Session 4 – Dezentrale Erzeugung und Energieeffizienz

- 135 ausgewählte Beiträge
- 8 aus Österreich
- 4 Blöcke
  - Planung und Studien
  - Regelung von Netzen mit DG/DER
  - Entwicklungen auf Kundenseite
  - Neue Technologien

Was hat sich geändert ?

- OUT
  - Micro KWK
  - Generatoren, Getriebe in WKA
  - Wechselrichter
- IN
  - Smart Metering
  - Elektromobilität
  - Energiespeicher
  - Grid Codes

DSO Business Model to speed up EVs mass market

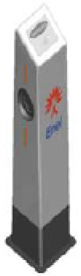
10–13 June 2013 | Stockholm

An extensive deployment of charging points by Enel to support electric mobility rollout in Italy

Overview of **geolocalization** of public infrastructure

Charging station solutions

Fast Charge for highways
43 kW



Fast Charge for cities
22 kW

Slow charge for private and fleets premises
3.3 kW

Frederico Caleno – Italy – Session 4 - 1073

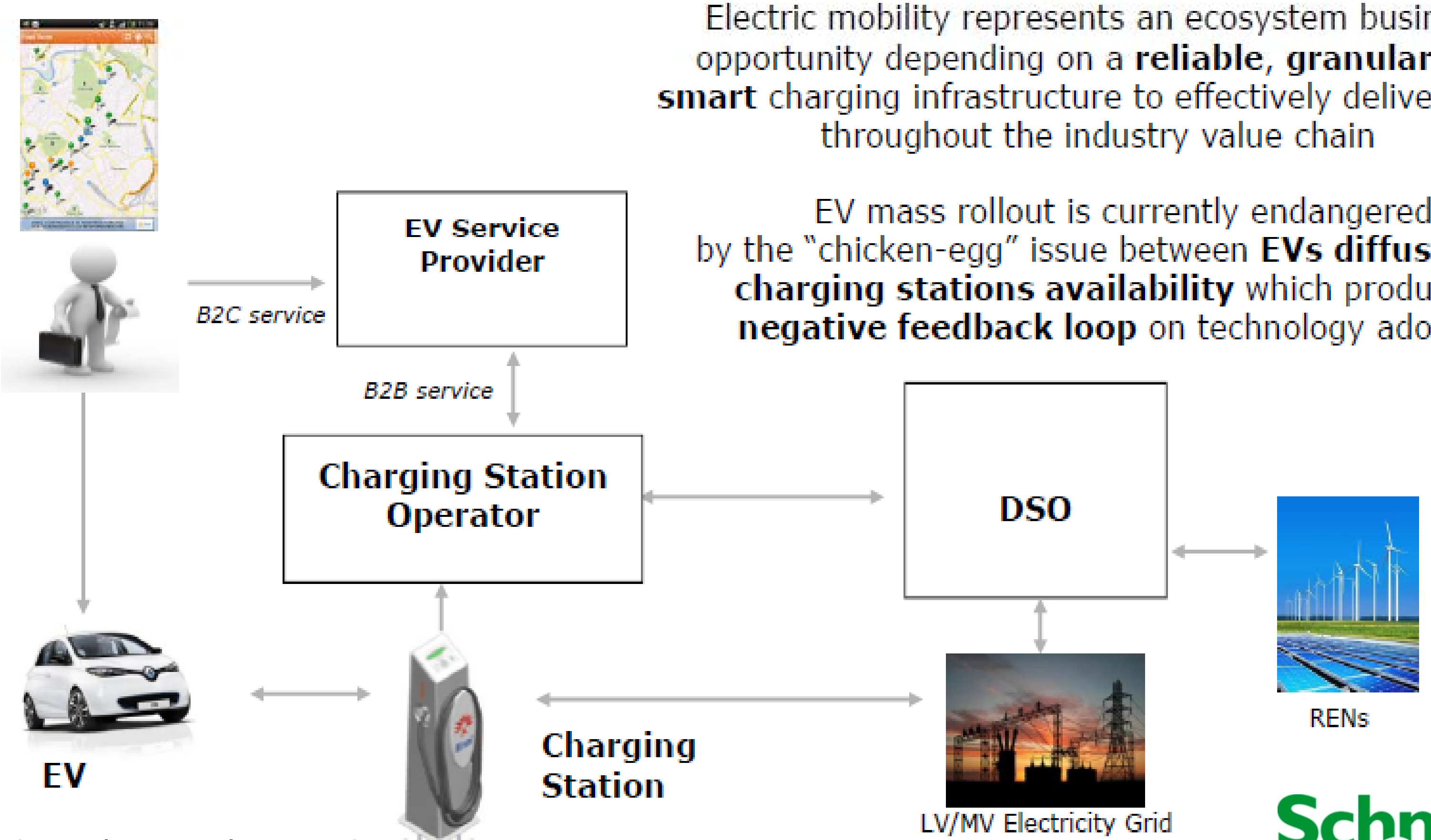
DSO Business Model to speed up Evs mass market

Enel

Business models for charging infrastructure deployment

Electric mobility represents an ecosystem business opportunity depending on a **reliable**, **granular** and **smart** charging infrastructure to effectively deliver value throughout the industry value chain

EV mass rollout is currently endangered by the "chicken-egg" issue between **EVs diffusion** and **charging stations availability** which produces a **negative feedback loop** on technology adoption



