



# ***SMARTer2020: ICT Driving a Sustainable Future***

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**ICT Solutions for Sustainable Lifestyles workshop  
13 February 2013, Zürich**

# GeSI members and partners

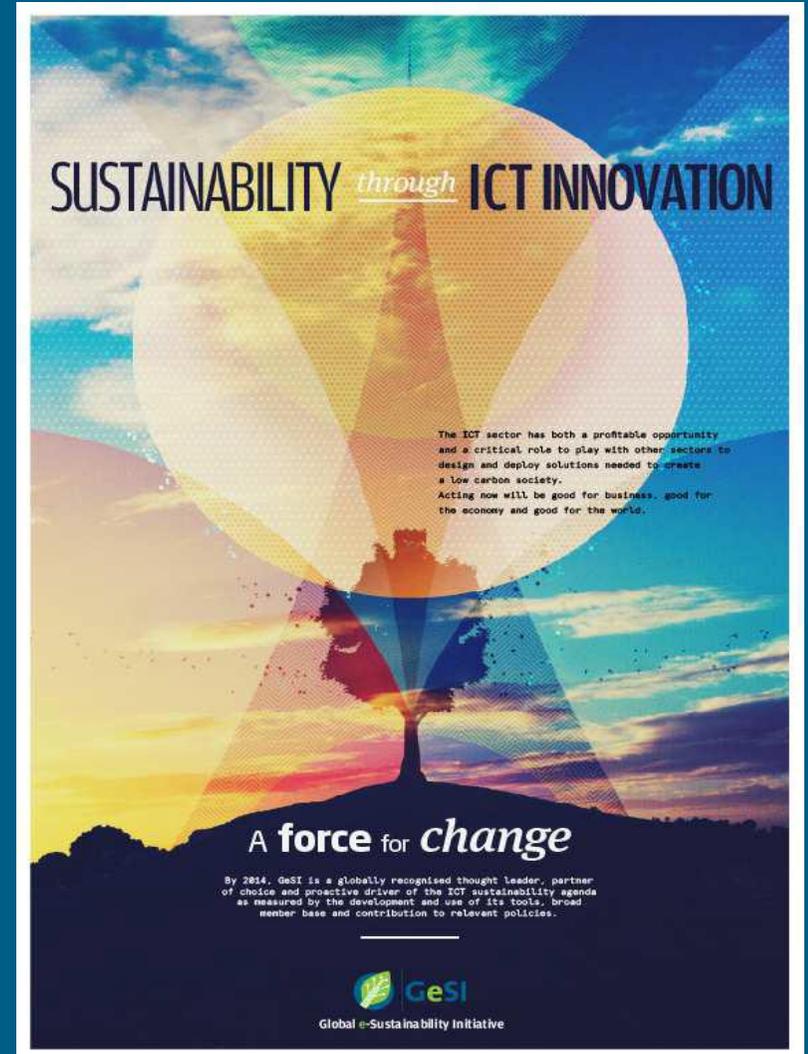
## Members



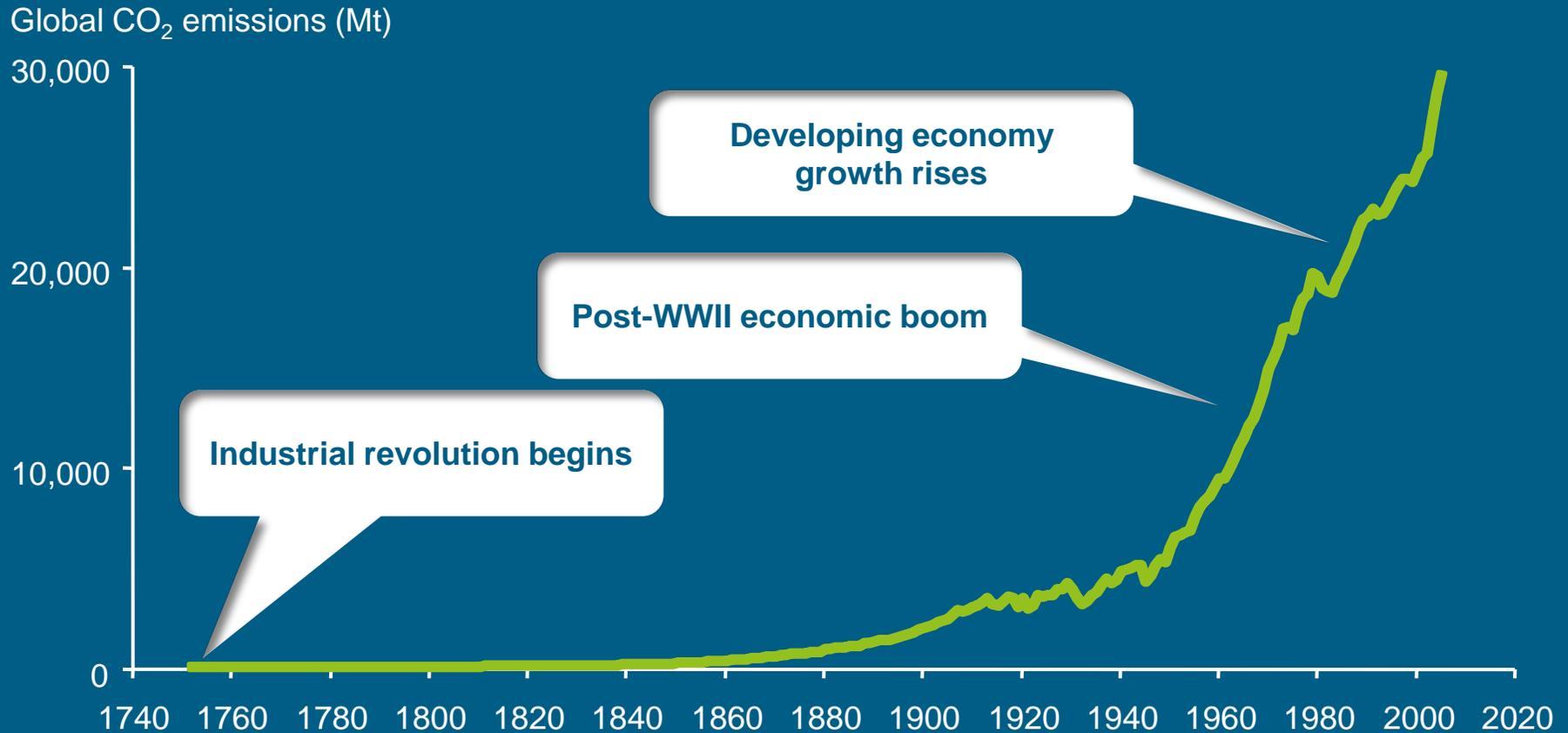
## Partners



A sustainable world through responsible, ICT-enabled transformation.



# Human activity combined with limited emissions abatement has pushed CO<sub>2</sub> emissions to nearly 32,000 Mt in 2009



# GHG emissions lead to dramatic and widespread temperature changes – there are also other destabilizing effects

A circular image showing a bright sun setting behind dark mountain silhouettes, with a warm orange and red sky.

**Temperature changes**

A circular image of a dark, stormy sky with a bright lightning bolt striking down.

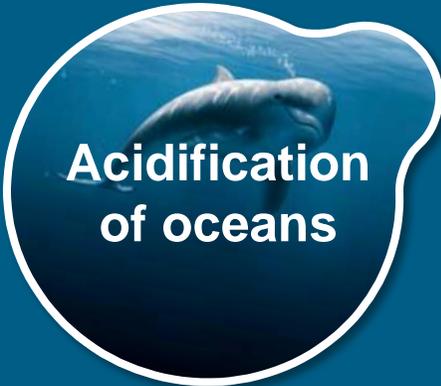
**Weather pattern shifts**

A circular image showing a large, white ice sheet melting and water cascading down a slope.

**Ice sheet melting**

A circular image of a dry, brown landscape with sparse, dead-looking vegetation and a clear sky.

**Rainforest dieback**

A circular image of a dolphin swimming underwater, with sunlight filtering through the water.

**Acidification of oceans**

A circular image of an elephant standing in a lush, green forest setting.

