جمهورية مصر العربية
وزارة التخطيط والمتابعة والاصلاح الاداري

معهد التخطيط القومي

بالتعاون مع

الجمهورية التونسية
وزارة التنمية والإستثمار والتعاون الدولي

المعهد التونسي للقدرة التنافسية
والدراسات الكمية

DIGITAL INNOVATIONS & SUSTAINABILITY

Dr. BEN KHALIFA Adel
adel.ben-khalifa@itceq.tn
benkhalifaadel2013@gmail.com
Chief economist
Tunisian Institute of Competitiveness
and Quantitative Studies

Workshop
Emerging technology and sustainable development: from concept to application
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Tunis

Context and Major Challenges

- Climate Change
- Resource Scarcity
- Increasing Population
- Increasing Inequalities
- Rights, Privacy And Security
- (Un)sustainable Consumption
- **Disruptive And Digital Innovations**

Digital Innovations And Sustainability

What, Which, Why and How?

❑ Contents

- What Trends Are Shaping Digital Innovations?
- How Digital Innovations Will Help To Achieve The SD In Its Three Dimensions?
- Which Sectors Are The Most Digital?
- How Digital Innovations Will Help To Achieve All SDGs?
- Why Is Current Digital Development Unsustainable?
- How To Govern The Transformation Toward Sustainability In The Digital Age?
- What Is The Reality Of Digital Transformation Strategy In Tunisia?

What Trends Are Shaping Digital Innovations?

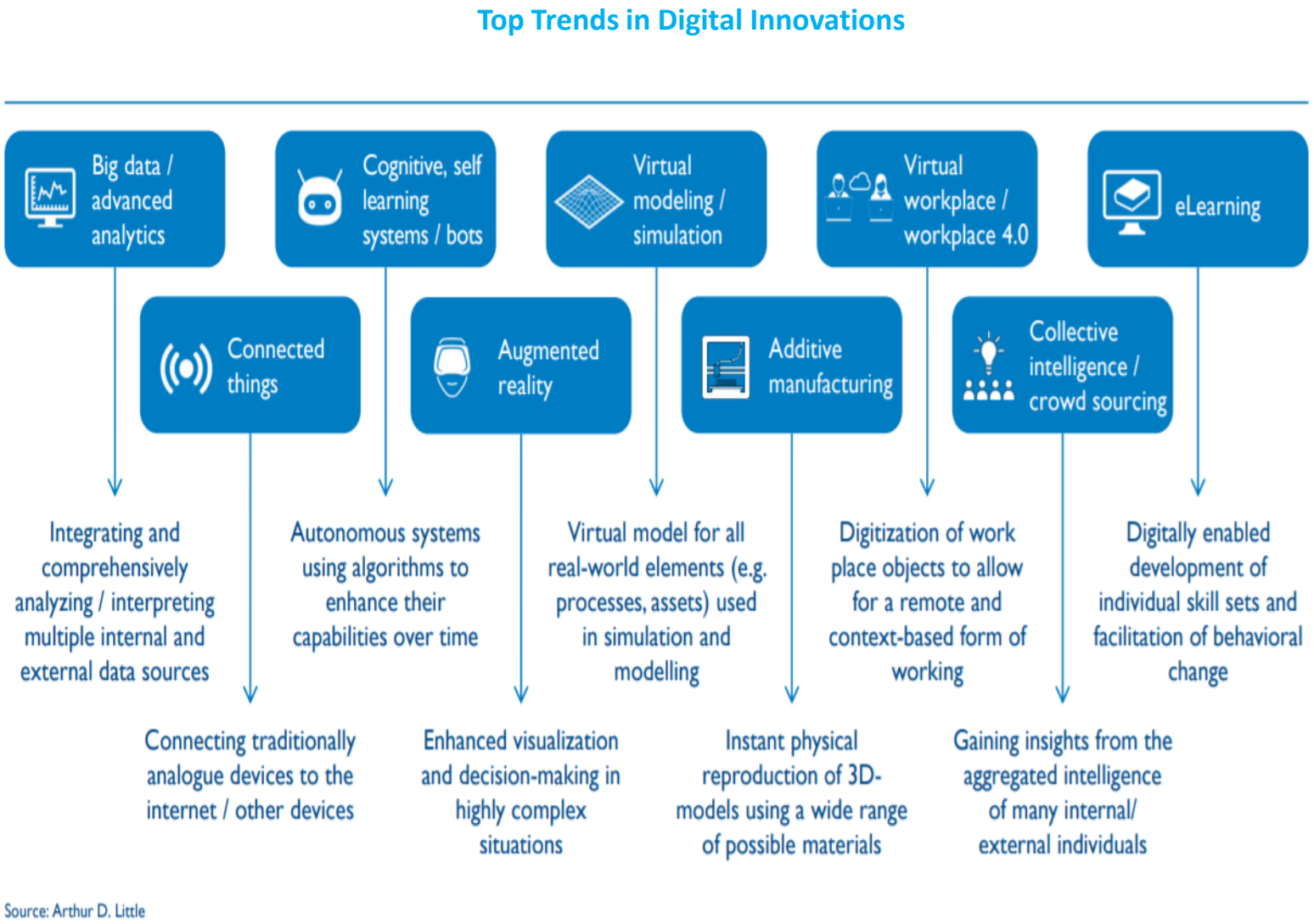
1. Trends in Digital Innovations

❑ What Is Digital Innovation?

- OECD (2016, p. 13)'s report suggests that digital innovation should be understood:
  - in a narrow sense, as the implementation of a new or significantly improved ICT product, i.e. *ICT product innovation;* mainly occurs in the supply side (i.e. the ICT producing industries);
  - in a broader sense, as also including the use of ICTs for the implementation of a new or significantly improved product or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations, or simply put as *ICTenabled innovation.* ICT demand side (across the economy)

1. Trends in Digital Innovations

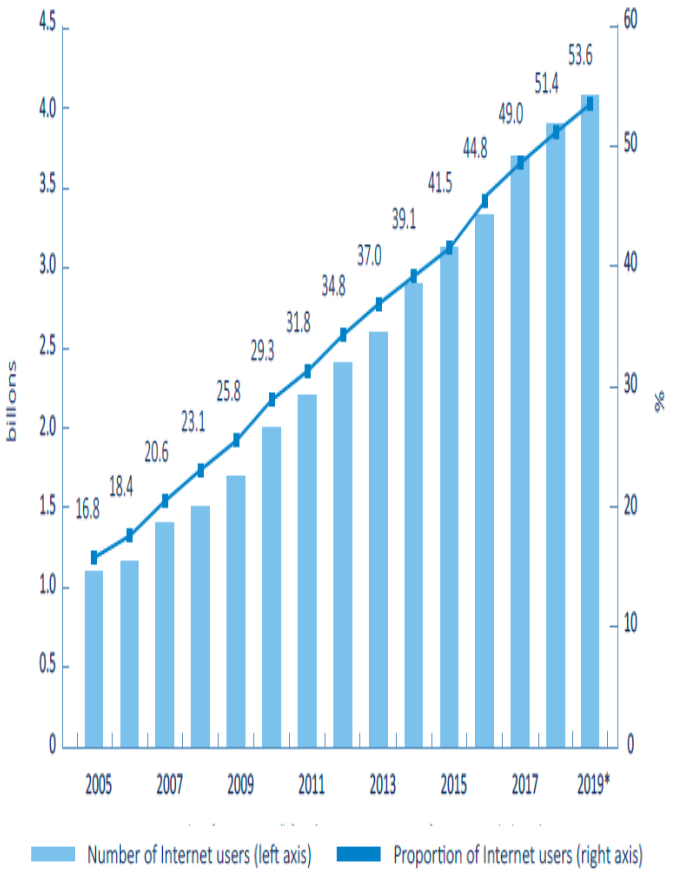
❑ Examples of Digital Innovation



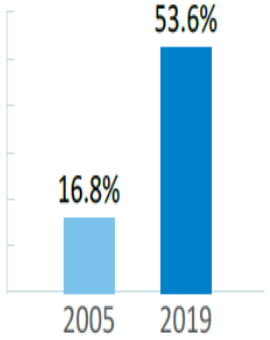
1.Trends in Digital Innovations

❑ Broadband

*Individuals using the Internet, 2005-2019**



An estimated 4.1 billion people are using the Internet in 2019, reflecting a 5.3 per cent increase compared with 2018.



The global penetration rate increased from nearly 17 per cent in 2005 to over 53 per cent in 2019.

10%

Between 2005 and 2019, the number of Internet users grew on average by 10 per cent every year.

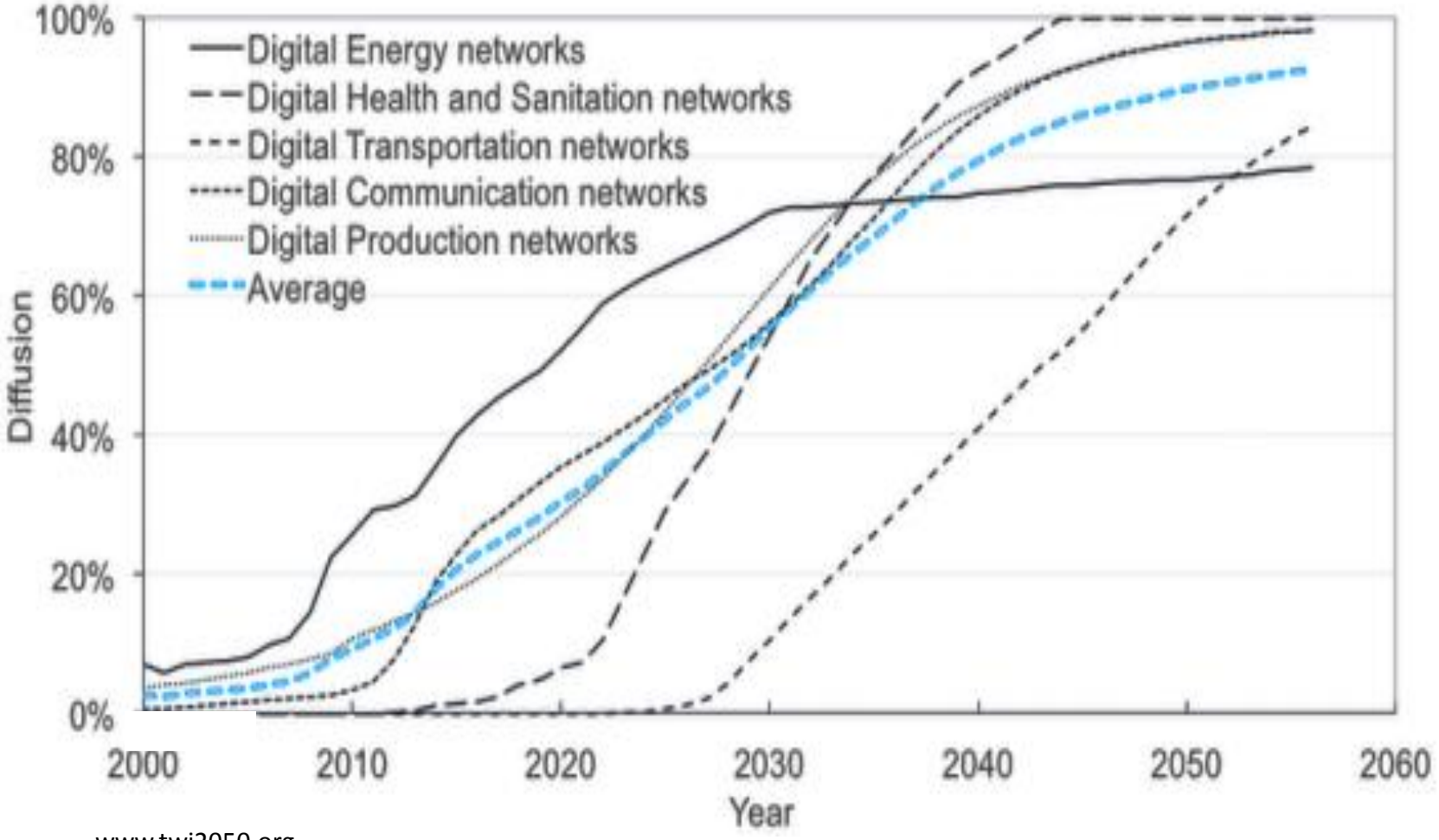
In recent years though, global growth rates are not as a high as a decade ago because some parts of the world are reaching saturation levels.

Note: * ITU estimate. Source: ITU.

