wetnet

true monitoring of water networks

Durata [giorni]	Valore [l/s]	Ranking	Distretto	Delta value [l/s]	Descrizione	Vai al grafico
125	0	100%	bilancio adduttrice 1000 per avane	0		
57	3.34	29.23%	distretto rete staffoli	1.06		
1	8.41	13.32%	QUERCIOLA	1.38		
1	64.49	-0.49%	rete cascina navacchio	-0.51		
7	3.84	-4.08%	rete Peccioli via Cappuccini	-0.26		

THE LAYMAN'S REPORT

english

Co-funded by the Eco-innovation Initiative of the European Union
ECO/12/332771 WETNET

BRE ELETTRONICA s.r.l. Telemetry Systems

INGEGNERIE TOSCANE

BIMATIK

instituto tecnológico de galicia

wetnet
true monitoring of water networks

The Layman's Report

Summary

What is the WETNET Project?

The WETNET Project (ECO/12/332771), co-financed by the CIP Eco-innovation Programme of the European Union, brings to market an innovative low cost flow-meter and control system to enable the European water companies to improve greatly their capacity to master distribution networks in detail, cutting down energy costs and emissions, and making better use of the resource.

WETNET technology allows water companies to have fine-grained, precise, timely data collection and a system that is easy to deploy and use.
Thanks to the WETNET system, every citizen can count on a water service able to pro-actively contribute to a better water management, cutting costs, managing needs in appropriate ways, optimizing consumes and investments, with a positive effects, considering the future climate scenarios.

The system has been designed to allow flexibility, incremental deployment and size (number of sensors) scalability, co-existence and/or integration with existing measurement and control systems - including communication infrastructures, to require minimal maintenance during an acceptable operational life time, to be replaceable and have a very low end-of-life impact.

WETNET in short

Project start date	01/07/2013
Project end date	30/06/2016
Total budget	€ 952,814.00
EASME contribution	€ 476,406.00
Coordinating Beneficiary	B.R.E. Elettronica S.R.L
Associated Beneficiaries	INGEGNERIE TOSCANE S.R.L., BIMATIK S.A.S. FUNDACIÓN INSTITUTO TECNOLÓGICO DE GALICIA
Contact person	Ing. Maurizio Creati – Project Manager
Postal address	Via Di Cardeta. 2/B-Arena Metato, IT-56017 San Giuliano Terme (PISA)
Telephone	+39 050 810640
Fax	+39 050 810740
E-mail	m.creati@bre.pisa.it
Project Website	http://www.wetnet.it
YouTube channel	https://www.youtube.com/channel/UCylzWK2s1fliZBQW0PiBGZw
Project location	Pisa, Firenze (IT)

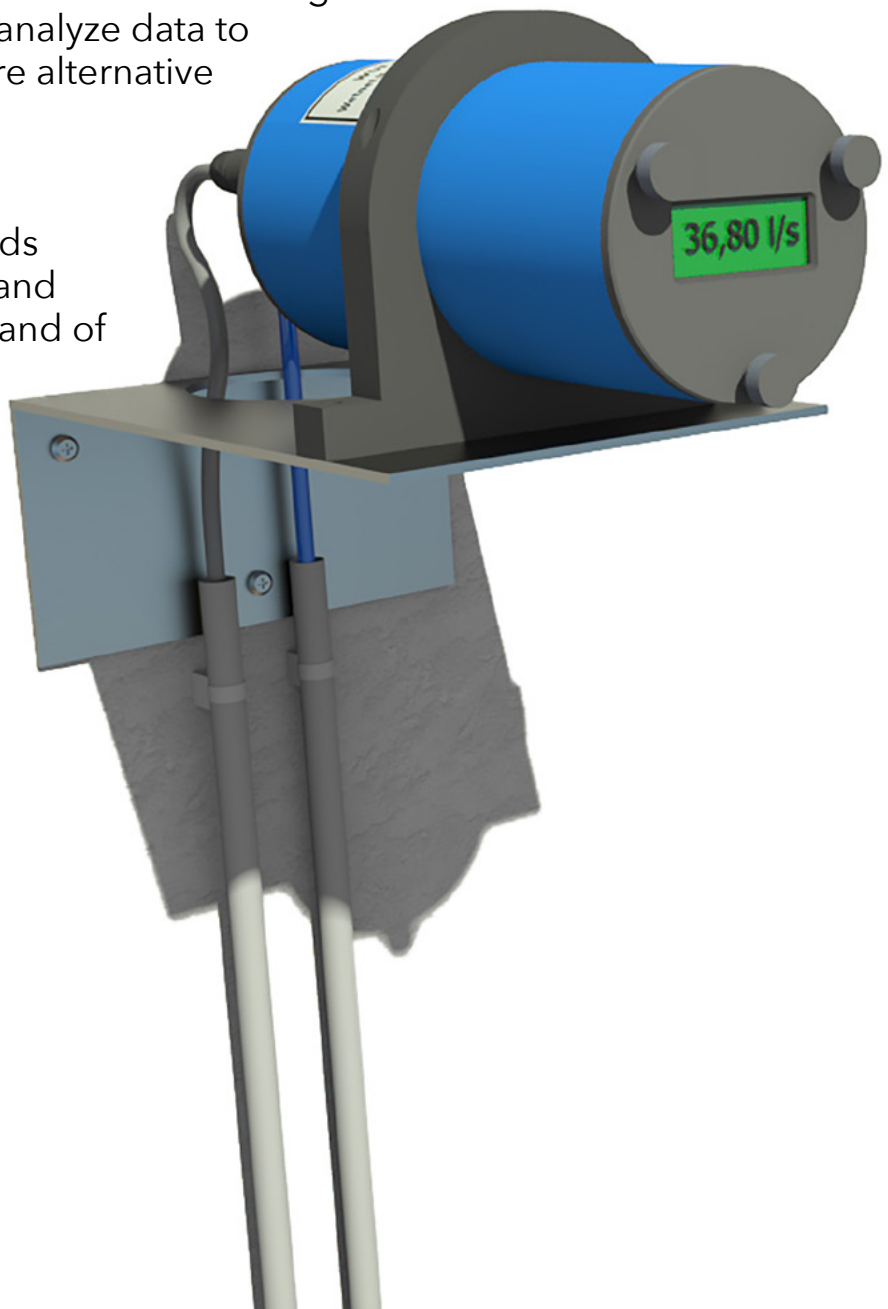
What is the WETNET Project?

Where did the WETNET idea come from?

Every cubic meter of water pumped into a drink water network that does not reach final use, sums up the quantity of water abstracted in excess, the energy to treat it and the emissions linked. Just think that the energy required to deliver 1,000 litres at tap is in a range between 0.3 to 0.6 KWh. That is why smart, efficient management of potable water systems reflects on the quality of service delivered, on costs, on revenues, on tariff, on environmental impacts.

