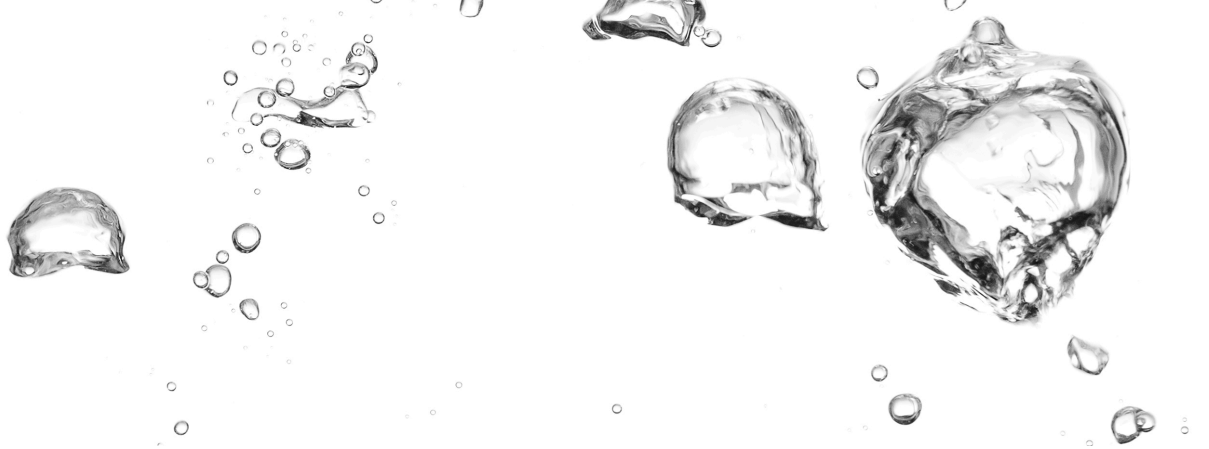


the smart H2O project

A European project on water sustainability

SmartH2O

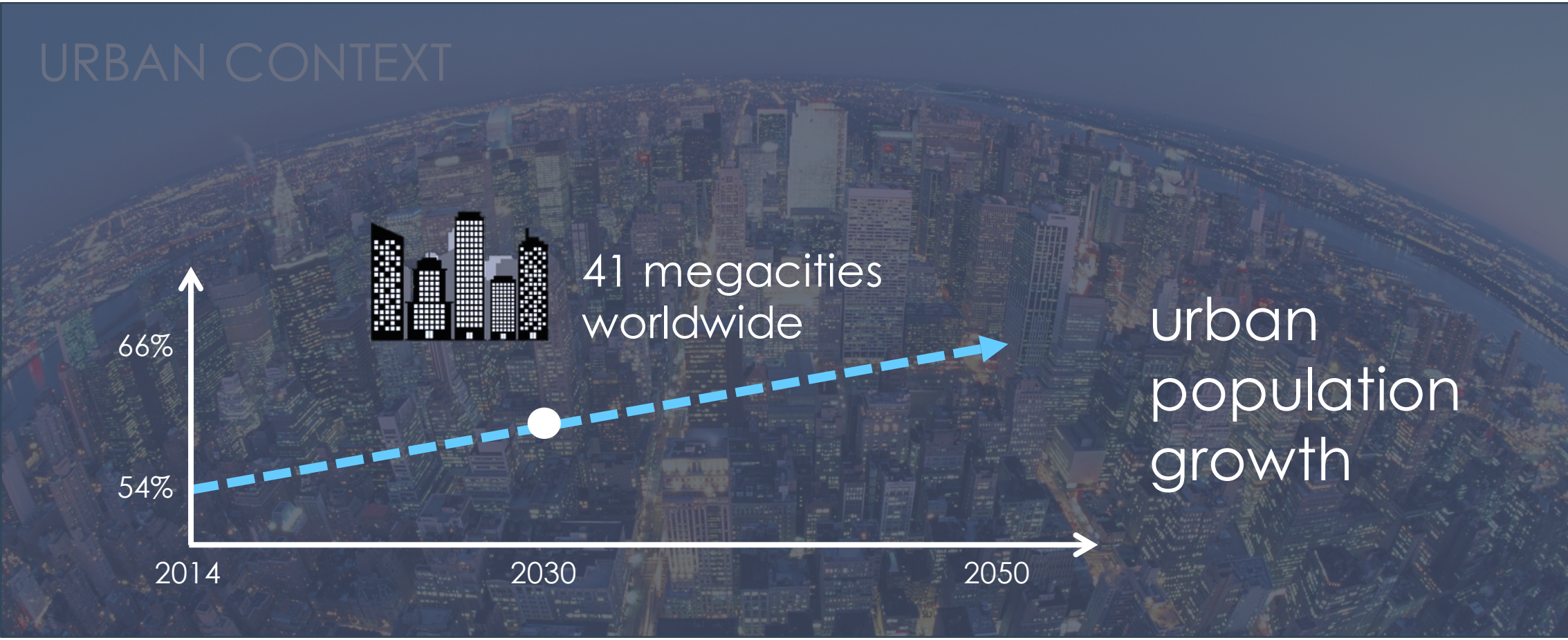
an integrated platform coupling smart water meters with ICT and data intensive modeling to support residential water management

Andrea Cominola, the SmartH2O Consortium

2nd International Electronic Conference on Sensors and Applications
15–30 November 2015

