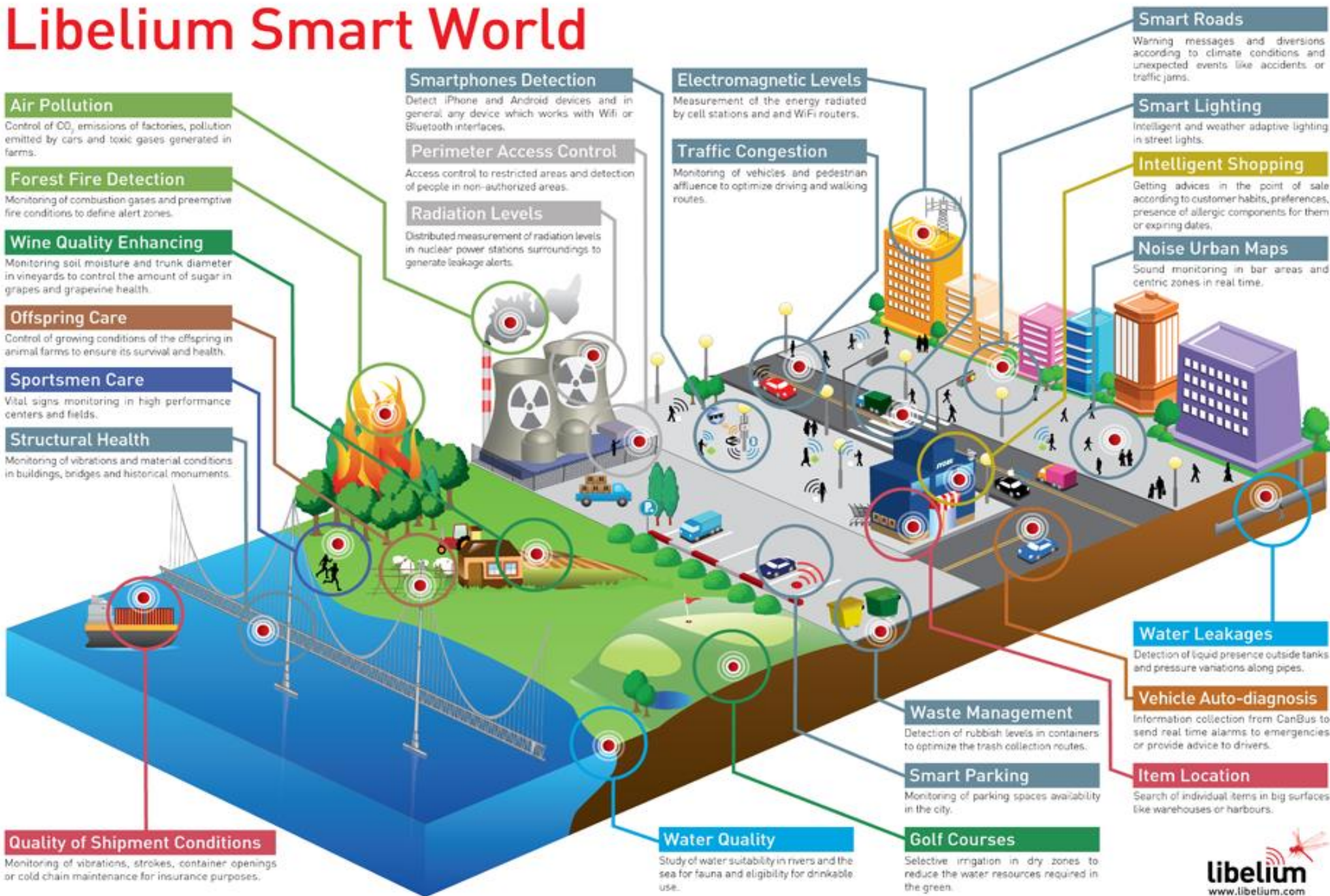


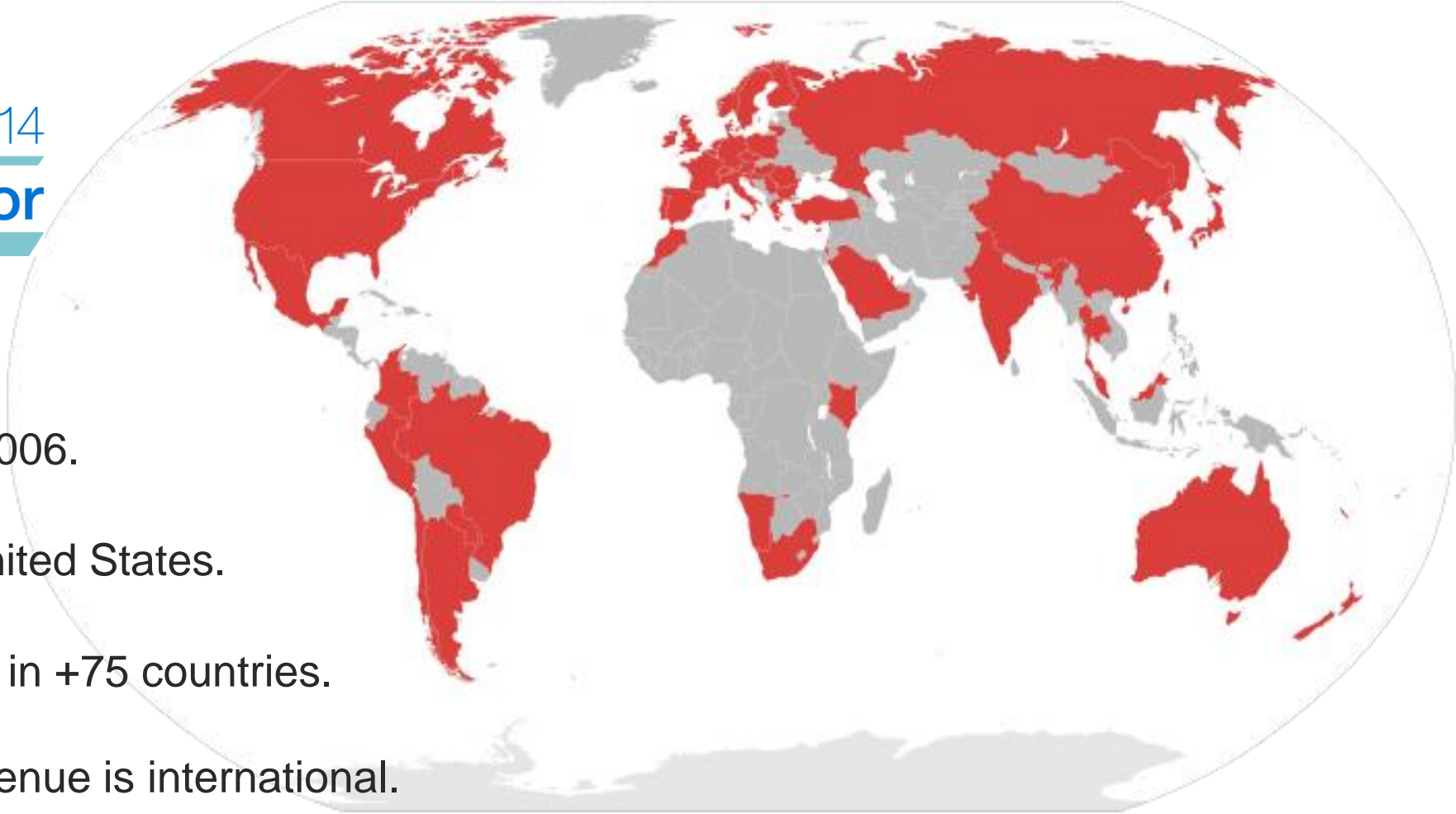


Smart Cities Global Solution Platform:
driving value through a connected
and interoperable city.

Libelium Smart World



Gartner 2014
CoolVendor



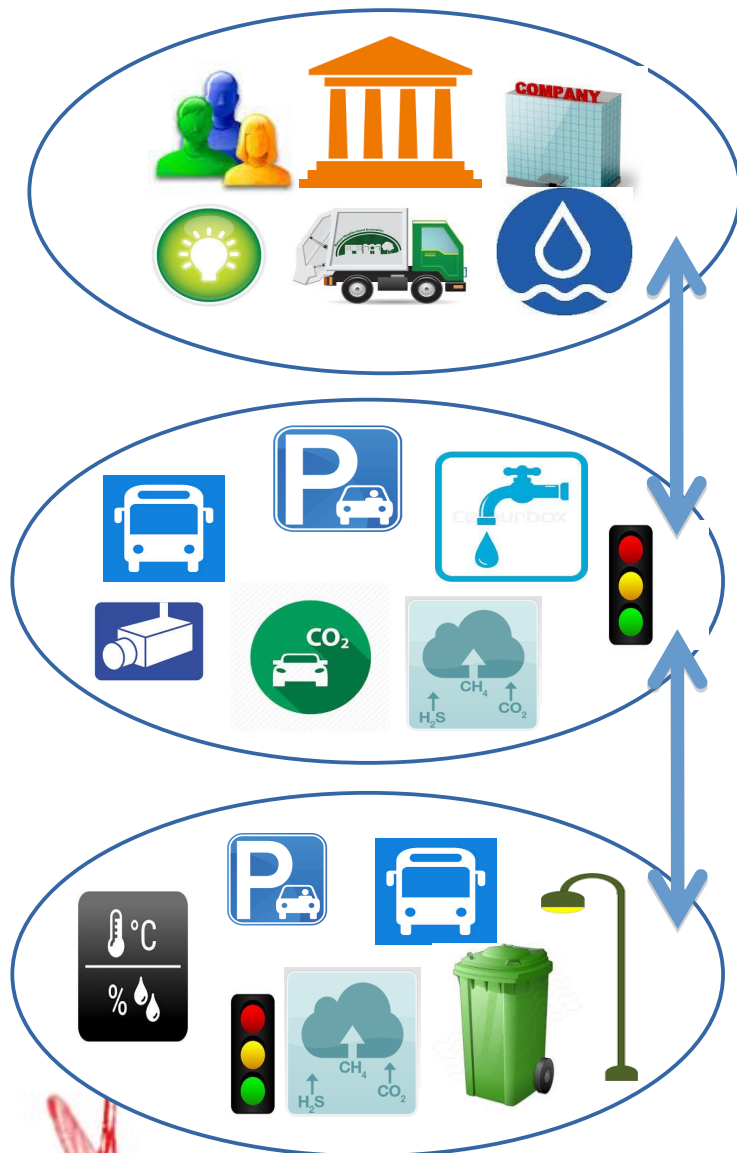
- Founded 2006.
- Spain & United States.
- Customers in +75 countries.
- 90% of revenue is international.
- VARs in N. America, Europe, LATAM, Asia, Pacific (16 VARs - 18 countries).



We help to solve problems in our society with wireless sensor networks that monitor continuously anything, anywhere



