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KOREA GREEN INNOVATION DAYS

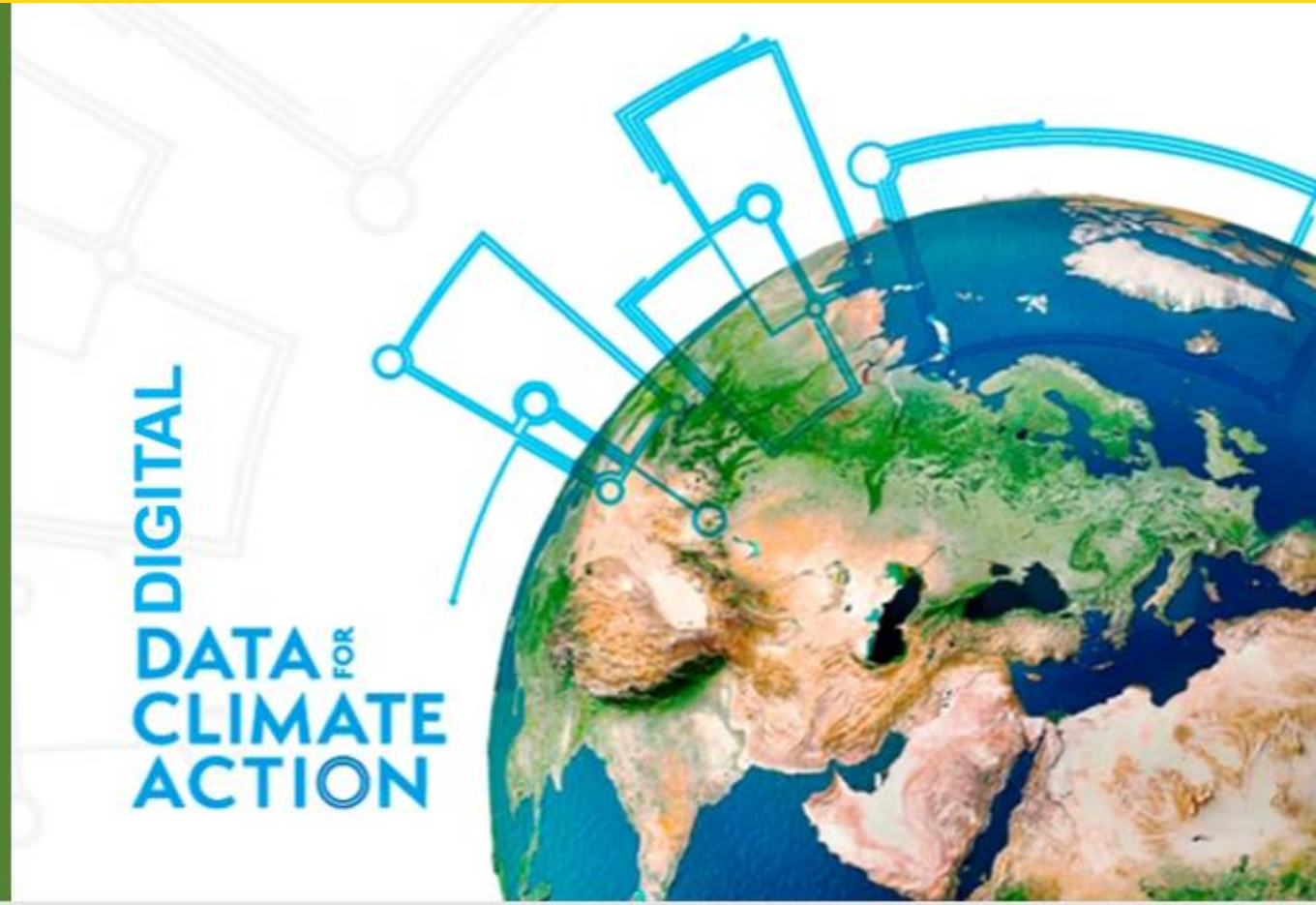
OCTOBER 17–19, 2023

LEVELING UP GREEN GROWTH IMPACTS

THE NILE RITZ-CARLTON, CAIRO, EGYPT

Data & Digital for Climate Action

Thursday Oct 19th (9:30 – 10:30 am)



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KOREA GREEN GROWTH TRUST FUND