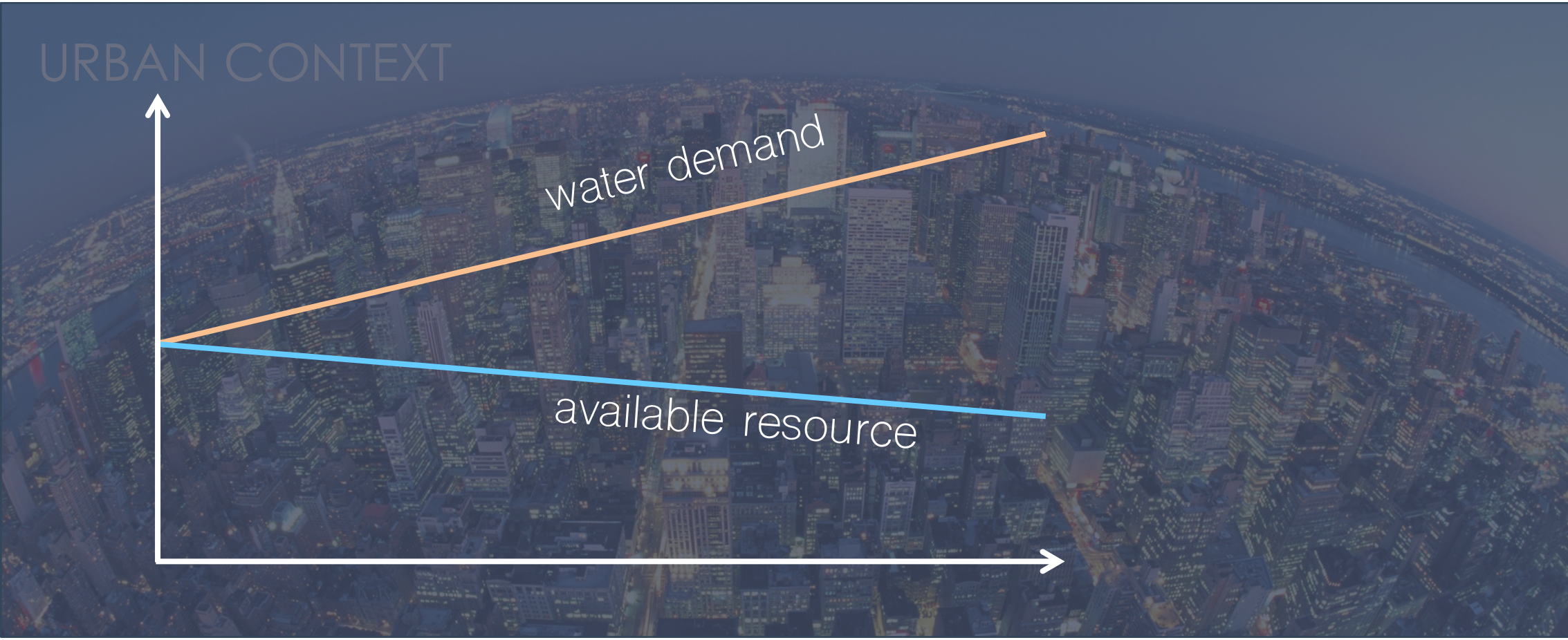
SEVENTH FRAMEWORK PROGRAMME

URBAN CONTEXT

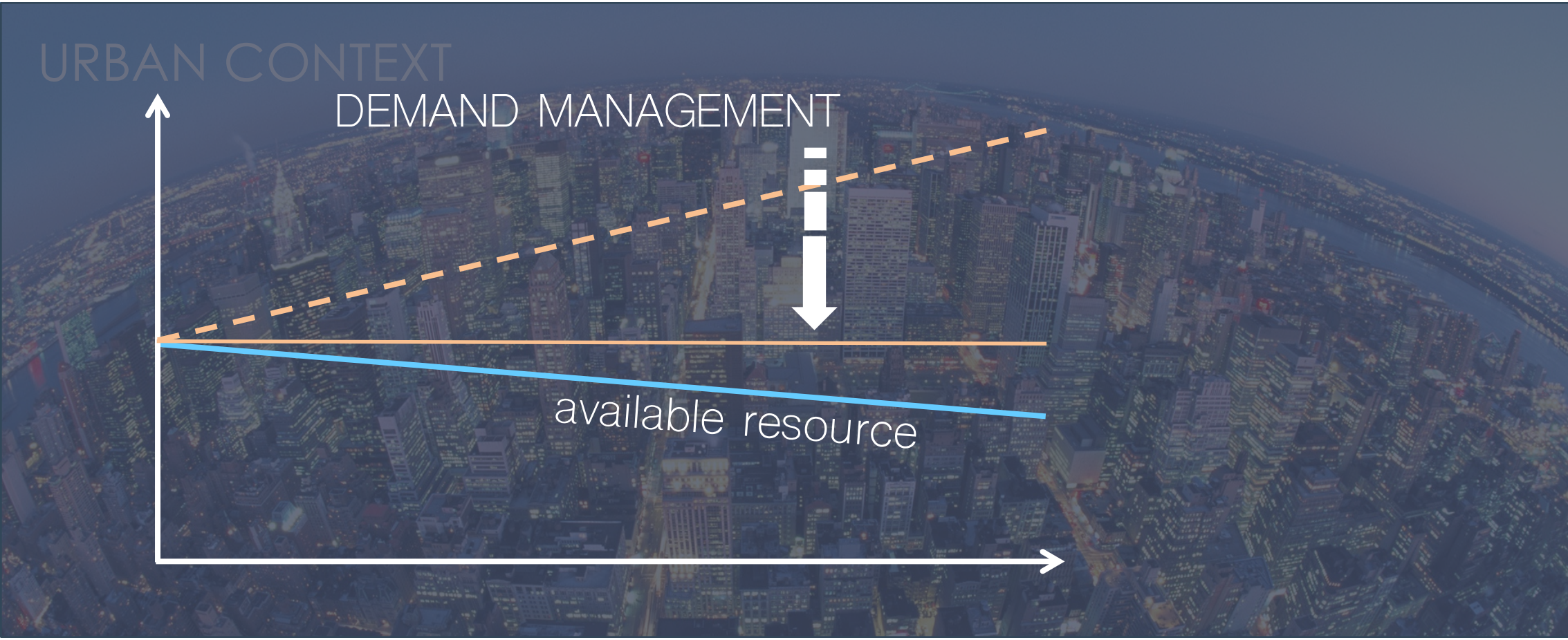


Source: United Nations. Department of Economic and Social Affairs. Population Division, 2010

