



# Sofia 2

## IoT Platform



# INDRA: LEADING MULTINATIONAL IN CONSULTING & TECHNOLOGY

Sales

**3.000 M€**

Multinational  
leader in Spain and  
Latin America

**28%**  
America

**39%**  
Spain

**20%**  
Europe

**13%**  
Asia/Africa

**6-8%**  
in R&D&i (over sales)

Among the first 4  
European IT companies by  
market capitalization

**78**  
Excellence  
Centers &  
Software Labs

Operations in  
**138**  
countries

Companies  
operating in  
**45**  
countries



# A PLATFORM THAT EVOLVES REMAINING COMMITTED TO R&D AND THE REALITY OF OUR CLIENTS

## ORIGIN

### SOFIA (SMART OBJECTS FOR INTELLIGENT APPLICATIONS)

European investigation Project to create a semantic interoperability platform

- SOFIA was developed during 3 years and **18 partners** participated from 4 EU countries
- SOFIA proved its effectiveness in over **7 pilots** related to contexts such as Smart City, Smart Spaces,...
- Electric car,
- Domotics,
- Video processing,
- Energy efficiency,
- Intelligent city

## PRESENT

### R+D PROJECTS CONTINUE TO CONSOLIDATE SOFIA

- **eVacuate.** Management of emergencies&evacuation
- **Arrowhead.** Cooperative automation in buildings, public infrastructure y industrial processes
- **IoE** (Internet of Energy). Intelligent management of energy networks via Internet in a safe manner
- **Smarcos.** Improve human-machine interfaces of interconnected embedded technologies

### COMMERCIAL CLIENTS

- **Smart Cities.** As the cities' brain.
- **Smart Energy.** As a tool for optimization and energy efficiency.
- **Smart Health.** As a teleassistance solution for patients and digital homes.
- **Smart Security.** As security management and alarm monitoring, access and surveillance.

## FUTURE

### NEW TECHNOLOGIES AND R+D EUROPEAN PROGRAMS

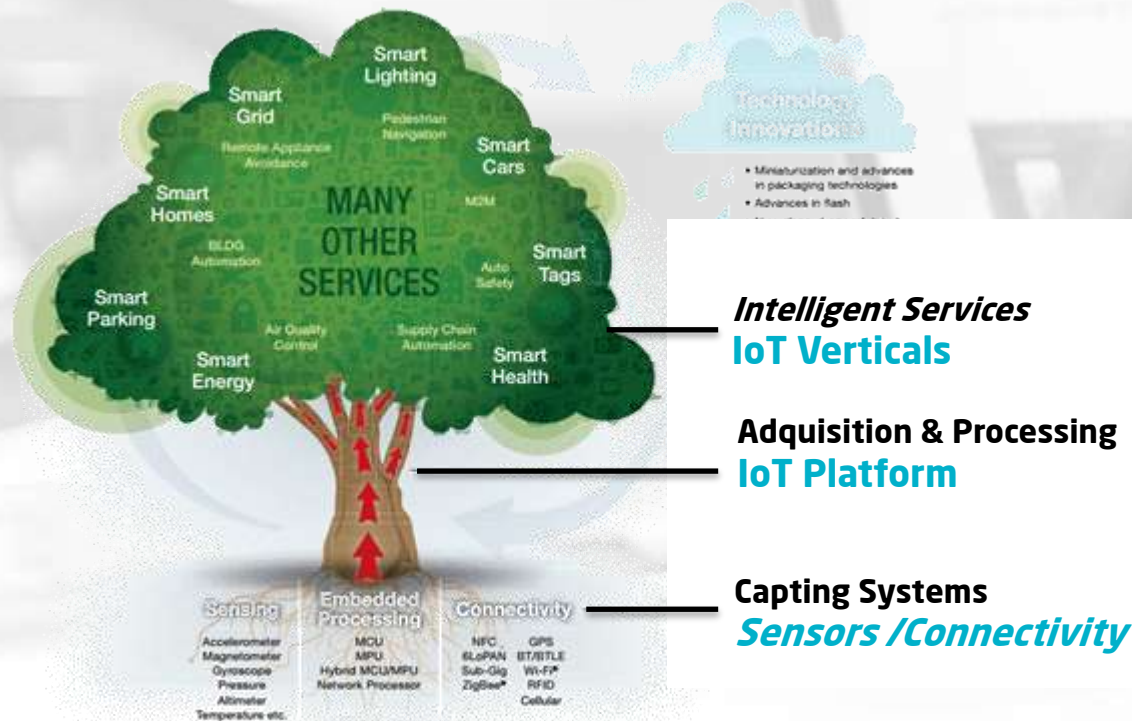
- H2020
- ECSEL / ARTEMIS
- COOPERATION WITH LATAM/ASIA

### AREAS OF INNOVATION

- Cyber Physical Systems
- City OS
- Internet of Things
- Robotics
- Social Interaction