The key to achieve efficient management is to converting into Smart Water Networks, which means grounding the decision making process on good knowledge of the underlying physical system. Having good knowledge allows to interprete the behaviour of water networks over time to set dynamic alarm thresholds; to perform fine-grained investigations in order to detect leakages and misoperations early, and to analyze data to prioritize interventions; to explore alternative management choices.

Knowledge is obtained through measuring and its quality depends on proper design, deployment, and management of sensor systems and of collected data.

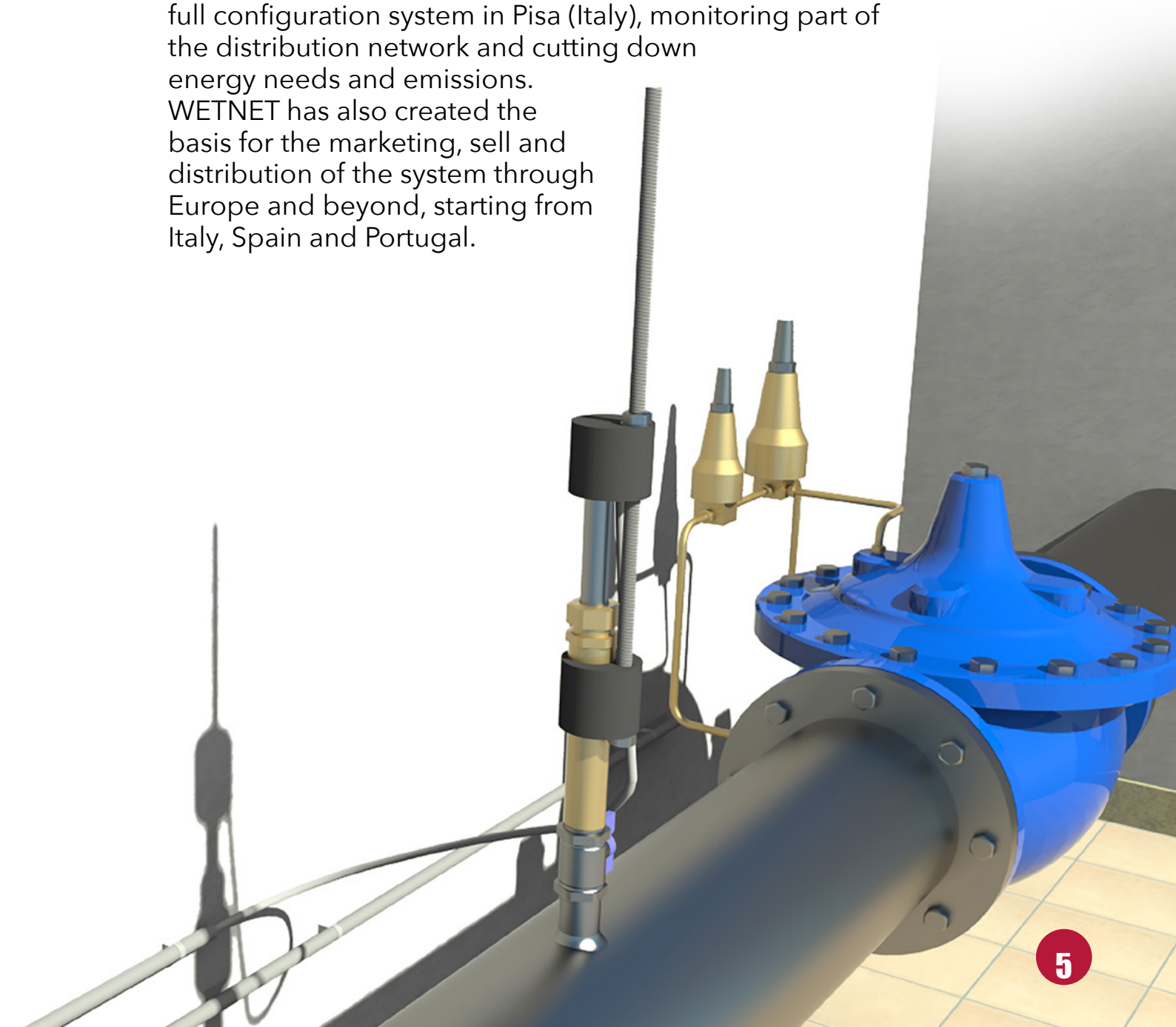


Objectives of the WETNET Project

The main project goal is to bring to market an innovative low cost flow-meter and control system that enables European water companies to improve greatly their capacity to master distribution networks in detail, cutting down energy costs and emissions and making better use of water.

Until now, converting into Smart Water Networks was an expensive choice. Instead, the solution designed by the WETNET project allows even small water companies to put in place smart, integrated network management.

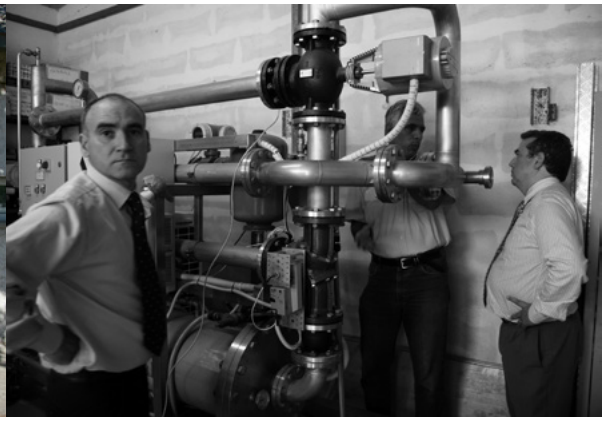
To demonstrate its actual viability, WETNET has implemented a full configuration system in Pisa (Italy), monitoring part of the distribution network and cutting down energy needs and emissions.
WETNET has also created the basis for the marketing, sell and distribution of the system through Europe and beyond, starting from Italy, Spain and Portugal.



Who participates in the WETNET project?

BRE ELETTRONICA s.r.l.
Telemetry Systems

BRE Elettronica (http://www.bre.pisa.it) is the **coordinating beneficiary**. B.R.E. is an highly specialized SME. Since its foundation it has been designing, producing, installing and maintaining high-reliability remote sensing devices in different sectors. The collaboration with Ingegnerie Toscane allowed to develop a prototype of a flow sensor that was the base for the development of the project. B.R.E. re-engineered the prototype for the first batch of new sensors, designed, produced and installed during the activities of the project.



INGEGNERIE TOSCANE

Ingegnerie Toscane (http://www.ingegnerietoscane.net) has a technical engineering role. It performed the fundamental task of defining and applying the information system underlying the project and of the supervisory platform (WSS) that is its core. Ingegnerie Toscane has an extensive experience in the design, control, optimisation of distribution networks and leakage search.
It is an **associate partner**.