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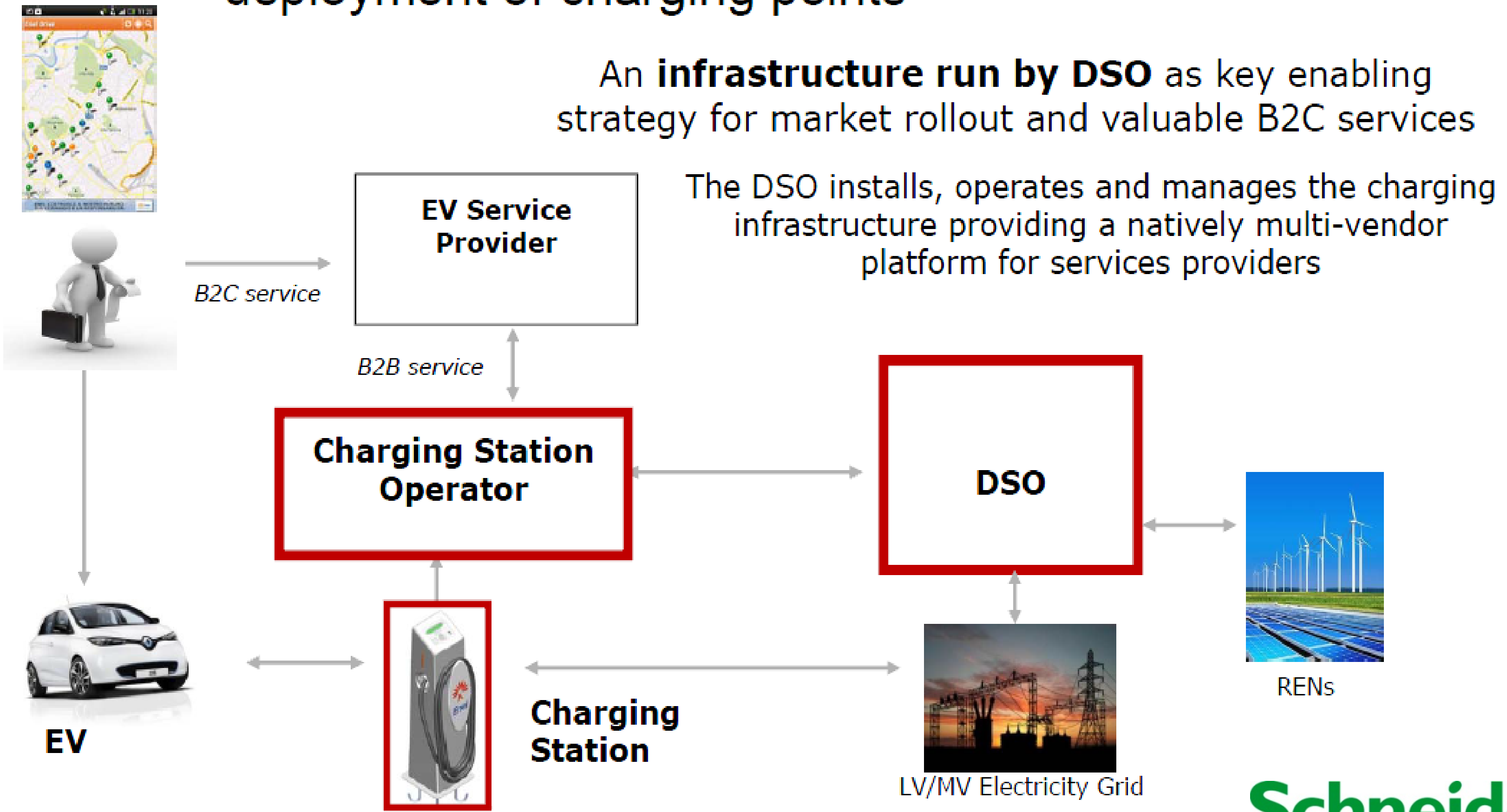
DSO Business Model to speed up Evs mass market

Tackling the “chicken-egg” issue through a regulated deployment of charging points

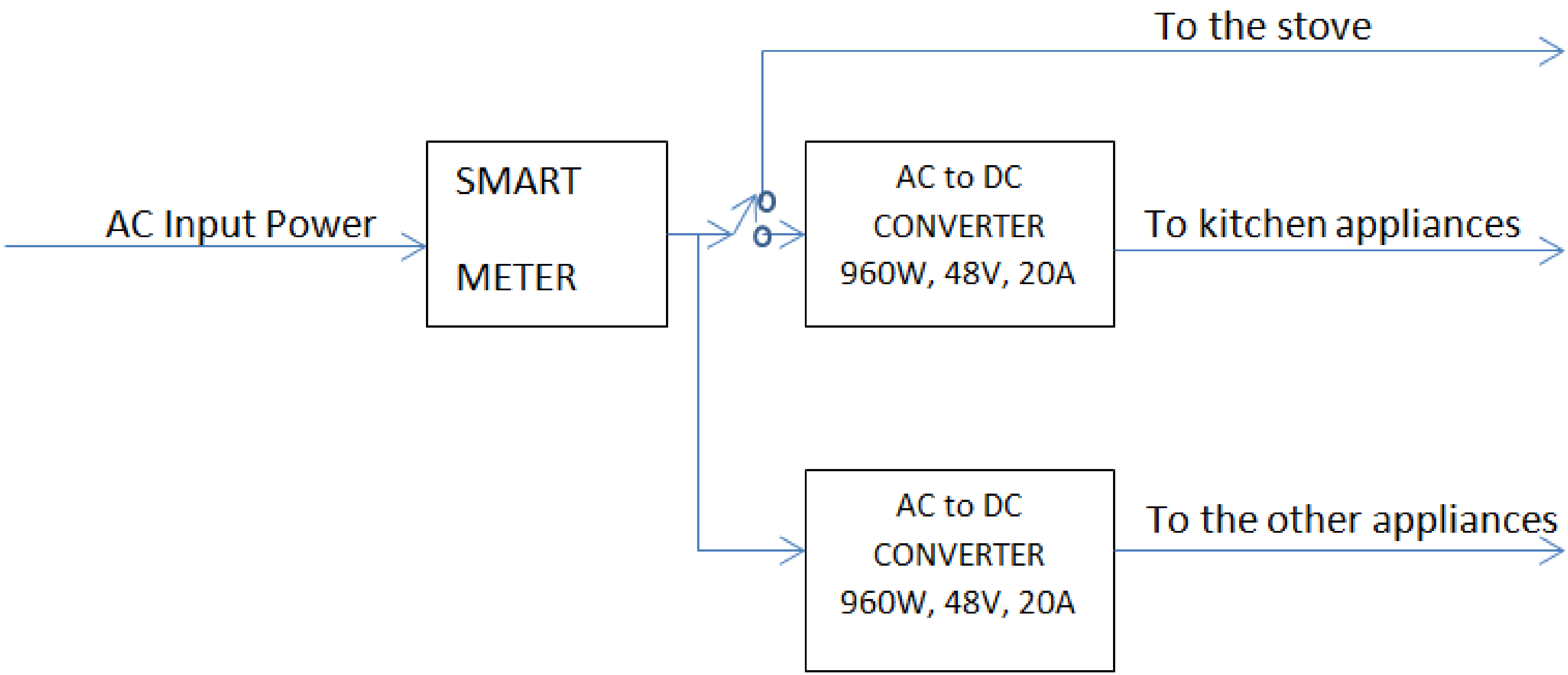
An **infrastructure run by DSO** as key enabling strategy for market rollout and valuable B2C services



