Prepared for:

LISBOA e·nova

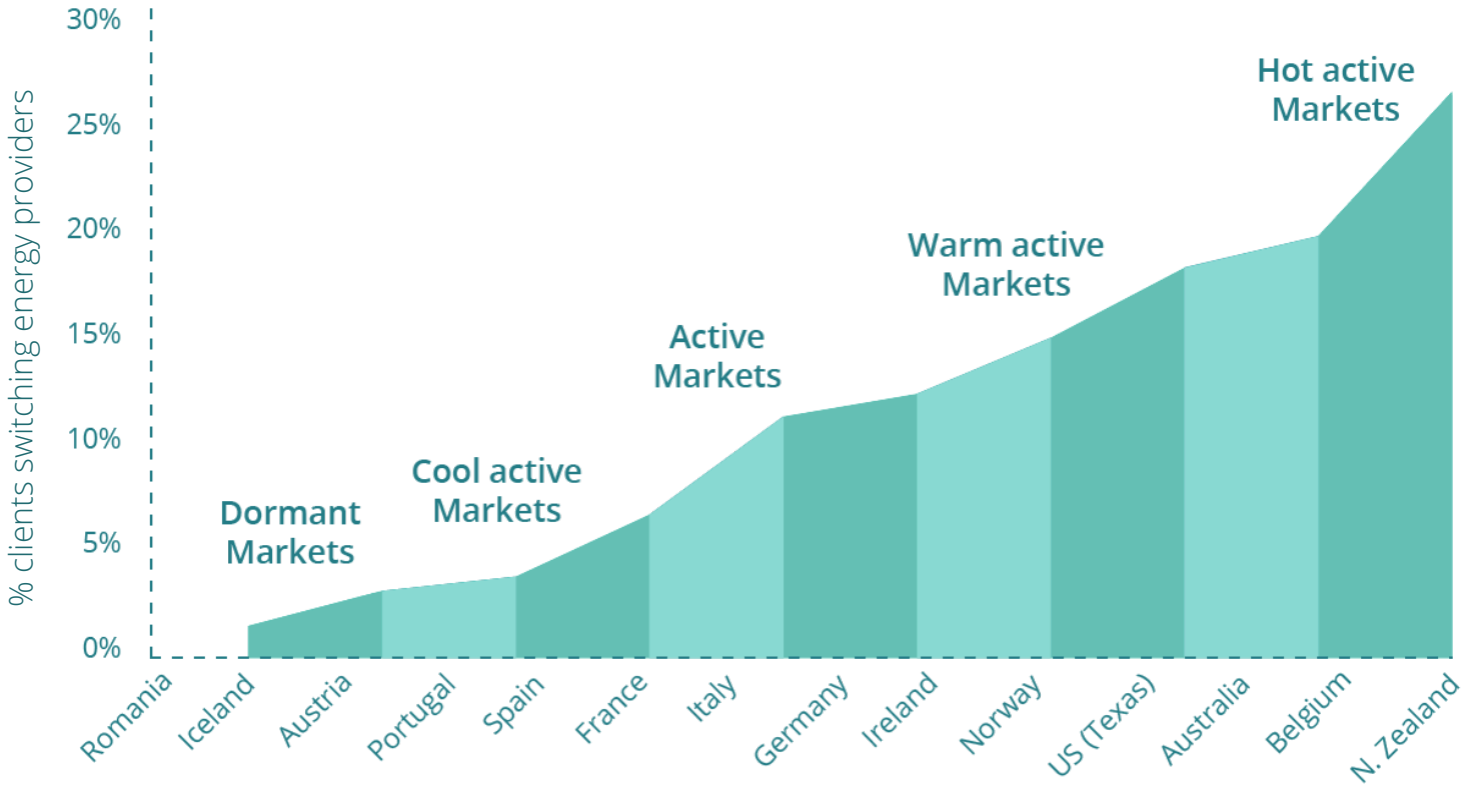
AGÊNCIA DE ENERGIA E AMBIENTE DE LISBOA

CIDADES INTELIGENTES
CIDADES DO FUTURO

November 30th, 2016

Generating Knowledge
to foster Energy Efficiency

CONSUMERS CAN SWITCH ENERGY PROVIDERS CREATING NEW COMPETITIVE DYNAMICS FOR ENERGY UTILITIES



Source: Adapted from VaasaETT Utility Customer Switching Research Project, 2013

Main reasons for churn:

- The evolution of wholesale energy prices
- Poor quality customer interactions
- Entry of new value propositions with better customer engagement

A NEW GENERATION OF SERVICES IS EXPECTED BY ENERGY CLIENTS

Recommendations on Decentralized Energy production solutions (solar, wind, etc.) to install

Early notifications when energy bill rises above normal

Personalized advice on actions that should be taken to reduce energy bill

Personalized advice on available products and services to help reduce the energy bill

Households

Enhanced self-service channels with business specific tools (e.g., forecast energy costs, detailed usage, etc)

Notifications when consumption is rising higher than expected

Recommendations on products & services to reduce energy costs.

Benchmarking of consumers by economic sector or by multiple facilities.

Small & Medium sized Enterprises (SME's)

Source: Adapted from "The energy consumer handbook", Accenture, 2013

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THE DIGITALLY ENGAGED ENERGY CONSUMER UNLEASHES MORE BUSINESS VALUE FOR ENERGY PROVIDERS.