Ministry of Economy and Finance

Data and Digital for Climate Action

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Agenda

Data and Digital for Climate Action

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1. **The Big Picture**
2. **World Bank Green-Digital Investments**
3. **Shared Data Platform for Early Warning:**
   The case of the Maldives
4. **A Way Forward**

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1 The Big Picture

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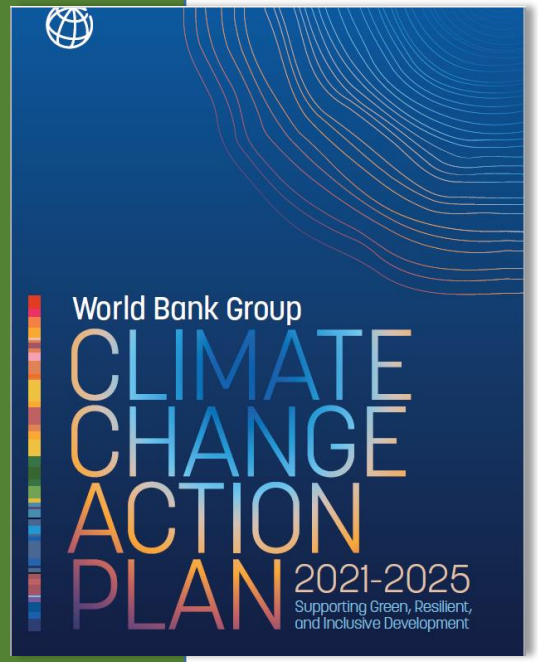
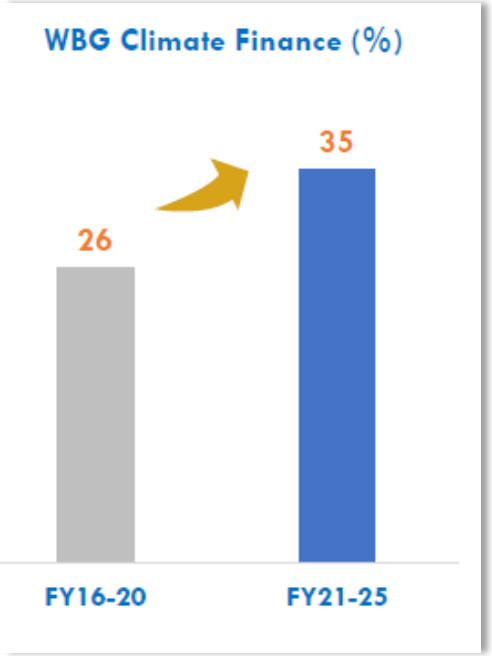
Green Digital Development

A World Bank Commitment





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How do we bridge the digital divide in sustainable way *and* leverage digital technologies effectively for climate action?

~3 billion

people remain offline and the vast majority are concentrated in developing countries

1.5 - 4%

of global GHG emissions is estimated for the digital sector (and growing)

