THE VALUE OF WATER

Multiple Waters,
for multiple purposes and users

Towards a future-proof model for a European water-smart society

Connected Smart Cities Conference – Digital Water session
Brussels, 12 January 2017

Introduction: the WssTP Vision
(Andrea Rubini Scientific & Policy Manager Wsstp)

- **European Commission thematic panel**
- **City and Utility thematic panel**
- **Technology Center, Industry and AIOTI thematic panel**

Conclusions and wrap up of the session
(Durk Krol Executive Director Wsstp)

European Commission thematic panel

- Mr. Panagiotis Balabanis, European Commission, DG RTD, Climate Action and Resource Efficiency

- Mr. Olavi Luotonen, European Commission, DG CONNECT, Internet of Things

City and Utility thematic panel

- Mr. Joan Carles Guardiola R&D Engineer at Grupo Aguas de Valencia

- Mr. Jakob Møller Nielsen, Director for Urban Development, City of Copenhagen

Technology Center, Industry and AIOTI thematic panel

- Ms. Montserrat Mussons Olivella, Digital Roadmap Manager, CETaqua

- Mr. Jesper Kjelds, Senior Vice President, Heat Cooling Water Systems Division Kamstrup

- Mr. Juergen Sturm, member of the management board of the Alliance for Internet of Things Innovation (AIOTI)

Update of the previous 6 year old vision

1. New societal developments e.g. towards circular economy, the emerging IoT

2. New insights in technological capabilities and prospects e.g. (waste) water treatment, digital solutions for water management

3. Increased awareness and urgency to deal with the impact of human behaviour on our environment and the effect of climate change events on our water system

RECOGNISE THE **TRUE VALUE OF WATER**:

Without water everything else in the 77.9 Trillion Euro global economy would fail!

"*Access to ..[water] .. is a basic human right and water is crucial for human health and well-being, as well as economic performance and business growth. It is also a finite and shared resource, therefore action by an individual, a business or a community can have a substantial impact on access to it by others*"

Deloitte Water Tight 2015

- world-wide growth in **water use** with 55% by 2050
- Diffuse **pollution**: affects 90% of river basin districts, 50% of surface water bodies and 33% of groundwater bodies across the EU
- Europe **water demand**: stabilise towards 2050 at around 1000 km3/yr
- **Water scarcity** is already a serious problem in 11% of EU, grow to 30% in 2030
- Increasing effects of **climate change** such as floods and droughts

Global water demand in 2000 and 2050
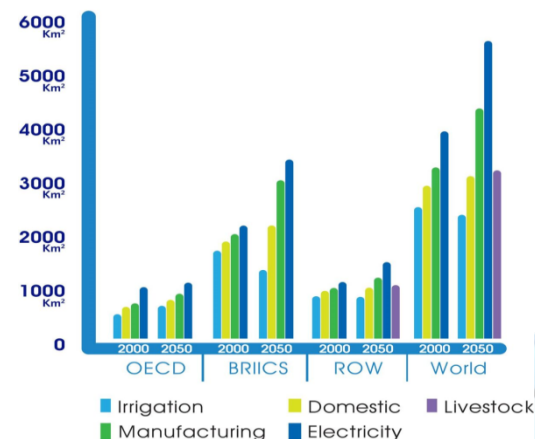
Need for:

- Novel solutions and routes towards important **reduction of fresh-water extraction** from our natural eco-system, while **making available sufficient water sources** for the 77.9 Trillion Euro global economy
- Innovations to secure protection of our **natural environment, resilience and reduced vulnerability** against external events (climate, terrorism)
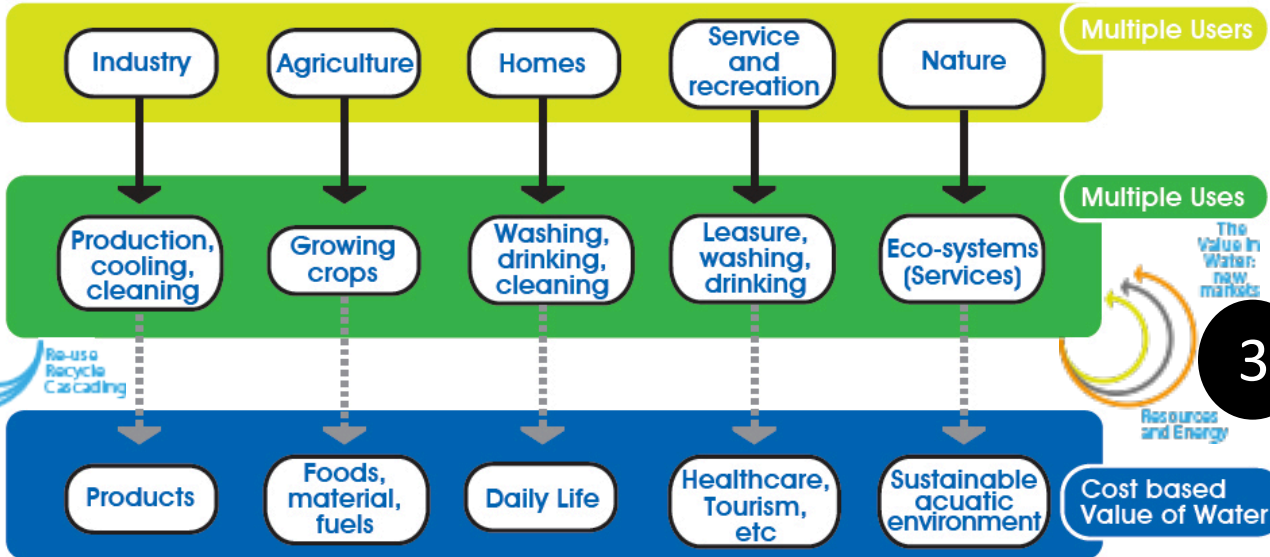
A future proof model for water-smart societies

WssTP — The European Water Platform

Developing a water-smart economy

Multiple Waters, for multiple purposes and users

Enabling multi-loop and resilient water systems

Rational use of multiple waters & boost markets

Increase circularity in the water economy

"Digital water" and Water Technologies

Involve all relevant stakeholders in joint water governance

THE VALUE OF WATER
A water-smart economy

Transparent costs and fit-for-purpose quality

Market for valorization of (used) water

Use, reduce, and re-use

Water, resources and energy

Cascading and fit-for-use

Incentives and awareness

Multiple/ alternative water sources

Treatment and distribution

Use, treat, and discharge

Closing the loops

TECHNOLOGIES
Manageability of the water quality and use

HYBRID GREY & GREEN INFRASTRUCTURES
Robust, flexible and resilient

GOVERNANCE
Multistakeholder involvement

Manage and maintain

Support and enable

Monitor and enable

Redesign

Decision Support

Key Impact Parameters

WssTP Key Impact Parameters

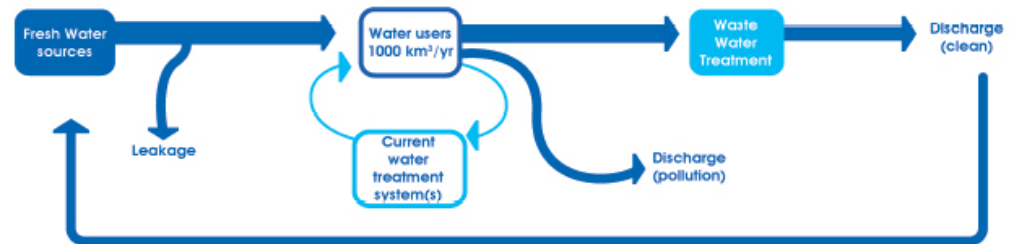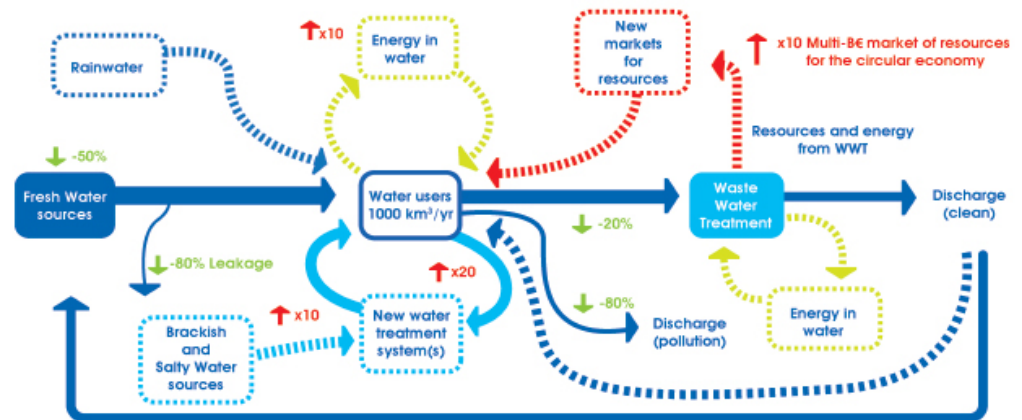| KIP 1: Reduce impact of Europe's water Footprint	KIP 2: True value of water and boost water market	KIP 3: Resilience, stability and sustainability