URBAN WATER MANAGEMENT

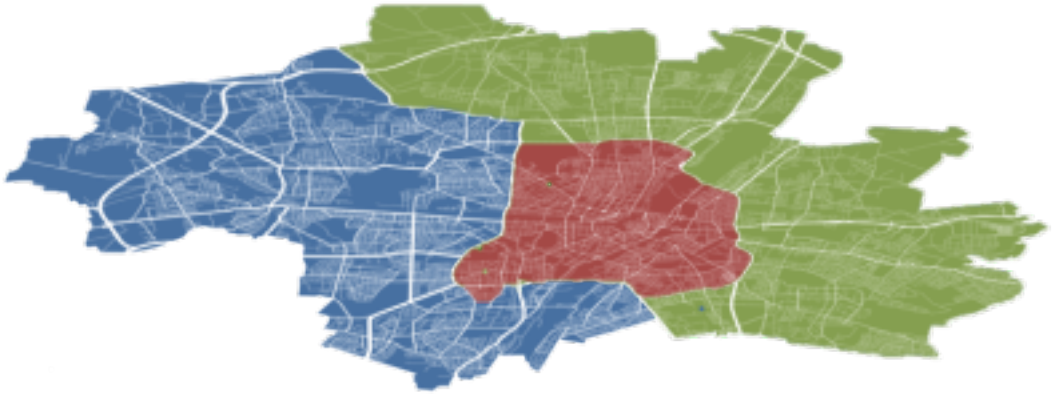


URBAN WATER DEMAND MANAGEMENT



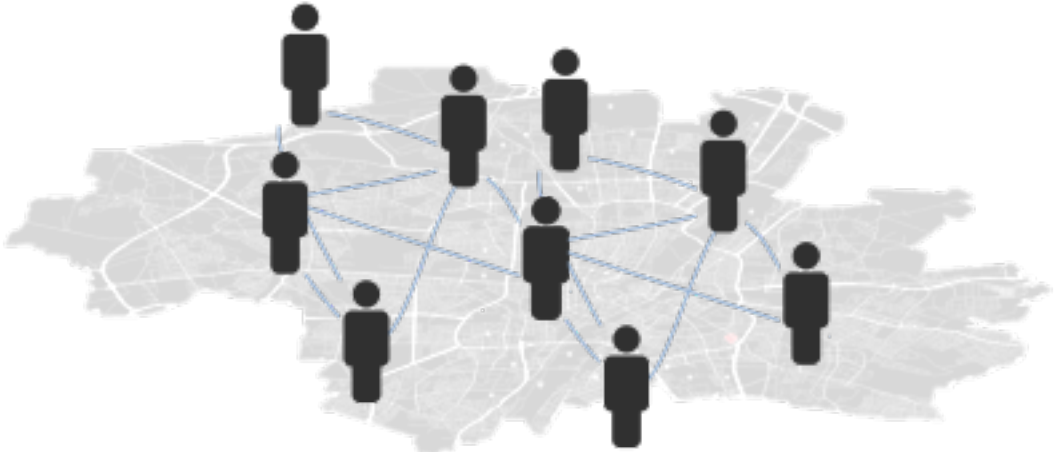
URBAN WATER DEMAND MANAGEMENT

city scale



strategic level
planning

user level



customized management
tailored WDMS

the smart H2O project
A European project on water sustainability

MAIN GOAL

Understanding, modelling and modifying consumers behavior to achieve quantifiable water savings in the residential sector

KEY ELEMENTS

- High-resolution water consumption data
- Interaction with customers for information sharing and socio-psychographic data gathering
- Gamification techniques for users engagement

LEVERAGES FOR WATER DEMAND MANAGEMENT

- Customized feedbacks to water consumers – **RECOMMENDATIONS**

- Rewards (and dynamic pricing) – **BEHAVIOURAL ECONOMICS**

THE sH2O PROJECT_USE CASES

LONDON | UK

Thames Water water supply utility
15 million customers served

2.6 Gl/day drinking water distributed

Development plan: 3 Million smart meters installed by 2030

LOCARNO | CH

Società Elettrica Sopracenerina
power supply utility, 80 thousand customers served

Interested in multi-utility smart metering (water, energy, gas)

Almost 400 smart water meters installed

VALENCIA | ES

EMIVASA water supply utility
2 million customers served

490,000 water smart meters currently installed

Development plan: 650,000 water smart meters installed by end 015.

