ORDEM DOS ENGENHEIROS

SIEMENS
Ingenuity for life

A mudança do paradigma energético
Cidades inteligentes e eficientes

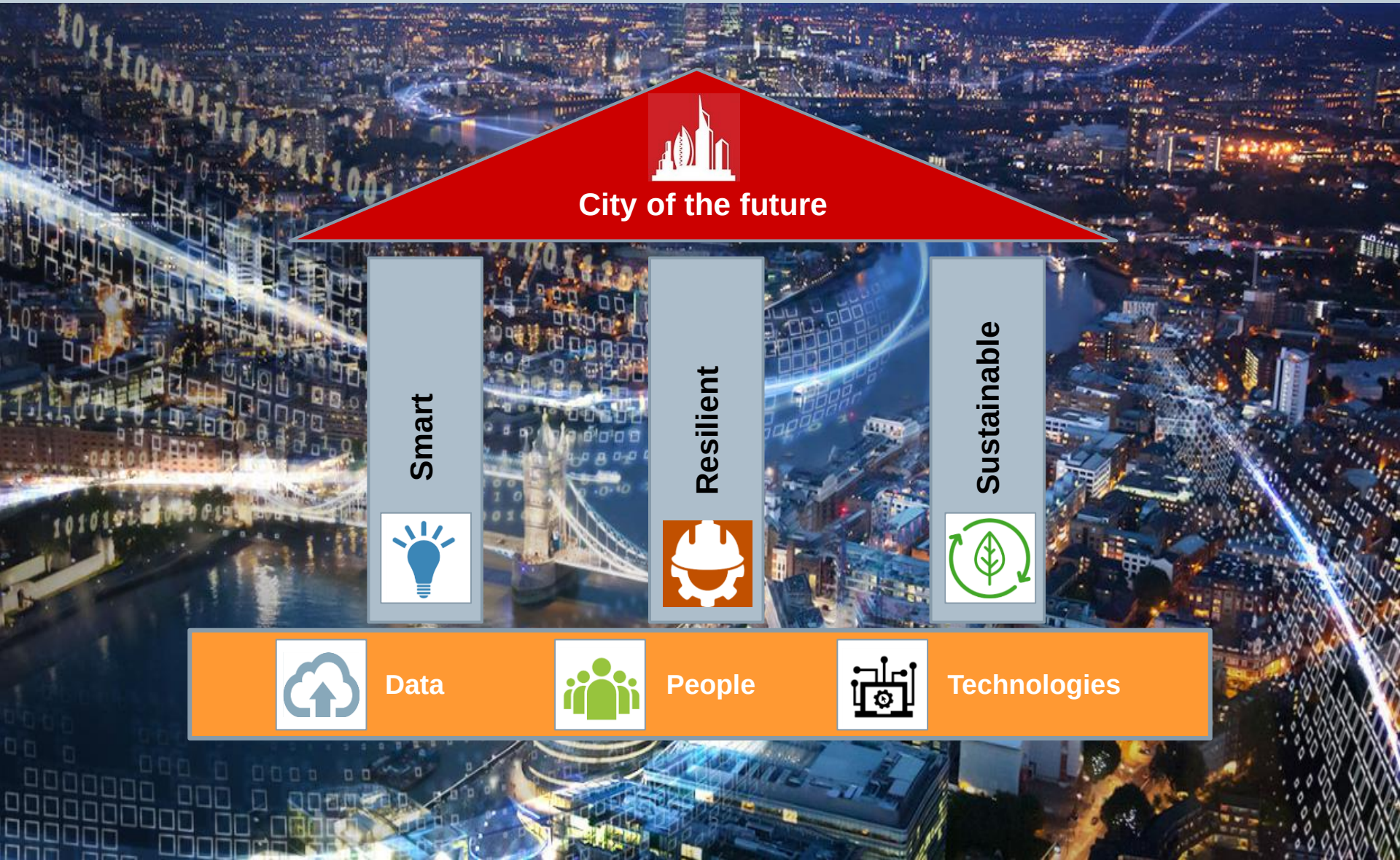
Ordem dos Engenheiros

Lisboa, 05 Junho 2018

Pedro Pires de Miranda | CEO Siemens Portugal

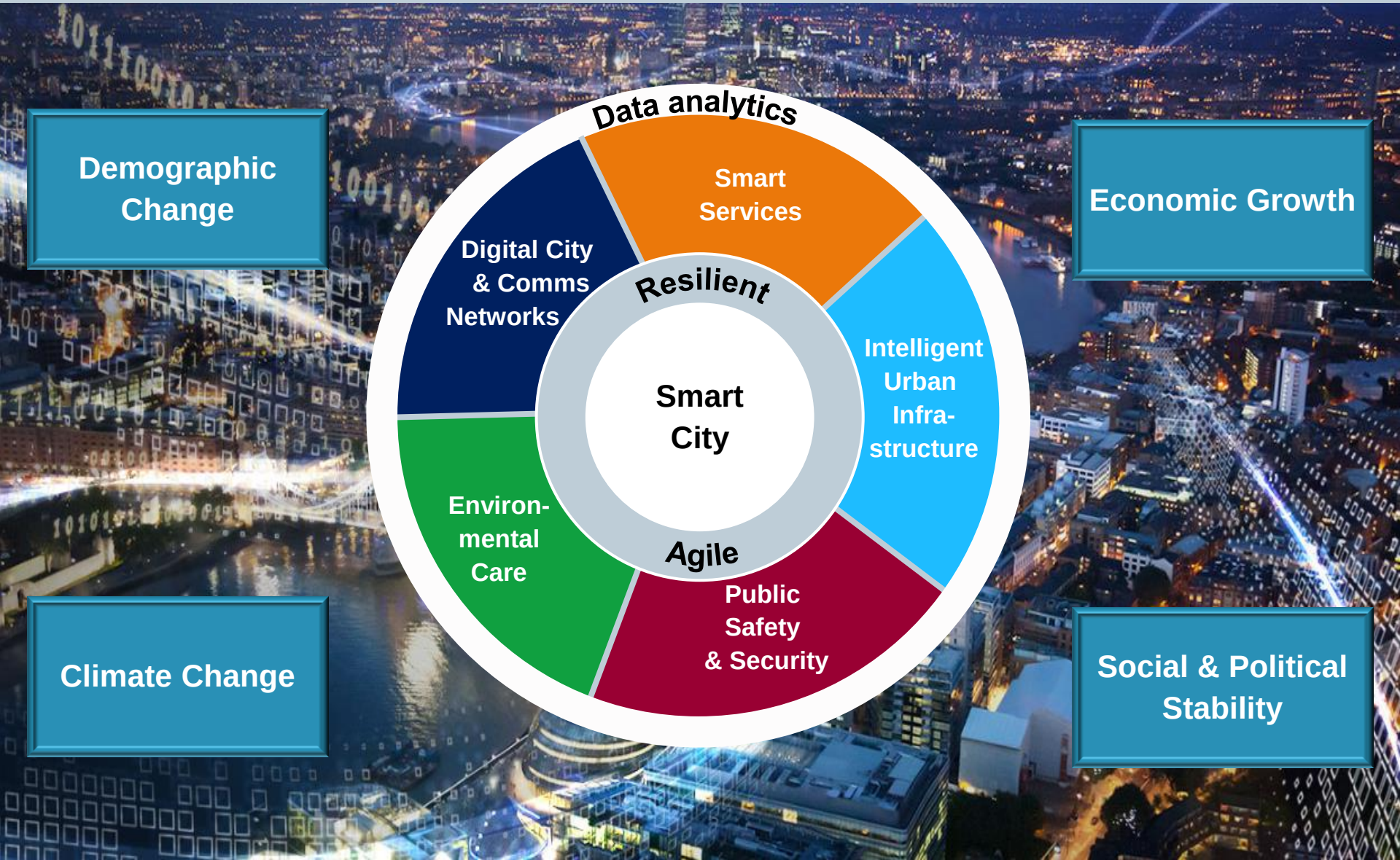