1. Reducing the impact of Europe's society on our natural water resources by 50% (>650km3/yr)

– Increasing re-use from the current 5% to up to 30%,

– Reduce water "loss" from average 20% to 5-10%

– much higher levels of alternative water sources (brackish, saline water and brine and rain water) – up to 15% of water demand

– Reducing the amount of water used for energy production with 10 - 20% (currently 25% of the overall water use)

Key Impact Parameters
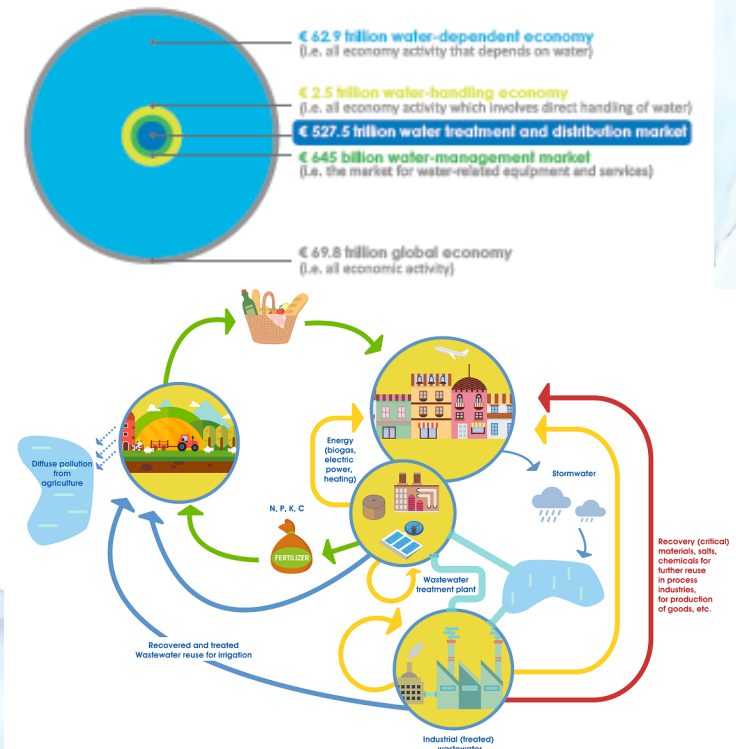
WssTP Key Impact Parameters

KIP 1: Reduce impact of Europe's water Footprint	KIP 2: True value of water and boost water market	KIP 3: Resilience, stability and sustainability

2. Recognise the **true value of water and boost the European water market** as well as global competitiveness of the European water industries

- new **advanced water technologies** (reducing water pollution and reuse for various purposes), management models, infrastructures and systems to exploit the value of multiple alternative water sources in a in the 650 Billion Euro global water-management market

- 5-10 times increase in the valorisation of water by **extracting and exploiting heat, energy, nutrients, minerals, (critical) metals, chemicals** for multiple applications in a multi-Billion global market

€ 62.9 trillion water-dependent economy
(i.e. all economy activity that depends on water)

€ 2.5 trillion water-handling economy
(i.e. all economy activity which involves direct handling of water)

€ 527.5 trillion water treatment and distribution market

€ 645 billion water-management market
(i.e. the market for water-related equipment and services)

€ 69.8 trillion global economy
(i.e. all economic activity)