**Species extinction**

# We have re-evaluated ICT's potential to enable a low-carbon economy in 2020

*SMARTer 2020 follows up the SMART 2020 study, which first evaluated ICT's potential to enable a low-carbon economy in 2020*

*In 2008*



**SMART2020**

*Today*



**SMARTer 2020**

# The potential for information technology to reduce global carbon emissions has been under-estimated until now

**9.1 GtCO<sub>2</sub>e**

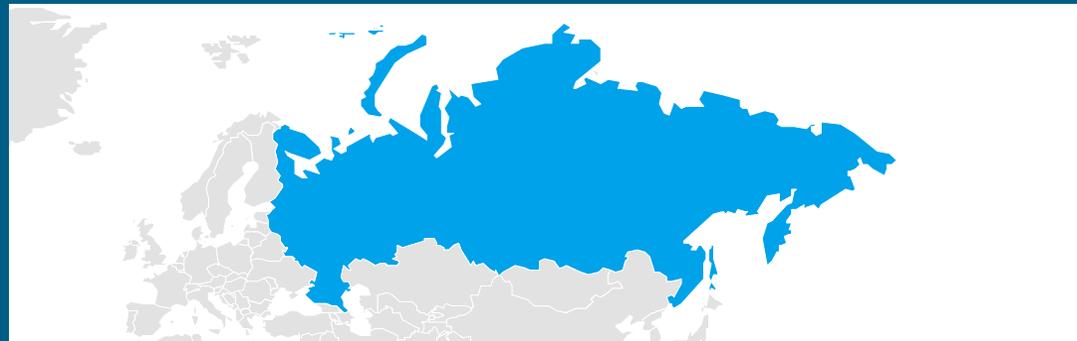
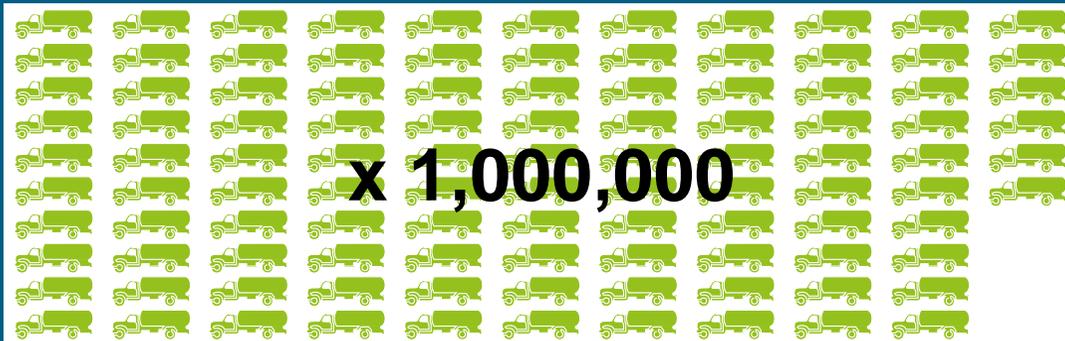
Total abatement potential of  
ICT-enabled solutions in 2020

**16.5%**

% of global GHG emissions  
in 2020

# 9.1 gigatons of GHG emissions amounts to USD1.9 trillion in gross energy and fuel savings

Savings of 21.6 billion barrels of oil<sup>1</sup>



Equivalent to GDP of the Russian economy<sup>2</sup>

1. Number of barrels of oil with equivalent emissions assuming Barrel of oil emits 0.43 metric tons of CO<sub>2</sub> 2. At today's crude oil price, value of the oil that would be saved (\$87.99 per barrel of crude oil as of Nov 6, 2012)

