meta build

META BUILD – Project Overview

HEP TOPLINARSTVO d.o.o.

FSB

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Overview

Title	Powering the METAmorphosis of BUILDings towards a decarbonised and sustainable energy system
Funding	HORIZON EUROPE, IA – Innovation Action
Lifetime	1 January 2024 - 31 December 2027 (48 Months)
Coordination	Institute of Communications and Computer Systems (ICCS)
Participants	38 Participants
Call / Grant	HORIZON-CL5-2023-D4-01

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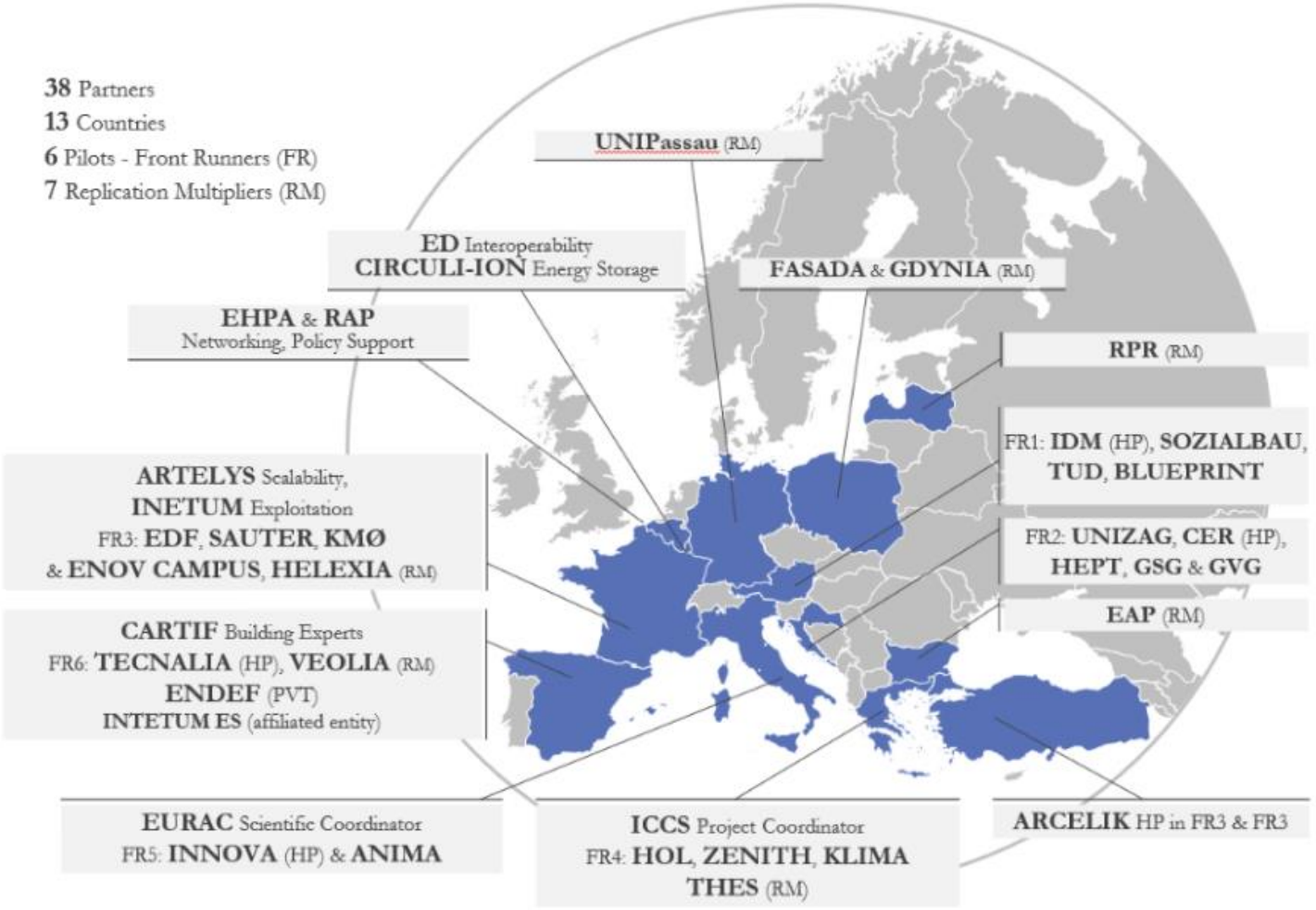
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Agenda