1. Trends in Digital Innovations

❑ Networks

Future of digital networks diffusion



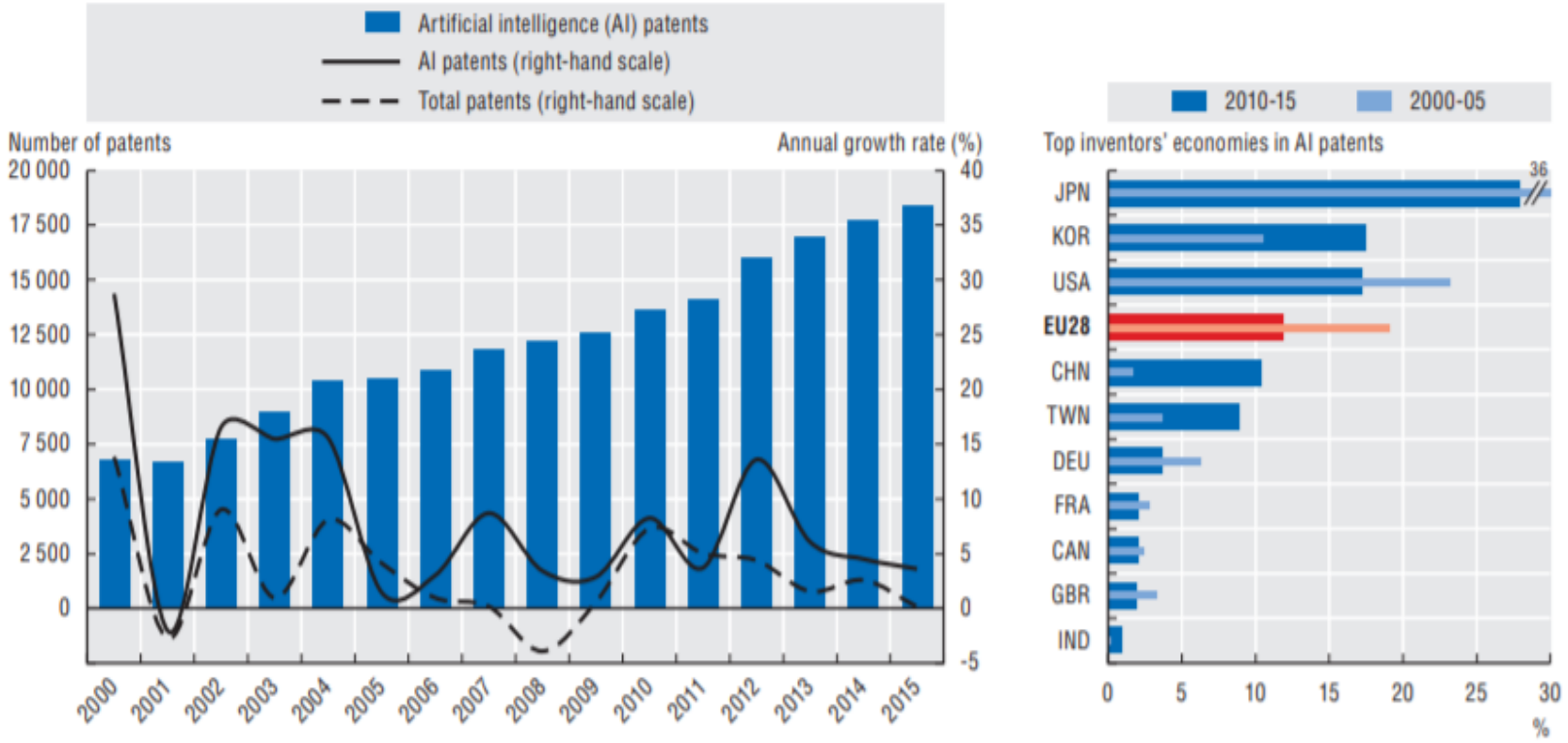
.www.twi2050.org

1. Trends in Digital Innovations

❑ Artificial intelligence

Patents in artificial intelligence technologies, 2000-15

Number of IP5 patent families, annual growth rates and top inventors' economies



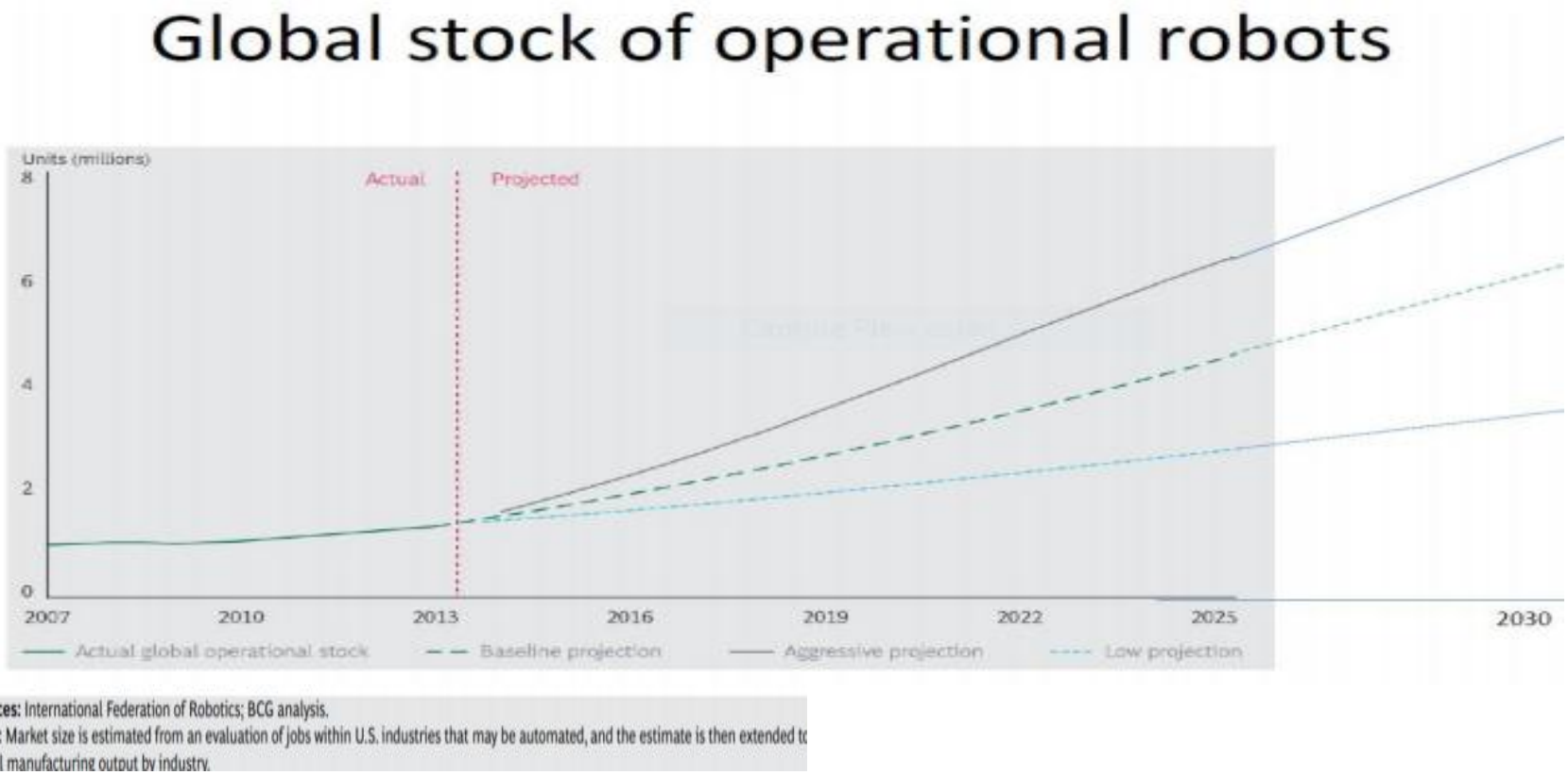
Source: OECD, STI Micro-data Lab: Intellectual Property Database, *http://oe.cd/ipstats* June 2017. StatLink contains more data. See chapter notes.

StatLink http://dx.doi.org/10.1787/888933616978

1. Trends in Digital Innovations

❑ Robot Revolution

❖ The number of industrial robots is increasing rapidly across the world



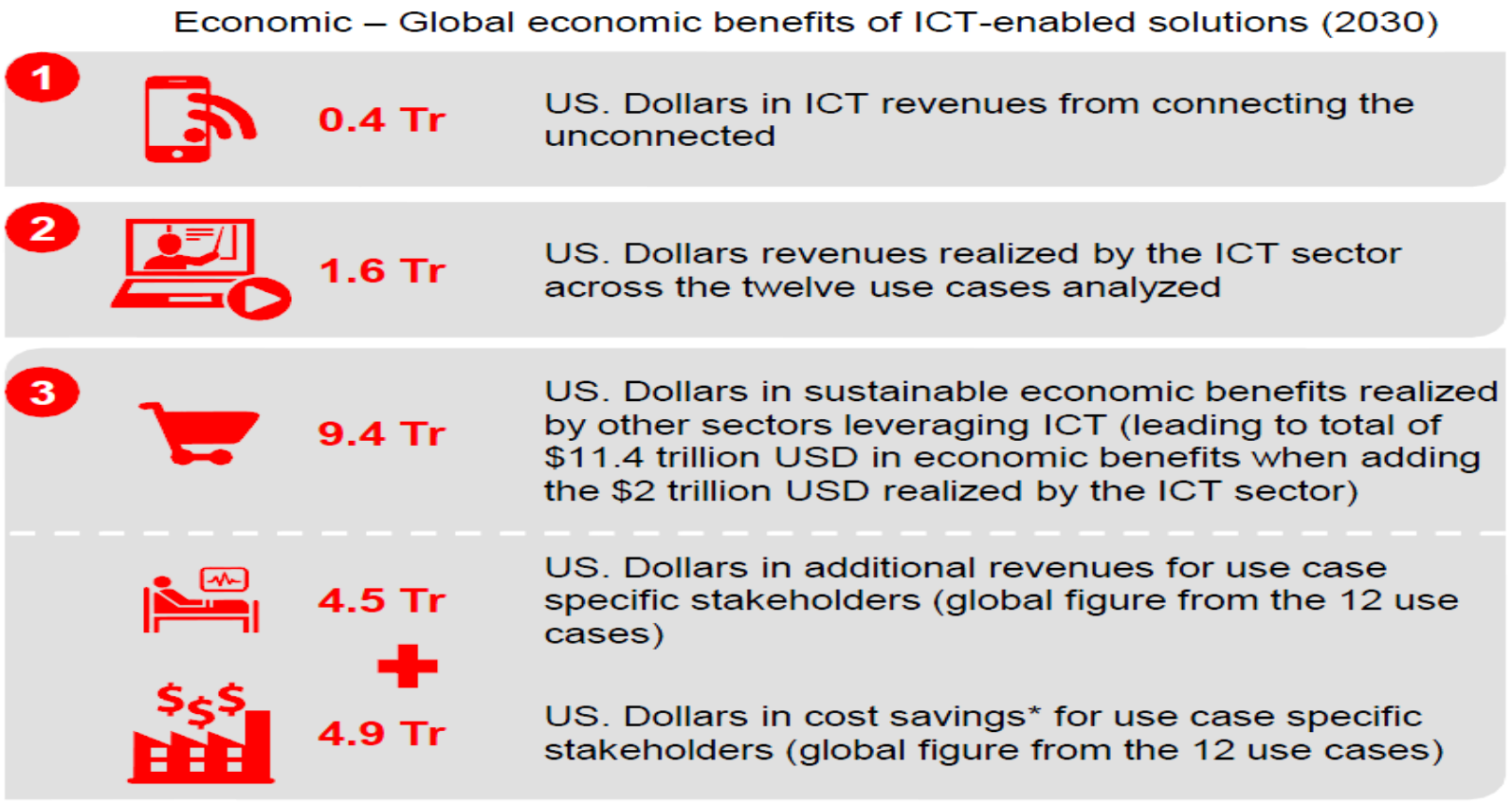
Sources: International Federation of Robotics; BCG analysis.
Note: Market size is estimated from an evaluation of jobs within U.S. industries that may be automated, and the estimate is then extended to global manufacturing output by industry.

How Digital Innovations Will Help To Achieve The SD In Its Three Dimensions?

2. How Digital Innovations Will Help To Achieve The SD In Its Three Dimensions?

2.1. Digital innovations and economic sustainability

- **Economic – ICT is good for business, creating new revenue opportunities and reducing costs**



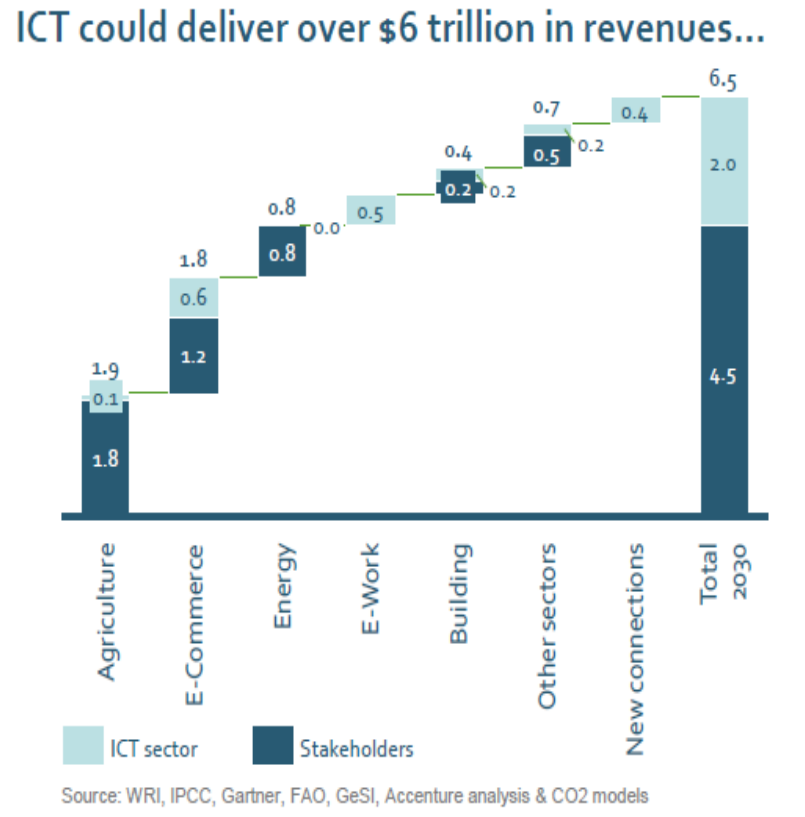
Source. GeSI #SMARTer2030 – ICT Solutions for 21st Century Challenges –

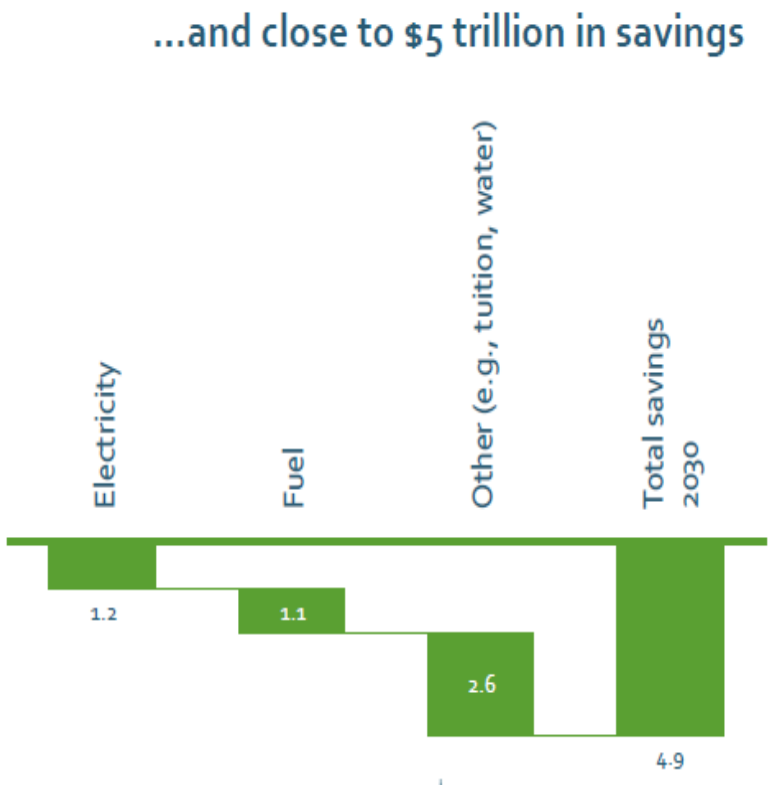
2.1. Digital innovations and economic sustainability

❑ ICT-enabled revenues and cost savings (USD trillion)

#SMARTer2030
ICT Solutions for 21st Century Challenges

Eight sectors will benefit most from ICT





Source. GeSI #SMARTer2030 – ICT Solutions for 21st Century Challenges –

2.2. Digital innovations and social sustainability

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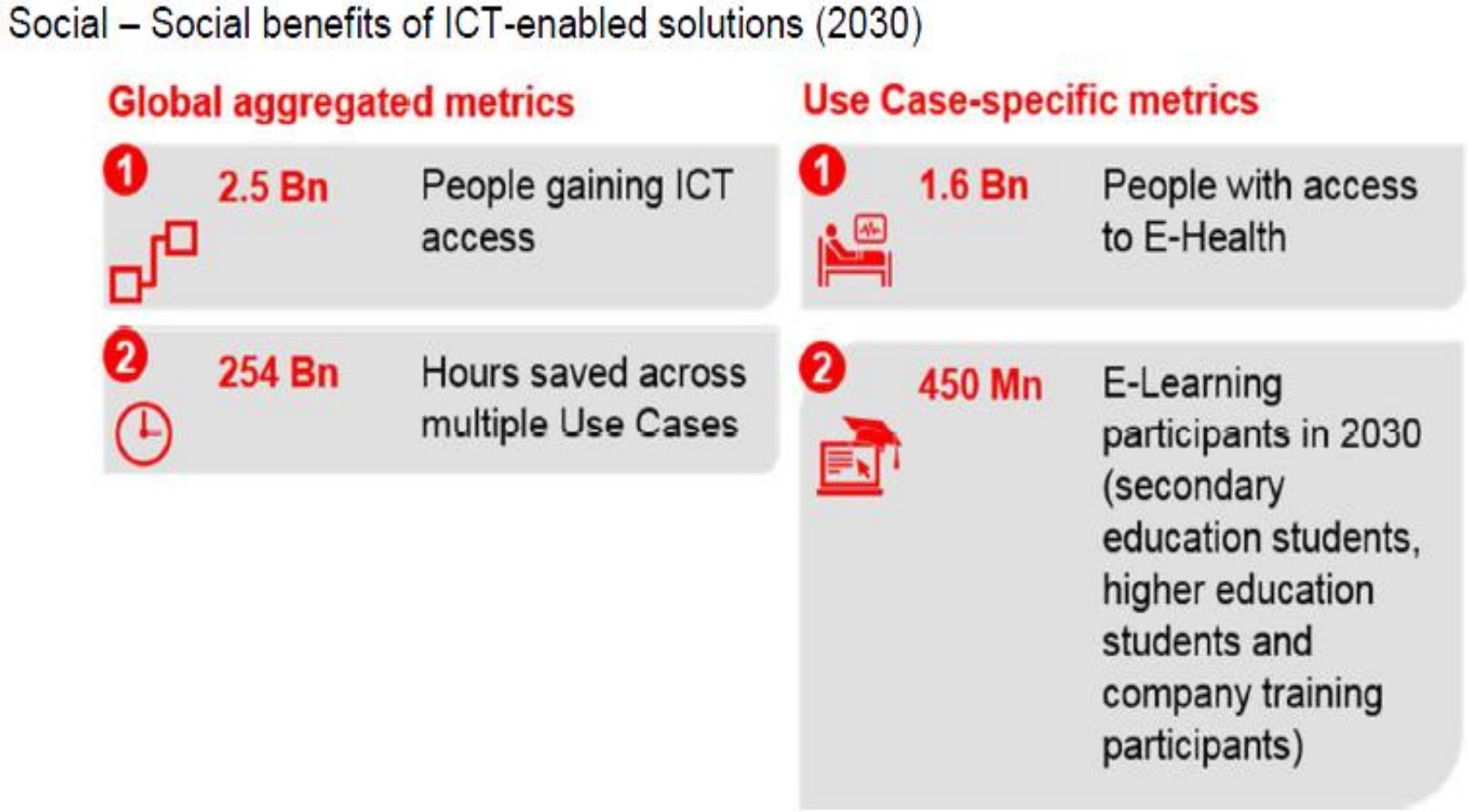
ICT Solutions for 21st Century Challenges