13% 42%

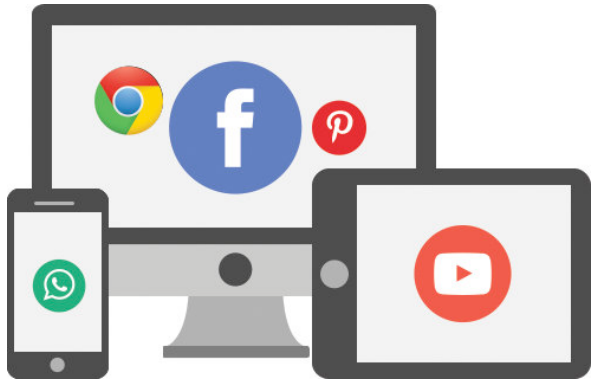
more likely to recommend their current energy provider

48% 70%

more likely to sign up for automated home energy management devices or services

55% 69%

more satisfied with their energy provider



53% 73%

more likely to sign up for home energy generation products

51% 73%

more likely to share their personal information and energy usage information

31% 41%

more trust in their energy provider

59% 80%

more likely to participate in an energy management program

- DIGITALY ENGAGED USERS
- NON-DIGITALY ENGAGED USERS

Source: Adapted from, New Energy Consumer research program, 2015, Accenture,

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SMART METERS WILL ACT AS ENABLERS ON THE DEVELOPMENT OF INNOVATIVE SERVICES AIMED TO FOSTER USER SATISFACTION

52M smart meters installed in the USA

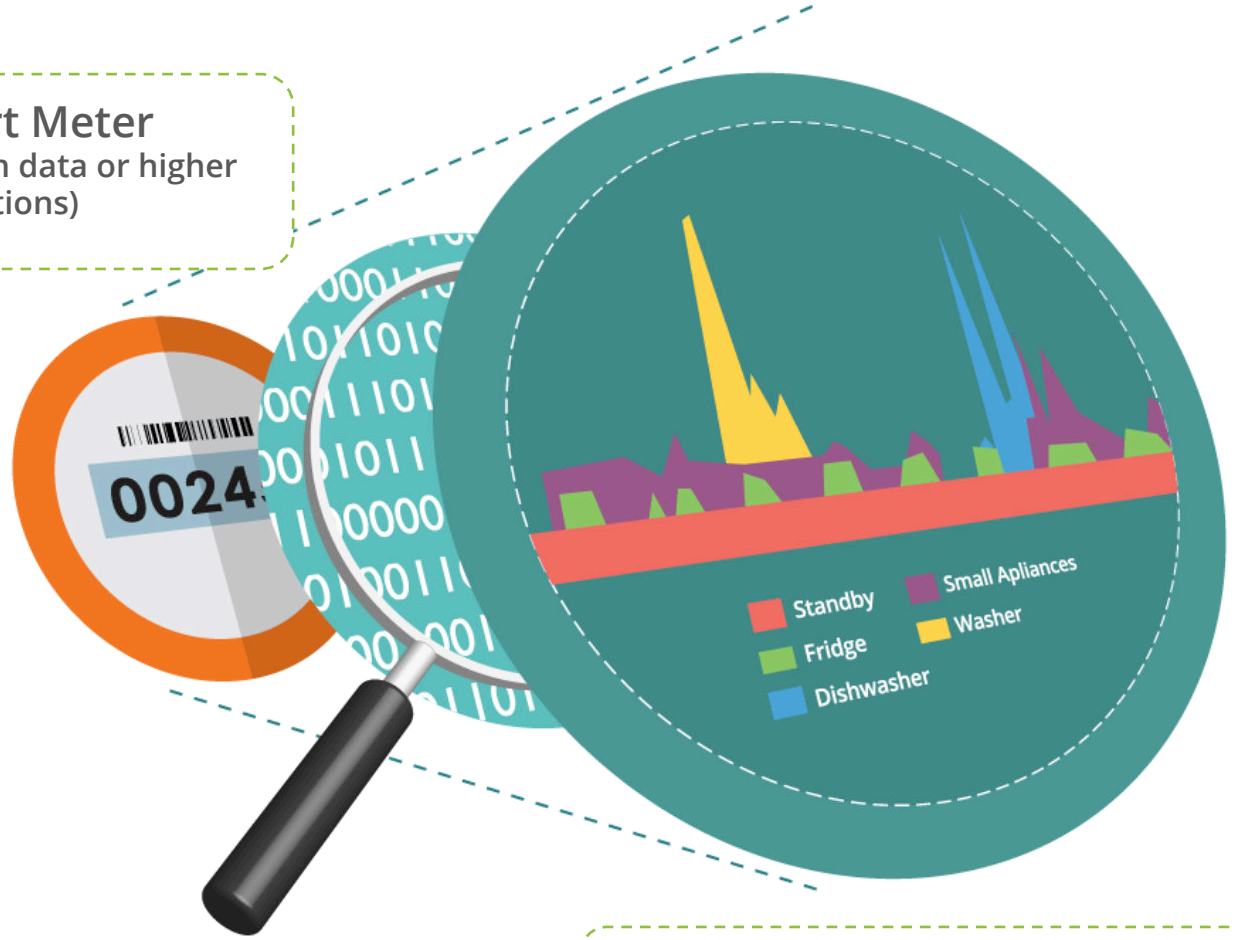
67M smart meters installed in the EU

52,8M smart meters installed in the Asia-Pacific (2010)

Around 1 billion smart meters are expected to be installed by 2020
(Source: Pike Research)

ADVANCED DATA ANALYTICS ARE KEY TO EFFECTIVELY UNDERSTAND ENERGY USAGE AND FULL OPTIMIZATION POTENTIAL

Smart Meter
(15 min data or higher resolutions)



Non-Intrusive Load Monitoring (NILM) Algorithm

ENERGY DISAGGREGATION DOWN TO THE APPLIANCE LEVEL

- DISHWASHER
- LIGHTING
- SMALL APPLIANCES
- WATER HEATER
- WASHER
- HVAC
- STANDBY
- DRYER
- FRIDGE
- OVEN

NILM algorithm prepared to handle the most common smart metering (SM) resolution periods.

