NRG4CAST

ENERGY FORECASTING

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SEVENTH FRAMEWORK PROGRAMME

The aim...

...is to develop advanced solutions for predicting behaviour of local energy networks for fundamental scenarios:

- **Predicting energy demand** on several network granularity levels (region, municipality, city, business, household and energy service provider),
- **Predicting energy network failures** on interlinked local network topologies,
- Detecting **short term trends in energy prices** and **long term trends in national and local energy policies.**

The main concept is monitoring of energy behaviour in different network layers: single buildings, neighbourhoods and urban environments.

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Intelligent sensors Existing infrastructure information Energy bidders Weather forecast, temperature,...	Data conversion and data adapters Data cleaning and data fusion Distribution	Modelling Information extraction Semantic Enrichment Metadata generation	Compelx events detection Route cause analysis Knowledge formalisation	Complex events description Multicriteria optimisation Situational awareness
Information collection Network topology Sensor information Energy prices External sources	**Basic processing and cleaning**	**Advanced processing and modeling**	**Realtime monitoring, management, complex events detection**	**Real-time decission support: Prediction, Trend detection, Optimisation and Planning** → Warnings and reactions → Context, plan generation
	Traditional networks	New energy network models	Integrated networks	Reasoning, diagnosis	API, Toolkit
WP1	WP2	WP3	WP4	WP5	WP6

Case Studies

1. NTUA campus scenario

- To monitor the energy consumption of the whole Campus and to be able to predict its energy demands.
- Electricity meters and natural gas flow meters will be installed across all Campus buildings. An office will be monitored, in terms of thermal comfort level; temperature sensors, relative humidity sensors and lux meters will be installed.
- The measuring data will be used as inputs for the energy forecasting software.
- A screen will be installed in the Rector's building to demonstrate the real time energy consumption of the NTUA campus.