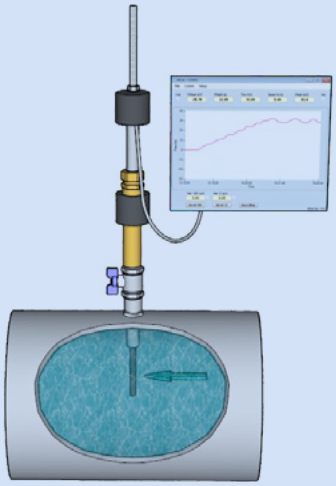
Bimatik (http://www.bimatik.it) operates as an integrator and distributor of services and water technologies. Bimatik is active in the Italian market and contributed with all WETNETpartners – especially ITG – to develop the WETNET business model and to support national and European marketing efforts with the goal to directly sell the products and to individuate distributors capable of developing national sales and post- sales networks.
It is an **associate partner**.



Fundación Instituto Tecnológico de Galicia (http://www.itg.es): a Spanish national technological center, with a great experience on the water sector, on water networks modelling and on the distribution and management of sensors for different applications. It contributed with a perfect mix of sales competencies, engineering skills and organisational abilities to promote, distribute and support post-sale servicing in Spain, Portugal and Latin America.
It is an **associate partner**.

WETNET: the innovation of the proposed solution and its results

HOW: the technical solution – Flow-meters and communication system



WETNET is a complete system for a modern management of water networks. It is composed by:

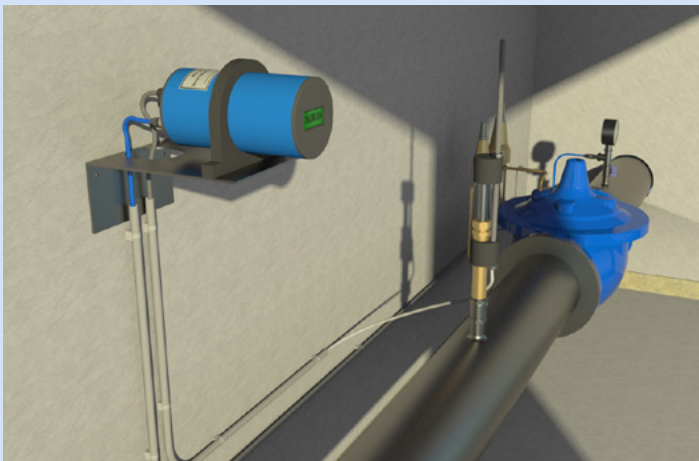
1. a strain-gauge hot-tap insertion flow-meter device;
2. a telemetric datalogger;
3. a supervisory service software.

On pipes side there is an innovative sensor that can be installed and activated without interrupting the water flow and that gauges water thrust. The flow-meter is easy to deploy, bi-directional, with a low energy consumption, that fits also with low-cost standalone installations.
The system requires simple hydraulic set-up operations, and is easy to maintain. Several types of low-costs configurations has been engineered, composed by different integrated devices.

WETNET Pulse Flow-meter (WPF): bidirectional insertion flow-meter, waterproof to IP68. The insertion, setup and activation can be performed without interrupting the water flow. It has a measuring range from 0.1 to 1.8 m/sec and open collector outputs for RTU or datalogger. It has very low energy consumptions and has a user-friendly software to setup and control the functioning of the system.

WETNET Link Box (WLB): logger unit with GSM/GPRS data link for data sending, housed in IP68 cylinder. It allows local logging on SD card and has been designed for low-power applications with both internal battery and external power source. It has analogue and digital inputs with counter function and digital outputs for supplying external instruments. It has USB interface for data downloading and settings and can have internal or external antenna.

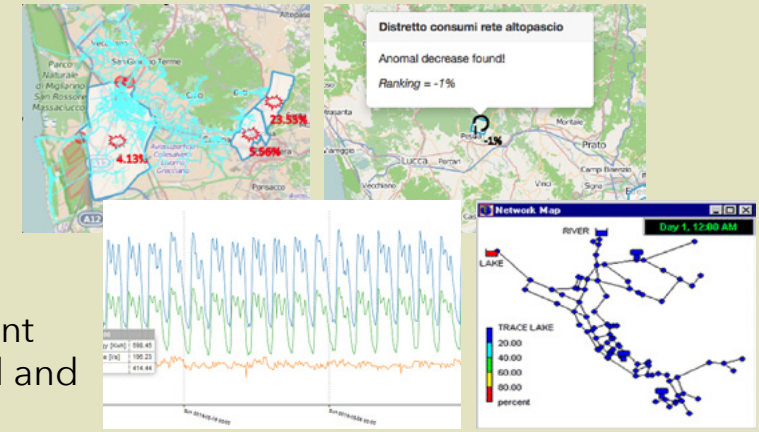
WETNET Uplink Flow-meter (WUF): bidirectional insertion flow-meter, waterproof to IP68. The insertion, setup and activation can be performed without interrupting the water flow. It has a measuring range from 0.1 to 1.8 m/sec and 4-20mA /0-5V analogue output. It has an internal GSM/GPRS module for data transmission and an SD card for data logging. Provided of analogical inputs for reading external meters.

