

## Contribution to the October - December 2021 Open Consultation of the ITU CWG-Internet

October 2021

Richard Hill<sup>1</sup>, APIG

### Summary

As an OCED report states: “ICTs, including the Internet, are having profound environmental impacts, both positive and negative.” ICTs, including the Internet, have greatly improved the efficiency of production and transportation processes, thus reducing greenhouse gas emissions. However, increased efficiency has resulted in lower costs and higher demand. It is not obvious that increased demand would have occurred without ICTs, and it is not obvious whether the efficiencies realized thanks to ICTs have been offset by the greater demand. Thus, it is very difficult to quantify the net impact of ICTs on the environment.

The direct negative effects of ICTs and the Internet on the environment are essentially their contributions to environmental pollution and greenhouse gas emissions.

E-waste constitutes a significant, and worsening, environmental issue. It is being combated by a number of programs, including in ITU. In our view, states should consider acceding to the 2012 International Telecommunication Regulations, whose article 11 states: “Member States are encouraged to adopt energy-efficiency and e-waste best practices taking into account the relevant ITU-T Recommendations.” As far as we are aware, this is the only treaty-level provision relating to e-waste.

While certain (mostly OECD) Member States support ICT-related proposals in trade agreements (including in WTO), we are not aware of any proposals regarding e-waste in trade agreements. We note in passing that the very same states that support ICT-related proposals in binding treaty-level trade agreements object to discussing such proposals in ITU, on the grounds that treaty-level provisions are not necessary, cannot be sufficiently flexible, and could hamper innovation. This appears inconsistent.

Regarding greenhouse gas emissions, it appears that the ICT industry’s contribution is comparable to that of the aviation industry, and that the Internet accounts for a significant proportion of global energy consumption and the consequent greenhouse gas emissions. ITU Recommendation L.1470 provides guidance on how to reduce greenhouse gas emissions in the ICT sector.

A small number of web sites, including adult entertainment sites and gaming sites, account for a significant proportion of web traffic and thus of greenhouse gas emissions. News also accounts for a significant proportion, but a significant proportion of news is misleading (fake news). This is due to the current advertising-driven revenue model. A tax on digital advertising could reduce the volume of collected data, and thus reduce the consumption of electricity

Data centers and content delivery networks also account for a significant proportion of greenhouse gas emissions (for example, it has been estimated that Bitcoin consumes as much electricity as countries like Indonesia or Sweden).

International data flows also account for a significant proportion of greenhouse gas emissions. Undesirable international data flows can also be reduced by enabling users to control what data are collected and stored, as is done by the European Union’s General Data Protection Regulation (GDPR). Unnecessary international data flows can also be reduced by promoting data localization, and customs duties on international data flows, including for e-commerce. Consequently, the current WTO moratorium on customs duties for e-commerce should be abrogated, and there should be no

---

<sup>1</sup> [info@apig.ch](mailto:info@apig.ch)

international agreements limiting data localization requirements, or preventing national limitations of cross-border data flows.

While robocalls (which are facilitated by the Internet) do not account for much traffic, most of them do not appear to provide social or economic benefits, thus their suppression would seem to be a priority item and indeed many countries, and the ITU, are taking measures to combat illegitimate robocalling.

At present, the Internet is a “best effort” network, that does not allocate priority to any particular type of traffic, so reasonable quality of service is achieved by allocating the bandwidth that will likely satisfy peak demand. Use of a signaling network might achieve higher efficiency, and thus less use of electricity for the same throughput. It is suggested that studies be initiated on the use of signaling networks to improve the efficiency of Internet traffic.

The respective roles of stakeholders are clearly set forth in paragraph 35 of the Tunis Agenda, however, we suggest a refinement that would more clearly specify the roles and responsibilities of the different stakeholders.

### **Contribution**

The topic for the October - December 2021 Open Consultation is:

#### **The Environmental Impacts and Benefits of the Internet**

- What effects does the Internet have on the environment and vice-versa?
- How can we improve the impact the Internet has on the environment and take advantage of its potential to help address climate-related issues?
- What role should stakeholders play in shaping the environmental impacts and benefits of the Internet?
- What are the policy, regulatory and other relevant matters associated with the environmental impacts and benefits of the Internet?

