Ateknea Solutions

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Ateknea Solutions

Lets us guide you towards **innovation.**

ATEKNEA SOLUTIONS AT A GLANCE

Since 1997, Ateknea Solutions has been helping Small and Medium-sized Enterprises (SMEs) across Europe to break down technological barriers and bridge innovation gaps to boost business and reach new markets.

With six offices throughout Europe, Ateknea can provide your company with a wide range of integrated services. From engineering services to business development, project management, and marketing support, our services and expertise can drive your technological innovation to the next level.

Our highly qualified business advisers can also recommend the best funding opportunities for your business, including non-refundable EU grants for innovation activities.

ELECTRONICS

Full product development from proof-of-concept to market-ready products, Product certifications (CE), V-model development process, Design complete IoT and Connectivity Solutions , Embedded Systems, Power electronics, Automotive and industrial products.

SOFTWARE

Development of complex and heterogeneous software services and products. Deep Learning, Machine Learning, Data Analysis, Computer Vision. IoT Solutions, Web Applications, Micro-services. Hybrid and Native Mobile Applications.

INDUSTRIAL PROCESSES

Product design and development, Manufacturing processes assessment, Product industrialisation, Rapid Prototyping, Commissioning & test support, Chemical, industrial & biological processes design and/or optimisation, Full industrial automation, Commissioning & test support, Evaluation and Analysis , Assessment for product development, Environmental impacts assessment, Industry 4.0 and Product design.

Ateknea Solutions

THE CITI-SENSE PROJECT

Development of sensor-based Citizens' Observatory Community for improving quality of life in cities

- Air pollution is a major problem for public health
- Outdoor air pollution kills 3.3 million people, mostly in cities, every year. That's more than HIV, malaria and influenza combined
- It is estimated to cost approximately 2% of GDP in developed countries and 5% in developing countries
- The problem is magnifying with unprecedented population growth in cities
- However, only few static points are measured in cities and mathematical models are used to map an overall picture

Ateknea Solutions Participated in the CITI-SENSE Project

- Collaborative project CITI-SENSE, 4-year project Budget, €12M and 28 partner. Co-investment, ownership.
- Low-cost, reliable and portable air quality sensors for NO (or CO), NO_2 and O_3 (and other gases)
- Thanks to a novel advanced post-processing algorithm and miniature engineering work
- Portable sensors that uses the mobile phone as gateway (using Bluetooth 2.0)
- 8 successful pilot studies using 86 node prototypes in the following cities: Barcelona (Spain), Belgrade (Serbia), Edinburgh (UK), Haifa (Israel), Ljubljana (Slovenia), Oslo (Norway), Ostrava (Czech Republic), and Vienna (Austria) by means of volunteer citizens
- The purpose was to know the quality of life of people in urban scenarios considering air pollution
- Full ownership

http://www.citi-sense.eu

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 308524

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THE CITI-SENSE PROJECT

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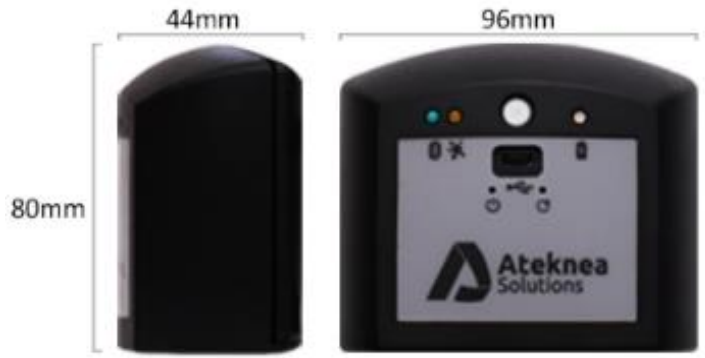