❑ Social – Boosting incomes, cutting costs and improving lives



Source. GeSI #SMARTer2030 – ICT Solutions for 21st Century Challenges –

2.3. Digital innovations and environmental sustainability

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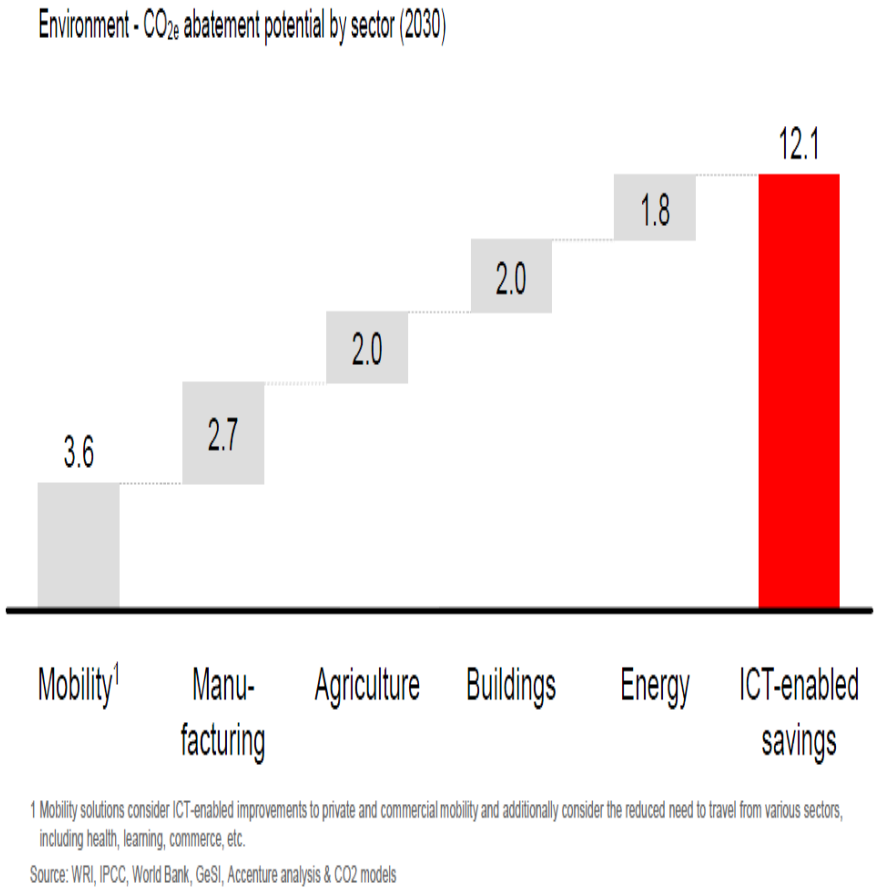
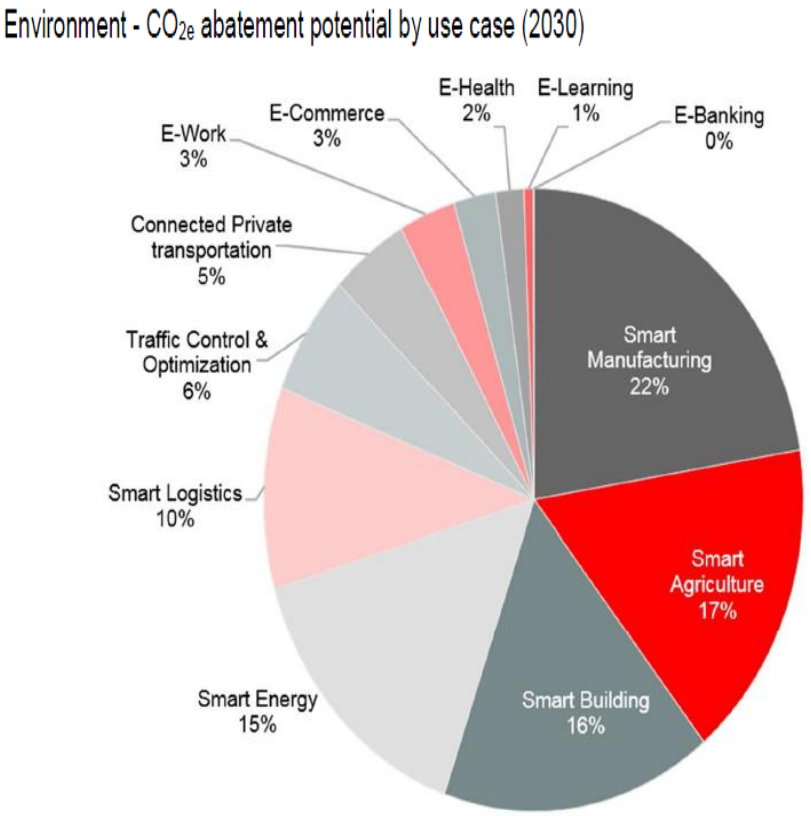
ICT Solutions for 21st Century Challenges

- **Environment – Decreasing emissions and resource consumption whilst allowing for growth**





Source. GeSI #SMARTer2030 – ICT Solutions for 21st Century Challenges –

2.3. Digital innovations and environmental sustainability

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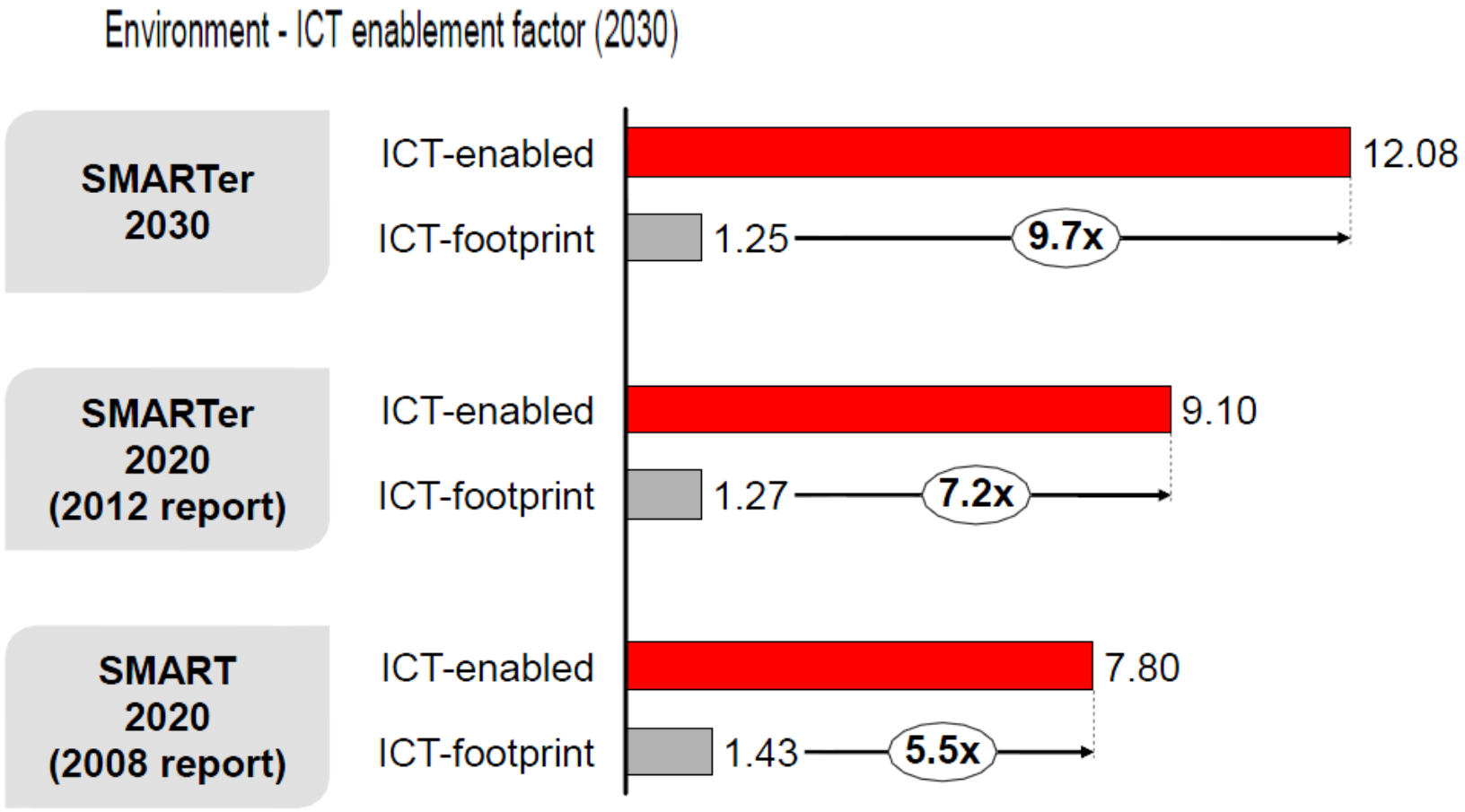
ICT Solutions for 21st Century Challenges

- **Environment - ICT solutions can help cut 9.7 times more CO2e than they emit**



Source: Source: WRI, IPCC, GeSI, SMARTer2020, Accenture analysis & CO2 models

2.3. Digital innovations and environmental sustainability

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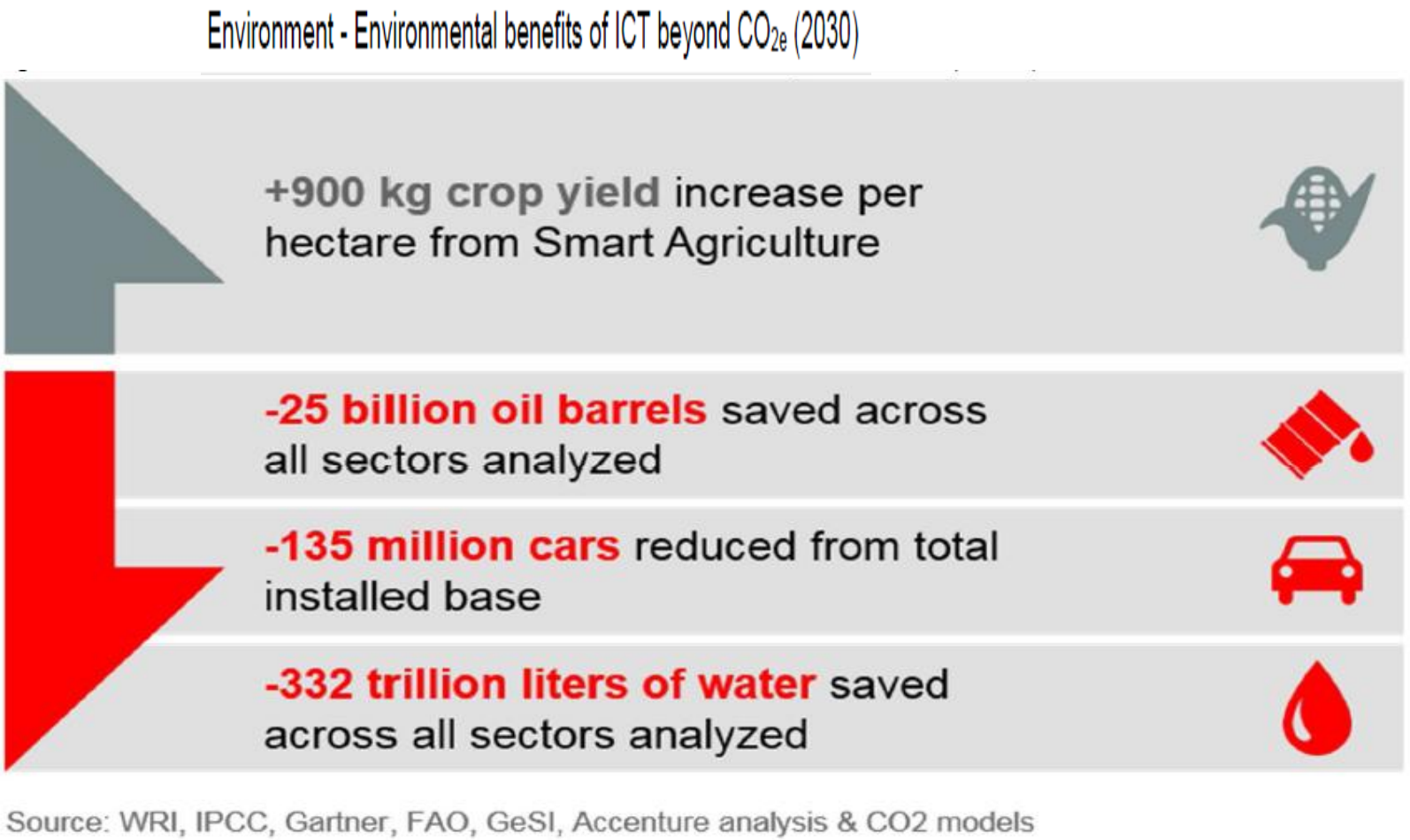
ICT Solutions for 21st Century Challenges

- **ICT enables increased resource efficiency**



Which Sectors Are The Most Digital?

3. Digital innovations and SD: Eight sectors will profit most

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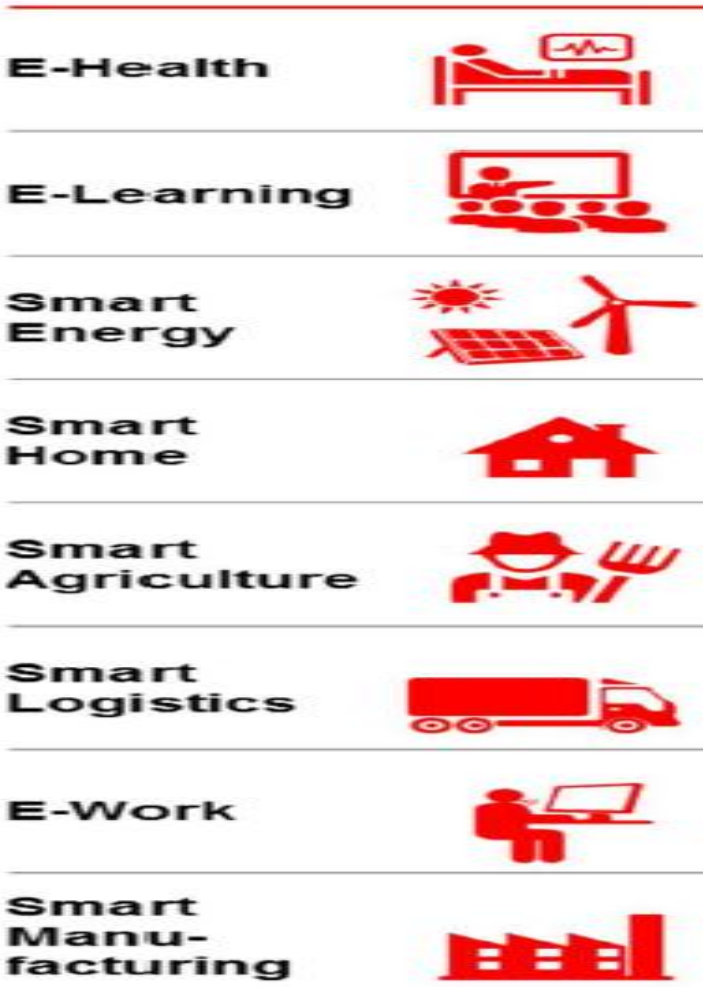
ICT Solutions for 21st Century Challenges



- #SMARTer2030 – ICT Solutions for 21st Century Challenges –

3. Digital innovations and SD: Eight sectors will profit most

❑ Future of E-Health

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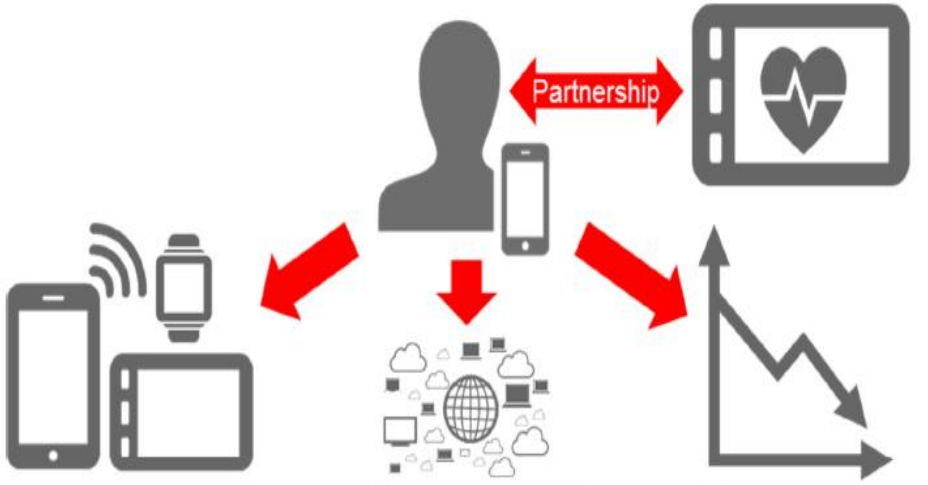
ICT Solutions for 21st Century Challenges

