People are exposed, people can help: do we meet their expectations?

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with contributions from the Citi-Sense consortium

www.citi-sense.eu

The title

- People are exposed (to air pollution)
- People **can** help (by contributing their observations)
- Do we meet "people's" expectations?
  - What are users expectations, and what participation modalities can we expect?
  - Technological supply - meets demand?
  - Product supply - meets demand?
- And what is in it for "us"? Seizing technological opportunity to improve data, sci understanding, management - governance, and life quality

CITI-SENSE

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

Starting date: 01/10/2012
Duration: 48 months
Budget:12M€
Call: FP7-ENV-2012.6.5-1 Developing community-based environmental monitoring and information systems using innovative and novel earth observation applications

CITI-SENSE Objective

To develop "Citizen's Observatories" to empower citizens to

- Contribute to and participate in environmental governance
- Support and influence community and policy priorities and associated decision making
- Contribute to Global Earth Observation System of Systems (GEOSS)

Citizen's observatories – *communities of users that will*

- *Share technological solutions, information products and services, and community participatory methods,*
- *Using approprite communication solutions,*
- *Thus complementing established environmental data and information systems and improving local env. decision making.*

CITI-SENSE Concept
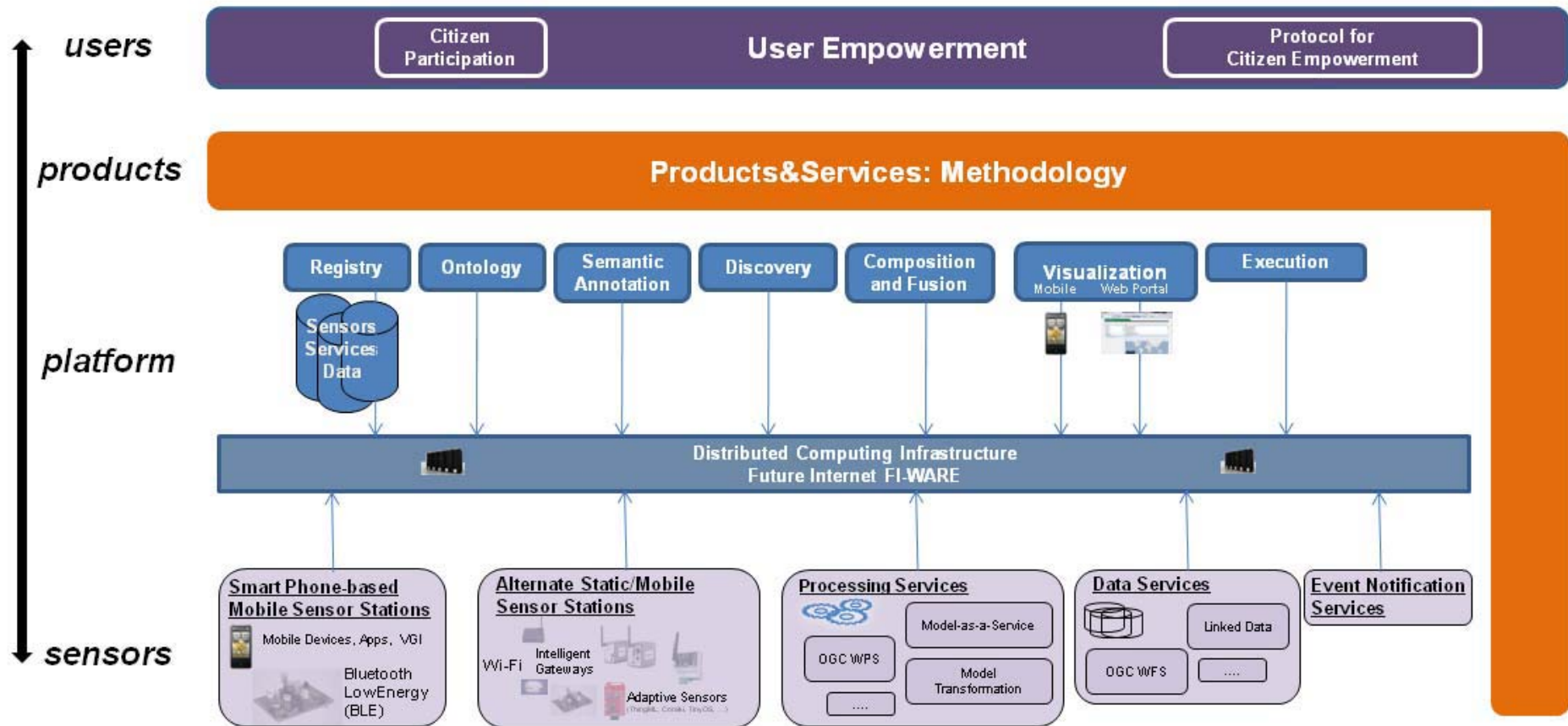
El Environment (CREAL)