1. Introduction, Need and Objectives
2. Front Runners and replication multipliers
3. Croatian Pilot
4. Expected Outcoms
5. Next steps
6. Summary

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Partners



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1. Introduction, Need and Objectives

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Goals

- Decarbonisation is a crucial global initiative
- Primary goal of decarbonisation is to reduce CO2 emissions and other greenhouse gases associated with human activities.
- Main goals of the META BUILD project:
  - Electrification technologies for thermal energy demand in building sector
  - Integration of renewable energy sources and storage
  - Building digitalisation and intelligence with smart energy menagement systems

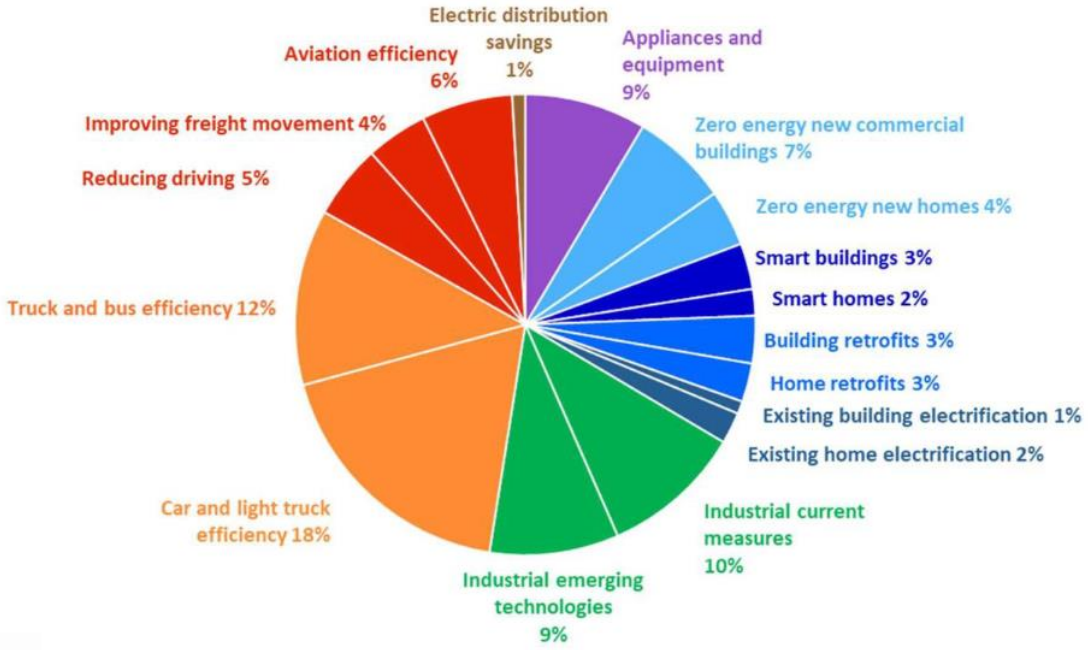


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Allocation of efficiency savings

- Improving energy efficiency across various sectors plays a vital role in decarbonization. By reducing energy consumption through efficient technologies and practices, the demand for energy production decreases, leading to a corresponding decline in carbon emissions.
- Energy-efficient buildings, households are instrumental in achieving this objective as 1/3 of those reduction need to come from them



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2. Front Runners and Replication multipliers

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Front Runner 1 - Austria

- Retrofitting a building owned by a non-profit social housing company that houses 58 residential units
- Building will be thermally insulated
- Brine-to-water heat pumps will ensure heating demand
- PV panels for providing electric energy for heat pumps