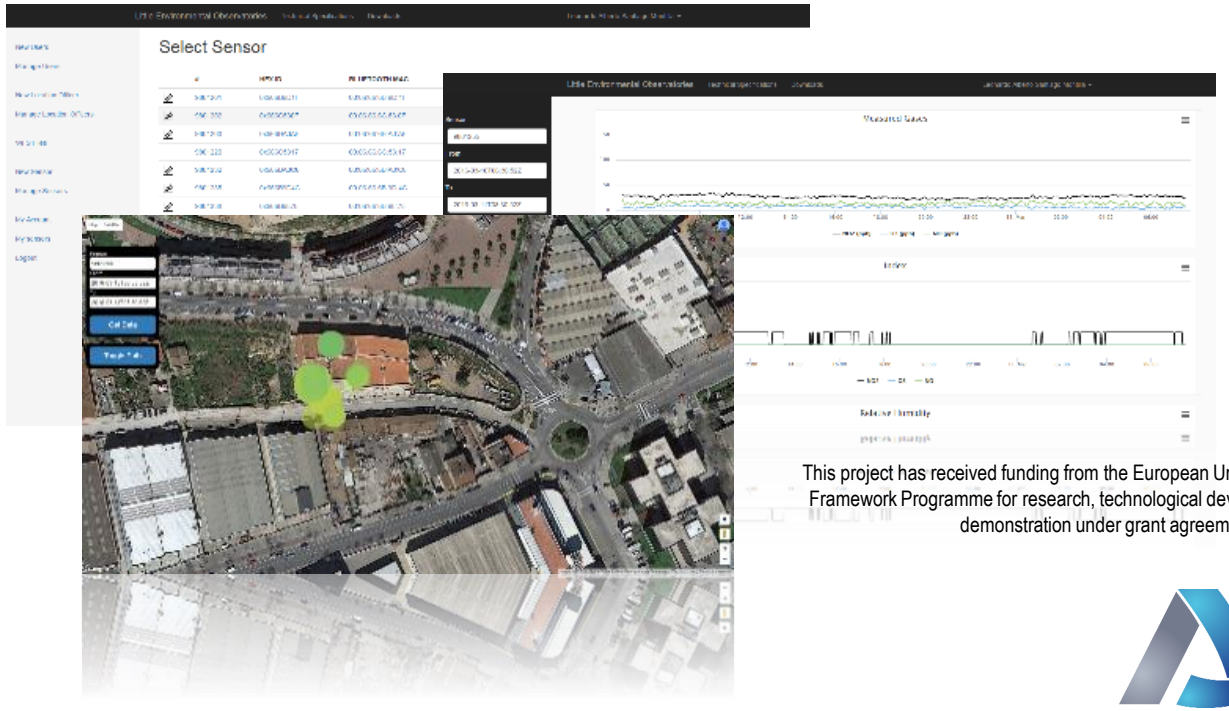

The technology has raised awareness from academia and private companies.

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Ateknea Solutions

bettair

Is a novel smart city technology that provides a dense and fast pollution mapping tool for large cities to better understand, bring insights, and mitigate pollution by taking smart actions

Please see:
https://bettaircities.com/

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THE NEED

- Air pollution is a major problem for public health, and it is only expected to get worse due to urbanization on a global scale. It seriously affects our bodies without us being aware of it.
- But state-of-the-art air quality stations are expensive, so cities only use a small number of them.
- In addition, some cities use complex mathematic models to estimate the extent of air pollution. But the results are not accurate as reality is dynamic.

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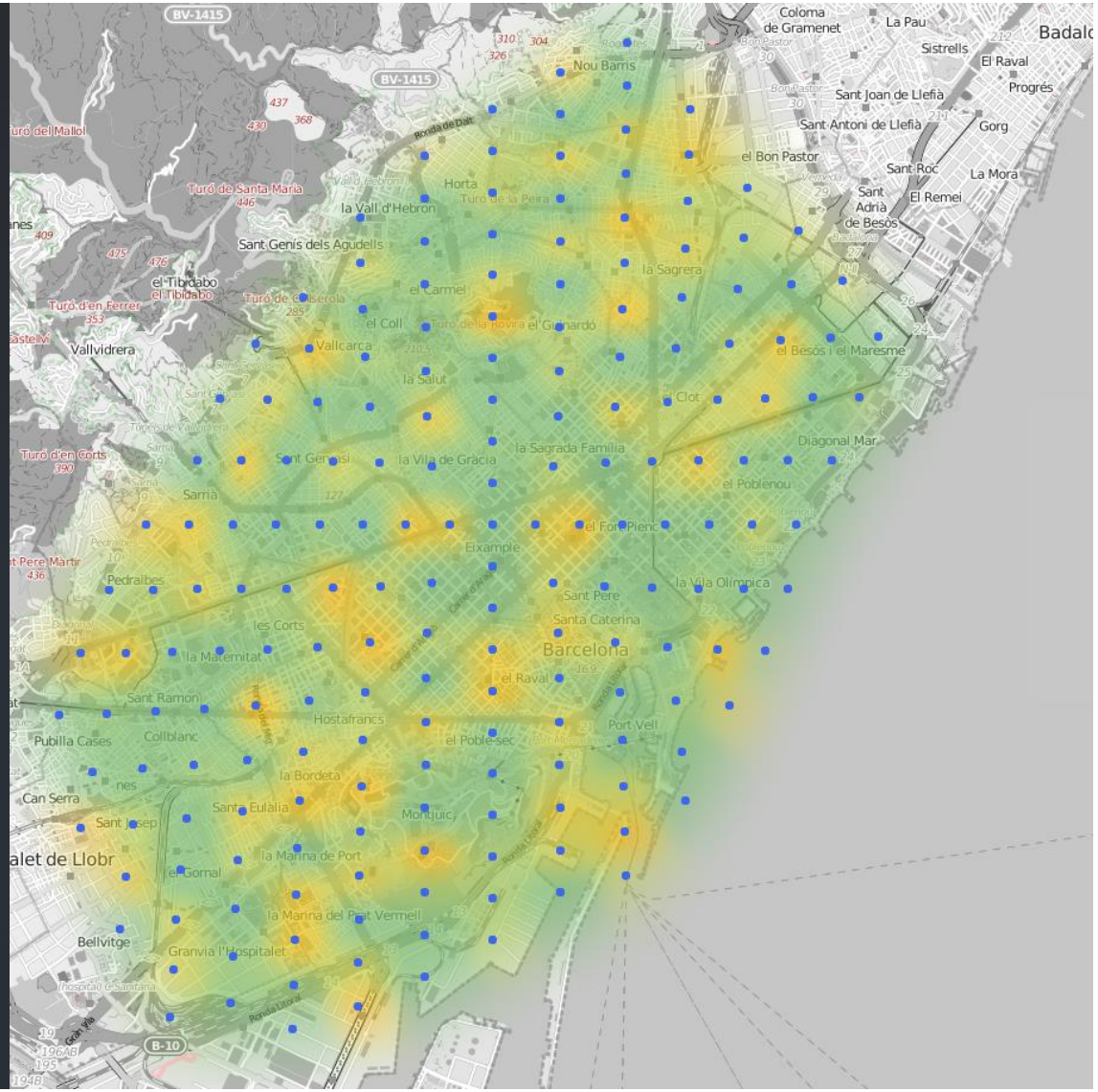
OUR SOLUTION