A city has...



Multiple and heterogeneous stakeholders & users

Multiple and heterogeneous needs & challenges

Multiple and heterogeneous data sources

A city needs...

Interoperability

Transversal approach

Horizontal technology

Multiple solutions

City as the IoT space.

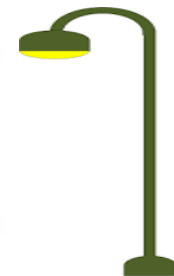
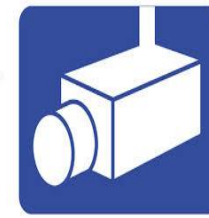
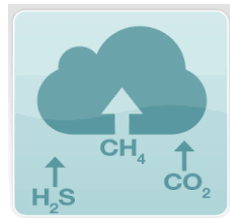
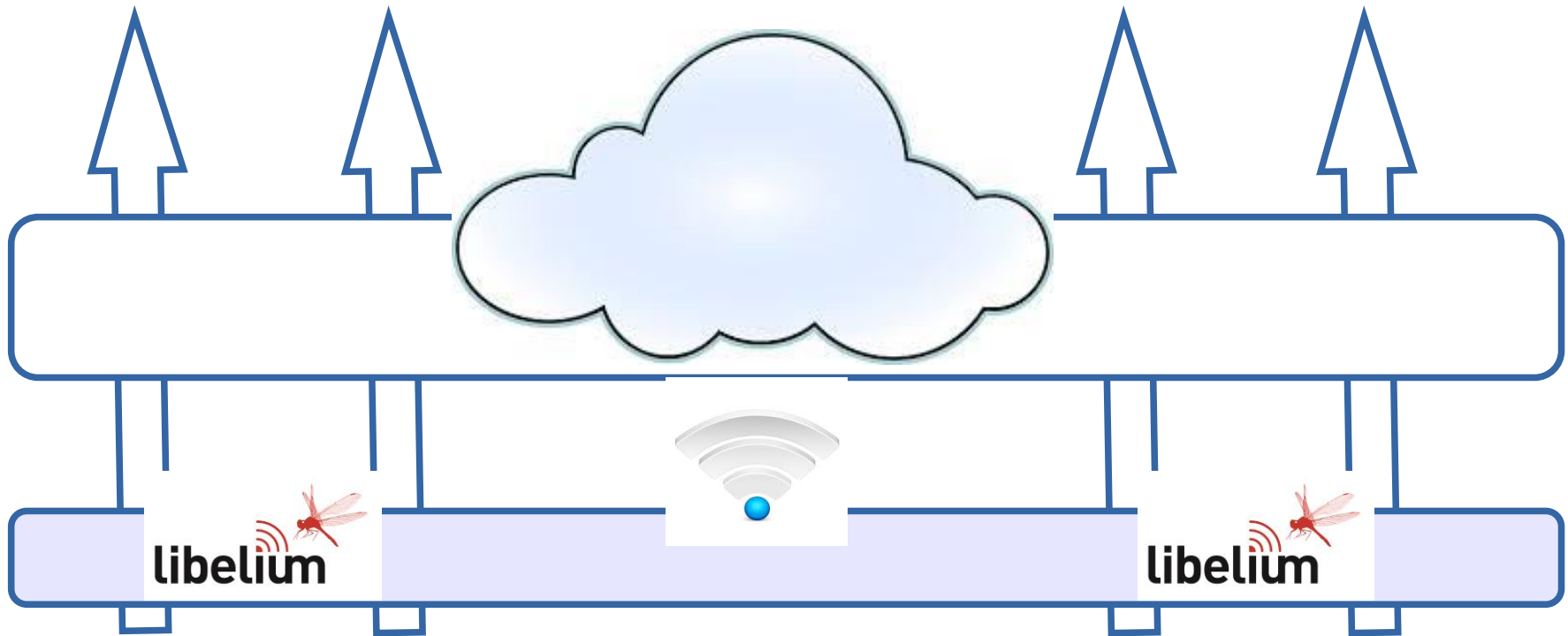
Beyond
connected
devices...