No need for additional equipment (smart plugs or higher resolution meters)

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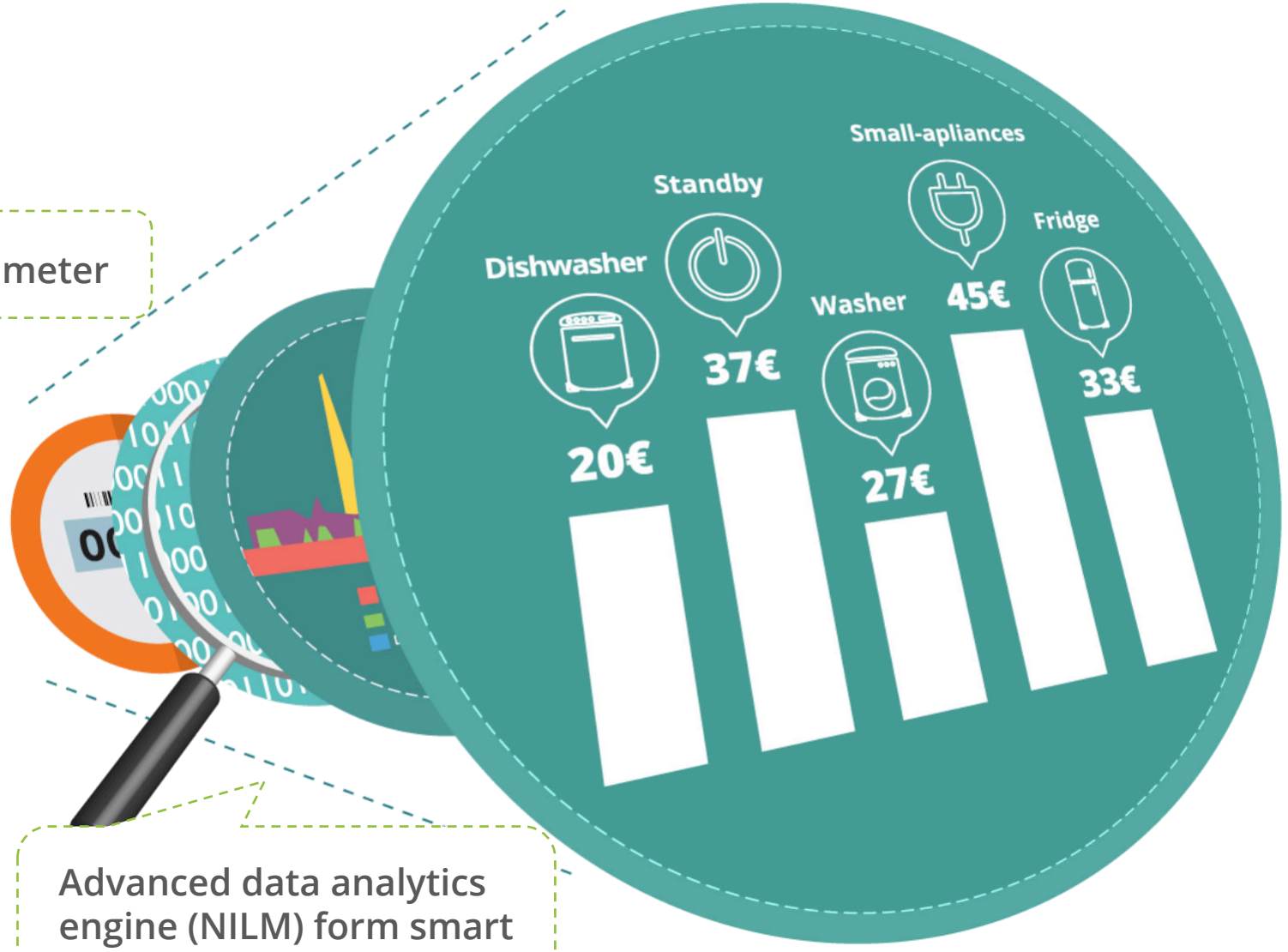
AT WATT-IS WE TRANSLATE ENERGY CONSUMPTION DATA INTO TAILOR MADE ENERGY EFFICIENCY MEASURES THAT MAKE YOU SAVE ON YOUR ENERGY BILL...

Smart meter



Advanced data analytics engine (NILM) form smart metering data

Tailor made energy efficiency measures

If you change to a triple hourly energy tariff you'll save 15€/month

Substitute your fridge and save up to €180 per year

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WEB BASED USER ENGAGEMENT PLATFORM FOR HOUSEHOLDS

Fully automated, scalable and re-brandable

Meaningful and quantified **tailor made energy efficiency measures**

Benchmarking / Competition & Gamification strategies

Smart Notifications (abnormal consumptions, forecasts, etc..)