City of the Future
Smart, Resilient, Sustainable

SIEMENS
Ingenuity for life



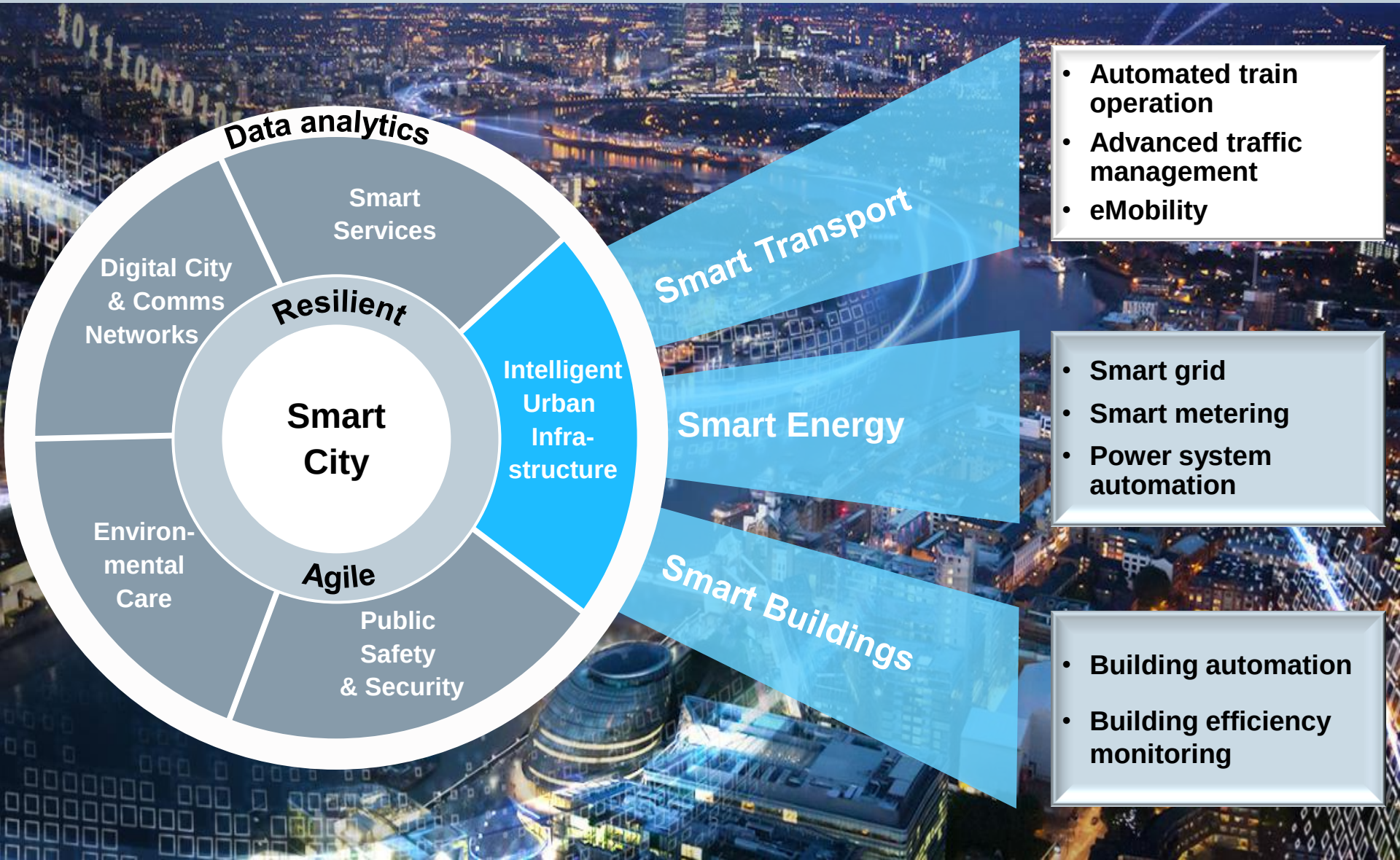
Smart City Framework

SIEMENS
Ingenuity for life



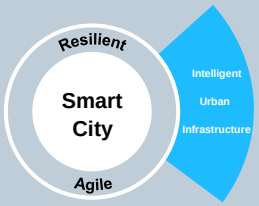
Smart City
Intelligent Urban Infrastructure

