Green ICT services in cities.

Regulation vs Implementation of
Voluntary Standards

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Telefonica

The best profile to approach the future

Customers	*312* millon customers
Services	*Integrated ICT services for customers*
Countries	Presence in *26 countries*
Employees	Around *285.000* professionals
CO2 & Energy	Energy: *4,2 TWh€* *1,8 mT CO2 e*

Notes:
- Central America includes Guatemala, Panama, El Salvador, Nicaragua and Costa Rica
- Total accesses figure includes Narrowband Internet accesses of Terra Brazil and Terra Colombia, and Broadband Internet accesses of Terra Brazil, Telefónica de Argentina, Terra Guatemala and Terra Mexico

Content

Telefónica

01

Why resource efficiency is key for sustainable urban development?

The evolution of cities

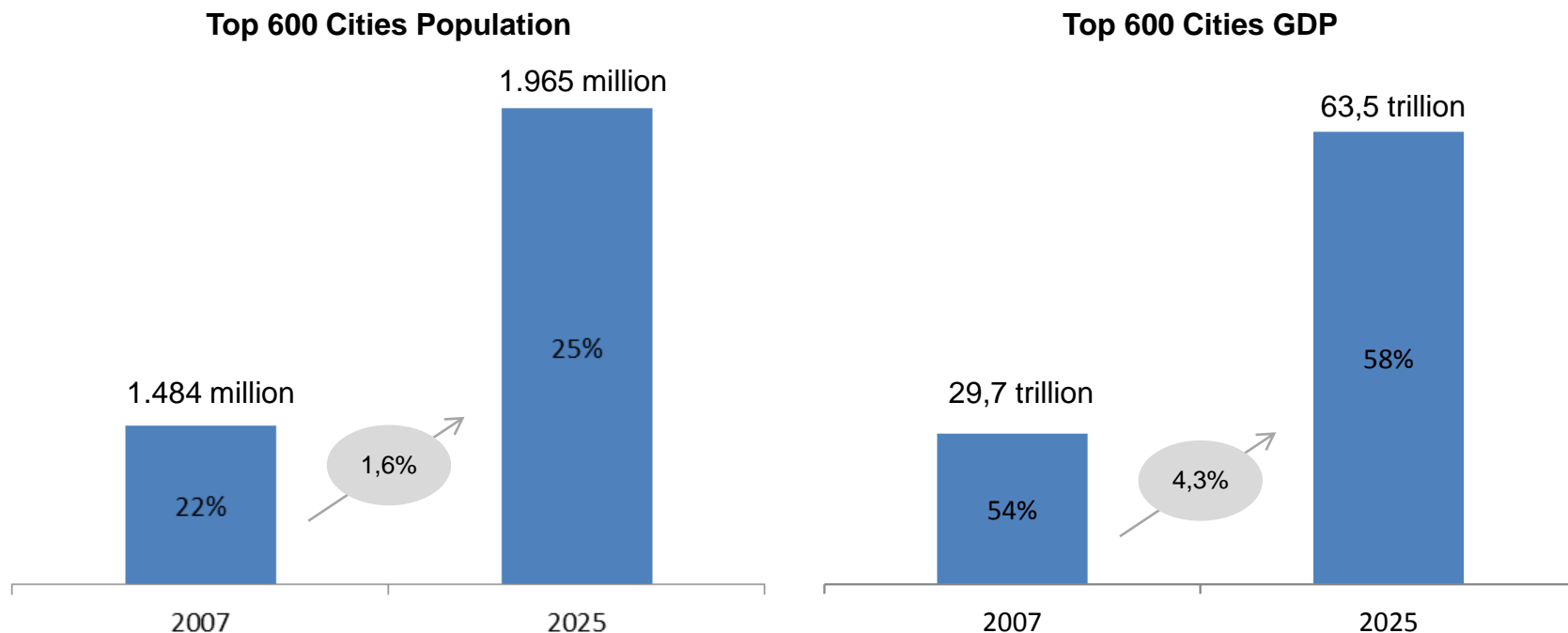| Population	Energy	CO2 & Environment	Connectivity	Mobility
In 2050 70% of the population will live in cities. Today more than 50%	Cities consume high amounts of energy. About 75%	80% of emissions of greenhouse gases are generated in cities	In 2020, expect more than 50 billion connected devices.	The transportation Sector is expected to grow more than any other in 2020

Source: International Energy Agency,

… and wealth distribution is going to be more polarized: 25% of the population in top 600 cities will account for 58% of global GDP, 75% in today's developing economies

