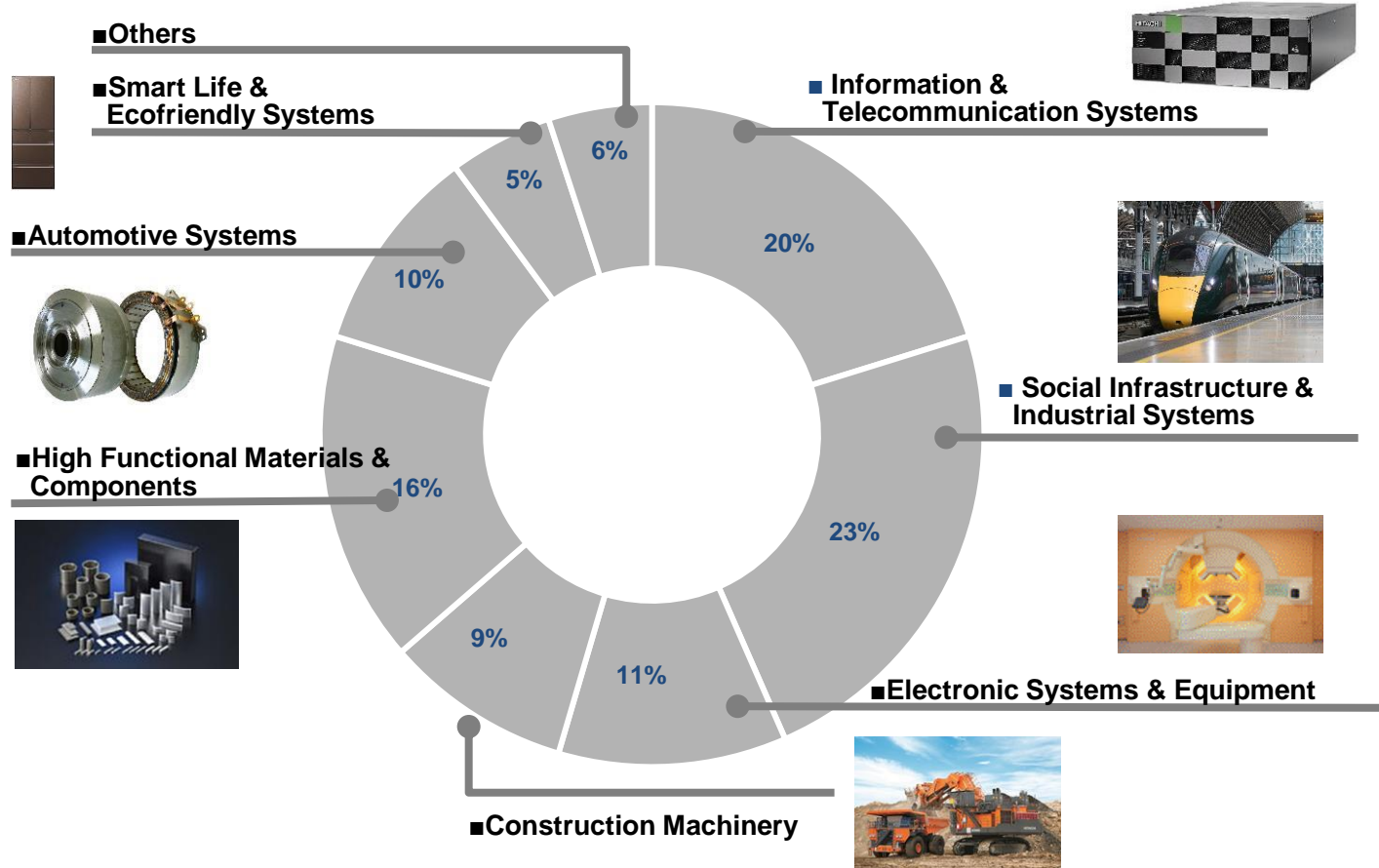




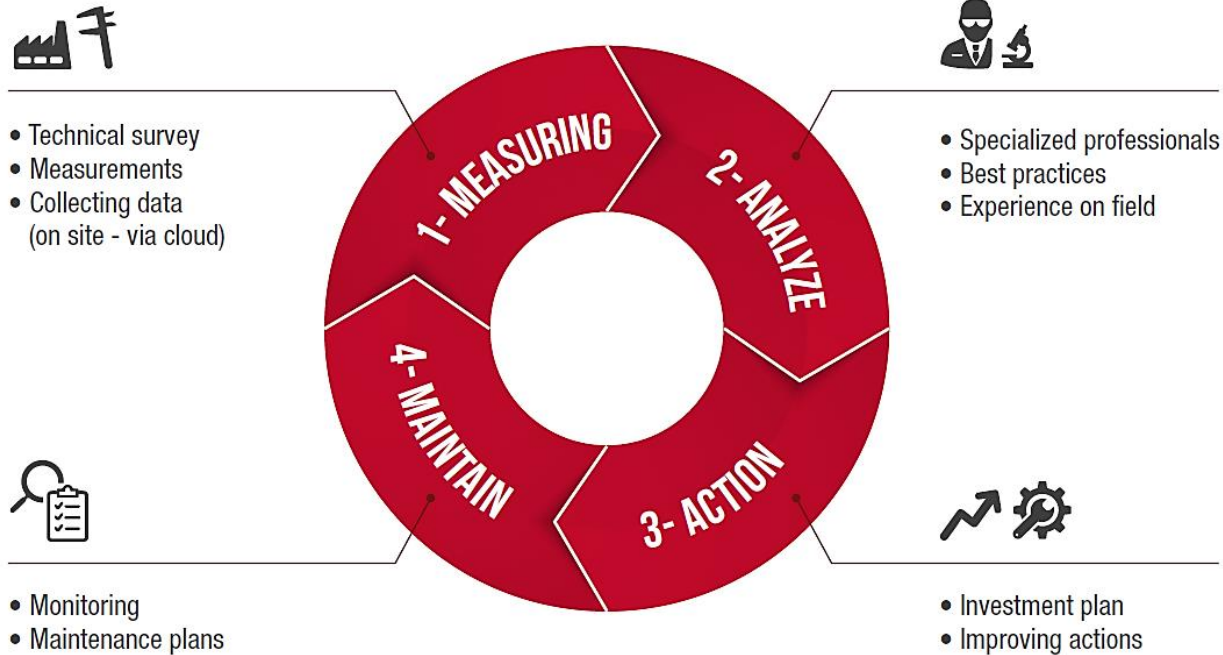
Alessandro Bettin

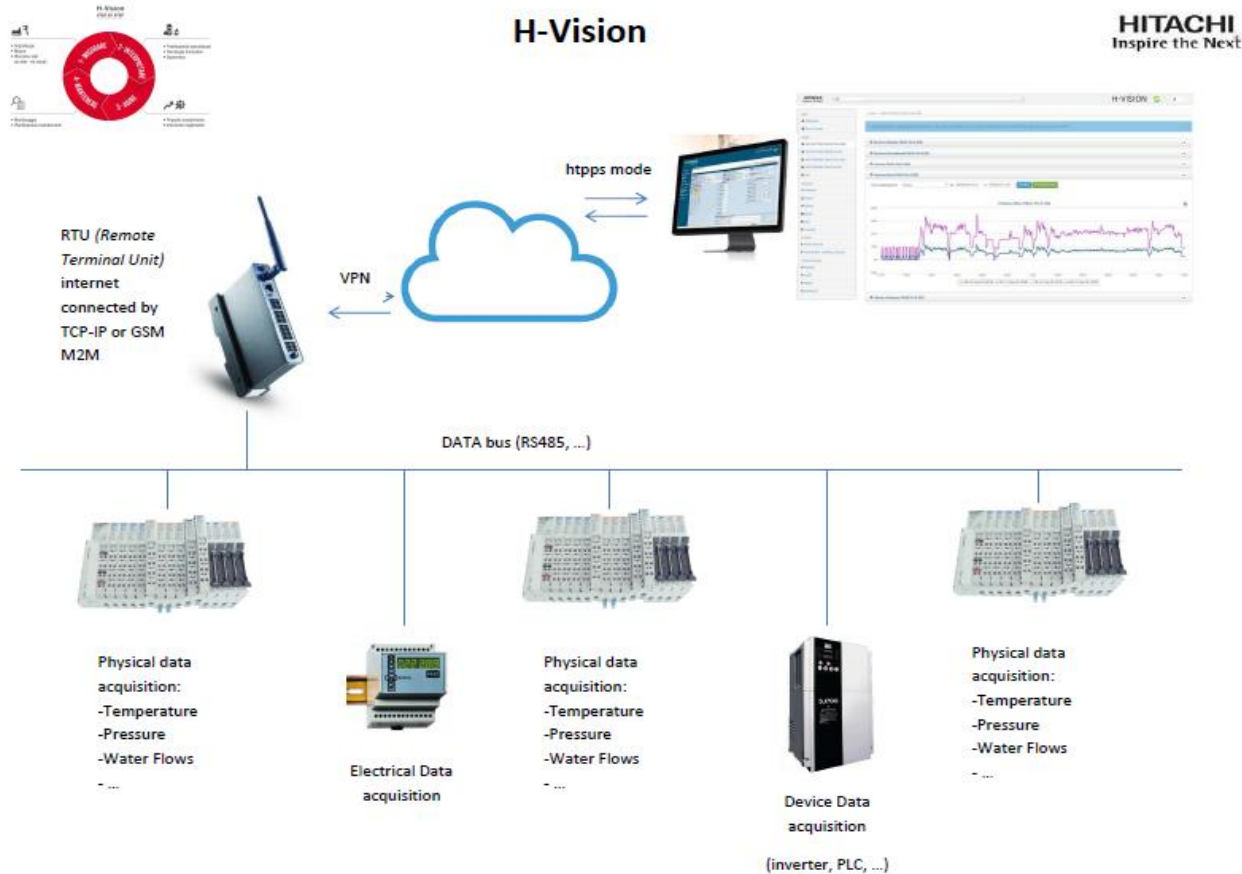
Energy Management

Hitachi Segment Constitution (FY2017)



H-Vision STEP BY STEP





- Hydraulic and electric metering
- Evaluation of **pumps operation**
- Calculation of the overall **Pumping Station Efficiency**
- **Upgrading** of the pumping station (design and start-up)
 - ✓ Use of **variable speed drives**
 - ✓ **Pumps operation** optimization
 - ✓ Installation of **high efficiency pumps and motors**
 - ✓ Pumps Start/Stop optimization
- **Water hammer** control
- **Air Control**



Water Pumping Station



MEASUREMENT

Flow - Pressure - Electrical power

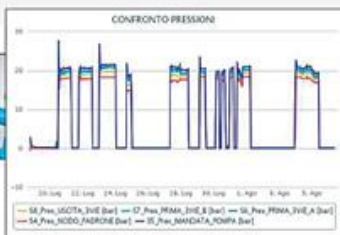