- **Aim:** Empowerment (health improvement, AQM), awareness and behaviour change; exposure info

- **Users:** citizens, administration, (public) info systems, research

- **Focus:** outdoor air and personal exposure

- **Own measurements:** primary gases + PM, PAH

- **Other data**: Monitoring networks, position

- **Platforms:** mobile (bus, car, bike); static (dense sensor network)

- **Products:** combination with external data and tools

EI indoor schools (NAAF)

Aim: Enable improvement of the school environment

Users: School administration & staff, students

Other use: Screening/monitoring database

Focus: indoor environment (w/outdoor info)

Own measurements:

– Dedicated sensor pack as a basis (CO, CO_2, temperature, VOC, other)

– Health and well being observatory

– Cleaning practices

Products: Web interface, mobile app, database and data access, warnings, advice on indoor environment

EI Public spaces (Tecnalia)

Aim: Empower citizens to contribute to better urban planning (protect public spaces)

Users: Citizen's movements, planners

Focus: Visual, acoustic and thermal comfort, UV irradiation, urban well being

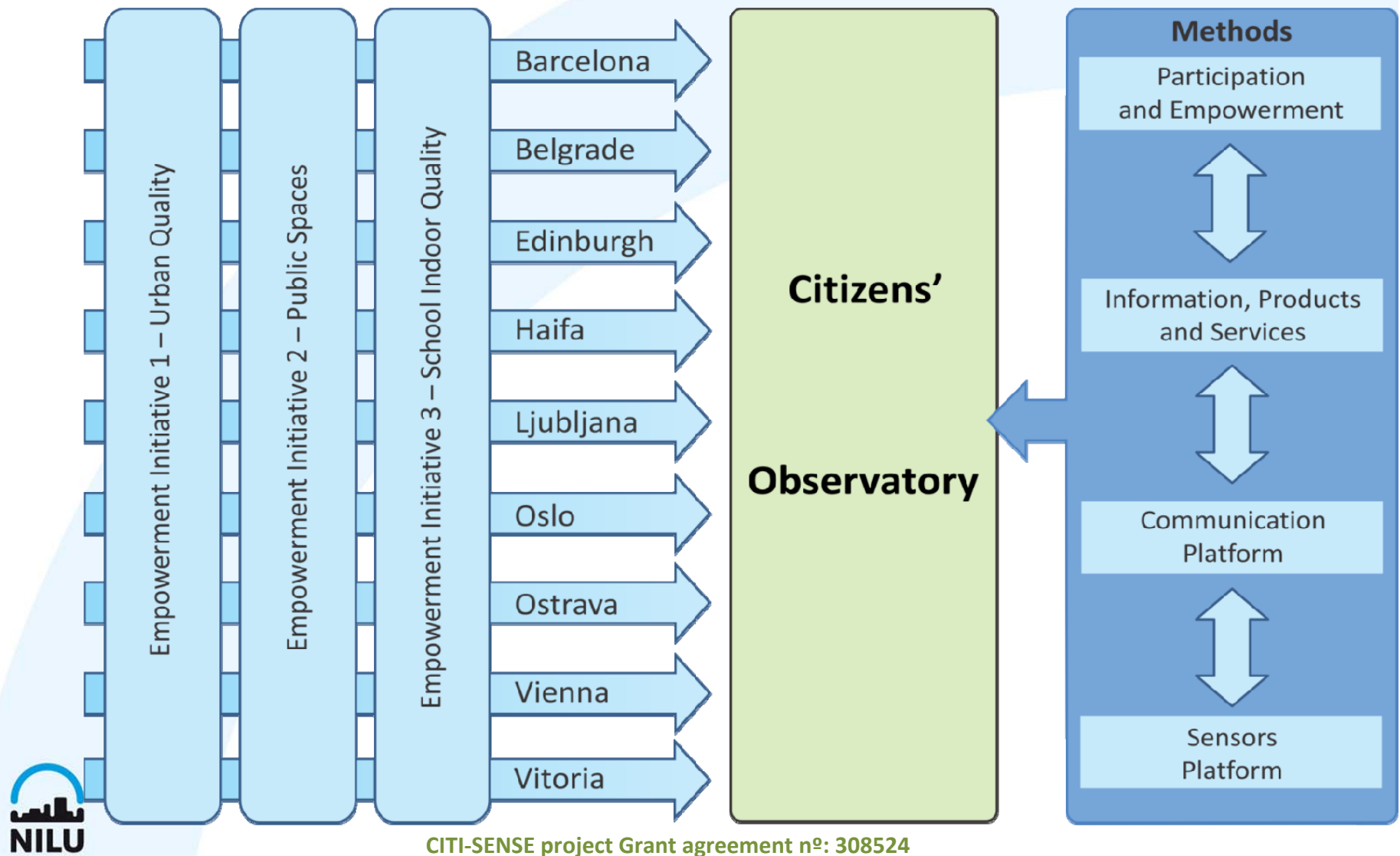**Own measurements:** UV, acoustic and thermal comfort, primary gases, photos

