Intelligent and Connected

Living in the Age of IoT and Smart Cities

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STMicroelectronics

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Who We Are

- A global semiconductor leader
- 2014 revenues of **$7.40B**

- Approximately **43,600** employees worldwide
- Approximately **8,700** people working in R&D
- **11** manufacturing sites
- Over **75** sales & marketing offices

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Listed on New York Stock Exchange, Euronext Paris and Borsa Italiana, Milano

Why Smart Cities?

Increasing urban density and changing demographics

2030 Demographic Dynamics

More than 8 billion people
More than 60% living in the cities
65+ generation will nearly double

Increasing challenges on resource management

Scarce Resources

Finite oil and gas reserves
Water shortages in large urban areas
Waste treatment & disposal challenges

Demand for clean energy

Climate Change

Programs focused on long-term reduction in CO2 emissions
Improve the quality of urban life

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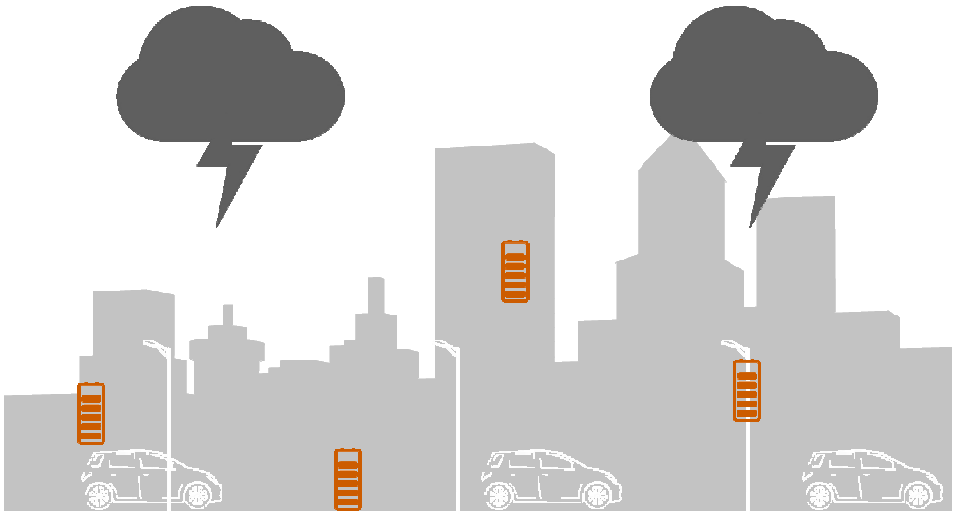
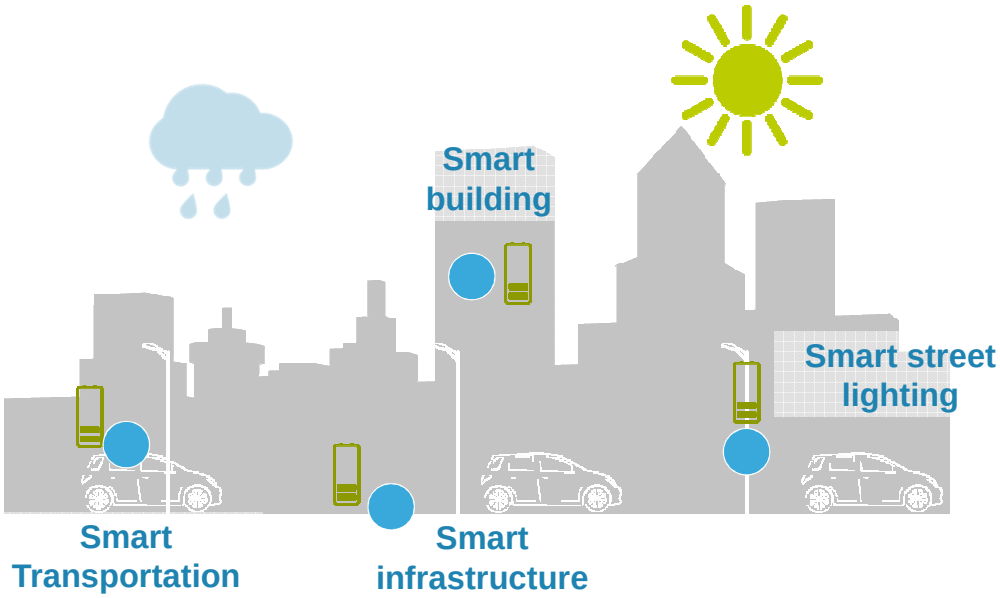
More Efficient, Greener Cities