Key Impact Parameters
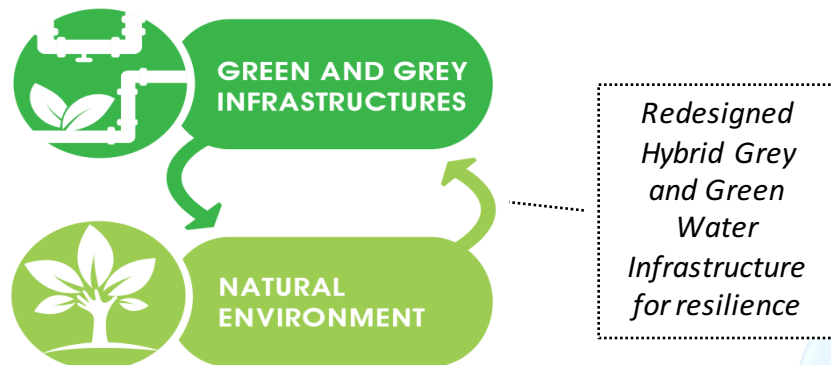
WssTP Key Impact Parameters

| KIP 1: Reduce impact of Europe's water Footprint	KIP 2: True value of water and boost water market	KIP 3: Resilience, stability and sustainability

3. Securing **long term resilience, stability and sustainability** of the water society

- Reduce impact and damage due to climate change events with 50%

- Source protection, minimising residual contamination

- New economic, investment and governance models and harvesting the value in water, as new sources for economic sustainability


GREEN AND GREY INFRASTRUCTURES

NATURAL ENVIRONMENT

Redesigned Hybrid Grey and Green Water Infrastructure for resilience

Joint governance for resilience stability and sustainability

Forecasting & Big Data Decision Support
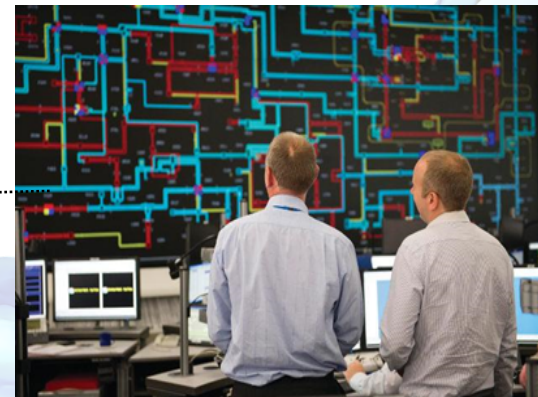
1. A **paradigm shift** in the way our future water society will be organised and managed

2. Developing solutions that contribute to tackling **global challenges** and **Sustainable Development Goals**

3. Reconfirming and strengthening **Europe's position** in global water market

4. Igniting new markets for finite resources and growing jobs in a global **circular economy**

SIRA - model
Strategic Innovation and Research Agenda
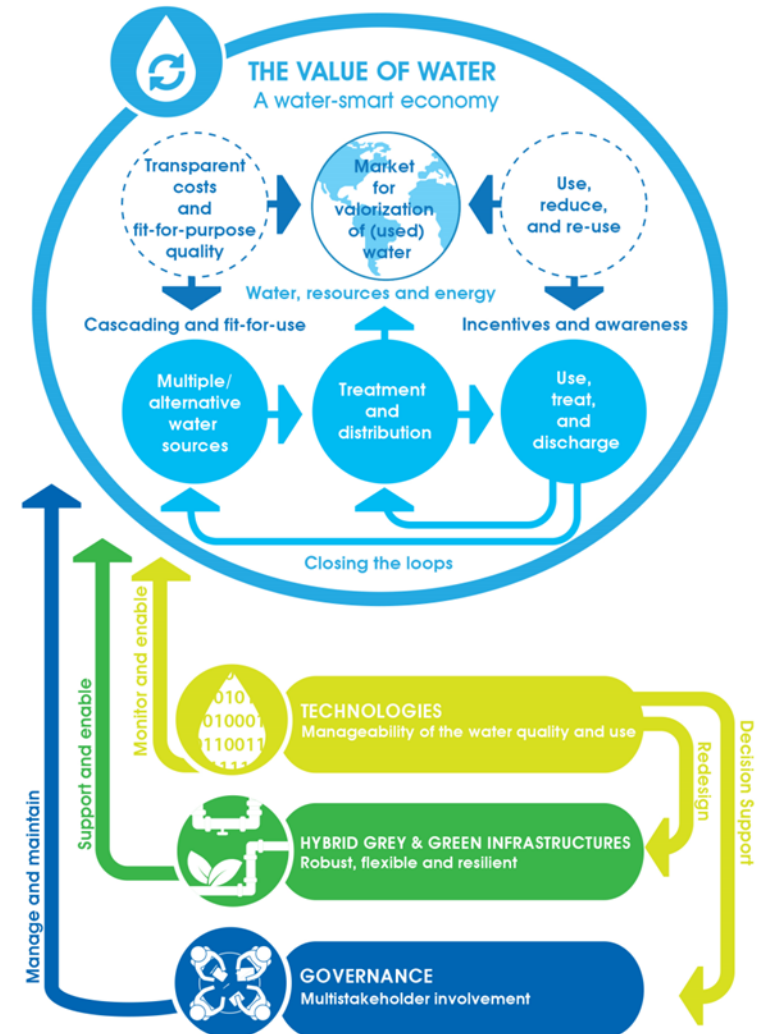
WssTP

