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IEEE Initiatives in Sustainability and Sustainable ICT

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IEEE SA
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Agenda

- Sustainability as a focus at IEEE
- Sustainable ICT programs at IEEE
- IEEE SA Telecom & Connectivity Practice
- Related IEEE and IEEE SA Initiatives

IEEE BoD Resolution

IEEE BoD Resolution 2019:

The BoD acknowledges *"the global scale of the human-made and other environmental, social and governance challenges that threaten to rapidly and critically impact the living conditions of current and future generations".*

In same resolution, the BOD makes the direct connection of these global challenges to IEEE's Code of Ethics encouraging IEEE members to strive to comply with *"ethical design and sustainable development practices".*

Call to action

- Develop professional and educational programs supporting capacity building for the development of engineering and technical professionals in parts of the world lacking strong technical communities.

- Promote technically feasible, economically viable solutions and sustainable development practices in IEEE's fields of interest.

- Explore IEEE's role in sustainable development practices and solutions, with such practices to address collaboration within IEEE and IEEE membership opportunities and models.

IEEE Climate Change and Sustainable Development Committee

- Committee that uses IEEE's commitment to the constant pursuit of innovation and excellence; and
- the technical expertise of IEEE members and volunteers; and
- the power of IEEE's convening and collaborative platforms
- to enable innovation to meet the needs of present without compromising the ability of future generations to meet their own needs.

- It supports long-term IEEE engagement in creating and promoting technical solutions for sustainable development, including technical focus areas of:
    - Sustainable Energy
    - Sustainable Information and Communication Technologies (ICT)

Sustainability and ICT Transformation

“We must look ahead at today’s radical changes in technology, not just as forecasters but as actors charged with designing and bringing about a sustainable and acceptable world. New knowledge gives us power for change: for good or ill, for knowledge is neutral. The problems we face go well beyond technology: problems of living in harmony with nature, and most important, living in harmony with each other. Information technology, so closely tied to the properties of the human mind, can give us, if we ask the right questions, the special insights we need to advance these goals.”

- Herbert Simon (1916-2001)
Nobel prize laureate 1978, A. M. Turing award 1975

IEEE

IEEE Sustainable ICT Initiative

Focused on building a holistic approach to sustainability through ICT by incorporating green metrics throughout IEEE technical domains.

Serves as a focal point for news, technology updates and information on conferences, publications, educational materials and standards activities on Sustainable ICT throughout IEEE.

Sustainable ICT Standards

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IEEE SUSTAINABLEICT™

IEEE 1680 Series: a family of IEEE sustainability standards dealing with the assessment of environmental performance of electronic products

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CONNECTIVITY & TELECOM

CONNECTIVITY AND TELECOM PRACTICE

Vision: To realize a robust, responsible and affordable connectivity to meet the ever-increasing data, innovation, and economic aims across different domains and regions of the world.

Workstreams

Rural Communications

Consumer Communications

Industrial Communications

Initiatives

6G

5G Framework

Open RAN

Cybersecurity

User Interface

Telehealth

Sustainability

Rural Connectivity

IEEE Technical Committee on Green Communications and Computing

A platform for IEEE members and the R&D, standardization and service communities focuses on energy efficient and environmentally sustainable communications, computing and relevant systems to exchange technical ideas, identify research and development challenges and collaborate on solutions for the development of energy-sustainable, resource saving and environment-friendly green communications and computing technologies.

Addressing such issues as:

- Green fixed communications and networking
- Green wireless access networks
- Software for green communications
- Energy harvesting
- Energy footprint of communications devices

IEEE Data Center and Cloud Sustainability Standards

- **IEEE P1922.1 –** Proposed standard for a method for calculating anticipated emissions caused by virtual machine migration and placement
- **IEEE 1922.2 -** Standard for a method to calculate near real-time emissions of information and communication technology infrastructure
- **IEEE 1923.1 -** Standard for computation of energy efficiency upper bound for apparatus processing communication signal waveforms
- **IEEE 1924.1 –** Proposed recommended practice for developing energy efficient power-proportional digital architectures
- **IEEE P1925.1 -** Standard for Energy Efficient Dynamic Line Rate Transmission System
- **IEEE P1926.1 –** Proposed standard for a Functional Architecture of Distributed Energy Efficient Big Data Processing
- **IEEE P1927.1 –** Proposed standard for Services Provided by the Energy-efficient Orchestration and Management of Virtualized Distributed Data Centers Interconnected by a Virtualized Network (currently balloting)
- **IEEE P1928.1 –** Proposed standard for a Mechanism for Energy Efficient Virtual Machine Placement
- **IEEE P1929.1 –** Proposed standard for an Architectural Framework for Energy Efficient Content Distribution

