DIGITAL FOR PLANET

THE GREEN CLOUD-EDGE-COMPUTING D4P WORKING GROUP

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DIGITAL WITH PURPOSE

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ICT FOR SUSTAINABLE DEVELOPMENT

Across several sectors - *smart energy/ grids, connected mobility, smart factories, smart buildings, smart farming, smart water*, digital technologies and solutions allow for:

- More efficient use of resources
- Optimisation of processes
- Environmental impact monitoring
- Access to essential (and not only) services, e.g., education, health care…

"ICT has the potential to maintain global CO_2 emissions at 2015 levels, decoupling the past pattern where each 1% of growth in GDP equated to an 0.5% increase in CO_2 emissions, and promote sustainable growth through 2030".

SMARTer 2030, GESI

BUT AS WE KNOW

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DIGITAL TECHNOLOGIES AND THEIR OVERCONSUMPTION ARE ALSO A BIG PART OF THE PROBLEM

Technology drives electricity demands

- Estimates show that ICT could consume 20% of global electricity by 2025, generating 5.5% of CO_2 emissions - with 25 billion "connected things" by 2021 (!)

Technology is damaging the environment

- Production, use and disposal have direct effects
- Mining rare minerals destroys natural ecosystems
- eWASTE - 53.6 million tonnes only in 2019 (!)

Technology is inducing overconsumption

- Enforcing culture of disposability
- Replacement rather than repair approach
- Software development vs. hardware upgrades


WORKING GROUPS OVERVIEW

D4P WORKING GROUPS

- **Green Cloud-Edge-IoT Computing WG**
- Climate-Neutral and Sustainable Smart Cities WG
- Sustainable Next Generation Internet WG
- Sustainable 5G/B5G Networks and Services

GREEN CLOUD-EDGE-IOT COMPUTING

- All sectors of business and society will increasingly rely on the Cloud-Edge-IoT continuum
- The ICT industry could use up to 20% of all electricity and emit up to 5.5% of the world's carbon emissions by 2025
- **The Edge Computing promise**: decentralisation is inherently faster, greener, more private and secure
  - Reduced latency
  - Reduced energy consumption
  - Intelligence and data value creation closer to users
- Is that all so easy? Are we ready?
- What is the European market space?

WG GOALS AND ACTIVITIES

D4P GREEN C-E-IoT WORKING GROUP

- At work for development of technologies and policies to **ensure the development of an eco-friendly cloud-edge-IoT-empowered market** accessible to both public and private organisations
- **D4P Green C-E-IoT WG** is active on:
  - Roadmap and R&I agendas definition
  - Facilitate entry points for SMEs as key market players in Europe
  - Engage experts and stakeholders from multiple industries and disciplines
  - Inject in EU Green Deal objectives / EC policies as relevant
  - Facilitate liaisons and dialogue across relevant initiatives

GREEN C-E-IOT WG: OBJECTIVES

FOUR MAIN ACTIVE GOALS

- Footprint study and assessment
- Architectures, models, solutions
- Policy development guidelines
- Digital transformation through the Cloud-Edge-IoT continuum

GREEN C-E-IOT WG: ACTIVITIES (1/2)

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FOOTPRINT STUDY AND ASSESSMENT

- Environmental impact of Data Centres
  - Clear and well known and modelled
  - Leveraging economy of scale
  - Best-in-class close to best efficiency
- Extension to Cloud-Edge-IoT continuum
  - Complete flip of Data Centre conditions
  - Diversity and scale of IoT devices
- Need for collaborative work

ARCHITECTURES, MODELS, SOLUTIONS

- Cloud and IoT towards Edge Computing
  - A convergence of both ends
  - Enormous device and application diversity
  - Energy efficiency not always a priority
- End-to-end design for Green ICT
  - Full life cycle carbon footprint assessment
  - Multi-level (device, network, edge server)
  - Trial and validation in multiple industries
- Both facilitation and direct innovation

GREEN C-E-IOT WG: ACTIVITIES (2/2)

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POLICY DEVELOPMENT GUIDELINES

- Green Cloud, green Edge, green IoT
  - Strategic topics for Europe now
  - R&I effort underway in H2020 already
  - High importance in HEUROPE, DEP, etc.
- Pipeline from research to market
  - R&I feeds into research agendas
  - Research combined with business/market feeds into policy recommendations
- Assess, discuss, propose approaches