- We offer a very powerful, innovative and unique urban air monitoring system that will permit, for the first time, to really map air pollution in cities on a scale previously unimaginable.
- It is based on a large deployment of outstandingly accurate gas sensors by using an advanced post-processing algorithm for a fraction of the cost of the traditional Air Quality Monitor (AQM) equipment.
- The output allows to apply appropriate urban plans for enhancing air quality and to make smart and better decisions to mitigate air pollution.
- Part of the technology was developed under the collaborative project http://citi-sense.eu/ and tested in 8 European countries.



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OUR NODES

The bettair® Static Nodes are standalone sensor packs. The nodes do not require any external power supply and transmit data directly to a server for cloud processing.
A portable version node is also available (3 gases, Temperature and Relative Humidity).

WHAT DO WE MEASURE?

The static nodes are composed of electrochemical gas sensors (up to 4) to measure (ppb or ug/m^3):

- NO_2
- NO
- CO or H_2S
- O_3 or SO_2

Optical Particle Counter (ug/m^3) for:

- PM_1
- $PM_{2.5}$
- PM_{10}

Other ambient quality indicators are also measured such as:

- Temperature (ºC)
- Relative humidity (%RH)
- Atmospheric pressure (hPa)
- Ambient noise (dbA)

THE CORE

Using advanced data post-processing techniques, along with an in-house calibration, the platform provides similar accuracy to traditional and expensive equipment for a fraction of the price. This, allows to deploy a large and dense sensor grid adaptable to any city.

Impressive Pearson Correlation (R^2) around 0.9 is achieved compared to a traditional AQM equipment.

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PLATFORM AS A SERVICE (PaaS)

We are not just a Hardware provider. We provide a complete solution by means of a novel business model - Platform as a Service - offering the information to the cities. We install and maintain the platform.

We also offer the data available from the platform - Data as a Service (DaaS) - in the event of collaborating with a Smart city integrator, telco or another third party.

MODULAR

The technology is modular and compatible with any kind of wireless communication such as NB-IoT, 3G/4G, Wi-Fi,. Wired connections are also supported (Ethernet, and others).

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THE TECHNOLOGY HAS BEEN ALREADY TESTED BY:

HELMHOLTZ CENTRE FOR ENVIRONMENTAL RESEARCH – UFZ

Generalitat de Catalunya
Departament de Territori i Sostenibilitat

Universiteit Antwerpen

COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK

Institute of Maritime Law
University of Southampton

dynamik
TECHNOLOGICAL ALLIANCE

Massachusetts Institute of Technology

Ajuntament de Sabadell

NILU

ISGlobal Institut de Salut Global Barcelona

Institute of Experimental Medicine of the CAS
EU Centre of Excellence

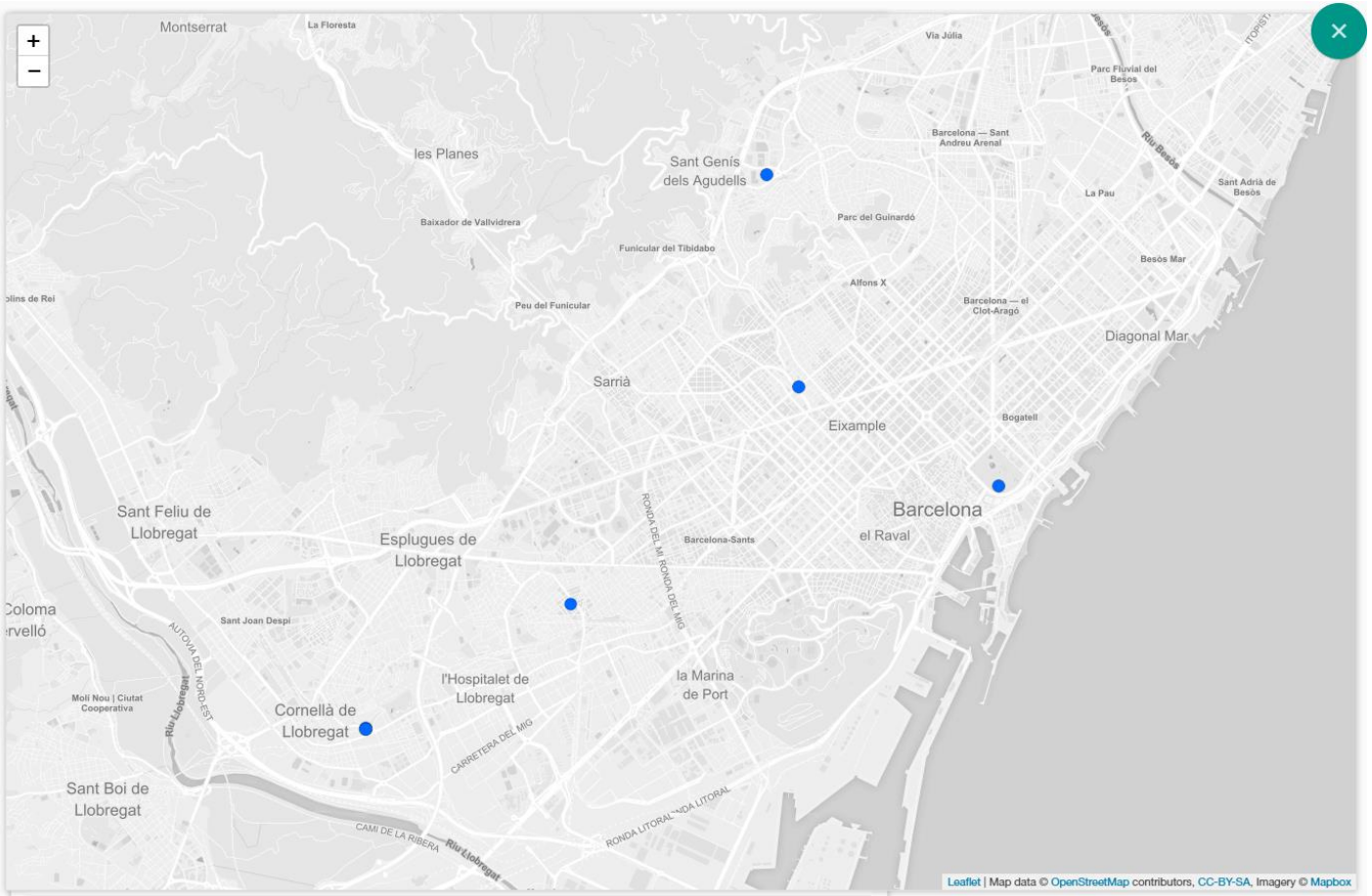
IJS

Technion
Israel Institute of Technology

