



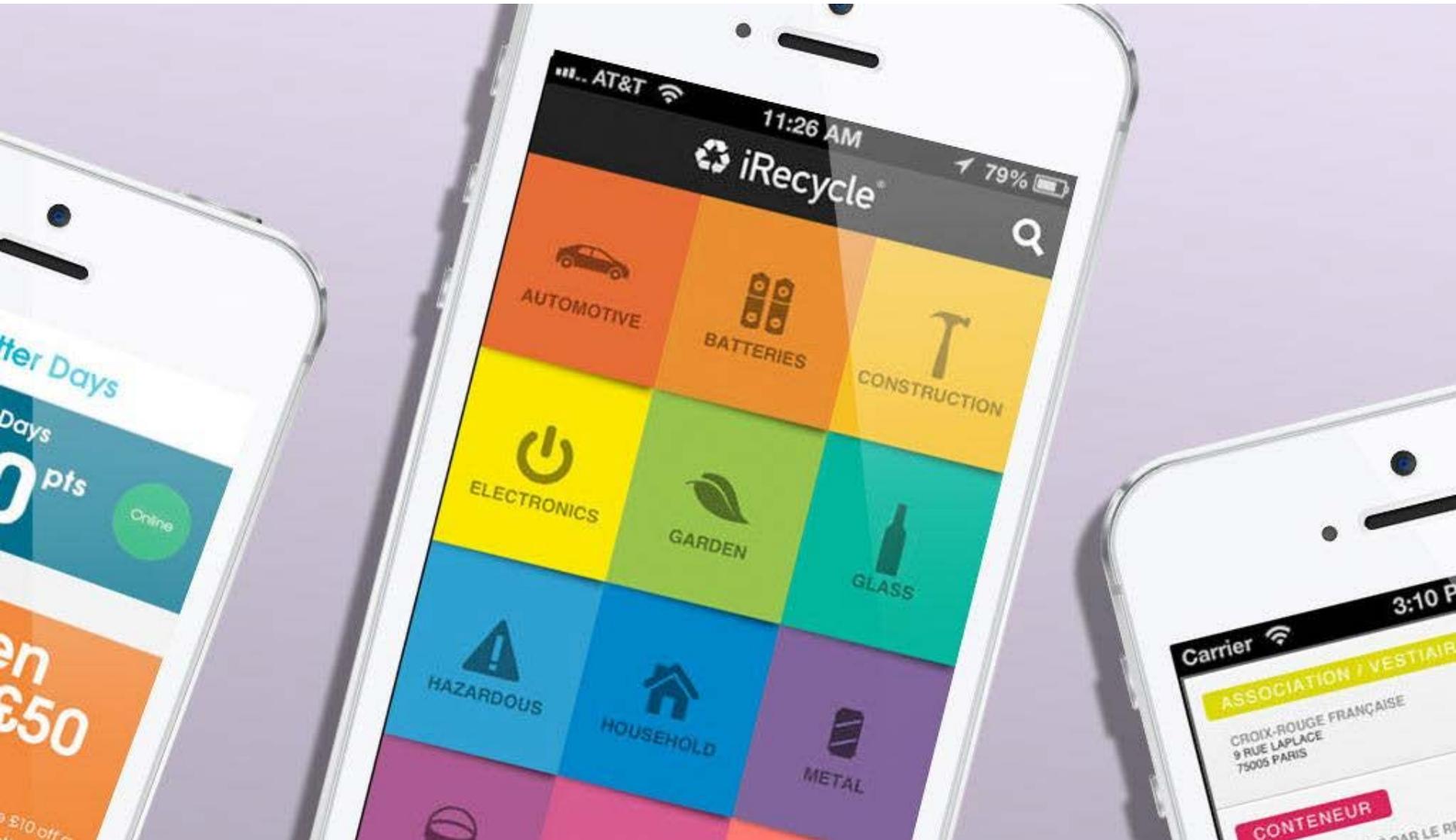
Optimizing urban services through digital innovation