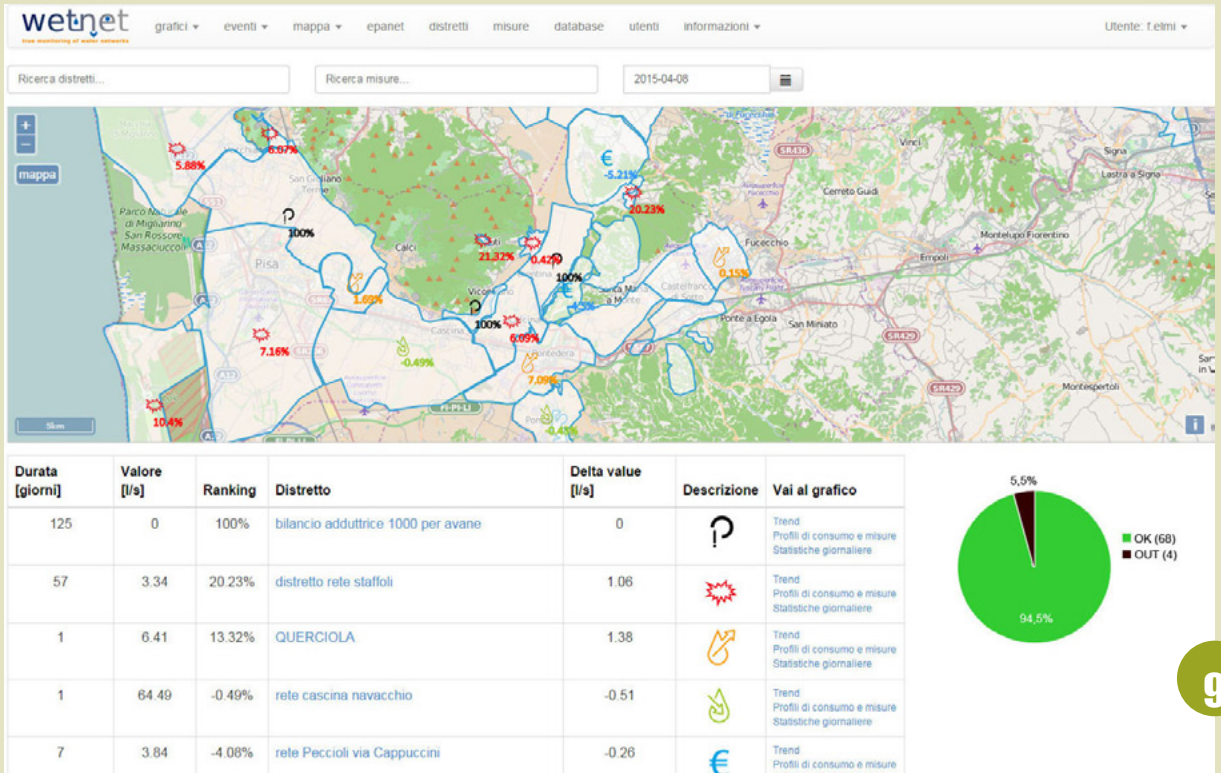


HOW: the technical solution – Supervisory Services

The WETNET flow-meters can coexist with others of different type, and send data over existing networks or dedicated new one that can host and serve old and new devices, allowing smooth upgrade plans.

On decision making desks, the sensors communicate with supervisory programs, the **WETNET Supervisory Services (WSS)**, that need only an Internet connection to be used. WSS are an elegant dashboard for data analytics and intelligent, knowledge-based Integrated Water Network Management, linking to data sources, simulation and modelling tools, and corporate management software in use.
WSS are able to immediately communicate the presence of leaks, breakages, malfunctions and to provide detailed information about the causes and thus facilitating the solution.
WSS perform continuing analysis of the water network, processing relevant data through mathematical and statistical algorithms.





WETNET: the innovation of the proposed solution and its results

WHAT: The Results achieved – Technologies

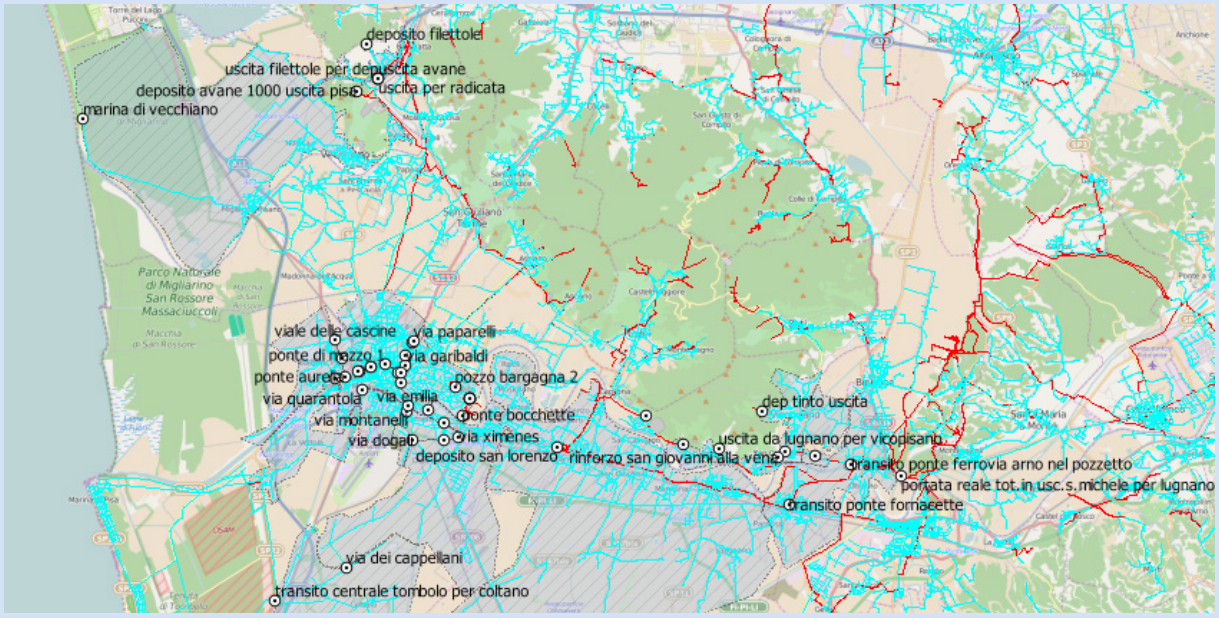
With WETNET in place, leaks, abnormal consumption variations, as well as inconsistent measurements, are constantly under control and linked to decisions that make sense for good management, for users, and for the environment.
WSS give information about:

- Consumption profiles and measures
- Nighttime pressure
- Modelling
- Districts' and water balance

WETNET allows fine grained measures and a great technological flexibility, supported by several feasible different configurations.

The main benefits are the deep knowledge of water network and the immediate alerts on the events that allow a quick solutions of problems and a resulting reduction of costs.

WSS is composed by a powerful processor, an SQL database and a web graphical interface. It can be used with common browsers.
WSS software is released under EUPL license.
WSS manage the exchange of pattern and calibration files with the Epanet software, one of the world most used software for the simulation of pipe networks.



WHAT: The Results achieved – Policy environment and governance

WETNET eases gathering the information needed to feed key indicators for a water management system that respects the environment and helps align environmental policies.
Particularly it allows to obtain useful data to evaluate the best use of resources and environmental performances:

- reduction of water consumption
- reduction of energy consumption
- reduction of greenhouse gas emissions

The positive effects of an integrated system are prominent on the Pisa deployment test site (**100,000 equivalent inhabitants, about 250 km of pipes**).

50 different flow-meters – and links – have been deployed on the water network to test the system as a whole and to adapt to different installation conditions.

