

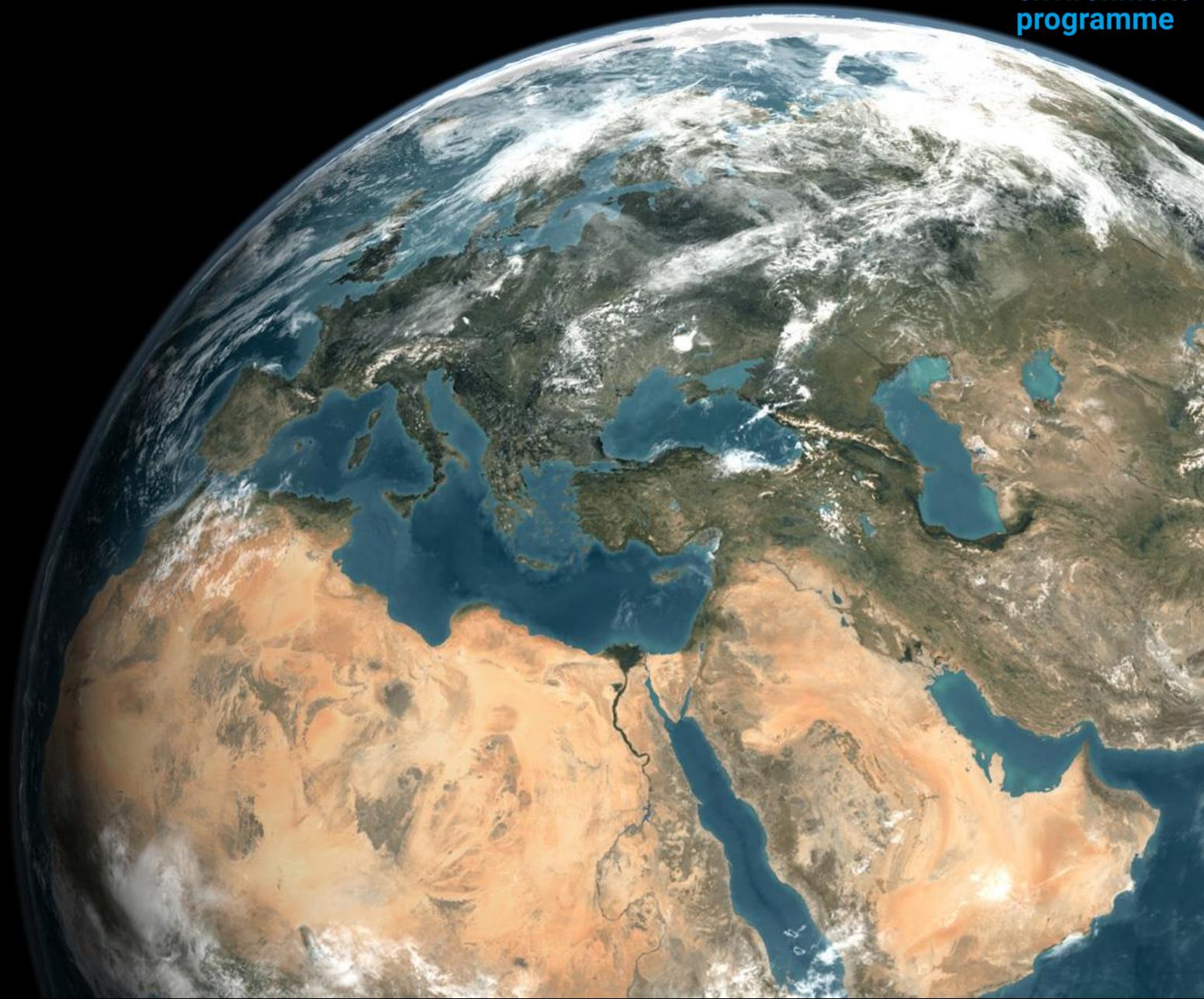
Building a 10-year action agenda for harnessing data and digital transformation to **accelerate** environmental sustainability

David Jensen

UN Environment Programme

Coordinator, Digital Transformation Task Force

16 November 2020



Two core trends sweeping the planet...

Compounding environmental crises

Climate crisis
Nature crisis
Pollution crisis

Must solve in
next 10 years

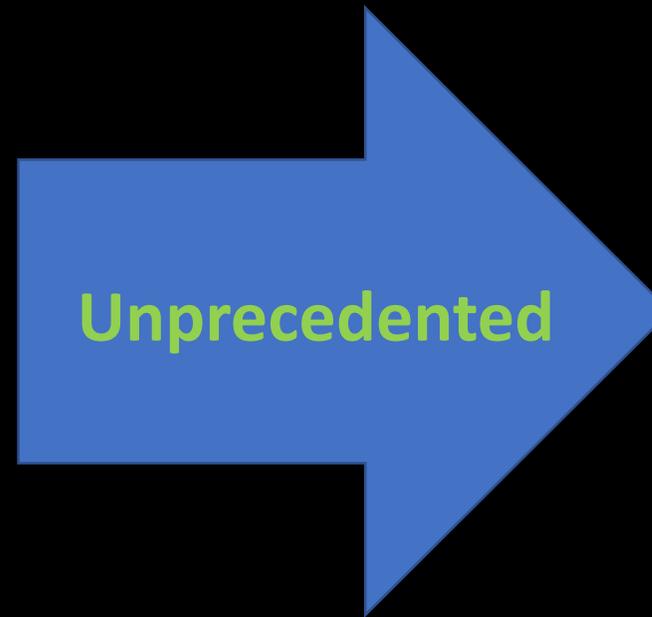
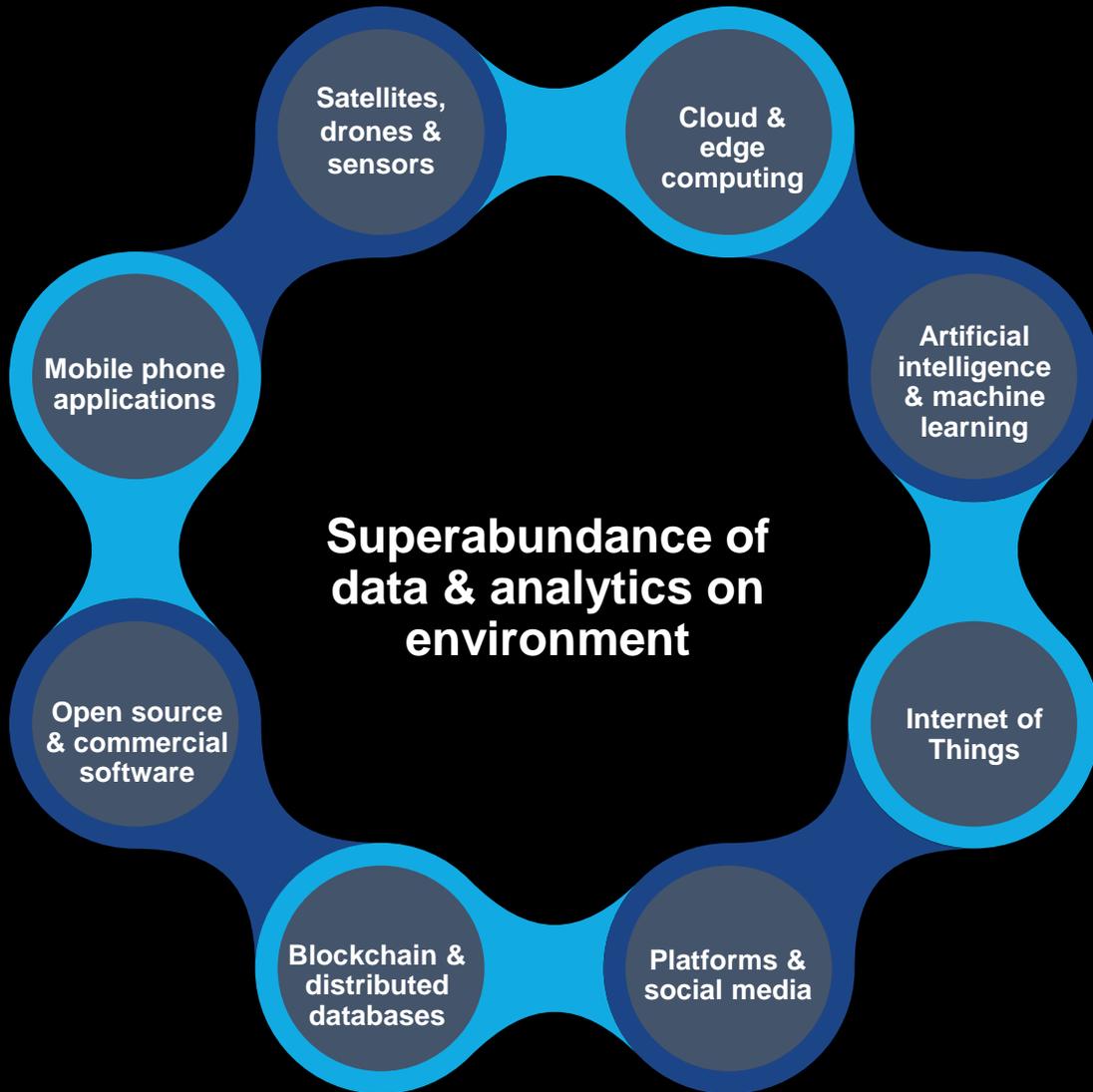