Feasibility Study on Low Voltage DC Systems

- Steigendes Interesse an DC-Versorgung
  - Steigender Anteil an DC-Verbrauchern in Haushalt/Büro
  - Steigender Anteil an DC-Erzeugern, bes. PV
  - Batteriespeicher für erneuerbare Energien
  - PHEV Batterien als Energiespeicher
    (Plugin Hybrid Electrical Vehicel)

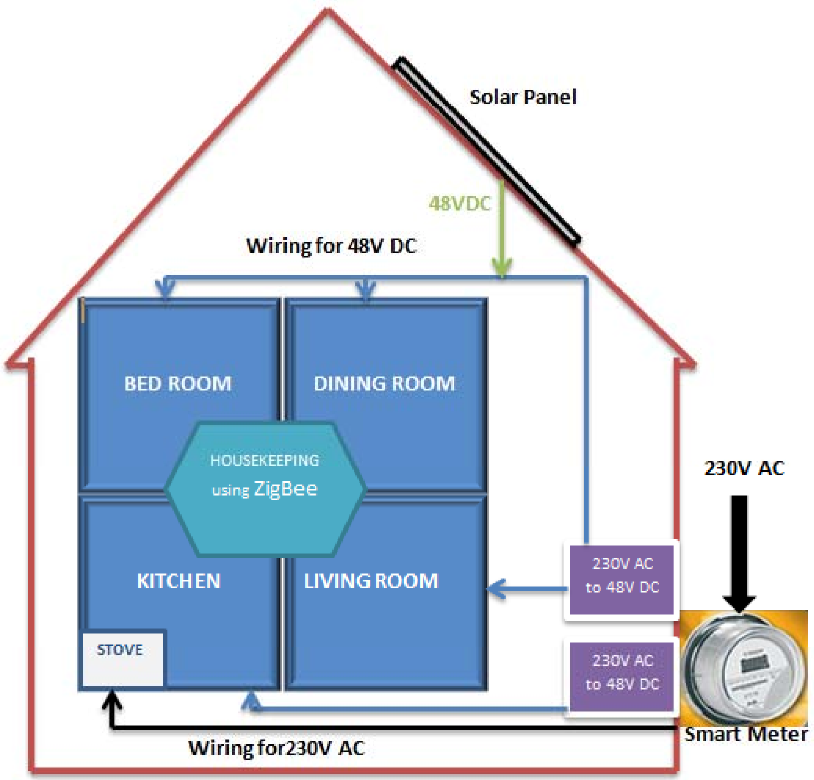
Feasibility Study on Low Voltage DC Systems



Feasibility Study on Low Voltage DC Systems

- Vorteile eines LV DC-Systems
  – Reduzierte Umwandlungsverluste
  – Keine individuellen Netzteile
  – Reduktion der elektromagnetischen Störungen
  – Verbesserter Gesamtwirkungsgrad

