

# @qua

ICT  
for water  
efficiency



ICT Water Consultation  
Brussels 31<sup>st</sup> of January 2013  
Ph.Gourbesville

## @qua – ICT for Water Efficiency

- Only thematic network working on water & ICT with 17 EU partners
- Gathering industrials from Water & ICT sectors + stakeholders (like Ofwat, municipalities, etc.)
- Objectives: roadmap for R&D relevant actions and guidelines for dissemination of tools
- Documents at: [www.a-aqua.eu](http://www.a-aqua.eu)

## Starting point: ICT for water efficiency

- In which domain a result could have real **efficiency**?
  - Not for domestic customers – no significant improvement with public awareness (limited part of consumption, close to physiologic limit)
  - Not for major industrials who are in constant cost-driven situation. (they have pioneered since decades reuse, cascading strategies and industrial ecology)
  - Not for agriculture which is politically driven in Europe.
  - The only domain is for water utilities

## Starting point: ICT for water efficiency

- **ICT for water efficiency = ICT for water utilities efficiency**
- The adopted strategy: analysis in all Business Processes (BPs) of ICT and identification of added value
- Identification of BPs (unified vision)

1 - Operation of Plants	6 - Measures
2 - Operation of networks	7 - Customers
3 - Asset Management	8 - Public Service Contract Management
4 - Works and Intervention	9 - Crisis Management
5 - Use and Maintenance of Geographic Information	

## Methodology to follow

- Need for a perennial, complete and evolutionary **conceptualization** of water industry
- Identify the added value within the BPs according to the Triple Bottom Line: Planet, People & Profit
- The starting points are invariants of BPs (which shared by all utilities)
- Vision has to be **technology free** and allows then to welcome any new relevant technology.

According to the established diagnostic, 3 domains are identified for ICT R&D actions which may significantly improve efficiency:

- **I. Water Information System**
- **II. Water business tools**
- **III. Near future water business tools**

Until now R&D projects have focused on narrow & specific topics. It is urgent to develop the **needed conceptual framework** and Europe has to take the lead now in order to keep initiative and sustain his leadership.

## I. Water Information System

**Theme:** towards standards and interoperability.

The main idea being to **follow the example of several other industries - like building, telecommunications, etc.** - that have already succeeded in the design and dissemination of **business-specific IS standards.**

### Priority 1 - short term (2013-2015)

Two main sectors can host major innovative actions:

- **Towards a standardized IS architecture compliant with BPs: WatBIS (Water Business Information System)**
- **Ontologies towards semantic interoperability**

## I.1. WatBIS – Water Business Information System

- Mainly a KM action, i.e. starts from **existing "TIS" (Target Information Systems) already designed in several water companies**, updates these concepts, shares and disseminates to the whole water sector.
- This action includes tools and methods for evolution towards SOA, and possibly building up of a shared library of business web services knowing the fact that usable (non water-specific) standards already exist (e.g. Open Geospatial Consortium's - OGC™).



## I.2. Ontologies

This action can be structured around two directions:

- Develop water-specific Ontologies, mainly "**Asset Descriptions**" and "**Works & Interventions**"
- Integrate and disseminate existing ontologies about sensors and measurements (mainly standards and recommendations from W3C and OGC), *such as Open Geospatial Consortium's (OGC™) Sensor Web Enablement (SWE), or W3C's Semantic Sensor Network ontology (SSN), or OGC's WaterML and Sensor Observation Service (SOS)*

## II . Water Business Tools

Identified sectors:

- **Asset management**
- **Work management**
- **Real time modeling and decision making**
- **From GIS towards geographic intelligence**

Actions have different priorities and time perspectives

## II . Water Business Tools

### Asset management

- Asset Management Tools **enhancements towards compliance with Business Processes** (mainly about the notion of "performance of a system of assets according to a set of rules of the game") - **Priority 1 / Middle Term (2013-2017)**
- Improvement of Asset Management Decision Making Tools - **Priority 1 / Middle Term (2013-2017)**
- Long term Feedback on Asset Management decisions - **Priority 2 / Long Term (2013-2020)**

## II . Water Business Tools

### Work management

- The objective is to achieve Work Management Tools **enhancements towards compliance with Business Processes - Priority 2 / Short Term (2013-2015)**.
- This action includes improvement of mobile tools for field workers (WeCo - Wearable Computers - , Ambient Intelligence and communicating devices, such as “smart” valve key or metal detector).

## II . Water Business Tools

### Real time modeling & decision making

In all domains ( networks, plants and environment monitoring), 2 operational levels are requested : from event detection to complete diagnosis (detection of abnormal situations, diagnosis and correction actions). All types of models (deterministic, stochastic, probabilistic and mixed/combined) could be implemented in order to support the decision process and ensure performance.

This action has a **Priority 2 / Middle term (2013-2017)**

*Several ICT solutions exist on the market but those approaches are still very partial and don't match the overall expectations of the water utilities.*

## II . Water Business Tools

### From GIS towards Geographic Intelligence

= i.e. Sprinkle BPs with drops of Geographic Services

The standards to use within the water domain already exist with the Open Geospatial Consortium's (OGC™).

The priority has to be given to the democratization / dissemination of the standards and the writing of guidelines for the modernization of existing Information Systems.

This action has a **Priority 1 / Short term (2013-2015)**

### **III . Near future water business tools**

Needs identified for the current trends of the water business which are mainly:

- Cities of Tomorrow: decentralized water technologies, reuse, cascading, etc.
- Water-Energy Nexus

3 significant actions can be mentioned:

#### **Priority 1 & short term (2013-2015)**

- Energy peak load shedding using water utilities and services
- Definition of methods and ICT solutions for optimal solutions in the water–energy mix

### **III . Near future water business tools**

Three significant actions can be mentioned according to priorities and timeframe:

#### **Priority 1 & medium term (2013-2017)**

- Integration of ICT tools towards decentralized water services
- Methods and devices for monitoring water reuse in buildings and water cascading in cities

#### **Priority 3 & long term (2013-2020)**

- Methods and solutions for Smart Water Grid Management



## Concluding remarks

- Water is not Energy and concepts used for Energy domain are not relevant for the water domain
- Energy (electrical or chemical) is destroyed during consumption
- There is no “consumption” for water but only use of water: water is returning to the big or small water cycles
- Operational time steps are completely different: 1/100 s for electricity and 15 min for water
- Water can be stored for long periods, not Energy
- Efficiency is not equivalent and has different characteristics
- Analogies between Energy and water are not relevant  
(A smart energy grid is not a smart water grid!)

## Concluding remarks

- It is urgent to develop the needed conceptual framework (standards ) and Europe has to take the lead now in order to keep initiative and sustain his industrial leadership (endorsement of standards).
- The @qua network will welcome new members sharing the interest of the developed approach.
- The concepts developed by @qua are obviously the only foundations for the emerging ICT for water efficiency.
- Due to interest shown at global scale (S.Korea, USA, Australia, India, China), @qua will be an international entity open to actors from both water and ICT domains.

@aqua

ICT  
for water  
efficiency

Thank for your attention!

Visit: [www.a-aqua.eu](http://www.a-aqua.eu)