64%

of NDCs mention using technology for adaptation and/or mitigation*

Countries are lagging behind on climate commitments

**an NDC, or Nationally Determined Contribution, is a climate action plan to cut emissions and adapt to climate impacts*

Digital contributes to 1.5-4% of global GHG emissions

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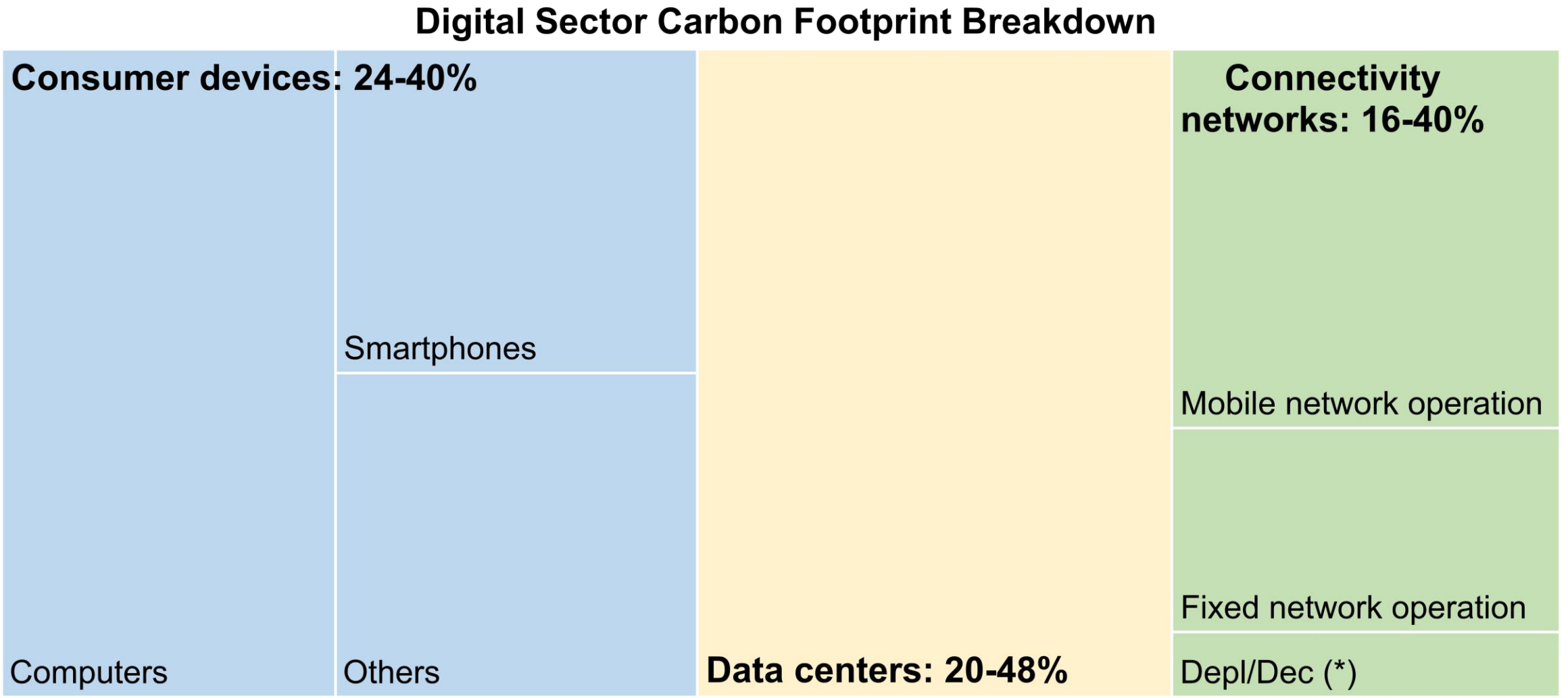