In very few months of use, the environmental results are more than encouraging:

- **33.6% reduction of water consumption, with a projected saving of 2,649,000 m^3/year of pumped water**
- **37.1% reduction of energy consumption, that correspond with projected 1.043.706 KWh/year**
- **35.9% of greenhouse gas emission, with a projected saving of 414 TCO_2/year**

WETNET: the innovation of the proposed solution and its results

FOR WHOM – WETNET Customers

WETNET has been engineered to return the maximum value to different potential customers:

- **direct customers**: they are organizations that manage water networks, whether they are private institutions, municipalities or consortia;

- **system integrators**: which also include the companies interested in carry out monitoring services or engineering services contractors – they are small and large companies offering turn-key solutions to end customers both as supplies or services;

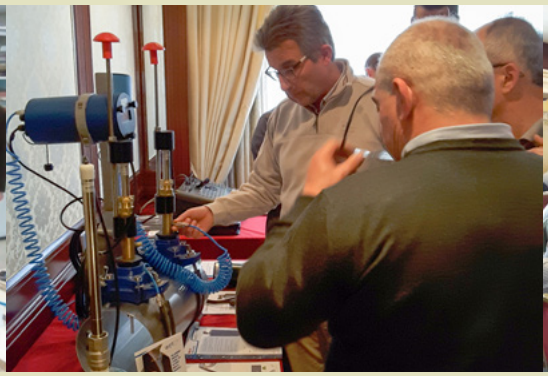
- **equipment vendors**: they are for the most part commercial distributors with some technical capacity or they are subjects - connected to installation companies - capable of providing capillary the devices required by end users and generally operate continuously even during maintenance phases and replacement of equipment.

WETNET also intends to offer to all its potential customers a common arena to discuss and debate main issues. For this reason WETNET Partners created the "**Club Wetnet**" an international community able to include professionals of the water sector to develop and progress knowledge, technologies and practices for the continuous improvement of water management.

FOR WHOM – The benefits for the community

In addition to the technical benefits brought in by WETNET as a great operational tool, we must not forget the positive effects and gains that the systems has on a large audience of stakeholders, directly and indirectly.
Thanks to an attentive use of WETNET resources and technologies:

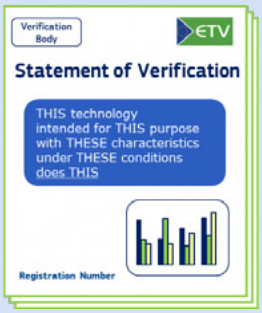
- ***Policy makers*** can discuss with water managers and understand how it is possible to propose the coordination of available resources, based on approaches that are oriented to a better governance.
- With WETNET, all the authorities – such as local administrators and ***planners*** – can examine different options with professionals and water managers to find the right answers for the main fundamental questions about water management and their consequences on citizens and final users. WETNET allows to calculate water availability, that is an essential element in the recent climate change perspective.
- ***Citizens*** can count on an improved management equilibrium that safeguard water resources and allows to orient resources and investments for a better service.


WETNET: the innovation of the proposed solution and its results

WHAT VALUE – For the market: EU Environmental Technologies Verification pilot programme (ETV)

Beyond the achieved results, we would like to emphasize the «value» of WETNET for its target market.
Breaking into the market with innovations can be a significant challenge since innovations by definition cannot show a successful track-record. "*Without credible information about innovative technologies, potential purchasers are unsure whether or not to trust the claims made about the performance. In consequence, manufacturers and vendors face serious difficulties offering their innovative, potentially excellent technologies on the market due to an inaccurate assessment of their risks, benefits and limitations.*"[1]



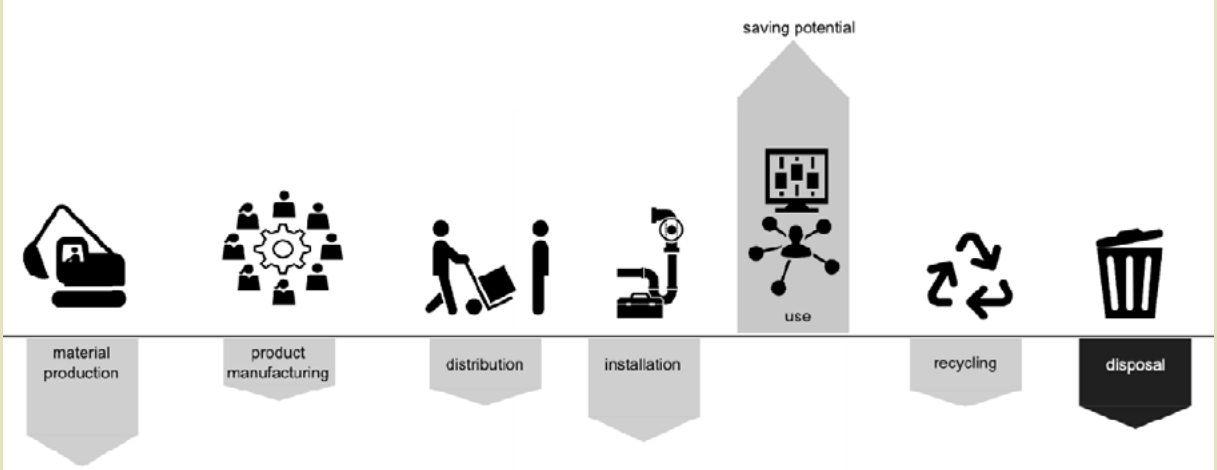
In order to improve the penetration of innovative environmental technologies into the EU and eventually global markets, the European Commission launched the **EU Environmental Technologies Verification pilot programme (ETV)** in 2011 to provide independent and credible information on new environmental technologies, by verifying that performance claims put forward by technology developers and vendors are complete, fair and based on reliable test results.

WETNET succesfully concluded its ETV process in June 2016 and its Statement of Verification – that declares that the system has a "**capacity of detection of abnormal operational conditions (within 1 day) and leakages (within 3 day), hence allowing to reduce the life of leaks and to optimize active monitoring and control of the volumes pumped**" – helps to build a trustworthy business relationship with potential customers and investors.

[1] European Union, Advance ETV, A Comprehensive Guide for Proposers to the EU Environmental Technologies Verification Pilot Programme (Environmental Technologies Verification, ETV), 2012

WHAT VALUE – For sustainability: LCA

Life Cycle Assessment (LCA) is a technique **to assess environmental impacts associated with all the stages of a product's life "from cradle to grave"** (i.e., from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling). In 2003 the European Commission (COM (2003)302) defined LCA the best tool available for similar analysis.
LCA is used in decision making as a tool to improve product design, for example the choice of materials, the selection of technologies, specific design criteria and when considering recycling.
LCA allows benchmarking of product system options and can therefore also be used in decision making of purchasing and technology investments, innovation systems, etc.



Following WETNET LCA analysis, from the **climate change and natural resources point of view**, on a process unit that serves 10,000 citizens, the environmental credit of a WETNET system accounts for savings up to **52,000m³ of water and 73,000 KWh, equivalent to 30 tons of CO_2**.