Frugal Networks - IEEE P2061 – Network Architecture

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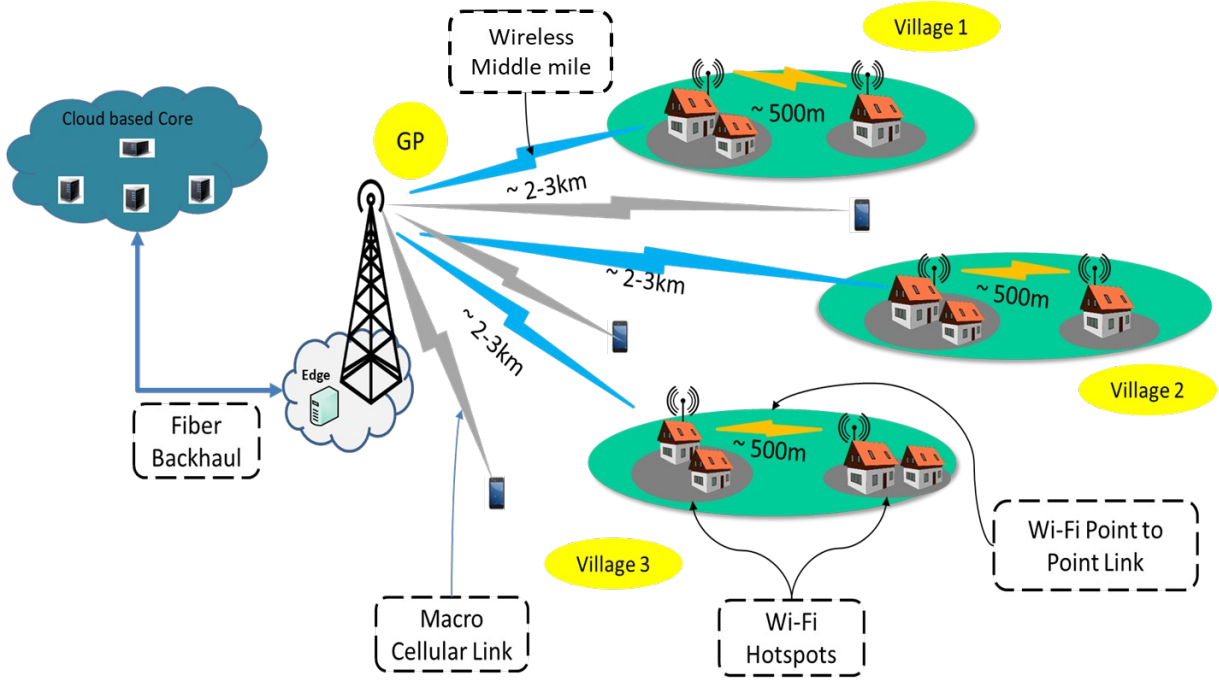
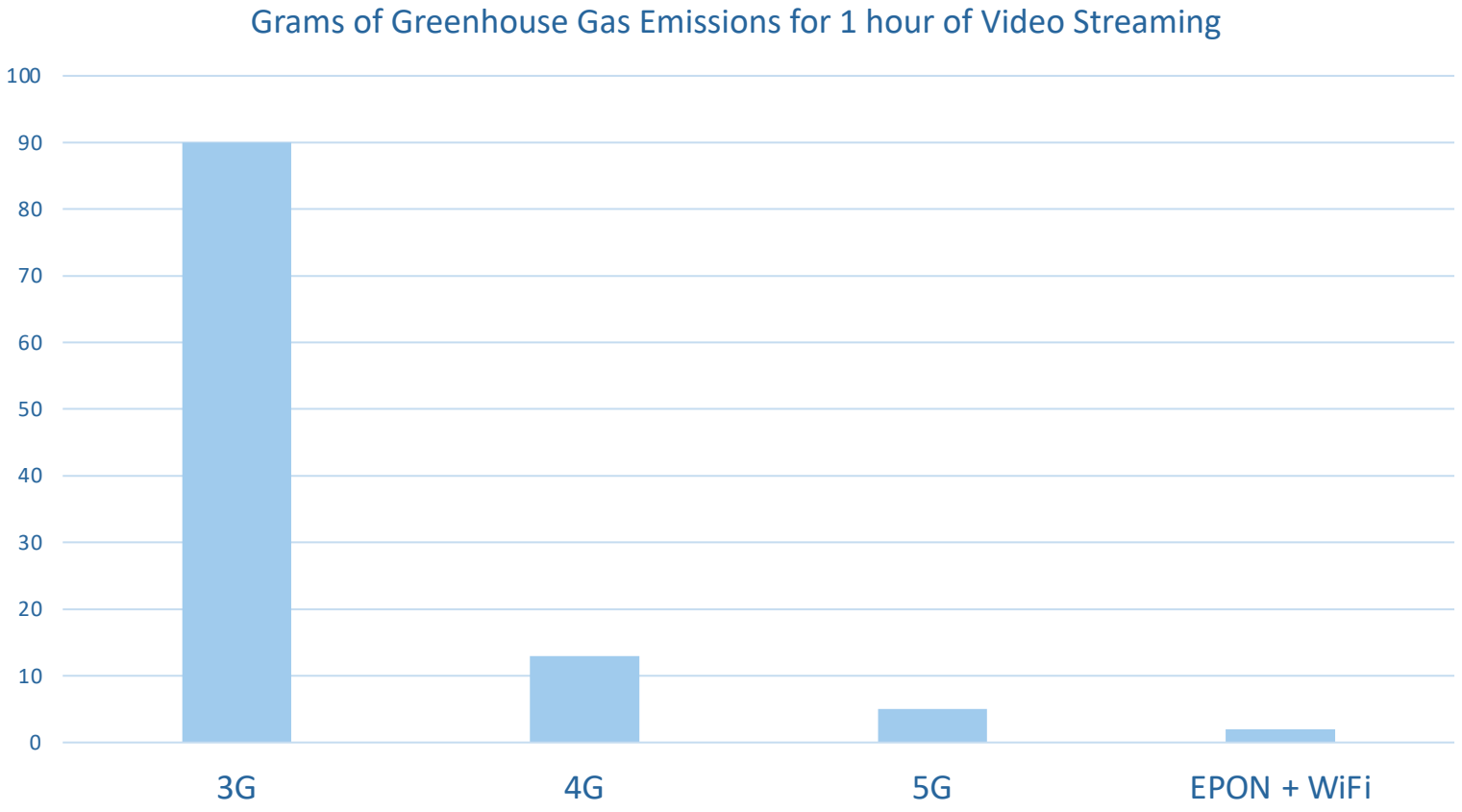
- Wireless Access Network – Can Connect to a Cellular Core
- Large Coverage Area Cells to provide Ubiquitous Connectivity
- Small Cells (IEEE 802.11 Hotspots) as high speed Access Points
- (Wireless) Middle Mile Network to Backhaul Data
- Point to point wireless links to connect the Nodes in Villages