Other data: monitoring networks

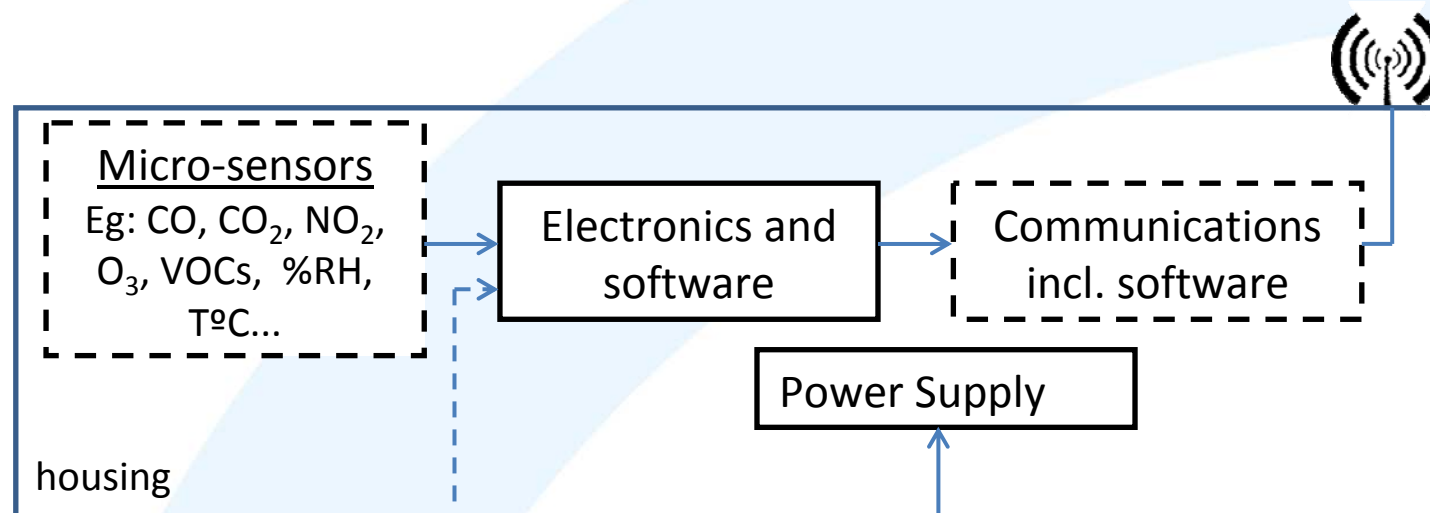**Platforms & products:** Mobile phones, apps

CITI-SENSE Implementation

Sensor platforms (CRIC)
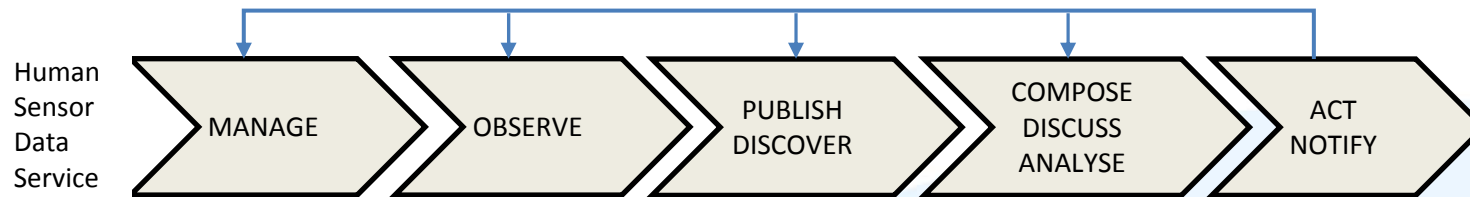
Examples of static platforms

Geotech

AirBase

Micro-sensors
Eg: CO, CO_2, NO_2, O_3, VOCs, %RH, TºC...

housing

Electronics and software

Communications incl. software

Power Supply

"Platform" implies a degree of flexibility, within limits, for example:

• Ability to use a range of micro-sensors

• Ability to offer different communication channels: GSM/3G mobile network, Wi-Fi network, Local Area Network (LAN)/Ethernet, etc.