How are we going to
harness data and digital
transformation to solve
global environmental
challenges in ten years?

Digital Transformation

Economy
Social relationships
Institutions
Humanity

Convergence of 8 core digital technologies



Speed
Scale
Scope
Source
Spatial

Combination of environmental data and digital technologies offer **new capabilities** for global sustainability and resilience.



Connect, Communicate & Collaborate to share environmental ideas, information, & innovations at the speed of light and planetary scale.



Monitor & Track the use of natural resources, the health of our life support systems and major changes to ecosystems.

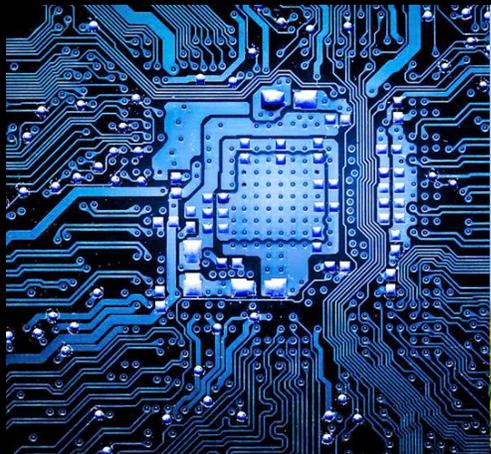


Integrate & Analyze unprecedented sources of environmental and socio-economic information to extract insights; **Optimise** the use of natural resources; and **Predict** future environmental trends and risks.



Augment our human abilities and **Automate** SMART systems to maximize the efficient use of natural resources and change our behaviors towards more sustainable lifestyles and livelihoods.

These new digital capabilities hold more potential than ever before to **inform** and **transform** the foundational sectors of the economy



Information



Food



Transport



Energy



Materials

- Decarbonize (10-20% reduction)
- Dematerialize (90% reduction)

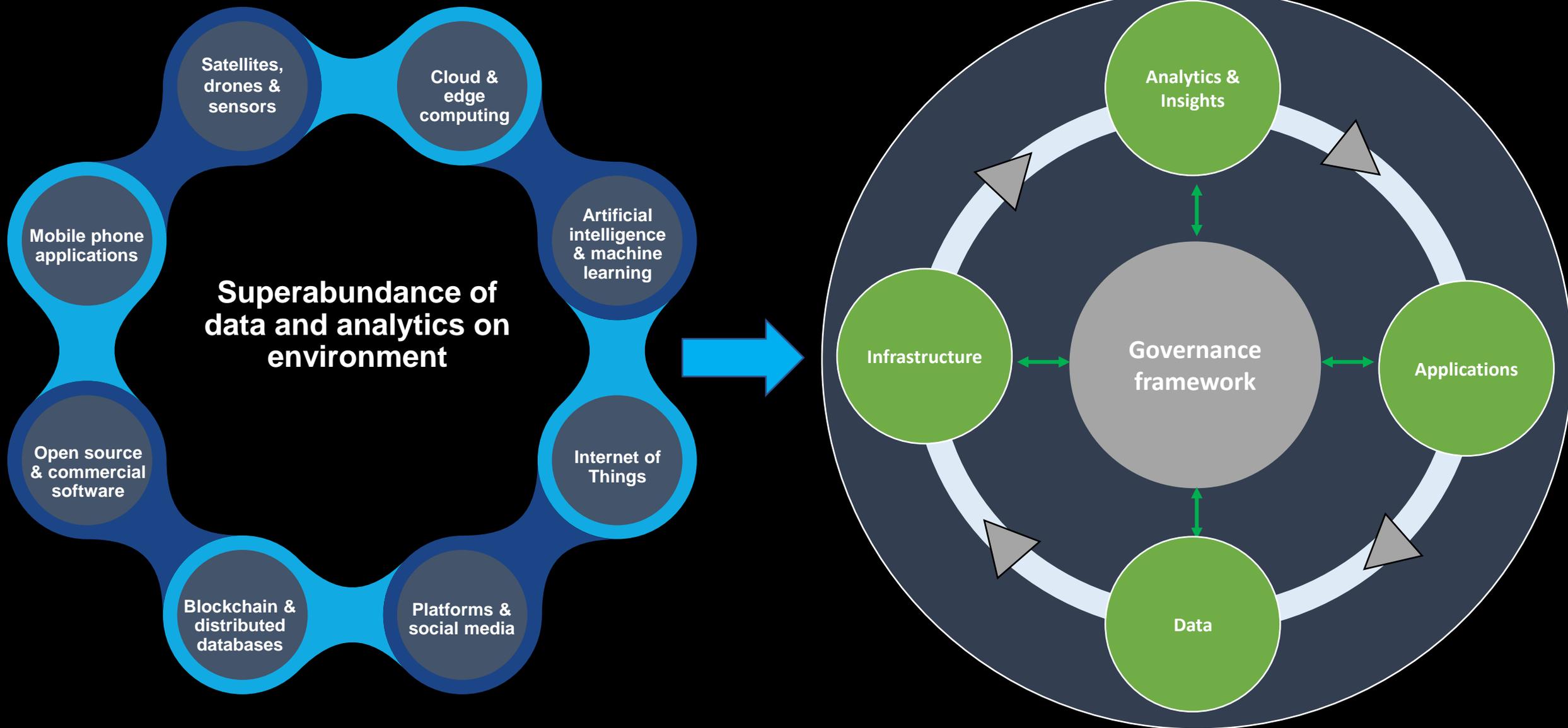
- Detoxify (10-100X less waste)
- Drive Circularity & Regeneration

We are standing at a **pivotal moment in human history** in terms of how we harness this potential.