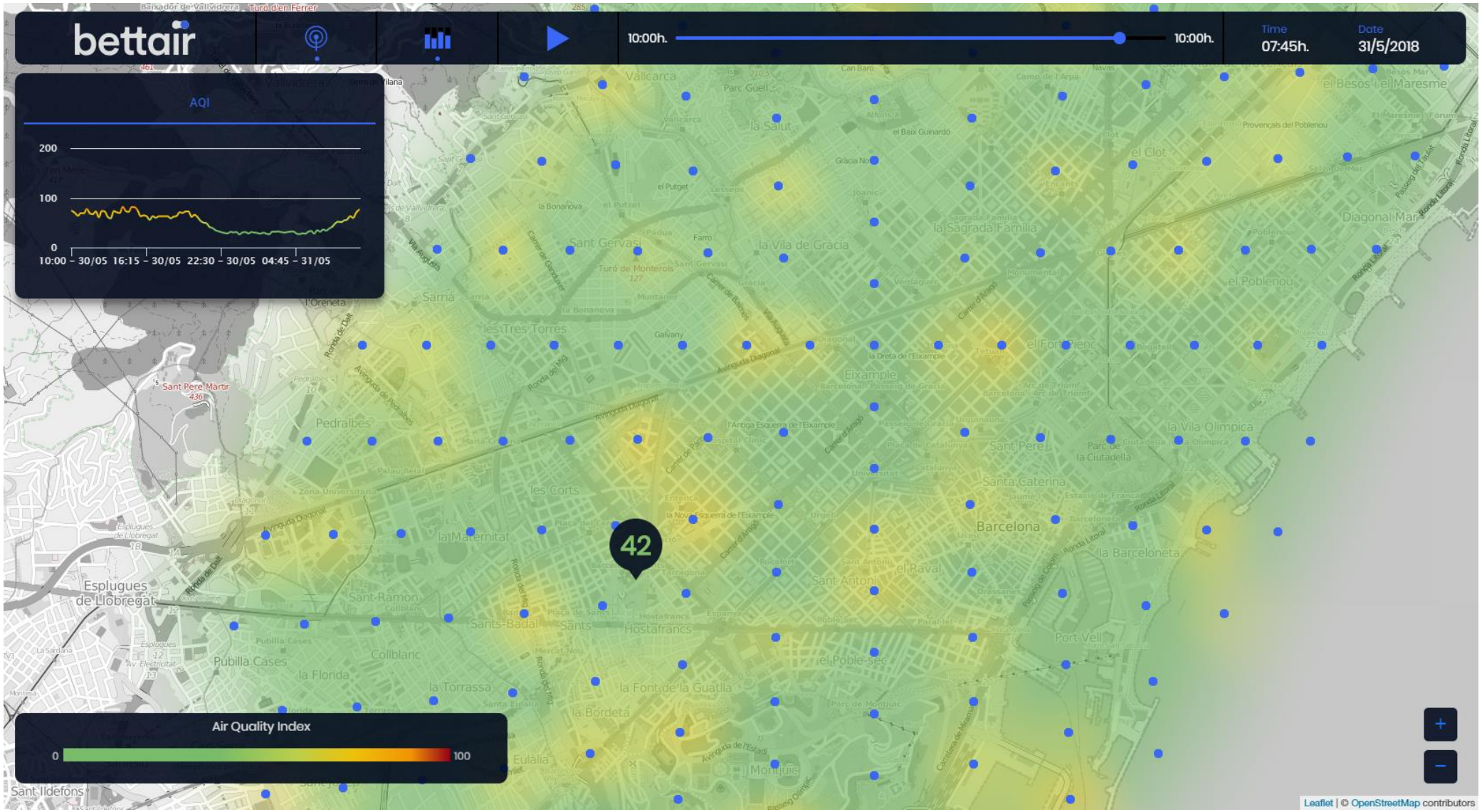
BETTAIR® NODE MANAGER

My Nodes

Node 106	00:0B:57:4E:87:C0	31/05/2018 07:49 UTC
Node 115	00:0B:57:4E:F5:19	31/05/2018 07:49 UTC
Node 117	00:0B:57:4E:86:B7	31/05/2018 07:49 UTC
Node 125	00:0B:57:4E:84:7D	31/05/2018 07:49 UTC
Node 128	00:0B:57:4E:87:7F	31/05/2018 07:49 UTC
Node 135	00:0B:57:4E:87:83	31/05/2018 07:48 UTC
Node 136	00:0B:57:4E:F5:25	24/04/2018 11:44 UTC
Node 140	00:0B:57:4E:FB:0D	31/05/2018 07:48 UTC
Node 142	00:0B:57:4E:EE:0C	31/05/2018 07:49 UTC
Node 143	00:0B:57:4E:84:72	31/05/2018 07:48 UTC