SIEMENS
Ingenuity for life



The Transportation Network

Levels of automation in the rail and automotive sectors



SIEMENS
Ingenuity for life

Partially automated
Supervised by driver

Highly automated
Limited driver action

Fully automated
No supervision by driver

Automatic Train Protection

Driver Advisory System

Automatic train operation

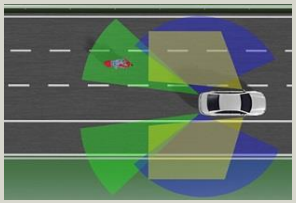
Driverless and unattended train operation

Product status	Series	Series Mass Transit – Development/Research Mainline

GoA0[1] GoA1 GoA2 GoA3 GoA4

Automation level/value proposition

SAE 0[2] SAE 1 SAE 2 SAE 3 SAE 4 SAE 5



Assistance systems

Advanced Driver Assistance System for Highways

Auto pilot

Challenge:
In case of failure, the system must be able to achieve a safe state at any time

Product status	Series	Development	Research	N/A

1 GoA Levels 0 – 4 = Grade of Automation according to International Electrotechnical Commission / Commission Électrotechnique Internationale, International Standard 62290-1

2 SAE Levels 0 – 5: Automation Levels defined by the Society of Automotive Engineers (SAE)

Three leading core components provide full control of traffic flow, safety and security aspects

Advanced Traffic Management Systems

- Advanced solutions
- Ready for integration of Sub-Systems via open interfaces
- Provides traffic information to the public
- Strategy Management to improve Traffic flow
- Complete services for installation and commissioning as well as operations and maintenance

Urban Traffic Control

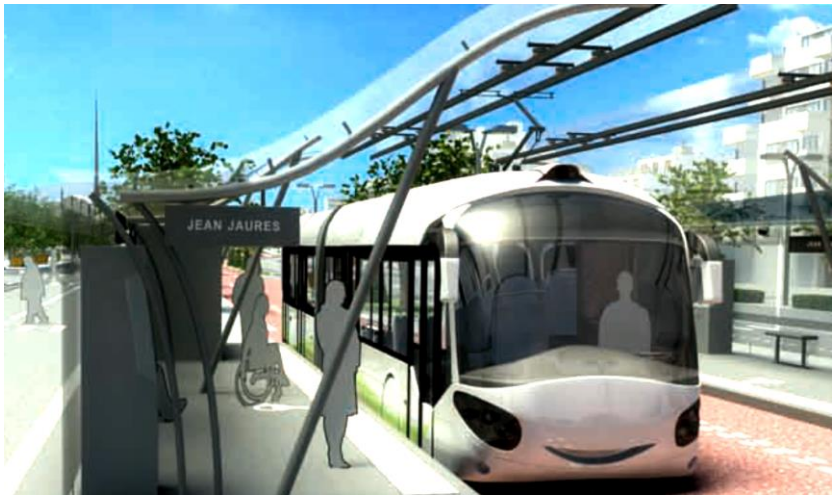
- Smart / advanced solutions
- Innovative solution for centralized monitoring and control
- State of the art technology platform
- Networking of independently arranged traffic management and control systems
- Archiving, analysis and statistics
- Fixed time, traffic actuated and adaptive control mode

Highway & Tunnel Control

- Integrated solutions for major roads and tunnel control
- Keeping highest security levels about fire detection, fire fighting, ventilation and flooding
- Schematic display over all installed sub-systems and outstations equipment
- Support of various standard interfaces