Top 600 Cities Population

1.965 million

25%

1.484 million

22%

1,6%

2007   2025

Top 600 Cities GDP

63,5 trillion

58%

29,7 trillion

54%

4,3%

2007   2025

Furthermore, economic growth will be mainly driven by cities…

- 2,000 metropolitan areas are expected to contribute 75% of global GDP growth from 2007 to 2025
- Top 600 Cities are expected to contribute 62% of global GDP growth from 2007 to 2.025

… and by developing countries: in 2,025 almost 75% of top 600 cities will be there

Source: McKinsey Global Institute (MGI), United Nations World Urbanization Prospects
Top 600 World Cities: top 600 cities of the world by GDP, as definced by MGI

In this context it´s necessary to transform of local government model

Sustainability

Efficiency

Service improvement

Yes, we need Smart Cities! To built resource efficient cities
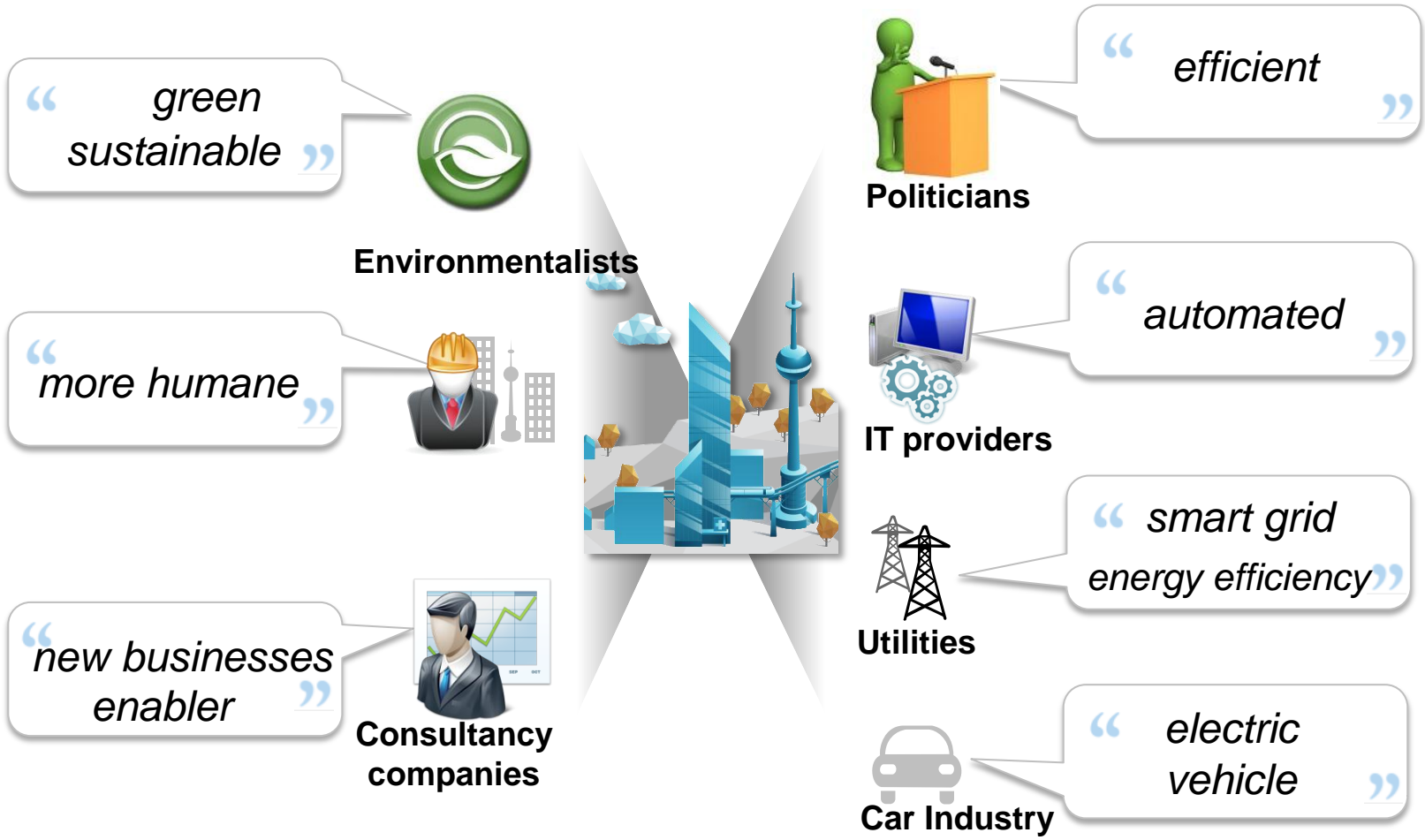
02