Four challenges:

1. Data is highly fragmented, unstructured and of variable quality
2. Increasing need for public-private collaboration to transform data into insights that can influence economic incentives and behaviors
3. Must close the digital divide and strengthen digital literacy and engagement by all actors
4. Our own institutions must undergo their own digital transformation process & set priorities

1. A **digital ecosystem for the planet** is needed to produce data and predictive analytics about the environment as digital public goods:



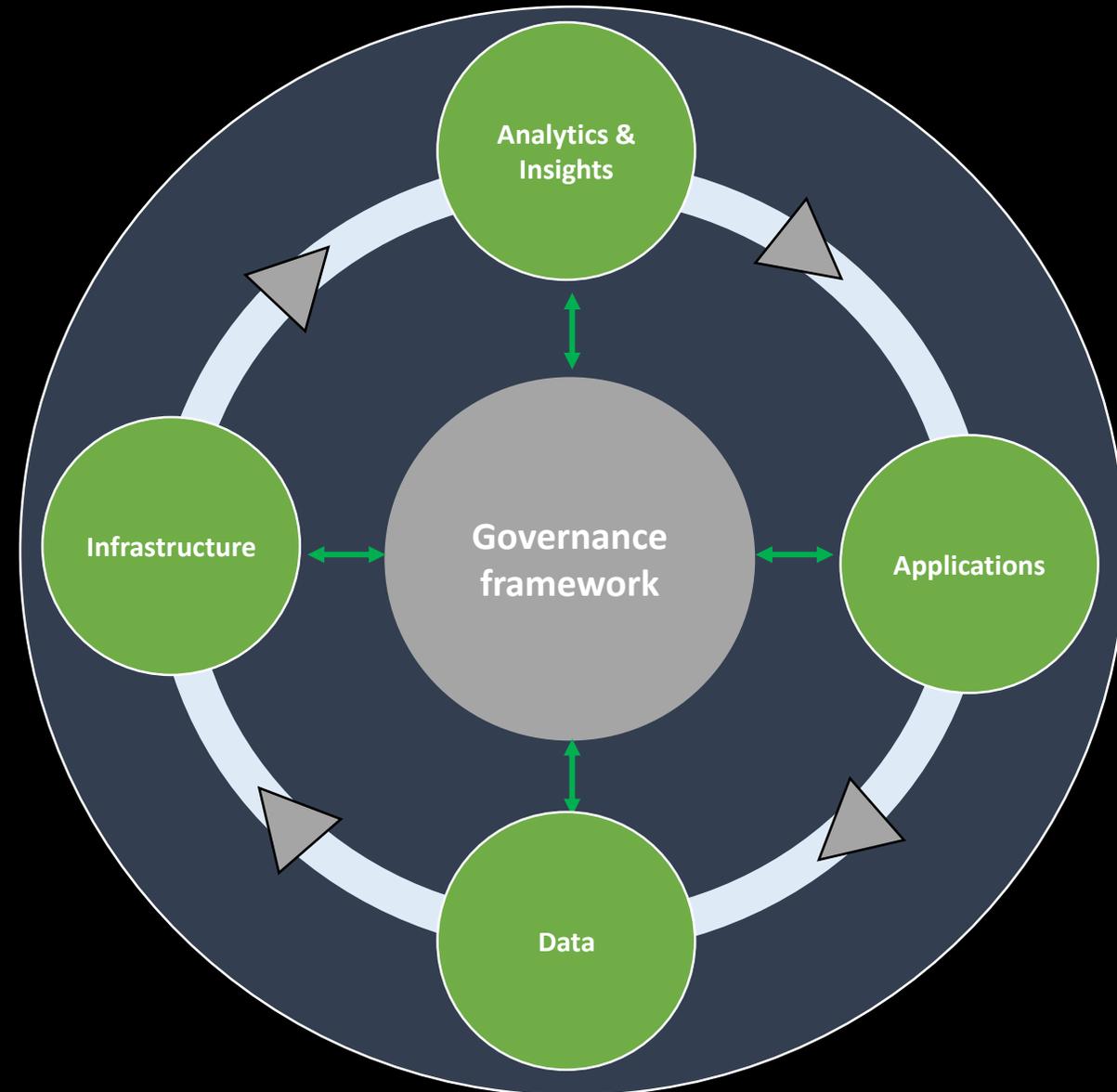
1. A **digital ecosystem for the planet** is needed to produce data and predictive analytics about the environment as digital public goods:

Must federate:

- 700 platforms
- 7,000 data providers
- 400 million data resources for earth observation

Must deliver digital public goods in the form of **actionable, real-time and predictive insights** that can advance the SDG agenda and drive collective action on climate, nature and pollution targets.

Inclusive Governance framework and **sustainable business models** are needed to protect public interest and ensure trust.



2. Accelerate the integration and application of environmental data, analytics, and norms to inform and transform core pillars of the digital economy

5 core partnerships:



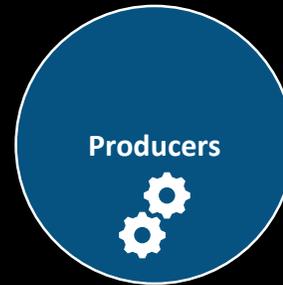
1. Bring transparency to global & national progress on SDG and MEA goals

32% of Environmental SDGs can be measured at global level



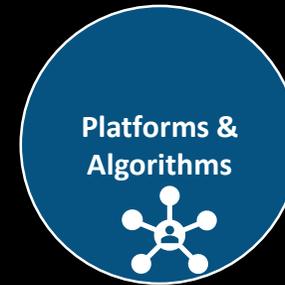
2. Align capital to environmental goals through ESG data, analytics & disclosures

95 trillion in global market capitalization, 1 trillion in ESG funds.