eBus/ eBRT

Electric equipment of buses for a better environment & cost reduction in service



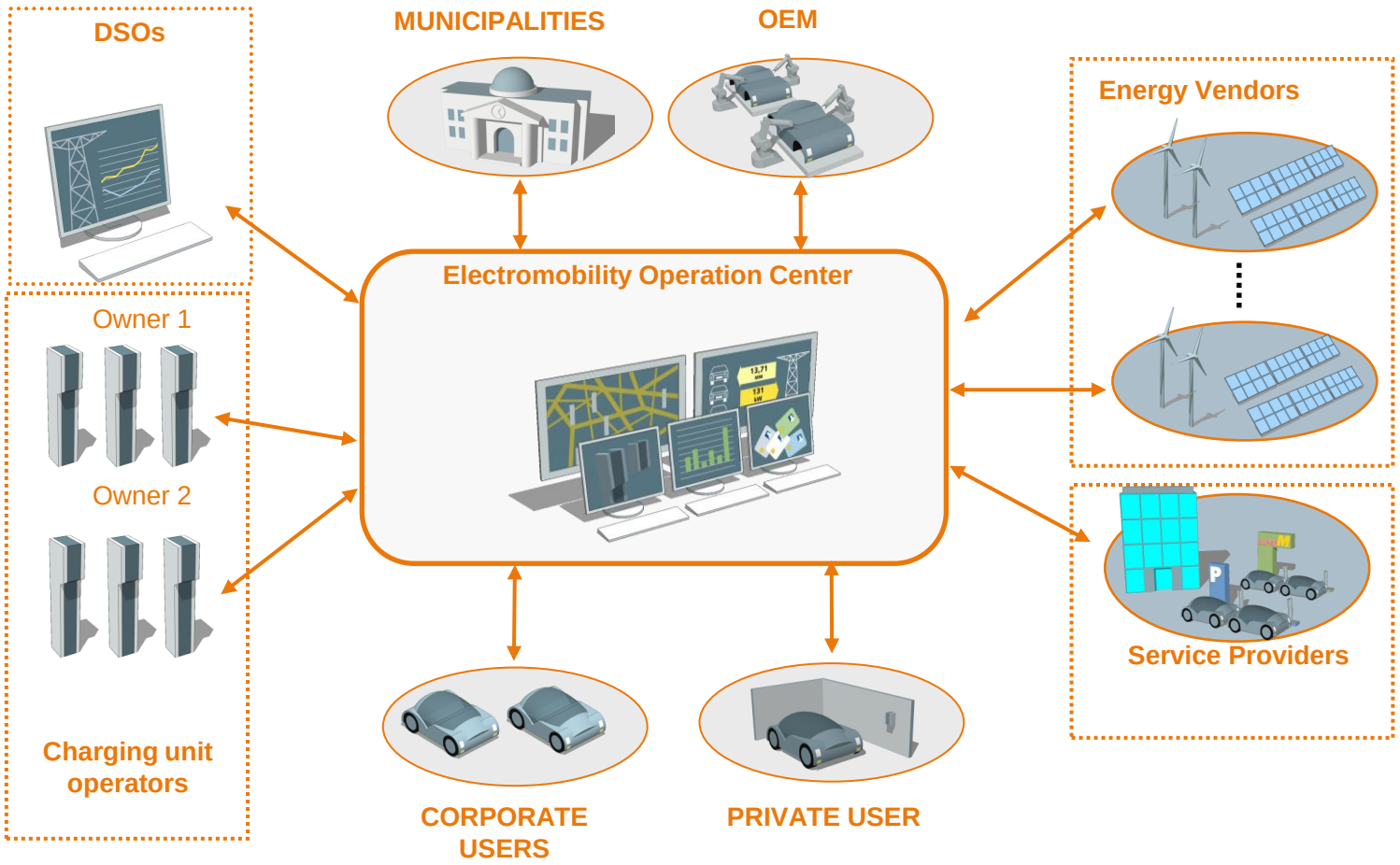
Fully electrically driven

- This system operates without overhead contact lines and integrates high-power storage units featuring intelligent charging, energy recovery and management technology.

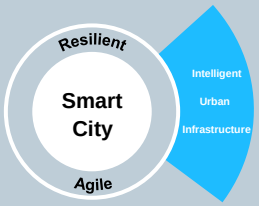
➔ eBus/ eBRT offer optimized ride comfort due to modern control systems with zero local emissions. Their energy utilization is about twice as high as that of thermal or hybrid solutions.

➔ Since there are neither overhead catenaries lines nor track beds the alignment can be modified easily. Cities have full flexibility to adjust the alignment to the current transportation needs.

eCar Operation Centers



Integrated Street Lighting and Traffic Solutions pave the way for Smart Cities



SIEMENS
Ingenuity for life

Isolated Infrastructures

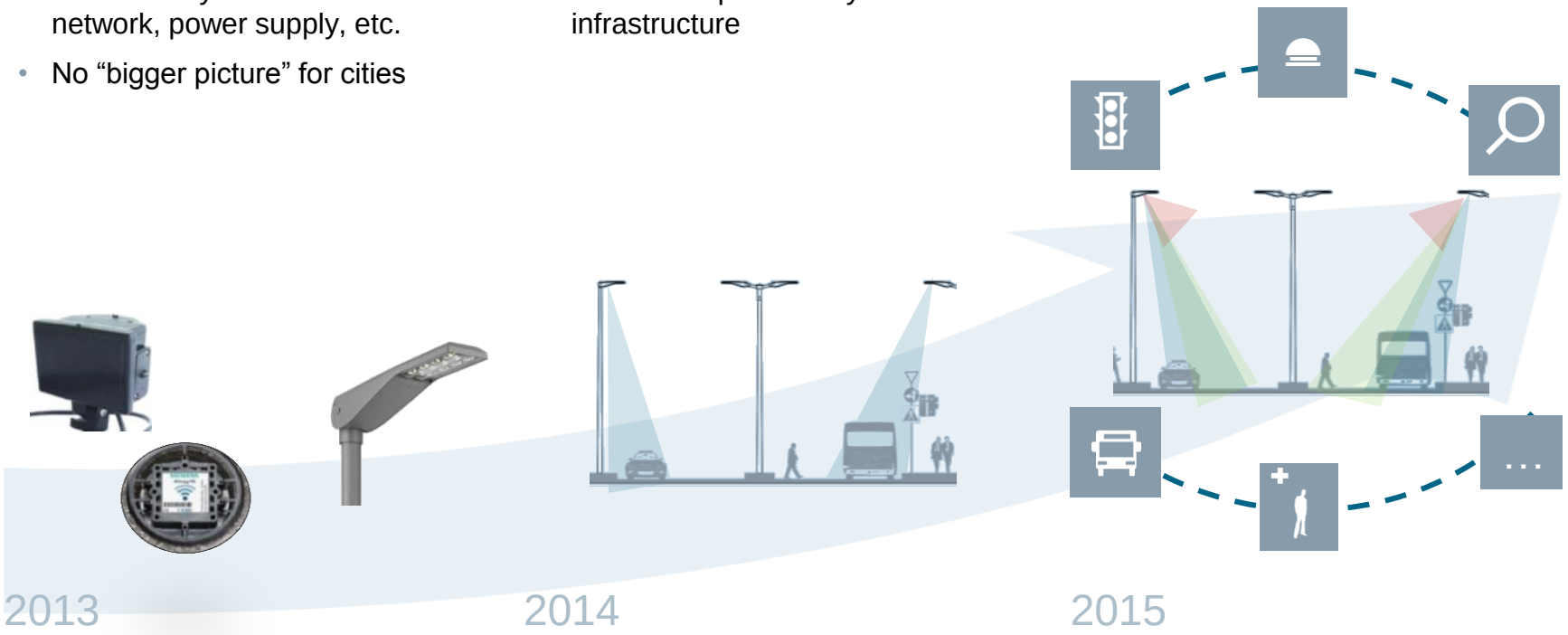
- Separate infrastructures for lighting and traffic verticals
- Redundancy of communication network, power supply, etc.
- No “bigger picture” for cities

Integrated Lighting and Traffic Solution

- Integration of parking sensors in street lighting
- Use of complementary infrastructure