2. MFC scenario

- The city-like pilot scenario.
- Correlates energy consumption data of Italian public buildings (CSI building, school and university building, public offices etc.), energy street light consumption data collected through a cognitive sensor network installed in Slovenia by Envigence and data and usage profiles for electric cars provided by FIR in Germany. The energy provider IREN will assure the energy data availability for the buildings involved.
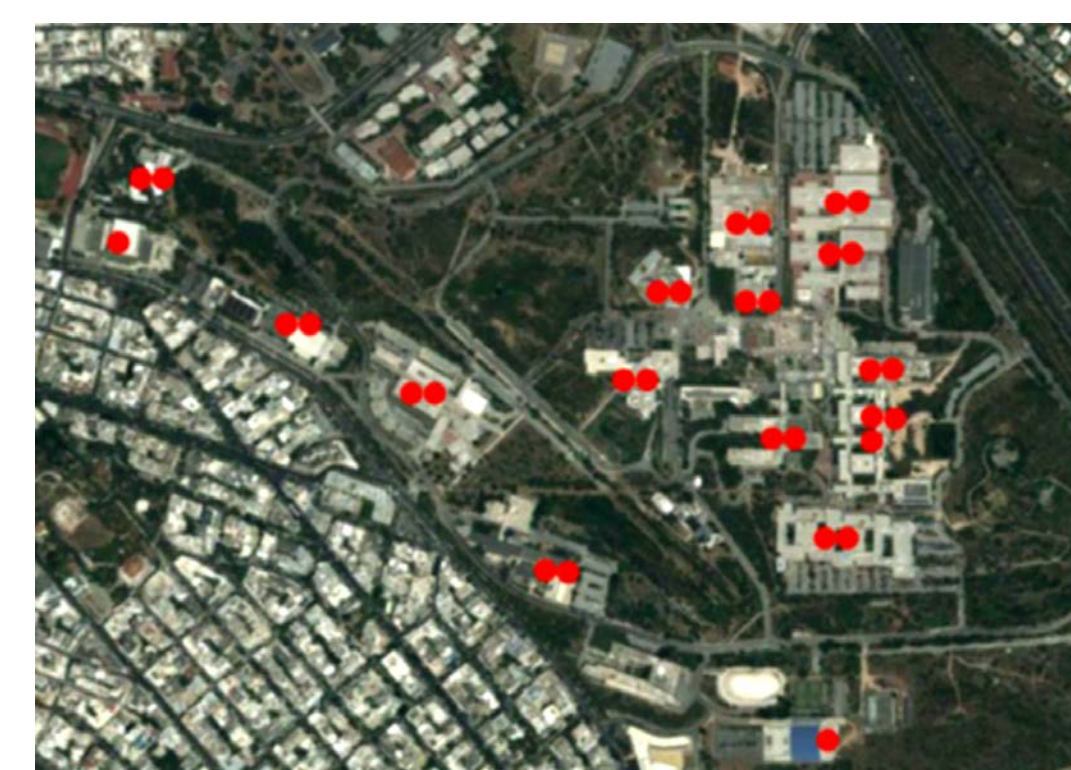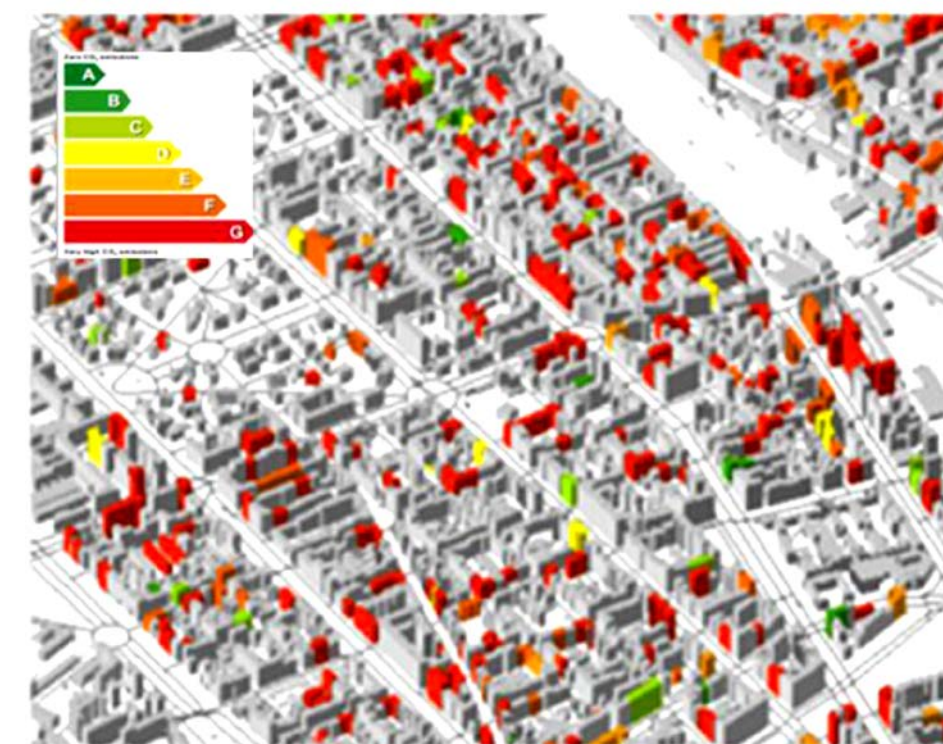
Architecture:
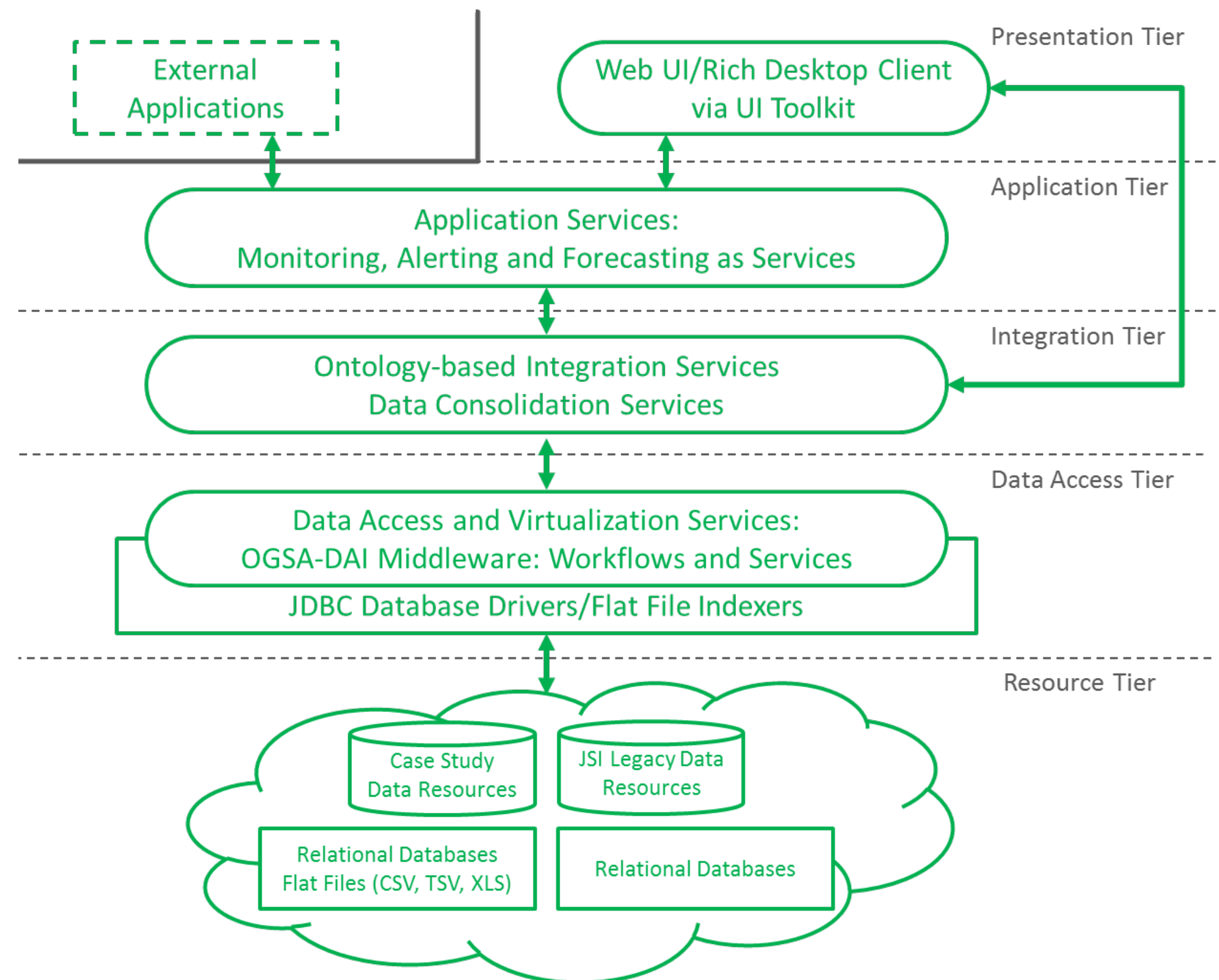
Objectives

The services integrated in a software module pipeline will provide prediction and the decision support system based on network monitoring, anomaly detection, route cause analysis, trend detection, planning and optimization.
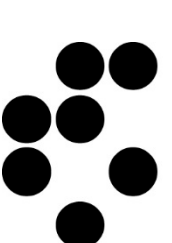
The platform will be tested in the two orthogonal case studies: energy efficiency in municipalities and energy efficiency in city districts.

The project concentrates on electric power networks through the development of a generic framework that is able to **control, manage, analyse** and **predict** behaviour in an extensible manner on other energy networks.

A result will be **a generic toolkit with programmable data adapters.**

Partners