3. Measure & disclose the environmental & climate performance of product supply chains

50% of global market cap discloses env. data to CDP. Only 2% score A



4. Integrate & code environmental metrics into content, products, algorithms & filters

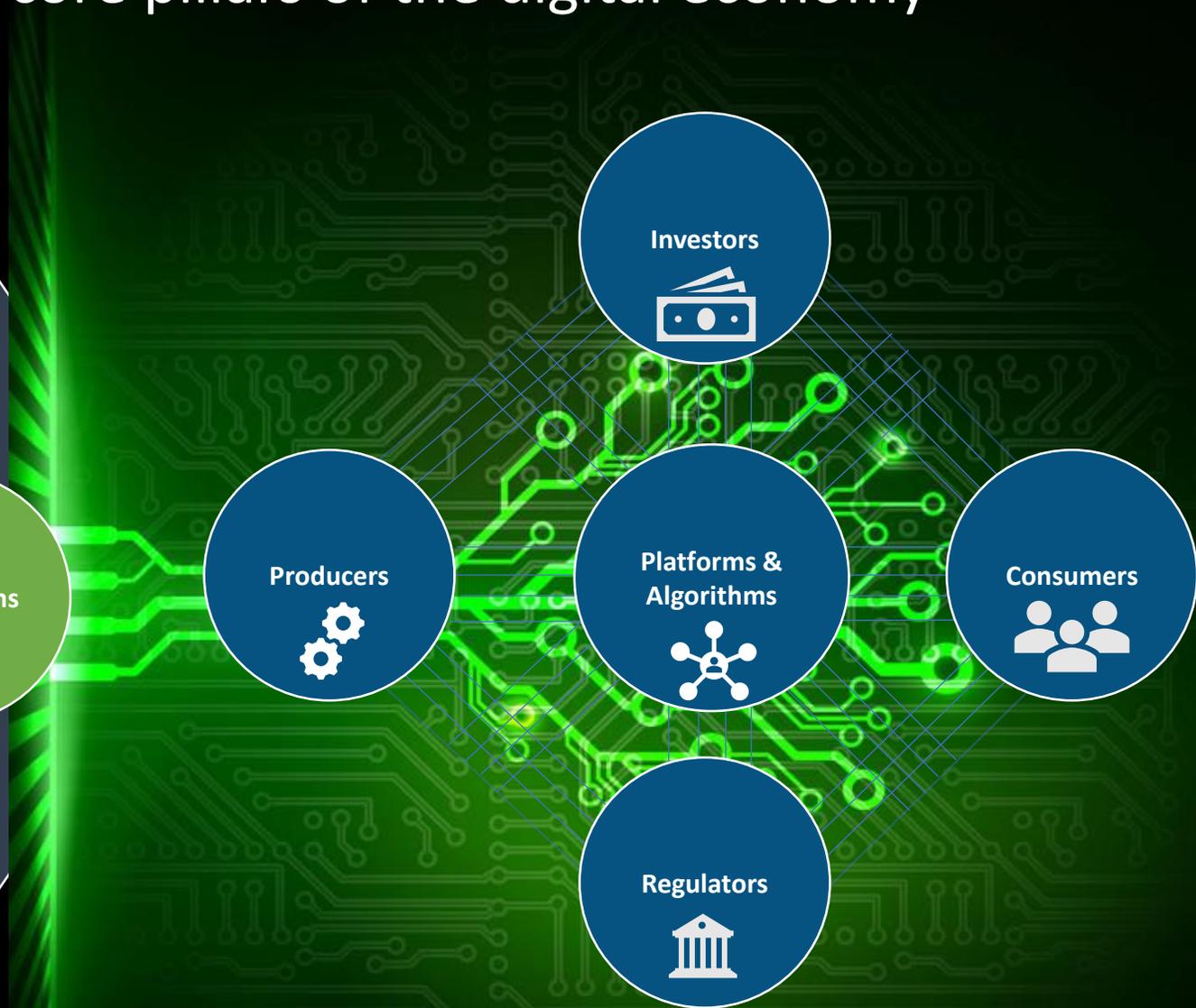
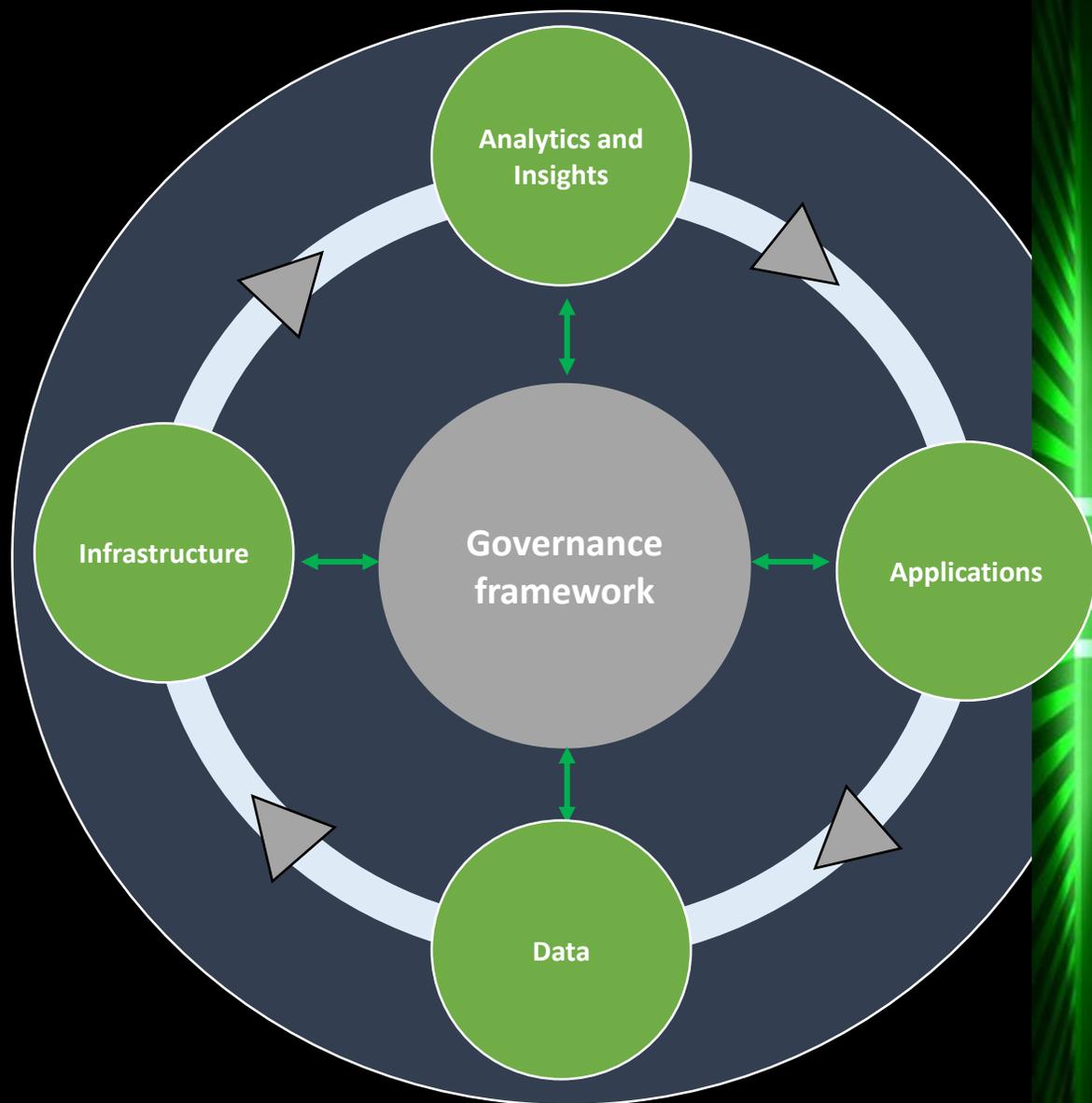
350 million products on Amazon, 25k (.007%) are Climate Pledge Friendly



5. Incentivise & nudge sustainable behaviours, lifestyles and livelihoods

4.5 billion internet users, 2.5B gamers, 2B digital consumers

2. Accelerate the integration and application of environmental data, analytics, and norms to inform and transform core pillars of the digital economy



Hard code environmental data and metrics into the core pillars of the economy

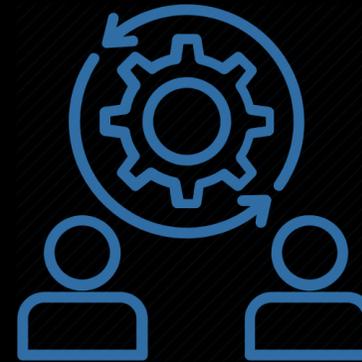
3. Strengthen the environmental **digital literacy** of stakeholders and support **e-governance applications** for public participation and citizen science



Help to close the digital divide and ensure no one is left behind as environmental goods and services are digitalized.