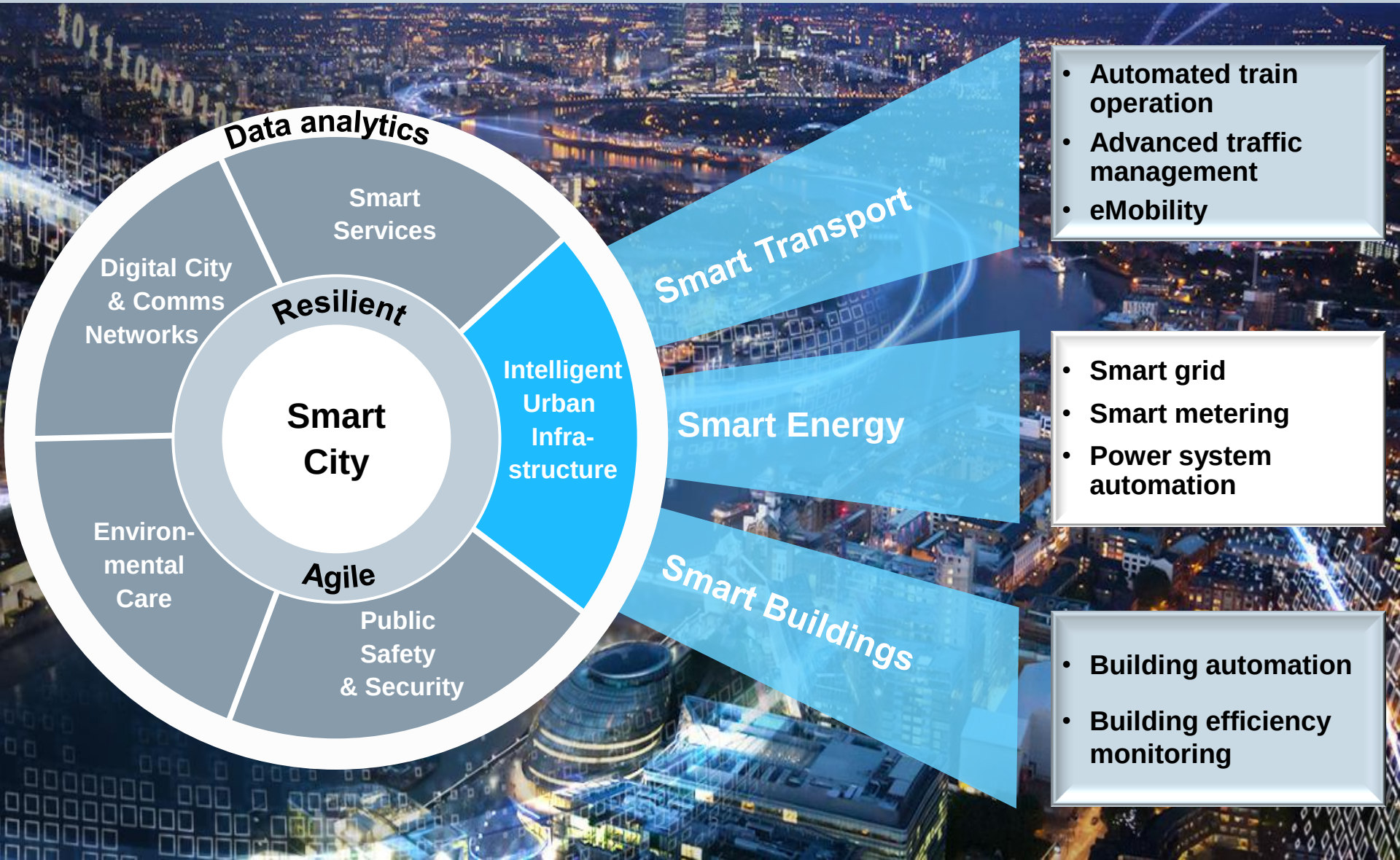
Sensor Network for Smart Cities

- Lighting pole as integration point of a multi-purpose sensor network

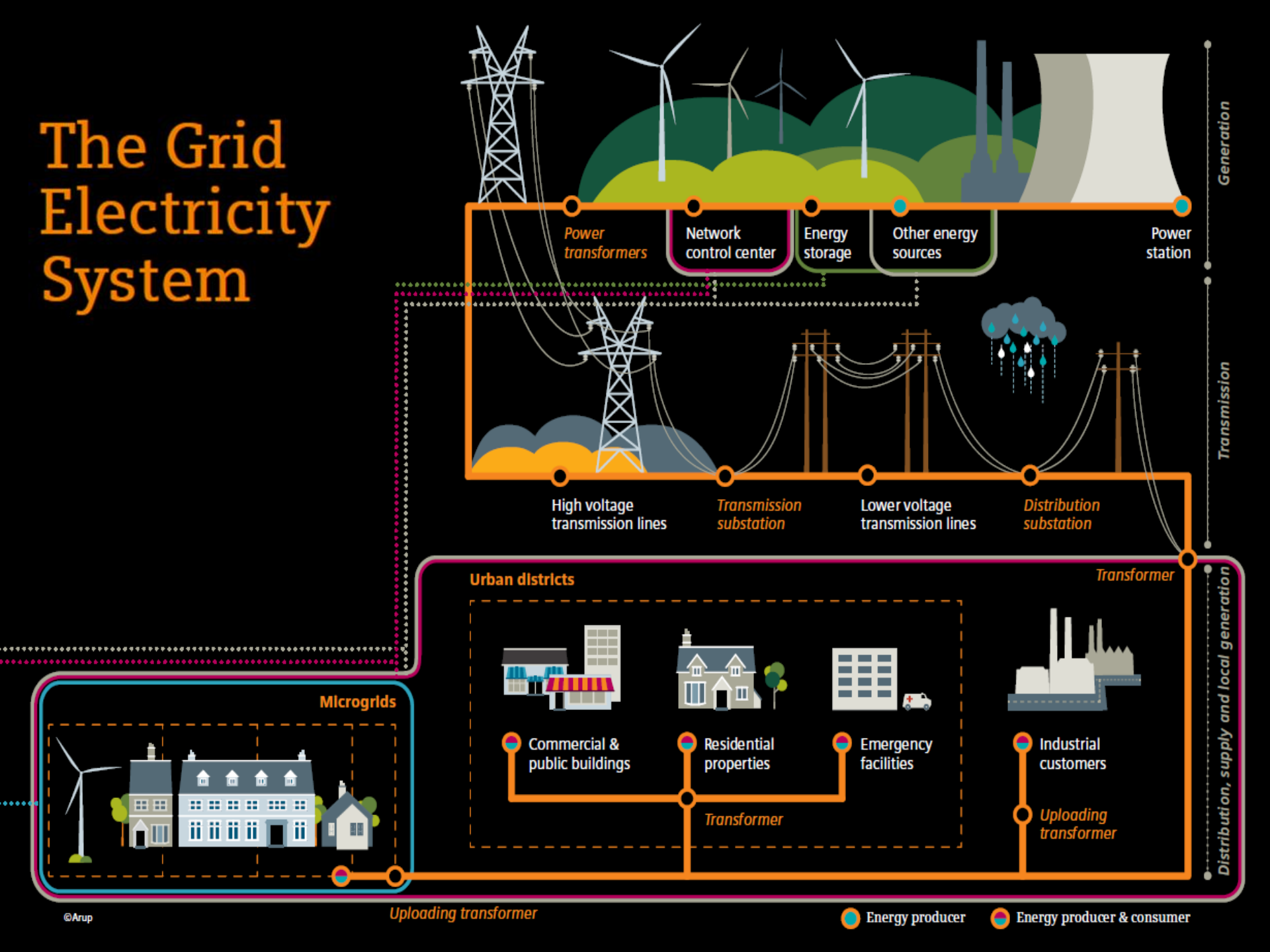