PECC, Taipei, March 2018

Towards a new urban civilization

- **The digital revolution is changing everything:**
 - *infrastructure is changing;*
 - *the relations between local authorities and citizens are changing;*
 - *services are changing;*
 - *the city is changing.*
- **More than a revolution,
“digital technology is a civilization” *.**

Part I – Digital technology is reshaping the ties between cities and business

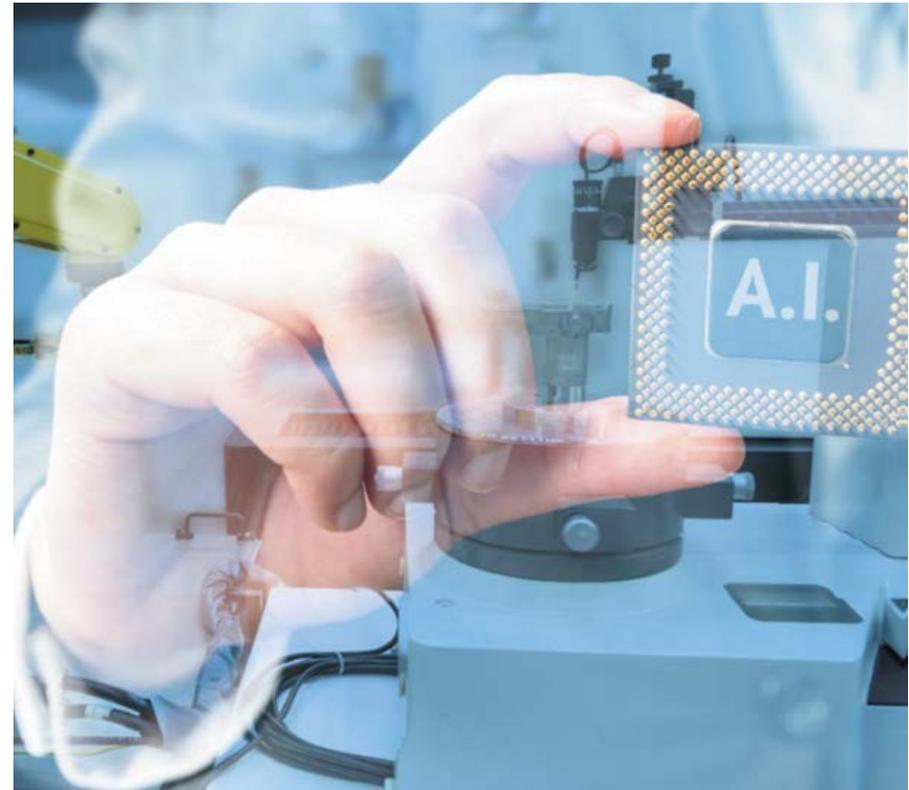


The digital revolution is exploding the universe of the possible (1)

- **Combining their respective power, connectivity and big data are opening up unprecedented prospects by boosting the capacity of cities, their local businesses and people to take action.**
- **The digital shift is opening the way to more efficient, more fluid and more cost-effective operation of local services:**
 - *improved efficiency is derived from the many sensors packed into infrastructure and equipment that make it possible to optimize real-time operation*
 - *instant detection of a leak in a public pipe or the immediate adjustment of heating in a municipal building result in annual savings of thousands of euros.*
- **The digital revolution is leading to the creation of high-value-added interactive services that make life easier for businesses, employees, residents and tourists, and raise a city's prosperity and profile.**
 - *These new services are very rational: more practical, faster, more personalized and less costly.*
 - *Digital systems can now give meaning and value to data that had neither, thereby making it possible to develop a multitude of new and previously unimaginable services. As a result, the ties between local government, business and people have become the focal point for the creation of shared wealth.*

The digital revolution is exploding the universe of the possible (2)