Electronic Communications Sustainability



From Bureau of European Regulators for Electronic Communications, 2022

Communications and Connectivity in Smart Grids

- The IEEE 2030 Series was developed in response to global interest in “Smart Grid” activities.
- These standards share the common goal of interoperability
- Since their inception, they have incorporated emerging grid technologies.

  - IEEE Std 2030.100—IEEE Recommended Practice for Implementing an IEC 61850-Based Substation Communications, Protection, Monitoring, and Control System
  - IEEE Std 2030.5—IEEE Standard for Smart Energy Profile Application Protocol
  - IEEE Std 1815.1—IEEE Standard for Exchanging Information Between Networks Implementing IEC 61850 and IEEE Std 1815 [Distributed Network Protocol (DNP3)]

- Four of the newer standards in the 2030 series address Microgrids, and include the following:
  - IEEE Std 2030.7—IEEE Standard for the Specification of Microgrid Controllers
  - IEEE Std 2030.8—IEEE Standard for the Testing of Microgrid Controllers
  - IEEE Std 2030.9—IEEE Recommended Practice for the Planning and Design of the Microgrid
  - IEEE Std 2030.10—IEEE Standard for DC Microgrids for Rural and Remote Electricity Access Applications


Join us as we work toward advancing technology for the benefit of humanity—and a sustainable future.

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Questions?

Contact me:

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