

Policy Options for Connecting and Enabling the Next Billion(s) – Phase III

Sustainable access & development: An Armenian Internet exchange point case study

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While it seems self-evident that “sustainability” is a core component of the Sustainable Development Goals (SDGs),¹ they often overlook the importance of sustainability in their targets. Such is the case with SDG 9, specifically target 9.C,² for instance, which concerns expanding Internet access by 2020. As we race to connect the next billion people (and the billions after that), however, we cannot legitimately discuss – much less scale – Internet access without addressing sustainability.

First defined during a roundtable workshop at the 10th European Dialogue on Internet Governance (EuroDIG) in Tallinn, Estonia, in June 2017,³ sustainable access refers to **the ability for any user to connect to the Internet and then stay connected over time**. Of course, this touches on many aspects of the relationship between technology, society, and the environment,⁴ including:

- The need for robust and reliable infrastructure, such as fiber optics and Internet exchange points (IXPs),⁵ and the kind of energy supplying critical Internet infrastructure or cooling servers;
- How much power information and communications technologies (ICTs) are consuming, how such power is being generated, and the energy costs of data generation, storage, and transit;
- The sourcing, manufacturing, and recyclability of Internet-connected devices/ICTs;
- Human-centric needs and skills, such as community access points, digital literacy skills, affordable services, local, relevant content, and community-led networking (community networks);⁶

¹ <https://sustainabledevelopment.un.org/sdgs>.

² <https://sustainabledevelopment.un.org/sdg9>.

³ https://eurodigwiki.org/wiki/WS_11_2017.

⁴ For more information, see: http://www.circleid.com/posts/20170619_internet_governance_for_sustainability/.

⁵ http://www.intgovforum.org/multilingual/index.php?q=filedepot_download/3408/442.

- Digital pollution, the availability of resources such as radio spectrum, Internet Protocol (IP) addresses, and Autonomous System (AS) numbers, and the implementation of IP version 6 (IPv6);⁷
- And lastly, the ecological impact the digital world is having, such as the impact of electronic waste (e-waste) on both the environment and communities.

Although some of these aspects have been addressed within the overall framework of development in the past,⁸ sustainability – environmental sustainability as it relates to the Internet and ICTs in particular – deserves greater attention. Whether it involves exploring the relationship between climate change⁹ and the Internet, or discerning how much energy the Internet and ICTs consume,¹⁰ making this a topic of discussion is critical for a number of reasons.

Why sustainability is important

Aside from connecting more people over time, current estimates¹¹ place the growth of the Internet of things (IoT) at a staggering 20.4 billion devices by 2020 – and that’s the conservative figure. Where are those devices going to come from? How are they going to be manufactured and eventually recycled (or simply discarded)? What kind of energy is going to power the data centers feeding our increasingly data-hungry habits?¹² How do we mitigate machine-to-machine (M2M), ICT, and data transit energy consumption, which is rising as well?¹³ What will we do with all the optic fiber that was laid when it needs to be replaced? And what about other aspects of technology, such as whether or not the minerals in those devices are mined from conflict zones, only to be shipped back one day to be dumped in a slum?¹⁴

These are but a few of the myriad questions that are going unanswered. The fact is we are reaching a point in our civilizational arc where we can no longer ignore that digital technology has a significant ecological footprint – or neglect the policy, laws, and regulation

⁶ For more information about the relationship between community networks and sustainability, see: http://internet-governance.fgv.br/sites/internet-governance.fgv.br/files/publicacoes/community_connectivity_-_building_the_internet_from_scratch_0.pdf. Also see:

https://www.internetsociety.org/sites/default/files/CommunityNetworkingAfrica_report_May2017_1.pdf.

⁷ http://www.intgovforum.org/multilingual/index.php?q=filedepot_download/3407/458.

⁸ http://www.circleid.com/posts/20160429_wsis_internet_governance_plea_for_star_trek_over_mad_max/.

⁹ http://www.circleid.com/posts/20161006_the_internets_climate_quandary_inconvenience_of_practicing/.

¹⁰ http://www.circleid.com/posts/20170321_shedding_light_on_how_much_energy_internet_and_ict_consume/.

¹¹ <https://www.gartner.com/newsroom/id/3598917>.

¹²

http://www.circleid.com/posts/20160811_internet_data_growth_iot_leading_to_unlimited_energy_consumption/.

¹³ <https://theconversation.com/the-hidden-energy-cost-of-smart-homes-60306>.

¹⁴ <http://www.greenpeace.org/international/en/campaigns/detox/electronics/the-e-waste-problem/where-does-e-waste-end-up/>.

needed to address it. Moreover, there is a growing trend throughout the Internet ecosystem: more data is being produced, stored, and consumed.¹⁵ Simply put, with more data comes more energy consumption and a greater impact on the environment.¹⁶ Fortunately, though, sustainability is good for the business behind technical operations.¹⁷

The experience of ARMIX, an IXP in Armenia

Energy costs are a significant contributor to an IXP's monthly operating costs, which was a growing concern for ARMIX, an Internet exchange based in Yerevan, Armenia.¹⁸ In 2014, ARMIX reached out to the Internet Society (ISOC) seeking ways to help them integrate renewable energy into their operations, promote green energy solutions, and reduce their electricity costs and consumption. ISOC eventually donated 18 solar panels that produce more than 4 kilowatts of power to help them with one of their points of presence (PoPs).¹⁹

As a result, their electricity costs have dropped by more than 30 percent, and they are now much less reliant on non-renewable energy sources. The panels have been so helpful, they are now looking for ways to expand the use of solar to their other two PoPs. Moreover, they want to set a good example of technology companies that help to change their physical environment, and are also encouraging other operators within the Commonwealth of Independent States (CIS) region to integrate renewable energy sources.

ARMIX's success is also an example of the success that can come from the combination of enabling government policy-making, effective public-private partnerships, and sustainable planning, since the government began incentivizing solar and a local solar solution provider assisted them. It is also a good example to other operators looking to cut their own costs. Perhaps other local or country-specific initiatives could help bring solar, wind, or other renewable solutions to an IXP or other technical body's operations, whether it is via a government mechanism or by collaborating with local solar providers in the private sector.

Policy-makers have an indispensable role to play in promoting sustainability and ensuring the SDGs are realized.²⁰ Thus, there is so much more we can do to help people get online and ultimately stay online. The Internet is an inherently collaborative project, and the more we work together, the better it will get. We hope policy-makers and other related decision-makers will help catalyze the technical community's role in ensuring that future of Internet development continues to be more innovative, enriching, and life changing – but also, by enabling a policy and regulatory environment that also make the Internet and ICTs greener.

¹⁵ Much of this growth is fueled by the demand for video streaming. For more information, see:

<https://qz.com/742474/how-streaming-video-changed-the-shape-of-the-internet/>.

¹⁶ <http://www.mdpi.com/2078-1547/6/1/117>.

¹⁷ https://labs.ripe.net/Members/michael_oghia/sustainability-is-good-for-the-internet-and-business-too.

¹⁸ <http://www.armix.am/eng/index.php>.

¹⁹ <https://www.internetsociety.org/blog/development/2017/06/armix>.

²⁰ <https://www.diplomacy.edu/blog/12-step-guide-implementing-sdgs>.