- **Cities that have embraced digital technology are catalysts for new companies and attract a greater level of investment.**
- **For companies operating in such cities, digital technology facilitates their relationship with customers, makes them more cost-competitive, provides them with access to a greater pool of human resources...**
- **By reducing the cost of communicating with their surrounding environment, the digital revolution is redefining the respective boundaries of public authorities and businesses, and fostering new creative collaborative connections.**



Cities of emerging countries versus cities of developed countries

- **In emerging countries:**

- *The Internet has made it possible to professionalize and build on informal practices, to make up for the failings of public operators.*
- *Over the years, they have been put to use to improve transportation in congested cities, public health by monitoring atmospheric pollution, resilience to natural catastrophes...*
- *Still, digital technology will never be able to overcome a lack of basic infrastructure. No digital technology will be able to make a drinking water, wastewater or electricity network operate more efficiently where there is none.*



- **In developed countries:**

- *The digital revolution is paving the way to the creation of bouquets of interactive services that make life easier and lift a city's prosperity and image.*
- *Based on high value added, there can be no denying the success of these new services, simply look at the silent vote exercised daily by millions of people in support of Uber or Airbnb.*

Part II – Helping cities to leverage digital technology, to provide new services to their client: a few examples



Digital technology and water services (1)

- **In Europe, more and more new management contracts include remote meter reading. These systems provide real-time data to residents about their consumption and detect anomalies.**
 - *In 2011, we created the company Birdz to roll out smart meters. Since then, it has become the leading operator of connected objects in France.*
 - *The data collected and processed comes from smart water meters but also from electricity and gas meters, as well as sensors for air quality, temperature, noise, etc.*
 - *By 2020, the penetration rate for smart water meters should exceed 50% in Europe.*
- **Control center for the water distribution system of large cities**
 - *In Lille, all network data is fed back to the center in real time. This “control tower” centralizes and processes within a single interface all data from the sensors in the field, water service agents’ smartphones, and data processing software.*
 - *It improves the network’s performance, ensures the safety of the crucial water service, manages crises, and keeps the elected officials, their technical services and residents informed.*