#### **A. What effects does the Internet have on the environment and vice-versa?**

1. As a preliminary comment, we note and applaud the ITU’s work on Climate Change and the Environment, see:

<https://www.itu.int/en/action/environment-and-climate-change/Pages/default.aspx>

We also note and applaud the Diplo Foundation’s work, see:

<https://dig.watch/trends/digital-and-environment>

2. In order to evaluate the effects of the Internet on the environment, it is necessary to define “the Internet”.

3. A variety of definitions have been proposed in various contexts<sup>2</sup>. This submission will use the 1995 definition of the US Federal Networking Council<sup>3</sup>:  
the global information system that:
  - (i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons;
  - (ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols; and
  - (iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein.
4. This is an extremely broad definition, since it encompasses the applications that run on top of the TCP/IP protocol as well as the hardware that is interconnected by that protocol. This broad definition would appear to correspond well to what is commonly meant by “the Internet”.
5. Thus, “the Internet” comprises a significant proportion of Information and Communication Technologies (ICTs).
6. It is obvious that ICTs have a significant effect on the environment. As an OECD report puts the matter: “ICTs are having profound environmental impacts, both positive and negative.”<sup>4</sup>

#### **A.1 Positive effects of ICTs and the Internet on the environment**

7. It is obvious that ICTs, including the Internet, have greatly improved the efficiency of production and transportation processes, thus reducing greenhouse gas emissions. For example, all forms of transport have been made more efficient by computer-aided design of vehicles (cars, trucks, ships, airplanes), computer-control of engines while they are running, and computerized optimization of routing and loading.
8. However, increased efficiency has resulted in lower transportation costs and higher demand for transportation. So the use of transportation (e.g. airline travel, container ships) has increased.
9. It is not obvious that such increases would have taken place without ICTs, and it is not obvious whether the efficiencies realized thanks to ICTs have been offset by the greater volume of transportation. Indeed, it is very difficult to quantify the net impact of ICTs on the environment.<sup>5, 6</sup>
10. Since it is very difficult to evaluate the net effect of ICTs, and the Internet, on the environment, and since the positive effects are obvious, the remainder of this submission will discuss the direct negative effects and how to reduce them.

---

<sup>2</sup> <http://www.apig.ch/Internet%20definition.doc> ; published in Richard Hill (2014), "The Internet, its governance, and the multi-Stakeholder model", *Info*, vol. 16. no. 2, March 2014

<sup>3</sup> See footnote xv of *Robert E. Kahn and Vinton G. Cerf*. “What Is The Internet (And What Makes It Work)” December, 1999, available at: [http://www.cnri.reston.va.us/what\\_is\\_internet.html](http://www.cnri.reston.va.us/what_is_internet.html)

<sup>4</sup> <http://www.oecd.org/dataoecd/4/6/1897156.pdf> , page 2

<sup>5</sup> <https://www.mdpi.com/2071-1050/10/8/2662/pdf>

<sup>6</sup> <https://www.ucc.co.ug/wp-content/uploads/2017/10/The-Future-impact-of-ICTs-and-Environmental-Sustainability.pdf>

## A.2 Negative effects of ICTs and the Internet on the environment

11. The direct negative effects of ICTs and the Internet on the environment are essentially their contributions to environmental pollution (A.2.1 below) and greenhouse gas emissions (A.2.2 below).

### A.2.1 E-waste

12. It is generally understood that e-waste, that is, the consequences of disposing of outdated ICT equipment, including in particular that used to operate and access the Internet, constitutes a significant, and worsening, environmental issue.<sup>7, 8, 9, 10, 11</sup>

13. E-waste is being combated by a number of programs, including in ITU, see:

<https://www.itu.int/en/action/environment-and-climate-change/Pages/ewaste.aspx>

14. In our view, states should consider acceding to the 2012 International Telecommunication Regulations, whose article 11 states: “Member States are encouraged to adopt energy-efficiency and e-waste best practices taking into account the relevant ITU-T Recommendations.”

15. As far as we are aware, this is the only treaty-level provision relating to e-waste.

16. While certain (mostly OECD) Member States support ICT-related proposals in trade agreements (including in WTO), we are not aware of any proposals regarding e-waste in trade agreements.

17. We note in passing that the very same states that support ICT-related proposals in binding treaty-level trade agreements object to discussing such proposals in ITU, on the grounds that treaty-level provisions are not necessary, cannot be sufficiently flexible, and could hamper innovation. This appears inconsistent, see:

<http://www.apig.ch/Inconsistencies.pdf>

<http://www.apig.ch/CSTD%20submission.pdf>

It appears inconsistent in particular given the similarity of the provisions propose in trade agreements to the provisions rejected in ITU, see:

<http://www.apig.ch/WTO%20ITU%20overlaps%20paper.pdf>

### A.2.2 ICT and Internet as % of GDP and % greenhouse gas emissions

18. To what extent to ICTs and Internet contribute to global warming? As shown below, the contribution of ICTs to greenhouse gas emissions may be comparable to that of the aviation industry, and the Internet contributes to a large portion of the ICT industry’s emissions.