Smart City
Intelligent Urban Infrastructure

SIEMENS
Ingenuity for life

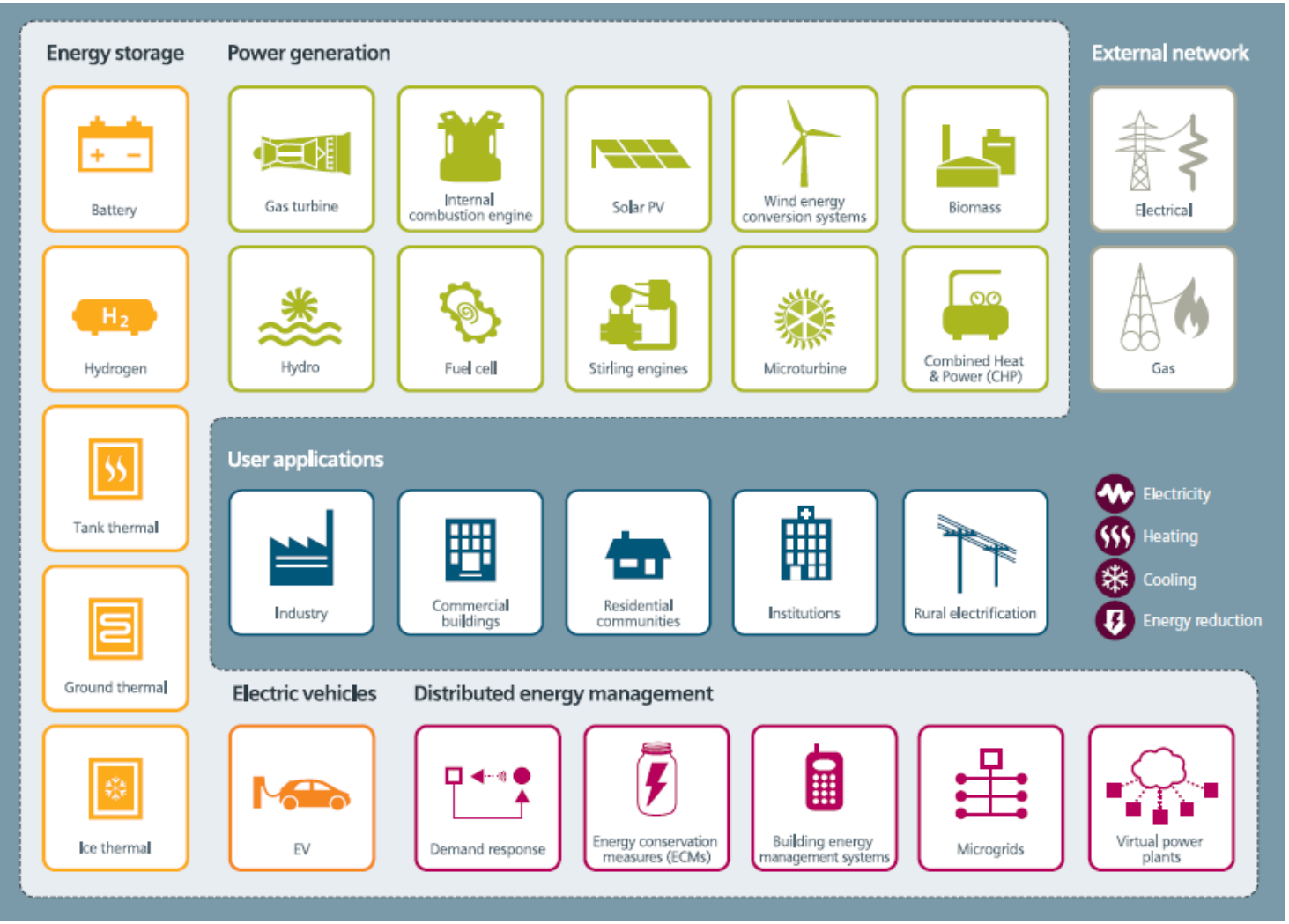


The Grid Electricity System



Distributed Energy Systems (DES)