Help deploy digital tools for e-governance, public participation in decision-making and citizen science applications.

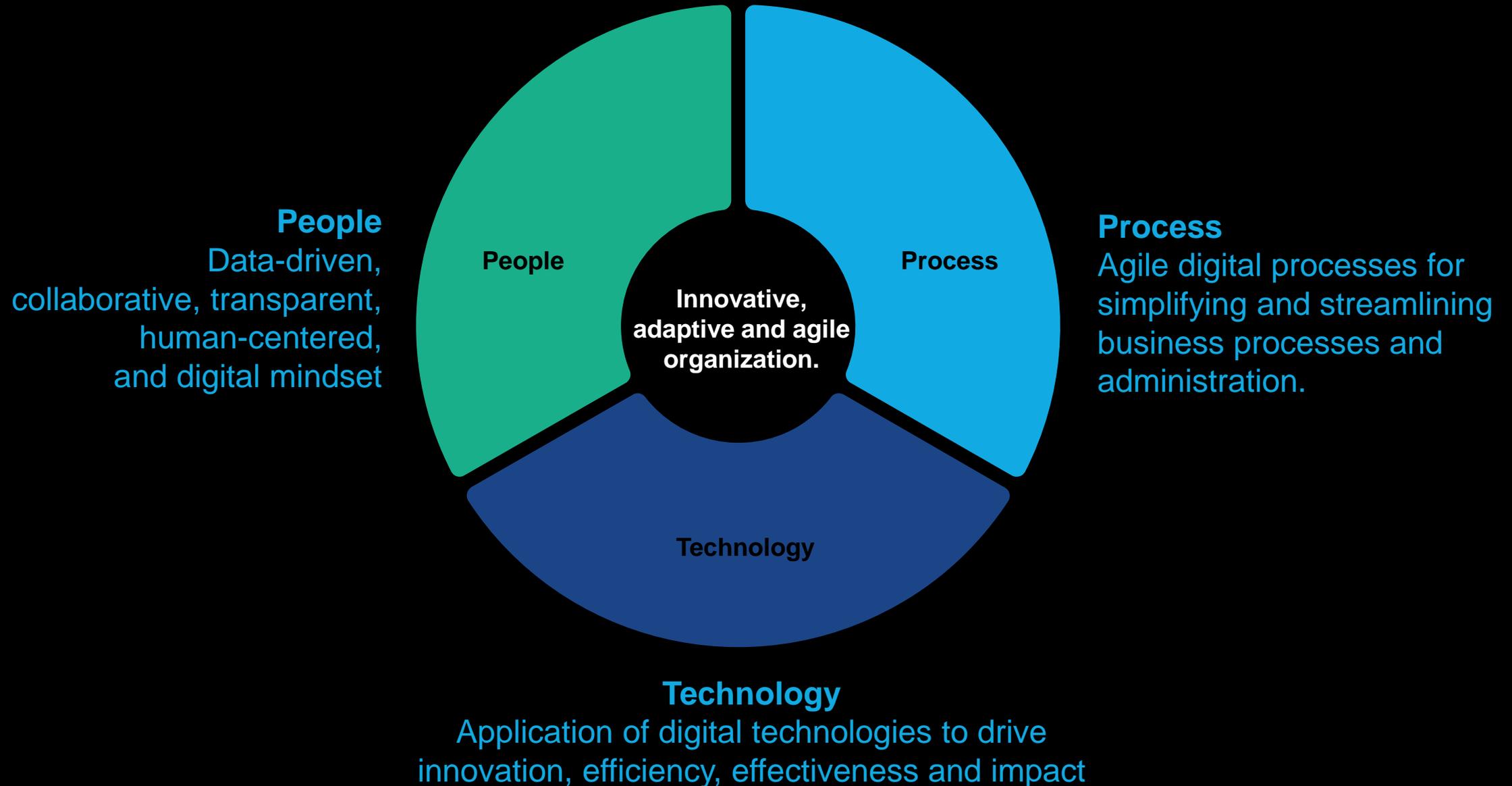


Enable stakeholders to engage in policy-making on environmental digital transformation.



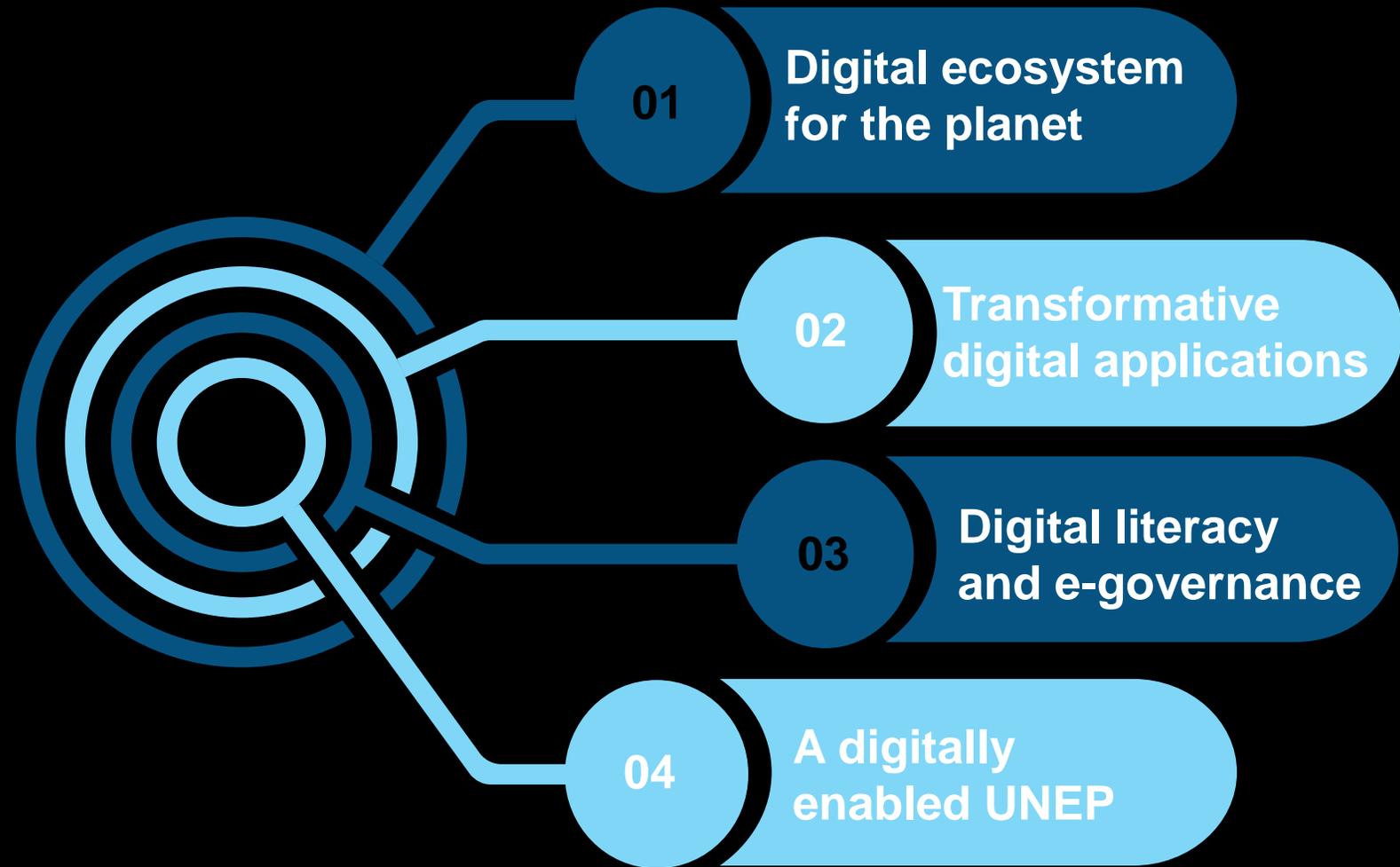
Use competitions and challenges to spark open innovation on environmental priorities.