THE sH2O PROJECT_PLATFORM

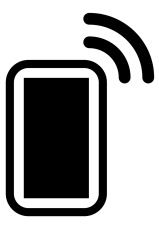
behavioral modeling

water consumption drivers identification

water consumption level forecast at the customer scale

administrator dashboard

gamified bill online and board game



smart meters and end use analysis

Response to WDMS

tailored feedbacks
prescriptive norms
gamified bill
price schemes

platform

Technological insights

SMART METERS

1-hour sampling resolution data
400 new smart meters installed in the Swiss case

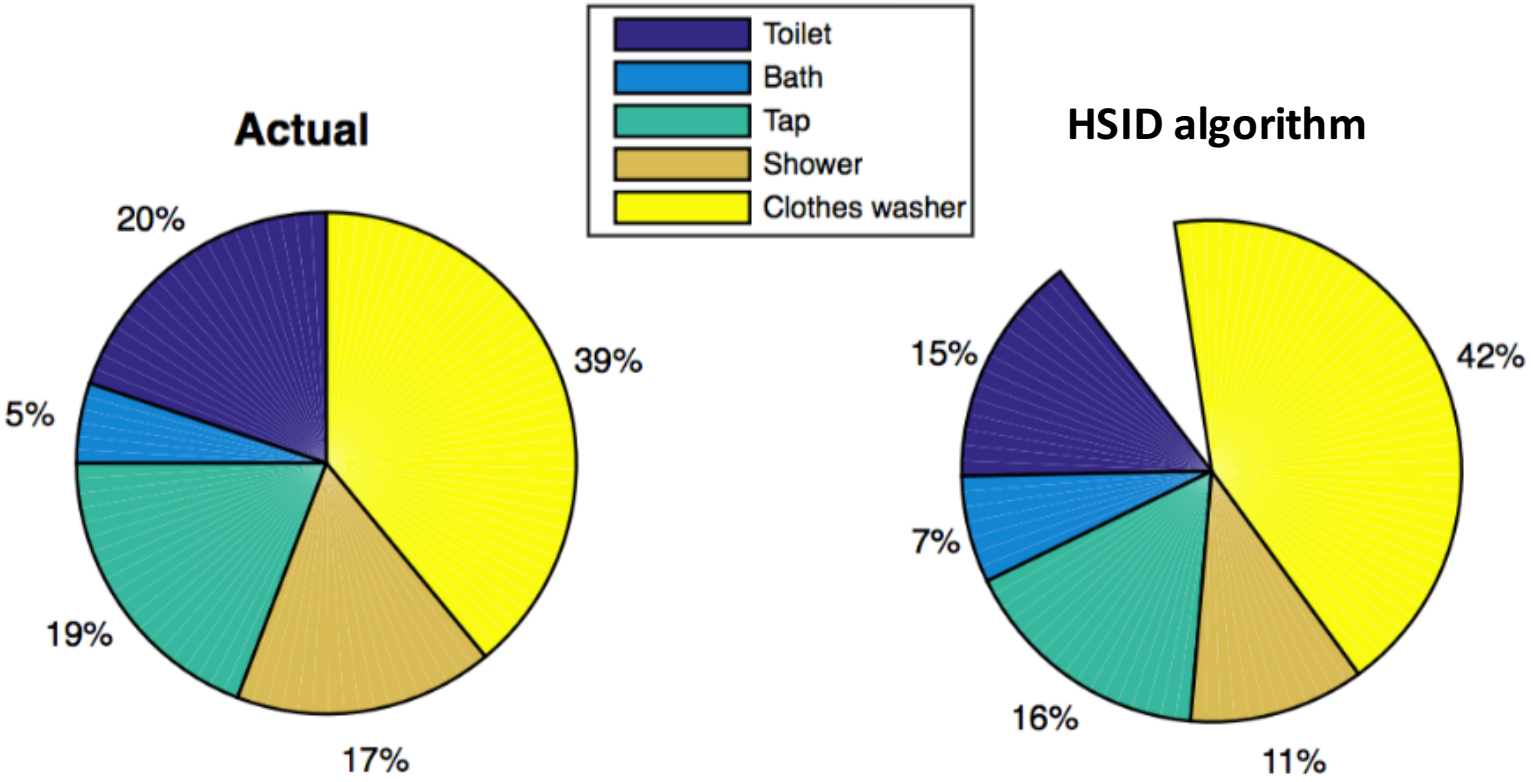
ONLINE SURVEYS

- online surveys are rolled out with the SmartH2O users, in order to collect **users' psycho-sociographic data** (e.g., house characteristics, water consumption devices) and **attitudes** (water saving and consumption attitudes and water price preferences)

- surveys are also developed to get feedbacks from the users on the usability of the SmartH2O platform

END_USE CHARACTERIZATION

A new algorithm to perform household energy and water consumption **TRACE DISAGGREGATION** into end-uses (e.g., washing machine, toilet, tap, etc…) has been developed, with the purpose of profiling users' consumption.