# The new research study identifies GHG abatement potential from ICT-enabled solutions ranging across six sectors

## Example 1: Smart farming

**Agriculture &  
Land-Use**



**Buildings**



**Manufacturing**



**Power**



**Service &  
Consumer**



**Transportation**



# The new research study identifies GHG abatement potential from ICT-enabled solutions ranging across six sectors

## Example 2: Automation of industrial processes

Agriculture &  
Land-Use



Buildings



Manufacturing



Power



Service &  
Consumer



Transportation



# The new research study identifies GHG abatement potential from ICT-enabled solutions ranging across six sectors

## Example 3: Integration of renewables

Agriculture &  
Land-Use



Buildings



Manufacturing



Power



Service &  
Consumer

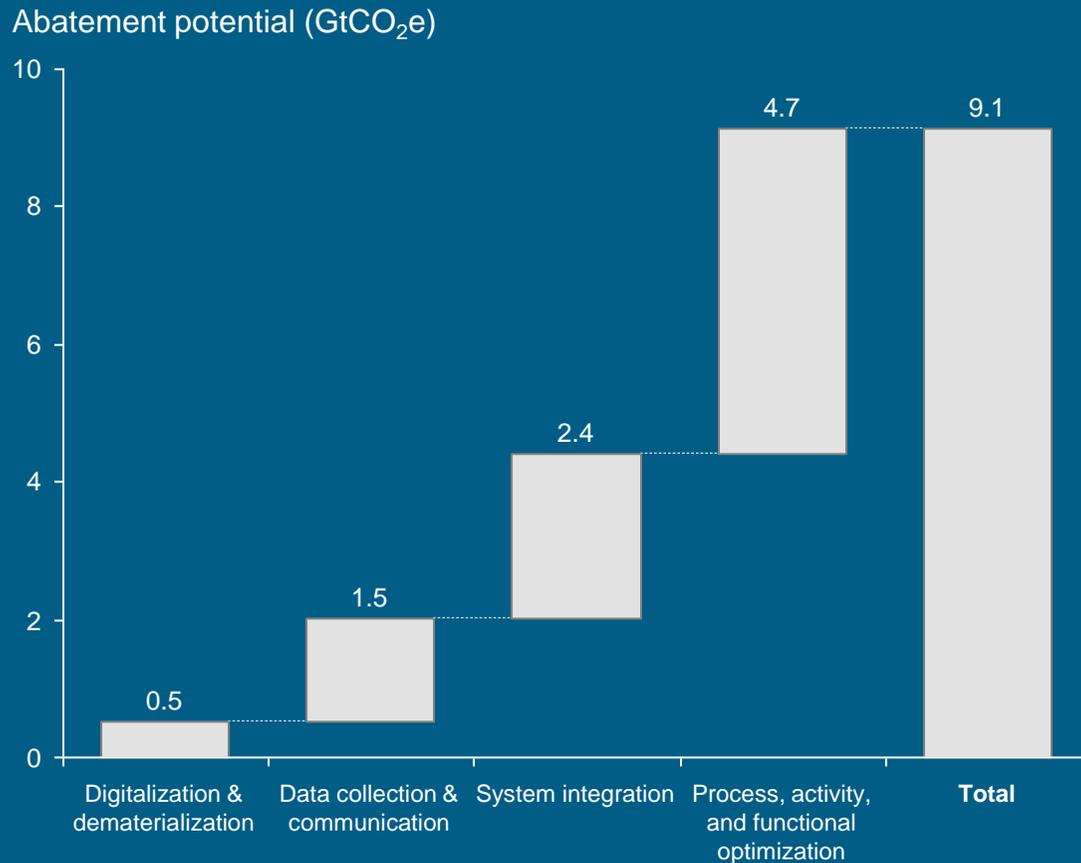


Transportation



# Emission reductions come from virtualization initiatives such as cloud computing, but also through efficiency gains

## Abatement potential by change lever



1. Of global GHG emissions in 2020  
Source: BCG analysis

## Major drivers

0101010  
1001000



Digital. & dematerial.

- Establishment of technologies that **substitute** or **eliminate** the need for a carbon-intensive product
- Not many new technological innovations in change lever



Data coll. & Comm.

- Trends in **increased data complexity** require real time analysis and communication
- Social media** and networking are also a major driver



System integration

- Driven by solutions that **manage** the use of resources (e.g. building management system) and **integrate** less-carbon intensive processes (e.g. renewables)