The European Water Platform

K.C. 5

| (peri-) Urban Living Lab-Pilots (TRL 7-9) | Future Industries Living Lab-Pilots (TRL 7-9) | Rural Living Lab-Pilots (TRL 7-9) |

Large scale Integrated systemic innovation Pilots

WssTP model for Water-smart Society

K.C. 1

THE VALUE OF WATER (non-tech, tech, TRL 6-8)
New economic models for the value of water, business models for valorizing
the value of water, harvesting and (pre) treating alternative water sources, applying existing and new technologies
(incl. new (ICT enabled) awareness and incentive systems),
new strategies to **rationalize, re-use and recycle water**, combine technologies and new business models to
extract and **valorise by-products and energy in used-water streams**

K.C. 2

TECHNOLOGIES (tech, TRL 3-5, 5-7)
Collaborative **multi-sensor** and devices observation systems, ICT, sensors, metering, big-data,
multi-level **modelling, and analyses** for governance support , new technologies for **monitoring and removal of
pollution**, and new **water treatment technologies** to foster cascading, re-use and recycling

K.C. 3

HYBRID GREY AND GREEN INFRASTRUCTURE (non-tech, tech, TRL 5-8)
Redesigning the (integrated) **grey and green infrastructure** for **resilience and multiple waters (multi-loop)**
distribution, new **digital tools** for resilience management, novel ways to integrate
nature for (rainwater) capturing and storage, new technologies (e.g. (self-healing) materials for infra, robotics) for
cost effective maintenance, New **finance models** for a sustainable infrastructure

Dedicated Research and innovation actions

K.C. 4

GOVERNANCE (non-tech, tech, TRL 4-7)
New socio-economic **governance models**,
Advanced up-to-date and (quasi) real-time, multi-layer **decision support systems**

K.C. 6

**Horizontal (LCA, standards, legislation, awareness, skills etc.) and
replication actions, also outside of Europe to boost competitiveness of Europe's water sector**

KC1: The Value of Water

Non-technical
New economic models, strategies and business models for multiple waters and exploiting the value in water (energy and by-products)

KC4: Governance

Non-technical
New multi-stakeholder governance models

Research & Innovation (TRL 4-7)
New (big data based) Governance Support Systems

Innovation (TRL 6-8)
Combine technologies and cascading strategies

Rationalise/Reduce

Re-use

Recycle

Research & Innovation (TRL 6-7)
Technologies to harvest, measure & (pre-) treat multiple waters

Innovation (TRL 6-8)
Apply new WWT technologies and business models

Valorise by-products in used water

Valorise energy in used water

Innovation (TRL 7-9)
First time experimental combination of new, existing technologies, new economic, business and governance models as well as new investments in large scale real-life Living Labs

Smart (peri-) Urban Living Lab-Pilots

Future Industries Living Lab-Pilots

Rural Living Lab-Pilots

KC2: Technologies

Research (TRL 3-5)
New Digital and water treatment technologies

Research & Innovation (TRL 5-7)
New Digital and water treatment technologies

Research & Innovation (TRL 5-8)
Redesign multi-loop resilient and smart grey and green infra

KC3: Hybrid Grey and Green Infra

Non-technical
Long-term financial and investment models for economically sustainable asset-management

KC5: Living Labs

KC6: Horizontal

Support eco-innovative companies

Water Footprint Assessment

Education, awareness, capacity building, tools

Water advocacy, planning and management

International cooperation

**Water becomes
a new oil as the
World runs dry**

Thank you

wsstp@wsstp.eu
www.wsstp.eu