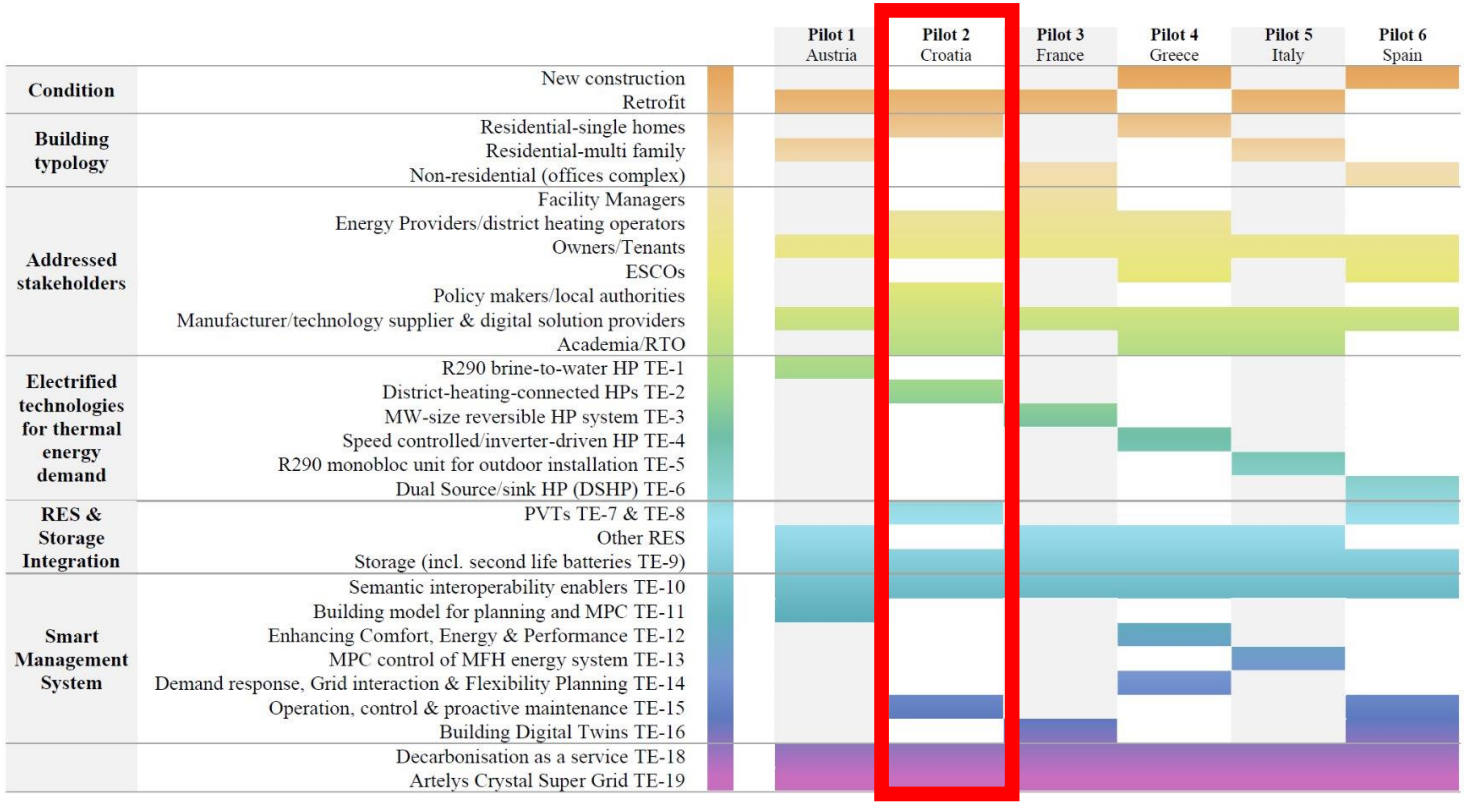


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Front Runner 2 – Croatia

- Retrofitting 6 residential buildings (GSG owned)
- Retrofitting existing 4.4 MW oil-fired boiler
- Installation of DH connected HP
- BMS integration