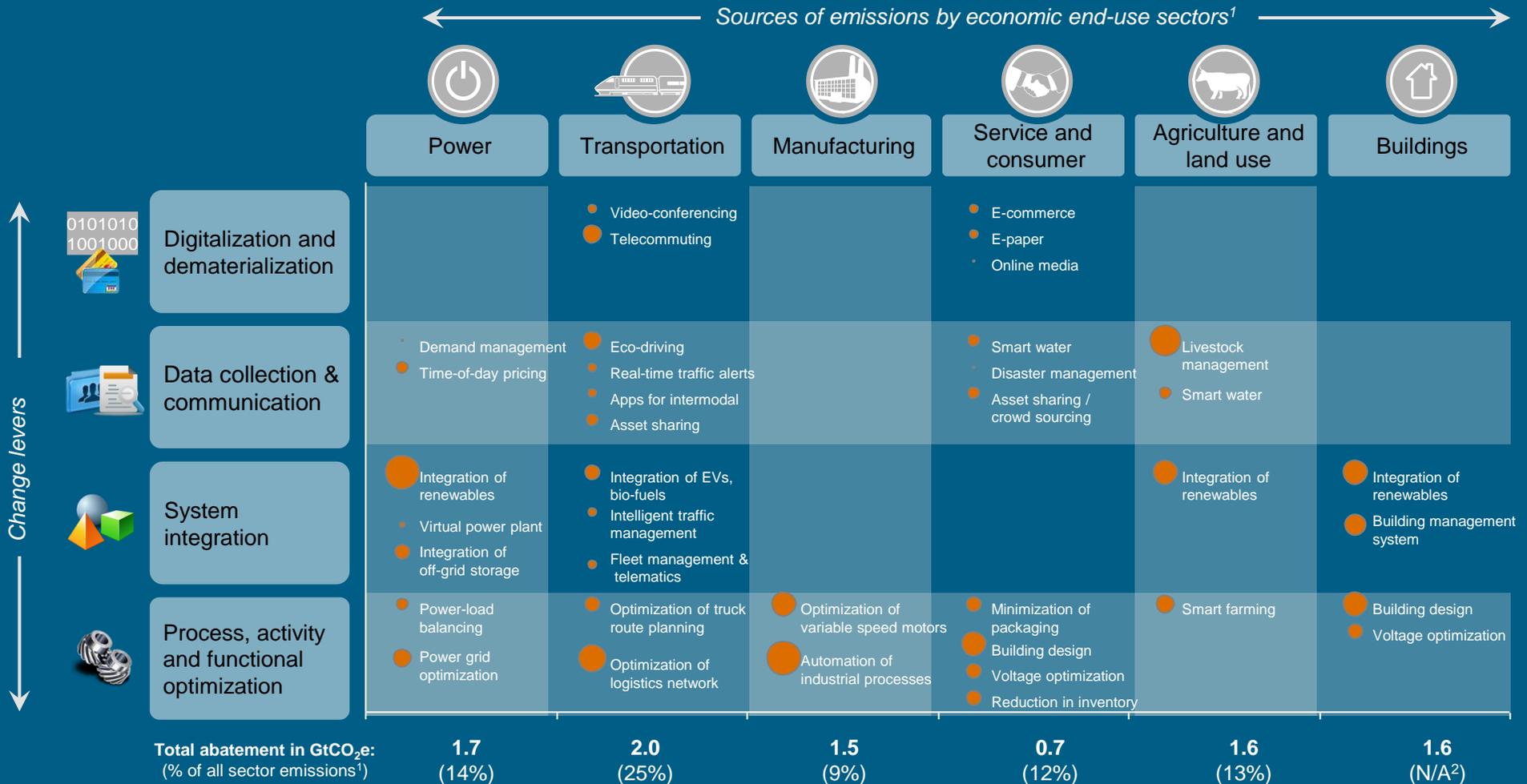


Optimization

- Result of **intelligent** simulation, automation, redesign, or control
- Improved **processing power** driving growth of change lever