Feasibility Study on Low Voltage DC Systems



Anspeisung über GLR

230/48V GLR

- Einsparung **983 kWh/yr**
- Investitionskosten 1096€
- Payback **9.5 Jahre**

CIRED
10–13 June 2013 | Stockholm

Preliminary Findings of a 1 MW Battery Energy Storage Demonstration Project

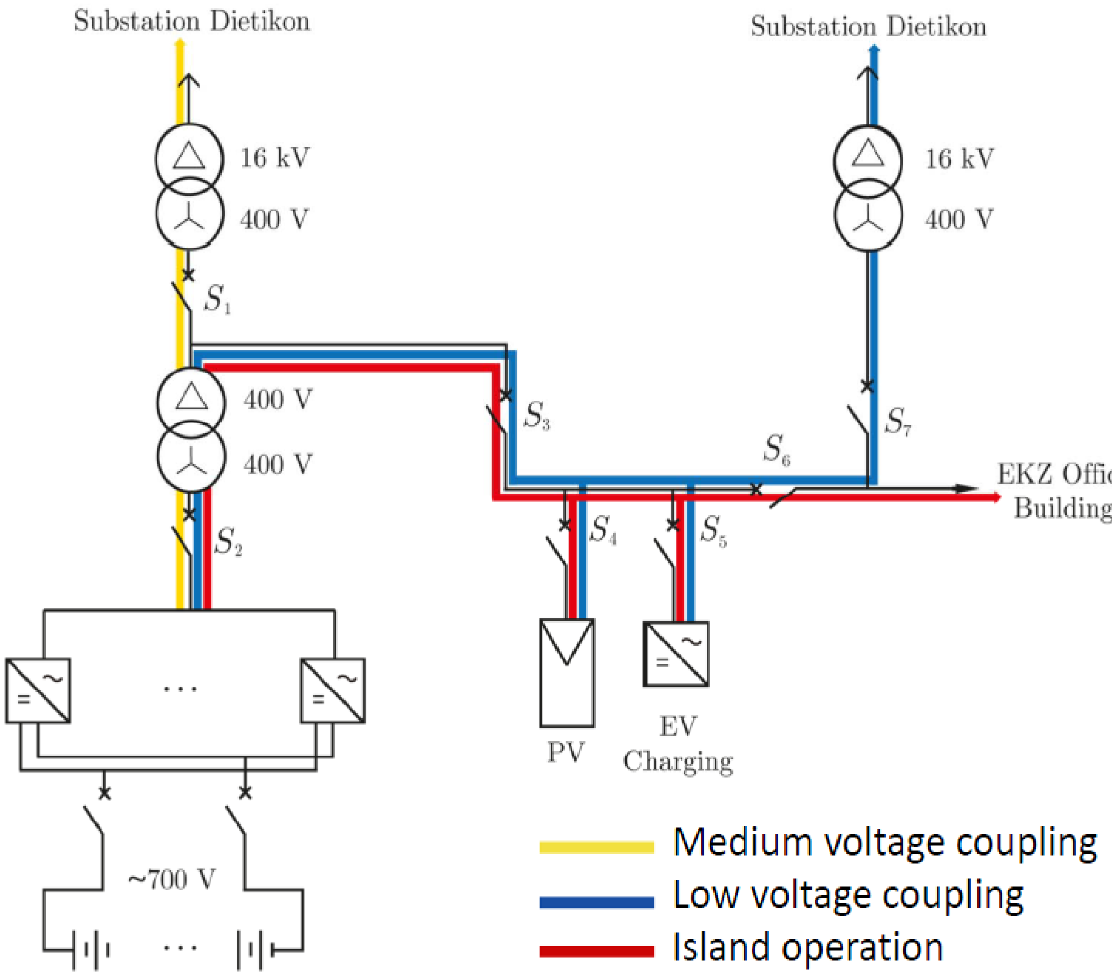
Schneider Electric

Preliminary Findings of a 1 MW Battery Energy Storage Demonstration Project

Key figures of the Zurich 1 MW BESS

Property	Value	Notes
Power	1 MW	both directions
Capacity	580 kWh	250 kWh @1 MW
Battery manufacturer	LG Chem	
Cell type	Li-Ion	$LiMnO_2$ cathode
Number of cells	10368	
Round Trip Efficiency	~80 – 90 %	
Lifetime	min. 3500 cycles	2 cycles/day, 250 kWh
System cost	ca. 2 Mio €	battery ca. 575'000 €

Single line diagram



Anwendungsmöglichkeiten

- Spitzenglättung
  - Verschieben von Netzausbauten
  - Kleinere Sicherheitsmargen aufgrund schneller Einsatzzeit
  - Reduzierung der Leistungspreise
- Spannungsregelung
  - Verbesserung der Einbindung von erneuerbaren Energien in das Verteilnetz
  - Verbesserung der Spannungsqualität für kritische Industrieanwendungen
- Frequenzregelung
- Inselbildung
  - Mikronetz Tauglichkeit
  - UPS für kritische Industrieanwendungen

- DSO Vorteil

- Kundenvorteil

Zusammenfassung

- Ein Jahr erfolgreiche Betriebsführung
- Technologiekenntnis angeeignet
- Strategien für Spitzenglättung erfolgreich
- Demonstrationsprojekt bildet Basis für mögliche zukünftige Speichereinsätze

CIRED
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In-home Displays at Household Customers. Results from a Norwegian Pilot Study.

Hanne SÆLE (SINTEF Energy Research),
Dag Eirik NORDGÅRD (SINTEF Energy Research)
Karl Anders FØLSTAD (Fredrikstad Energi)
Stein O. RIVELSRØD (eWave)

Pilot Studie

- Pilot Projekt über ein Jahr – 2012 beendet
- 91 in-home Anzeigenmodule bei Haushaltskunden installiert
  - 47 in Askøy (West-Norwegen) und 44 in Follo (Ost-Norwegen)
- Drei Kundenumfragen wurden durchgeführt
  1. Vor der Installation des in-home Anzeigenmoduls
  2. Drei Monate nach der Installation
  3. Am Ende des Pilotprojekts
- Zusätzlich: Zwei Umfragen wurden bei 42 Haushalten in einer Kontrollgruppe durchgeführt

