



ACQUEAU

An initiative for Growth and innovation

Smart Electronic Needs for WATER



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EURIPIDES FORUM





the CLUSTER FOR WATER

- **Dedicated to the water industry and related technologies**
- **Established in April 2010 supported by 18 countries**
- **First call on-going : 70M€ proposals**
 - 9 major water components based on the water cycle
 - 5 major programmes for key technological needs
 - Open to any proposal relevant to the strategy (BLUE BOOK)
- **AISBL established in Brussels (ESE offices)**



Water a strong impact on HEALTH ñ ECONOMY- SOCIETY

- **VITAL but:** Unequal availability over the world
 - high energy consuming (treatment)
 - non efficient use
- **Huge market:** 250 to 350 Billion € ⁽¹⁾
(drinking and waste water)
- **Considerable assets:**
 - > 3.5 Million Km water distribution pipes
 - > 2.5 Million Km waste water sewers
- **Low cost product for the customer**

• 1€/m ³	>	water
• 1€/l	>	gasoline
• 1€/ml	>	pharmaceuticals
- **Large social impact:** > 600,000 **direct** jobs in Europe

(1) According to different sources



Water sector in Europe:

Key features

- Thousands of water service providers (~75,000)
- Diffuse and dispersed knowledge
- Market dominated by local SMEs
- Very large, long life assets (> €33Bn invested in 2008)
- Fragmented and scattered R&D with little investment
- Address a wide spectrum of industrial activities and technologies

**Strong need in technology development
in diverse areas and sectors**



Technology Road Map

Water Technology Needs

1. Water resources & alternative sources
2. Water treatment
3. Water distribution
4. Customer
5. Agriculture
6. Industry
7. Wastewater treatment
8. Biosolids and other sludge's
9. Urban drainage and wastewater collection



⇒ **5 programmes considered as priorities for the first calls**



5 major programmes



- **To promote a better environment and health**
⇒ Membrane technologies
- **To protect water resources, the environment & to boost competitiveness**
⇒ Real time system management
- **To preserve the planet & to increase energy efficiency**
⇒ Low energy wastewater treatment
- **To design the future of water deliveries**
⇒ Materials for pipes and coating
- **To develop new processes with better environmental footprint**
⇒ Low environmental impacts for disinfection & oxidation



ACQUEAU - Planning and Development

Planning

- First call launch: July 7th (Brussels)
- First call labeling: December 15th 2010

Development of ACQUEAU (initial estimation)

- Objectives: 30 simultaneous running projects
(5 m€ mean value – 3 years duration)
- R&D Volume: 500 M€ over 10 years.

Development of ACQUEAU (First results - 6 months)

- 24 proposals 70M€ volume – 3 years duration



Smart Electronic Needs for the Water Cycle Resource Management

Quality and quantity monitoring, Resource protection
Sensors
Long range communication
Data analysis



Smart Electronic Needs for the Water Cycle

WATER PRODUCTION



Smart Electronic Needs for the Water Cycle

WATER DISTRIBUTION

No energy available !!



Water Quality
Energy consumption
Leaks detection
Assets management
cost

Sensors
Short range
communications
Data analysis



Smart Electronic Needs for the Water Cycle

WASTE WATER TREATMENT



Smart Electronic Needs for the Water Cycle

ISSUES

- **Issues**
 - Total Cost of Ownership (TCO)
 - Reliable sensors for new parameters
 - Wireless communication
 - Energy
 - Integration



Smart Electronic Needs for the Water Cycle

Total Cost of Ownership

- Production and installation
- Maintenance, communication, energy, data processing
- Taking down and Recycling

Significant **scale effect** on water networks

Smart network management in a **mid sized European city** requires :

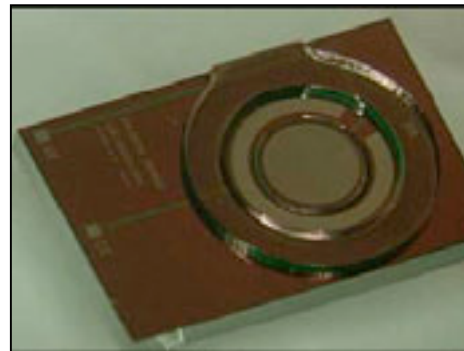
- hundreds or even **thousands of sensors**
- **tens of thousands** of water meters
- and associated communication devices



Smart Electronic Needs for the Water Cycle

SENSORS

- Key components to monitor water quality, hydraulics, equipments operation (pumps, valves...) or the state of the assets (pipes...)
- **New parameters (regulations) measurement**
 - new components in water resources, processes and distribution (emerging pollutants...)
 - Corrosion or mechanical constraints of pipes (asset management)
- **Reliability**
 - Long term stable performance despite cloaking, aging...
 - Hostile environment (chlorine or hydrogen sulfide, electromagnetic noise...)
- **Low maintenance costs**
 - Reliability
 - self tests



Smart Electronic Needs for the Water Cycle

Wireless Communications

- **Large area network** (city and suburbs coverage) for data gathering :
 - Numerous **widespread sensors**
 - rather **low volume of data**
- Data transfer to the **open air** from :
 - **underground sensors**
 - **pipes**
 - through the pipe itself?
 - through the water?
- Long lasting protocols

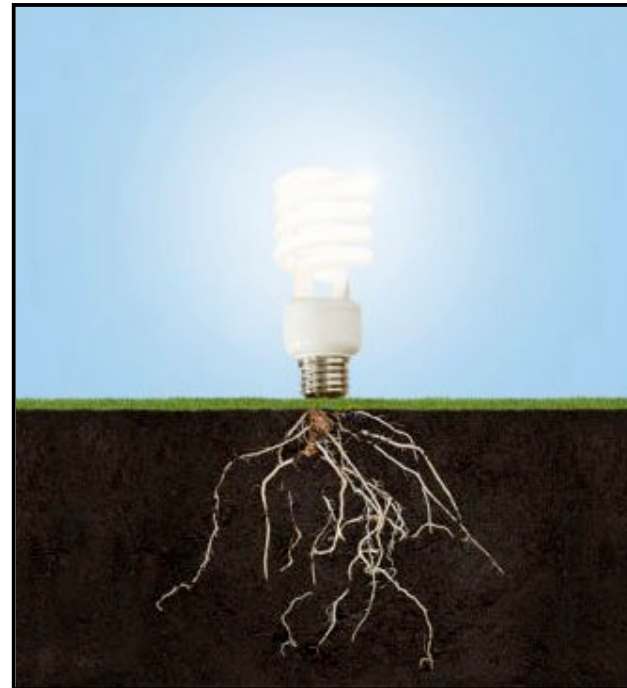


Smart Electronic Needs for the Water Cycle

ENERGY

NO ENERGY AVAILABLE LOCALLY

- **Low consumption sensors**
- **Low consumption communication devices**
- Local specific energy production and **micro-power sources** ?
 - micro-turbine
 - vibration ?
 - temperature variation ?
 - chemical components from the soil or from water ?



Smart Electronic Needs for the Water Cycle INTEGRATION

- Mass production of packaged **integrated systems** (sensor, computing, energy generation and communication) >>> decrease production and installation costs
- **Multi-parameters sensors** to provide more and higher level information
- Two strategies : **installation in facilities and networks:**
 - **easy to install and remove** systems (disposable low cost equipments)
 - **integration** of components in assets (“smart” pipe)
very low or no maintenance



THANK YOU FOR YOUR KIND ATTENTION

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