...towards
connected
products &
services.

Interoperability in a Connected City.

Our vision: a connected and interoperable city.



This is what we have learnt from our experience working
with cities

Melbourne	Barcelona	Christchurch
Hoboken, NJ.	Sydney	Dublin
Belgrade	Rotterdam	Newcastle, UK.
Malaga	Santander	Valparaíso, Chile.
Salamanca	Gerona	Pancevo



Each IoT project needs to...

Integrate varied technology

Interact with any information system

Adapt to specific customer needs

Allow rapid programming

Be cost-effective

Be easy to maintain

Involve different stakeholders

Libelium sensor platform is...

Horizontal and adaptable

Programmable Open Source

Customizable

Supported by +2,000 developers

Modular, including only needed hardware

Solar-powered and re-programmable via Internet

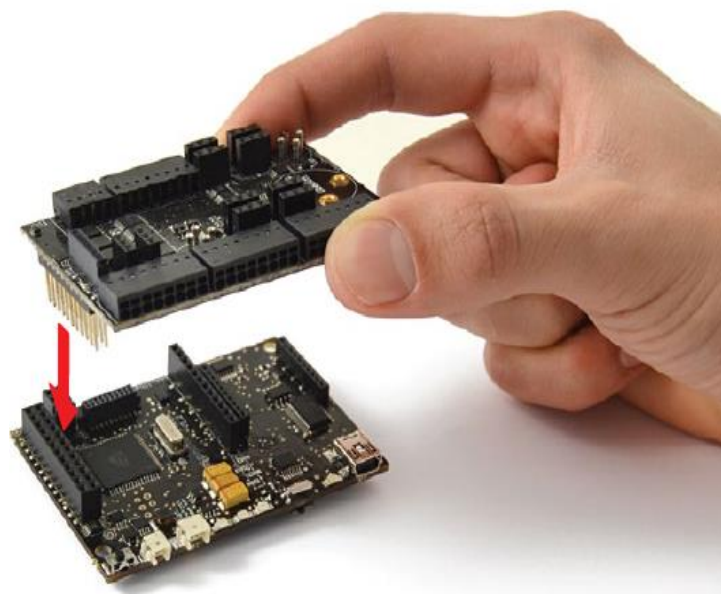
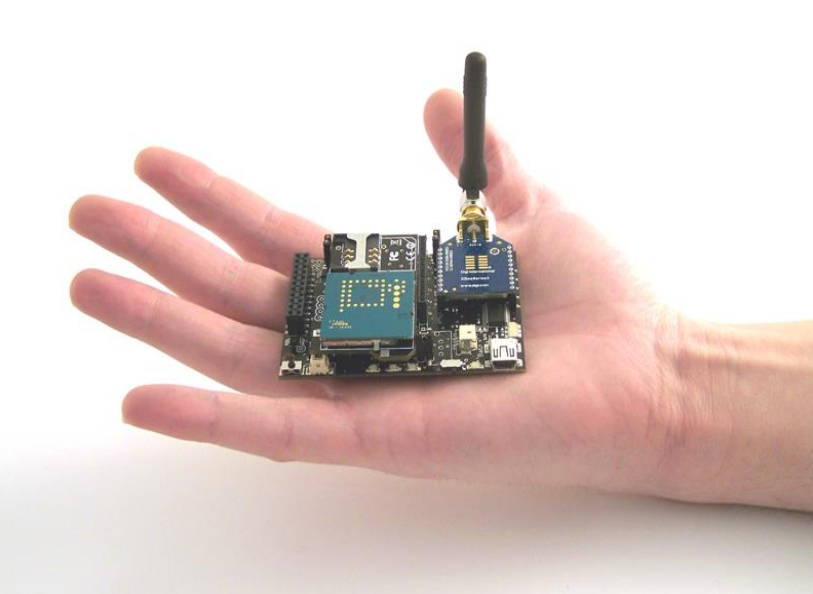
Sold through different channels

Wasp mote is the IoT hwd platform that enhances interoperability of connected things, with the fastest TTM



We identify 3 elements common to all IoT projects:





HORIZONTAL

MODULAR

SCALABLE

OPEN SOURCE

- + 80 sensors
- + 10 verticals
- + 50 IoT applications

Pluggable
add-ons





Up to 6 different sensor probes per enclosure:

- Easy to change any sensor probe
- Easy to add new sensor probes

Additional features:

- External SIM socket
- OTAP

Solar powered:

- Internal or external panels





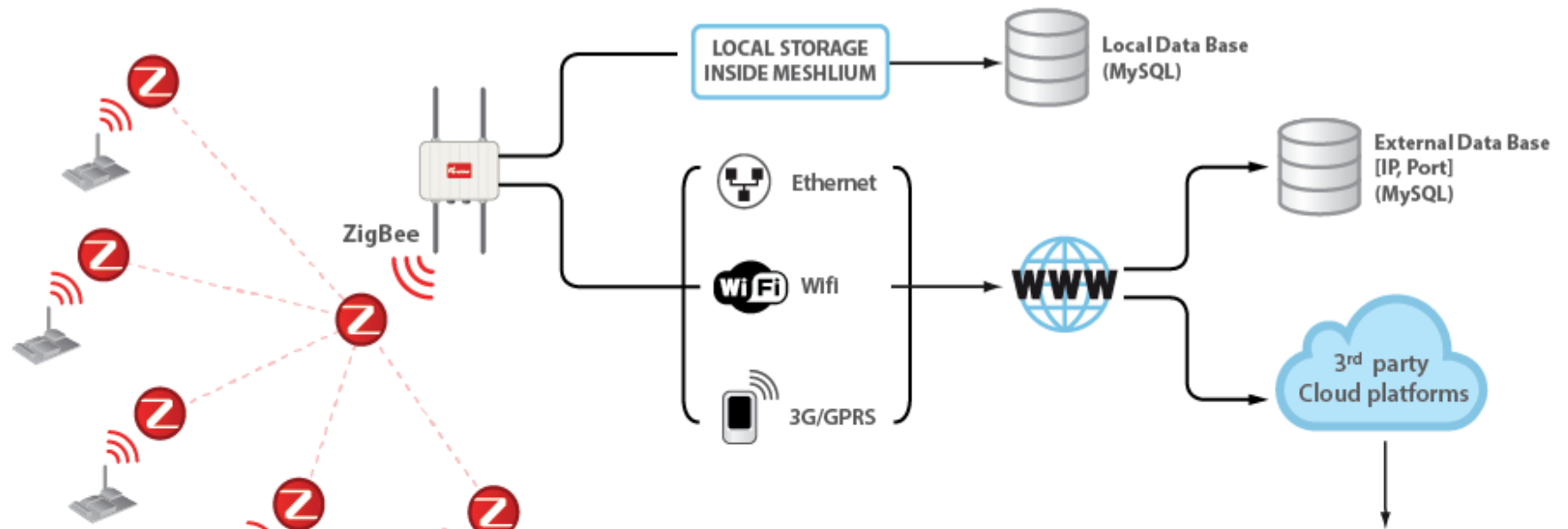
Wireless Sensor Nodes



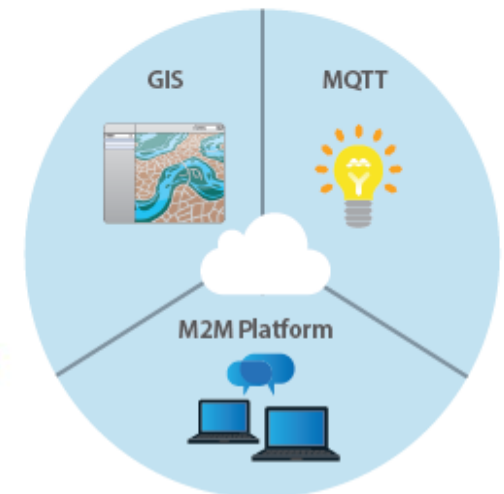
Gateway

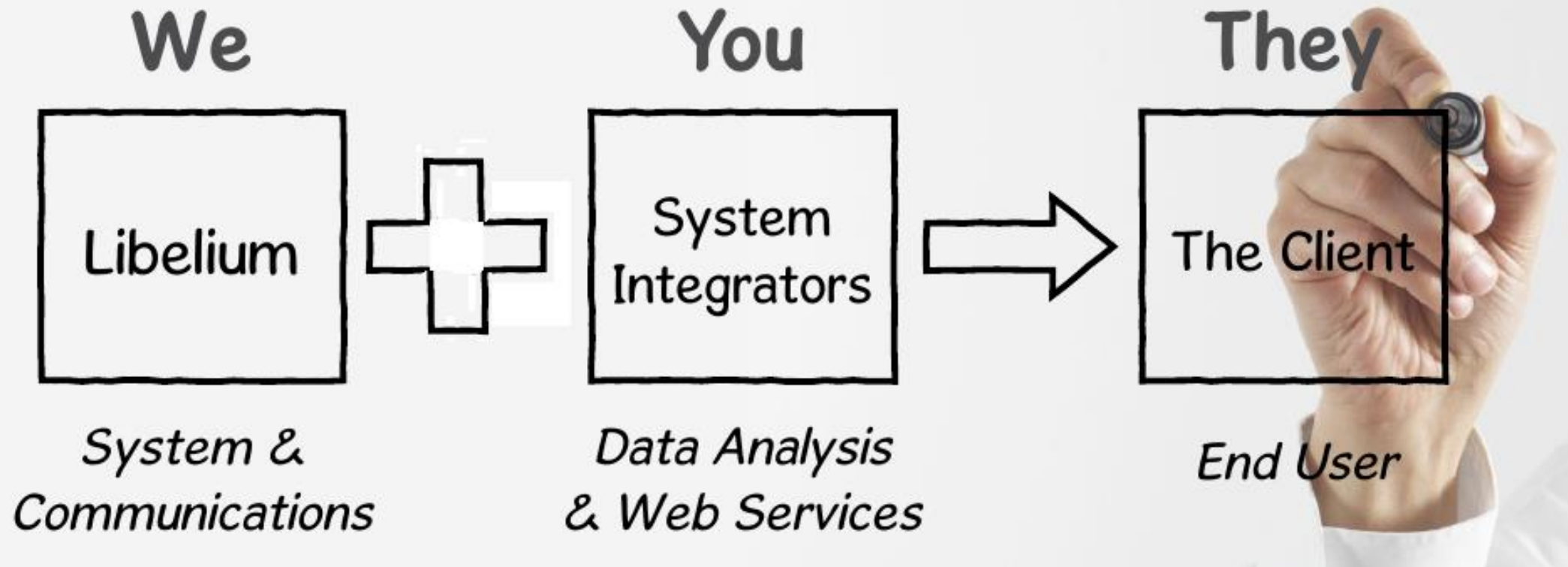
- Easy to maintain
- Easy to deploy
- Easy to scale





- ZigBee
- 802.15.4
- 3G / GPS
- GPRS
- 868 / 900 MHz
- WiFi
- BT / BLE
- LoRa





- + A HORIZONTAL approach to market, targeting MULTIPLE VERTICALS
- + ONE HORIZONTAL HDW PLATFORM, MULTIPLE VERTICAL SOLUTIONS
- + Partnering with system integrators allows to build complete, A to Z solutions for the end user.