DIGITAL TRANSFORMATION

- Cloud-Edge-IoT convergence as a driver
  - Pervasive data generation and processing
  - Synergies with AI/ML and local context
  - Concerns with data location/sovereignty
- Social, economical, and behavioural sides
  - Discuss and foster analysis and debate
  - Support selected initiatives and projects
  - Promote, engage, and raise awareness

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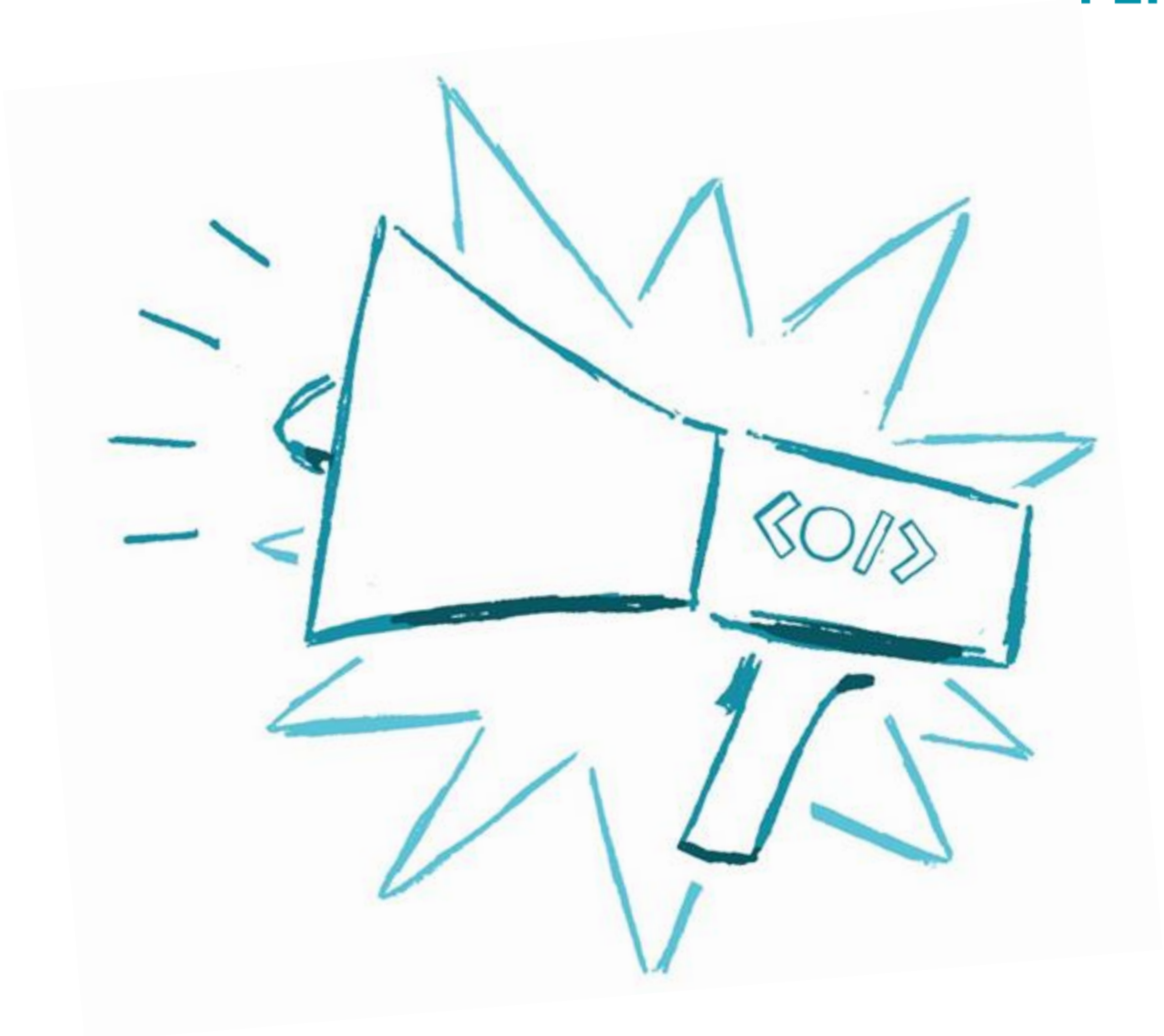

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