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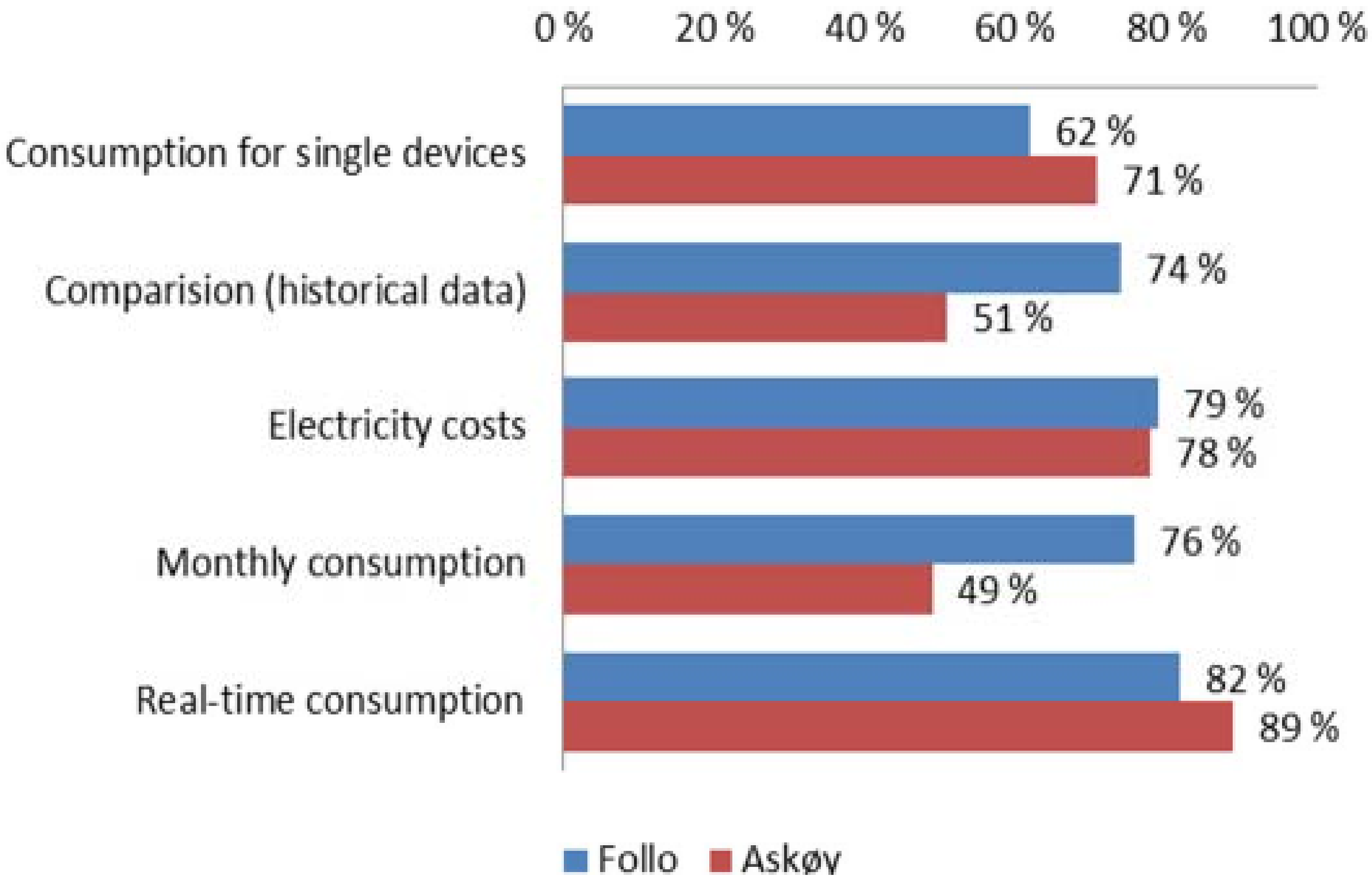
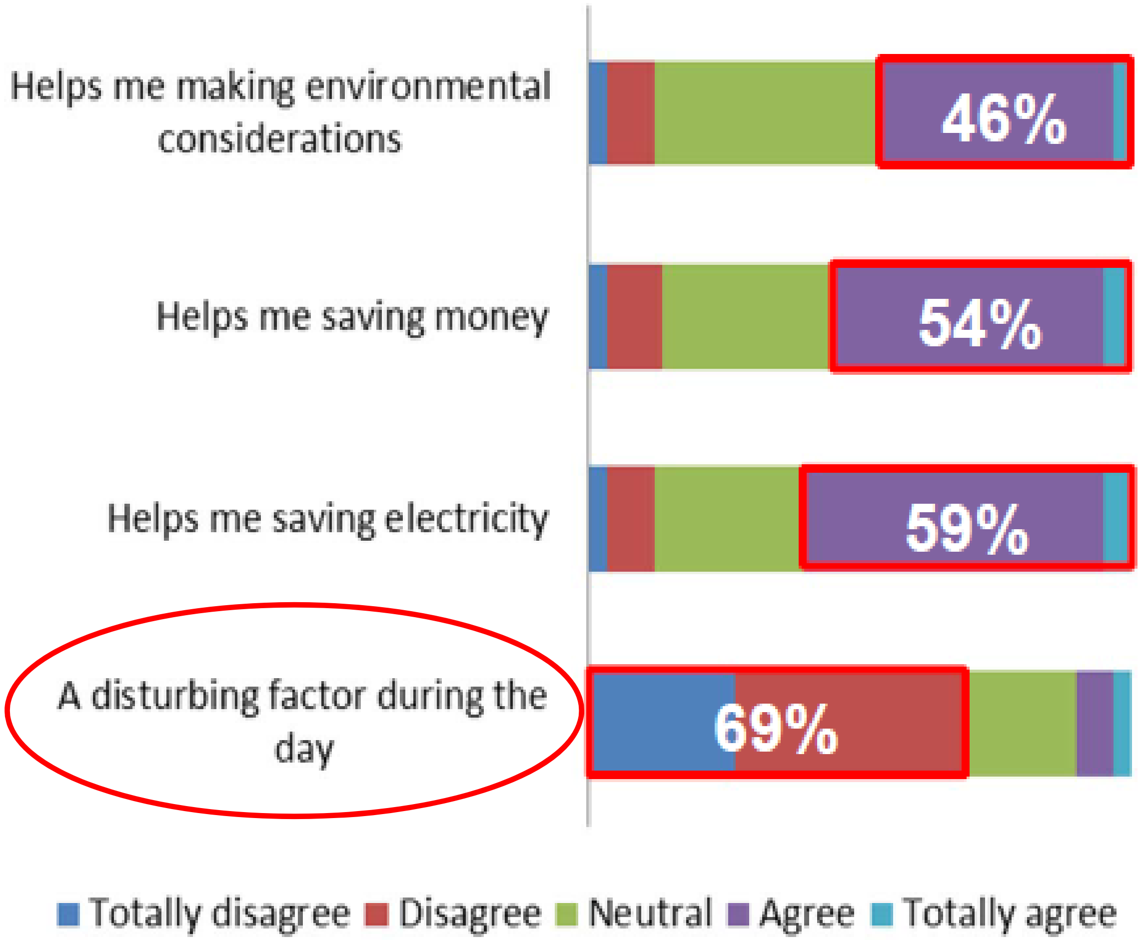
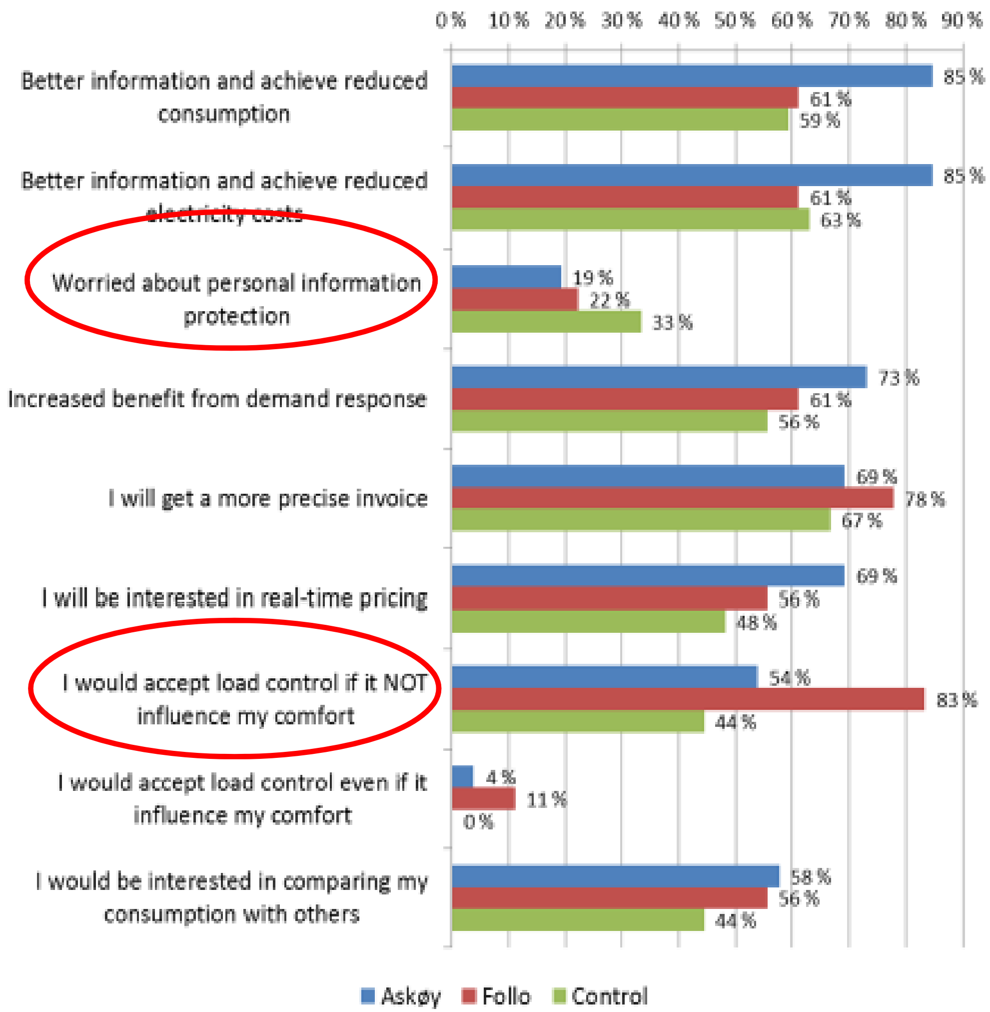
First survey – before installation