Urbanization creates unhealthy city climates and contributes significantly to climate change



With SMART systems, we can **Do More With Less**



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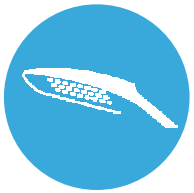
Smart Cities – Application Examples

The smart city is built on awareness and (some elements of) real-time control of all the critical city infrastructure

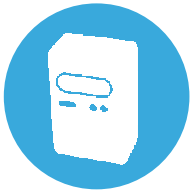
The citizens of the city and their "smart things" are key actors in enabling the smart city to *do more with less*



Smart Street Lighting

Smart Driving

Smart Parking



Smart Metering

Smart Garbage

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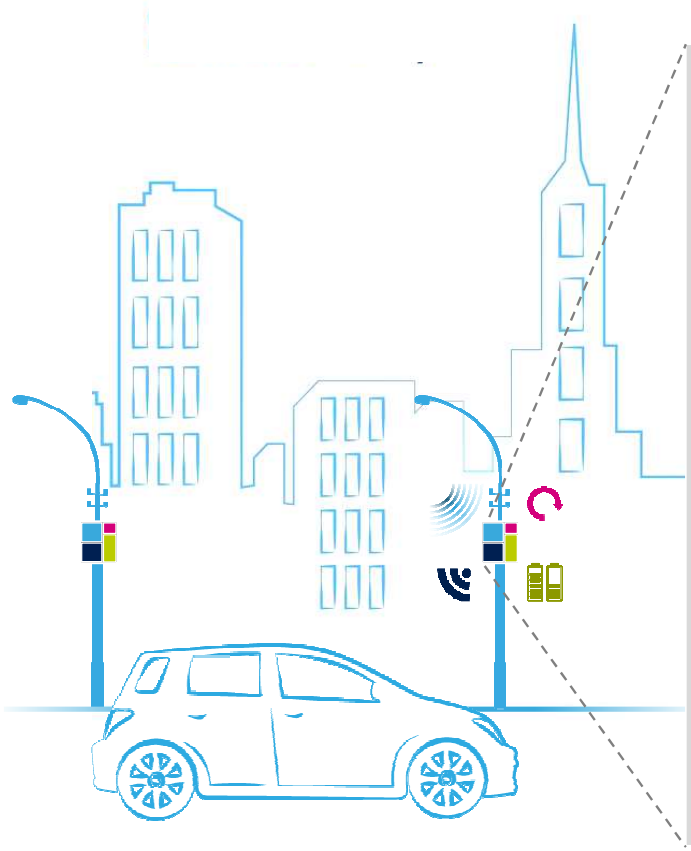
Smart Street Lighting



Smart Sensing

- Motion MEMS
- Acoustic MEMS
- Environmental sensors (Light, Temperature, Humidity, UV)

Processing

- STM32 32-bit MCU

Energy management

- Digital power management
- Energy harvesting ICs
- Power MOSFET

Connectivity

- Wi-Fi module
- STarGRID™ PLC
- Bluetooth module
- Sub-GHz SPIRIT1

Infrastructure evolution using **smart sensor nodes** enabling **new services** like traffic monitoring, weather station, improved security