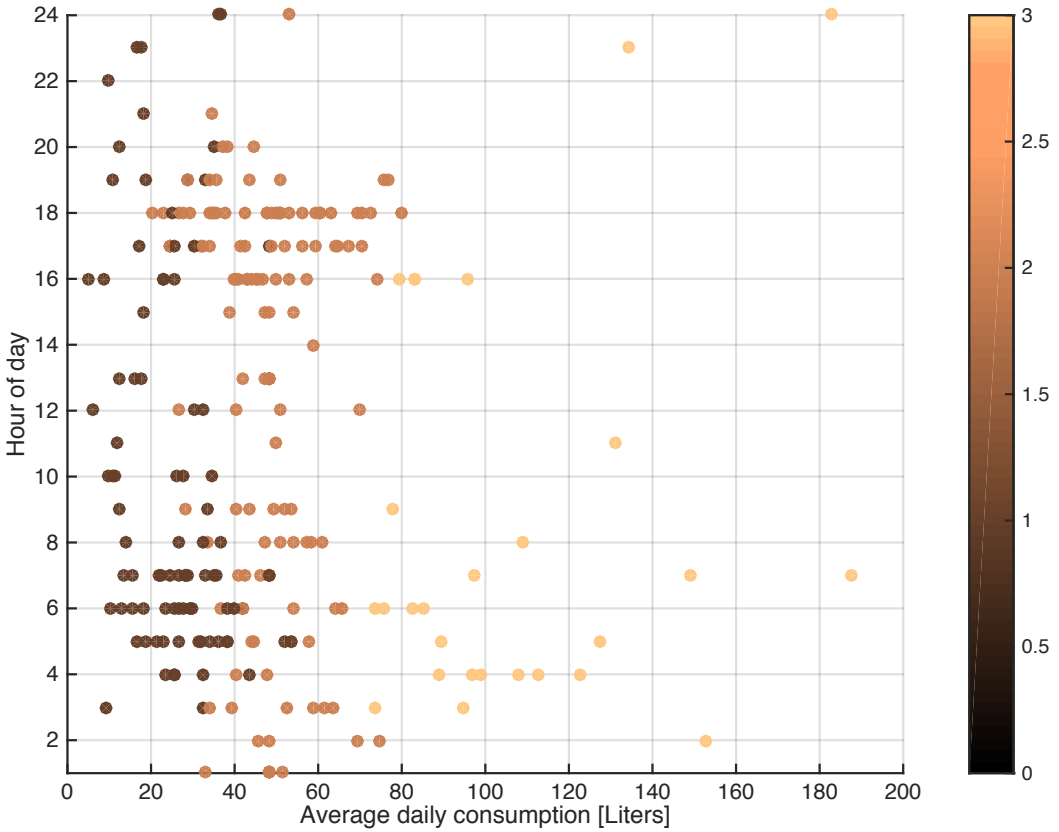


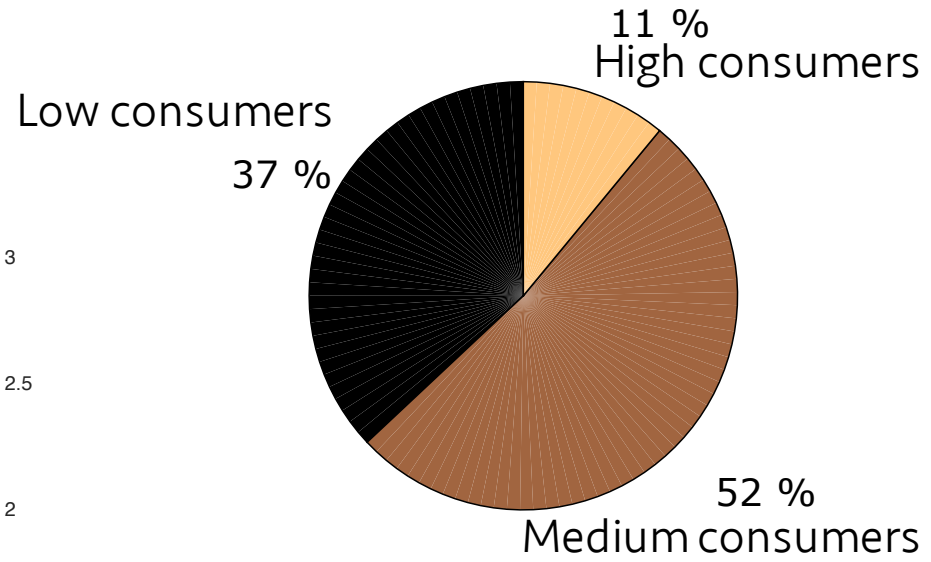
Preliminary experiment:

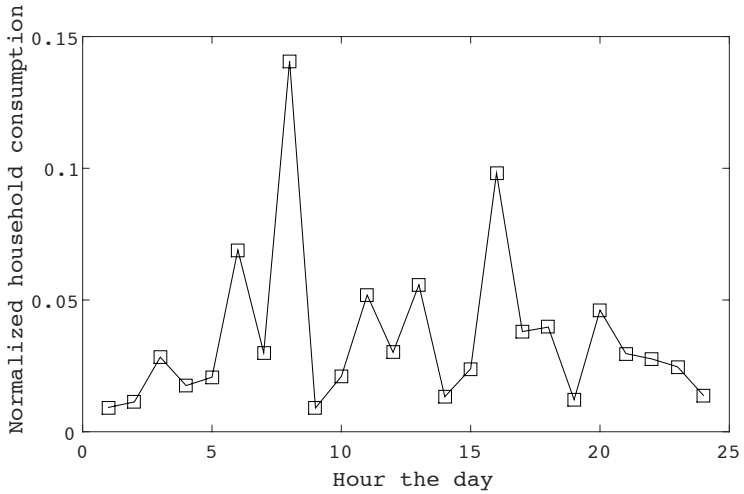
1 household (New Zealand)

Piecewise constant trajectories on 1 min resolution built from 10s resolution sampling