# INTERNET OF THINGS AREAS



Our IoT Platform turns Things into **Smart Things**



# FLOW



Data is gathered, processed, filtered, and transmitted by a "terminal" or connected device.



Data passes over networks, which may be Wi-Fi, cellular, mesh radio, satellite, or fixed line



Information from across the IoT network is gathered and stored, often in the cloud



Through manual analysis or automated processing, insights are extracted and presented.



Based on these insights, alerts are sent to people, enterprise systems, or IoT devices to take action



IoT data is exchanged with other systems, monetizing it and enriching it with third-party data.

**IoT Platform**



# EXPLAINING SOFIA2

## Sofia2 as BRAIN of the System



1

Acquires real-time information through the **senses** (sensors and system devices)

2

Take **real-time decisions** based on the information received and prior learning

3

Stores all the information that reaches you in the area of **short-term memory**

4

Consolidates the relevant information retrieved through the day in the **long term memory**

5

Match data on the different memories to learn and **act smarter** next time



# ORIENTED TO THE ENTERPRISE WORLD, FOCUSING ON INNOVATION AND ALIGNMENT WITH NEW STANDARDS

Indra adapts SOFIA concepts to the enterprise world creating SOFIA2 as

## IoT Interoperability Platform with Big Data approach

**Integrated Platform  
(no coupling)**

**Integrated Security**

**UI + API centralized  
management**

**Customizable and  
extensible**