Remote activation and dimming control for **energy saving**

Lamp / infrastructure **failure monitoring**

Connected monitoring station for **air quality**, **security** and **traffic**

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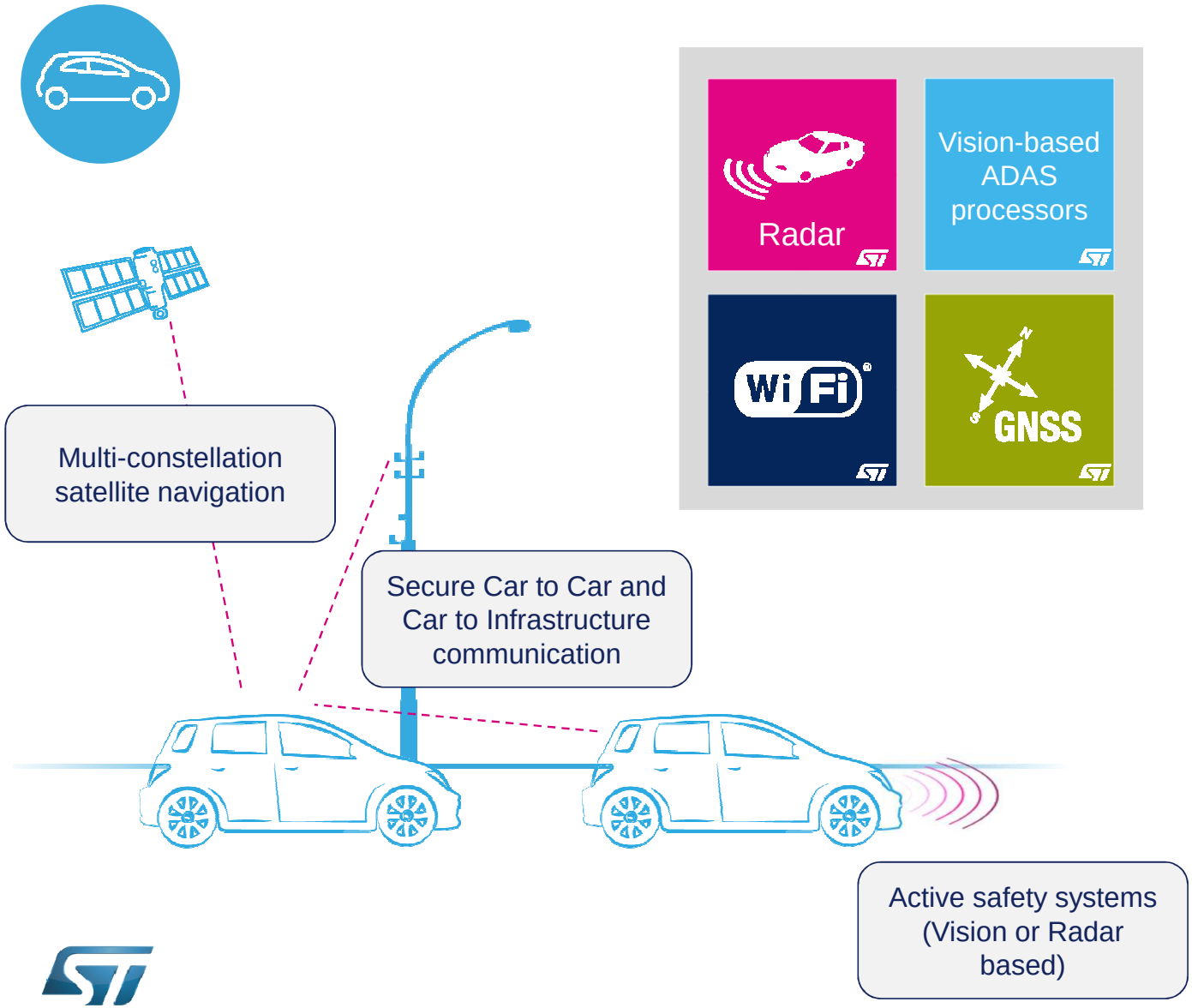
Smart Driving



Smart connected cars make for a safer, more efficient and greener journey

- Best routing to avoid traffic and minimize fuel consumption
- Active safety measures make driving safer
- Information for the city traffic controllers on a real-time basis

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Smart Parking

Smart Sensing
sensors

Processing
MCU

Connectivity
Wireless Connectivity

Energy management
Management & harvesting

Helping drivers to find a parking spot faster and enabling cities to manage their parking spaces more efficiently