The impact of WETNET **in terms of direct effects on human health is absolutely minimal: it is that of 1computer per 7,500 people!**

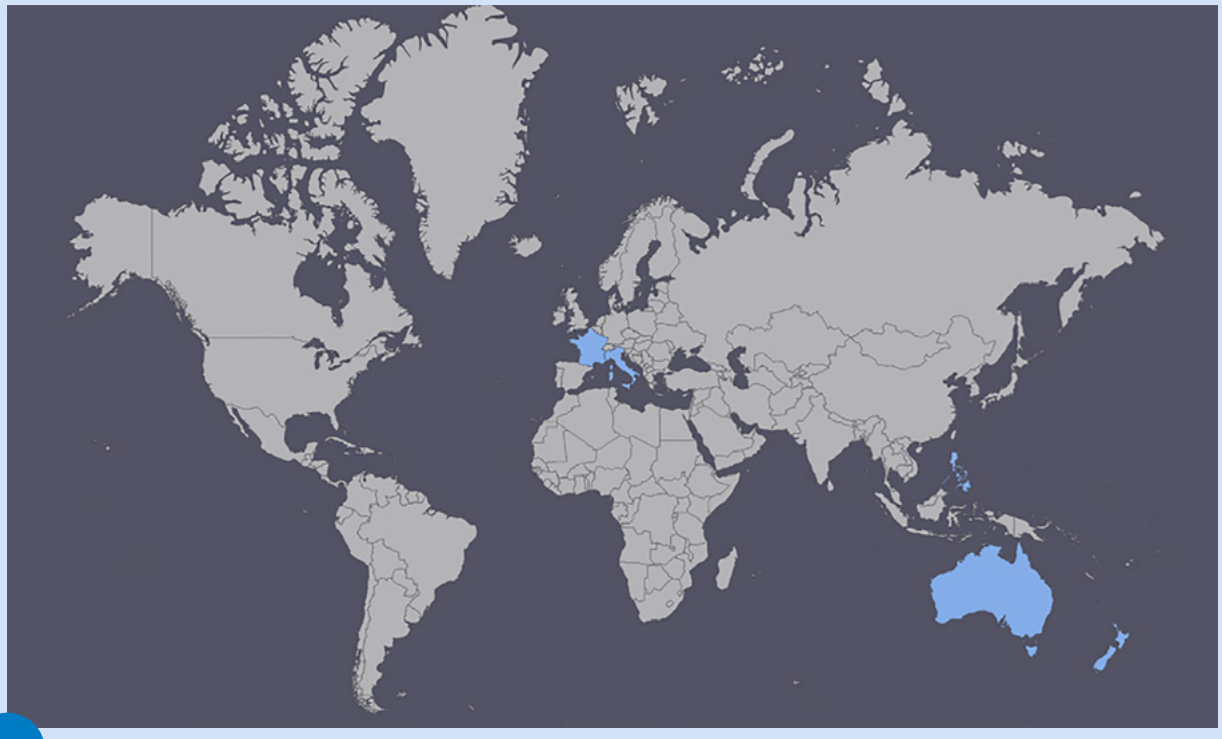
WETNET: the innovation of the proposed solution and its results

ON WHAT MARKETS – Established markets

During project activities, the exploitation of the WETNET solution has achieved concrete results, thus indicating the value of the idea, very well welcomed on European and international markets.
During the implementation of the project, WETNET Partners have created several market opportunities, attending to sectoral exhibitions and fairs, sales meeting at EU and international levels and through direct sales strategies, also with the support of marketing and sales expert services.

The complementary use of traditional sales and marketing tools – as customer panels – and of more original strategies (from free test on different sites to allow the knowledge of the technology, to the use of social media strategies – starting from LinkedIn - to involve potential customers and the creation of the Club Wetnet) allowed an excellent coverage of targeted markets.

The results were almost immediate. Until now, thanks to the intense and fruitful marketing activities of the partnership, the WETNET system has been installed in different locations in Italy (in addition to the pilot site of Pisa in Tuscany, in Umbria, Lazio, Lombardy, Sardinia and Friuli Venezia-Giulia), in France and even beyond the borders of Europe in New Zealand, Australia and the Philippines, and received an outstanding welcome.

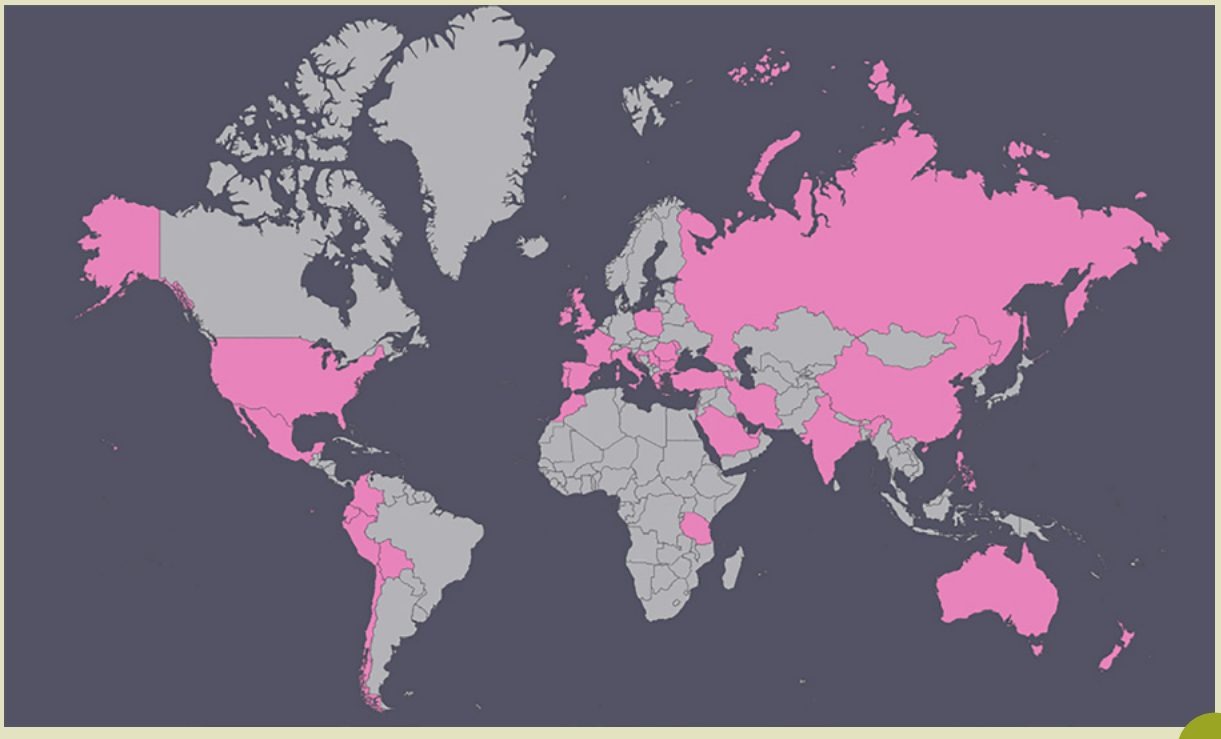


ON WHAT MARKETS – Future markets

With the business plan development, the fundamental elements for exploitation and market access have been defined, together with market segmentation, business models, costs evaluation, prices polices and expected profitability, performance targets.