**Multidevice**

**Interoperability**

**Big Data approach**

**Semantic vision**

**Horizontal  
scalability**

**Market Technologies  
and Standards**

**On Premise & On  
Cloud**

**Open Source /  
Commercial**



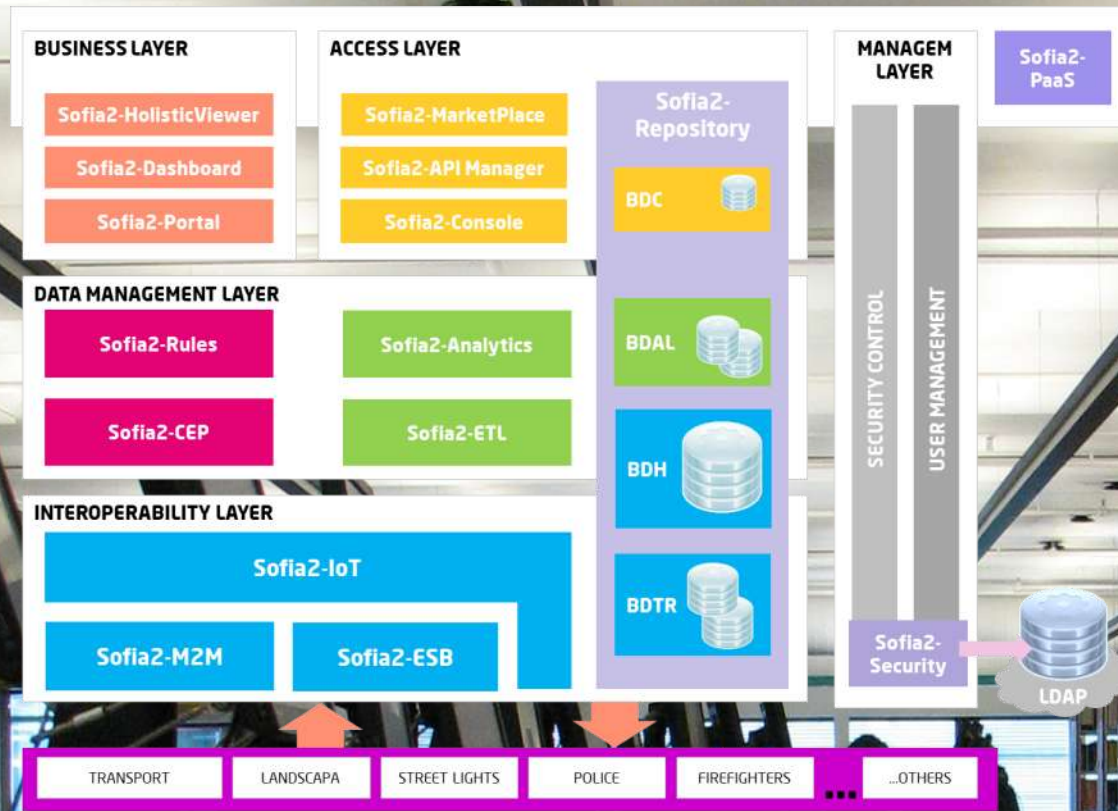
# SOFIA2 WORKING

SMART SPACE





# SOFIA2 MODULES





# GENERATION OF AN ACTIVE ECOSYSTEM AND DEVELOPMENT OF NEW BUSINESS MODELS PROMOTING ENTREPRENEURSHIP

## ECOSYSTEM

**SW  
PROVIDERS**

**SOLUTIONS AND  
ENTREPRENEURS**

**HW AND DEVICES  
PROVIDERS**

**UNIVERSITIES,  
COUNCILS AND  
COMMUNITIES**

**JOINT COMMERCIALIZATION  
EXPERIMENTATION ENVIRONMENT**

**ACTIVE TRAINING  
COMMUNITY**

**ROADMAP AND OPEN EVOLUTION**

**INNOVATION**

**CERTIFICATIONS**

**ENTREPRENEURSHIP**

**INTEGRATORS**



# EXPERIMENTATION INSTANCE & CHANNELS



**SOFIA2 CloudLab** is an instance of SOFIA2 deployed in the cloud so that **any person, company, organization, developer or citizen** can have **free** access to the public data managed in it and create their own applications with experimental purposes:

<http://sofia2.com>

- Multilanguage APIS and multienvironment SDK
- Centralized configuration console
- Partners Ecosystem
- Monthly updated Environment

**Blog SOFIA2**  
<http://about.sofia2.com>

**SOFIA2 Community**  
<http://sofia2.org>

**Twitter Channel**  
[http://twitter.com/SOFIA2\\_Platform](http://twitter.com/SOFIA2_Platform)

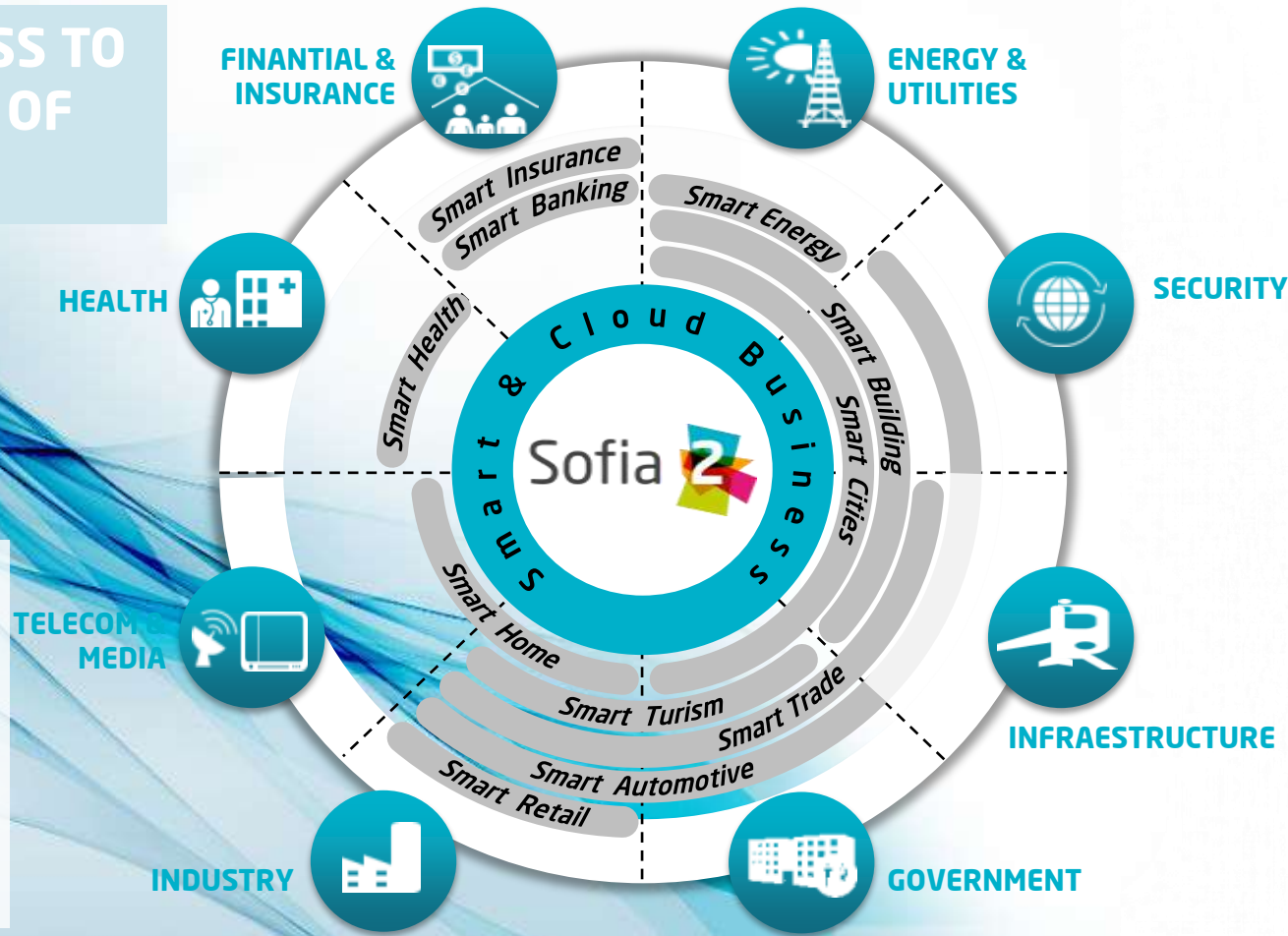
**email & newsletters**  
[plataformasofia2@indra.es](mailto:plataformasofia2@indra.es)