4. Embrace a **digital transformation agenda** in our own institutions



UNEP's digital transformation priorities: 2022-2025

Four key
Strategic
Actions to
Speed and Scale
Climate, Nature
and Pollution Action



First step is to co-design an **environmental data governance framework**

In 2021, UNEP would like to convene a global stakeholder consultation process to seek consensus on 6 key questions:

- 1) Is environmental data different from other kinds of public data?
- 2) Who should own environmental data and how can an essential set be managed as a digital public good?
- 3) What core principles and safeguard should govern public-private collaboration in the creation or application of environmental digital public goods?
- 4) How can environmental data be licensed, shared and quality controlled using the emerging API ecosystem ?
- 5) What business models can be used to finance digital public goods?
- 6) How to mitigate the environmental impacts of ICT in terms of energy, e-waste and materials?



Let's connect, collaborate and combine efforts to harness data
and digital transformation **to save the planet !**

Thank you for your attention

Coordinator of the Digital Transformation Task Force
Head of Policy and Innovation, Crisis Management Branch

David Jensen

david.jensen@un.org



GET IN CONTACT

Combination of environmental data and digital technologies offer **new capabilities** for global sustainability and resilience.



Connect, Communicate, and Collaborate to share ideas, information, & innovations at the speed of light and planetary scale.

Social network
Collective learning



Monitor & Track the use of natural resources, the health of our life support systems and major changes to ecosystems.

Feedback
Transparency



Integrate & Analyze unprecedented sources of environmental and socio-economic information to extract insights; **Optimise** the use of natural resources; and **Predict** future environmental trends and risks.

Sense-making
Understanding complexity



Augment our human abilities and **Automate** SMART systems to maximize the efficient use of natural resources and change our behaviors towards more sustainable lifestyles and livelihoods.

Automated decisions
Sustainable consumption

Key performance indicators

1

Access to environmental data infrastructure and a trusted digital ecosystem for people and planet

Use of digital technologies for **automatically monitoring** global progress against climate, nature and pollution targets to support **transparency**, **predictive analytics** and **risk identification**.

2

Transformative digital applications shift markets, supply chains and consumer behaviors

Use of data, analytics, lifecycle analysis and digital solutions to **influence** and **incentivize** consumer behavior, markets, supply chains and policies towards climate, nature and pollution targets.

3

Strengthened environmental digital literacy and e-governance

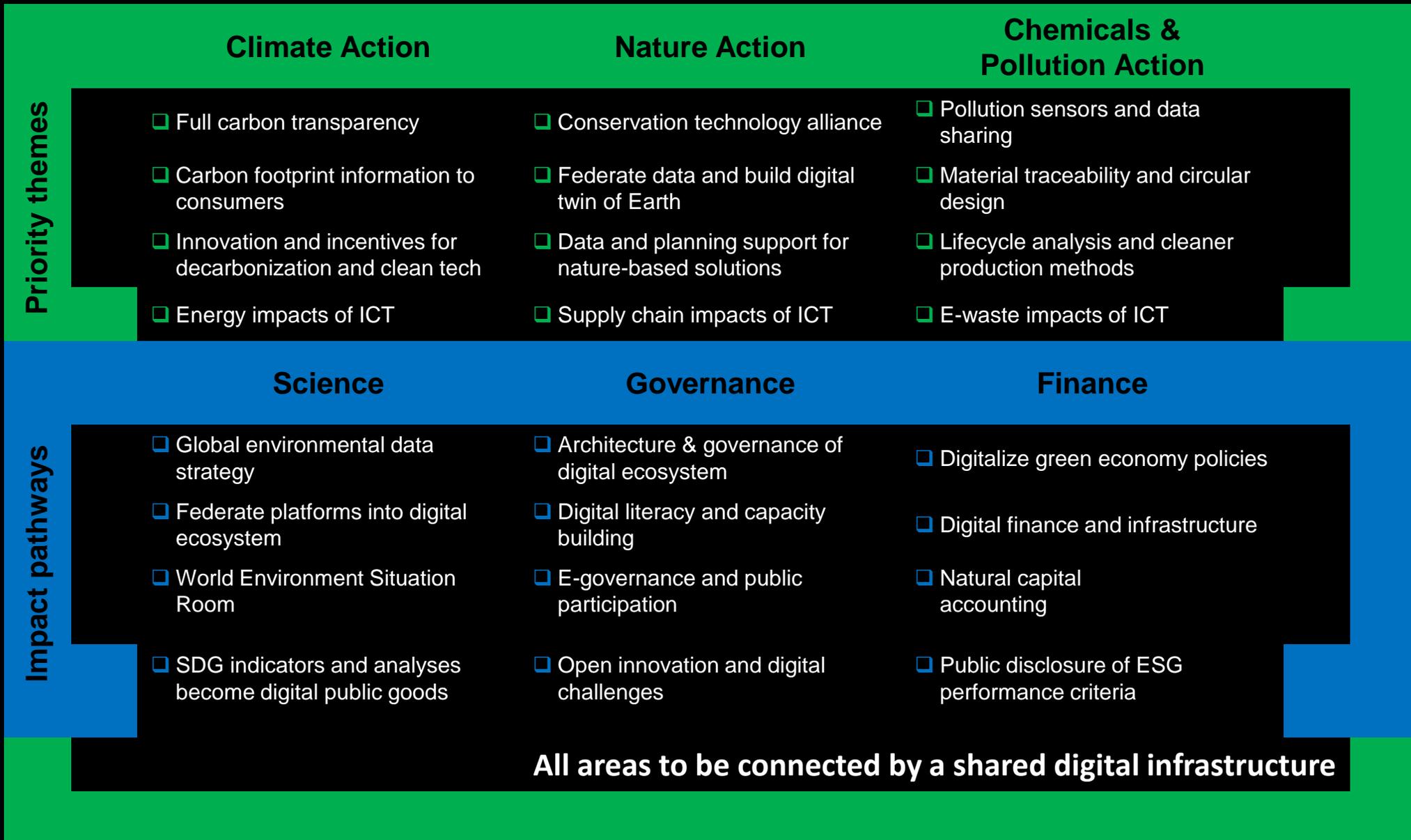
Use of digital technologies to **support electronic governance & enhance public participation** in environmental monitoring, consensus building, decision-making and digital transformation linked to climate, nature and pollution actions.