• Some flexibility in power supply, and housing arrangements

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SINTEF

Human Sensor Data Service

| MANAGE | OBSERVE | PUBLISH DISCOVER | COMPOSE DISCUSS ANALYSE | ACT NOTIFY |

GEOSS/INSPIRE/Member State Common Infrastructures

Registries

- Components & Services
- Standards & Interoperability
- Best Practices
- User Requirements
- Vocabularies

GEO Portals

- Discovery Service
- Discovery & View Application
- Metadata editor
- GEOSS Clearinghouse

CITI-SENSE Observatory

| Citizen Participation | User Empowerment Social media | Protocol for Citizen Empowerment |

Web Apps, Mobile Apps, GEO-PORTALS, REPORTING

CITI-SENSE Products and Services

Business Process Tier

Registers: Ontologies App Schemas .....

User & Rights Management

Workflow Management & Orchestration (Service Chaining)

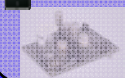| Uncertainty Handling & Provenance | Semantic Annotation, Mediation & Discovery | Data Composition & Fusion Services | Visualisation & Portrayal Services | Model Transformation & Model-as-a Service |

Sensor Platform Tier

Smart Phone Mobile Sensors

Mobile Devices, Apps, VGI

Bluetooth Low Energy (BLE)

In situ/Mobile Sensors

Wi-Fi

Intelligent Gateways

Adaptive Sensors (ThingML, Contiki, TinyOS, ...)

Data Access Tier

| OGC Web Services (WFS, WCS, SOS) | Event Services (WS-N, SAS, SES) | Linked Data Services | Download Services |

Information products and services (NILU)

Why: provide quantified environmental data products on air pollution to users at their level of interest – timely, upscaled from street level, locally specific

Quantification: numerical values with errors (data without errors info are useless)

Other: metadata, aggregation level

Error analysis – data assimilation and fusion

Engaging with the society (IOM)

Building the bridge betwee what the user wants and what we can provide

Keep "people issues" at the centre of this work

Learn what works and what does not (and why)

Managing the dialogue

NILU

Citizen's observatory

- Internal exchange mechanism

- External data exchange mechanism

- User management ++

- Public interface to own "products"

- Dissemination

CITI-SENSE Timeline

Year 1: Develop specifications and pilot cases (0-6,7-12)

Year 2: Implement pilot cases, prepare Citizens' Observatory

Review

Year 3: Implement Empowerment Initiatives, recruiting for Citizens' Observatory

Year 4: Methodology assessment and central platform

What have we learned (M5)

- What are users expectations, and what participation modalities can we expect?
- Technological supply - meets demand?
- Product supply - meets demand?

Users – diverse community, local situation determines interest and modalities, perhaps little in common except special groups; both expectations and involvement will vary

Technological demand does not match supply (yet), combinations of methods and technologies needed; ICT requirements daunting but a lot in progress

Air quality: much driven by legislation, good grip on what the managers need. The role and potential for, and of, the public and publicly contributed data is as yet unknown (limited evidence, to be expanded on)

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CITI-SENSE Partners

Nº	Partner short name	Country	Nº	Partner short name	Country
1	NILU	Norway	15	**U-Hopper**	**Italy**
2	**PVDH**	**Netherland**	16	CREAL	Spain
3	NAAF	Norway	17	IEM	Czech Republic
4	Technion	Israel	18	VINCA	Serbia
5	CVUT	Czech Republic	19	JSI	Slovenia
6	QU	Australia	20	SINTEF	Norway
7	**AirBase**	**Israel**	21	TECNALIA	Spain
8	**CRIC**	**Spain**	22	KITC	Republic of Korea
9	**GAC**	**Czech Republic**	23	UCAM	United Kingdom
10	**IOM**	**United Kingdom**	24	**DNET**	**Serbia**
11	**IBATUZ**	**Spain**	25	**SNOWFLAKE**	**United Kingdom**
12	**S&C**	**Spain**	26	**Geotech**	**United Kingdom**
13	**Alphasense**	**United Kingdom**	27	**Obeo**	**Norway**
14	**UBIMET**	**Austria**			

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CITI-SENSE Work Packages

- WP2 Empowerment Initiative 1 – Urban Quality (CREAL)
- WP3 Empowerment Initiatives 2 & 3 – Public Spaces (Technalia/NAAF)
- WP4 Citizens' Observatories (NILU)
- WP5 Participation and Empowerment (IOM)
- WP6 Information Products and Services (NILU)
- WP7 Communication Platform (SINTEF)
- WP8 Sensor Platform (CRIC)
- WP9 Dissemination, Exploitation, Training (S&C)
- WP1 Management and Administration (NILU)

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THANK YOU