# 35 ICT-enabled abatement solutions identified in the study

Abatement potential modeled individually for each sublever



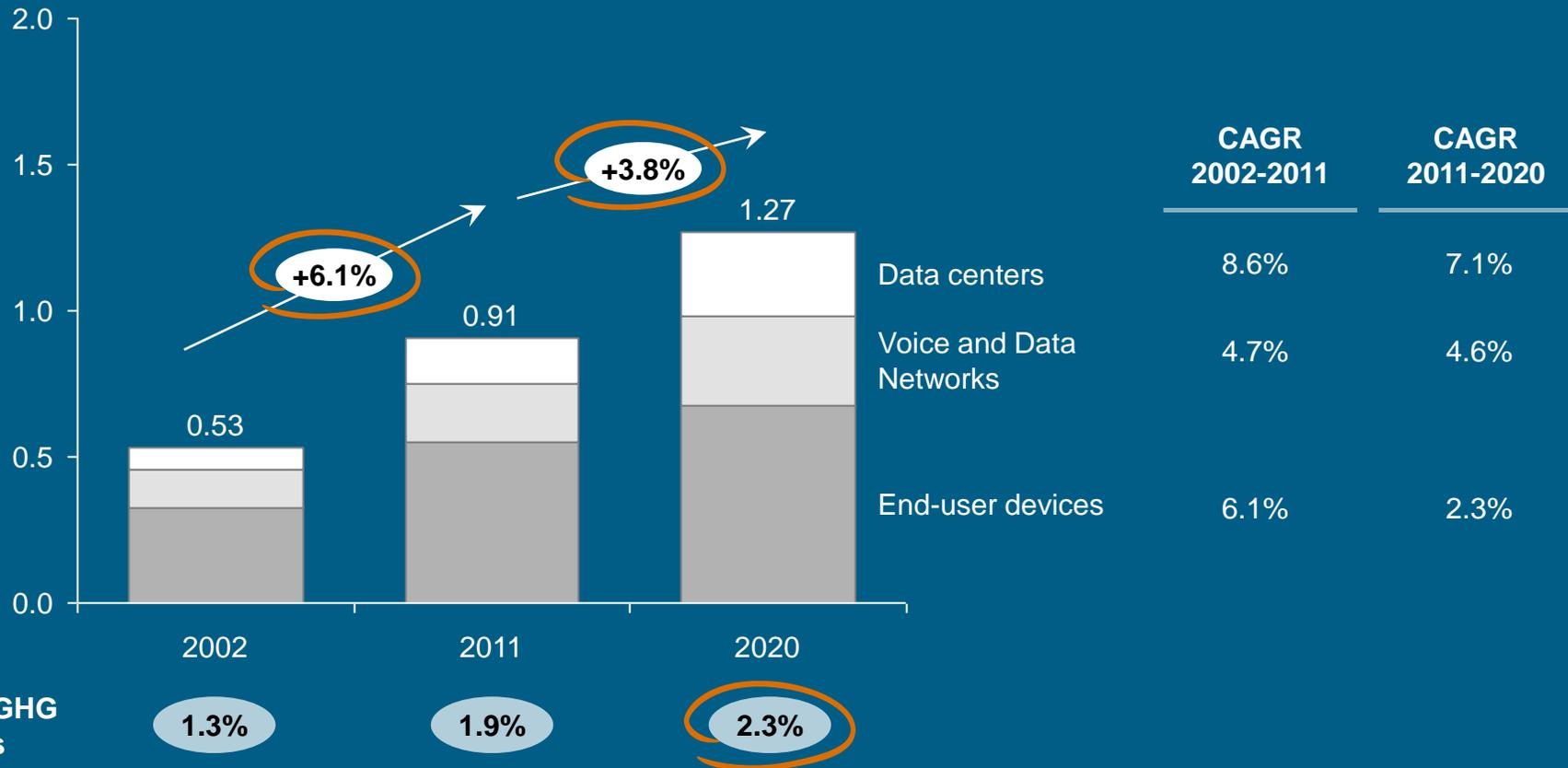
1. Based on 2008 data – EDGAR; 2. EDGAR data does not split building out as a separate sector