4

A digitally enabled UNEP improves data-driven insights, innovation and impact

Application of data and digital infrastructure, digital skills, digitalized business processes and digital transformation partnerships to increase **data-driven decision making, innovation, efficiency, effectiveness and impact**.

Digital transformation outcomes across the MTS



But digital transformation to accelerate environmental sustainability is **incomplete** without also governing **negative impacts**:



Increasing concentration of power in few hands



Loss of employment opportunities



Increased inequality and asymmetry



Decreasing privacy and human agency



Increasing misinformation and polarization



Environmental footprint (Energy, e-waste, materials)

Digital transformation and green house gas emissions

In 2015, ITU calculated the ICT carbon footprint was 740Mt CO₂e including embodied emissions, or **1.4%** of global carbon footprint.

New estimates varying from **2-4%** of total Greenhouse Gases (GHGs).

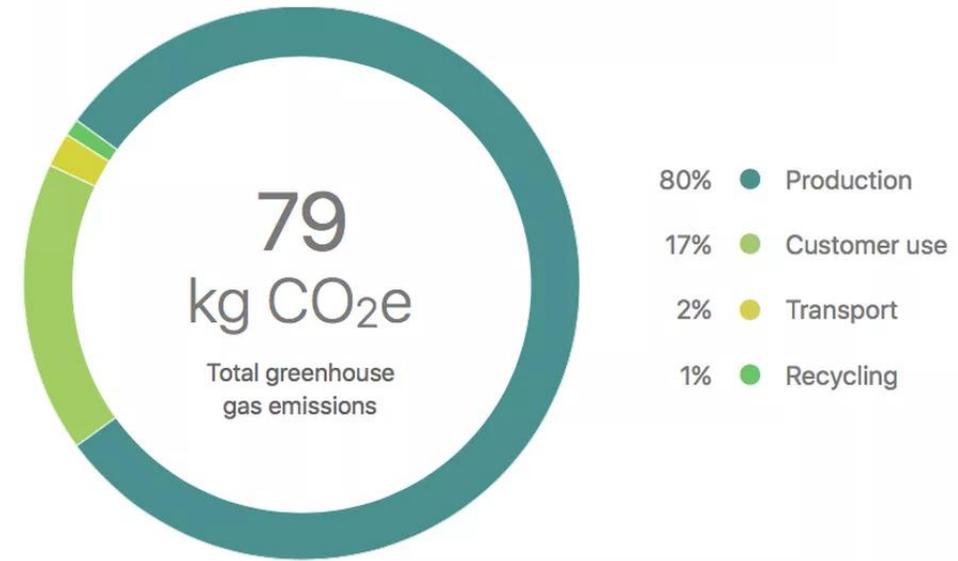
Global data centre electricity demand in 2019 was around 200 TWh, or around **0.8%** of global final electricity demand.

Focus is often on major improvements on efficiency.

But embedded emissions within the ICT devices (e.g. phones) account for **80-90%** of the footprint.

Mobile phones are used for an average of 2 years and only **10%** of phone are recycled.

Greenhouse Gas Emissions for iPhone X—64GB model



Digital transformation and e-waste

A record **53.6 million metric tonnes** (Mt) of e-waste is reported generated worldwide in 2019, up 9.2 Mt in five years.

The amount of e-waste is rising **3X** faster than the world's population. Now at **7.3 kg** per capita per year (Europe at 22 kg).

The value of raw materials in the global e-waste generated in 2019 is equal to approximately **\$57 billion USD - 69 elements**

In 2019, only **17.4 per cent** of e-waste was officially documented as formally collected and recycled. Increases in recycling rates are not keeping pace with growth rates.

Global e-waste will reach **74 Mt by 2030**, almost double the 2014 figure.

Only **78** countries have e-waste legislation.

The ITU, the Plenipotentiary Conference, established a target to increase the global e-waste recycling rate to **30 per cent** by 2022



Digital transformation, green technologies and mineral intensity

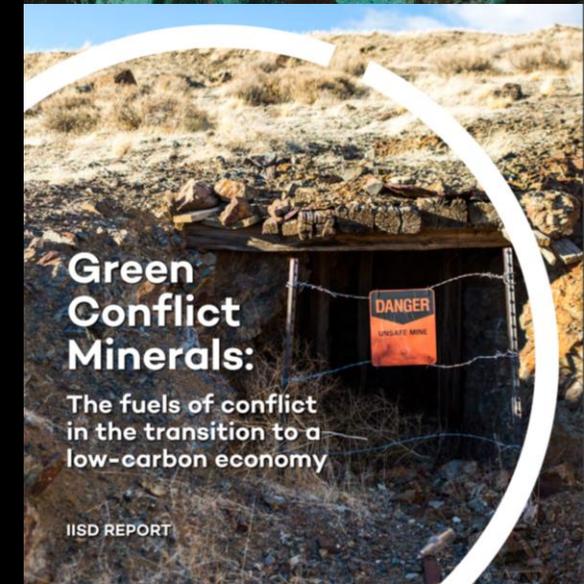
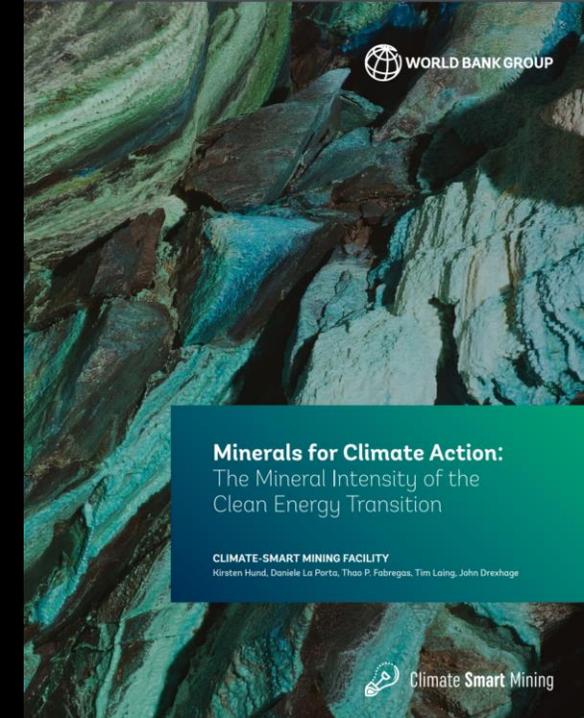
The mining sector will play a **key role** in the transition toward a zero-net emissions future by 2050 driven by green and renewable technologies.

Demand for green energy technologies, and the underlying minerals is predicted to **increase dramatically** in the years and decades ahead.

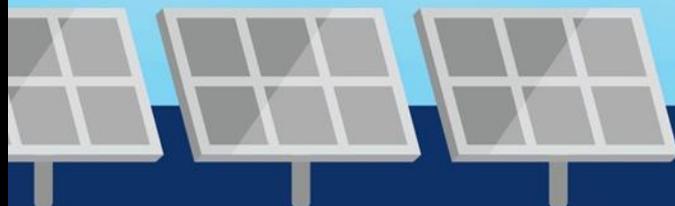
E.g. demand for the minerals required for solar panels—including copper, iron, lead, molybdenum, nickel and zinc—could increase **by 300** per cent through 2050.