# PROMOTING BUSINESS TO DIFFERENT SECTORS OF ACTIVITY

## SMART EVERYWHERE

The IoT solutions are positioned transversely across different sectors and business





# FOSTERING INNOVATION IN DIFFERENT SECTORS



## SMART ENERGY

- Platform for home device management.
- Collects information from home devices.
- Stores, processes and makes decisions on large volumes of information.

## SMART CITIES & INFRA

- OS brain of the city
- Data collection from sensors of the city
- Integrated with other city systems.

## SMART INDUSTRY

- Behavioral and shopping habits management (supermarket, retail, visitors, real time analytics ...)
- Connected cards
- Intelligent factories

## SMART HEALTH

- Integrating healthcare devices, both in hospital and remotely.
- Historical information storage and analysis.

## SMART SECURITY

- Emergencies management in real time.
- Access control and video surveillance
- Cybersecurity and pattern analysis.

## SMART SPACE

- Airspace management and ground information analytics.

## SMART BANKING & INSURANCE

- Fraud detection
- Real time segmentation and customer follow-up
- Smart branches and ATMs
- Pay as You X Models (Pay as you Drive,...)

## SMART TOURISM

- City events in real time
- Mobility and access to touristic resources.



# HOLISTIC CROSS DOMAIN CITY MANAGEMENT ENABLED BY UNDERLYING TECHNOLOGY, ALREADY PRODUCTIVE



**SMART CORUÑA**  
IOT PLATFORM OF THE CITY OF LA CORUÑA



# VERSIONS

## ✓ Community Version

- Open-source license.
- No cost per use.
- Base version of the operative platform.
- Does not include Web management console nor advance tools (Scripting Rules and CEP).
- Source code available at Sofia2 Forge: <http://sofia2.org>
- Includes user guides and SDK <http://sofia2.com/>



## ✓ Enterprise Version

- Commercial support under several levels and SLAs.
- Complete Platform including all tools.
- Includes use, installation and customization guides.
- SDK including Hadoop and BI support.
- Includes advanced plugins and gateways,

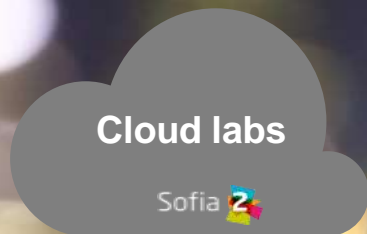




# DEPLOYMENT MODEL

## Cloud Labs or PoC

OPTION 1 | Cloud availability for pilots and experimentation



Solution is deployed on a public cloud and is accessible via Internet. Deployed for experimentation purposes and PoCs. Amazon, Azure, Google, etc...

