



# Intelligent energy efficiency control in hospitals-Pilot Case Seinäjoki Hospital

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# Project background



- In the complex environment of a hospital, Heating, Ventilating, Air-conditioning (HVAC) and Lighting account for nearly 80% of all energy use.
- The potential savings achievable can reach up 40% depending on the current condition of the hospital
- HVAC and lighting are the major contributors.
- Half of it, being 20%, can be attributed to the impact of ICT.

# Consortium



- Partners

1. Philips Lighting, NL ◀ **Coordinator**
2. Philips Iberica S.A.U., ES  
Acciona Infraestructuras S.A., ES
4. Fundacion Labein, ES
5. Valtion Teknillinen Tutkimuskeskus, FI
6. Centre Scientifique et Technique du Batiment, FR

- Partners

1. Philips Lighting, NL



## **Coordinator**

2. Philips Iberica S.A.U., ES

# Project Objective



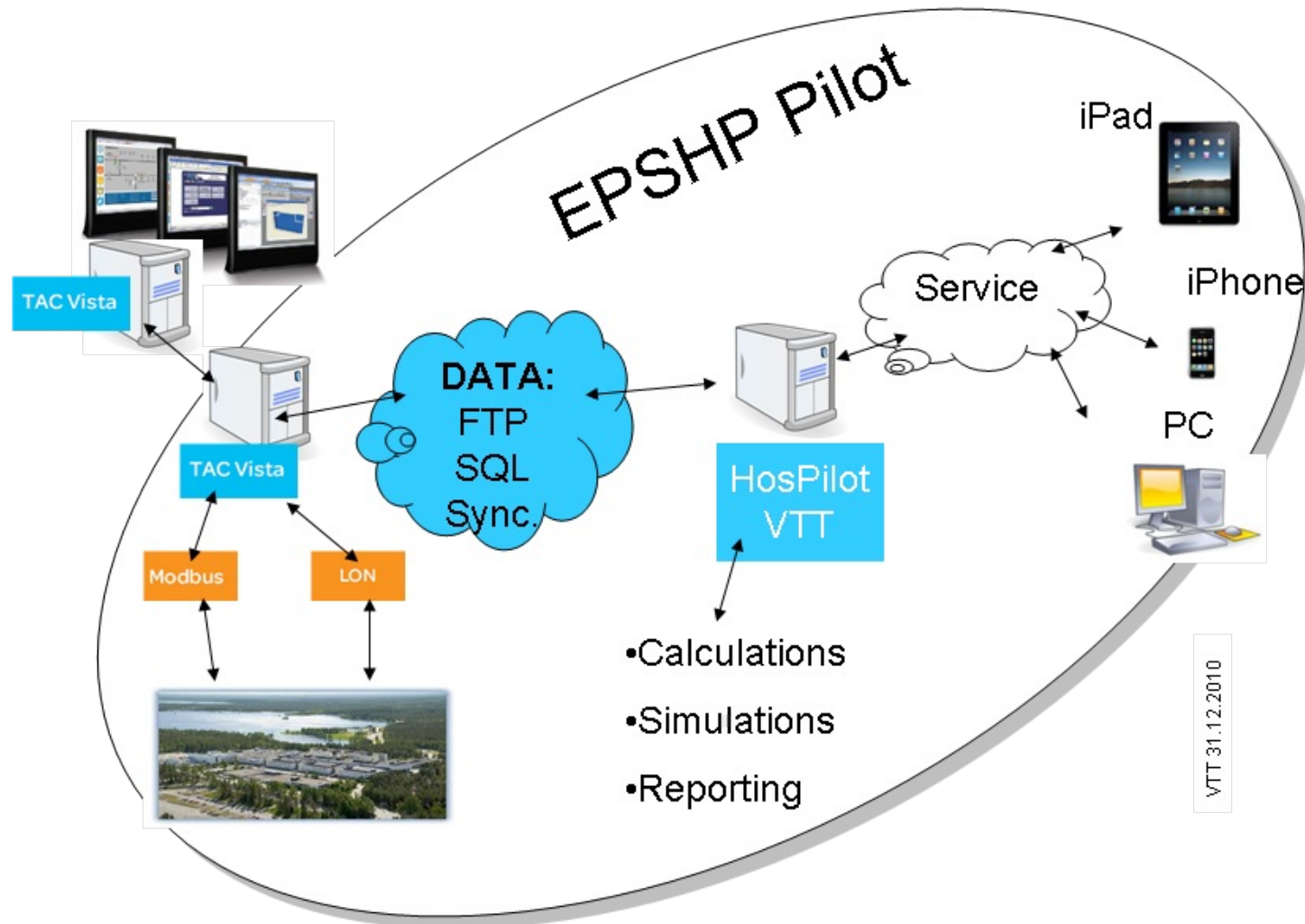
- The **ultimate goal** of The HosPilot project is to support the decision makers
- Systematic approach (Methodology)
- Hardware plan based on hospital-specific requirements
- Prove the simulated energy savings