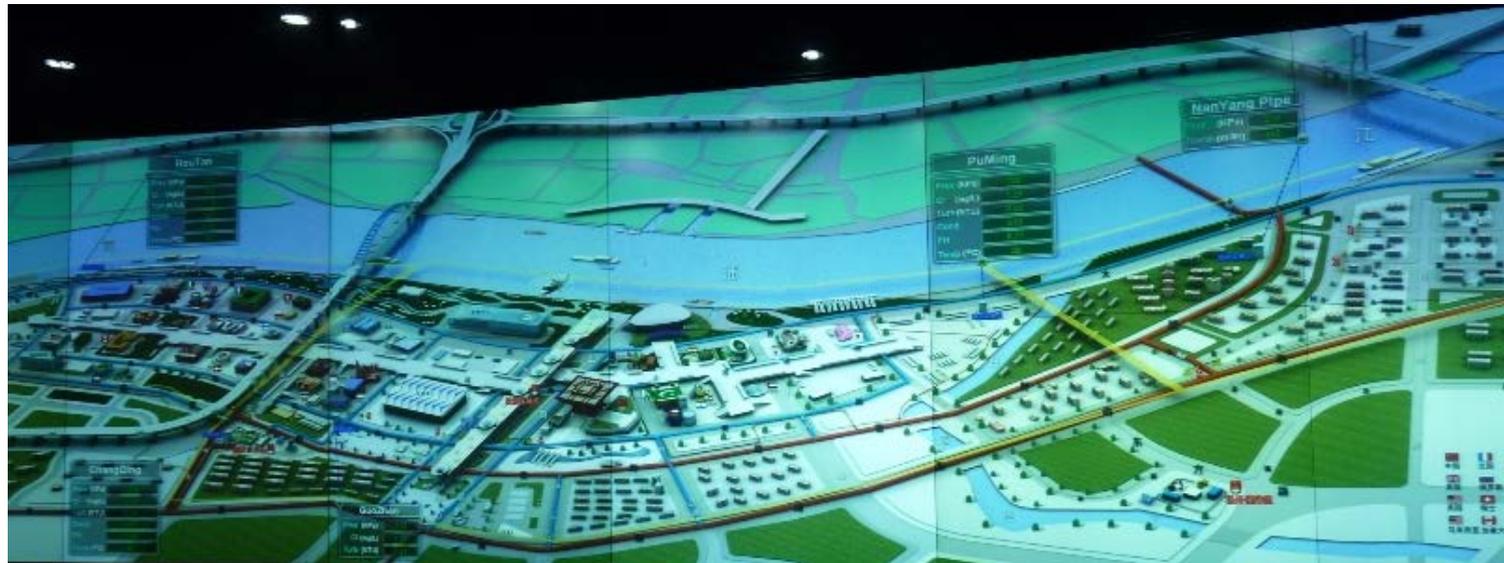


Digital technology and water services (2)



- **Protecting urban services against terrorist attacks.**

- *Our Company designed probes to monitor water quality in real time and detect the presence of N, B or C contaminants.*
- *These probes were implemented at the Shanghai World Expo (2010), then at the London Olympics (2012), in Paris, during COP 21 (2015). In Paris, we worked closely with the government, the city council, the RAID (an anti-crime branch of the French national police), and the central inter-ministerial technical emergency service.*
- *Large city water systems, are vulnerable because they stretch over thousands of kilometers and a higher security depends on recourse to digital innovation.*



Shanghai World Expo area and traceability system



Digital technology and waste services

- **Smart waste container system**

- *The containers are equipped with electronic antennas and connected, to relays to signal their fill rate. This information is used to improve collection-round logistics and minimize disturbance such as noise.*
- *They also make it easier to introduce volume charging based on the principle of “the more you sort, the less you pay,” which encourages householders to recycle more of their waste.*

- **Smart reverse logistics services**

- *In Lille, we introduce reverse logistics, where retail delivery trucks collect non-hazardous waste for their return trip.*

- **Auto-adaptive sequential sorting and remotely operated sorting**

- *IA increases productivity and quality of waste sorting in Amiens sorting center*



Digital technology and energy services optimization (1)

- **Data management—and therefore digital technology—is at the heart of energy efficiency.**
 - *Detailed knowledge of the consumption habits of local government authorities, manufacturers and households is needed to anticipate and adapt the production of electricity, heat and cold with a high degree of precision.*
- **Our innovative solutions are helping many cities improve their thermal and energy performance.**
 - *We are contracted either to manage all municipal buildings (schools, gyms, swimming pools, local city hall offices, cultural venues, etc.), or certain specific buildings (for example, the Metropolitan Museum of Art in New York).*



Digital technology and energy services optimization (2): Veolia hubgrade centers

- Our energy saving centers in Sydney, Brussels, Dubai... improve our clients' energy efficiency. Without radio frequency identification (RFID) and digital technology, these centers would not have been possible.
 - *Our hypervision centers can display a city's energy or water supply system, its operational parameters and the various potential management scenarios.*



Part III – Are digital innovations making cities more sustainable ?