## On Premise

OPTION 2 | Installation of Sofia2 in customer's datacenter or customer's private cloud.

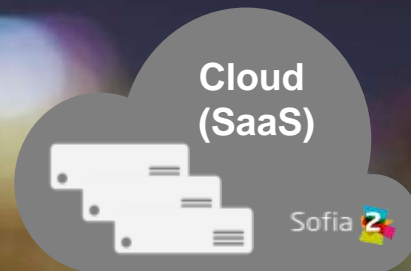


### Customer's Datacenter

Solución deployed on customer's datacenter. Configuration determined by the number of instances defined for Sofia2. Customer's infrastructure.

## Cloud (SaaS)

OPTION 3 | Service (operated or not by Indra) available on Cloud and pay per use.



Solution deployed (operated or not by Indra) in the Cloud and provided as a service with defined SLAs. Amazon, Azure, Google, Flex-IT (Indra)



# Sofia2 BY INDRA

Sofia2 enables IoT interoperability with any device or system because of its multiplatform and multilanguage connectors. Sofia2 supports web modelling of entities, includes a real-time database and additional data storage for historical information with analysis capacities, dashboards and central management of all the platform's concepts via web Console.

## LANGUAGES

JAVA JAVASCRIPT

C/C++ NODE.JS

ANDROID PYTHON

...

## MESSAGING PROTOCOLS

MQTT/MQTTs

HTTP/HTTPS

WEBSOCKETS

TCP/IP

## NATIVE CAPABILITIES

- Light Semantic
- Asset Management
- Central Management
- M2M Gateway
- Social Media analysis
- Analytics
- Real-time and historical storage
- Rules
- Integration

## TOP USE CASES

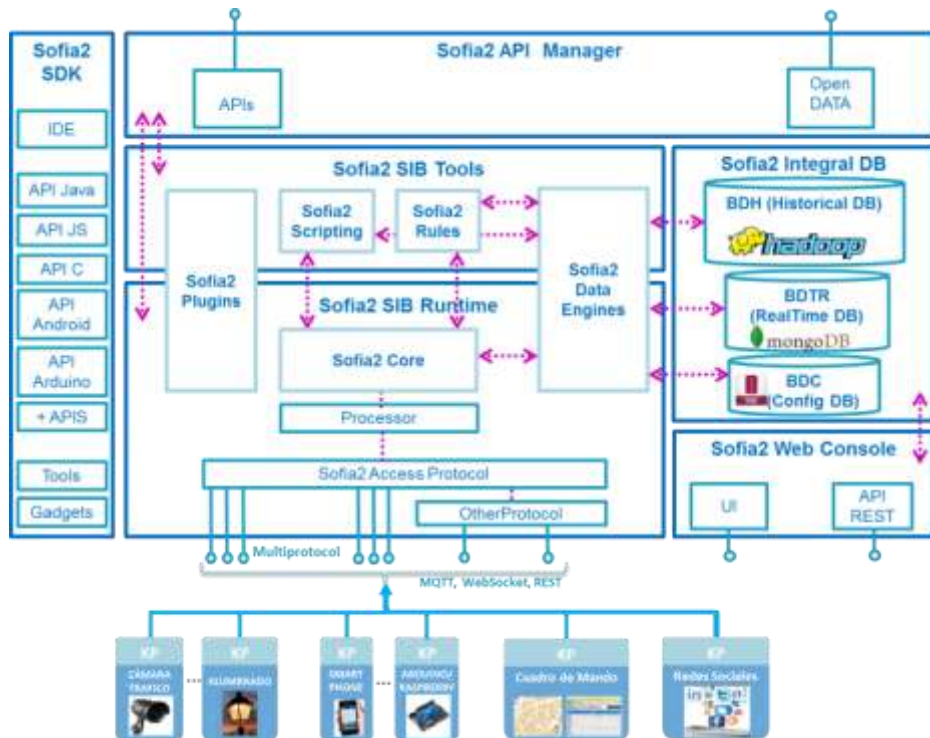
1. Smart Cities/Utilities/Grid
2. Home Automation/Smart Home
3. Smart Services Sector
4. Medical
5. Transportation
6. Wearables

WEBSITE [sofia2.com](http://sofia2.com)

TWITTER [@SOFIA2\\_PLATFORM](https://twitter.com/SOFIA2_PLATFORM)