Diverse array of generation, storage and energy monitoring and control solutions



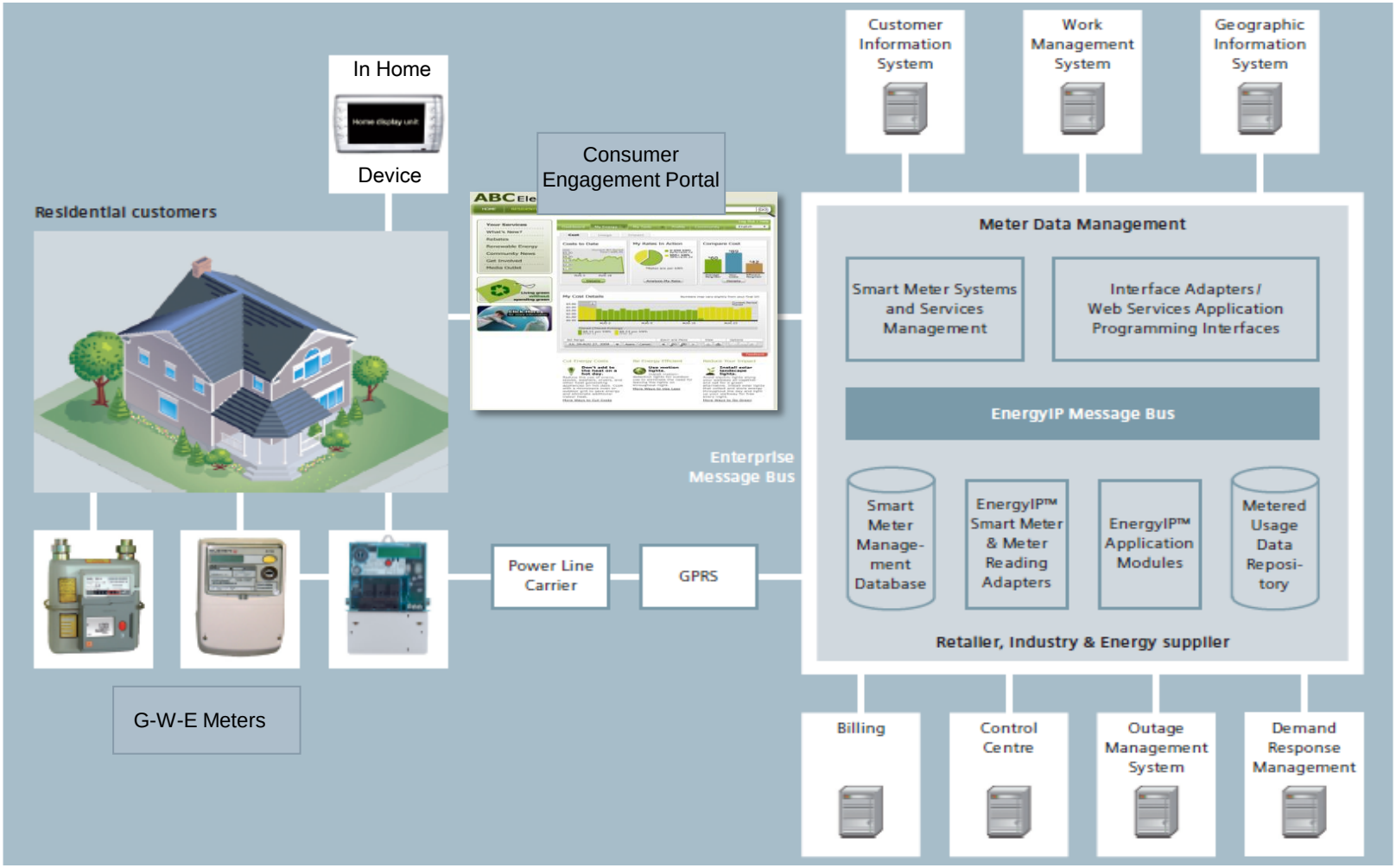
DES can be tailored to very specific requirements and users' applications including cost reductions, energy efficiency, security of supply and carbon reduction.

DES categories

- Power generation
- Combined heat and power (CHP)
- Energy storage
- Distributed energy management systems

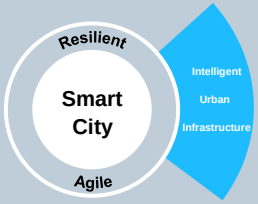
DES covers energy in the forms of electricity, heating and cooling.

Smart Metering
Advanced Metering Infrastructure Architecture



Energy IP Applications

Transforms your data into actionable information and gets it to people who need it most throughout your utility