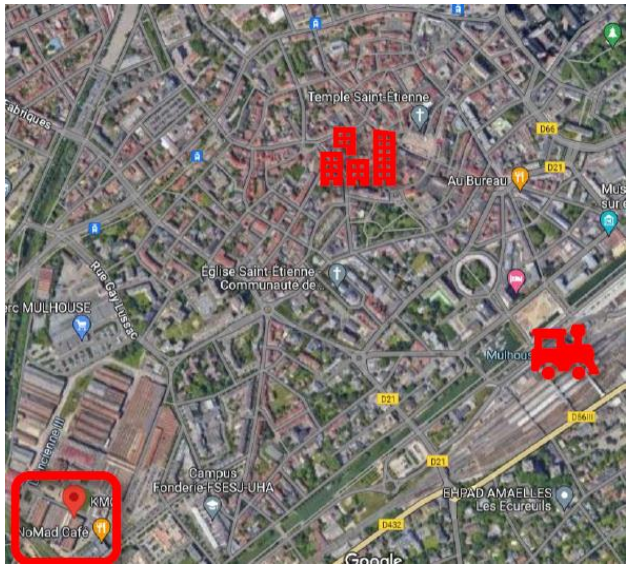
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Front Runner 3 - France

- Transforming historic industrial complex into an eco-district
- Integrating PV panels with heat pumps for electrifying heat demand
- Looking for ways to integrate PVT panels for extra heat
- Digital twin → User interaction with energy system

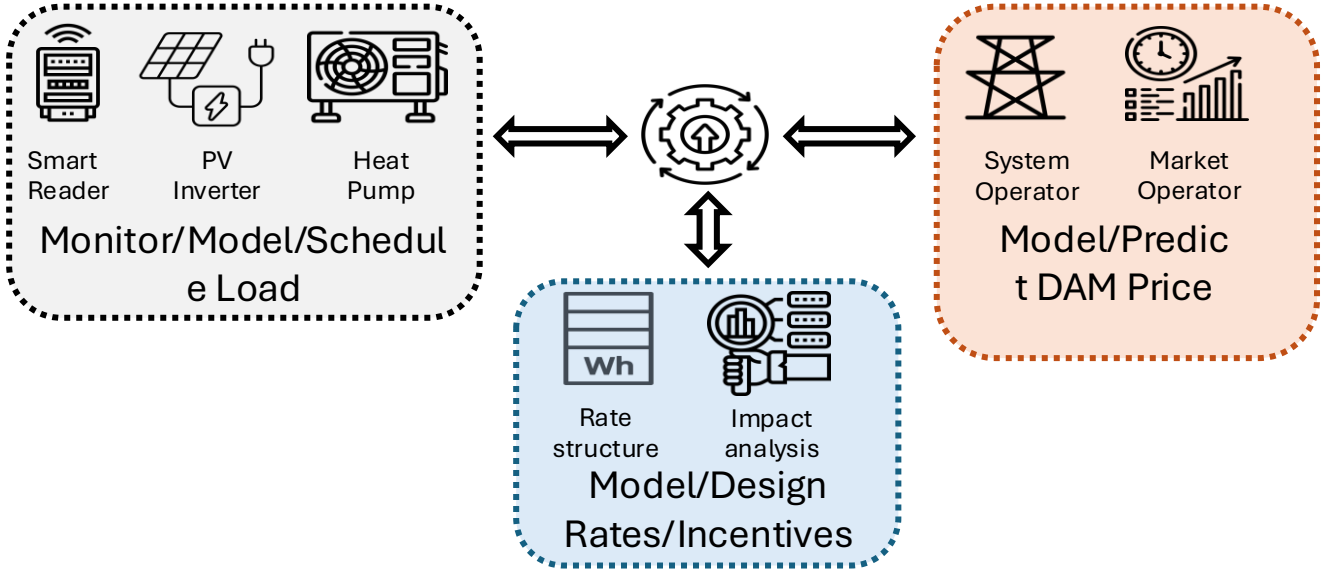




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Front Runner 4 - Greece

- Innovative Decarbonisation-as-a-Service Lab by creating ecosystem of 7 diverse homes/apartments
- Focus on Energy Efficiency and Demand Response
- Integration of smart energy menagement systems such as: Indoor air quality, Load monitoring, Solar thermal + PV inverter API's