## HOSTING OPTIONS

Cloud Hosted or On-Premise





# DEMO HOLYSTIC VIEWER



**eVidens** is an integral system of advanced visualization (Holistic and interactive) that allows the management of geolocalised information associated with a three-dimensional display and multimedia

Lets understand the territorial events intuitively giving the opportunity to obtain detailed information in accordance with the level of detail that is desired, for decision-making aid

**eVidens** provides geovisualization real-time terrain and is designed for optimal management of information coming from different data sources

## WHAT IS IT?

## HOW DOES IT WORK?

## WHAT IS IT FOR?





# R&D PROJECTS

## General Information

- **Partners:** 77
- **Coordinator:** Lulea University of Technology (Sweden)
- **Founded by:** MINETUR
- **Program:** ARTEMIS
- **Start Date:** 01/03/13
- **End Date:** 31/12/16



## Embedded Systems for a Sustainable Europe

### Description of the project

Its objective is the development and demonstration of a pilot urban platform that can intelligently integrate various urban services, taking into account: Sensing, Communications Network, Bus integration, monitoring and control and automation and generation rules for decision making and a number of services developed under a common platform to help improve urban energy efficiency through intelligent lighting and "smart buildings"

### Used Technologies:

- Analysis of ubiquitous large-scale data collected across heterogeneous sources
- Smart grids
- Sensing (cameras, sensors volumetric, ...)
- Comprehensive management of sensing

- Network communications
- Short technologies and long range (Zigbee / RFID / wifi)
- integrator bus
- Center operational management
- Business Intelligence
- Developing rules and algorithms management for automated ...
- Interaction with the citizen through mobile devices ...



Spanish Consortium:





## A holistic, scenario-independent, situation-awareness and guidance system for sustaining the Active Evacuation Route for large crowds

### Description of the project

eVACUATE aims to produce an integrated system:

- Provide a detailed system assessment and updated in real-time to situations requiring mass evacuation.
- It dynamically adapts to new circumstances
- Ensure Optimal Evacuation Strategy
- Facilitate the integration of the results of these analyzes in real tools and emergency management command and control
- Allow use and exports in centralized and distributed fields (mobile portability, etc.)

### Used Technologies

- **Persistent communications**
- **Systems Modeling and Simulation**
- **Printed RFID Tags**
- **Actuated Sensors Vision**
- **Decision-making tools**
- **Warning Systems at the population**
- **Realtime Architectures**

### Industrial Partners

**EXODUS**  
eSOLUTIONS

**indra**

**Tekniker**  
S.A. - SISTEMAS DE COMUNICACIÓN

**HKV**

**TECHNICAL SERVICES**

**ATHENS**  
TECHNOLOGICAL CENTER

**crowd dynamics**

**metro bilbao**



**TELECOM**  
ITALIA

**VITROCISET**

**stx Europe**

**DIGINEXT**  
TECHNOLOGICAL CENTER

**POUR NATIONALE**

### General Information

- **Partners:** 20
- **Coordinator:** Exodus S.A.
- **Founded by:** European Commission
- **Program:** FP7 Security
- **Start Date:** 22/04/13
- **End Date:** 30/04/17





## Towards a more sustainable city model

### Description of the project

Innpronta CITY 2020 is a project that aims to achieve a breakthrough in the areas of energy efficiency, Future Internet, Internet of things, human behavior, environmental sustainability and mobility and transport, in order to design the city of the future, sustainable, smart and efficient.

Therefore, 2020 City conceives, designs and implements a new paradigm of sustainable and efficient city supported on three key areas:

- **Energy**
- **Transport**
- **Environmental Control**

**2020 CITY** achieve the 20-20-20 targets: **20% reduction of emissions, producing a 20% renewable energy and 20% improvement in energy efficiency.**

### Used Technologies

- **Internet of the future & Internet of the things**
- **Cloud computing**
- **Fix and Mobile Participative Sensors**
- **Vehicular Communications**
- **Short and Large Range Communications**
- **Sensing, models and power management**

- **Energy awareness**
- **Data mining**
- **Reality mining**
- **Open Data**



### General Information

- **Partners:** 9
- **Coordinating Enterprise:** Indra
- **Found:** CDTI
- **Program:** Innpronta 2011
- **Start Date:** 01/01/11
- **End Date:** 31/12/14
- **URL:** <http://www.innprontaciudad2020.es>

**Consortium:**







**Thank you for your attention!!!**