Less time = less fuel = less emissions = cleaner environment

Reducing congestion

Car park owners get better control and pricing flexibility

Parking lot occupation detection sensor embedded in the road

Radar and camera assisted parking

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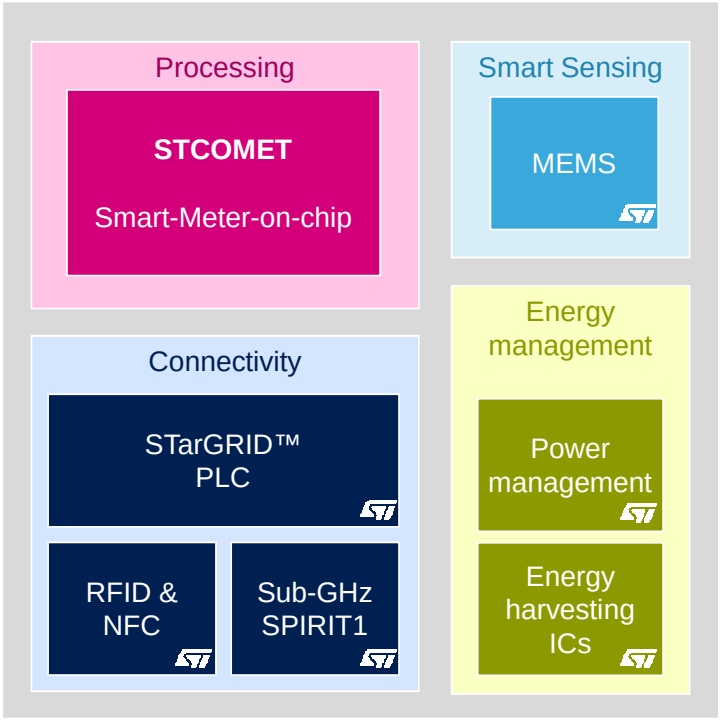
Smart Metering



Smart meters allow power generators to match consumption in a more efficient way and give users more control over their usage

Real-time **information** for consumers

Real time **consumption**, quality and outage info for providers

More **flexible tariff** schemes and billing

20+ years proven partnership with key Smart Grid players
Over 60 Millions PLC and metering SoCs installed

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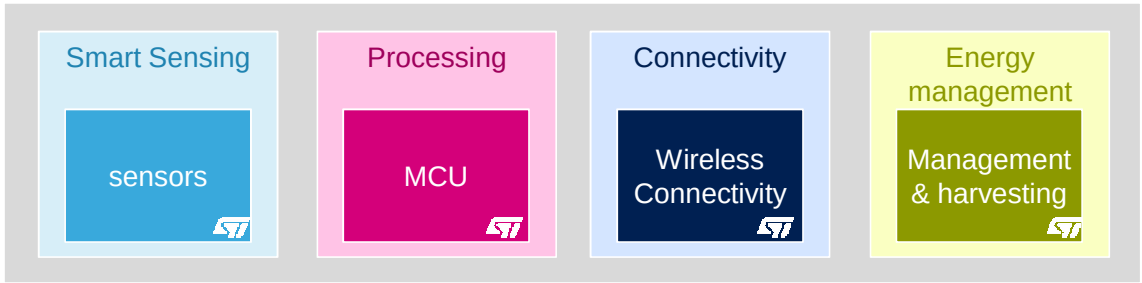
Smart Garbage Collection



Connected containers allow cities to more efficiently manage collection and provide better services

Only collect when necessary

Avoid overfilled containers leading to user frustration and dumping

Improved garbage fleet management

How to make the City Smart

Smart Things

Internet Connectivity

(Big) Data Processing Cloud Computing

Smart Energy

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What you need to make a Smart Thing

Software & Tools

Sensors & micro-actuators — Sense & Act

Ultra-low power microcontrollers & Security — Process

Ultra-low power connectivity — Connect

Analog and mixed signal components — Translate

Power and energy management — Power

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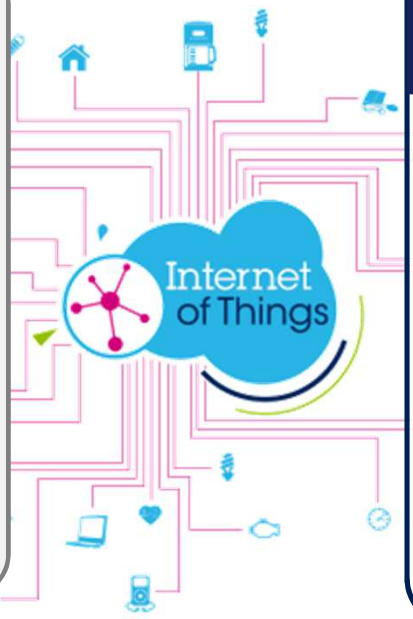
ST has All the Ingredients