Telefonica´s vision and value
of Smartcities

The Smart City is an undefined heterogeneous concept

green sustainable

Environmentalists

more humane

new businesses enabler

Consultancy companies

efficient

Politicians

automated

IT providers

smart grid energy efficiency

Utilities

electric vehicle

Car Industry

Telefónica has identified that cities have different interests

Waste Management

i.e. Sau Pablo

Tourism & cultural engagement

i.e. Madrid

Traffic & mobility Management)

i.e. Barcelona

Cities interests

Business & commerce

i.e. Berlin

Urban planning

i.e. Brasilia or Santiago de Chile

Safety

i.e México City, Rio de Janeiro

Sources: Business units in Telefónica`s Operating Business

For Telefonica, the Smart City is the intensive use of ICTs to optimize current urban services and enable new businesses

City Management

Urban Services

City businesses

Citizens

Technology

It'll be critical to base any Smart City proposition on a sounded value opportunity

Value levers

Telefonica Smart City
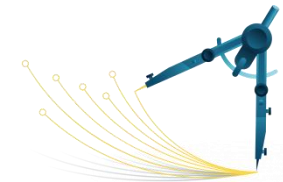
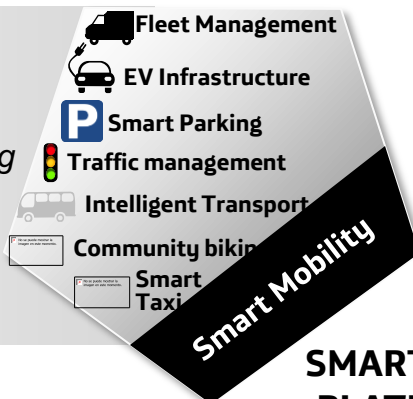| I | Cost reduction & efficiency |
II	Increase Income
III	Governance & city planning
VI	Sustainability and quality of life

03
Green ICT services in cities

Telefónica has an integrated smart city model…

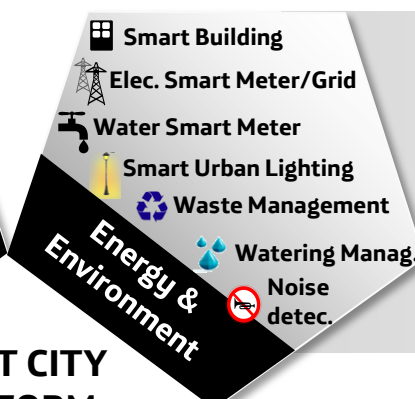## Smart Mobility

Services focused on decreasing city traffic density and citizen driving times, and optimizing public services routes.

Smart Mobility
- Fleet Management
- EV Infrastructure
- Smart Parking
- Traffic management
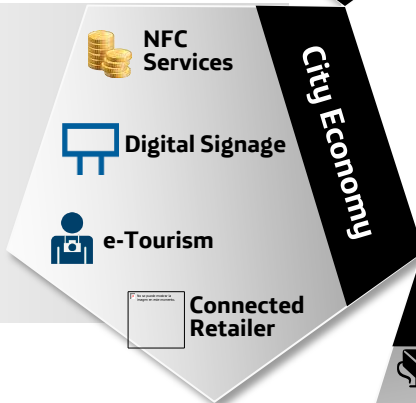- Intelligent Transport
- Community biking
- Smart Taxi

Energy & Environment

Services to reduce energy consumption (electricity, oil and gas, water, etc.), to better manage waste or to improve environment indicators.

Energy & Environment
- Smart Building
- Elec. Smart Meter/Grid
- Water Smart Meter
- Smart Urban Lighting
- Waste Management
- Watering Manag.
- Noise detec.

SMART CITY PLATFORM

Data Collection & Analysis

M2M Transactions

City Economy

Services focused on modernizing how city businesses are performing and enabling city growth

City Economy
- NFC Services
- Digital Signage
- e-Tourism
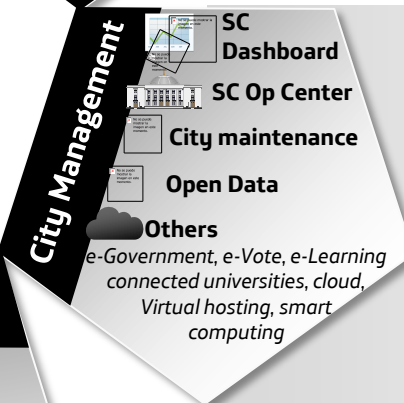- Connected Retailer

City Management

Services focused on modernizing public administration through IT and mobile solutions to better allocate city resources, prioritize investments thanks to an integrated view of the city.