4 months of continuous collection of data (1 minute sample) in order to define the baseline of consumption, peaks and temporary change of load. Thanks to these information together with localized and distributed pressure loss in the pipe plant it was possible to determinate the correct working point.



DATA ANALYSIS

- 4 mono-stadium centrifugal pumps 75 kW
- Consumption: 877.820 kWh
- Non optimized efficiency 45-52%

One of the main problem has been identified as to a manual valve "half-closed" to reach the flow rate desired.



ACTION

- Fully open the cut valve
- Installation of a pressure sensor to drive 2 inverters (not 4) and reduce the output pressure
- Electrical motors have been changed to IE3 and some pipes has been changed too



RESULTS

The single pumps efficiency reached is now 66% in media, and the total electrical consumption has been reduced of almost 15%.

RESULTS

BEFORE H-Vision: 2.603.473 kWh/year
AFTER H-Vision: 2.217.331,20 kWh/year
DIFFERENCE €: 81.089,57 Euro/year
ROI: 11 months

Hospital



MEASUREMENT

Temperature - Refrigeration

What's first necessary in an Hospital Operating Room is to guarantee the aseptic ambient. The control of temperature is fundamental, so it's necessary to provide a refrigeration system. Plus, there are patients rooms. How do these system works in terms of efficiency, especially when these units are very big and their consumption is important?



DATA ANALYSIS

- Output temperature from the 3 refrigeration units: 9 °C.
- Minimum input temperature inside the operation rooms before the exchange point: 14,5 °C
- Difference lost: 5,5°C
- Electrical Efficiency: 48% (low)

Every 1°C of temperature lost for the entire circuit corresponds to 370 kWh/day. Total losses cost to the Hospital more than 149.000 Euro/year.



