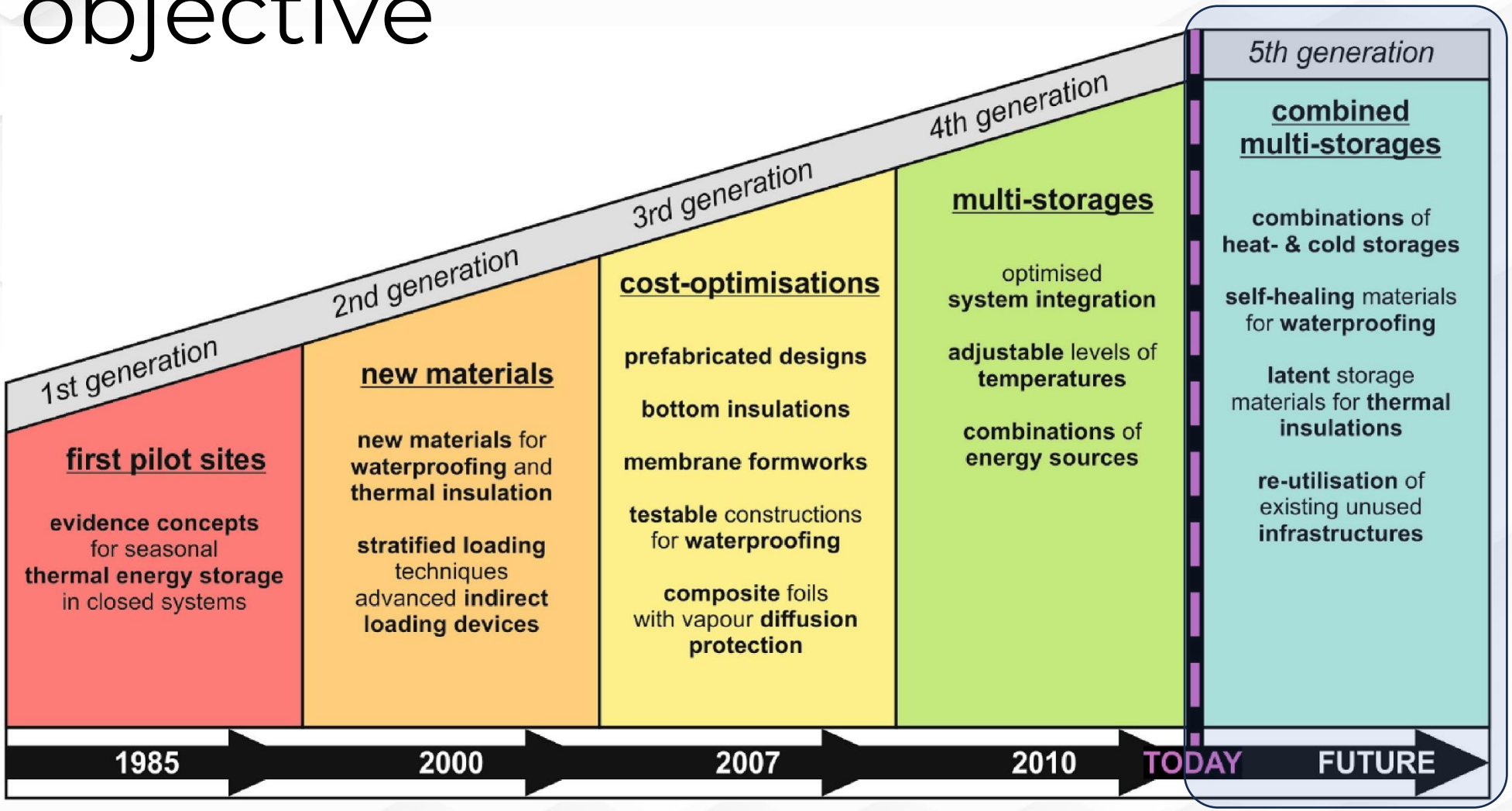
2 demo sites

9 countries

14 partners

Funded by
the European Union

INTERSTORES
Main objective



Funded by the European Union

Bott et al. (2019). State-of-technology review of water-based closed seasonal thermal energy storage systems. RSER, 113, 109241.