● = calculated abatement potential by sub-lever

# ICT emissions growth expected to slow down from 6% to ~4%

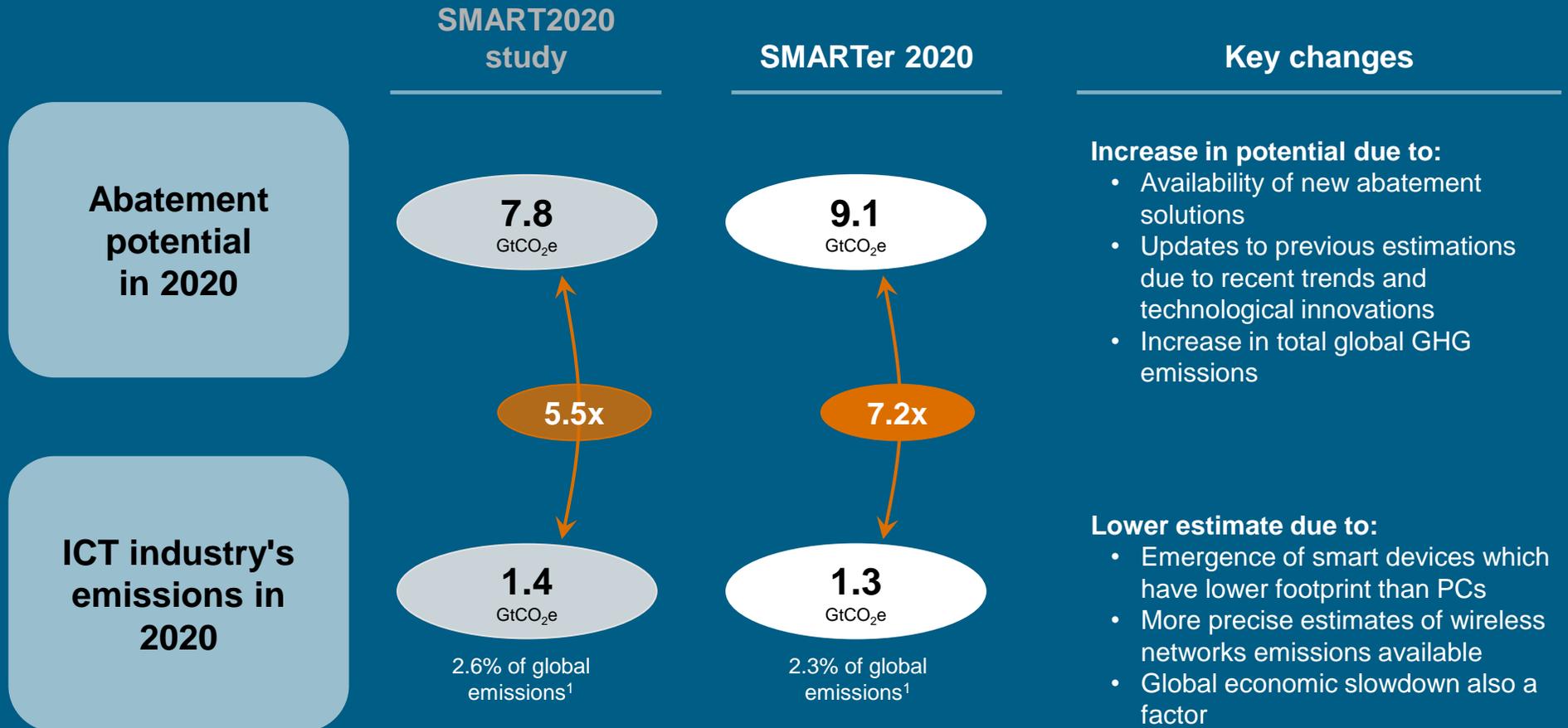
ICT emissions 2.3% of global emissions by 2020

Global ICT emissions (GtCO<sub>2</sub>e)