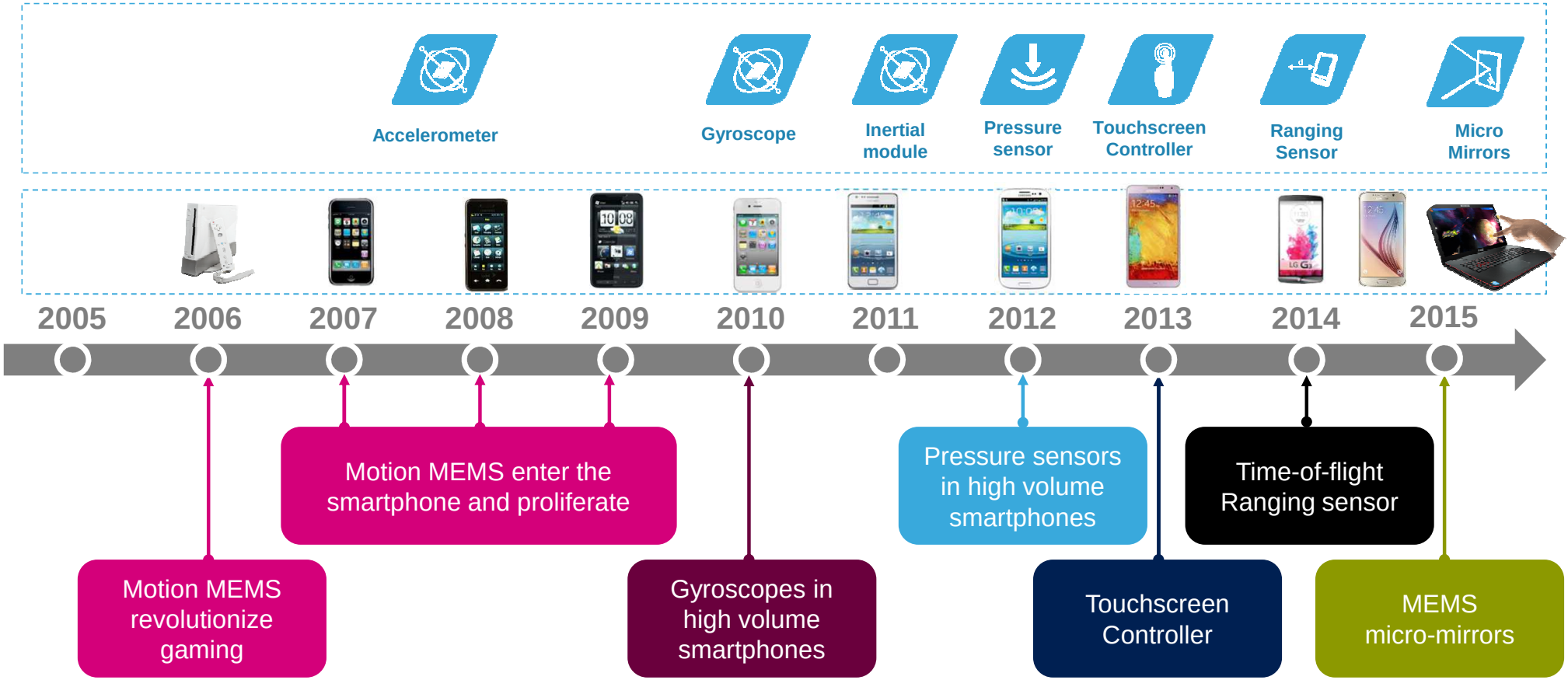
- Sensors & micro-actuators
- Ultra-low power microcontrollers & Security
- Ultra-low power connectivity
- Analog and mixed signal components
- Power and energy management



ST Enabling Smart Things for Smart Cities

- A unique portfolio with all the key technologies & products
- Understanding the **sensor-to-cloud value chain**
- Engaging with a **broad ecosystem**
- Expertise in **digital-security** technologies
- State-of-the-art **semiconductor technologies** and high-volume production capabilities

10 Years of MEMS and Sensors at ST



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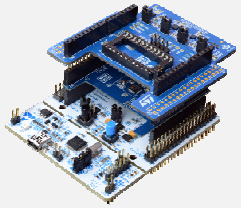
Providing Open Development Platforms

Platform ready solutions & Ecosystem

STM32 Open Development Environment



A **fast** and **affordable** way to **prototype** and **develop** innovative devices and applications with **state-of-the-art** ST components