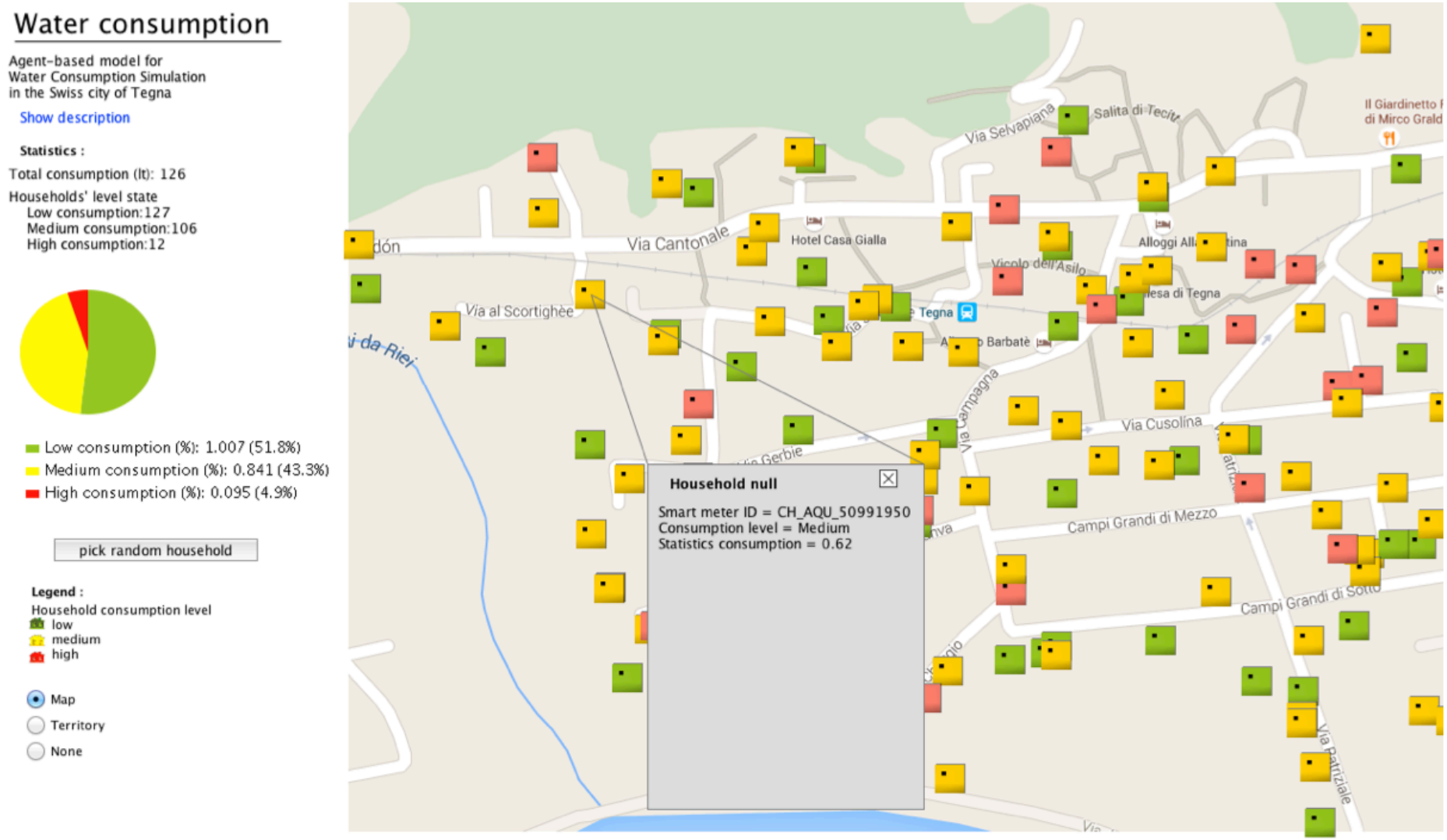
Single user's BEHAVIORAL MODELING through CLUSTERING and CLASSIFICATION techniques.