# Project Aim-

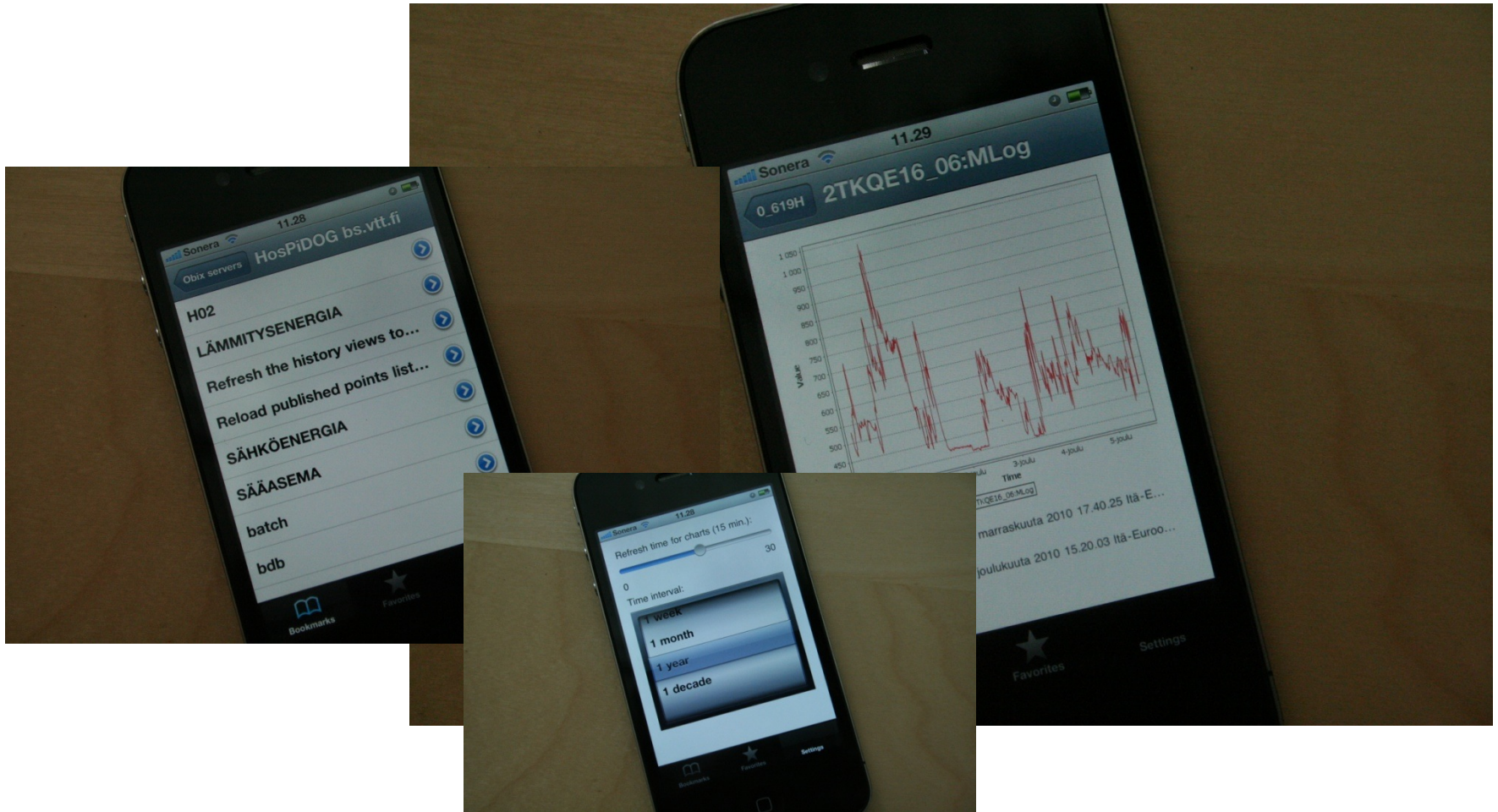


- Energy efficiency in the EPSHP is **targeted** as “the same or more comfort with less energy”
- final results will be therefore Discussed vs  
comfort

# Pilot actions vs FM systems



# Pilot data in iPhone / iPad



# Next steps

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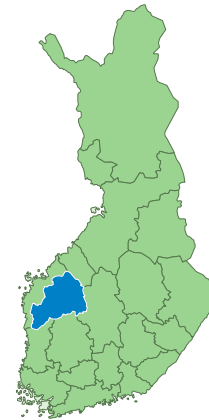
- Monitorig will continue almost to end of 2011 in Seinäjoki Hospital
- Pilot specific simulations to compare with monitored data
- test version of a service to show Seinäjoki Hospital monitored data using iPhone