SIEMENS
Ingenuity for life

Grid control, efficiency and energy saving

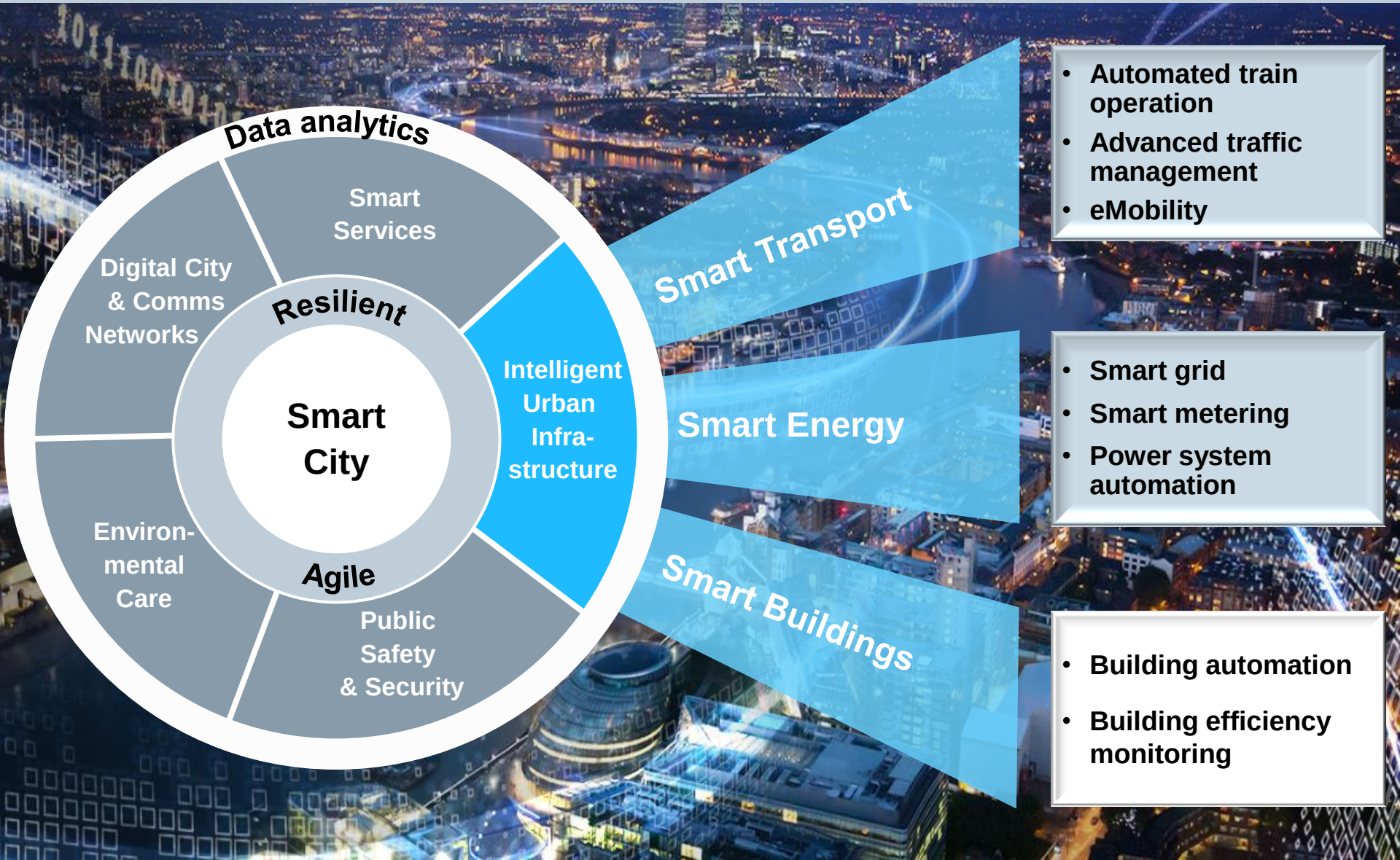
- eMeter applications are the fastest path to turn your meter data into usable information for your business units and customers.

➔ Quickly turn your AMI data into actionable information that can be leveraged across your utility. Get easy access to near real-time, information and see faster ROI on your investments.

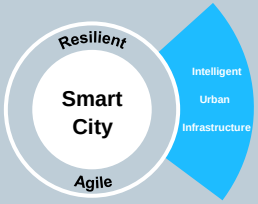
➔ The Energy Engage Customer Portal fosters utility-customer collaboration to help save energy and resources. You can custom-tailored programs to drive customer satisfaction, improve communications, encourage conservation and reduce peak demand.

Smart City
Intelligent Urban Infrastructure

SIEMENS
Ingenuity for life



With Smart Buildings in Smart Grids towards Smart Cities

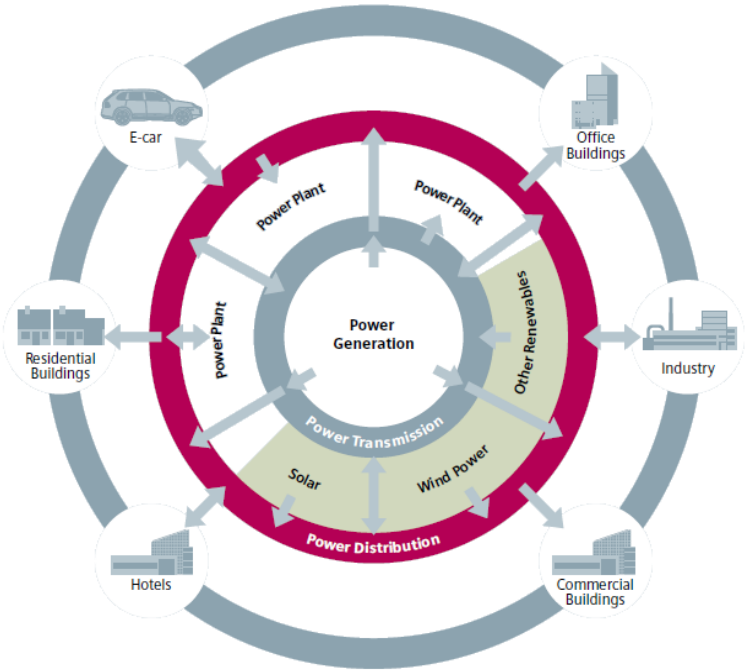


SIEMENS
Ingenuity for life

Smart Building

Smart Buildings communicate and integrate with the Smart Grid

Smart Grid

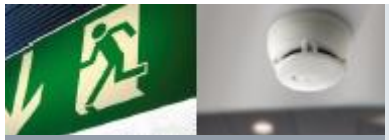


Smart Cities

Together with the Smart Grid, Smart Buildings form the basis for a Smart City

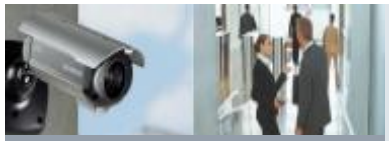
Energy efficient and safe buildings

Life Cycle Management



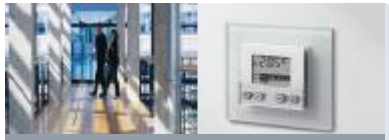
Fire safety

- Fire, smoke and gas detection
- Evacuation
- Extinguishing
- Danger management



Security

- Access control
- Video surveillance
- Intrusion detection



Comfort

- Building automation and management
- Heating, ventilation, air conditioning
- Lighting and shading

Energy efficiency

- Energy Saving Performance Contracting
- Energy management
- Energy consulting

For energy-efficient and safe buildings and infrastructures


ORDEM
DOS
ENGENHEIROS
SIEMENS
Ingenuity for life
Obrigado
Pedro Pires de Miranda | CEO Siemens Portugal