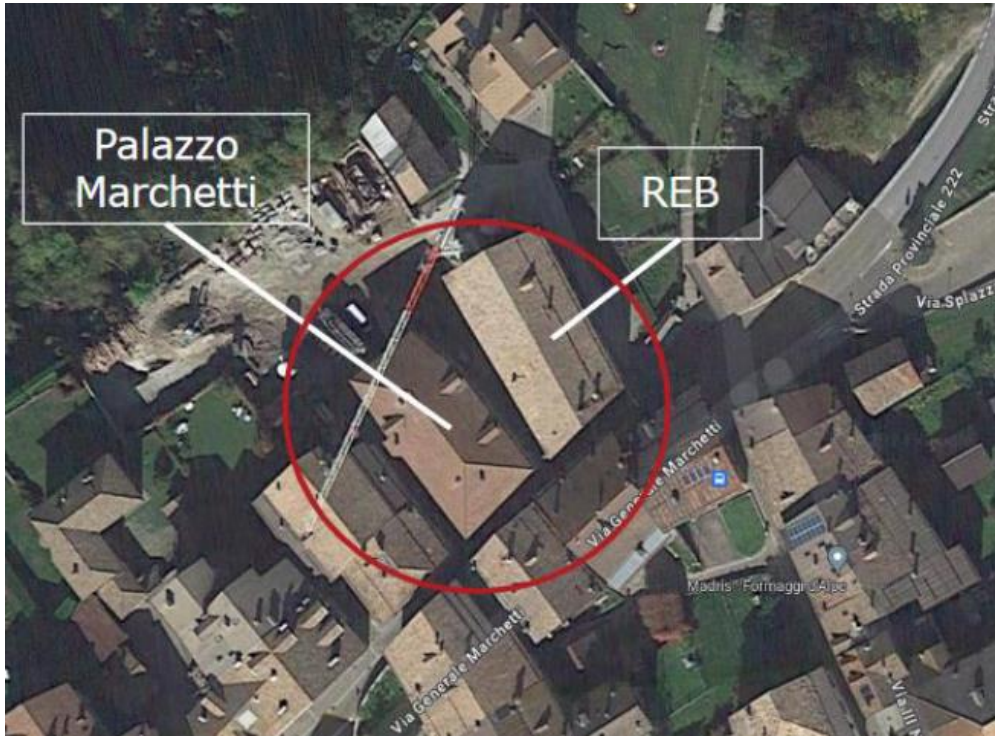


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Front Runner 5 - Italy

- Retrofitting REB structure into 13 individual dwellings and Palazzo Marchetti into luxury hotel
- Goal is to preserve architectual heritage and economic and cultural revitalization
- Technologies that will be integrated include: Heat pumps, Phase change material storage and PV system