ICT sector's contribution to the global GHG emissions

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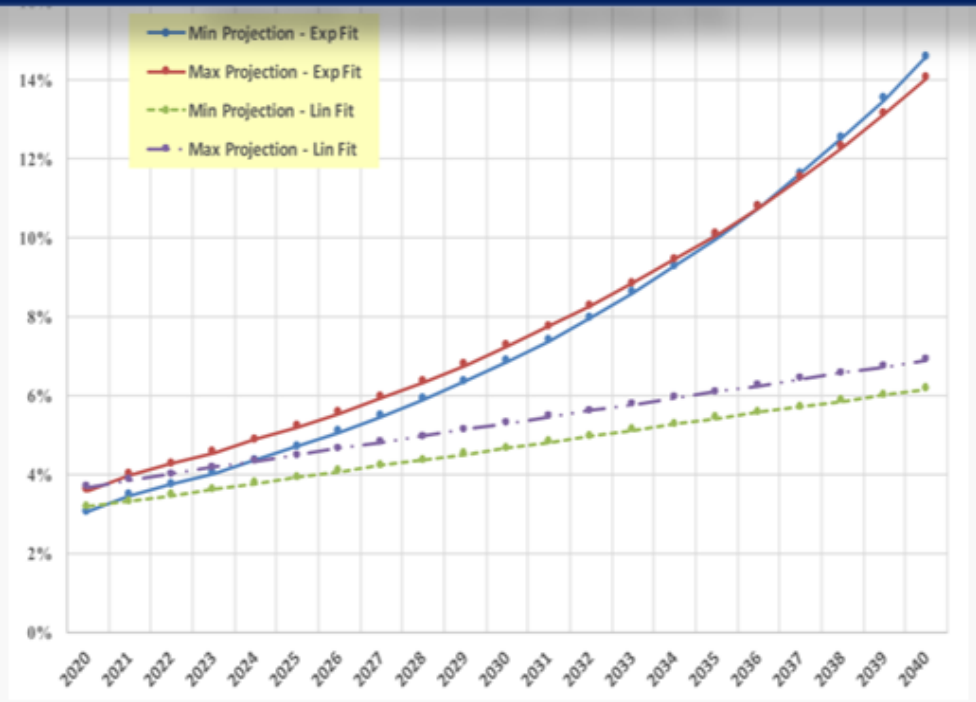
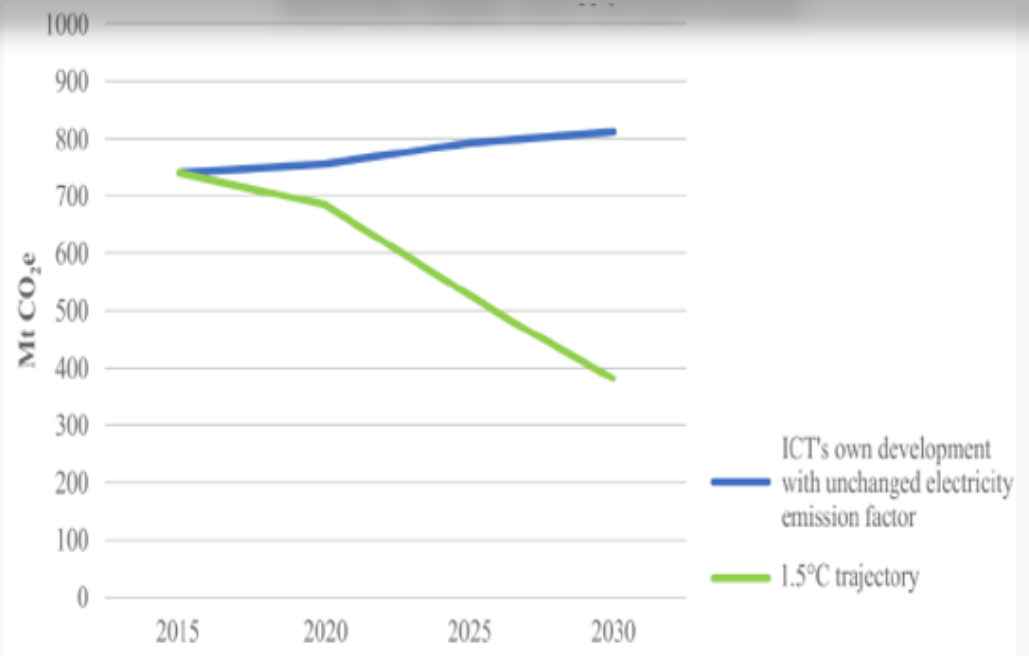
- ICT sector is estimated to emit 740 Mt-CO_2 eq annually and responsible for 1.4-3.6% of the global GHG emissions in 2020
- By 2040, the ICT carbon footprint could account for as much as 14% of the total worldwide carbon footprint(Belkhir and Elmeligi (2018))
- ITU stresses that in order to follow the 1.5˚ C trajectory, GHG emission from the ICT sector **should be halved and limited to less than 400 Mt-CO2 equivalent in 2030**.

ICT carbon footprint as a percentage of total GHG emissions projected through 2040 using both an exponential and linear fits



Source: Belkhir and Emigli (2018)

ICT sector carbon footprint baseline 2015-2020 and forecasts 2025-2030 (including electricity supply chain and grid losses)



Source: ITU(2020)

The Green Digital Nexus

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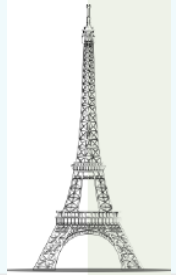
	Greening Digital	Greening with Digital
CLIMATE ACTION	**GREENING THE DIGITAL SECTOR**	**GREENING WITH DIGITAL TECHNOLOGIES**
ADAPTATION	Greening the digital sector by climate proofing digital infrastructure and services	Leveraging digital technologies to enhance resilience of economies, populations, and sectors
MITIGATION	Greening the digital sector through energy efficiency measures and use of renewable energy	Leveraging digital technologies to decarbonize other sectors such as energy, transport, and cities



2050

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Climate Action: Informing Policies and Investments

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Greening Digital

Greening *with* Digital

ADAPTATION

Climate Resilient Digital Infrastructure

Digitization of Service Delivery for Resilience

Digitization for Economic Resilience

Sectoral Applications for Adaptation

Digital Disaster Risk Management

DATA

MITIGATION

Energy Efficiency

Renewable Energy for ICT

e-Waste & Circular Economy

Digitization for Green Growth & Jobs

Sectoral Applications for Mitigation

DATA

CROSS-CUTTING

Policy & Regulation

Monitoring, Reporting or Transparency Tools

Research & Innovation

Capacity Building & Training

Digital Tools for Behavioral Change & Awareness

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2 World Bank Green-Digital Investments