Health- Future of E-Health: Technology vision for 2030

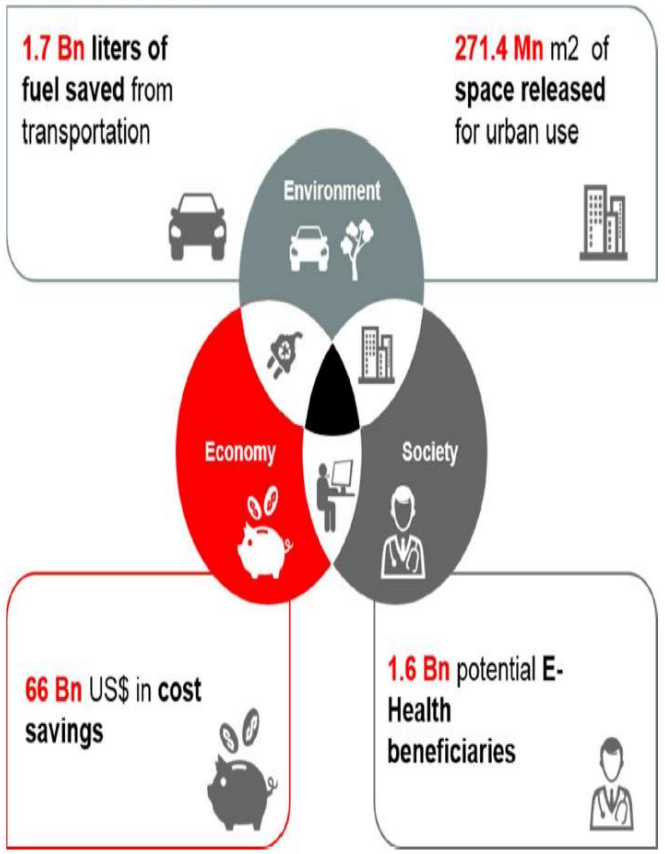


Remote access to electronic patients' health records on smart devices and use of wearables and biosensors

Data generation and big data analytics enable automatic processing and interpretation of data for self-directed health recommendations

DNA sequencing due to plummeting costs will become affordable for everyone enabling e.g. gene therapy

Health - Benefits from E-Health



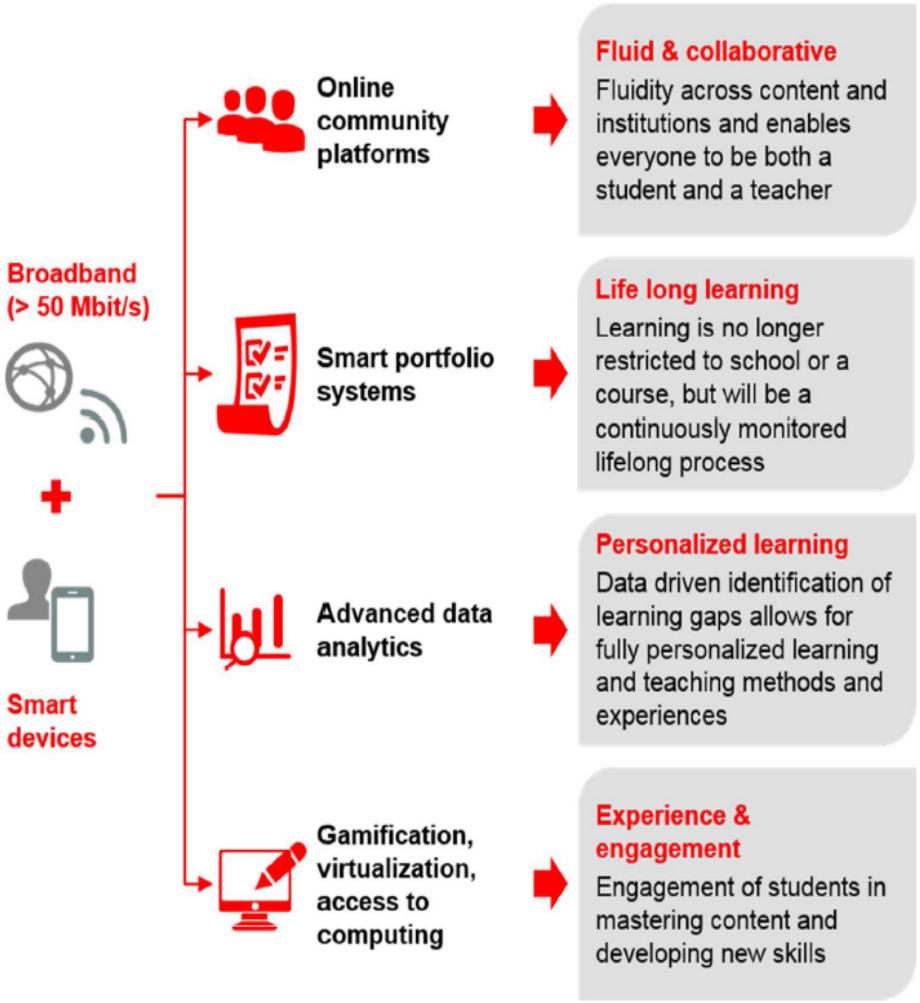
- #SMARTer2030 – ICT Solutions for 21st Century Challenges –

3. Digital innovations and SD: Eight sectors will profit most

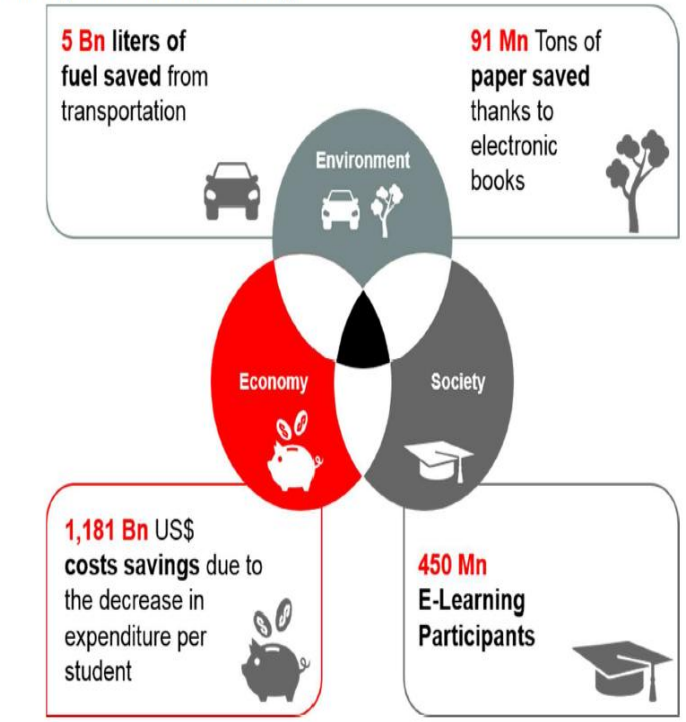
❑ Future of E-Learning

#SMARTer2030
ICT Solutions for 21st Century Challenges

Learning – Future of E-Learning: Technology Vision for 2030



Learning – The Benefits of E-Learning



3. Digital innovations and SD: Eight sectors will profit most

❑ Future of Smart Building

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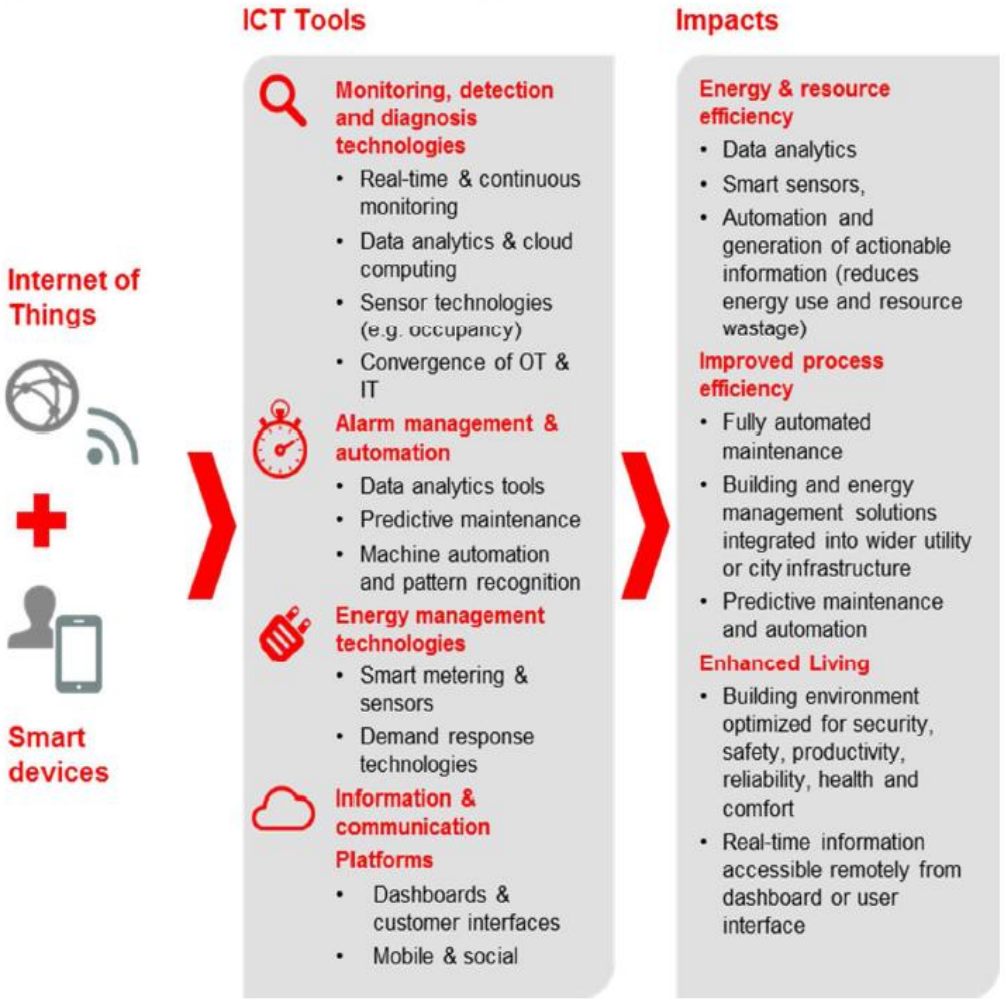
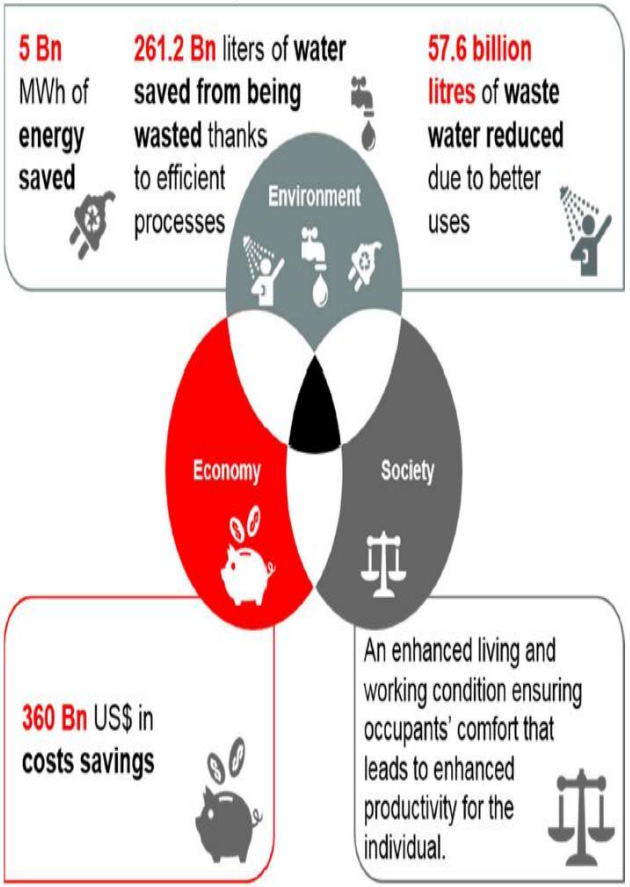
ICT Solutions for 21st Century Challenges

Buildings - Future of Smart Buildings: Technology Vision for 2030



Buildings - Benefits of Smart Building



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3. Digital innovations and SD: Eight sectors will profit most

❑ Future of Smart Agriculture

#SMARTer2030
ICT Solutions for 21st Century Challenges

Food – Future of Smart Agriculture: Technology Vision for 2030

Broadband (> 50 Mbit/s)

Smart devices

Precision agriculture
- **Connectivity between machines and equipment**
- **Sensors and satellites**
- **Advanced data analytics**
- ICT enabled processing of **genomic sequencing** of livestock, seeds and plants

= **Resource efficiency**
Monitoring, tracking, real-time data and the right information to the right people via mobile apps or messaging enhances resource efficiency (water, fertilizer, nutrition, equipment, etc.)

Information & communication platforms
Online platforms and apps that collect data and transform it into meaningful information, communication and decision-making support.

= **Food waste prevention**
Tracking, data-centric decision-making processes based on real-time data and the right information throughout the food chain reducing food waste at production, distribution & consumption.

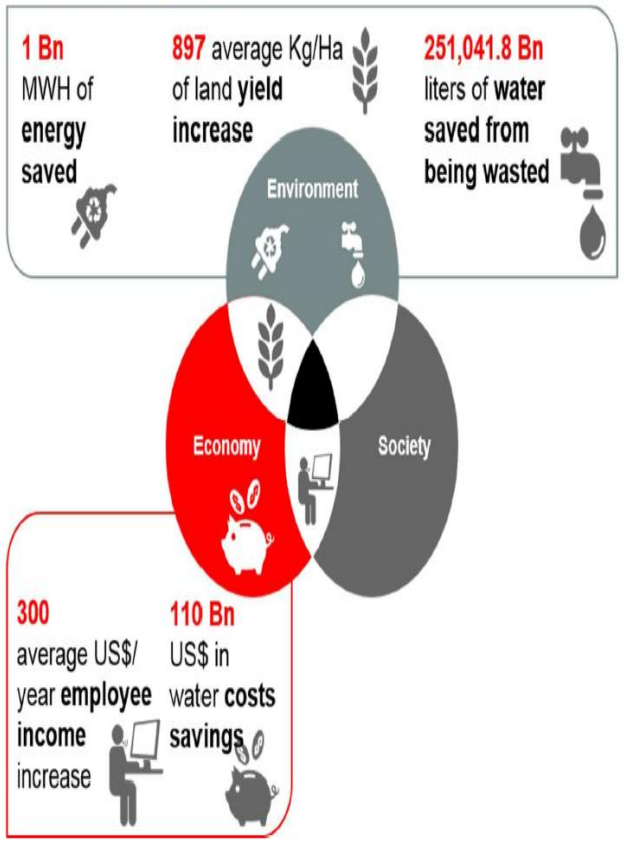
Farm management technologies
Automation and optimization of general farm management practices and back-office IT

= **Enhanced productivity**
Higher crop yield and income potential by enhanced farm management technologies, e.g. monitoring soil and livestock, forecasting, early detection of problems.