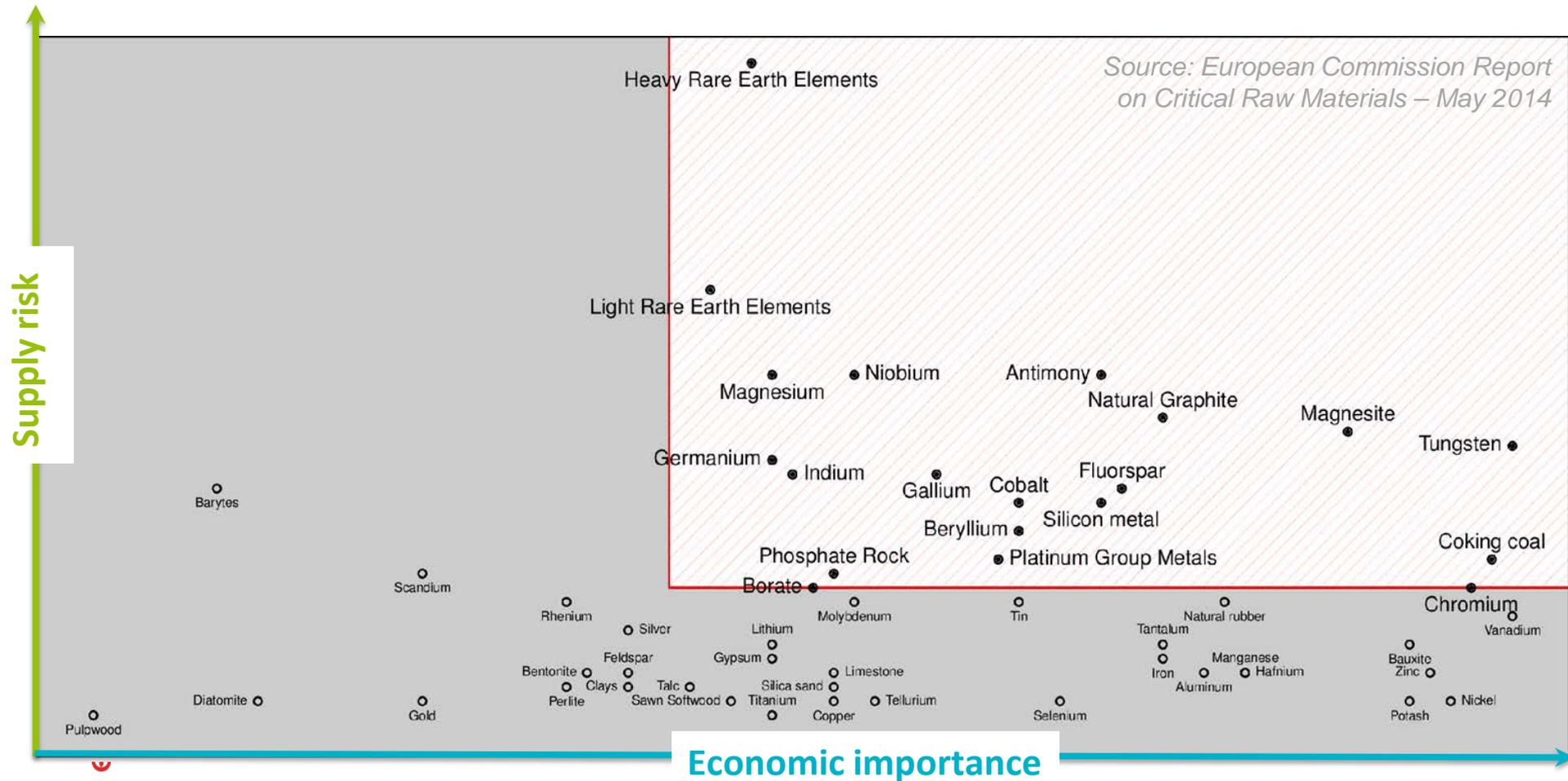


Yes, but with an increase of energy consumption and WEEE production

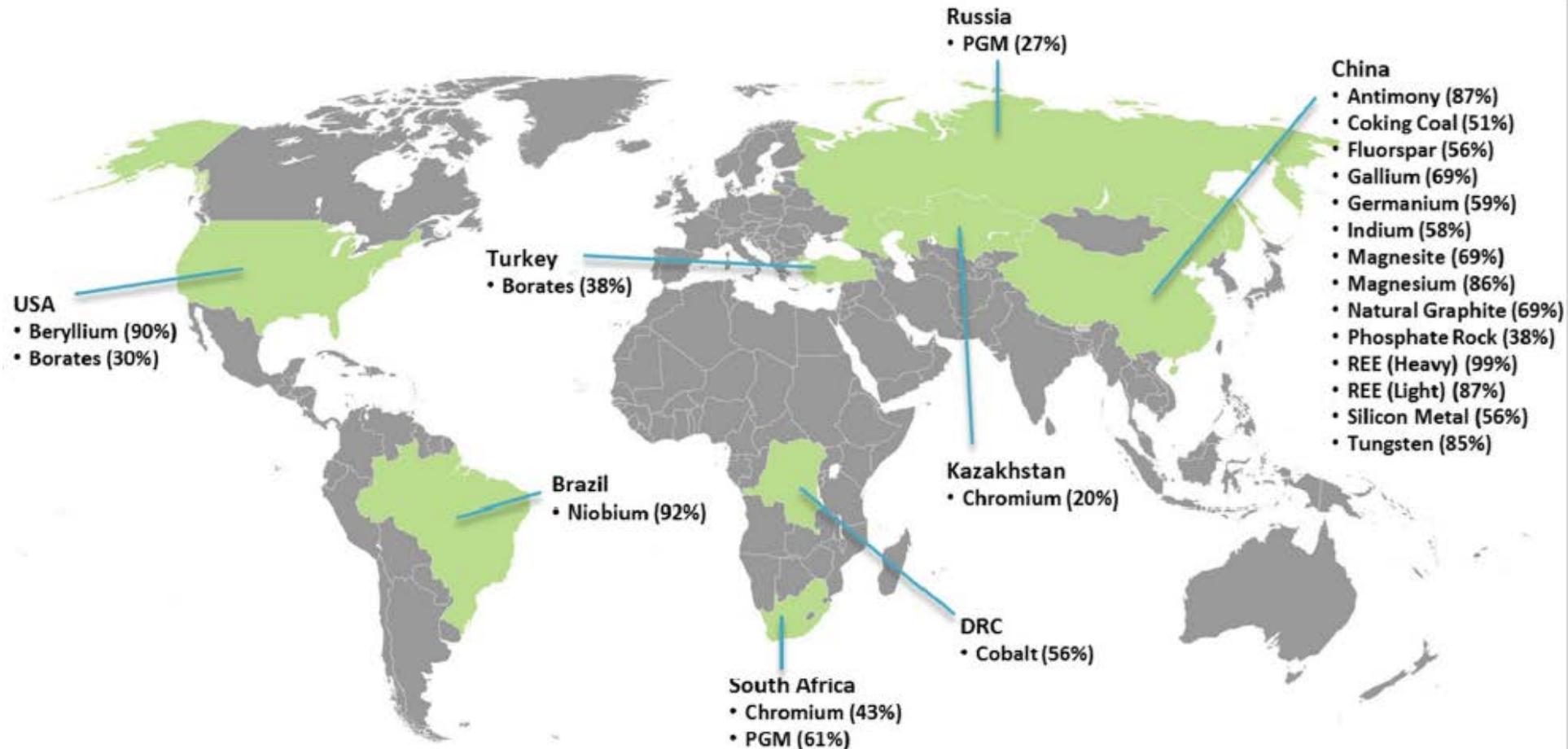
- **By improving energy or water management using digital tools, cities save essential resources and reduce their environmental footprint.**
- **The same applies to residents: their meters communicate with them in real time helping them manage their water, electricity and heat consumption and the associated cost.**
- **However, digital technology consumes a lot of energy.**
 - *Worldwide, it already accounts for 10% of electricity consumption.*
- **Additionally, digital technology consumes many rare materials.**
 - *In the world, the growth of Waste Electrical & Electronic Equipment (WEEE) amounts to 3 to 5% per year. It exceeds that of all other forms of waste.*
- **This raises the issue of the availability of rare materials resources and the recycling of polluting and toxic waste.**
 - *With the support of France's Alternative Energies and Atomic Energy Commission (CEA), Veolia has designed a cutting-edge process to recycle lithium from batteries. The process yields ultra-pure lithium: at 99.99% pure, it is directly useable by industry.*

A higher vulnerability of countries and cities for the supply of raw material

The EU has identified 20 metals the availability of which will become critical in the next decades, and which are essential for modern economies to function.