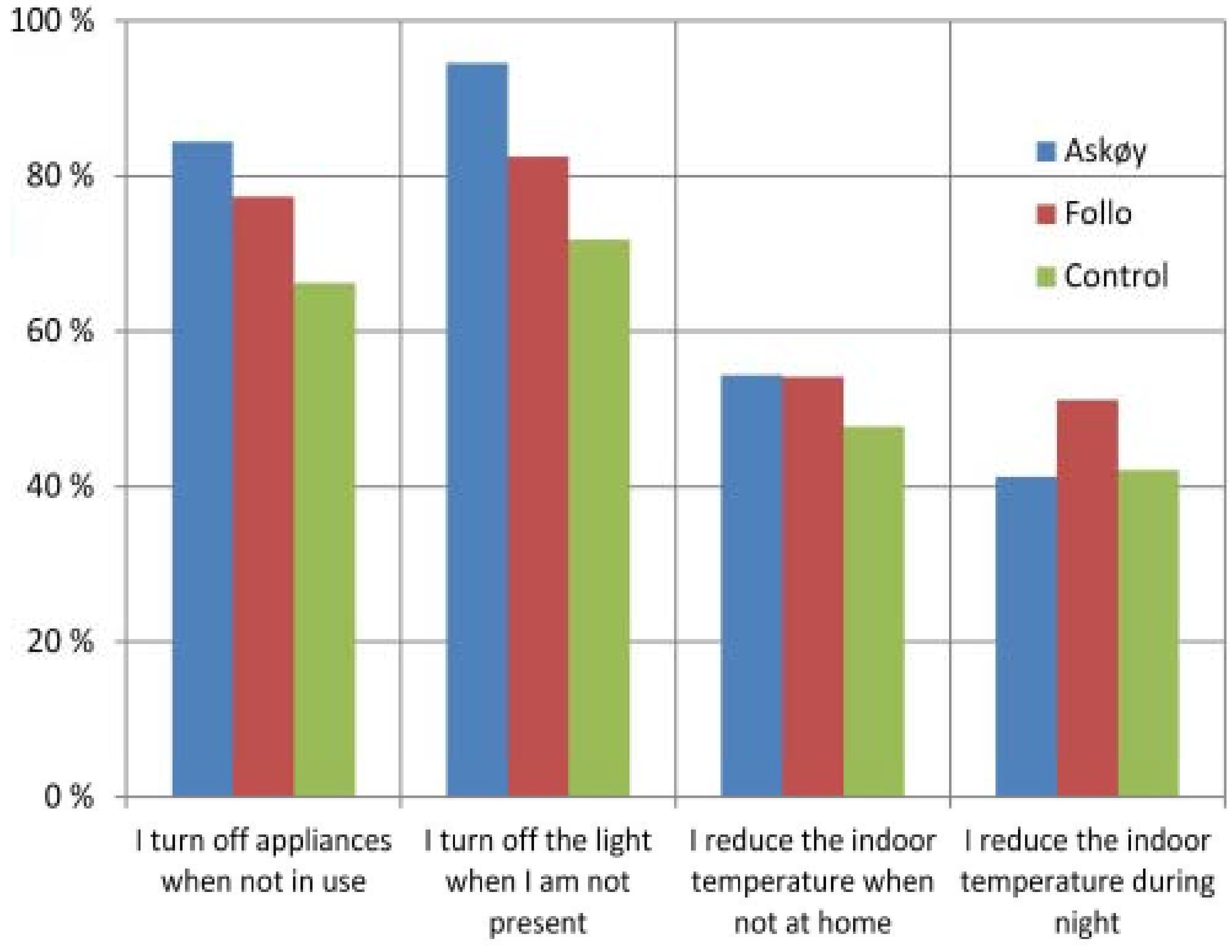
Second survey – After 3 months



Third survey – After one year



Habits related to electricity

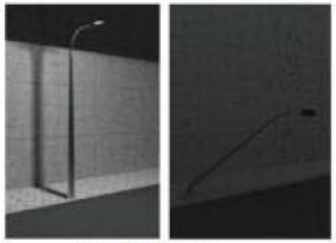


Efficient and Adaptive LED Public Lighting Integrated in Évora Smart Grid

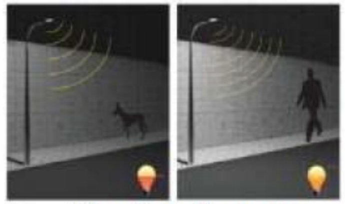
Carreira – Portugal – Session 4 - 0576

Efficient and Adaptive LED Public Lighting

45 full intelligent historical lantern-light were installed replacing old Metal Halide lantern-light.