BETTAIR® AIR QUALITY INDEX HEATMAP

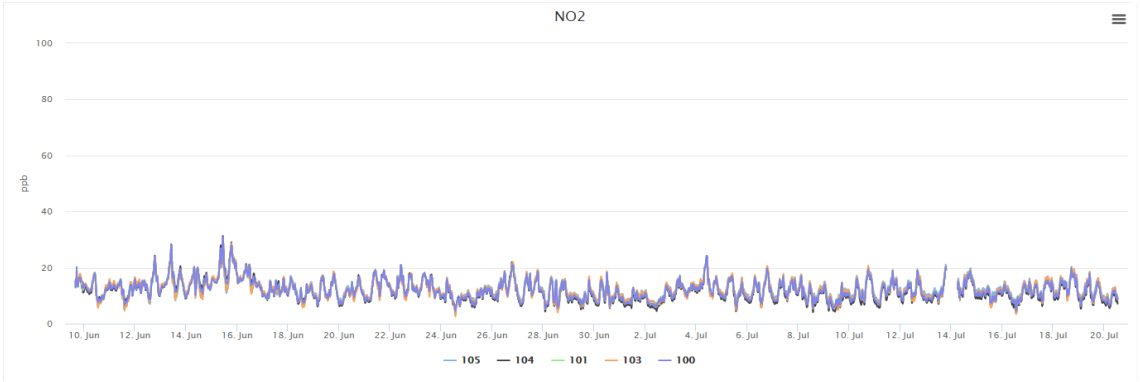


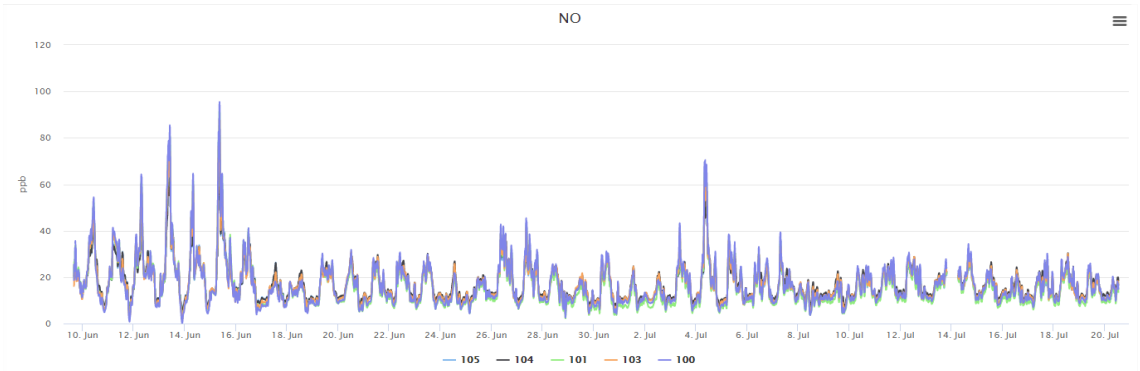
REPEATABILITY AMONG NODES

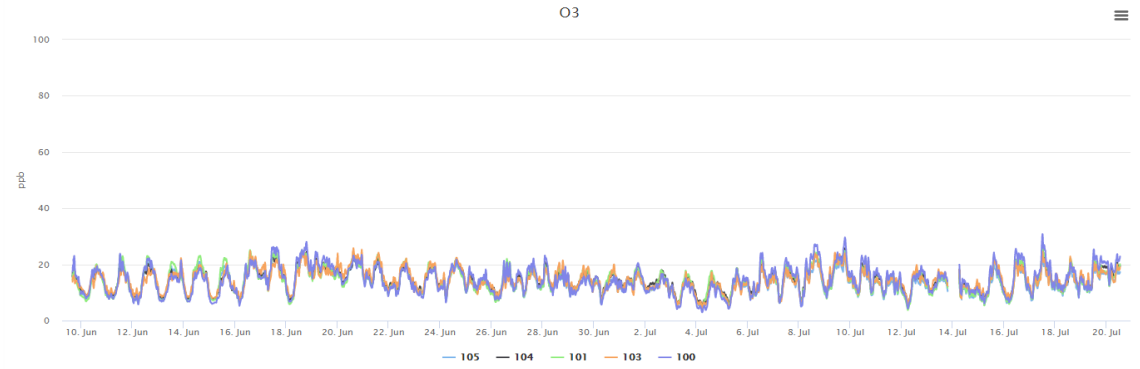
REPEATABILITY RESULTS

The period covered in this section starts on the 9th of June 2017 until the 20th of July 2017.
The scatter plots shown on the right show that node-to-node reproducibility is high

Nodes	R^2		
	NO_2	O_3	NO
104 vs 105	0.93	0.95	0.99
101 vs 105	0.97	0.95	0.98
103 vs 105	0.98	0.88	0.98
100 vs 105	0.95	0.87	0.96
Average	0.97	0.91	0.98







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URBAN, TRANSIT AQM STATION

Two nodes with three electrochemical sensors

- NO_2
- O_3
- NO

Barcelona (Gràcia - Sant Gervasi)

Code: 08019044

Installation date: 01/01/1982

Altitude: 57m

BACKGROUND AQM STATION

Two nodes with three electrochemical sensors

- NO_2
- O_3
- NO

Barcelona (Parc de la Vall d'Hebron)