Important **geopolitical implications** in terms of minerals sourcing and global supply chains.

Many countries lack capacities to **mitigate negative social and environmental impacts** from the mining sector.



Minerals Required for Green Energy Technologies



Percent of global reserves located in fragile states

Copper	41%
Bauxite	44%
Graphite	73%
Cobalt	70%
Iron	42%
Lithium	21%
Tin	69%
Rare earths	58%
Zinc	52%

Al Bauxite & Aluminum	Ge Germanium	Ni Nickel	Te Tellurium
Cd Cadmium	In Indium	Se Selenium	Sn Tin
Cu Copper	Fe Iron	Si Silicon	Zn Zinc
Ga Gallium	Pb Lead	Ag Silver	

Al Bauxite & Aluminum	Fe Iron	Mo Molybdenum
Cr Chromium	Pb Lead	* Rare Earths
Co Cobalt	Mn Manganese	Zn Zinc
Cu Copper		

Al Bauxite & Aluminum	C Graphite	Li Lithium	* Rare Earths
Co Cobalt	Fe Iron	Mn Manganese	Si Silicon
Cu Copper	Pb Lead	Ni Nickel	Ti Titanium

* The "Rare Earths" designation refers to 17 different elements, including dysprosium and neodymium (critical for wind technologies and energy storage), as well as praseodymium (critical for electric vehicles and energy storage).

SOLAR TECHNOLOGY

WIND TECHNOLOGY

ELECTRIC VEHICLES & ENERGY STORAGE

Discussion: Are we moving in the right direction to build a digital ecosystem for the planet?

Strengths:

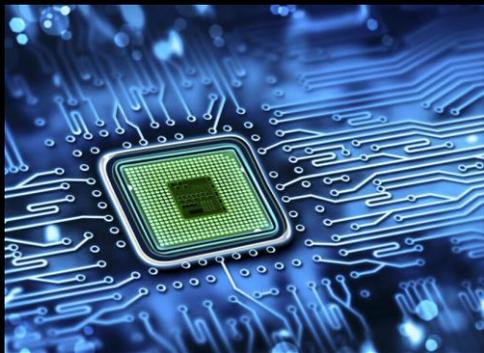
- 1) UN Roadmap for Digital Cooperation – increasing uptake of digital priorities including environment
- 2) UNEP planned adoption of a Digital Transformation programme and World Environment Situation Room
- 3) Range of platforms being stood up to monitor environmental change as digital public goods
- 4) AI used for predictive analytics on different environment and climate risks
- 5) Progress on data integration across supply chains / digital nudging

Challenges:

- 1) Still no overarching governance framework
- 2) Concerns about data, algorithm and platform quality, transparency and inter-operability
- 3) Significant data licensing issues still plague the sector
- 4) Little strategic dialogue across tech companies (winner take tall mindset)

One of the key challenges is the fundamental difference in the clock rate of our different systems:

Technology



Speed of light

Institutions



Election cycles

Humans



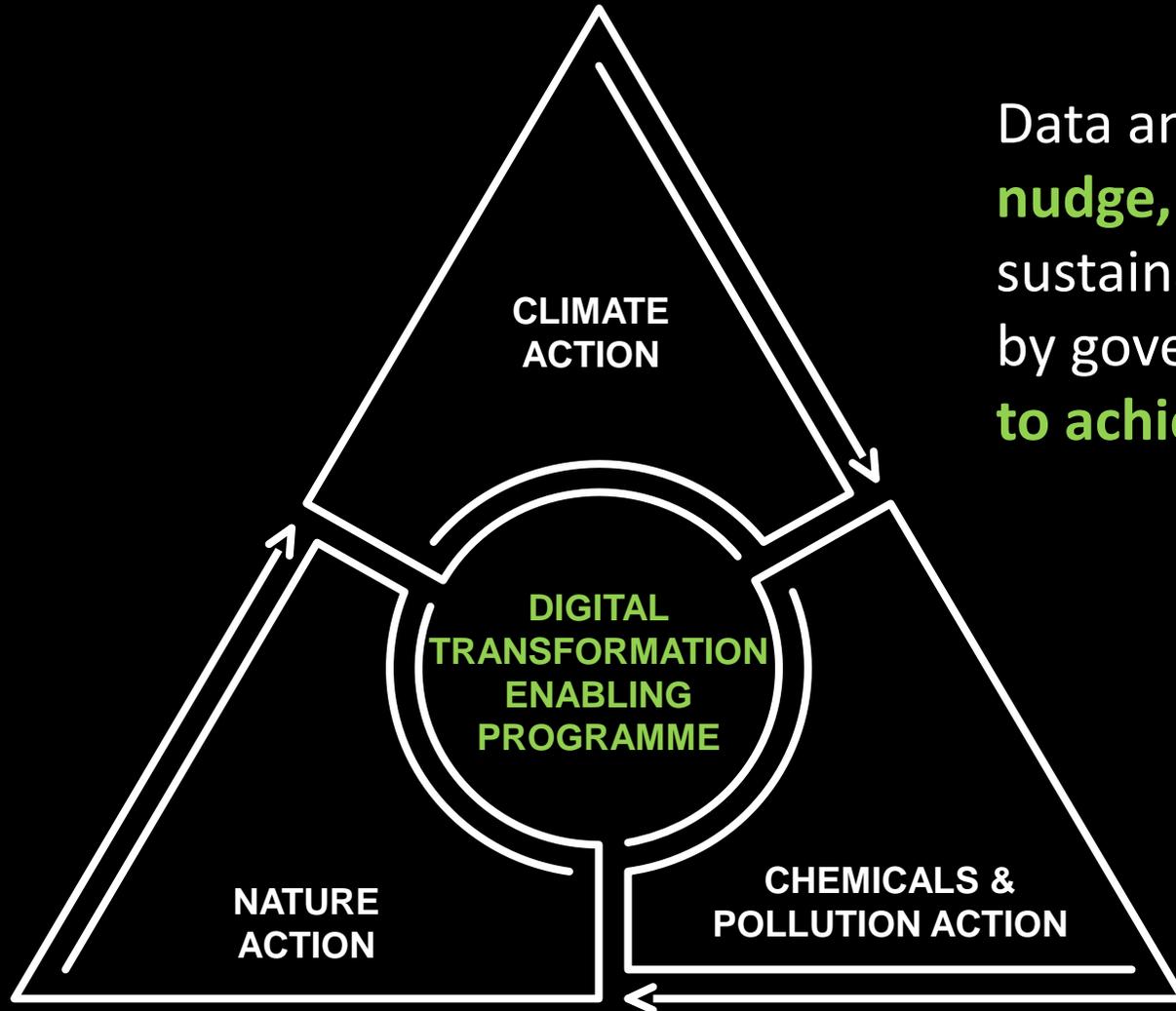
DNA / Culture

Ecosystems



Natural selection

UNEP priorities 2022-2025



Data and digital technologies are harnessed to **nudge, direct, amplify and accelerate** sustainable consumption & production behaviors by governments, companies, investors and consumers **to achieve climate, nature & pollution action targets.**