Monthly reports to be sent jointly with billing information

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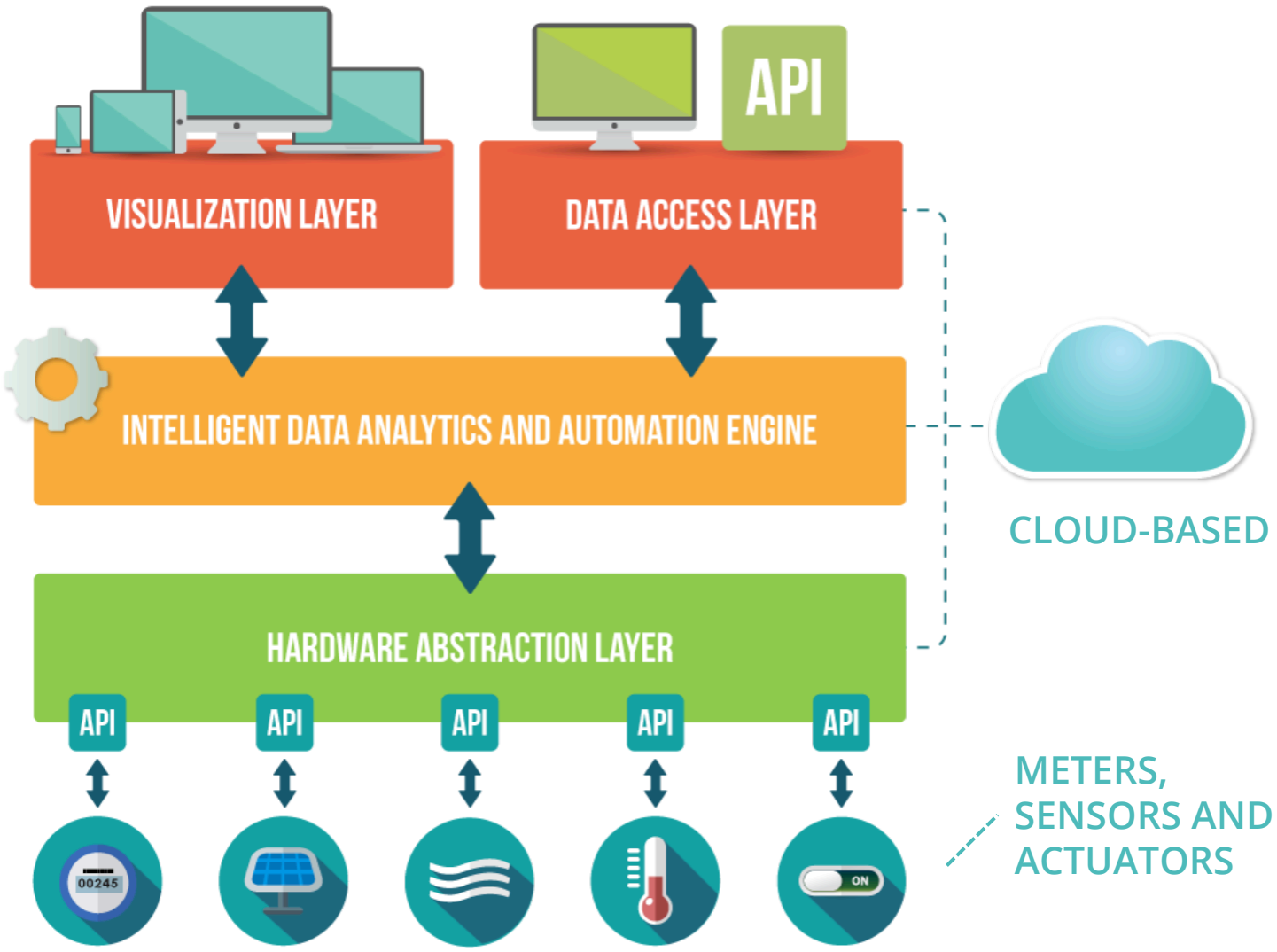
SCALABLE CLOUD-BASED IT ARCHITECTURE



Flexible, **cloud-based** IT architecture that implements an **hardware abstraction layer.**

Allows the incorporation of **meters, sensors and actuators** from multiple vendors and communication protocols.

Dedicated energy meters supported

FLUKSO OWL efergy Cloogy by VPS

Renewable production meters

RbeeSolar SMA

More coming soon...

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VIRTUAL ENERGY MANAGER FOR SMES

Real-time energy monitoring for multiple facilities **(multi-site)** and metering points **(sub-metering)**

Benchmarking

Energy tariff optimization modules

Machine-learning capabilities to provide **self-learning alarms** and **tailored made energy efficiency measures**