A high geographical concentration of critical metals. Poorly shared resources translate into countries' dependence



New technology, new scarcities and new economy: the example of strategic metals recycling in cities

- **165,000 metric tons of dust are swept up from Britain's streets each year.**
- **After years of research, we have opened a plant in Ling Hall, capable of recovering particles of precious metals from the dust on the roads emitted from car exhausts, such as platinum, palladium and rhodium.**
 - *The quantities collected are minimal, but they are found in the same proportions as in the ore containing these metals.*
 - *The substantial taxes on the waste dumping in UK and the high prices of these strategic metals ensure the operation's economic viability.*
 - *The price of platinum exceeds €40,000 a kilo; it is one of the rarest metals in the world, as it is found in only 2 geological formations on earth (one in South Africa and the other in Russia).*
- **Thanks to this facility, 90% of the materials in street sweeping dust are recovered.**



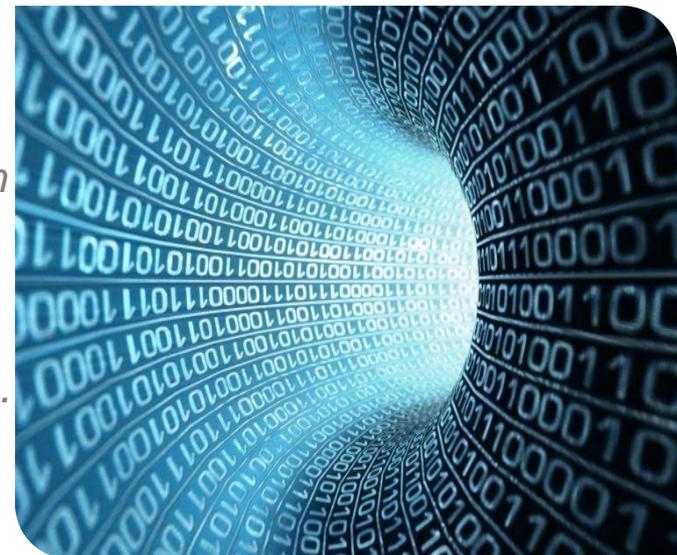
– Part IV –

A few
limits
of
digital
technology



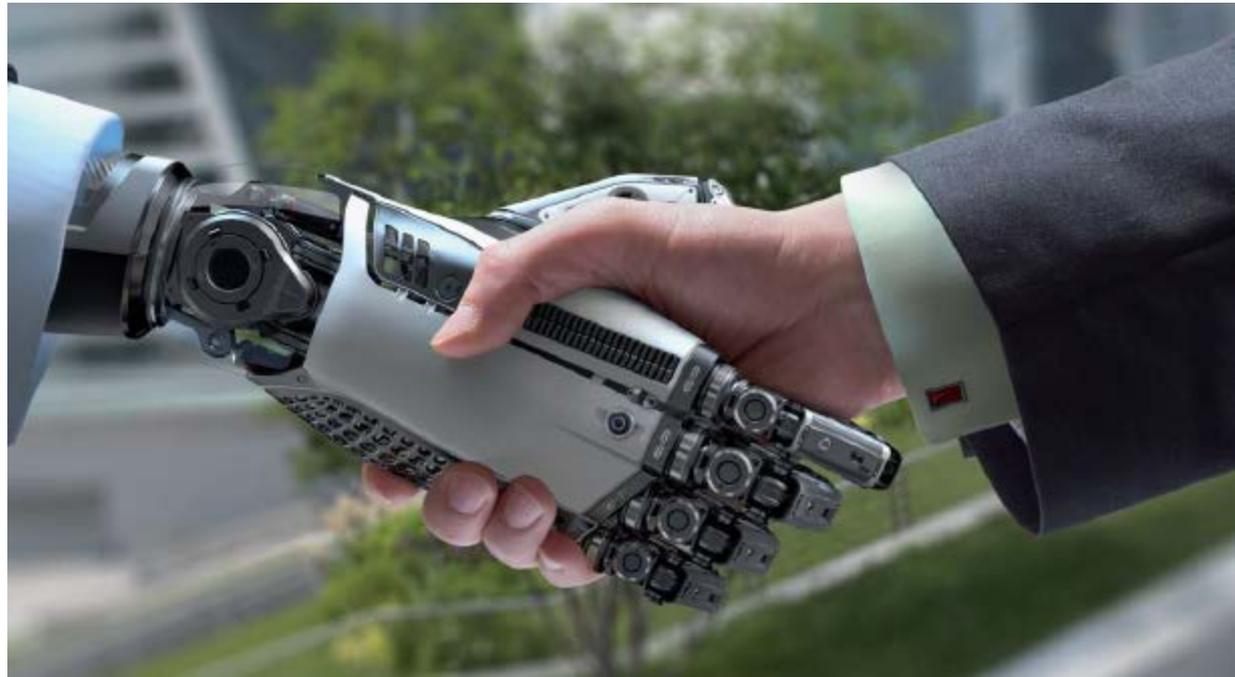
The two sides of digital technology

- **Digital technology may be liberating but it also bears the seal of ambivalence.**
 - *Digital technology is a powerful tool, but used for what, by whom, with what purpose and with what controls?*
 - *Software is not neutral: the choices made by programmers remain a mystery to users. Through their data-based activities, citizens leave a digital trace everywhere, that can be used without their knowledge.*
- **Both a solution and a problem, digital technology can lead either to social progress or an Orwellian nightmare.**
 - *On the one hand, it has democratized access to economic initiative, reinforced multijobbing, encouraged the emergence of an economy of sharing, energized innovation, and stimulated local service business.*
 - *On the other hand, the digital mutation is unsettling: precarization of casualized labor, reduced social welfare cover, unequal sharing of value added between freelance workers and the intermediary platform, flawed taxation.*
