Introducing the SUSTAIN RG charter

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SUSTAIN RG Vision

The long-term goal of the SUSTAIN RG is to contribute to the advancement of the Internet as a fundamental part of sustainable and resilient societies and the planet, through conceptual and evidence-based multi-disciplinary research collaboration.

Definition of Sustainability for SUSTAIN RG

- “Meeting the needs of the present without compromising the ability of future generations to meet their own needs” as per the 1987 definition of the UN Commission on Environment and Development.
- This requires considering environmental, social and economic aspects together.
- It is a systems-centric view, covering the interconnection among different actors and sub-systems for real-world sustainability impact and outcomes.

Scope of SUSTAIN RG

- Long-term research challenges in developing and operating an environmentally, socially and economically sustainable Internet,
- Networking perspective, mindful of overall impact to systems & services (considering user side, as well as data centres (source),
- Critical view on evidence and data (trustworthiness of research results and their dissemination),
- Architectural and policy implications, without going into advocacy.
- Focus on the Sustainability of the Internet (env, social, econ. footprint), & appreciation of the Internet for Sustainability (handprint).
- Multidisciplinary, systems perspective with lifecycle and supply chain considerations.

Research Areas - Footprint

Reduction of the Internet environmental, social and economic footprint:

- working with quantitative and qualitative indicators, their baselines and targets, measurements and assessments, sharing related data and evidence,
- conceptual and policy frameworks,
- considering lifecycle as well as supply chain issues,
- adopting a holistic system perspective on impact.

Research Areas – Environmental Footprint – 1/2

- Investigate and experiment with novel approaches to greenhouse gas (GHG) emissions reductions:
  - explore innovations in energy proportionality, savings and efficiency,
  - increase the role of renewables in powering Internet infrastructure,
  - advance GHG-aware networking,
  - balance the supply and demand of renewables and computing,
- Circularity, materials/resource efficiency/use, equipment upgrade cycles, total-cost-of ownership (TCO).

Research Areas – Environmental Footprint – 2/2

- Investigate the relationship between environmental sustainability and the Internet architecture (e.g., distributed, centralized, edge computing, cloud, virtualized, overlaid, including caching and in-network computation, as well as the impact of service delivery methods) to understand the implications and impact of differing approaches to network design and the trade-offs.
- Investigate environmental limits and boundaries within which the Internet and its applications should operate safely and the corresponding policy implications.

Research Areas – Social & Economic Footprint

- While we recognize the importance of the social and economic footprint of the Internet, we are lagging in our understanding of the topics due to the increased multidisciplinary nature of the challenges.
- SUSTAIN RG aims to bridge this gap, by attracting researchers from different disciplines and by collaborating with other RGs like GAIA, HRPC, DINRG to develop further these perspectives.
- Social and economic footprint aspects have a strong relation to policy and regulation aspects as well.

Research Areas – Policy & Regulation

- Understand the role of policy and regulation in the environmental, social and economic sustainability of the Internet, as complementary to technological and operational factors, for example to incentivize sustainability.
- Identify and explore sustainability policy-relevant research domains, not policy advocacy work.

Research Areas – Rebound Effect

- Understanding the impacts of different strategies for managing the potential rebound effects (Jevon’s paradox) of Internet sustainability gains, including technical, policy and regulatory aspects.

Research Areas – Climate Change Adaptation

- Understanding new methodologies, architectures and strategies to ensure Internet resilience in the face of climate change impacts that are already taking place,
- Considering resource impacts and operational complexity in creating a more environmentally resilient Internet.

Mode of Operation - 1/2

- Attract research contributions from academia, government and industry with a multi-disciplinary outreach, prioritizing research publications in journals and conferences,
- Hold regular meetings – on-line and hybrid modes prioritized, co-location with sustainable networking conferences, workshops and other events to be considered.
- Coordinate with other IRTF RGs, like GAIA, HRPC, NMRG and DINRG, with IETF WGs like GREEN, TVR, OPSWG and IAB E-impact, as well as with the Internet Society, and the sustainability efforts of other SDOs, industrial consortia, and research organizations

Mode of Operation - 2/2

- Organize awareness-raising activities, such as invited talks from sustainability experts, including from systems, environmental, social and economic sciences and practitioners that work on sustainability target setting, policy, assessments and strategy, to clarify the linkages.
- Organize and promote a special session on sustainability at the ACM/IRTF Applied Networking Research Workshop (ANRW), working with the ANRW Programme Committee.
- Occasionally publish RFCs to transfer research results and feedback to the IETF community, deferring to the IETF for technology standardization.

Potential Initial Output – 1/2

- Develop and publish a common sustainability terminology reference document,
- Identify focused research areas, groupings of research topics (tracks) and invite the publication of survey papers on them, identifying baseline know-how, research coverage and gaps,
- Establish a sustainability session at ANRW 2025,
- Collaborate with GAIA , HRPC, DINRG and other RGs for joint action on sustainability outcomes, including on policy relevant ones,

Potential Initial Output – 2/2

- Coordinate with Green and other WGs as well as other RGs about contributions they could refer to SUSTAIN RG,
- Organize a workshop on a priority topic for the RG alongside a networking research event,
- Organize invited talks from systems, environmental, social and economic sciences and policymakers and regulators to develop awareness and know-how,
- Hold meetings during regular IETF weeks as well as on-line interim meetings, inviting contributions, especially on one or several selected themes to create focus.

Thanks very much!

Questions - Feedback?