19. For 2019, according to UNCTAD, “Depending on the definition, estimates of the size of the digital economy range from 4.5 to 15.5 per cent of world GDP.”<sup>12</sup> For European Union states, ICTs are

---

<sup>7</sup> <https://unemg.org/our-work/emerging-issues/innter-agency-issue-management-group-on-tackling-e-waste/>

<sup>8</sup> <https://www.itu.int/en/action/environment-and-climate-change/Pages/ewaste.aspx>

<sup>9</sup> <https://www.itu.int/en/ITU-D/Environment/Pages/Spotlight/Global-Ewaste-Monitor-2020.aspx>

<sup>10</sup> <https://dig.watch/trends/digital-and-environment#view-15857-4>

<sup>11</sup> <https://dig.watch/issues/e-waste>

<sup>12</sup> [https://unctad.org/en/PublicationsLibrary/der2019\\_en.pdf](https://unctad.org/en/PublicationsLibrary/der2019_en.pdf) , page xvi; for the complexities of defining ICTs, see p. 6. For data by country, see p. 74.

between 3% and 6% of GDP.<sup>13</sup> According to the OECD, in 2012 ICTs<sup>14</sup> accounted for about 6% of value-added (of which about 1.8% was “telecommunications” and 1.9% “IT and other information services”).<sup>15</sup> These estimates are confirmed by a private sector statistical source.<sup>16</sup>

20. It would appear reasonable to assume that ICTs account for at least 3% of world GDP and that the “Internet” as defined above accounts for at least 1% of world GDP.
21. Given its share of the global economy, and given that ICTs are energy-intensive, it is not surprising that ICT’s share of global greenhouse gas emissions has been estimated to be at least 1.8-2.8% of global emissions, and possibly as high as 2.1-3.9%.<sup>17, 18, 19, 20</sup> This is comparable to emissions from the aviation sector, which have been estimated at between 2%<sup>21</sup> and 3.5%<sup>22</sup> of total worldwide emissions. The ICT industry however provides a lower estimate for its emissions: 1.4%<sup>23, 24, 25</sup>
22. Be that as it may, it cannot be contested that ICTs, and the Internet, account for a significant portion of energy consumption and the consequent greenhouse gas emissions.
23. Thus it is appropriate to estimate which components of “the Internet” contribute most to greenhouse gas emissions and other negative environmental effects.
24. In particular, what are the contributions of:
  - A.2.1.1 the World Wide Web
  - A.2.1.2 Data Centers and computing
  - A.2.1.3 International data flows

---

<sup>13</sup> <https://ec.europa.eu/eurostat/databrowser/view/tin00074/default/table?lang=en>

<sup>14</sup> <https://stats.oecd.org/glossary/detail.asp?ID=3038>

<sup>15</sup> [https://www.oecd-ilibrary.org/science-and-technology/measuring-the-digital-economy\\_9789264221796-en](https://www.oecd-ilibrary.org/science-and-technology/measuring-the-digital-economy_9789264221796-en) , pages 14 and 37.

<sup>16</sup> <https://www.nationmaster.com/nmx/ranking/ict-services-share-in-gdp>

<sup>17</sup> <https://arxiv.org/pdf/2102.02622>

<sup>18</sup> <https://ictfootprint.eu/en/about/ict-carbon-footprint/ict-carbon-footprint>

<sup>19</sup> <https://dig.watch/trends/digital-and-environment#view-15857-3>

<sup>20</sup> <https://theshiftproject.org/en/article/unsustainable-use-online-video/>

<sup>21</sup> <https://www.atag.org/facts-figures.html>

<sup>22</sup> <https://www.eesi.org/papers/view/fact-sheet-the-growth-in-greenhouse-gas-emissions-from-commercial-aviation>

<sup>23</sup> <https://www.ericsson.com/en/reports-and-papers/research-papers/the-future-carbon-footprint-of-the-ict-and-em-sectors>

<sup>24</sup> <https://itif.org/publications/2020/07/06/beyond-energy-techlash-real-climate-impacts-information-technology>

<sup>25</sup> <https://www.iea.org/commentaries/the-carbon-footprint-of-streaming-video-fact-checking-the-headlines>

### A.2.1.1 The World Wide Web

25. There is general agreement that Google, Youtube, Facebook, and Twitter are the most visited web sites. Some sources show adult entertainment sites (pornography) in the top ten, others don't. For example, one ranking shows the following<sup>26</sup>:

	Site	# Monthly Visitors	Category
1	Google.com	92.5B	Search Engines
2	Youtube.com	34.6B	TV Movies and Streaming
3	Facebook.com	25.5B	Social Networks and Online Communities
4	Twitter.com	6.6B	Social Networks and Online Communities
5	Wikipedia.org	6.1B	Dictionaries and Encyclopedias
6	Instagram.com	6.1B	Social Networks and Online Communities
7	Baidu.com	5.6B	Search Engines
8	Yahoo.com	3.8B	News and Media
9	xvideos.com	3.4B	Adult
10	pornhub.com	3.3B	Adult

26. The above figures for PornHub are consistent with what that website itself reports for 2019: over 42 billion visits, which means there was an average of 115 million visits per day; in 2019, Pornhub claims to have transferred 6597 petabytes of data, which was about 18,073 terabytes per day, and 209 gigabytes per second.<sup>27</sup>

27. According to one study, pornography accounts for about 27% of all online video traffic.<sup>28</sup>

28. While exaggerated claims have been made regarding the proportion of Internet traffic related to Google and Facebook, it would appear that Google-operated sites receive 12 % of total internet traffic, Netflix about 11%, and Facebook-controlled sites nearly 8%.<sup>29, 30</sup>

29. Gaming also accounts for a significant portion of Internet traffic. Twitch operates one of the world's leading social video service for gamers where millions of people come together each day from all over the globe to interact around live and on-demand content. This includes watching, talking, and

---

<sup>26</sup> <https://www.visualcapitalist.com/the-50-most-visited-websites-in-the-world/> ; comparable rankings are at: <https://www.similarweb.com/top-websites/> and <https://www.semrush.com/blog/most-visited-websites/>

<sup>27</sup> <https://www.pornhub.com/insights/2019-year-in-review>

<sup>28</sup> [https://theshiftproject.org/wp-content/uploads/2019/07/Excutive-Summary\\_EN\\_The-unsustainable-use-of-online-video.pdf](https://theshiftproject.org/wp-content/uploads/2019/07/Excutive-Summary_EN_The-unsustainable-use-of-online-video.pdf)

<sup>29</sup> <https://truthonthemarket.com/2019/09/27/debunking-elizabeth-warrens-claim-that-more-than-70-of-all-internet-traffic-goes-through-google-or-facebook/>

<sup>30</sup> <https://www.sandvine.com/blog/netflix-vs.-google-vs.-amazon-vs.-facebook-vs.-microsoft-vs.-apple-traffic-share-of-internet-brands-global-internet-phenomena-spotlight>

chatting about video games and e-sports, as well as traditional sports, anime, music, the creative arts, and other shared interests.<sup>31</sup> Twitch is among the top 50 sites according to Alexa.<sup>32</sup> It has about 3 million broadcasters monthly and 15 million daily active users, with 140 million unique users per month.<sup>33</sup> On average, Twitch streams over 2 million hours per day.<sup>34</sup> (Other sources give much higher estimates.<sup>35, 36</sup>)

30. News of course accounts for a significant, and socially and politically important, component of Internet traffic. Unfortunately, it appears that the percentage of unreliable information (co-called fake news) transmitted on the Internet (primarily through social networks) has been increasing.<sup>37</sup> Apparently, a majority of users have seen some fake news on the Internet.<sup>38, 39</sup>
31. Given their advertising-driven revenue model, social networks have a financial incentive not to scrutinize news too carefully, and to allow unreliable news to be published. As author Cory Doctorow puts the matter (cited from a review<sup>40</sup> of Doctorow's book *How to Destroy Surveillance Capitalism*):

“Facebook is tops for segmenting.” However, despite the fine targeting, its ads don't always work: “The solution to Facebook's ads only working one in a thousand times is for the company to try to increase how much time you spend on Facebook by a factor of a thousand. Rather than thinking of Facebook as a company that has figured out how to show you exactly the right ad in exactly the right way to get you to do what its advertisers want, think of it as a company that has figured out how to make you slog through an endless torrent of arguments even though they make you miserable, spending so much time on the site that it eventually shows you at least one ad that you respond to.”

Thus it practices a form of deception: “So Facebook has to gin up traffic by sidetracking its own forums: every time Facebook's algorithm injects controversial materials – inflammatory political articles, conspiracy theories, outrage stories – into a group, it can hijack that group's nominal purpose with its desultory discussions and supercharge those discussions by turning them into bitter, unproductive arguments that drag on and on. Facebook is optimized for engagement, not happiness, and it turns out that automated systems are pretty good at figuring out things that people will get angry about.”