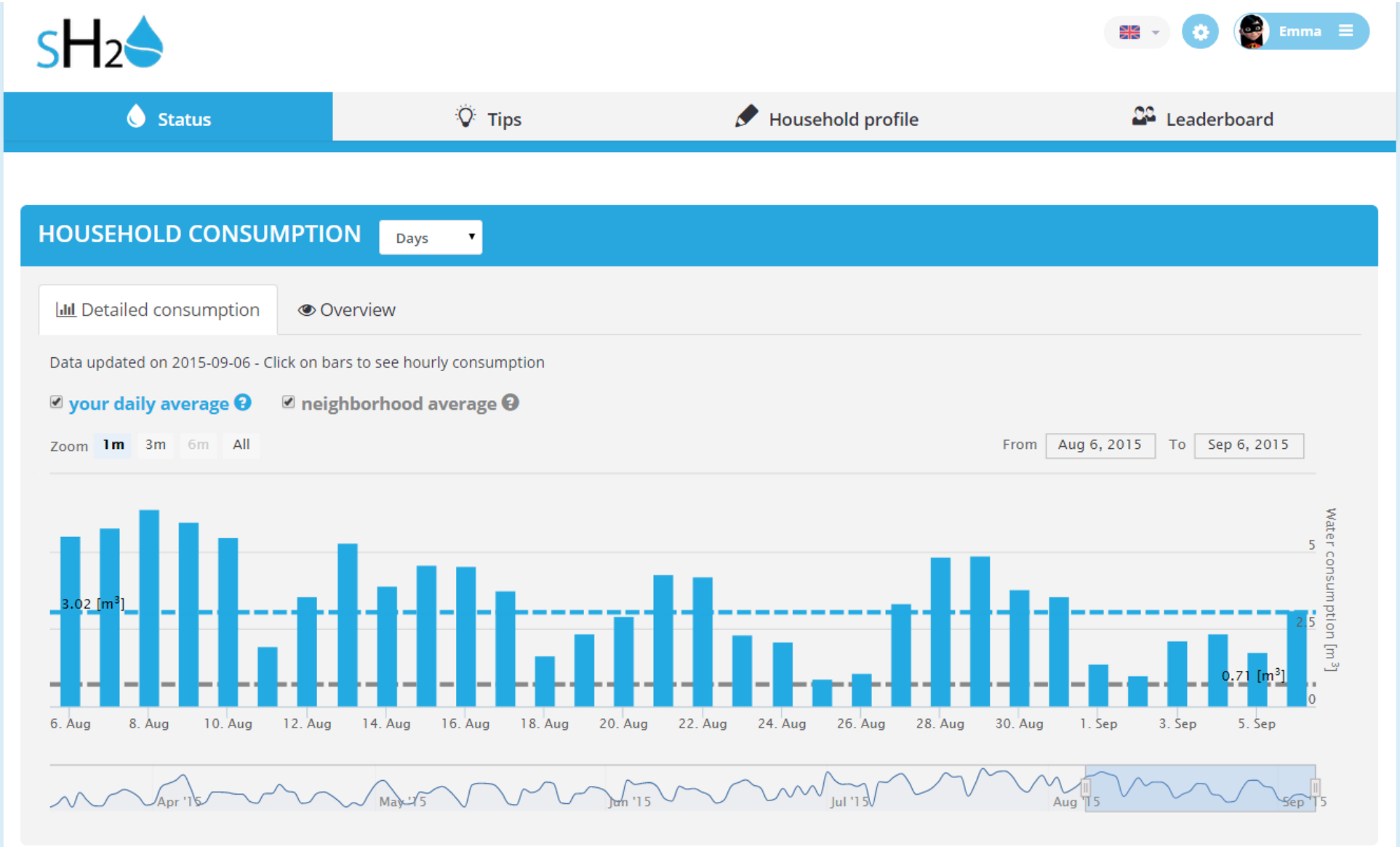




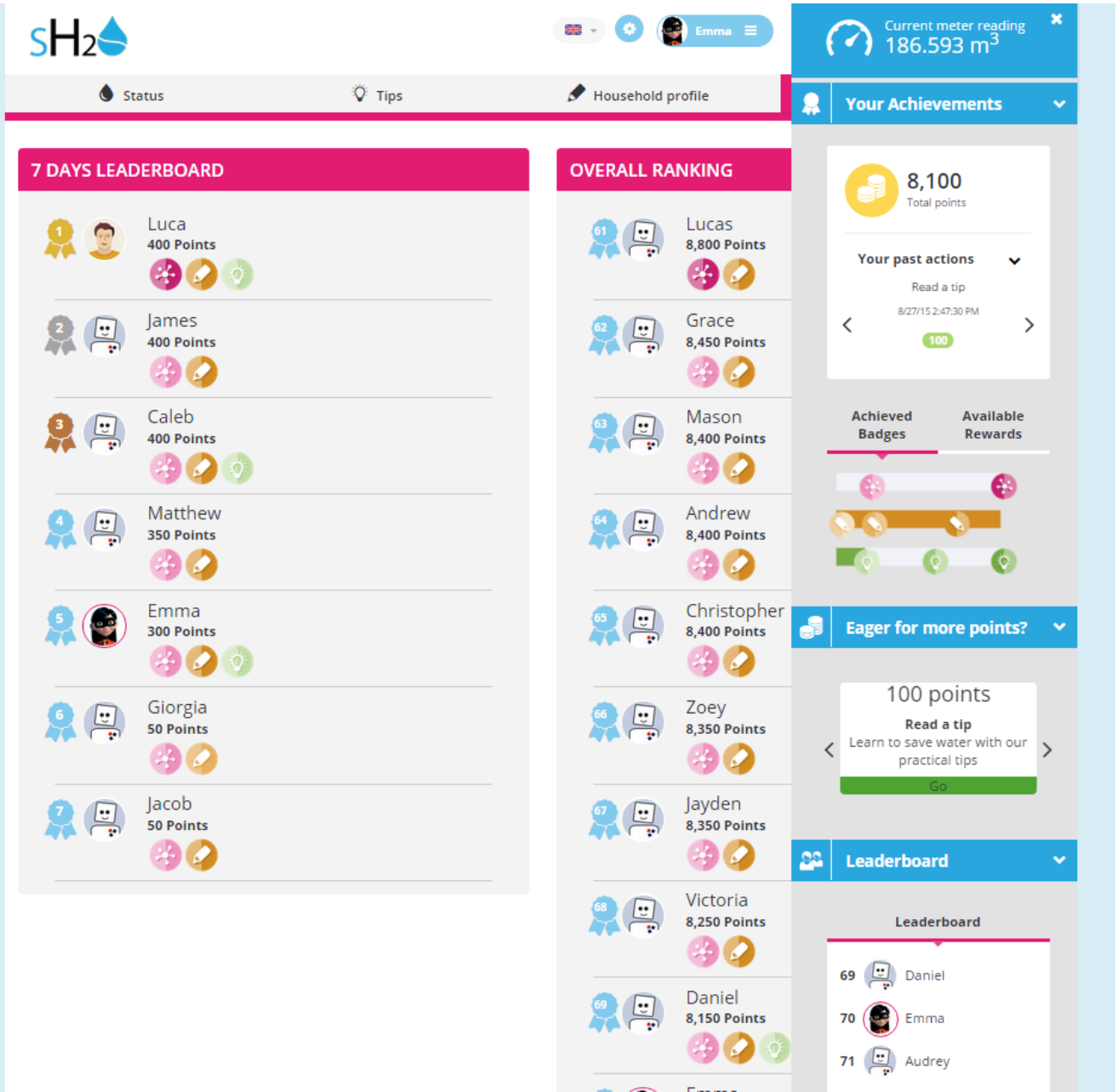
A first prototype of AGENT-BASED MODEL for multi-user modelling