Traceability and tracking systems
Smart logistics (RFID, GPS) allow better tracking of food as it is stored and transported and tracking of equipment throughout lifecycle or food chain

= **Shock resilience**
Advanced analytics and forecasting allow for preventive cautions to environmental shocks and build resilience

Food - Benefits of Smart Agriculture



– #SMARTer2030 – ICT Solutions for 21st Century Challenges –

3. Digital innovations and SD: Eight sectors will profit most

❑ Future of Smart Mobility and Logistics

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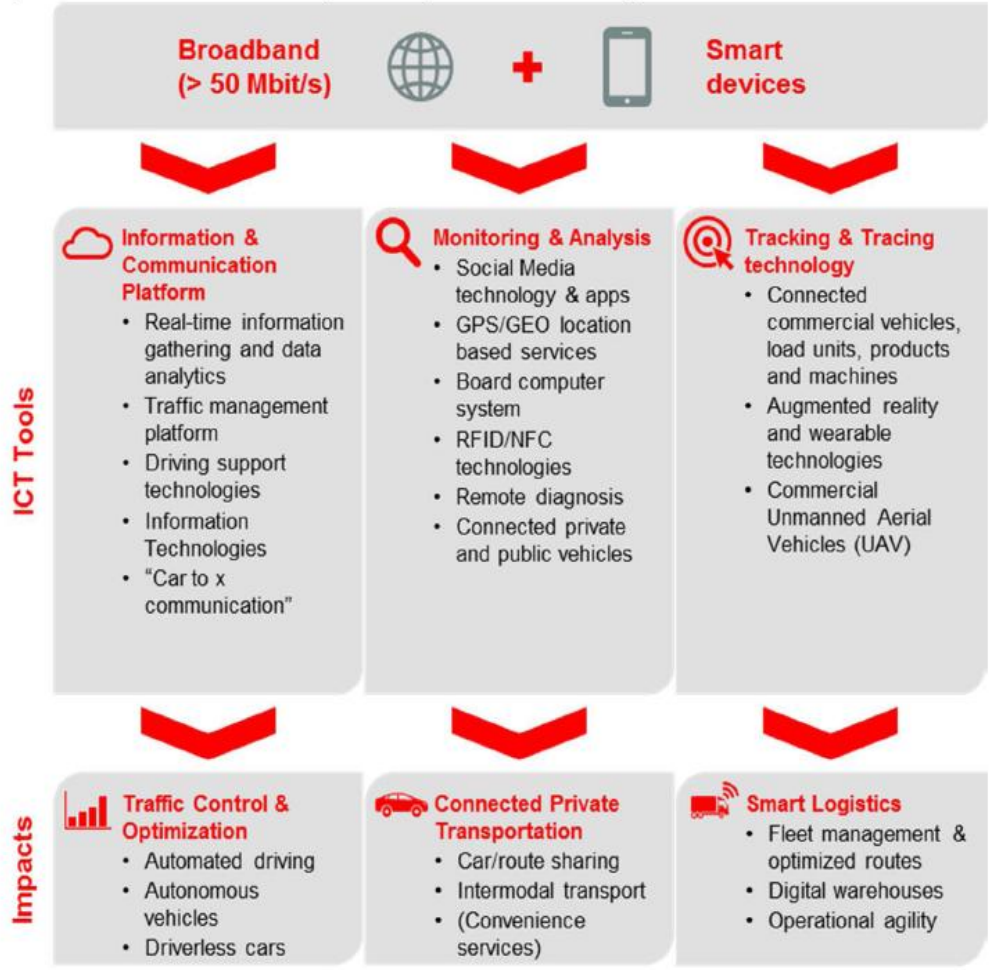
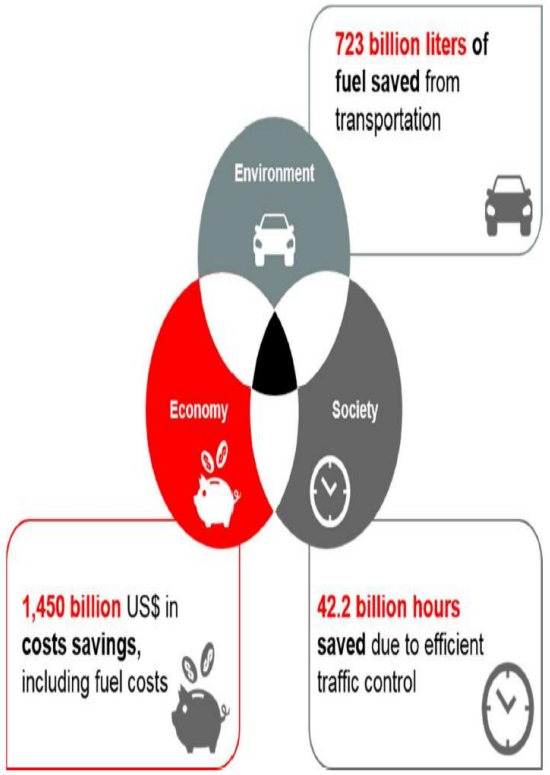
ICT Solutions for 21st Century Challenges

Mobility - Future of Smart Mobility and Logistics: Technology Vision for 2030



Mobility - Benefits of Smart Mobility and Logistics



– #SMARTer2030 – ICT Solutions for 21st Century Challenges –

3. Digital innovations and SD: Eight sectors will profit most

❑ Future of Smart Energy

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ICT Solutions for 21st Century Challenges

Energy - Future of Smart Energy: Technology Vision for 2030

ICT Tools

Convergence of IT/OT
Integration of Operations Technology (OT) – enterprise technology used to monitor and control physical devices, assets and processes – and Information Technology (IT)

Distribution management system
Two-way flow of information, component management and sensor technologies

Demand response technologies (B2B, B2C)
Technologies using real-time information to better match supply and demand (load management); incentives to shift demand

Advanced analytics
Modelling support, real-time system analytics, forecasting, predicting and contingency analysis

Energy storage technology
Help to manage power supply

Impacts

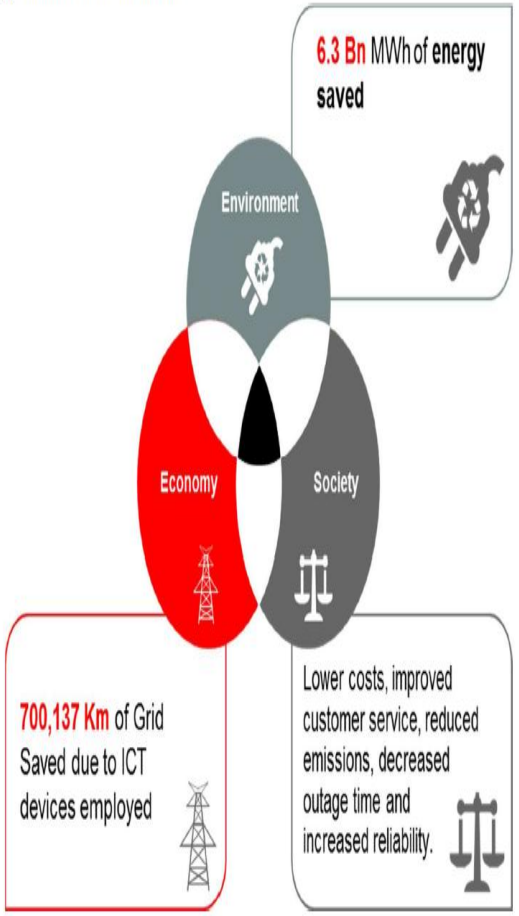
Improved load management
Real-time demand response technologies flattens out demand curve, decreases system load by better supply & demand matching

Enablement of renewables
Improved load management allows better integration of variable and distributed energy (e.g. in microgrids).

Grid efficiency
Improved load management and remote optimization of assets/ operations through grid monitoring result in **lower efficiency losses** during transmission, storage and/or distribution.

Resilient energy infrastructure
Improved management of power supply and peak loads through energy storage creates a more resilient grid.

Energy - Benefits from Smart Grid



– #SMARTer2030 – ICT Solutions for 21st Century Challenges –

3. Digital innovations and SD: Eight sectors will profit most

❑ Future of E-Business

E-Business – Future of E-Work, e-commerce and e-banking: Technology vision for 2030

Broadband (> 50 Mbit/s) + **Smart devices**

	Integrated multichannel infrastructures	Financial services	Work opportunities
ICT Tools	• Apps for retail mobile shopping • Videoconferencing / Augmented reality • Location based services • Advanced data analytics • Retail 3D printing	• Online banking apps • Digital currencies (e.g. BITCoin) • Financial market insight and investment platforms (e.g BuX) • Videoconferencing, digital assistants / consults	• Voice over IP • Telecommuting/collaboration tools • Videoconferencing • Augmented reality
Impacts	**E-commerce** • Integrated multichannel infrastructures / Mobile shopping • 3D printing • Delivery on demand	**E-banking** • Faster and 24/7 access • Transparency of banking products/services	**E-work** • Telework ("mobile workspace") • Virtual business meetings

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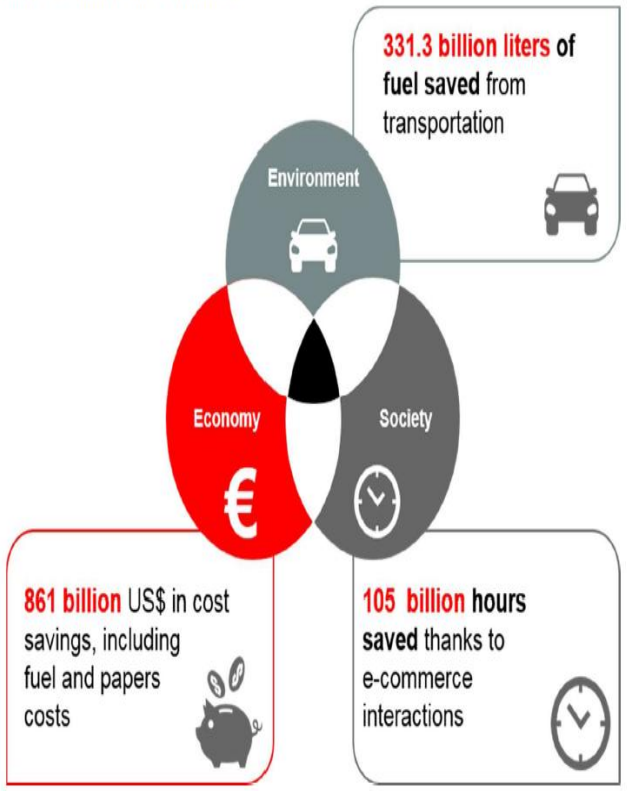
ICT Solutions for 21st Century Challenges

E-Business - Benefits of E-Business



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3. Digital innovations and SD: Eight sectors will profit most

❑ Future of Smart Manufacturing

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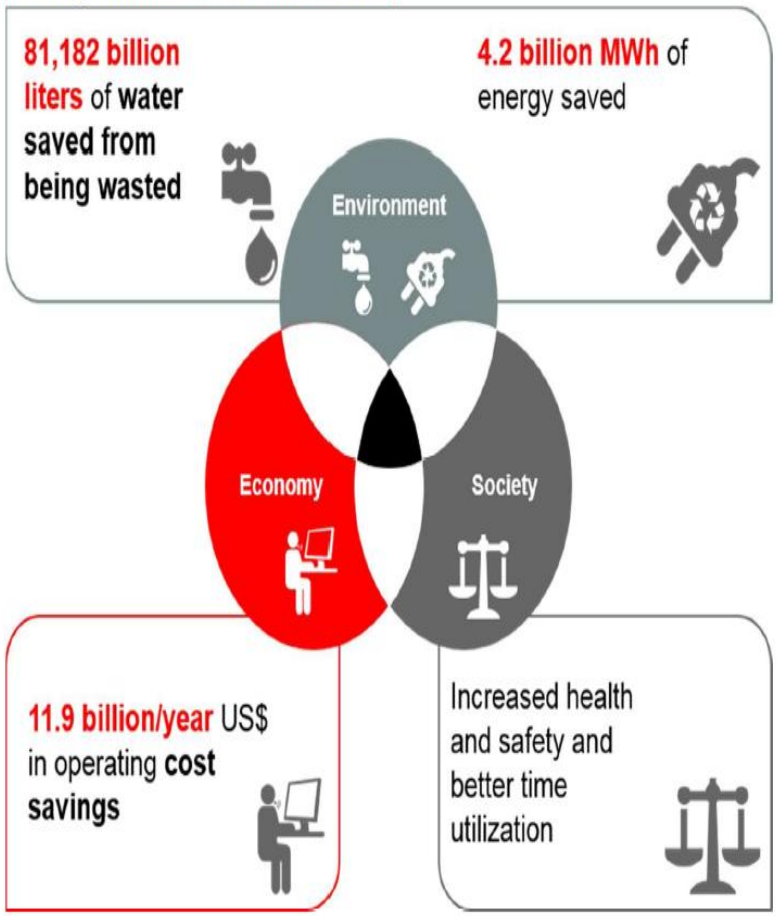
ICT Solutions for 21st Century Challenges

Manufacturing - Future of Smart Manufacturing: Technology Vision for 2030

ICT Tools	Impacts	
Cyber-physical systems (CPS) Industrial Internet of Things (IIoT)1 and M2M Embedded system production technology	**Virtual Manufacturing** • CPS combined with IIoT/M2M and advanced data analytics allows e.g.: • Remote monitoring of physical processes, • Real-time communication and cooperation • Performance management and continuous refinement of processes.	↑ Productivity Quality
Global network Data analytics & cloud computing 3-D printing Drones & Robotics	**Customer-centric production** • Integrating customer preferences in development and production processes, • Decentralized production networks / distributed manufacturing	↑ Flexibility
	Circular Supply Chain Remanufacturing of products, components, and waste; circular packaging.	↑ Resource Efficiency
Augmented reality devices	**Smart services** Creation of a cross-sector ecosystem of services with up- and downstream integration.	↑ Value

Manufacturing - Benefits of Smart Manufacturing



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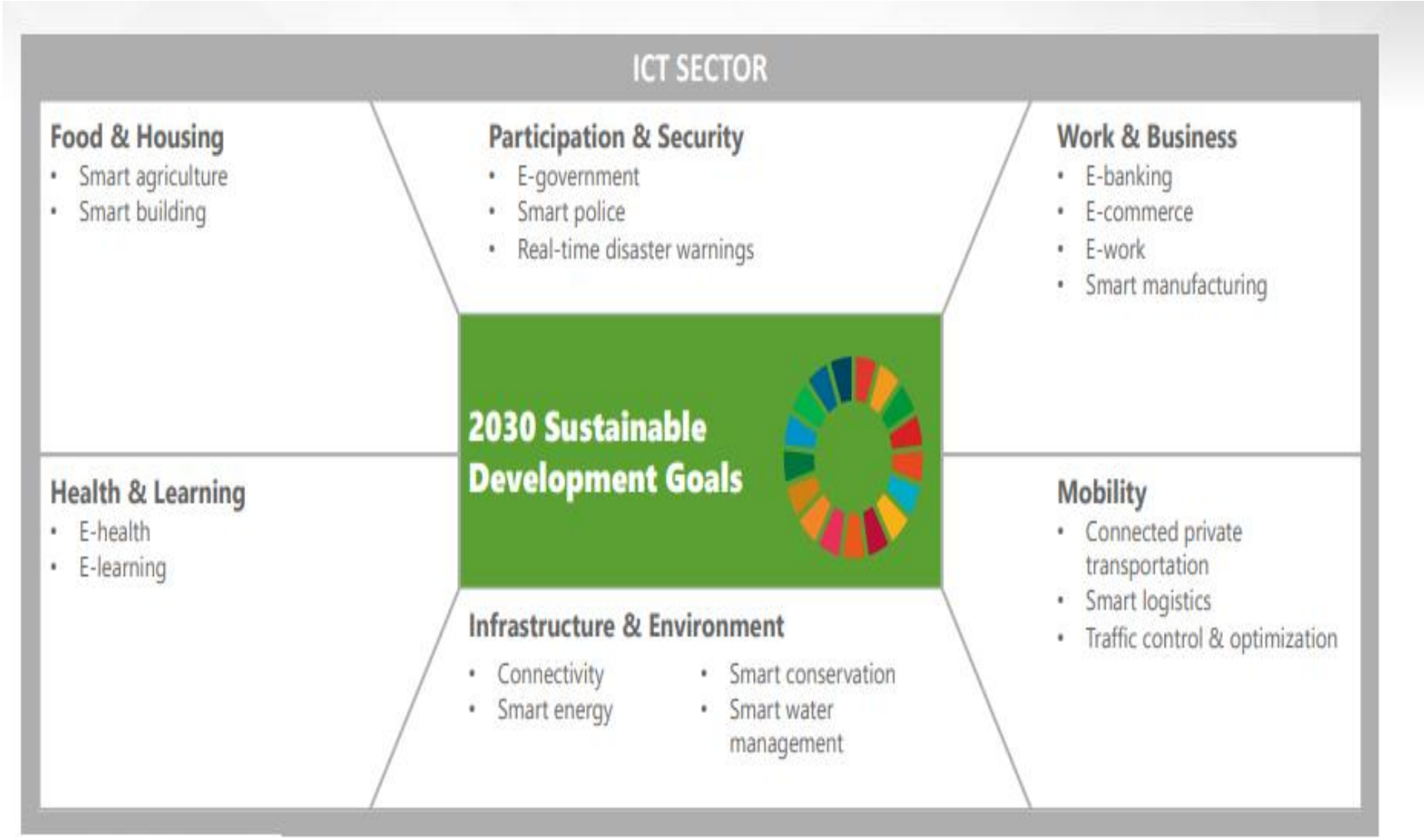
How Digital Innovations Will Help To Achieve All SDGs?

4. Digital Innovations Catalyze the Achievement of all SDGs

- **Connectivity & 17 digital solutions are indispensable to meeting the SDGs for 8.5 bn people by 2030**

#SystemTransformation
HOW DIGITAL SOLUTIONS WILL DRIVE PROGRESS TOWARDS THE SUSTAINABLE DEVELOPMENT GOALS

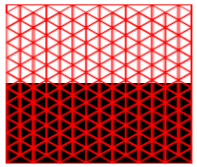


Source: GeSI and Accenture Strategy Analysis, 2016

4. Digital Innovations Catalyze the Achievement of all SDGs

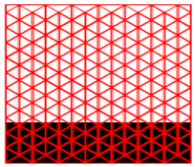
- **Status of the world analysis results - performance towards SDG achievement in per cent of countries**

Gaps



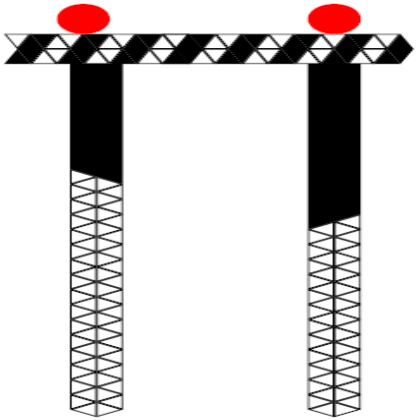
50%

Every country has achievement gaps in greater than 50% of SDGs.



25%

25% of countries have achievement gaps in all 17 SDGs.



Roadblocks

Regulatory barriers such as intellectual property protection, poor regulations and infrastructure & connectivity monopolies.