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Exponential Growth in World Bank **Digital Investments**

Digital investments are expected to grow dramatically over the next 3 years

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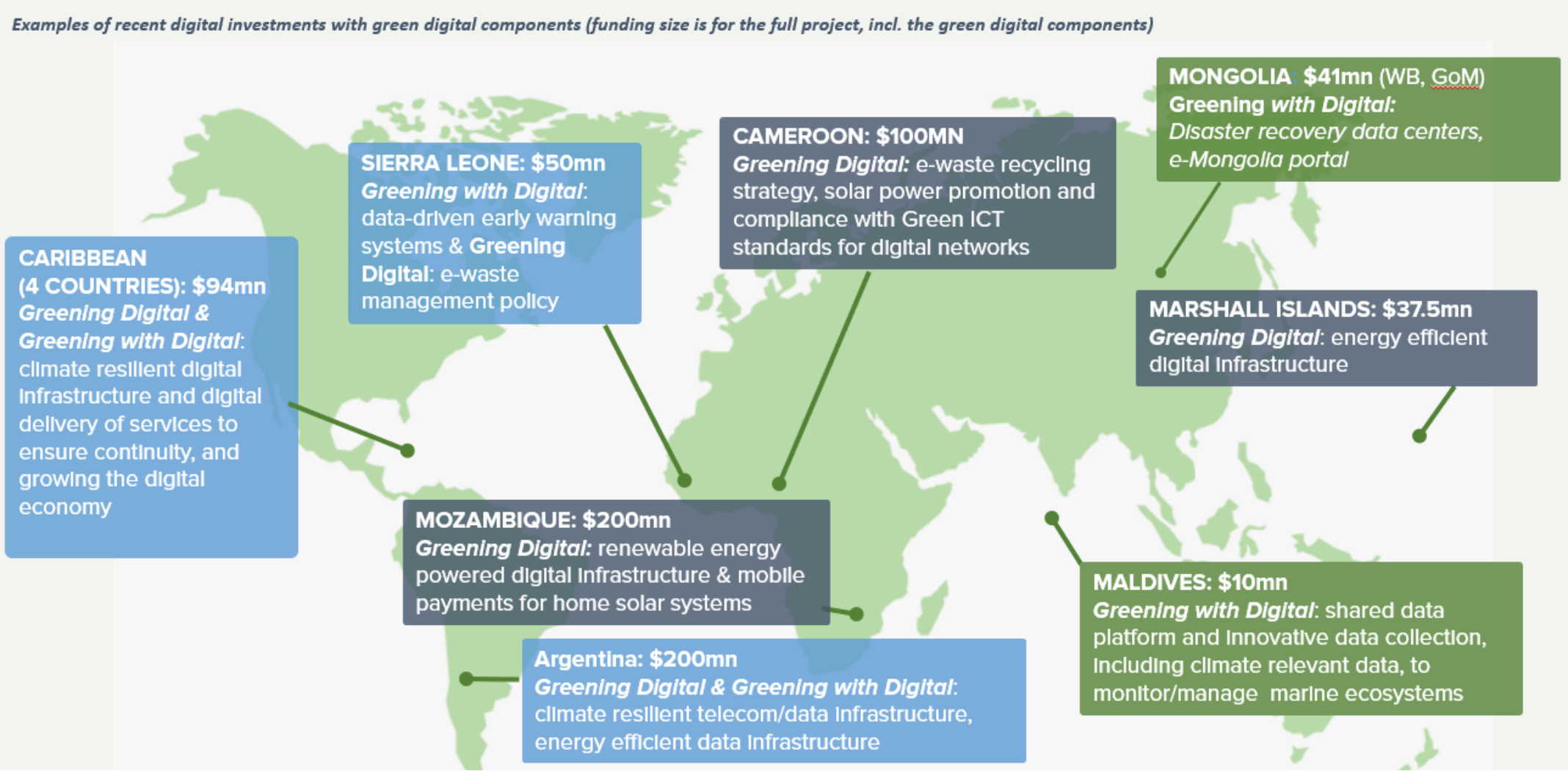
Mainstreaming Green in World Bank **Digital Investments**



Digital Investments in other Key Sectors too

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Agriculture

Challenge: Agriculture, forestry, and land use change produce almost 25% of global GHG emissions

Opportunity: Digital technologies can potentially **reduce GHG emissions by 1-4%** from agriculture sector by 2030

Transport

Challenge: Transport accounts for 20% of the world's greenhouse gas emissions

Opportunity: Optimizing traffic flow; contributing to the establishment of digitally-enabled modern logistic systems that improve freight management; and transitioning to electric vehicles.