ACTION

- Restructure some principal pipes
- Full open the radiator windows
- Change the polarity of radiator fans

Another action will be to change the cold water pumps. The electrical efficiency will be increased of about 6%.



RESULTS

The electrical consumption of this application has been reduced by about 23%.

RESULTS

BEFORE H-Vision: 3.244.700 kWh per year
AFTER H-Vision: 2.498.400 kWh per year
DIFFERENCE €: 149.256,20 Euro/year
ROI: 12 months



Photo: Visit Isles of Scilly (Islands' Partnership © Rob Lee)

A £10.8 million project, co-financed by the **European Regional Development Fund**, is the first Smart Islands Partnership project.

Objective: to show how smart software can support a reliable, cost-effective, low-carbon energy system that delivers savings to homeowners and the community.



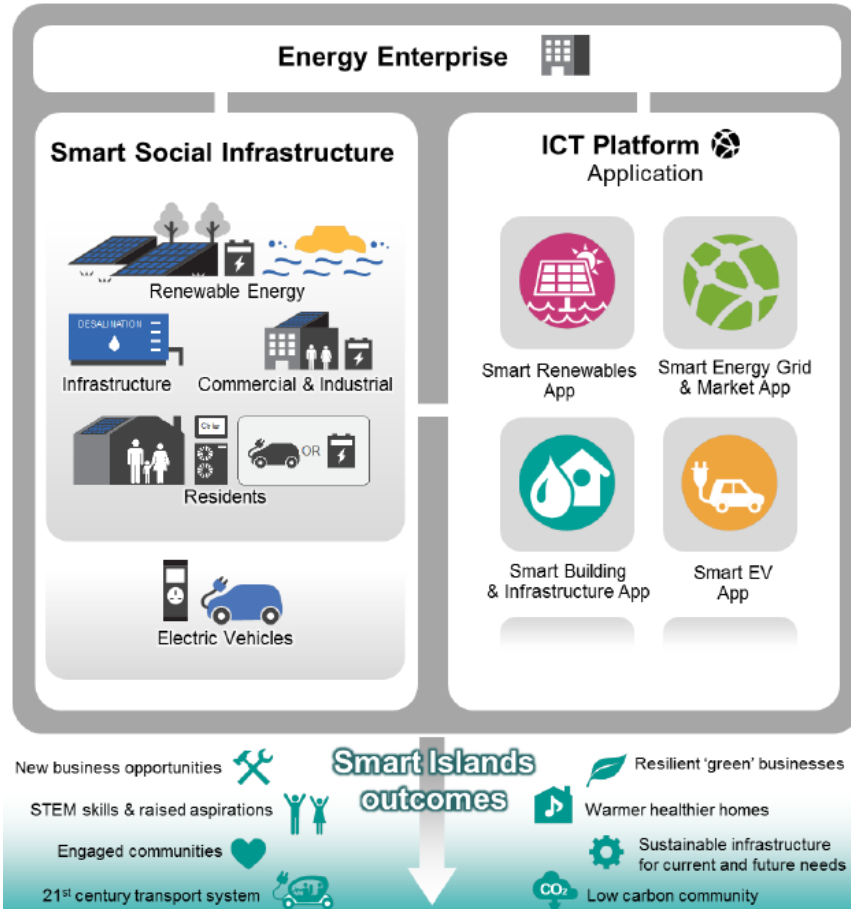
- 20% reduction in average electricity bills by 2020 & 40% by 2025
- Implement a full programme of energy efficiency measures by 2020 in domestic and commercial properties



- >40% of islands energy requirement from renewable energy located on the Isles of Scilly by 2025



- Deliver electric vehicle charging points powered by renewable resources by 2025
- To drive the uptake of electric vehicles registered on the Islands' with a target of 40% by 2025



Hitachi Europe Ltd. Has developed an ICT Platform that monitors electricity loads in houses and businesses, as well as electric vehicles, home batteries, smart heating technologies and other Infrastructure to optimize electricity generation and demand on the islands.



GREENING
THE ISLANDS

OBSERVATORY ISLAND MEETING

Crete/Greece | 28th February & 1st March 2019

in association with



ΠΕΡΙΦΕΡΕΙΑ ΚΡΗΤΗΣ
REGION OF CRETE

THANK YOU

Alessandro Bettin