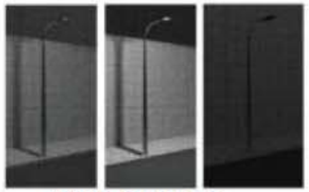


G Sensor

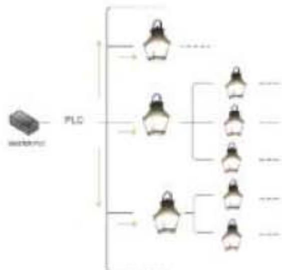


Tractus Sensor

Thermal Sensor



Sun Sensor



Communication System (PLC)

Efficient and Adaptive LED Public Lighting

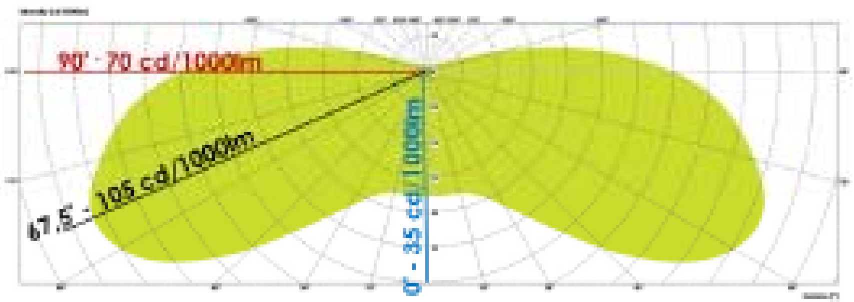


Figure 7 - Old VSAP Luminaire Light Distribution Diagram

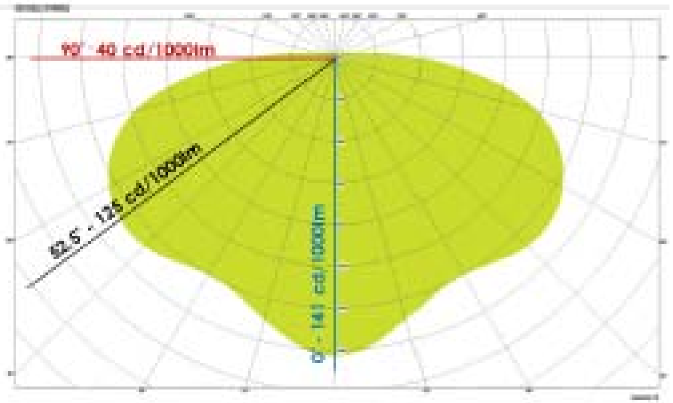
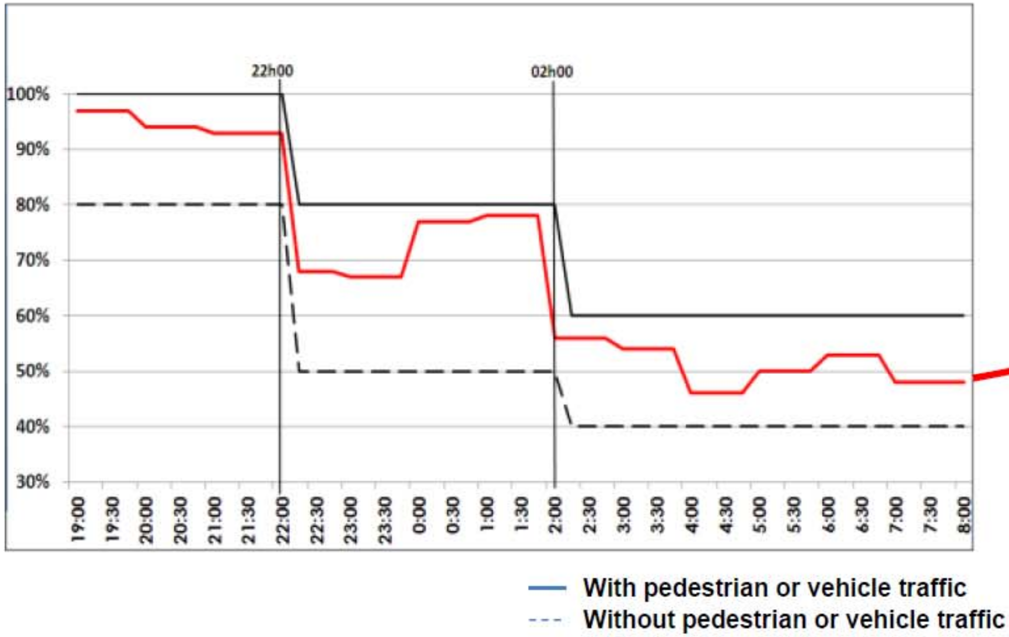


Figure 8 - New LED Luminaire Light Distribution Diagram

Efficient and Adaptive LED Public Lighting

With dynamic and intelligent system, the luminary has the capacity to manage the lighting flux profile concerning sensor information

Main plaza luminary (exclusive pedestrian area)



For example: Between 11:30 pm and 02 am, the lighting flux increase corresponds to the culture night activities typical in the plaza.

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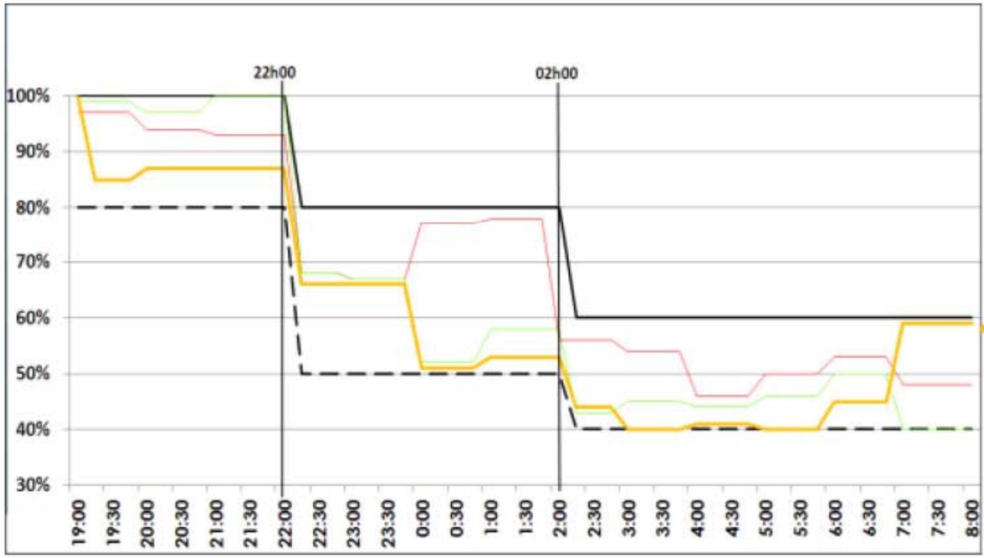
Efficient and Adaptive LED Public Lighting