INTERSTORES
Objectives

Market acceptance, uptake and competitiveness

Novel concepts for sTES

Efficient, cost-effective sTES solutions

Full-scale realization

Maximize replication potential

Interdisciplinary cooperation

Improved simulation models and planning methods

Re-purposing of infrastructure as sTES

Funded by the European Union

INTERSTORES
TRL multi-faceted improvements

Market
- Risk of investments
- Competitiveness
- Transfer sites
- CAPEX, OPEX

Storage
- Energy losses and efficiency,
- Sealing and insulation materials,
- Monitoring, control and maintenance,
- Optimal planning, construction and operation

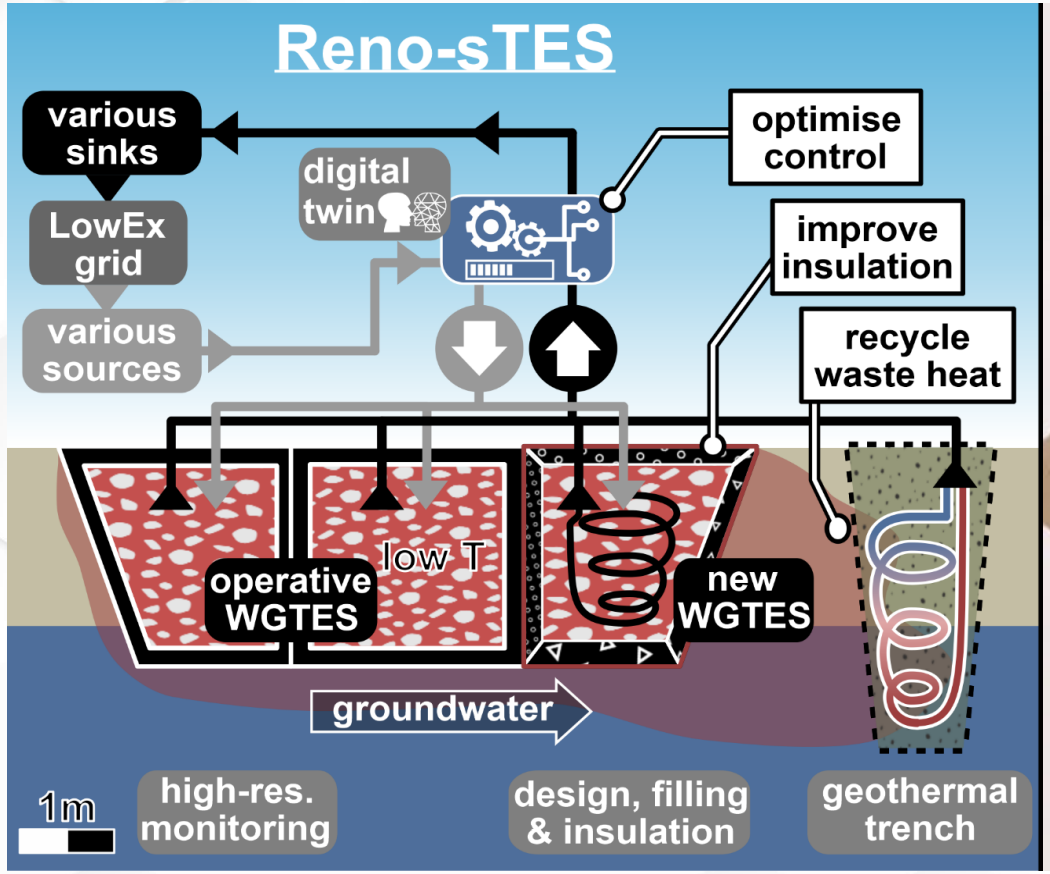
Environment
- Life-cycle perspective,
- Cycle economy,
- Sustainable energy sources,
- Space demand,

Energy system
- Systemic approach,
- Methods for buffering thermal energy,
- Smart integration and management,
- Robust, secured energy supply,