 - *Above all, in many professions, the ramp-up of digital technology will result in the massive destruction of jobs.*



The key issue of urban governance. Who will control the smart city: GAFA, public authorities, the citizens?

- It is therefore the responsibility of mayors, together with business leaders and civil society, to refocus digital technology on the priority needs of their cities, including employment.
- Without which there is considerable risk that the “digital disruption” will bring “social disruption” in its wake.
- The digital economy is exploding the city’s governance systems.
 - *By opening up unprecedented prospects to the city, it is radically changing the relationship between local authorities and their citizens, and so the modes of urban governance.*
 - *Crucial for their future, the governance of smart cities is yet to be defined.*





Cities have several challenges to tackle, if they are to fully benefit from the promises inherent in digital technology, while avoiding its downsides.

- **Sharing the value generated from the data collected (the black gold of the 21st century) and redistributing it among the city' stakeholders: data operators-producers, service providers, consumers, public authorities...**
- **Digesting the flow of figures and indices produced; otherwise a digitized city is soon saturated by the hyper-inflation of data.**
- **Not confusing the end with the means.**
 - *A smart city does not come down to just pooling data, sharing infrastructure, and machine-to-machine communication standards.*
 - *The important thing is not the technology in itself, but rather the more efficient solutions it delivers for managing local services, public health, environmental protection, mobility and work.*
- **Protecting citizens' privacy**



Conclusion

Reinventing cities

- *Although poorly defined, the smart city has become the new frontier for urban planning.*
- *Digital technology provides an opportunity for cities to reinvent themselves, to improve local policies, optimize regional development, support economic growth and drive local innovation.*
- *It also makes cities more attractive, and therefore in a better position to compete with other cities.*

ARTIFICIAL INTELLIGENCE AND ROBOTICS IN THE CITY

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