Financial barriers such as lack of capital on the supply side, low affordability and digital skills on the demand side.

Ethical barriers such as digital trust, cyber crime and negative impacts on employment.

Source: GeSI and Accenture Strategy

4. Digital Innovations Catalyze the Achievement of all SDGs

❑ 65% of SDGs with a positive link to digital access

Correlations of GeSI's Digital Access Index with SDG Index
for all 17 SDGs and 157 countries

On the SDG level of analysis, 3 patterns of relationship between digital access and SDG achievement appear:

– 11 of 17 SDGs (65%) have a positive link with digital access

– 1 SDG (SDG 12) has a negative correlation with digital access (explored in the section about negative environmental aspects below)

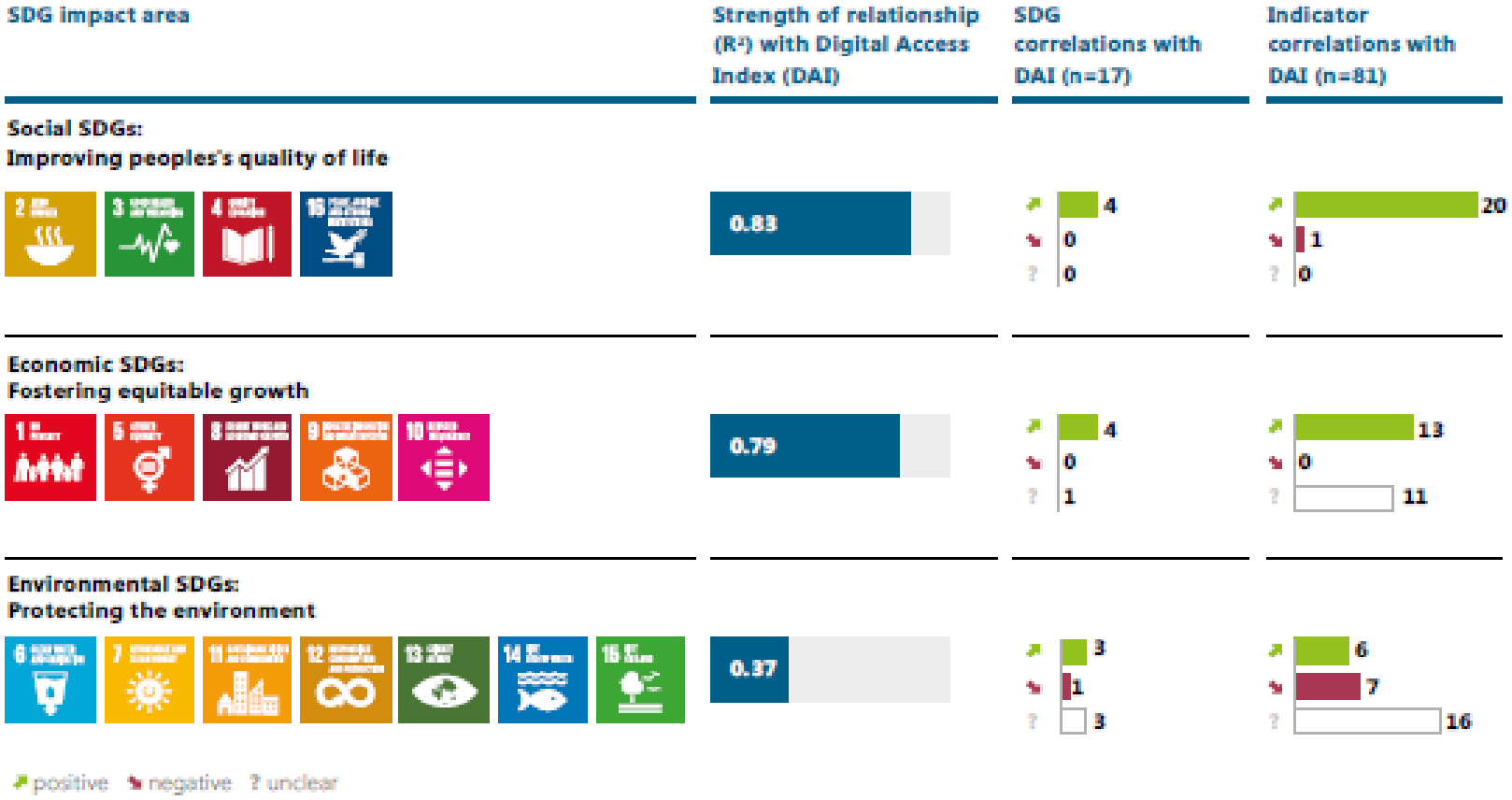
– 5 SDGs have a yet unclear relationship to digital access

Source: GeSI and Accenture Strategy

4. Digital Innovations Catalyze the Achievement of all SDGs

- **Digital's strong positive relationships with social and economic SDGs; a mixed picture for environmental SDGs**

Correlations for SDG impact areas of GeSI's Digital Access Index with SDG achievement globally (157 countries)

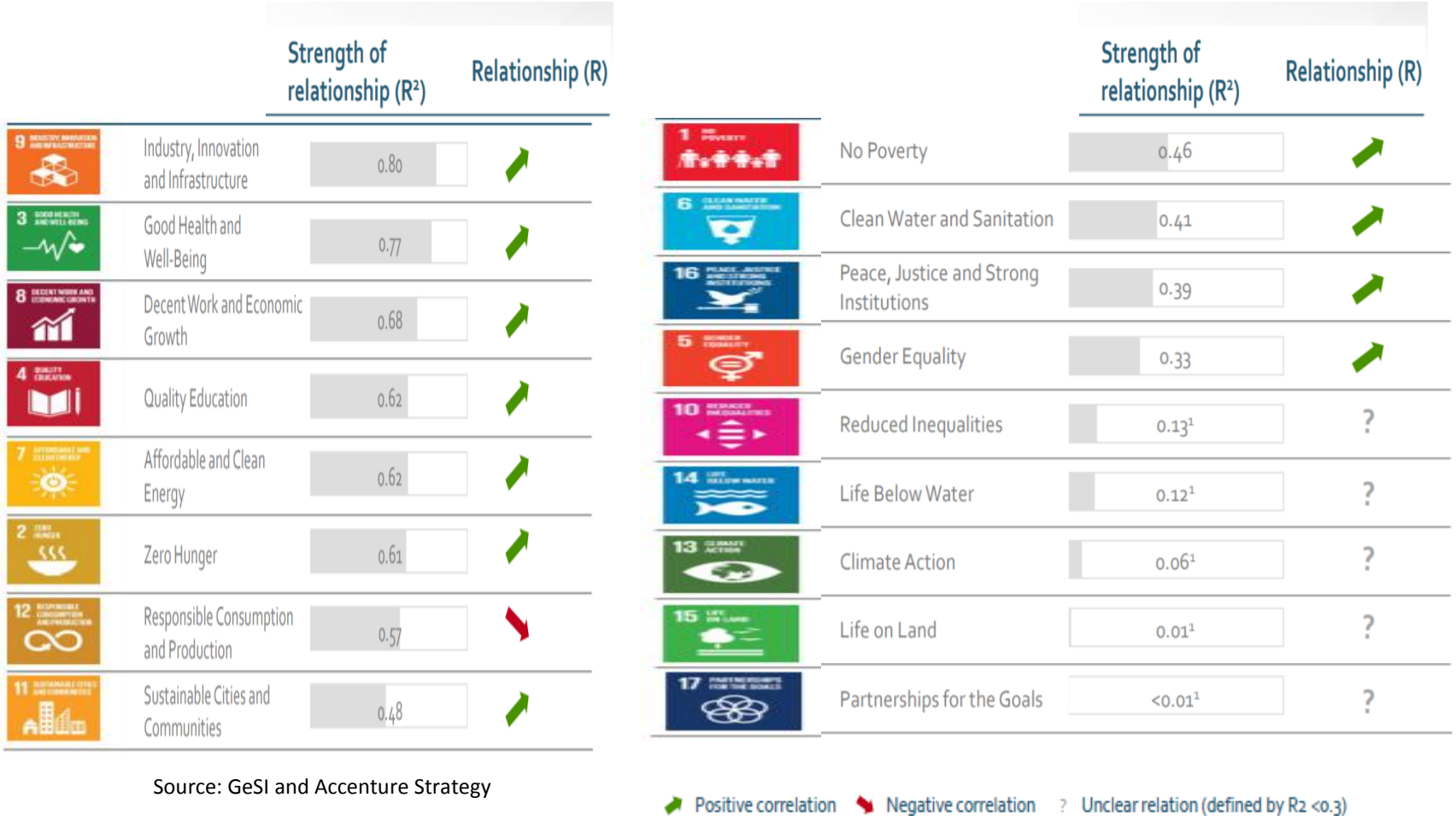


Source: GeSI and Accenture Strategy

4. Digital Innovations Catalyze the Achievement of all SDGs

- **SDGs 9, 3, 8, 4 and 7 have the strongest correlation with digital access on an index level**

Correlation strength and relationship per SDG



Source: GeSI and Accenture Strategy

Why Is Current Digital Development Unsustainable?

5. The Unsustainable Truth About Digital future

❑ The Rebound Effect

The rebound effect refers to the relationship between improvements in technological efficiency which lead to an increase in per capita consumption (http://www.cdist.dk 2014).

Rebound effect

Increase of consumption

Technology innovation

Reduction of cost (time, money, place, linked to effort, etc.)

Leaves room (time, money, space, etc.)

The savings in energy or resources initially predicted by the use of a new technology are partially or completely compensated following the adaptation of society's behavior.

5. The Unsustainable Truth About Digital future

❑ The Rebound Effect

- **Income effect**: We reduce the energy intensity of a service => its cost drops => the savings thus made allow us to consume more of this same service.
- **Comfort effect**: The consumer considers that he has reached a satisfactory level of consumption of the service whose price has dropped => he otherwise spends the money saved => increases the flow of materials and the dispersion of resources in society.
- **Time effect**:
  - Transport: technologies make it possible to reduce journey times => they promote rapid transport and individual journeys at the expense of collective journeys => road congestion, longer queues at airports, etc.
  - Internet: a wealth of information just a click away => we spend more hours reading.

5. The Unsustainable Truth About Digital future

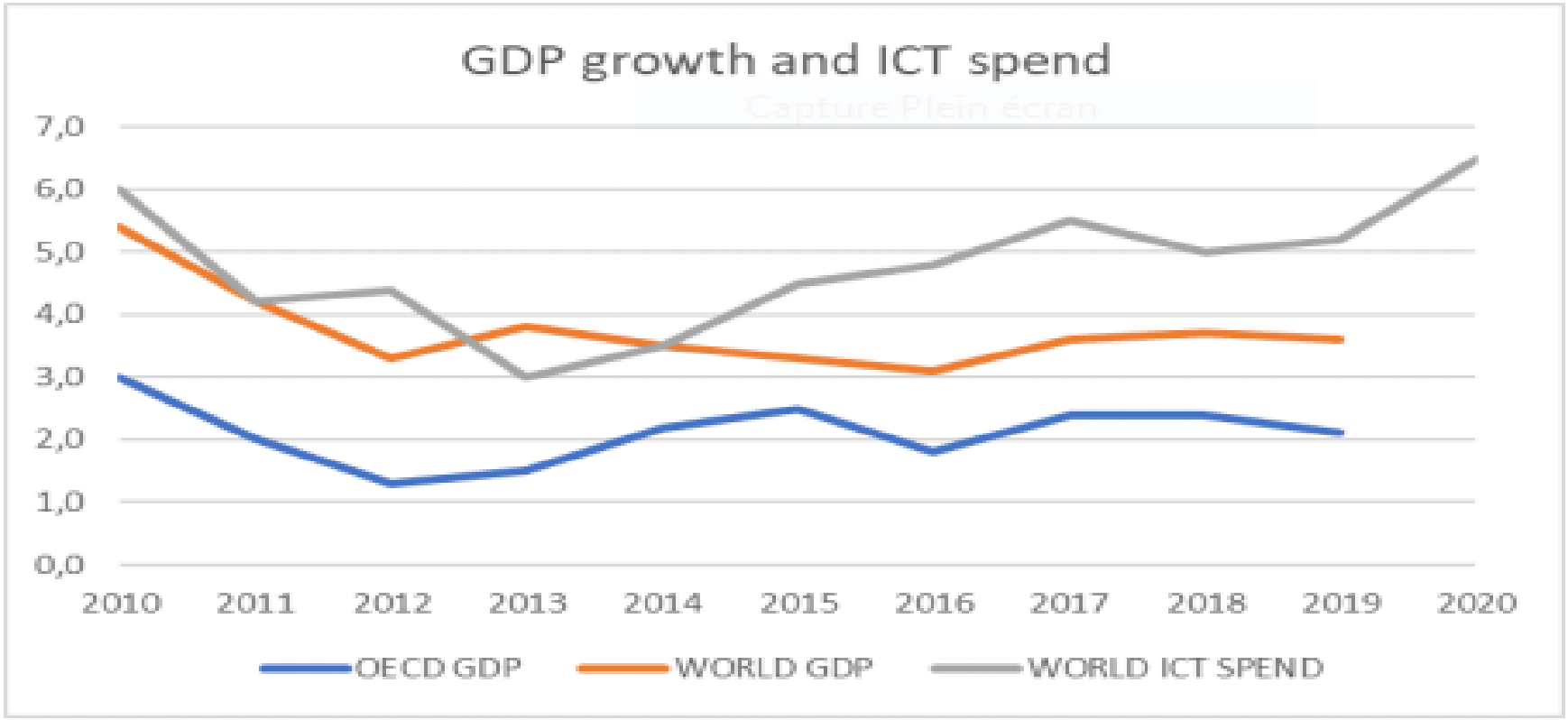
❑ The Rebound Effect

- **ICT saves us time** … but the number of hours spent using it is increasing!
- **Online commerce**: saving time => easier to buy?
- **Distribution of ERP software** => strong increase in productivity => increase in the number of tasks achievable per person.
- **Server optimization** => the stored GB becomes cheaper (& e.g. we can make the cloud!)
- **Volume effect**: flat screens take up less space => you can put it anywhere

Up to now, the rebound effects have proven themselves to be greater than the gains provided by technological innovation (Magee & Devezas, 2017).

5. The Unsustainable Truth About Digital future

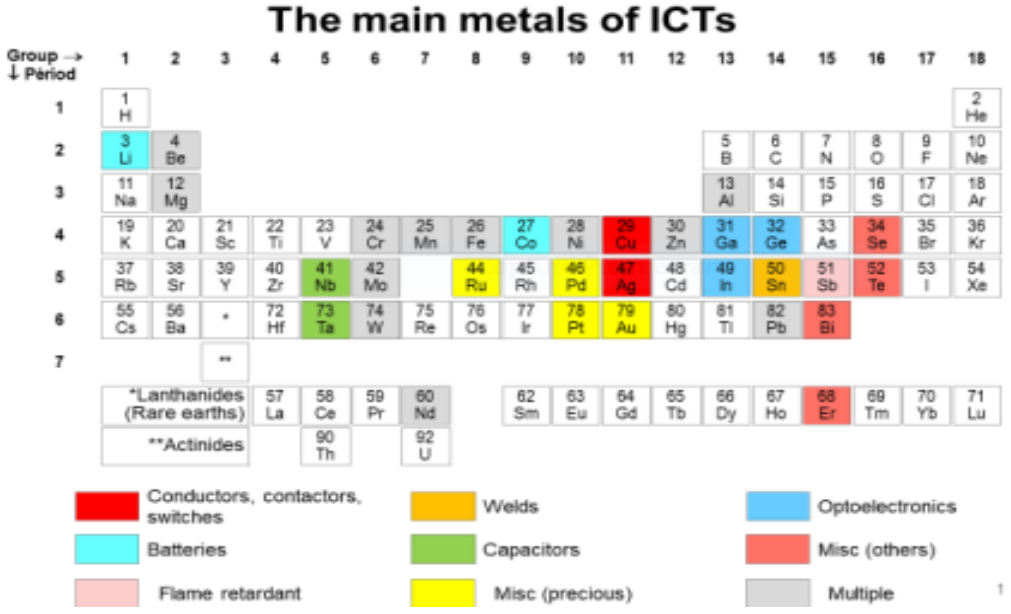
- **Digital overconsumption does not have a perceivable impact on global economic performance**



