EIT developed a Smart Energy Simulation Based Control method to reduce the energy consumption in the operational stage of existing non-residential buildings. The Consortium created new techniques based on the prediction of indoor comfort conditions and user behavior performance to improve Lifetime and Efficiency of Energy Equipment and Installations through continuous commissioning and predictive maintenance with the possibility to centralize the remote control of different buildings in a single automated process.

### TECHNICAL WORK PLAN

1. **Requirements & System Architecture**
2. **Simulation Reference Model**
3. **Whole building Intelligent Control System**
4. **Diagnosis & Continuous Commissioning**
5. **Energy Decision Support Tool**
6. **System Integration & Pilot-Scale Validation**
7. **Demonstration through demo sites**

### DEMO SITES & INTERMEDIATE RESULTS

Energy IN TIME is being tested and validated at four non-residential demo sites located in different geographical areas with diverse climatic conditions with different characteristics, such as building use, properties and age.

- **Airport - Faro (Portugal)**
  - Area: 41,000 m²
  - Open spaces, 6 million of passengers

- **Offices and Test Labs - Bucarest (Romania)**
  - Area: 17,384 m²
  - Built: 1982
  - Closed and distributed spaces, constant flow of people, scheduled occupancy

- **Commercial and Office Building - Helsinki (Finland)**
  - Area: 38,190 m²
  - Built: 1999
  - Open and distributed spaces, 1,400 people working daily, scheduled occupancy

- **Hotel - Levi-Lapland (Finland)**
  - Area: 42,500 m²
  - Built: 2010
  - Distributed spaces, seasonal occupation, 170 guest rooms

### EXPECTED IMPACT

Energy efficiency tangible optimization in buildings

Energy IN TIME goes beyond existing building control techniques and presents an innovative solution for building operation energy and maintenance costs with savings of up to 20% over traditional energy consumption.

### THE ‘W²’ GOALS OF THE EiT SOLUTION

1. **When?**
   - Ensure energy consumption IN TIME, only when really needed
2. **What?**
   - Consume only what is really needed

### IMPLEMENTED TECHNOLOGIES

- Automatic operational plan generator
- Building HVAC Fault Detection & Diagnostics
- Fault-adaptive control for VAV damper stuck in a multizone building
- Decision support method for building mid-long term analysis
- Data mining for building operations improvement

### REAL APPLICATIONS

- Verify the function of the existing systems in real buildings
- Detect possible ways to improve developed systems
- Find direct energy and maintenance cost savings
- Improve indoor climate in spaces to ensure energy and economic strategies
- Implement proactive maintenance procedures