Models

Smart Environment



Sensors

- Carbon Monoxide (CO)
- Carbon Dioxide (CO₂)
- Oxygen (O₂)
- Methane (CH₄)
- Hydrogen (H₂)
- Ammonia (NH₃)
- Hydrogen Sulfide (H₂S)
- Nitrogen Dioxide (NO₂)
- Ozone (O₃)
- Hydrocarbons (VOC)
- Isobutane
- Ethanol
- Toluene
- Temperature
- Humidity
- Atmospheric pressure

Smart Cities



Sensors

- Dust concentration
- Ultrasound
- Noise
- Linear displacement (crack measurement)
- Temperature
- Humidity
- Luminosity (LDR)

Smart Metering



Sensors

- Current
- Ultrasound
- Liquid level
- Liquid flow
- Temperature
- Humidity
- Luminosity (LDR)

Smart Agriculture



Sensors

- Soil moisture
- Soil temperature
- Leaf wetness
- Solar radiation
- Atmospheric pressure
- Stem diameter
- Anemometer
- Wind vane
- Pluviometer
- Temperature
- Humidity

Smart Security



Sensors

- Presence
- Hall effect
- Water presence
- Liquid level
- Liquid flow
- Temperature
- Humidity
- Luminosity (LDR)

Ambient Control



Sensors

- Temperature
- Humidity
- Luminosity (LDR)
- Luminosity (Luxes accuracy)

Radiation Control



Sensors

- Geiger tube [β , γ] (Beta and Gamma)