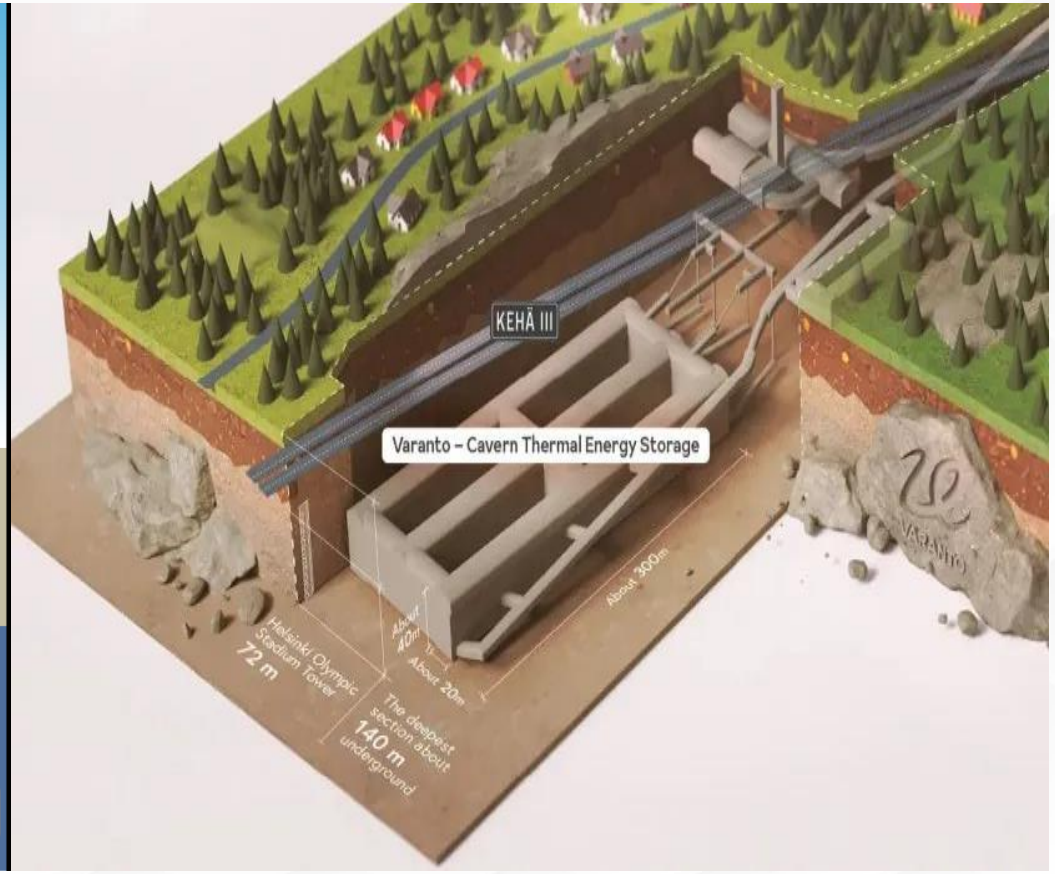
Funded by
the European Union

INTERSTORES
Demo-sites and innovations

IN-Campus, DE (18,000 m^3)



Varanto-VECTES, FI(1,000,000 m^3)



Funded by the European Union

Thank You

for Your Attention

Dr. Abdulrahman Dahash

AbdulRahman.Dahash@ait.ac.at

https://www.ait.ac.at/themen/sustainable-thermal-energy-systems/projects/interstores

Funded by
the European Union

INTER STORES

MARTIN-LUTHER-UNIVERSITÄT HALLE-WITTENBERG

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

energie global sprong alliance

GreenFlex

GTK

HSLU Lucerne University of Applied Sciences and Arts

incampus

INOSENS

PGMM GEBÄUDE.TECHNIK.DENKEN

Technische Hochschule Ingolstadt Institute of new Energy Systems

vantaa energy

VTT

WIZ RESEARCH

Funded by the European Union