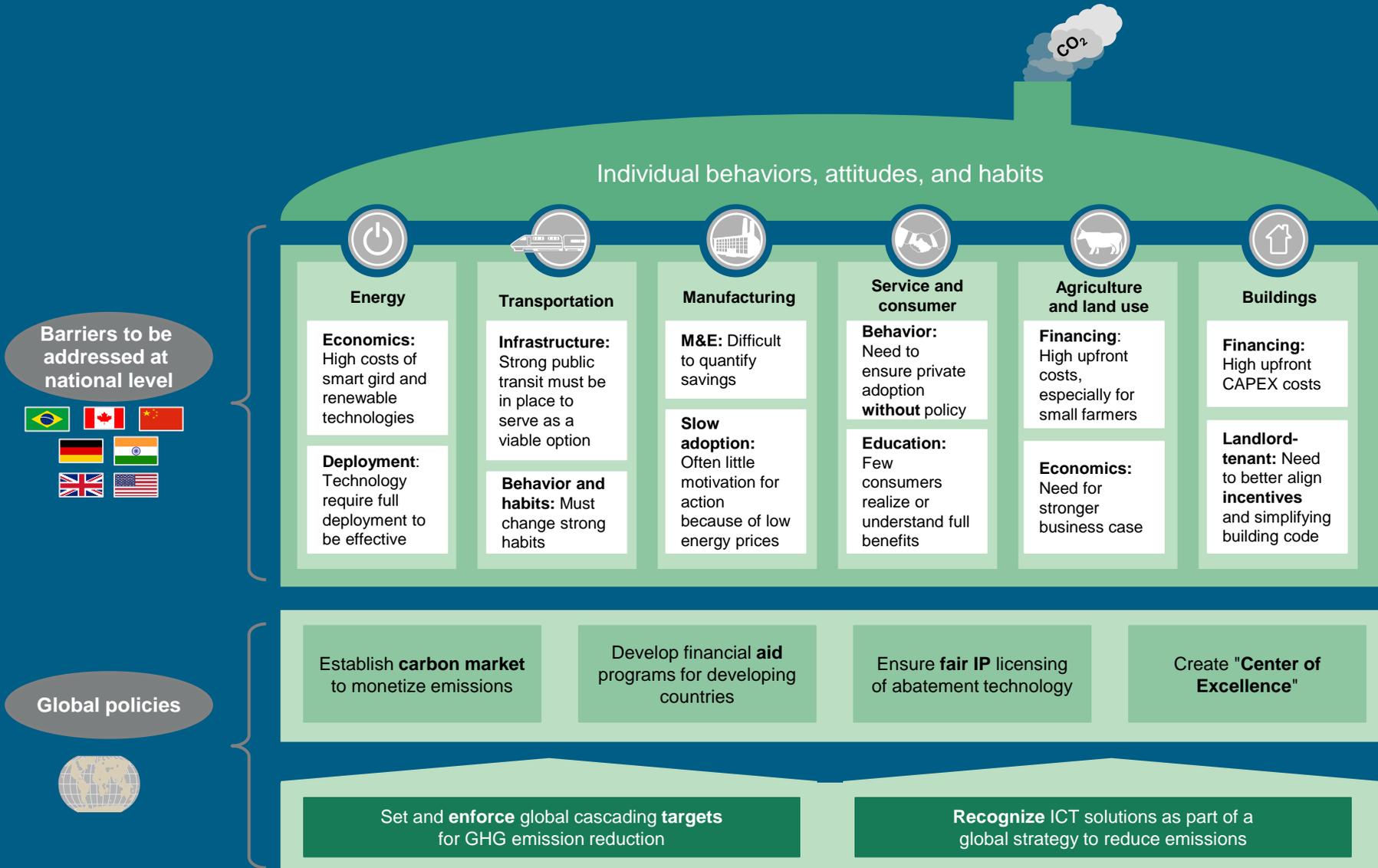
1. Data for 2010 2. Previous study used an incorrect number for the wireless network emissions (50 vs. 24kWh/yr) and therefore ended up with higher total emissions  
 Source: Gartner; Forrester ; U.S. Census Bureau; IEA; Greentouch; CEET; CDP; Ovum; GSMA; CERN; Cisco; CEET; SMART 2020: Enabling the low carbon economy in the information age; academic publications; industry experts; academic experts; manufacturer websites; GeSI Smart2020 Refresh team members; BCG analysis

# The abatement potential of ICT is seven times the size of the ICT sector's own carbon footprint



1. On a base of 55 Gt CO<sub>2</sub>e GHG emissions (IEA)

# Policies at the national level have the most significant potential to drive sub-lever adoption



# Country deep-dives provide context to demonstrate how national and local policies can yield higher abatement



**Brazil**



**Canada**



**China**



**Germany**



**India**



**U.K.**



**U.S.**

**All countries have unique circumstances that impact their ability to abate GHGs**

**Those differences drive which end-use sectors and which sub-sectors deserve most attention**

**Policies at the national level are the most effective drivers of change in all countries**

# The findings are being released today in a report titled “SMARTer 2020”



GeSI SMARTer 2020:  
The Role of ICT in Driving a Sustainable Future



Please visit [www.gesi.org/SMARTer2020](http://www.gesi.org/SMARTer2020) for the full text version of SMARTer 2020

**Thank you**

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**Backup**

# Emissions savings could yield USD1.9 trillion in gross energy and fuel savings, and 29.5 million jobs would be created

**GHG emission reductions**



**Number of barrels of oil with equivalent emissions<sup>1</sup>**



**At today's crude oil price, value of the oil that would be saved<sup>2</sup>**



**Equivalent number of jobs if the money was used in other sectors<sup>3</sup>**

**9.1 Gt**  
(16.5% of total)

*As estimated in the report*

**21.6B**  
**barrels**

*Barrel of oil emits 0.43 metric tons of CO<sub>2</sub><sup>1</sup>*

**\$1.9T**

*\$87.99 per barrel of crude oil as of Nov 6, 2012<sup>2</sup>*

**29.5M jobs**

*Using the same ratio of economic value to jobs created as in SMART2020 report*

**Though estimates, these calculation give a sense of the magnitude of the economic benefits**