Smart Parking

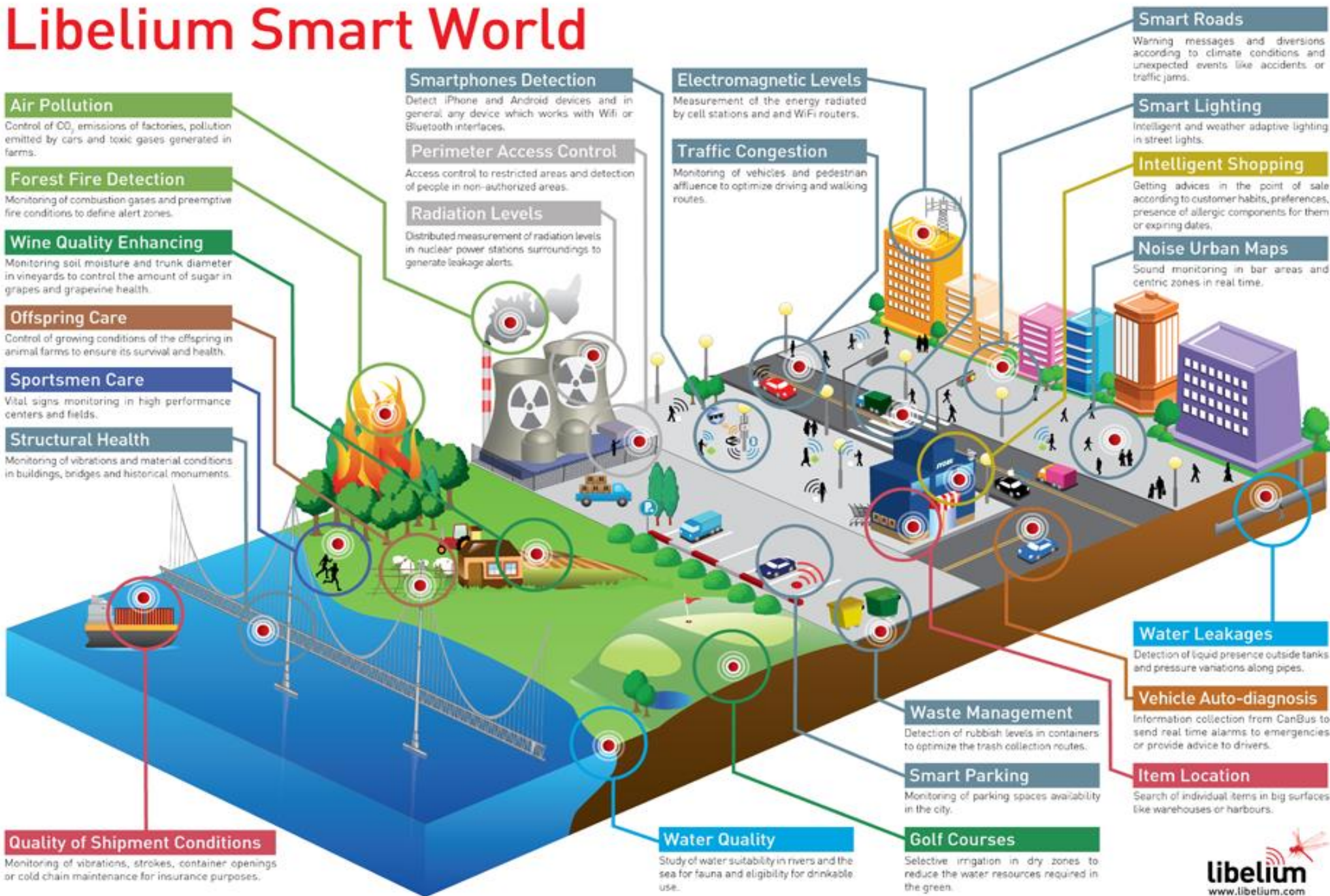


Sensors

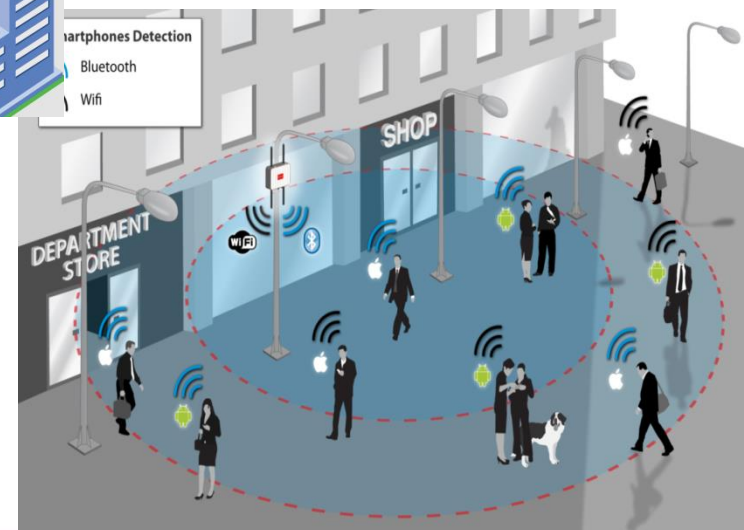
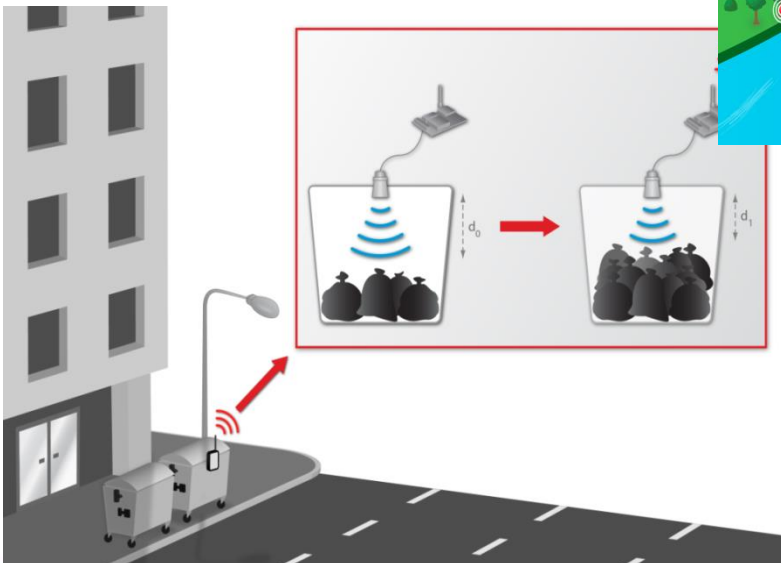
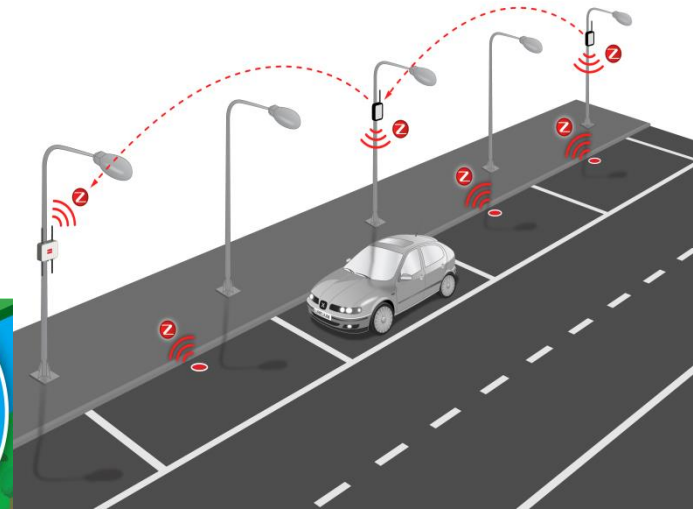
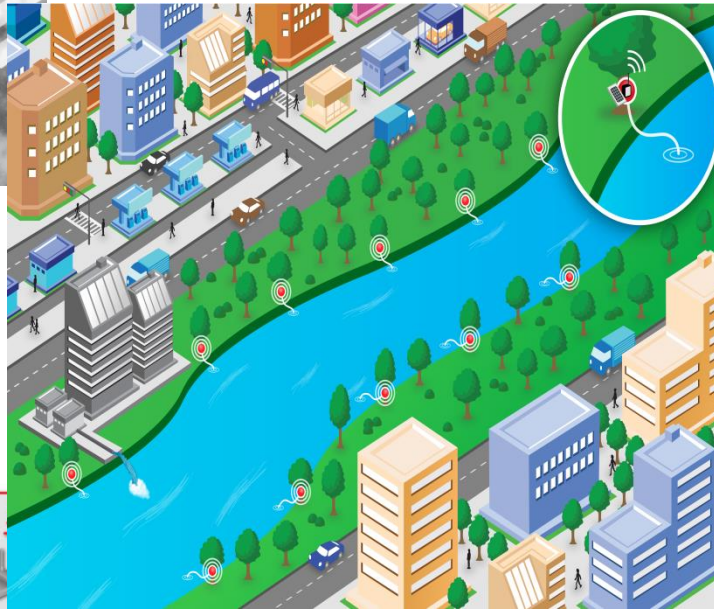
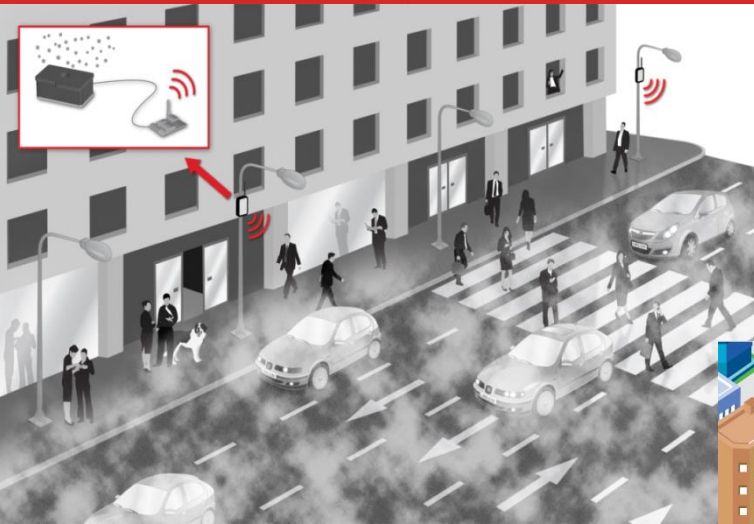
- Magnetic field (3 axis)



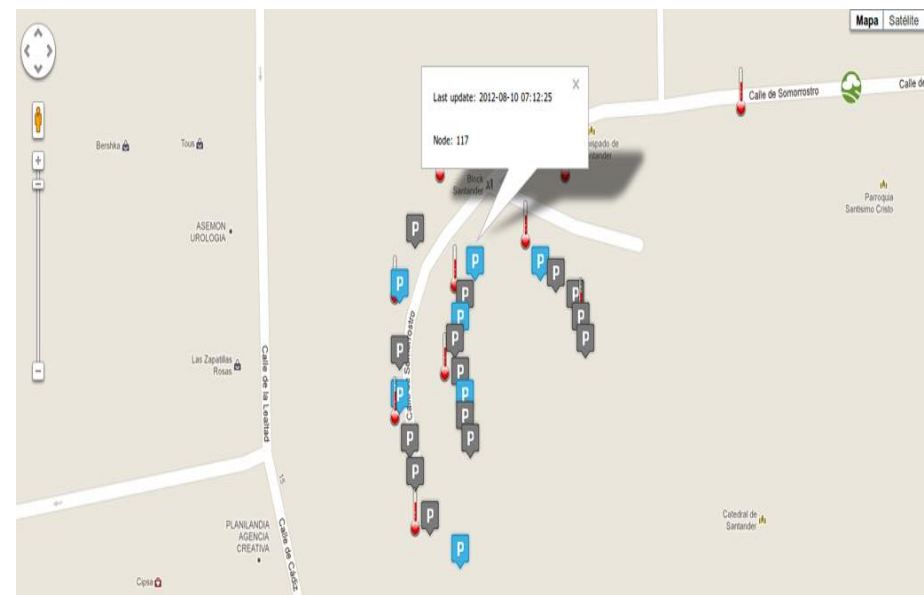
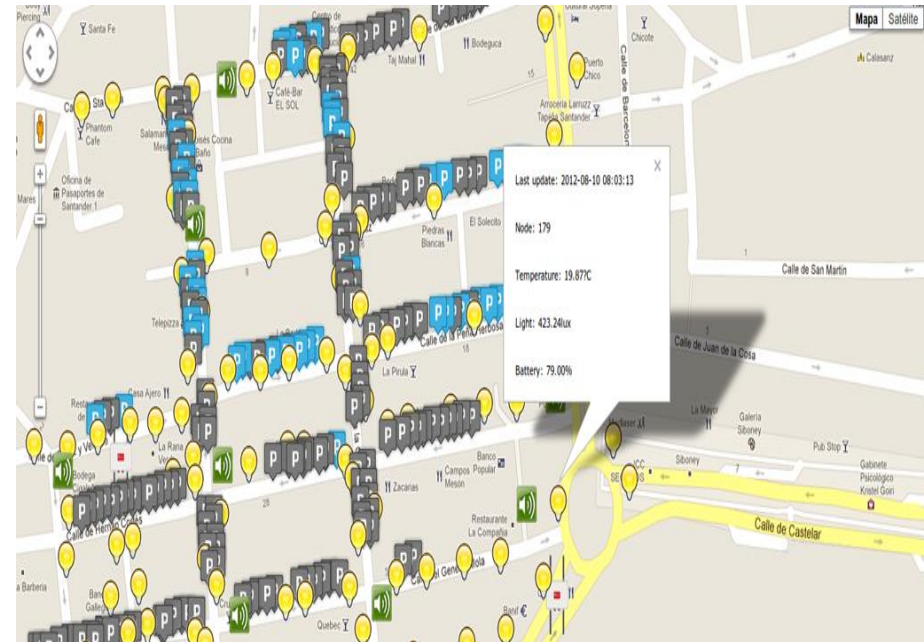
Libelium Smart World