OFF

Automation capability to connect or disconnect specific energy loads

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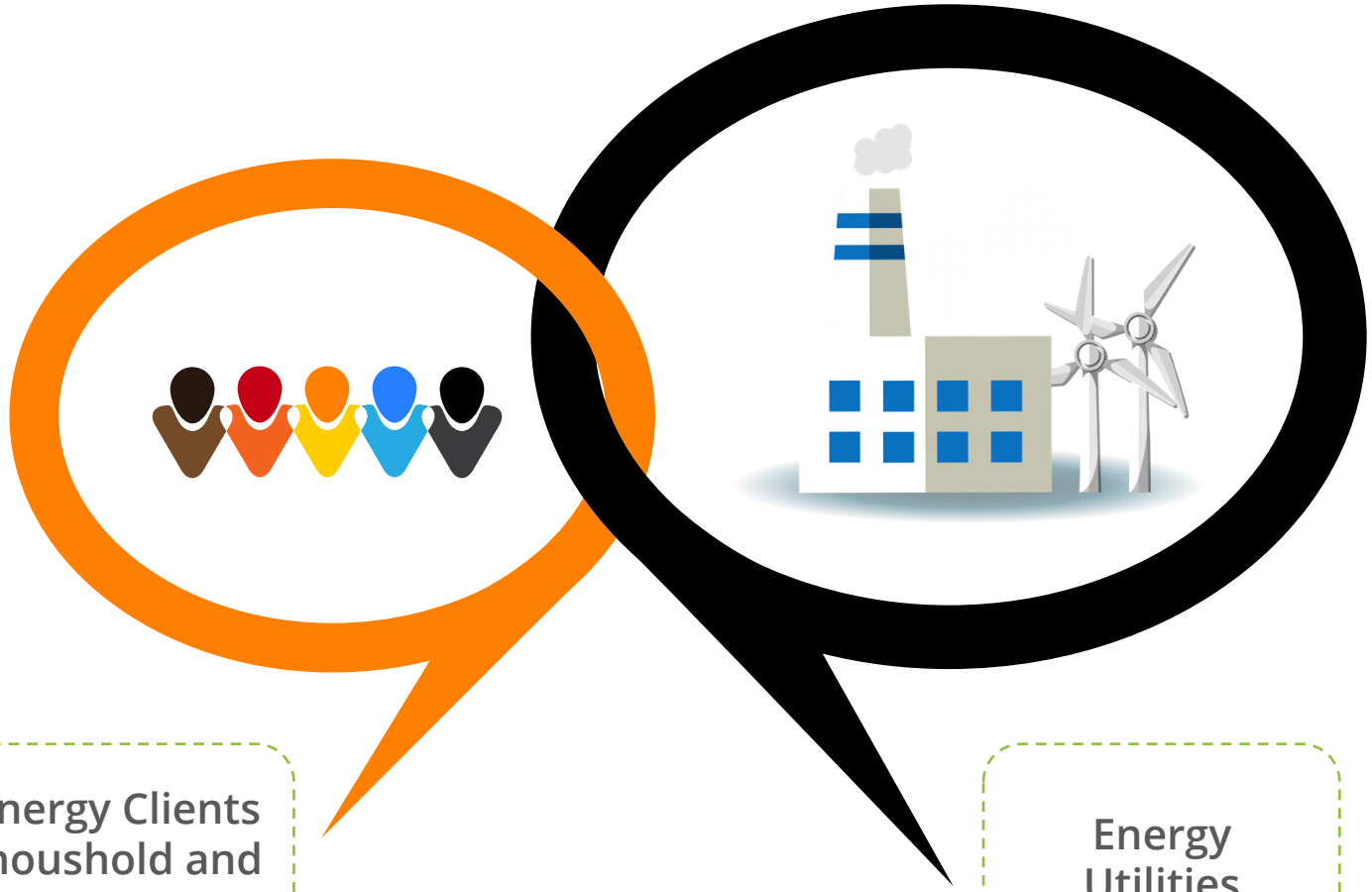
CREATING VALUE THROUGH A STRONGER ENGAGEMENT BETWEEN ENERGY UTILITIES AND ENERGY CLIENTS BY DIFFERENTIATION AND INNOVATIVE SERVICES



Energy Clients (houshold and SME's)

Energy Utilities

Energy utilities support an average cost of **100€** to **135€** to aggregate a new client

Industry benchmarks highlight that **retaining existing clients is typically 6 times cheaper** than aggregating a new client

Watt-IS is the utilities partner to capture this value through a **stronger engagement focused on energy efficiency**

Source: Woodlawn Associates, Electrical Potential: Reducing Customer Acquisition Cost and Increasing Lifetime Value in Solar and Competitive Electricity, 2013