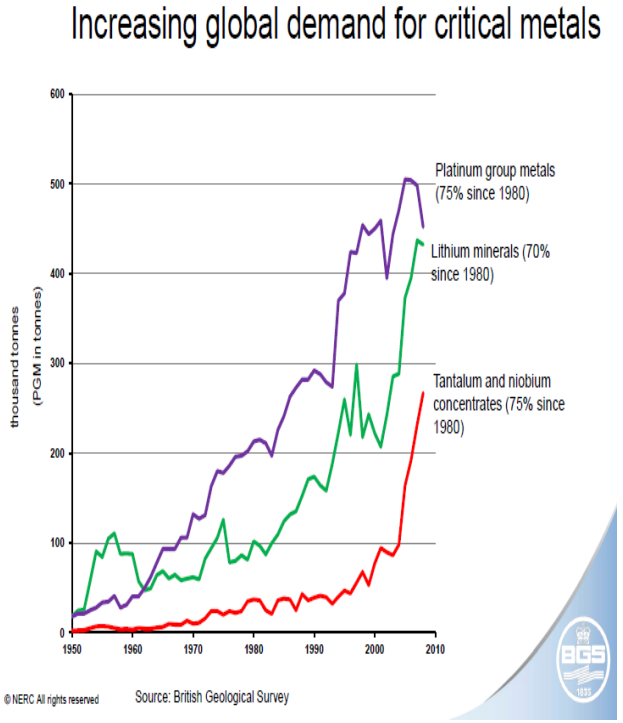
Source: IDC, IDC State of the Market 4Q17: IT Spending Review and Outlook, 2017

5. The Unsustainable Truth About Digital future

❑ ICTs Are Non-renewable Resources



Source. Bihouix P. , 2015

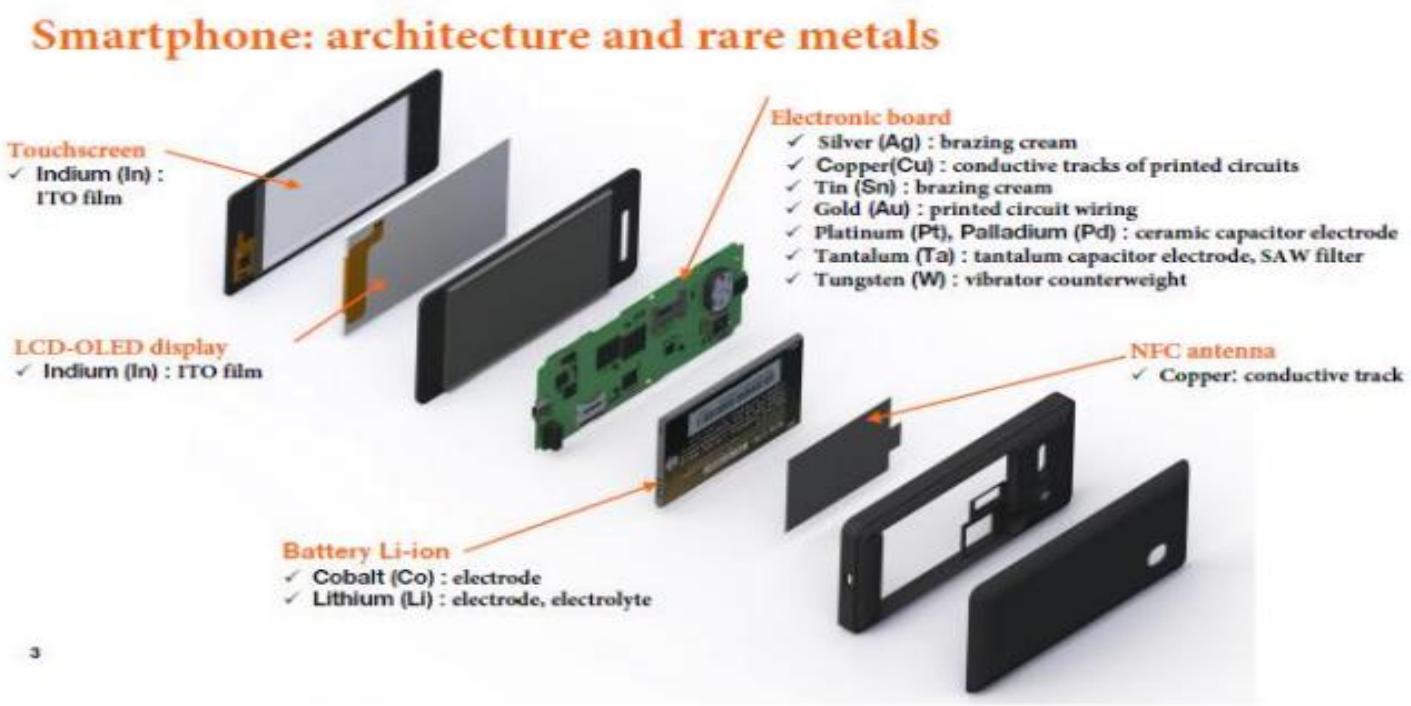


The production of digital equipment makes it a heavy consumer of metals, some of which are rare and/or critical and whose accessible reserves (at current cost and with current technologies) are limited. Many of them also present probable production peaks in the decades to come. This situation is likely not only to weaken the development of uses but also to undermine the resilience of our digital societies.

5. The Unsustainable Truth About Digital future

❑ ICTs Are Non-renewable Ressources

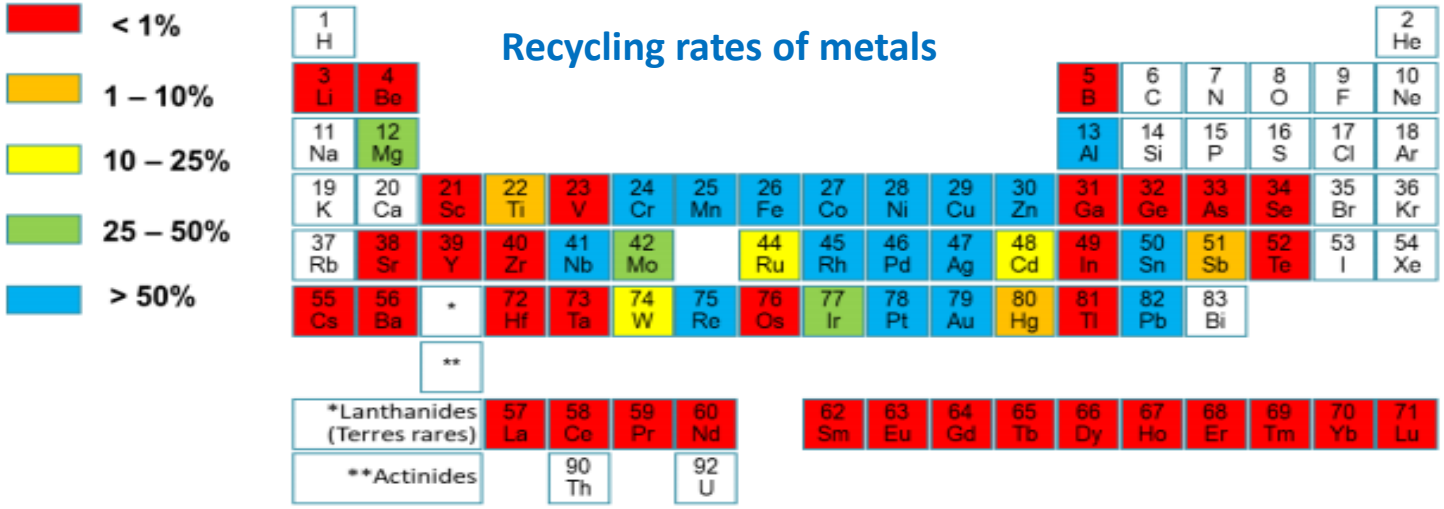
For example, at least forty metals are present in a smartphone, each in quantities ranging from a few milligrams to several tens of grams



Source : Orange Labs, 2017

5. The Unsustainable Truth About Digital future

❑ ICTs Are Non-renewable Ressources



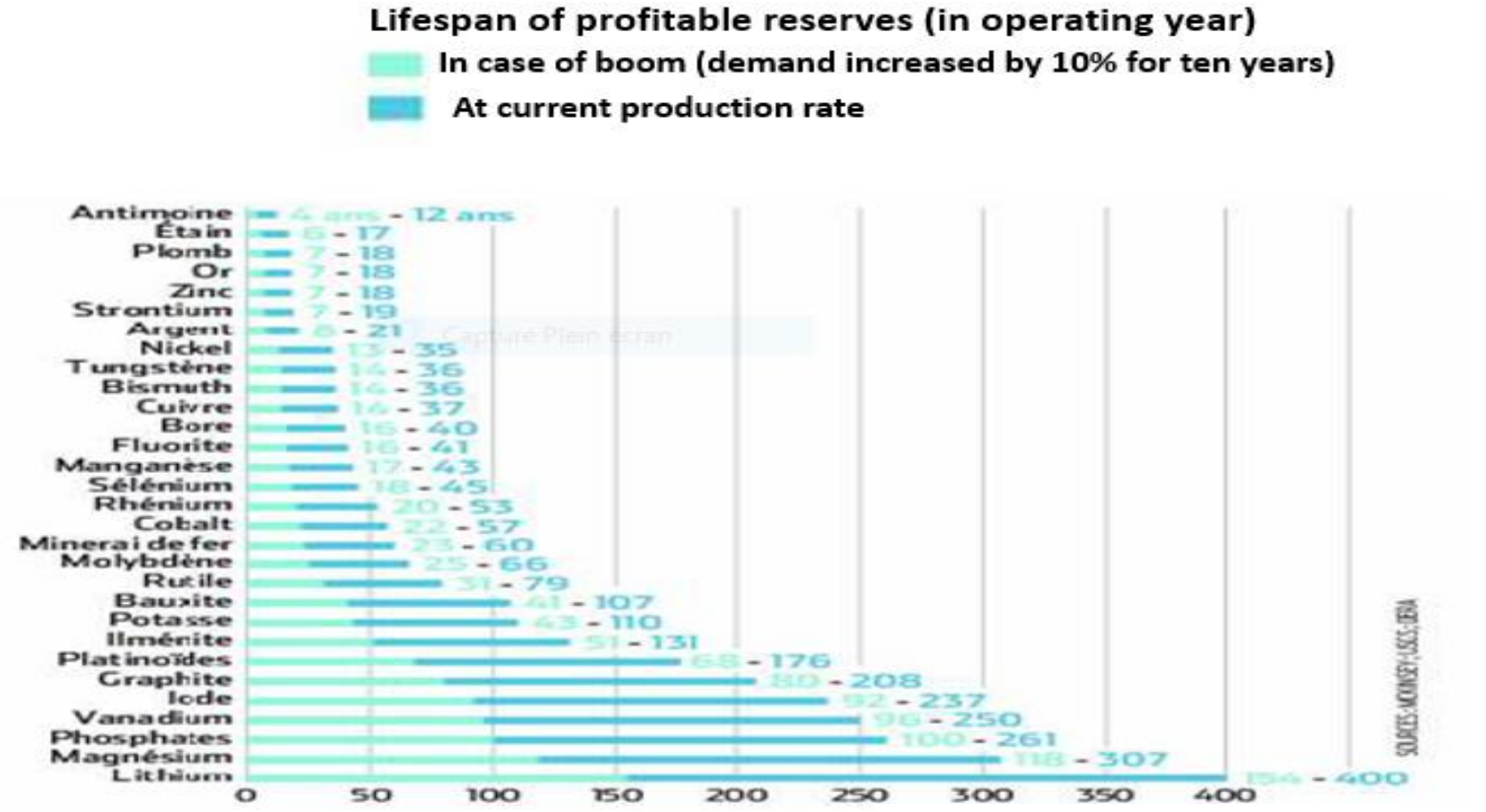
Source: Recycling rates of metals, UNEP, 2011

Recycling also becomes more difficult as the number of metals in a component increases and concentrations decrease. This situation can therefore lead to a technological dead end if the growth in needs does not slow down, especially since many of these metals are also used (World Bank, 2017) in large proportions for the production of equipment needed for renewable energies (wind, solar), as shown in the table.

5. The Unsustainable Truth About Digital future

❑ ICTs Are Non-renewable Ressources

- ➢ They will have disappeared in 1 or 2 generations

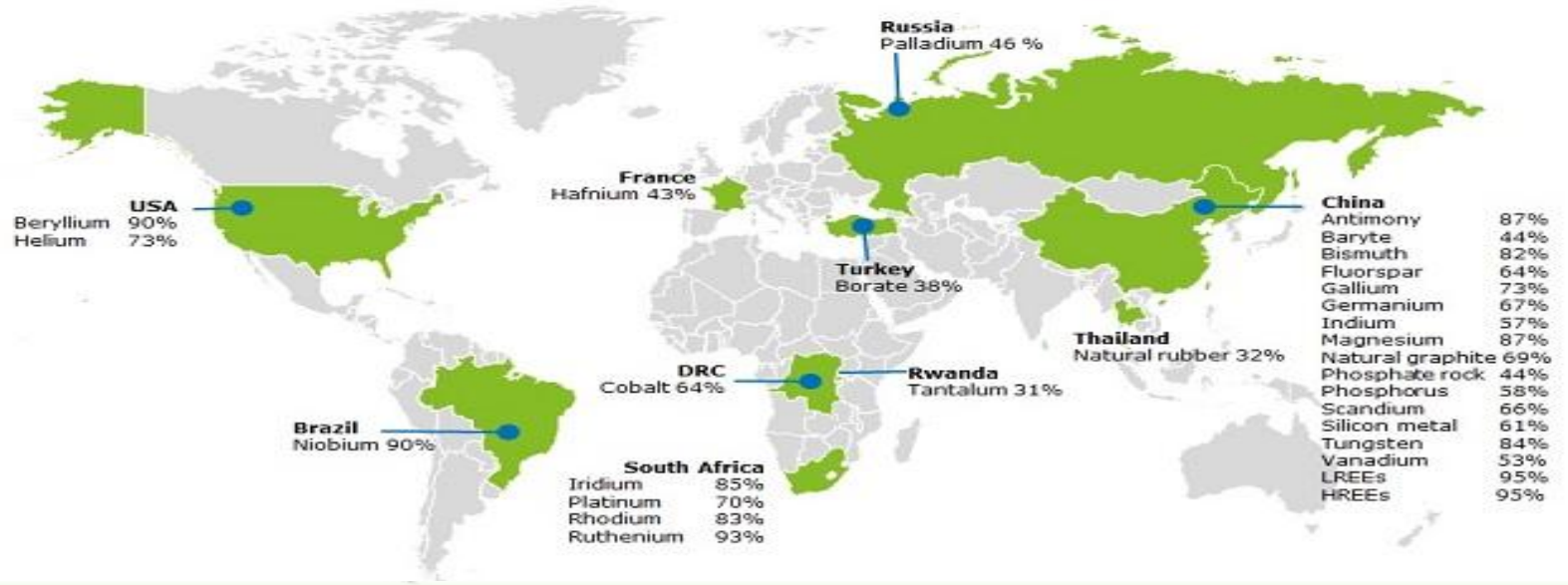


Source : « Empreinte environnementale du numérique mondial », GreenIT.fr, 2019

5. The Unsustainable Truth About Digital future

❑ Rare Earth Supply: Concentration of Ressources in China

Countries accounting for largest share of global supply of CRMs



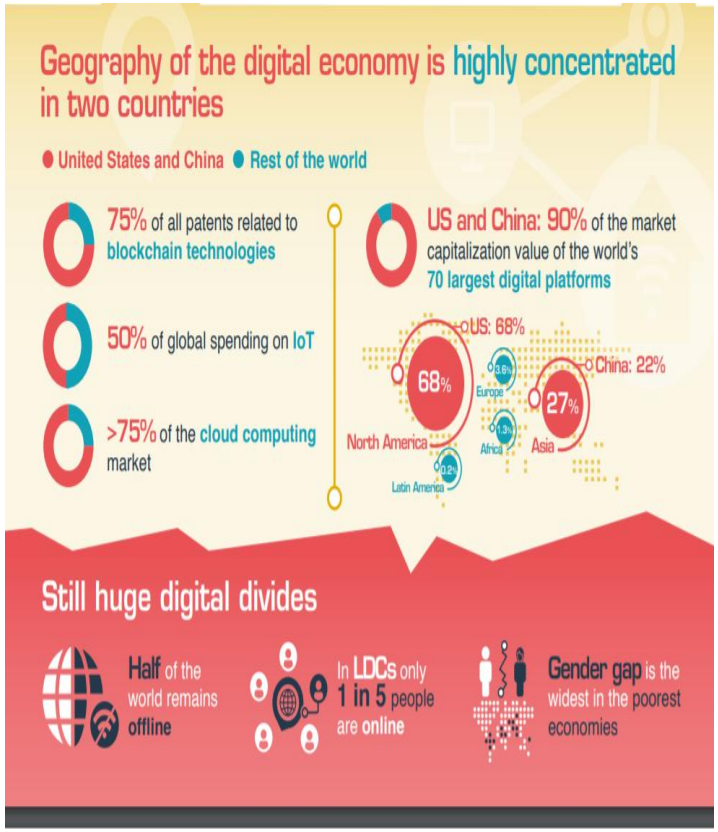
- ✓ Most of these rare metals are produced either in highly unstable countries (for example, 65% of the world's production of cobalt comes from the Democratic Republic of Congo), or almost monopolistically by a superpower (**90%** of the production of rare earths is under the control of China, which consumes **60%** (Lepesant, 2018).
- ✓ This situation involves supply risks, or at least pressures on prices, both of which can brutally call into question industrial choices and thus the functioning of our societies, which are increasingly reliant on digital infrastructures.