Energy

Challenge: It is estimated that energy accounts for more than two-thirds of total GHG emissions globally.

Opportunity: Enhancing **energy efficiency**, and by enabling demand-side flexibility and mobile money enables new business models for delivering affordable home solar systems.

Urban

Challenge: Cities consume 2/3 of the energy used worldwide and account for about 70% of carbon emissions.

Opportunity: Digital technologies can help **reduce total energy demand in the building sector by about 10%** through operational efficiency compared to IEA's reference scenario, from 2017-2040.

Climate Change Amplifies the Risks

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FLOODING

- ICT equipment at risk of outage due to flooding of premises
- Flooding-caused power outages
- Water with debris, causing surface damage, risking cabling and ground level backup power
- Risks to underground cables and ducts.
- Critical risks to submarine cable landing stations

SEA LEVEL RISE

- Poses long-term risk to submarine cable landing stations, and terrestrial networks accessing them.
- Flooding risk for data centers and ICT equipment in coastal areas.

WIND, STORM

- High wind with debris damages wireless communication antennas and related passive infrastructure (poles, towers, building fixtures)
- Top-soil erosion damages underground infrastructure

TSUNAMI

- Severely damages submarine cable landing stations
- Damages and puts high risks for terrestrial infrastructure of all kinds
- Risk for data centers in coastal areas.

WATER SCARCITY & HIGH TEMPERATURES

- Impacts operation of data centers (cooling systems)
- Medium level impact on the operation of servers and network equipment that requires cooling.
- Shorter lifecycle of devices

The **impacts of climate change**, causing floods; droughts; frosts; and heatwaves, affect the world's population.

Data and Digital transformation will help in implementing urgent action to combat climate change

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Hazards Impacting Digital Connectivity Infrastructure

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Infrastructure/Climate event	Inland/Coastal Floods	Earthquake	Tsunami	Sea level rise	High Temp	Water Scarcity	High Winds/Storm
Submarine Cable (undersea)	🟢	🔴	🟠	🟢	🟢	🟢	🟢
Submarine Cable (near shore)	🟢	🔴	🔴	🟢	🟢	🟢	🟢
Submarine Cable Landing Station	🔴	🔴	🔴	🔴	🟢	🟢	🟢
Terrestrial Cables (underground)	🟠	🔴	🟢	🟢	🟢	🟢	🟢
Terrestrial Cables (overland/aerial)	🟢	🟠	🟢	🟢	🟢	🟢	🟠
Network Nodes (switches, cabinets, points of presence etc.)	🔴	🟠	🟢	🟢	🟠	🟠	🟢
Antennas/ mobile BTS	🟢	🟠	🟠	🟢	🟢	🔴	🟠

🟢 = *Low* 🟠 = *Medium* 🔴 = *High*

Source: Adapted from GSA (2014), UK DRO (2018), Fu et al. (2016), and Dept. of Homeland Security (2017)

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3 Shared Data Platform for Early Warning:

The case of the Maldives

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About the Maldives

- About 550,000 people live across 185 islands
- The country covers approx. 90,000 square kilometers, but only 298 square kilometers is dry land
- Of which, more than 80% lies less than one meter above sea level

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Why are coral reefs important?

Among the most biologically diverse and valuable ecosystems on Earth

Approx. 25% of all marine life, including over 4,000 species of fish, are dependent on them

An estimated 1 billion people worldwide benefit from their ecosystems

Source: https://www.epa.gov/coral-reefs/basic-information-about-coral-reefs

Coral Reefs are critical to The Maldives

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Tourism

Fisheries

Sustainability

Digital Maldives Project

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Three components:

1. Improved digital connectivity & competitiveness
2. Digital identification for improved in-person & online service delivery
3. **Digital technologies & data platform for climate resilience**

- 3a. **Climate data platform**: To provide a means for government entities, people, and businesses to find and engage with climate-relevant data
- 3b. **Pilot** featuring state-of-the-art digital technologies and tools to collect and analyze data related to climate-critical ecosystems

How can a Shared Data Platform Help?