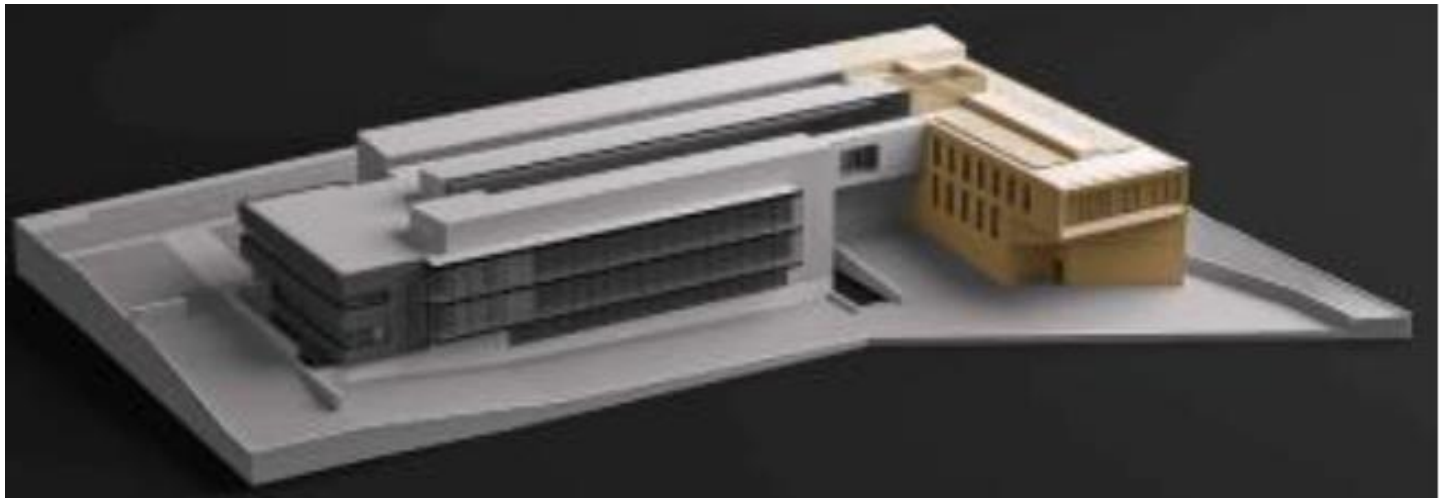


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Front Runner 6 - Spain

- Extension of Tecnalia's headquarters
- Thermally activated foundations and Hybrid heating/cooling system
- Dual-Source heat pump with PVT system and Smart monitoring
- Reducing energy demand, optimizing efficiency and increasing RES share



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Replication Multipliers

- University of Passau – Germany
  - Retrofitting the Sports center/Kindergarten and maximizing PV consumption, utilizing waste heat and implementing AI-based prediction analysis
- Facade Elevation Works Company LLC – Poland
  - HP installation and smart management in kindergarten
- Riga Planning Region – Latvia
  - HP installation with PV and smart management in multi apartment building
- Energy Agency of Plovdiv Association – Bulgaria
  - Implementation of smart management in single-family residential building

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Replication Multipliers

- Municipality of Thessaloniki – Greece
  - Integrating geo-sourced HP with PV and smart management school complex
- Veolia Servicios Lecam Public Limited Company – Spain
  - HP installation with PVT and smart management at residential and non-residential buildings
- Helexia Corporate – France
  - Retrofitting of warehouse and implementing HP’s and hybrid solar panels with energy storage

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3. Croatian Pilot

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Pilot Site

- 6 residential buildings
- Built in 1974.
- Usable area of 6310m²
- Heated building volume of 19950m³
- 400 MWh/a electricity demand
- 680 MWh/a heating and hot water demand