Smart Cities: user cases & applications

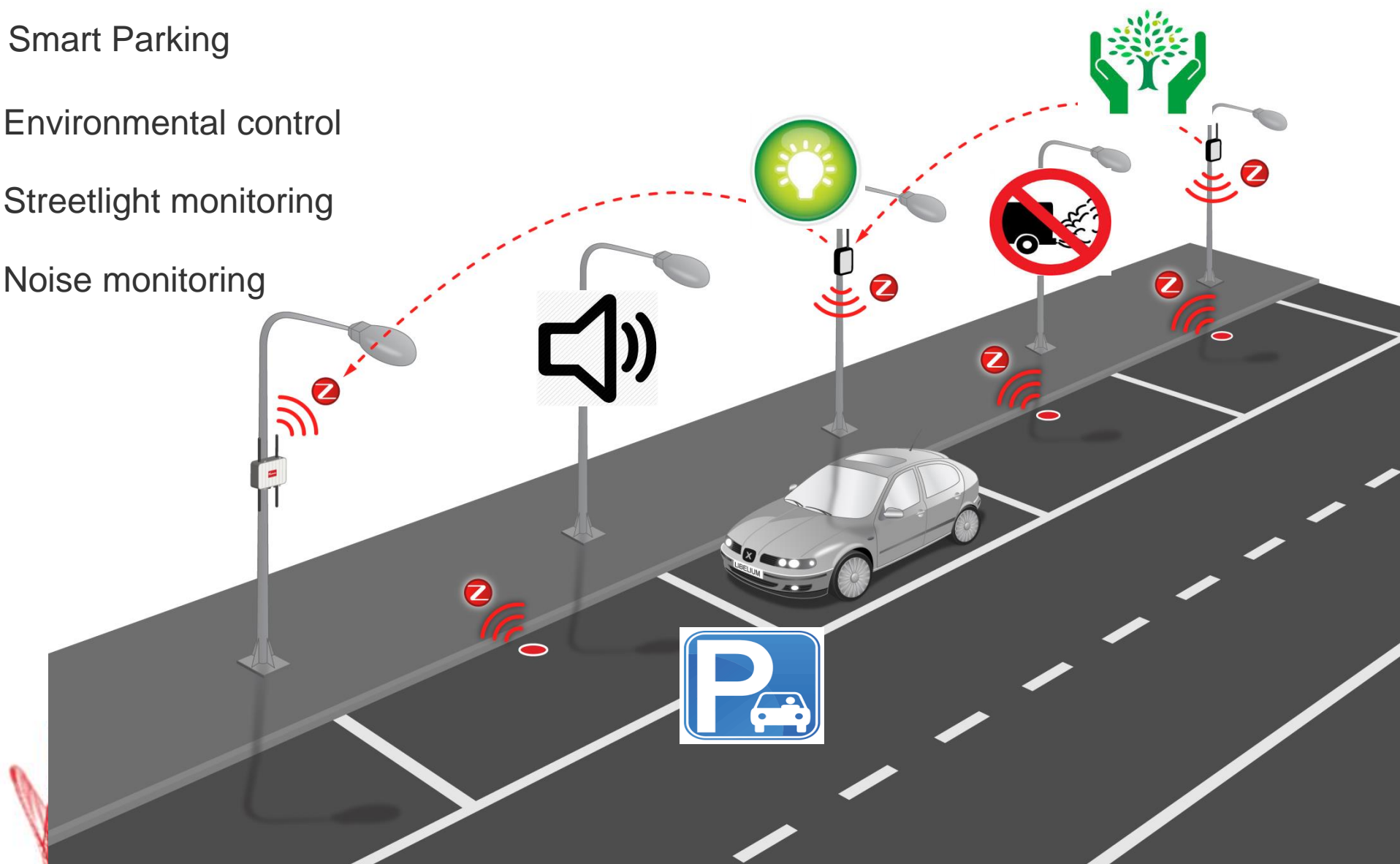


#1 - A Smart City project with a horizontal vision



1 single platform, 4 smart city solutions.

- ✓ Smart Parking
- ✓ Environmental control
- ✓ Streetlight monitoring
- ✓ Noise monitoring



#2 - Environmental and pollution monitoring in Europe



Temp., Humidity, CO, CO2,
NO2, GPS location.



