



## OPTIMUS Decision Support System: An Overview

### Introduction

The OPTIMUS DSS is an integrated web-based platform which is designed to help local authorities identify the best energy saving opportunities available in their buildings. It is composed of multiple different modules and its internal architecture is shown in Figure 1.

### Data Capturing Modules

These are modules that capture data from the sources and send it to the semantic framework. The modules have been developed as Java or Python applications. The data captured by each module are:

- **Weather forecasting:** data regarding forecast weather conditions as well as weather data from control units.
- **De-centralised sensor-based:** data regarding energy and environmental performance, mainly through sensors.
- **Feedback by occupants:** data from building occupants acquired through the TCV application or social media, regarding comfort aspects.
- **Energy prices:** data regarding energy prices from the day-ahead market.
- **Renewable energy production:** data regarding the production of energy from any renewable energy sources.

### Semantic Framework

The framework consists of a communication infrastructure based on semantic web technologies which facilitates transfer of data from distributed sources, and subsequent contextualisation of the raw data in specific contexts.

The semantic framework is based on the publish-and-subscribe communication pattern which has been implemented with the Ztreamy system, a Semantic Service which processes the data with the purpose of contextualising them, and the Virtuoso triple-store as a data repository.

#### More technical information on the:

- **Semantic Framework can be found [here](#).**

### DSS Engine

The goal of the DSS engine is to propose action plans to the end user. To do so, the intelligent rules have to be fed with predicted, real-time and static data.

The DSS engine is composed of prediction models –implemented as RapidAnalytics processes– inference rules, and a MariaDB database to store the results. The inference rules have been implemented as Symfony PHP web application.

More technical information on the:

- Prediction Models can be found [here](#).
- Inference Rules can be found [here](#).

### DSS Environments

The DSS has two environments for different kinds of users:

- An end-user environment for energy managers of the buildings to visualise monitored data and manage suggested action plans.

- A management environment for technical users to setup and fine-tune the DSS.

The end-user and management environments have been implemented as a PHP web application, using the Symfony framework.

More technical information on the:

- Environments can be found [here](#).
- DSS can be found [here](#).

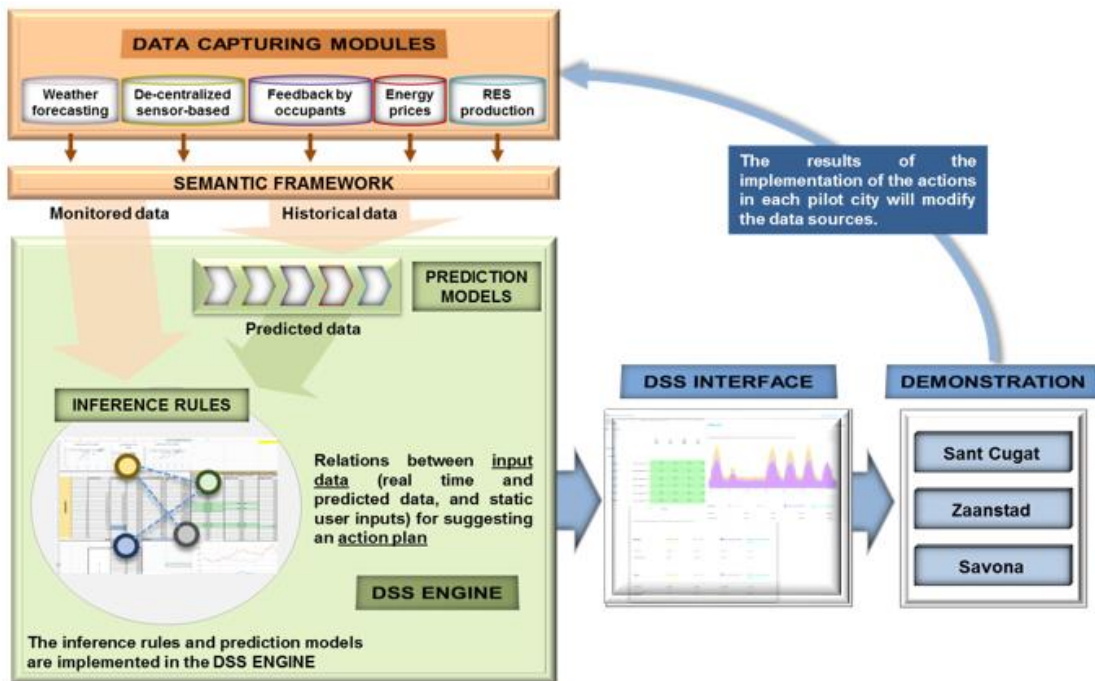


Figure 1. OPTIMUS DSS internal architecture

### The OPTIMUS project

OPTIMUS aims to design a Decision Support System (DSS) to help towns and cities reduce CO<sub>2</sub> emissions by optimising energy use in public buildings.



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 608703. The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained therein.