Thanks to the participation in events and meetings in Italy, to the organization of two customer panels in Pisa and Bologna also opened to international customers, to direct missions in target countries, to the participation in business meetings and industry conferences, over 400 prospective customers were qualified both from European markets (Spain, Portugal, France, UK, Ireland, Romania, Bulgaria, Moldova, Poland, Serbia, Croatia, Greece, Cyprus, Malta) and non-European countries (from Turkey, Russia, from Brazil to the United States and Mexico, from Australia to New Zealand, the Philippines to India and China, from Israel to Iran, the United Arab Emirates, Morocco and Tanzania, from Paraguay to Bolivia, Ecuador and Peru, from Colombia to Chile).

In areas of the world where climate change effects are getting heavier, WETNET is proving attractive because it offers a viable solution for better water resource management. In fact WETNET is definitely gaining a prominent place at international level.



European Added Value: the benefits at EU level

In a global world you cannot develop a technology which is bound to a single market even less if you are dealing with a global problem such as the optimization of water supply networks

The design of WETNET, its industrial development and its validation has been possible because the global view brought in by the Italian technical partners, a distribution capable to grasp the requirements from several countries and the global technical view brought it by ITG who allowed to target also intercontinental markets.
There is also an European environmental added value because the scale up of the project in a transnational partnership was a precondition to go through an ETV certification. In fact the transnational partnership allowed to consider and compute the environmental advantage produced by WETNET in a way that is applicable in all EU countries (and abroad).

From a competitiveness point of view, the transnational alliance was imperative to understand and approach water technology markets within and outside Europe. Within Europe because the Consortium does not suffered of cultural barriers, and outside because it takes advantage of the different links existing in both partners countries.

As a result the entire water community at European level may **exploit an effective, leading edge technology for improving operational capacity**, make optimal use of water resources, reduces GHC, improve the positioning in global eco-business.

The Numbers of WETNET

wetnet
true monitoring of water networks

- 50 flow-meters produced during the project to be installed on the Pisa test site (IT)
- Development of commercial documentation: technical sheets, manuals for administration and use of devices (IT/EN/ES)
- One test rig re-engineered to test the WETNET flow-meters
- One complete system applied and completely functioning on the Pisa test site (IT) equivalent to 100,000 inhabitants and 10 replications in Italy (Acque Spa and Acquedotto del Fiora, Tuscany Region; Valle Umbra Servizi and Umbra Acque, Umbria, ACEA ATO 5 – Isola del Liri, Fiuggi, Talete, Viterbo, Lazio; IRIS Gorizia, Friuli Venezia-Giulia; AOB2 Rovato Brescia e ATENA Vercelli, Lombardy; ABBANOA, Sardinia)
- + than 400 prospects actively involved in the project
- + than 50 stakeholders involved in the definition and validation of requirements
- Organization of 2 customer panels with a total of more than 50 attendants (Pisa, 29th February-1st March 2016; Bologna, 25th May 2016)

- 5 articles and/or technical/scientific presentations published in international and national magazines and web portals and platforms:
  - "ITG lanza WETNET para detección de fugas en redes de agua potable", ESMARTCITY, main Spanish website dedicated to Smart cities, 10,000 monthly users, 28th October 2014 [https://www.esmartcity.es/noticias/itg-lanza-wetnet-para-deteccion-de-fugas-en-redes-de-agua-potable]
  - "Wetnet: smart integrated management of water networks to cut down leaks, energy costs and emissions, The Parliament Magazine N. 413 – 1st June 2015, distributed to all the members of EU Parliament and EC and to more than 400 delegates participating to the Green Week 2015 [https://www.theparliamentmagazine.eu/articles/magazines/issue-413-1-june-2015]
  - "Tecnologias para el control de las redes de abastecimiento en smart cities" , Maggio 2016 su Equipamiento y Servicios Municipales – 5,500 printed copies, 10,000 readers of digital review and on RETEMA - Revista Técnica de Medio Ambiente, main Spanish review dedicated to the environment, with 6,500 printed copies, 19,000 readers of digital review, 25,000 monthly

visit of the website [http://www.retema.es/noticia/tecnologias-para-el-control-de-las-redes-de-abastecimiento-en-smart-cities-uDD6x]

- Presentation of the WETNET services on the European Innovation Partnerships (EIP) platform [http://www.eip-water.eu/products-and-services/wetnet-innovative-pipe-hot-tap-insertion-flow-sensor-and-supervisory-services]
- "Los Ayuntamientos ya pueden reducir hasta un 15% las fugas en sus redes de agua potable" - May 2016 - on AguasResiduales.info independent web portal of water professionals with more than 50,000 monthly readers [http://www.aguasresiduales.info/revista/noticias/los-ayuntamientos-ya-pueden-reducir-hasta-un-15-las-fugas-en-sus-redes-de-agua-potabl-cvKzy]

- + than 15,000 page views at the official website of the project, + than 9,150 active sessions, + 7,600 users (http://wetnet.it)

- Creation of 4 social profiles for communication strategy and marketing activities (TWITTER: https://twitter.com/

wetnetecoinnova; LINKEDIN: https://www.linkedin.com/groups/8340099; FACEBOOK: https://www.facebook.com/Wetnet-864940133586128/; YOU TUBE: https://www.youtube.com/channel/UCylzWK2s1fliZBQW0PiBGZw)

- 4 videos + 1 animation of WETNET products and system
- 6 official press releases issued
- + 1,500 brochures/leaflets, posters and other communication/marketing materials (1,600 commercial sheets)
- • 10 exhibitions and specialistic events attended:
  - Rem Tech Expo, Ferrara (Italy), 17-19 September 2014
  - H2O 2014, Bologna (Italy), 22-24 October 2014
  - Water Brokerage Event, Murcia (Spain) November 2014
  - CONAMA 14, Madrid (Spain) November 2014
  - I Encontro Entre Empresas E Concellos, A Coruña (Spain) 26-28 November 2014
  - NZ WATER EXPO 2015, Wellington (New Zealand) 16-18 September 2015 (participation of a potential distributor)
  - Aquatech Amsterdam (The Netherlands) 3-6 November 2015
  - PAWD 37th National Convention, Clarkfield, Pampanga (Philippines), 3-5 February 2016 (participation of a potential distributor)
  - Transfiere, Malaga (Spain), 10-11 February 2016;
  - WEX Global, Lisbona (Portugal), 28 February – 2 March 2016
  - Water Innovation Europe 2016, Bruxelles (Belgium), 21-23 June 2016