5. The Unsustainable Truth About Digital future

❑ Digital innovation is a source of inequalities

Current digital consumption is very polarized

Regional split 2016	Population (millions)	Devices per capita	Traffic per capita (GB/mth)	GES (MtCO2e)	GES per capita (kgCO2e)
USA	322	7,8	97,0	331	1027
Western Europe	415	5,3	34,0	201	486
Japan	126	6,3	35,0	60	474
China	1374	2,5	12,0	400	291
Developing countries	3700	1,1	1,5	238	64
World	7500	2,3	13,0	1630	217

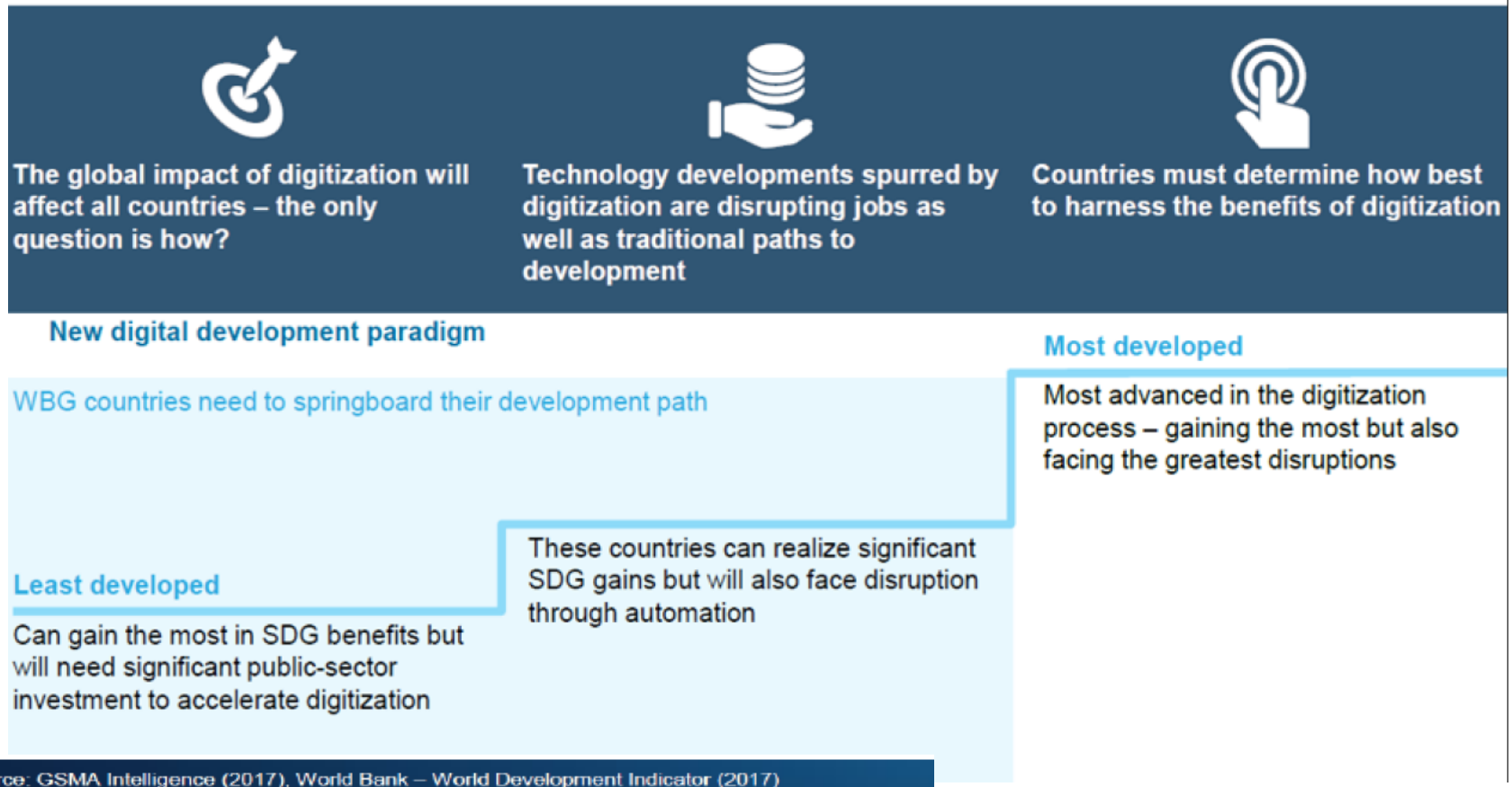


Source: [Lean ICT Materials] Forecast Model. Produced by The Shift Project from data published by (Cisco, 2017b)]

5. The Unsustainable Truth About Digital future

❑ Digital innovation is a source of inequalities

Digital disruption will impact countries differently and could exacerbate global inequality



Source: GSMA Intelligence (2017), World Bank – World Development Indicator (2017)
See Annex, pp20-24 for additional data on the emerging digital divide and trends in the digital sector

How To Govern The Transformation Toward Sustainability In The Digital Age?

6. How to Govern the Transformation Toward Sustainability in the Digital Age?

The worldwide systemic effects of the current digital transition are for now highly uncertain. With appropriate governance, digital transition can be more sustainable and sober. The report TWI2050 (2018) highlights Six Fundamental Transformations needed to achieve the 17 SDGs and long-term sustainability for all: They are necessary and potentially sufficient to achieve the SDGs if addressed holistically and in unison".

6. How to Govern the Transformation Toward Sustainability in the Digital Age?

❑ Six Fundamental Transformations

- (i) *Human Capacity & Demography* : Substantial advances in human capacity are needed through further improvements in education and health care.
- (ii) *Consumption & Production:* Responsible consumption and production cut across several of the other transformations, allowing us to do more with less.
- (iii) *Decarbonization & Energy:* It is possible to decarbonize the energy system while providing clean and affordable energy for all.
- (iv) *Food, Biosphere & Water:* Achieving access to nutritional food and clean water for all while protecting the biosphere and the oceans requires more efficient and sustainable food systems.
- (v) *Smart Cities:* Transforming our cities will benefit most of the world's population.
- (vi) ***Digital Revolution:*** Science, technology and innovations are a powerful driver, but the direction of change needs to support sustainable development.

Source: TWI2050 (2018).

6. How to Govern the Transformation Toward Sustainability in the Digital Age?

❑ Six Essential Mechanisms

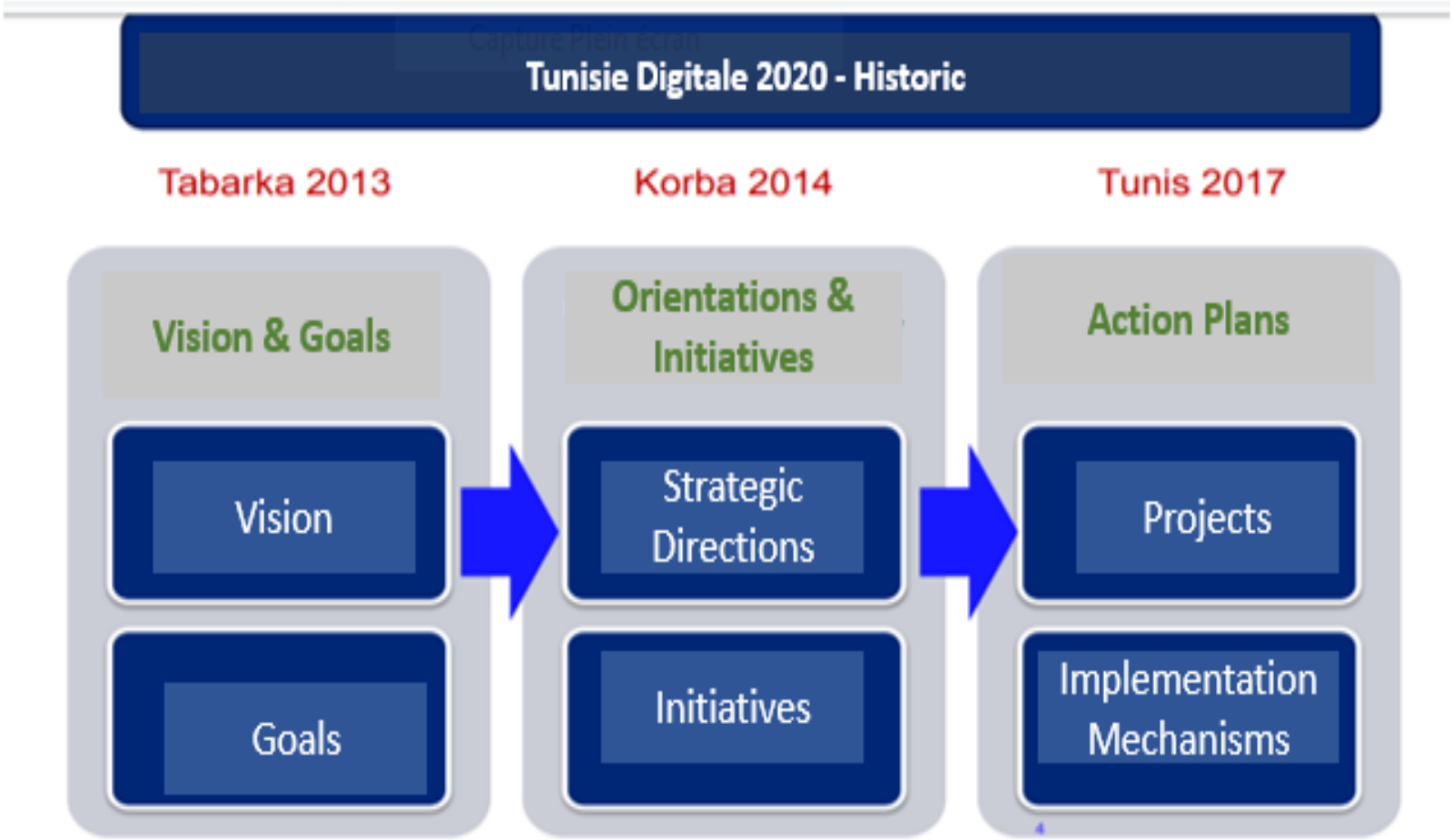
The report TWI2050 (2018) proposes **Six Essential Mechanisms** that can link digital dynamics with sustainability strategies to enable the **Six Fundamental Transformations**:

- **(I)** ***Shifting innovation vision and patterns*** by creating sustainable digitalization perspectives in the science, research, and R&D communities;
- **(Ii)** ***Mobilizing market forces*** by getting the prices right, for example, through carbon pricing and ecological tax reforms that incentivize the mobilization of digital innovations in support of sustainable solutions;
- **(iii)** Helping to ***shift markets*** and planning processes in a sustainable direction by using digitalization to visualize and establish transformation roadmaps that include sharper definitions of clear goals and milestones for energy, mobility, land use systems, cities, and industrial sectors;
- **(iv)** ***Investing in digital modernization programs*** *at the state level* to massively increase digital knowledge in public institutions in order to build governance capacities in the digital age;
- **(v)** ***Transforming sustainability*** *research* by supporting and scaling up strong networks with the digital research communities; and
- **(vi)** ***Creating dialogue structures*** with the private sector, civil society, science, and the state to develop joint perspectives on institutional, social, and normative guardrails in the digital age.

What Is The Reality Of Digital Transformation Strategy In Tunisia?

7. What Is The Reality Of Digital Transformation Strategy In Tunisia?

❑ National Strategic Plan « Tunisie Digitale 2020 » (PNS 2020)



7. What Is The Reality Of Digital Transformation Strategy In Tunisia?

❑ Vision & Strategy « Tunisie Digitale 2020»

Vision →

Become an international digital reference and make ICT an important lever for socio-economic development

Strategic axes →

- Ensure **social inclusion** and reduce the digital divide
- Strengthening digital culture through generalization
- Evolving to an **e-Administration**
- Contribute to the **reduction of unemployment** and the creation of jobs in the digital and Offshoring sectors as well as the creation of national champions.
- Support the **creation of added value**, a guarantee of the sustainability of businesses and jobs, by supporting entrepreneurship and stimulating innovation.
- Improve the **competitiveness of businesses**, all sectors combined, by investing in ICT and positioning in the digital economy.
- Ensure Tunisia's transition to digital via the establishment of an appropriate **regulatory framework, governance** and **security environment.**

https://www.mtcen.gov.tn/

7. What Is The Reality Of Digital Transformation Strategy In Tunisia?

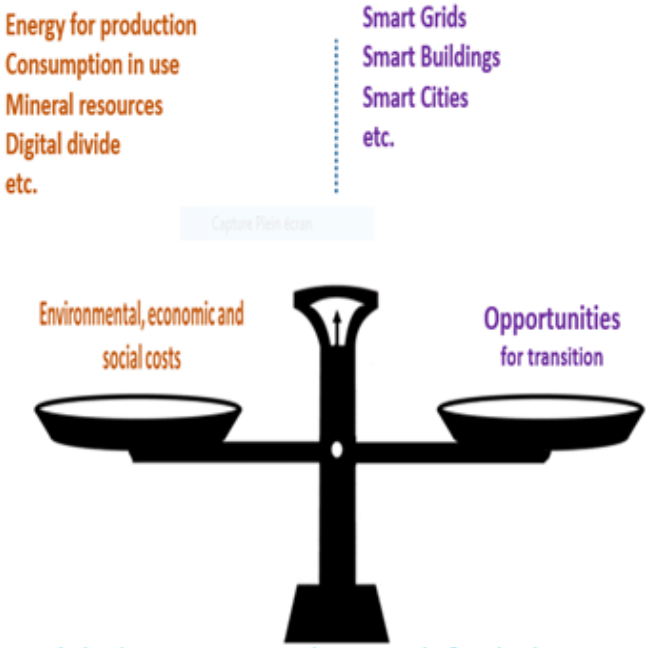
- From « **Tunisie** digitale 2020 » to « Tunisie digitale 2025 »

2019- Launch of the DECA Project: Diagnostic Phase

The DECA (Digital Economy Country Assessment-Etude) exercise has been started, in collaboration between the Ministry of Communication Technologies and the World Bank, since 2019 aims to assess the state of maturity of Tunisia's digital economy. Its results should feed into reflection on the future development and strategy of the 2021-2025 sector.

Conclusion

- Digital innovations can, at a much faster rate than ever before, help (as enablers) decarbonization across all sectors (e.g., energy, mobility, and industry), and promote dematerialization, resource and energy efficiency and sufficiency, the monitoring and conservation of ecological and other Earth systems, the protection of the global commons, and sustainable behaviors. However, this is not an **automatic process** and will not happen by itself. In fact, until now, the opposite has generally been the case:



Digital governance in search for balance

- The digital overconsumption trend is not sustainable in regard to its need for energy and raw materials;
- The digital industry's energy intensity is increasing globally;
- Current digital consumption is highly polarized;
- The rebound effects seem to be greater than the gains provided by digital innovations.

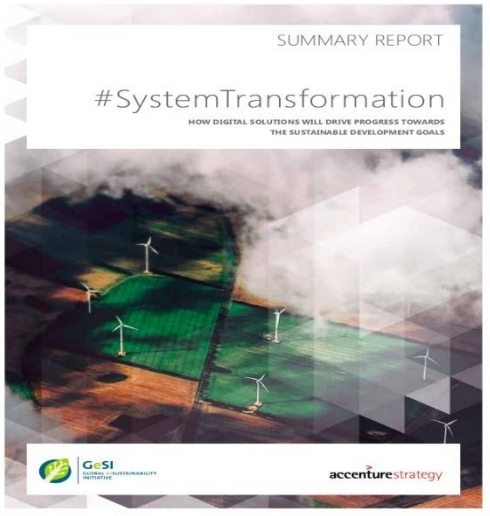
- Technology has not yet been mobilized toward sustainability transformations. Therefore, a **good governance** of current trend is required to reduce the disruptive potentials of digitalization and create pathways toward sustainability and digital sobriety.

Main References

About GeSI

GeSI – Driving the global transformation to a smarter, more sustainable world with digital solutions at its core

Created in 2001, GeSI is a strategic partnership among the world's leading Digital/ICT companies and international organisations committed to advancing digital solutions that foster sustainability, while driving economic growth and productivity.



Main References

The World in 2050

TWI2050 was launched by the International Institute for Applied Systems Analysis (IIASA), the Sustainable Development Solutions Network (SDSN), and the Stockholm Resilience Centre (SRC).

This report is based on the voluntary and collaborative effort of 45 authors and contributors from about 20 institutions, and some 100 independent experts from academia, business, government, intergovernmental and non-governmental organizations from all the regions of the world, who met four times at IIASA to develop science-based strategies and pathways toward achieving the Sustainable Development Goals (SDGs).

Thank you for your attention!

Dr. BEN KHALIFA Adel
adel.ben-khalifa@itceq.tn
benkhalifaadel2013@gmail.com
Chief economist
Tunisian Institute of Competitiveness
and Quantitative Studies