# Seinäjäki Central Hospital



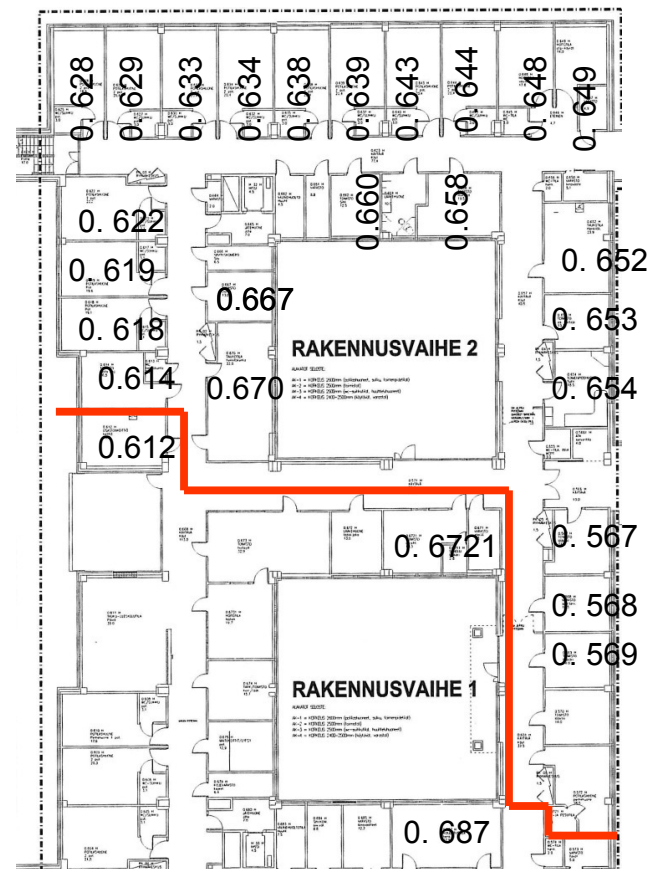
- Seinäjoki Central Hospital
- Communes 20
- Inhabitants 198 800
- 2500 employees



# Electricity Measurements



- Electricity pilot target
- Phase 1: conventional equipment.
- Phase 2: LED-tubes, daylight and presence detection.
- The selected DALI-solution enables collecting of measurement-, status- and consumption data from individual lights.



# Electricity Measurements



- The Floor is divided in 6 electricity-centrals. This all makes it possible to compare total electricity usage comparison between these two half's. The measurement begin at 9.11.2010 and will last up till 31.10.2011.



# Electricity results



- Preparative results indicate the benefit of LED-tubes, daylight and presence detection:
- Total energy consumption 9.11.-10 - 20.1.2011:
  - 7505 kWh (H01 renovated)
  - 5084 kWh (H02 HosPilot, daylight and presence detection, LED-lamps)

# Electricity results



- Momentary energy consumption 14.2.2011 at 11.00 am:
  - 1020 kW (H01 renovated)
  - 975 kW (H02 HosPilot, daylight and presence detection, LED-lamps)
- Energy consumption 14.2.2011:
  - 12,6 kWh (H01 renovated)
  - 9,4 kWh (H02 HosPilot, daylight and presence detection, LED-lamps)

# Electricity preliminary findings



- Four seasons in Finland take into consideration.
- The benefits of daylight detection will be highlighted at spring and summer.
- Measurement indicate that in the day time only 25 percent or less of the whole lighting power is in use.
- The users have been satisfied with the possibility to adjust the brightness of the lighting (corridors 0/10 %).

# HVAC Measurements



- **The main goal** of HVAC measurements is to compare conventional HVAC solution of this ward with more advanced technical room level solutions concerning energy savings.
- **The conventional HVAC** solution of this ward consist of CAV on room level and thermostatic radiator valves.

# HVAC Measurements cont.



- o **The more advanced** technical room level solutions include occupancy, room air quality and room temperature controlled variable air flow, presence controlled air flow (minimum/normal), occupancy controlled heating and window/door switch activated energy saving mode of air flow control and heating control.



# HVAC Measurements cont.



- On the testing area there are 17 rooms equipped as follows:
  - VAV boxes+ motorized radiator valves (5 rooms)
  - CAV + thermostatic radiator valves (3 rooms)
  - CAV + motorized radiator valves (2 rooms)
  - CAV + thermostatic radiator valves (3 rooms)
  - VAV boxes+ motorized radiator valves (2 rooms)
  - Occupancy sensor controlled minimum / (2 rooms)  
normal air flow + motorized radiator valves

# HVAC Results



- All HVAC-measuring in the ward is carried out by VTT. The collection of data begun in November 2010 and will continue to the end of October 2011. In this stage of the process has VTT not yet made any conclusions but continues with data collection.

# HVAC Discussion



- At the stage of deployment we had some difficulties with indoor climate in the area of new installations, mostly with room temperatures.
- After some tuning of building automation we have now won the difficulties and personal feel pretty satisfied with indoor climate.

# Discussion cont



- When it is about the conclusions concerning energy savings, we must keep in mind the weather in our latitude ( $62^{\circ}56'$ ). It varies so much during a year that to be sure of the results, it is better to be patient and collect data for a time long enough before final conclusions.

# 5 min Youtube Video

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o <http://www.youtube.com/watch?v=cmdvd4Qv7Rs>

# Thank you

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## Project website

<http://www.hospilot.eu>

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