Source: Turning on utility customer loyalty, Bain & Company, 2013

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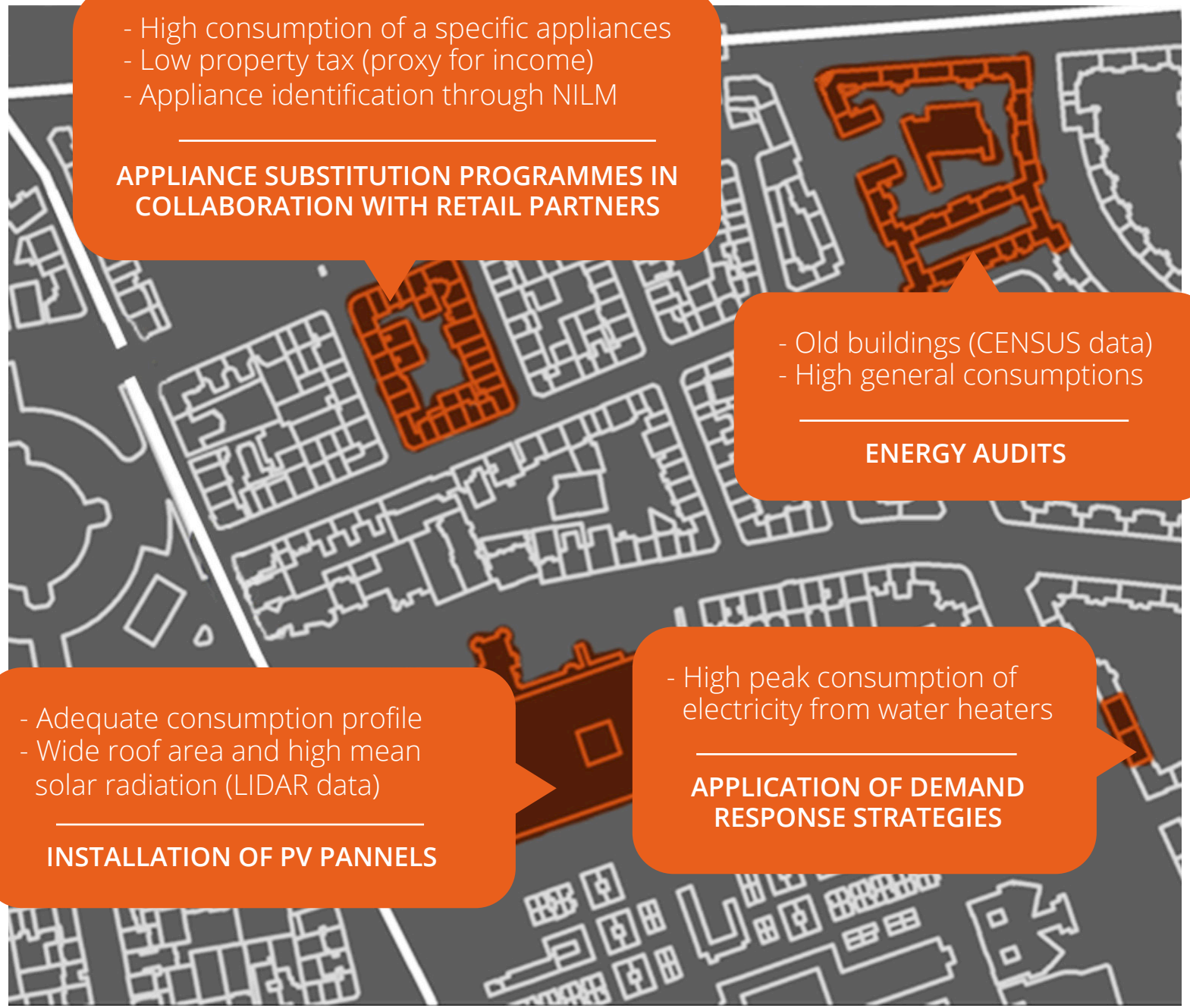
With Watt-IS you engage consumers in energy efficiency, reduce churn rates and generate new revenue streams along the process
watt is
Replace your fridge
More
ENERGY EFFICIENCY TECHNIQUES
YOU CAN SAVE
YOUR SAVINGS
MONTHLY CONSUMPTIONS
CONSUMPTION DISAGGREGATION
SUMMARY INFORMATION
Client Information
Address
Contract Number
Cost disaggregation (€/month)
Visit watt-is.com or call +351 216 074 063 for more information
june 2016



NEW SERVICES - DATA ANALYTICS AS THE ENABLER

Applying our intelligent data analytics engine with other information such as **weather, LIDAR data, property tax, energy certificates** and others, we can help identify segmented marketing strategies.

To each group of identified market segments, new **services that generate value added for the end user, may be targeted.**

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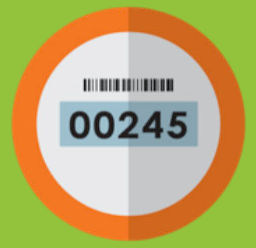
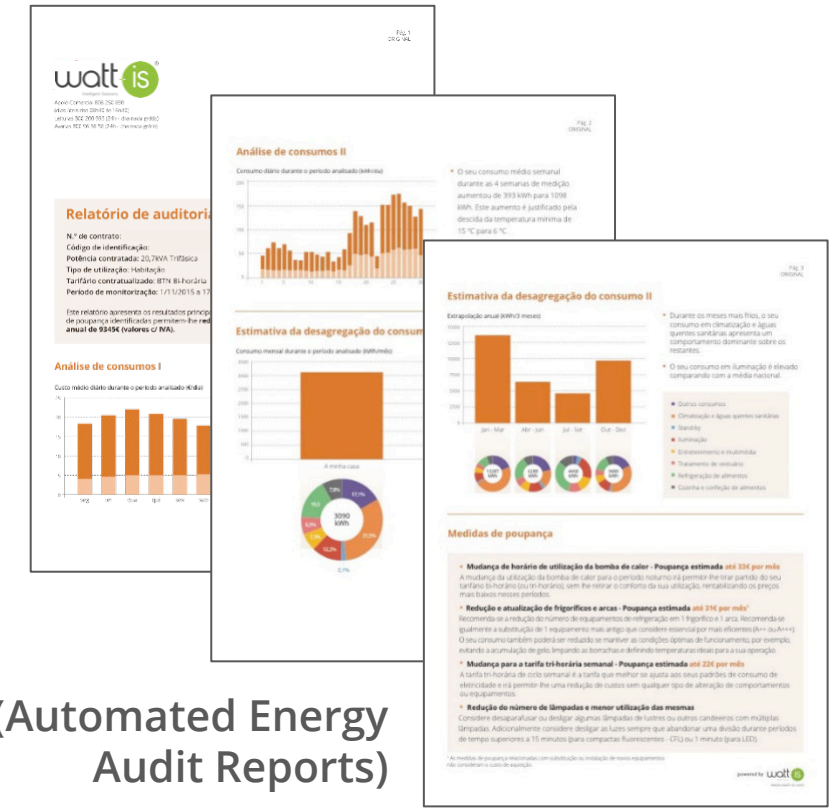
NEW SERVICES – REMOTE ENERGY AUDITS SERVICE TO PROVIDE MORE DETAILED ENERGY EFFICIENCY ADVICES