Code: 08019054

Installation date: 08/01/2001

Altitude: 136m

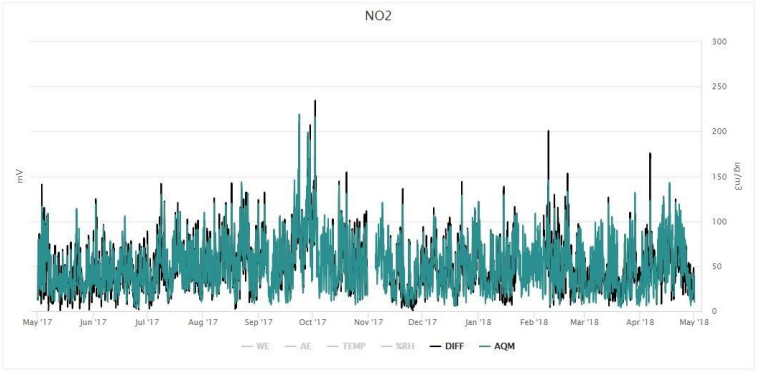
RESULTS OF COLLOCATION AGAINST AN URBAN AQM STATION

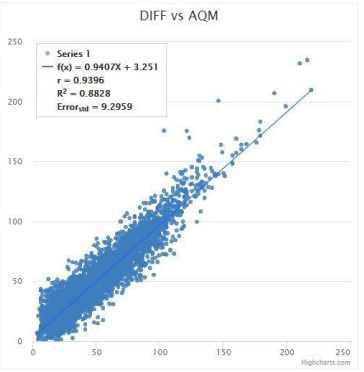
COLLOCATION RESULTS

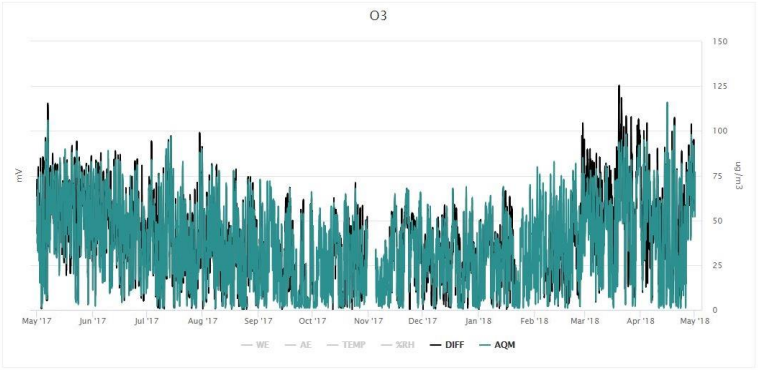
The co-location period covered in this location starts on the 1st of May 2017 until the 30th of April 2018

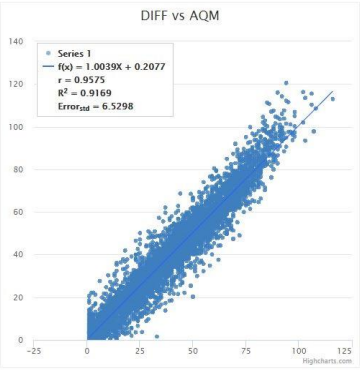
The results of this experiment clearly show that the electrochemical sensors used to measure NO_2, O_3 and NO agree well with established AQM reference for these species

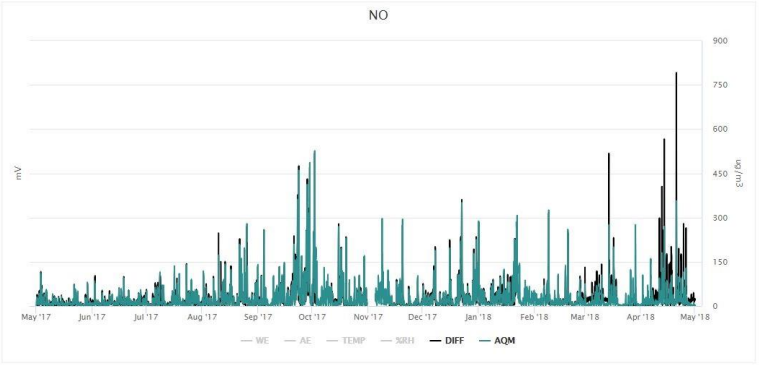
Nodes – AQM Station	R^2		
	NO_2	O_3	NO
143 - AQM 08019044	0.88	0.92	0.95
140 - AQM 08019044	0.86	0.93	0.98