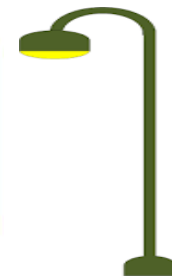
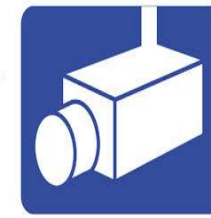
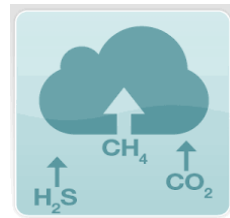
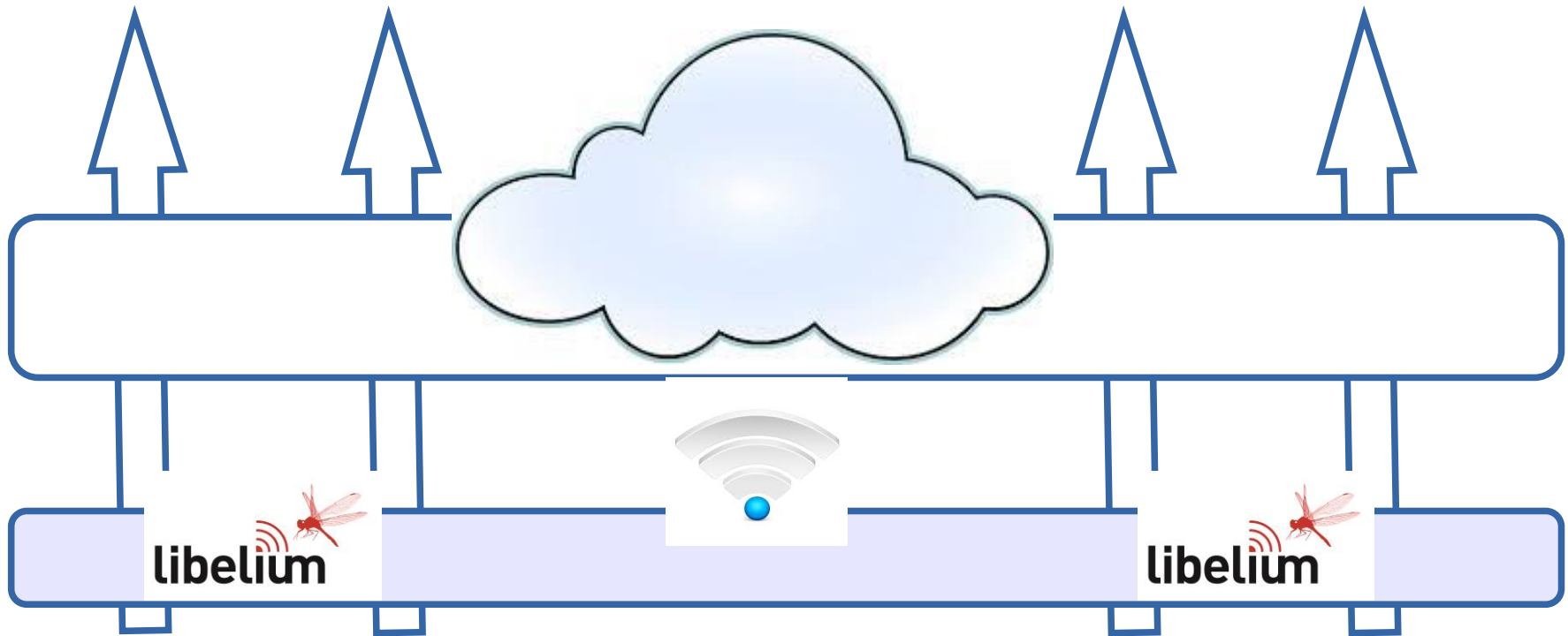
Product philosophy → holistic approach for Smart Cities and IoT refined by experience.

Technology chosen for the biggest Smart City project in Europe.

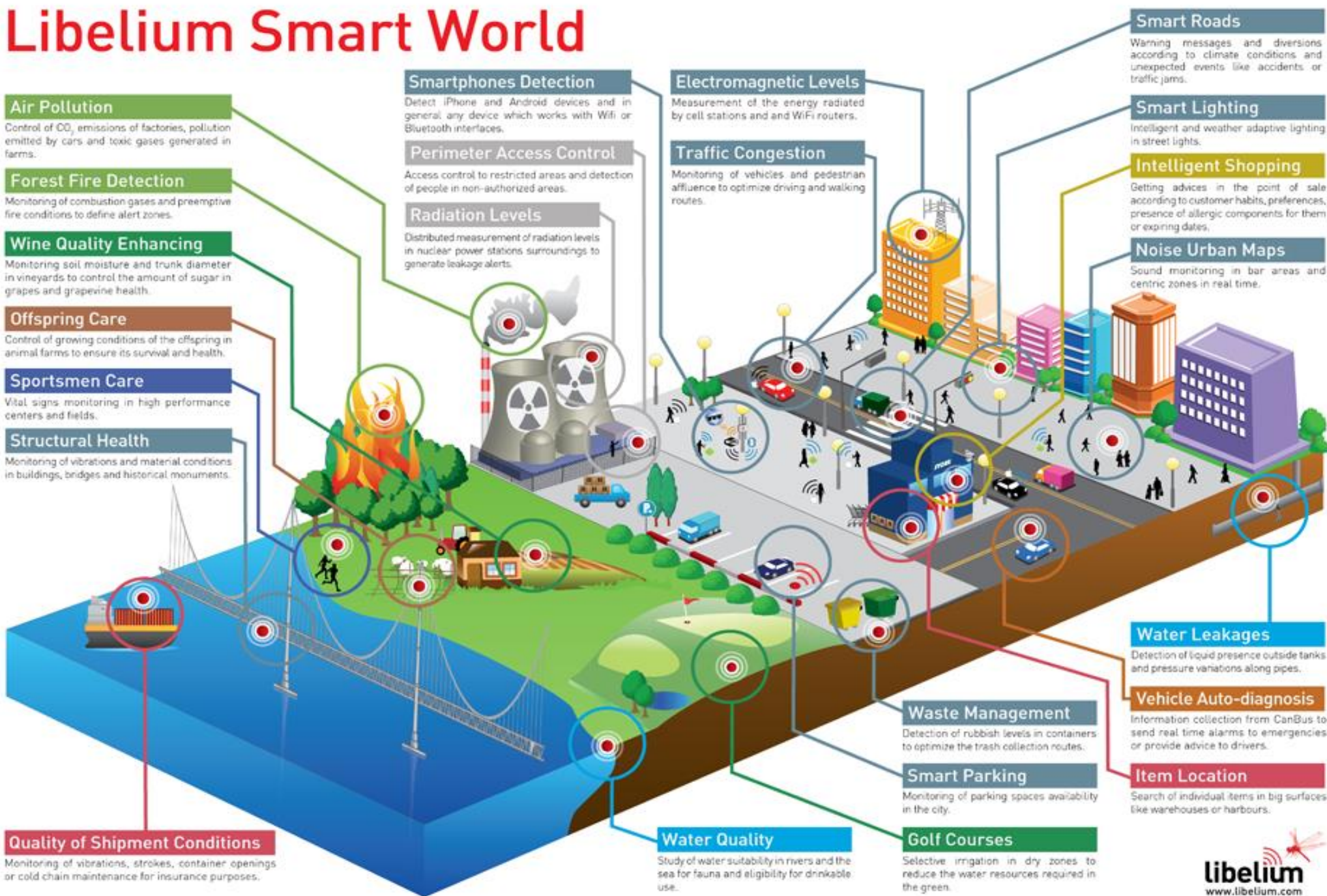
Smart Cities data acquisition platform 2.0: “premium” model, fully integrated, total scalability.



Our vision: a connected and interoperable city.



Libelium Smart World



Let's build smarter cities together.

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