- Direct relations and network meetings with other EU projects (LIFE SANePLAN)
- Presentation of WETNET technology in the Spanish Annual Report of FEDIT - Centros Tecnológicos de Espana, the main national organisation that gathers the private technology centers of the country (October 2014) [http://issuu.com/c-sar/docs/esp_fedit_2013]
- 6 participation and presentation of WETNET project to events, symposium, seminars:
  - Vigo University, Master MIIOP "Industrial Innovation and Process Optimization (October 2014) (Spain)
  - A Coruña University, Master in Building Sustainability Technologies (January 2015) (Spain)
  - Seminar Jean Monnet Module "European Water Utility Management (EWUM)": "European Water Utility Management: promoting innovation within the water industry and spreading knowledge on relevant and cutting edge water utility issues" - 3 June 2015, Aula Magna - Polo Piagge Pisa University (Italy)
  - Forum Telecontrollo - Reti di pubblica utilità, Milan 29-30 September 2015 (Italy)
  - Seminar "WATER METERING IN THE WSS SECTOR" 1-2 October 2015, Starosel (Bulgaria)

Contacts and references

Maurizio Creati
Project Manager, BRE Elettronica Srl
+39 050 810640 m.creati@bre.pisa.it

Oberdan Cei
WSS development; Ingegnerie Toscane Srl
+39 050 843442 o.cei@ingegnerietoscane.net

Franca Sussarellu
Communication and Information Team, Ingegnerie Toscane Srl
+39 050 843442 f.sussarellu@ingegnerietoscane.net

Enrico Bertocchi
Marketing and sales (Italy, Europe), Bimatik Sas
+39 02 92889638 info@bimatik.it

Juan Sobreira Seoane
Marketing and sales (Spain, Portugal, Latin America, other extra-EU countries)
ITG + 34 981 173 206 jsobreira@itg.es

wetnet
true monitoring of water networks

http://www.wetnet.it
sales@wetnet.it
wetnet@wetnet.it

Partners
BRE Srl (Beneficiary Coordinator)
Ingegnerie Toscane Srl
Bimatik Sas
Fundación Instituto Tecnológico de Galicia

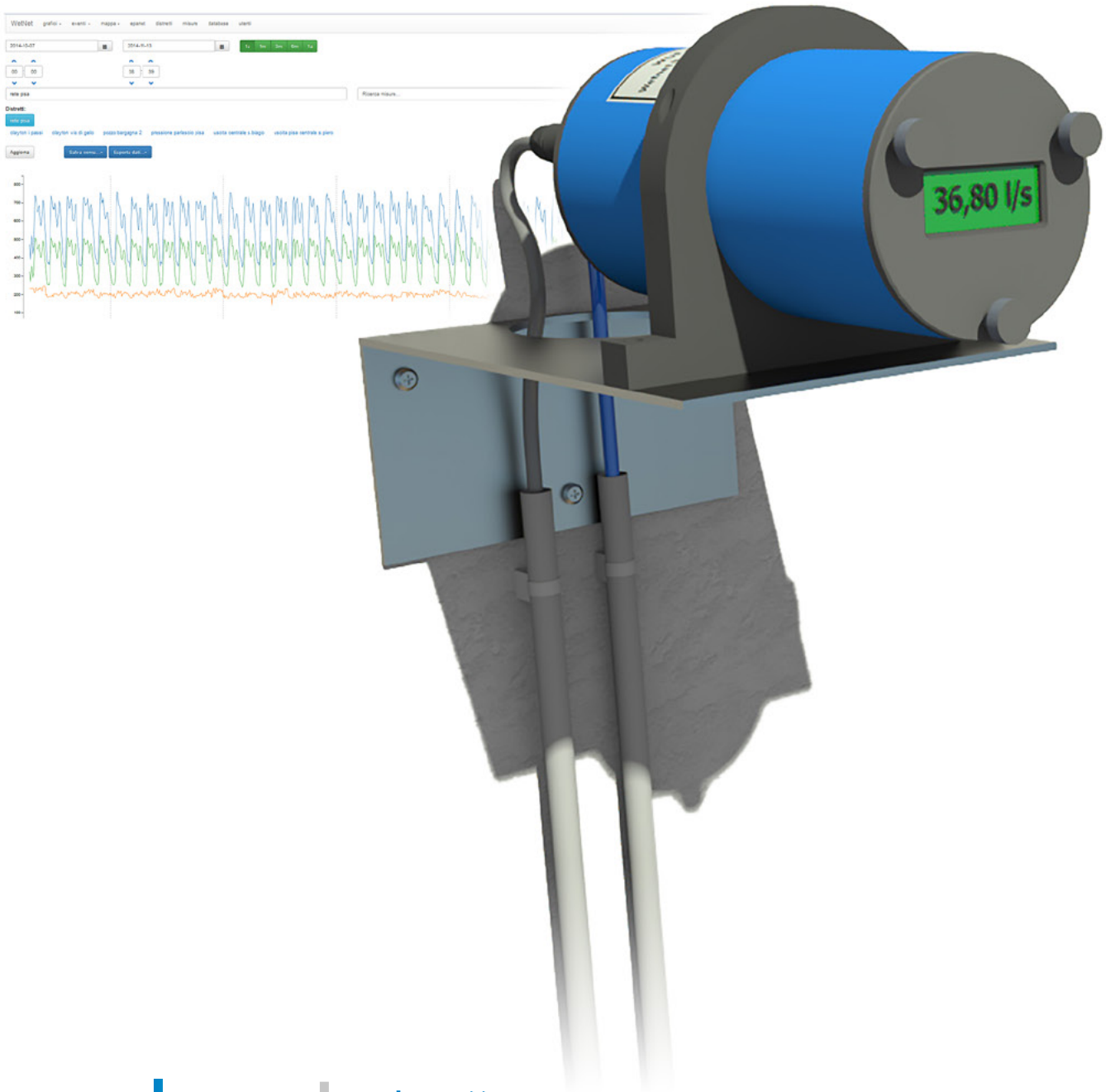
BRE ELETTRONICA s.r.l. Telemetry Systems
INGEGNERIE TOSCANE
BIMATIK
instituto tecnológico de galicia

Co-funded by the Eco-innovation Initiative of the European Union
ECO/12/332771 WETNET

The project have been realized with the contribution of the Eco-Innovation Initiative of the European Union.
The sole responsibility lies with the Authors of this publication.
CE and EASME are not responsible for any use that may be made of the information contained therein.

Acknowledgments

We wish to thank all Partners involved and the entire staff of WETNET teams and external experts for their effective contribution to the good results of the project.



wetnet
true monitoring of water networks

http://www.wetnet.it
sales@wetnet.it
wetnet@wetnet.it

noè