ARM Cortex

ST is a **lead partner** with **ARM** in developing Cortex™-M core MCUs

ST simplifies and accelerates product development and reduces time-to-market

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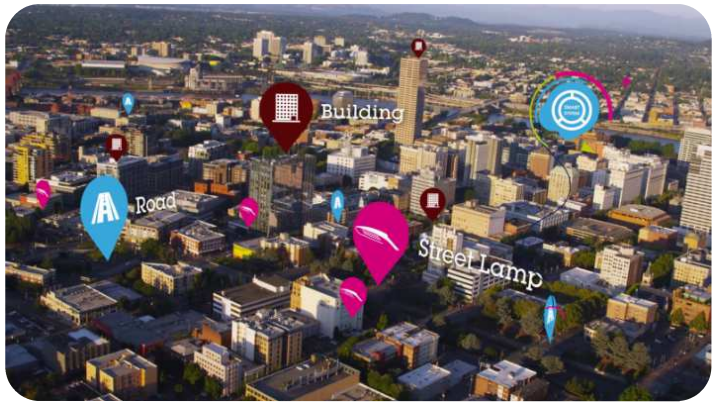
Takeaways



Smart cities will impact our quality of life for **Doing More with Less**

ST has a complete portfolio of technologies to enable many of the systems and applications that are at the heart of smart cities

ST is deploying innovative open development systems to make it easier and faster for creators of devices for smart cities to prototype and develop their ideas

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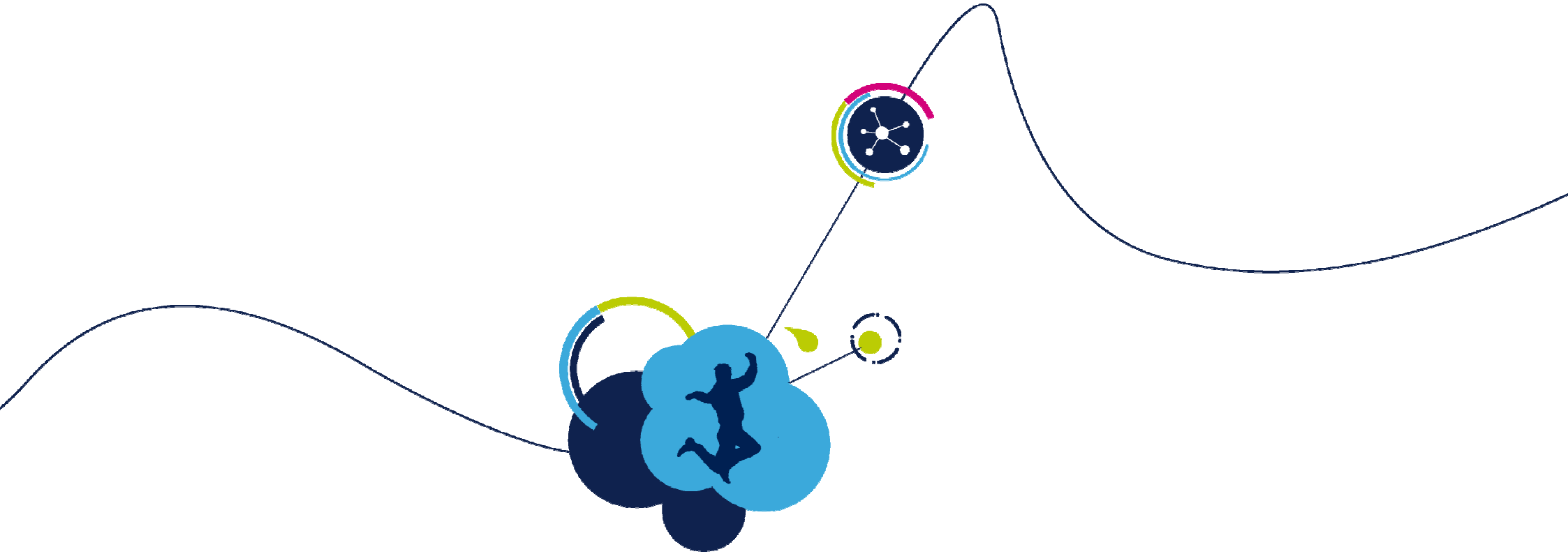

Thank You

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