(Smart Meter)

(Remote Energy Audit Platform)

NILM



(Automated Energy Audit Reports)

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NEW SERVICES – RECOMMENDATION OF DECENTRALIZED SOLAR PV SOLUTIONS WITH ENERGY POTENTIAL PRODUCTION ESTIMATION

Integration of solar PV production data to propose **energy efficiency measures tailored towards prosumers.**

With LIDAR data available it is possible to **integrate automated solar PV dimensioning modules**.

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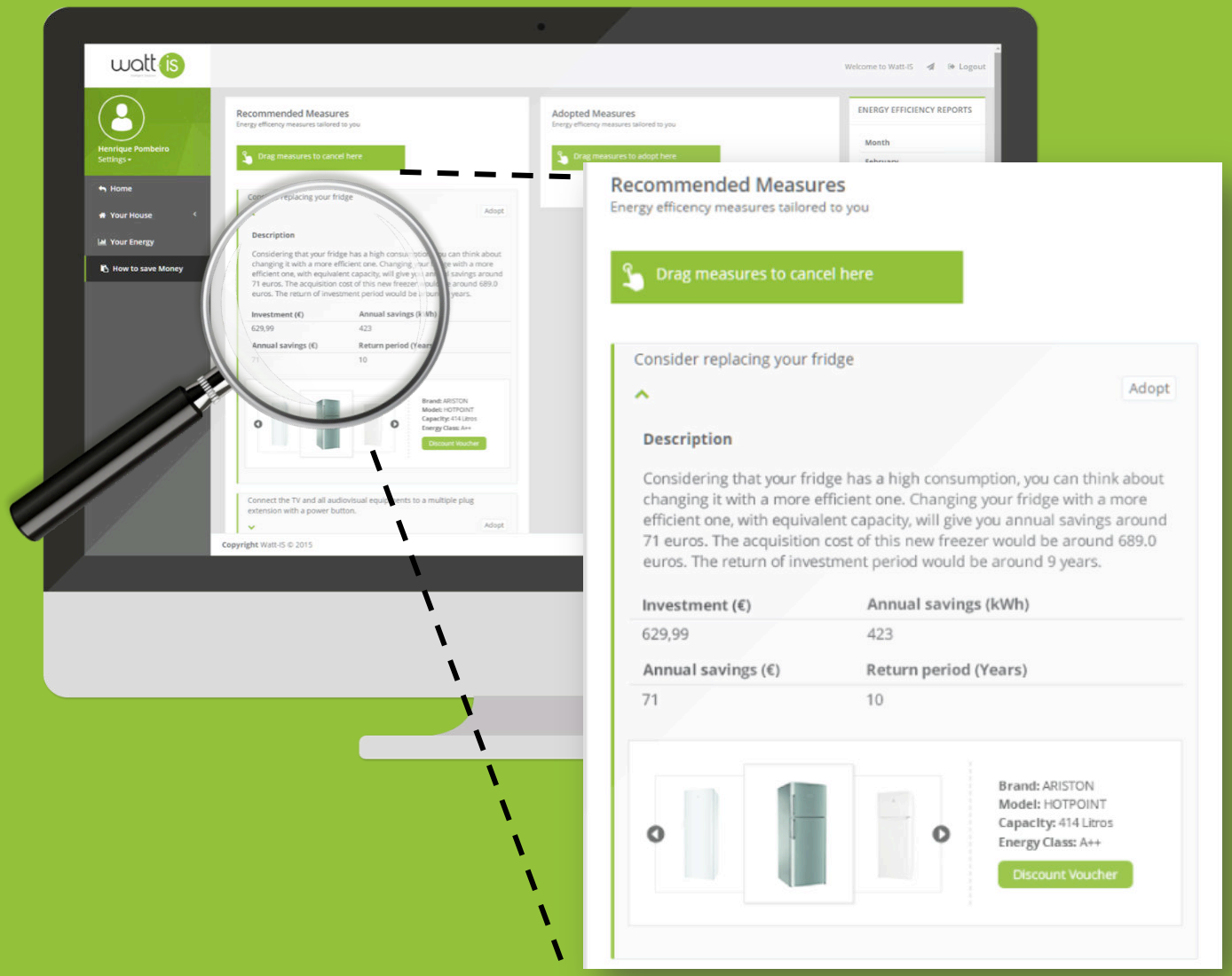
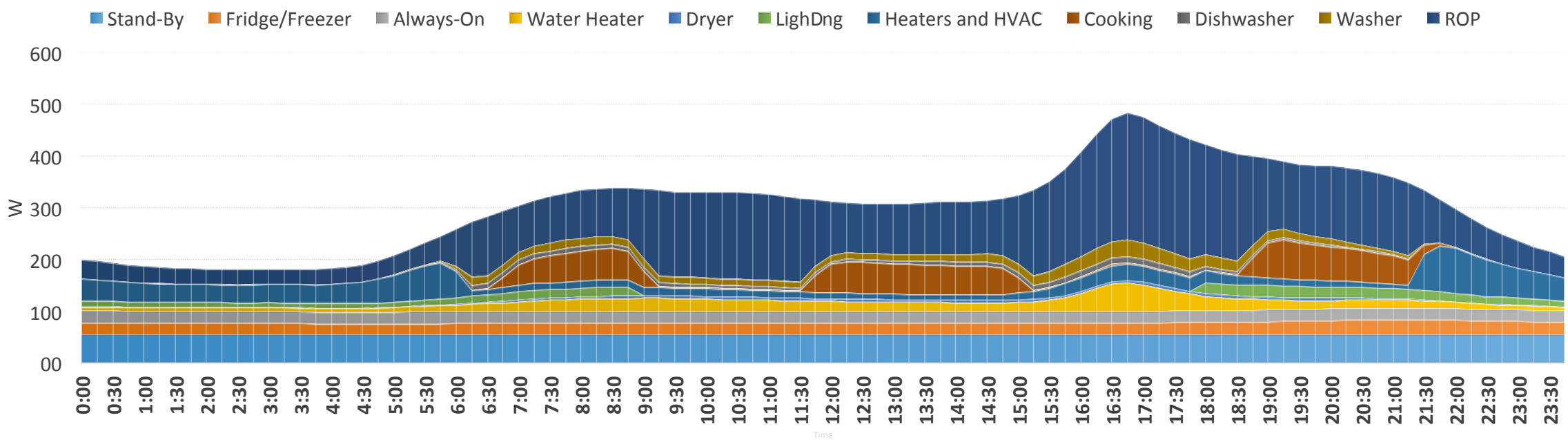