CUSTOMERS WEB PORTAL



CUSTOMERS ENGAGEMENT and GAMIFICATION



next steps

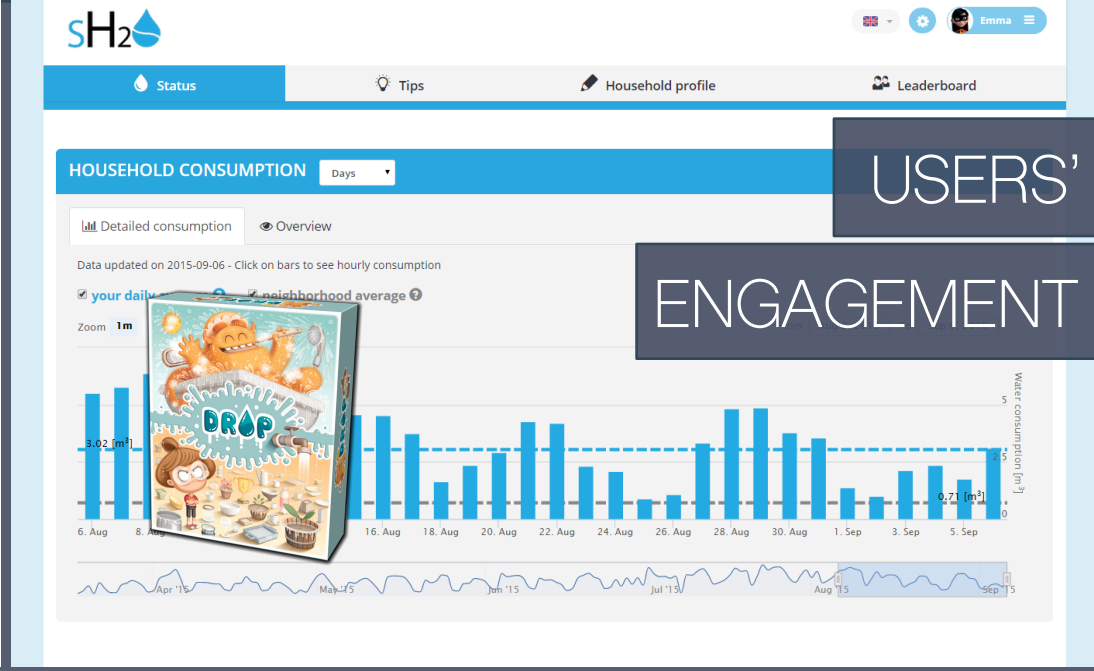
SMART

SENSORS

MODELLING

SMART SENSORS

MODELLING



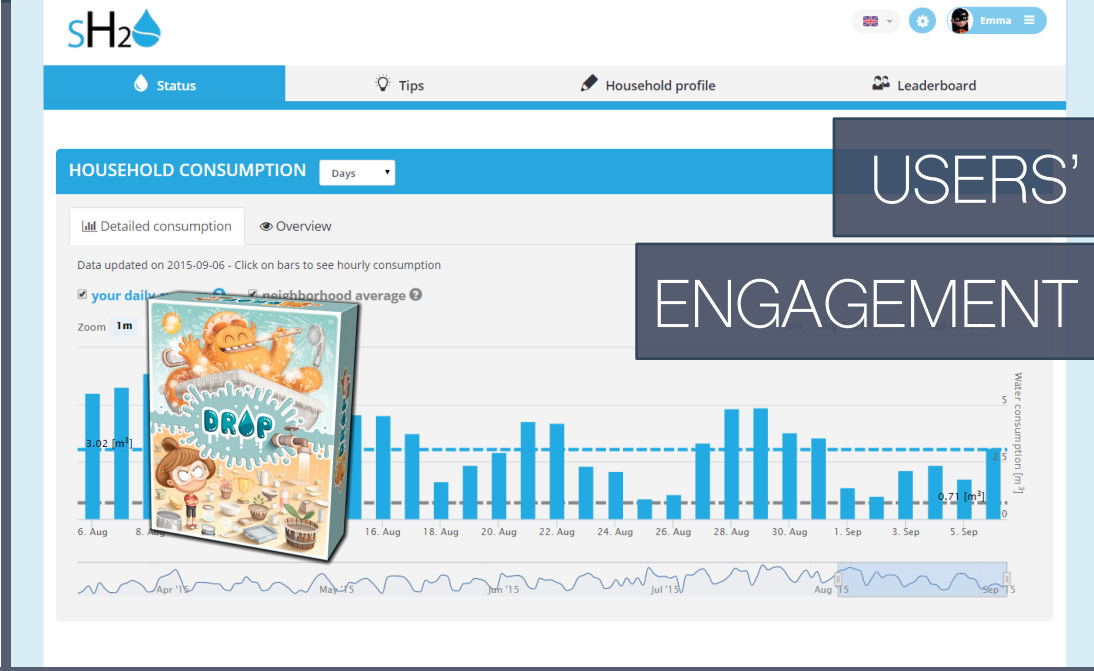
USERS'

ENGAGEMENT

SMART

SENSORS

MODELLING



USERS'

ENGAGEMENT

SMART

SENSORS

Closing the loop with the design and implementation of customized water demand management strategies

Water savings monitoring

The sH2O consortium

Scuola universitaria professionale
della Svizzera italiana
SUPSI

POLITECNICO
MILANO 1863

MANCHESTER
1824
The University of Manchester

UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA

SETMOBILE

EIPCM
EUROPEAN INSTITUTE FOR
PARTICIPATORY MEDIA

Thames
Water

SES
Società Elettrica Sopracenerina

moonsubmarine

emivasa
AJUNTAMENT DE VALÈNCIA

SEVENTH FRAMEWORK
PROGRAMME

the smart H2O project

A European project on water sustainability

http://www.smarth2o-fp7.eu/

@smartH2Oproject
#SmartH2O
@AndreaCominola
@NRMPolimi

thank you

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Department of Electronics, Information and Bioengineering