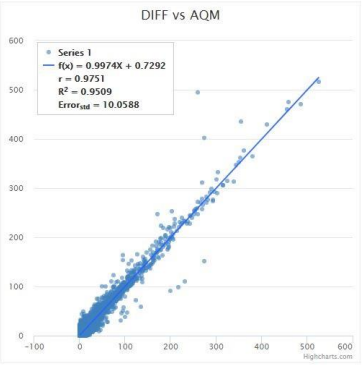












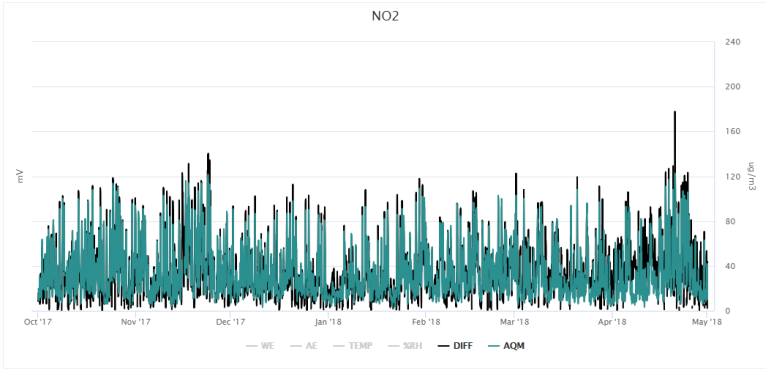
RESULTS OF COLLOCATION AGAINST BACKGROUND AQM STATION

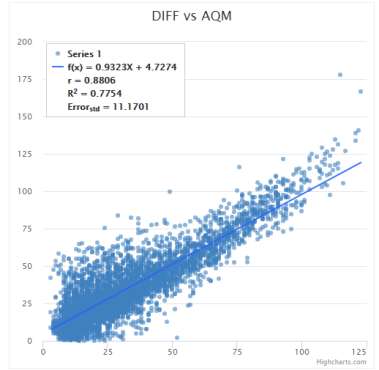
COLLOCATION RESULTS

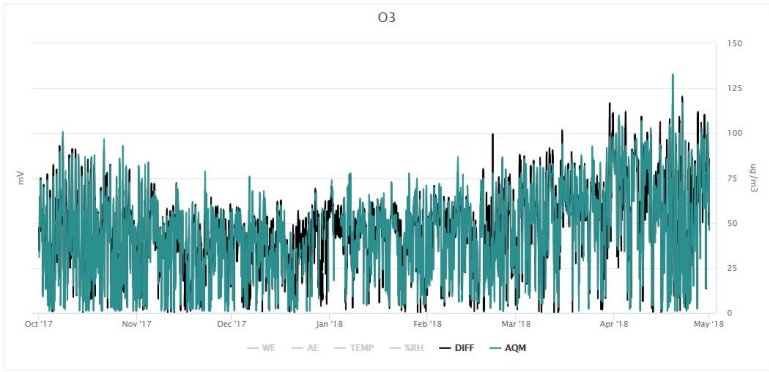
The co-location period covered in this location starts on the 1st of August 2017 until the 30th of April 2018.

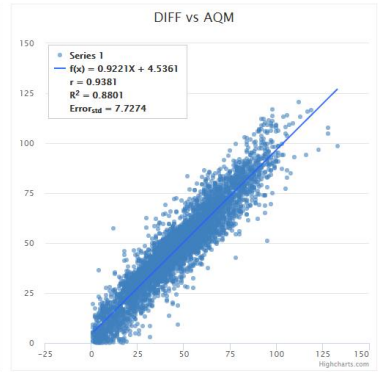
The results of this experiment clearly show that the electrochemical sensors used to measure NO_2, O_3 and NO agree well with established AQM reference for these species

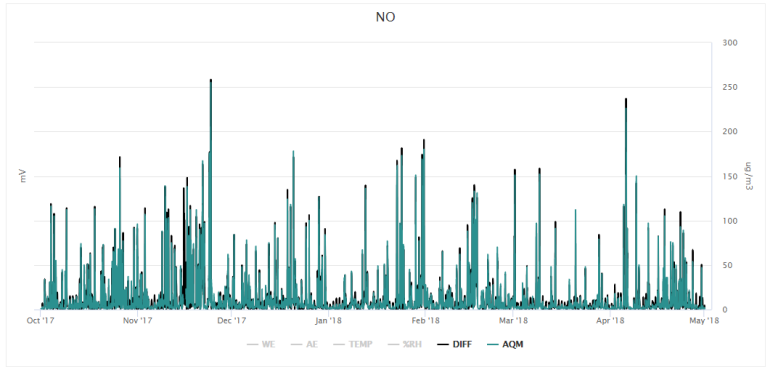
Nodes – AQM Station	R^2		
	NO_2	O_3	NO
117 - AQM 08019054	0.78	0.88	0.98
115 - AQM 08019054	0.77	0.76	0.96

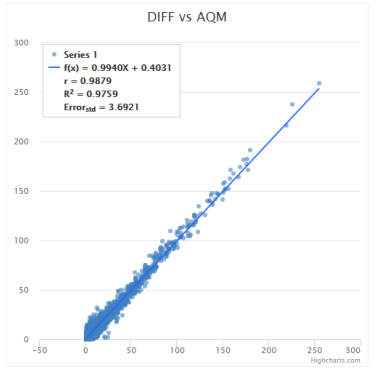












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For the first time, an **Internet-of-Things (IoT) platform** will allow us to **improve air quality in cities.**

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