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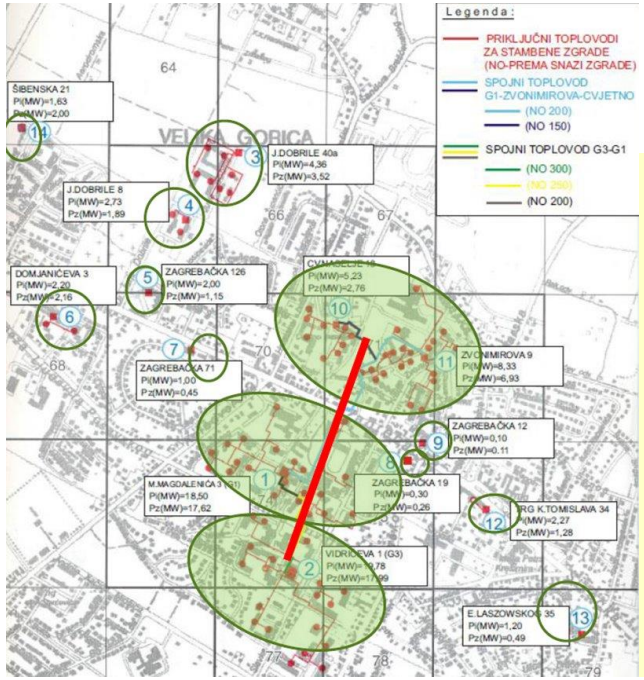
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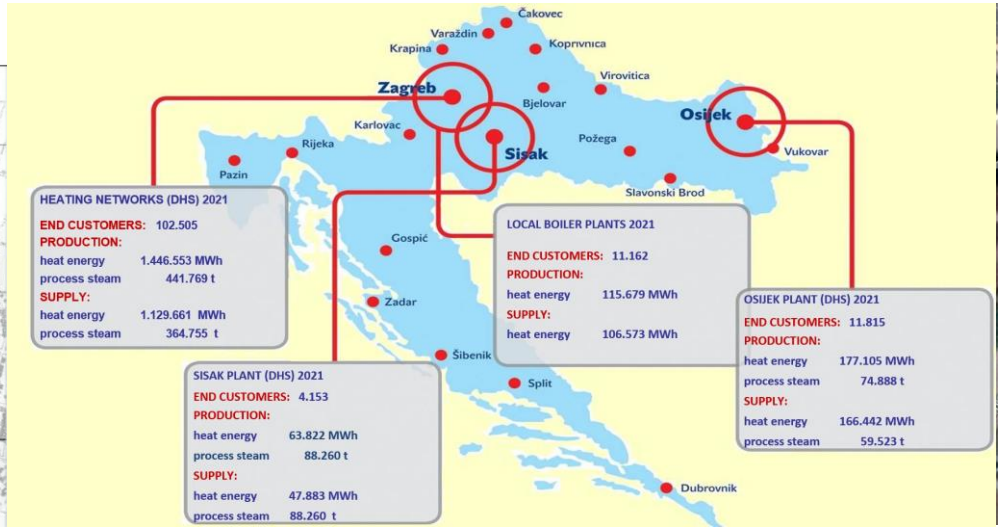
Pilot Site

- 4.4 MW boiler room
- 90/70°C
- Integration with existing DH

SYSTEM PARAMETER	VALUE
CONTRACTED POWER	46,56 MW (installed 59 MW)
HEATED AREA	338.379,91 m^2
NUMBER OF HEATING SUBSTATIONS	120
PIPELINE LENGHT	10.671m
PERCENTAGE OF PREINSULATED PIPES	70%

Year	Fuel oil consumption (L)	Heating energy (MWh)	Efficiency (%)
2021.	991,024.00	6,611.00	68
2022.	954,096.00	5,888.00	63