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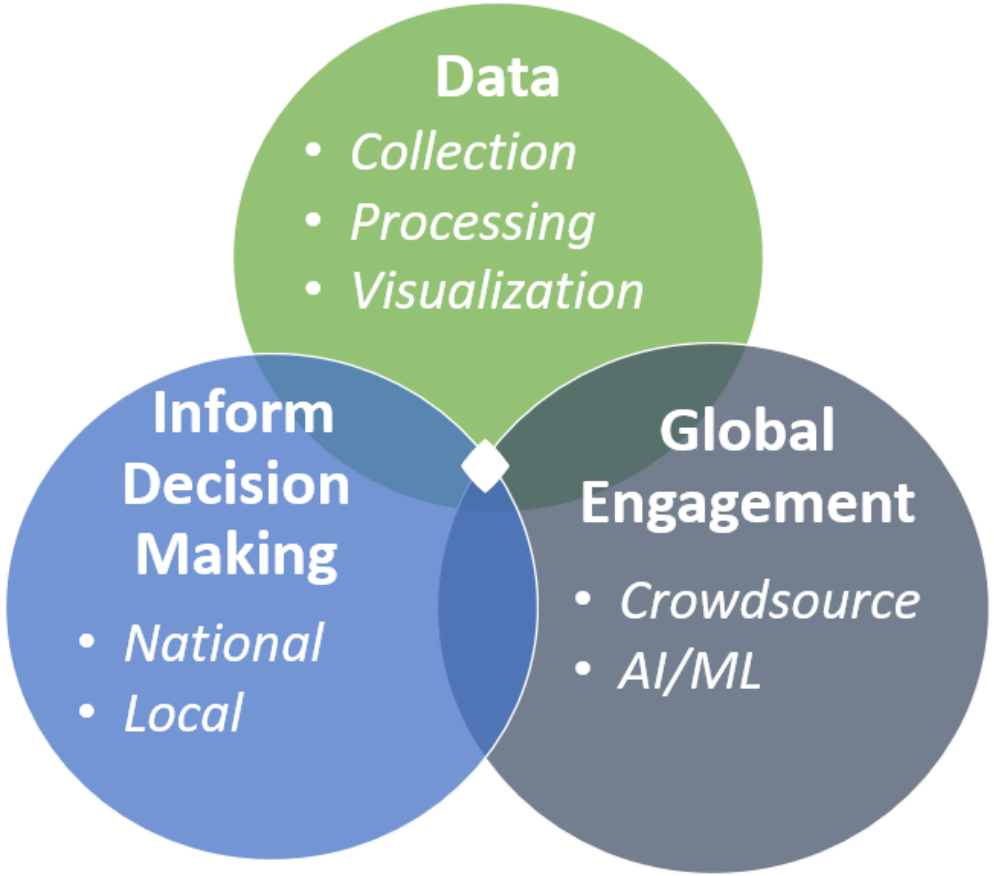
It is difficult to protect Coral Reefs

- **Complex & Fragile**
  - Water temps, salinity, acidity, runoff, physical damage, etc.
- **Hidden**
  - Not visible



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Foundations for development of **Shared Data Platform for Climate Action**

- **Data**
  - Collection / Continuous
  - Aggregation
  - Processing
  - Visualization
- **Decision making**
  - Relevant and easy to use
- **Global engagement**
  - Crowdsource / Build for many

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KoDi
Accelerating Digital Transformation

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4 In Conclusion ... A Way Forward