City Management
- SC Dashboard
- SC Op Center
- City maintenance
- Open Data
- Others
  e-Government, e-Vote, e-Learning connected universities, cloud, Virtual hosting, smart computing

Security & e-Health
- Video surveillance
- Tele-Health & Tele.Care
- Hospital Capacity Tracking
- Emergency Management
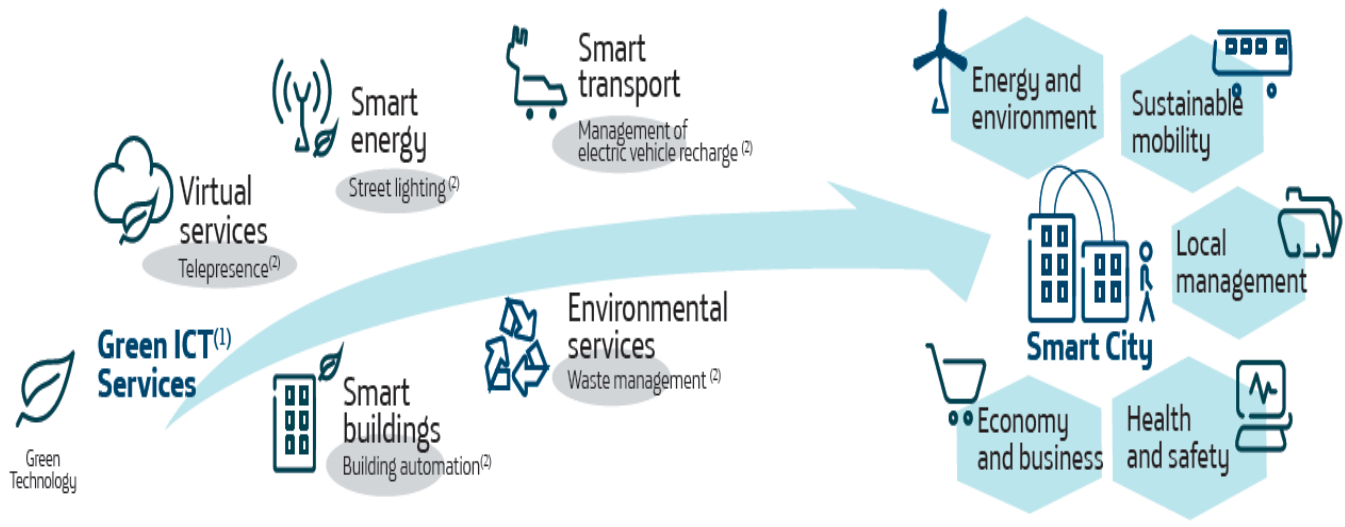- Fire Detection

Security & e-Health

Services focused either on crime prevention and prosecution and health care system quality and efficiency.

Energy & environment comprises services whose main motivation is to reduce resource consumption (electricity, oil and gas, water, etc.), to better manage waste or to improve environment indicators

Green ICT services are part of the model

Energy & environment

- Smart building
- Smart meter elec / grid
- Smart Meter Water
- Smart urban lighting
- Waste Management
- Watering management
- Noise detection

[1] ICT: Information and Communication Technologies [2] Green ICT Services in the market.

Green Smart Cities are meant to improve sustainability and quality of life

Reduce carbon emission with a better traffic management that reduces on-road time, congestions by optimising routes and with tips to improve driving skills.

Reduce carbon emissions

Optimise the use of limited resources (water, electricity) thanks to a better insight on the consumption, remote control and automated solutions
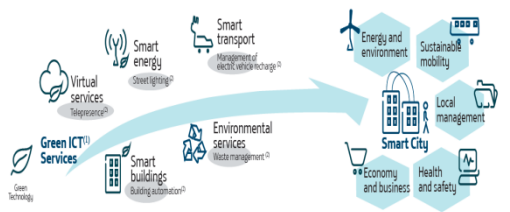
Efficient use of limited resources

SUSTAINABILITY AND QUALITY OF

Improve environment indicators

Reduce noise levels and improve air quality thanks to a smart traffic systems that reduce congestions,

Green Credentials

Green Technology

Provide city councils with a green speech based on sustainability measures already implemented as part of their marketing strategy

Optimisation of the use of time

Reduce the time spent in roads thanks to smart traffic systems and smart parking solutions.

04

Challenges for greener & smarter cities

Different types of challenges…

- Need for accelerating **innovation**
- Demand of a Green ICT **solutions portfolio**
- **Leveraging** the **interest of customers**
- Demonstrate that **Green ICT solutions** are good business

Market Challenges

- Increase the **sustainability and profitability of the business.**
- **Standards to incentivize** competition
- Establish a **more simple and balanced distribution**

Regulatory Challenges

- Technology is there, what is required are business models.
- Need of **standards to assess benefits.**

Technology   **Standards**

Regulation vs voluntary commitments…

Models with grants and economic support

Green Cities

Models that facilitate the externalization of city services.

Models with business cases based on resources savings (energy, water, and $$)

Green citizens