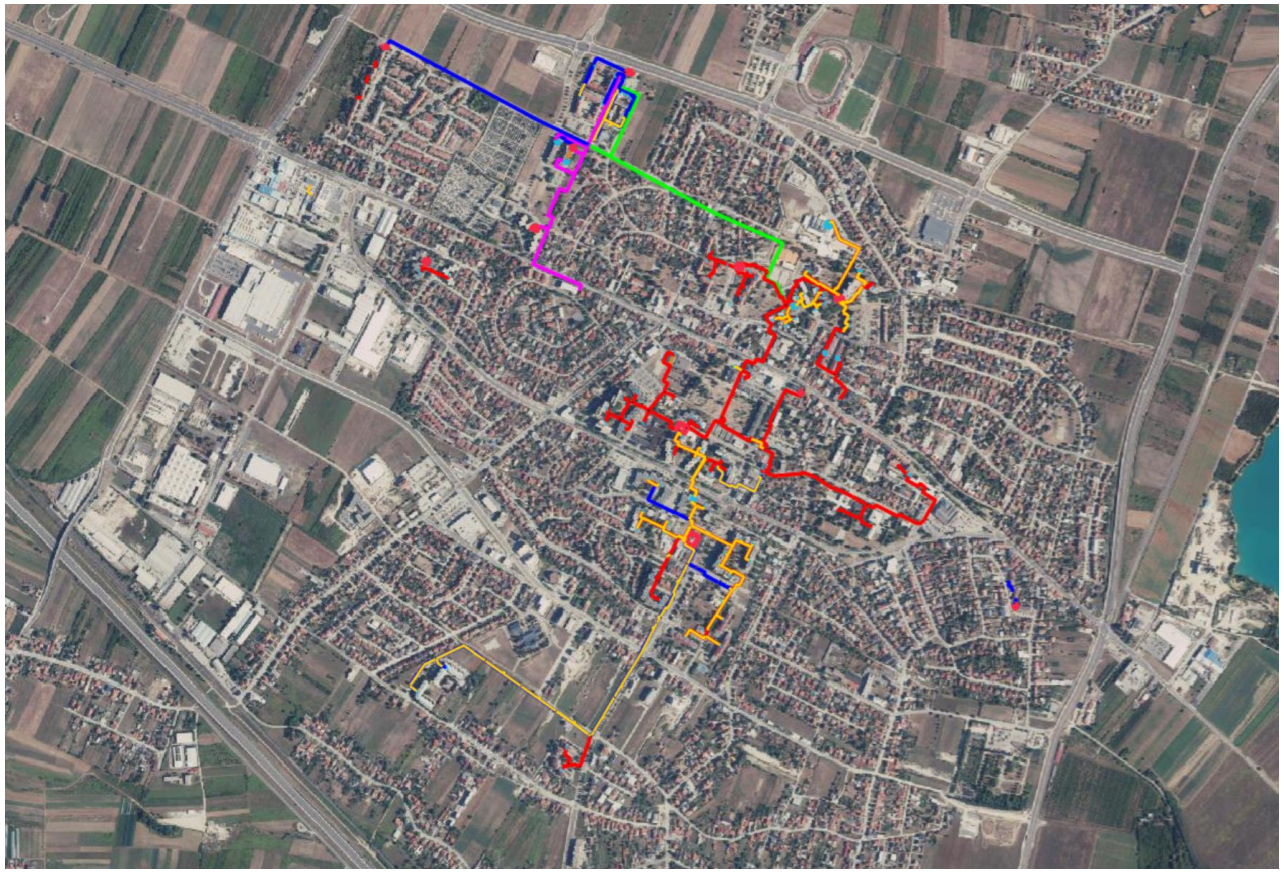






Existing DH system in Velika Gorica

General data	
The temperature regime	90/70°C
Total number of consumers connected to the system	878
Total heated area	821 households and 57 commercial consumers
Total number of heating substations	15
Length of the heating network	1900 m
Total heated area	41,160m^2
Delivered energy on annual basis	Approx. 5.7 GWh



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4. Expected Outcomes

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Expected Outcomes

- Renovated buildings with improved energy efficiency
  - Retrofitting of the existing residential building by implementing energy efficiency measures
- Integration of HPs and PVT panels
  - integration of hybrid technologies, monitoring and control systems
- Building electrification rate
  - implementation of electrification technologies

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Expected Outcomes

- Energy bill savings
  - Renewable energy integration, DH optimisation
- Improved indoor enviromental quality
  - User experiance analysis

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5. Summary

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Summary

- META BUILD project focuses on electrifying thermal energy demand in buildings using:
  - Energy Efficiency Measures
  - Intelligent Energy Menagement
  - Heat pumps
  - Photovoltaic Panels (PV)
  - Photovoltaic-Thermal Panels (PVT)
- Project's main focus is helping to achieve EU goals for building decarbonisation through advanced technologies. It showcases innovative solutions for not only reducing energy consumption and CO2 emissions, but also enhances building comfort, reliability and overall performance

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