NEW SERVICES – APPLIANCES SUBSTITUTION PROGRAMS IN COLLABORATION WITH RETAIL PARTNERS

Win-Win situation where **end energy clients capture directed discounts** for the substitution of non efficient appliances, and **retail partners** have highly directed leads.

NEW SERVICES – ESTIMATE THE DEMAND SIDE FLEXIBILITY POTENTIAL OF ENERGY UTILITY CLIENTS



Load disaggregation for the average client and day from a 30k client dataset

Peak shiftable load (30k household clients – 15 min) ≈ **3,4 MW**

Total shiftable energy 1 avg. year (30k household clients) ≈ **13 GWh**

CLOUD BASED AND DATA ANALYTICS PLATFORM

HOUSEHOLDS

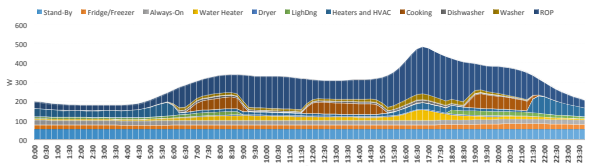
NILM

User Engagement Platform

Appliance Replacement Programs

Remote Energy Audits

Data analytics for Utilities



SME's

Virtual Energy Advisor

- Real-time energy monitoring & automation
- Benchmarking
- Machine learning

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CURRENTLY GAINING MARKET TRACTION

COMMERCIAL & PILOT PROJECTS

- Projects generating revenues
- Commercial projects to start in the next 3 months
- Pilot projects to start in the next 3 months

AWARDS

H2020 SME INSTRUMENTS (Phase 1)

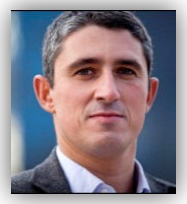
WATT-IS TEAM

Watt-is is a startup that emerged from the MIT Portugal Program.

Watt-is team is composed by 12 highly qualified members:

- 3 PhD's (Mechanics and Physics)
- 1 PhD candidate (Environment Engineering)
- 1 MSc & MBA
- 1 Mechanical Engineer
- 4 IT Engineers
- 1 Designer
- 1 Electrotechnic Engineer

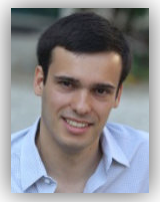
Given its strong focus on data analytics and energy efficiency our team is able to create value added for **EDP**



Miguel Carvalho
Co-Founder & CEO

Henrique Pombeiro
Co-founder & COO

Carlos Silva,
Co-founder & CSO

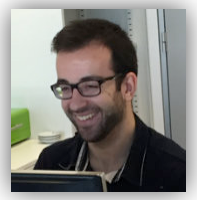


André Pina,
Co-founder & CTO

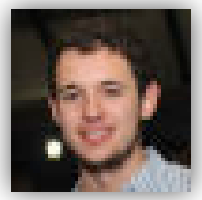
Gonçalo Pereira
Data ScienĠst

Gonçalo Almeida
IT Expert

Carla Reis
Web Developer

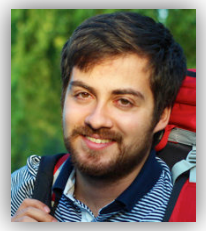


Tiago Nunes
Web Designer



Diogo Frazão
IT Developer

Diogo Guerra
Electrotechnic Eng.



Ricardo Sousa
Data ScienĠst

David Silva
Web Developer

OUR CLIENTS & PARTNERS

ADENE
AGÊNCIA PARA A ENERGIA

boa energia

CEVE
COOPERATIVA ELÉCTRICA DO VALE D'ESTE

dstelecom

eit Climate-KIC

eit Digital

ESMIG
WE MAKE ENERGY SMART

VPS
Virtual Power Solutions

UTEN Portugal
University Technology Enterprise Network

2bpartner

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Intelligent Solutions

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Intelligent Solutions

Your partner in energy data analytics

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