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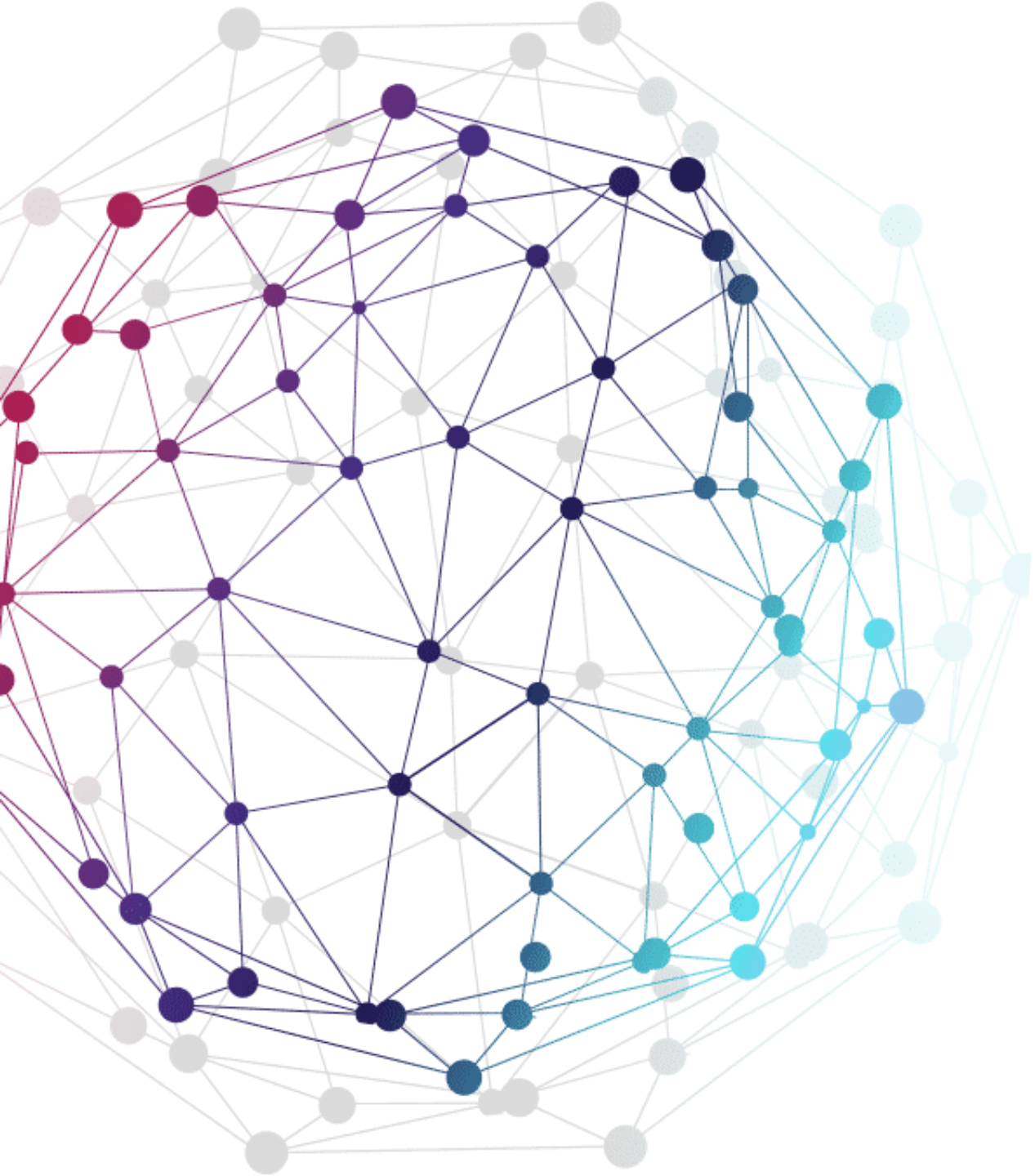

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More needs to be done…

Compared to other sectors the relationship between digital and climate change is less clearly understood and further work is needed – research, policy and regulation good practices and investments

The Way Forward

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- Digital is part of the climate change **solution** – and the **challenge**
  - Climate change and digital are global **policy** priorities but often addressed in silos….bridging the **twin transition** of green and digital is necessary
  - Reducing **emissions** from the digital sector requires national action. Digital sector is the largest renewable energy consumer
- Digital technologies can help countries **adapt** to climate change but require investments in Connectivity, Data, and digital skills for developing the appropriate solutions
  - **Digital infrastructure** needs to be treated as **critical infrastructure** with the necessary climate proofing
  - Leveraging **data** for climate reporting, decision making, citizen engagement is critical for climate action and requires investments in digital public goods, interoperability and safeguards
  - **Climate financing** largely ignores the digital sector, which needs to change if digital is to be a catalyst for climate action

Priority Actions

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- **Continue upstream support while growing our downstream work**
  - Upstream
    - Project design, diagnostics, Analysis and Assessment, etc.
  - Downstream
    - Technical design

- **Mainstream “greening digital” while expanding “greening with digital”**
  - Greening digital
    - Resilience and GHG emission; green data centers; etc.
  - Greening with digital
    - Shared data platform; digital technologies for climate use cases; etc.

- **Increase awareness for the nexus of digital and climate change**
  - Promote knowledge sharing and raise awareness both externally and internally

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https://www.worldbank.org/en/programs/kodi/overview