With dynamic and intelligent system, the luminary has the capacity to manage the lighting flux profile concerning sensor information

Pedestrian residential access road (pedestrian traffic)



— With pedestrian or vehicle traffic
--- Without pedestrian or vehicle traffic

For example: between midnight and 06:30 am the lighting flux follows the absence of pedestrian traffic in the road. After 06:30 am till sunrise the light flux increases due the awaking of the city.

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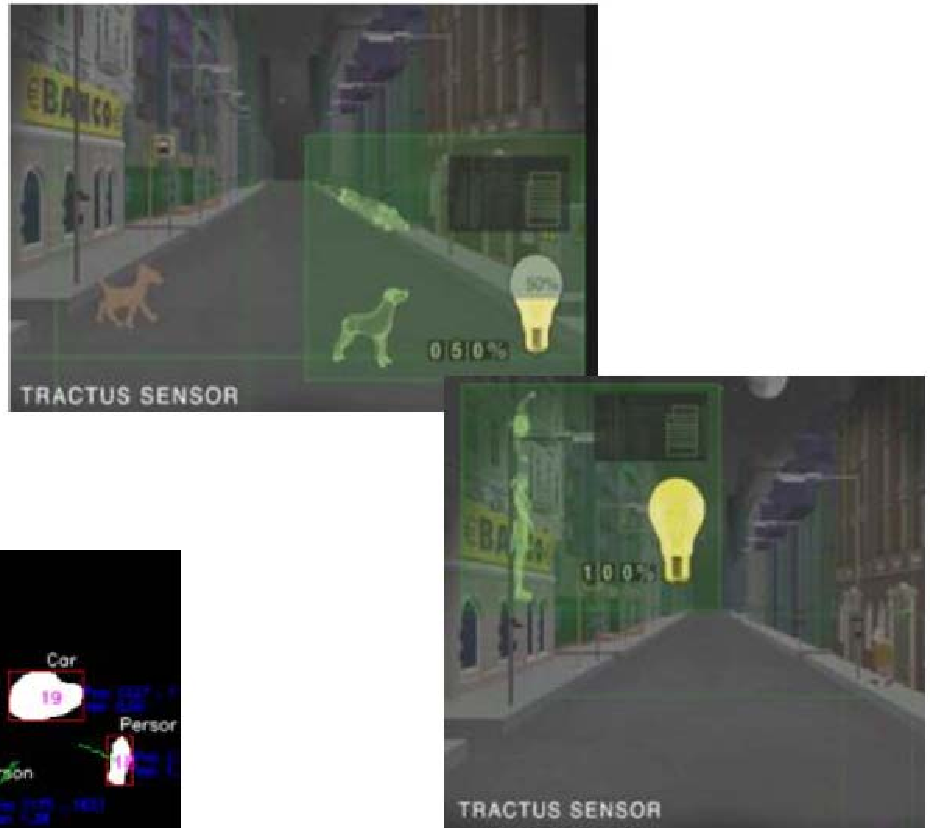
Efficient and Adaptive LED Public Lighting



Efficient and Adaptive LED Public Lighting

In 1912, Portugal already had a dynamic adaptive street lighting using carbide fuelled luminaires!!!

Aldeia das Dez – Oliveira do Hospital

... **a person was hired to light the system every night and to take care of its maintenance.** The conditions of the public competition were: Obligations:

- **1st The person in charge is obliged to light up the system every night until dark;**

- **2nd at nights when the moon is bright enough, the person in charge will light only at half load two hours after dark;**

- **3rd If the moon is bright enough and there are no clouds in the sky one hour after the established ON-hour, the person in charge is not obligated to light up the luminaires;**

...

- **5th the person in charge is obliged to light up the system on saturdays and sundays of the Holly Spirit.**

BACK-UP

Beiträge aus Österreich

1186 Loss calculation and optimisation in low-voltage networks
W Brandauer, K Köck, C Wakolbinger, L Fickert, *Graz University of Technology, Austria*

1268 Controlling EV charging and PV generation in a low voltage grid
J Groenbaeck, S Bessler, *FTW Telecommunications Research Center*, Austria, C Schneider, *Kelag Netz Austria*

1320 Optimal distributed hybrid-storage and voltage support of photovoltaic systems
S Begluk, R Schlager, W Gawlik, *Technical University of Vienna, Austria*, E. Tröster, *Energynautics GmbH, Germany*

0094 Decision support system for distributed energy resources and efficient utilization of energy in buildings
E Perea, A Mera, *Tecnalia Research and Innovation, Spain*, A Siddiqui, S Heydari, *University College London, United Kingdom,* M Stadler, M Groissböck, *Center for Energy and Innovative Technologies, Austria,* A Alvarez, *HC Energia, Spain*

Beiträge aus Österreich

0308 Appliance-specific energy consumption feedback for domestic consumers using load disaggregation methods
C Elbe, E Schmautzer, *Graz University of Technology, Austria*

1208 Self-adapting buildings models and optimized HVAC scheduling for demand side management
D Atabay, S Herzog, J Jungwirth, F Sänger, *Technische Universität München, Germany*,
V Mikulovic, *Siemens AG, Austria*

1277 Active and anticipatory Demand-Side-Management in households
C Groiss, C Maier, W Gawlik, *Vienna University of Technology, Austria*

0260 Low voltage ride through capability of gas engine driven units
B Herzmaier, H Renner, *Graz University of Technology, Austria,* J Gomez, *GE Jenbacher, Austria*