---

<sup>31</sup> [https://en.wikipedia.org/wiki/Twitch\\_\(service\)](https://en.wikipedia.org/wiki/Twitch_(service))

<sup>32</sup> <https://www.alexa.com/topsites>

<sup>33</sup> <https://videogamesstats.com/twitch-stats-facts/>

<sup>34</sup> <https://sullygnome.com/channels/365>

<sup>35</sup> <https://mediakix.com/blog/top-twitch-statistics-live-streaming-game-platform/>

<sup>36</sup> <https://videogamesstats.com/twitch-stats-facts/>

<sup>37</sup> <https://www.vox.com/policy-and-politics/2020/12/22/22195488/fake-news-social-media-2020>

<sup>38</sup> <https://phys.org/news/2019-06-percent-internet-users-duped-fake.html>

<sup>39</sup> <https://www.statista.com/topics/6341/fake-news-worldwide/>

<sup>40</sup> <http://www.boundary2.org/2021/04/richard-hill-the-curse-of-concentration-review-of-cory-doctorow-how-to-destroy-surveillance-capitalism/>

### A.2.1.2 Data Centers and Computing

32. The data centers and content delivery networks (CDNs)<sup>41</sup> that house the data that users access through the World Wide Web account for a significant proportion of the electricity used by the Internet, and thus of the greenhouse gas emissions that can be attributed to the Internet. According to one study, access to data centers accounts for about 20% of ICT green house gas emissions, while use of computers to produce data and services accounts for about 17%.<sup>42</sup>
33. Bitcoin and other cryptocurrencies consume significant computing power, and thus electricity. The consumption of Bitcoin alone has been estimated at over 100 TWh/year.<sup>43,44</sup> This is equivalent to the consumption of countries such as Malaysia or Sweden.<sup>45</sup>

### A.2.1.3 International Data Flows

34. Data flows also account for a significant proportion of the electricity used by the Internet, and thus of the greenhouse gas emissions that can be attributed to the Internet. According to one study, data flows account for about 16% of ICT green house gas emissions.<sup>46</sup>
35. The shift of telephony towards IP-based technology (Voice over IP) has facilitated the emergence of nuisance advertising and fraudulent calls, often referred to as robocalling. According to one study, US consumers received nearly 4 billion robocalls per month in 2020.<sup>47</sup>
36. While such illegitimate unwanted calls do not involve significant volumes of data, they nevertheless contribute to green house gas emissions, for no discernible social or economic benefit.

## B. How can we improve the impact the Internet has on the environment and take advantage of its potential to help address climate-related issues?

37. As mentioned above, ICTs, including the Internet, indirectly contribute to increasing efficiency and thus to mitigating climate change.
38. We focus here on what can be done to reduce the direct impacts of the Internet, in particular, how to reduce wasteful use of electricity.
39. ITU developed Recommendation ITU-T L.1470 "GHG emissions trajectories for the ICT sector compatible with the UNFCCC Paris Agreement"<sup>48</sup> in collaboration with the GeSI, GSMA and SBTi. It is supported by its Supplements ITU-T L.Suppl.37<sup>49</sup> and ITU-T L.Suppl.38<sup>50</sup> which provide guidance to

---

<sup>41</sup> [https://en.wikipedia.org/wiki/Content\\_delivery\\_network](https://en.wikipedia.org/wiki/Content_delivery_network)

<sup>42</sup> [https://theshiftproject.org/wp-content/uploads/2019/07/Excutive-Summary\\_EN\\_The-unsustainable-use-of-online-video.pdf](https://theshiftproject.org/wp-content/uploads/2019/07/Excutive-Summary_EN_The-unsustainable-use-of-online-video.pdf)

<sup>43</sup> <https://cbeci.org/index>

<sup>44</sup> <https://digiconomist.net/bitcoin-energy-consumption/>

<sup>45</sup> <https://hbr.org/2021/05/how-much-energy-does-bitcoin-actually-consume>

<sup>46</sup> [https://theshiftproject.org/wp-content/uploads/2019/07/Excutive-Summary\\_EN\\_The-unsustainable-use-of-online-video.pdf](https://theshiftproject.org/wp-content/uploads/2019/07/Excutive-Summary_EN_The-unsustainable-use-of-online-video.pdf)

<sup>47</sup> <https://www.fcc.gov/spoofed-robocalls>

<sup>48</sup> <https://www.itu.int/ITU-T/recommendations/rec.aspx?id=14084&lang=en>

<sup>49</sup> <https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14318>

<sup>50</sup> <https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14582>



operators of mobile networks, fixed networks, data centres and ICT manufacturers on how to set the science based targets in compliance with ITU-T L.1470. For more information see:

<https://www.itu.int/en/mediacentre/Pages/PR04-2020-ICT-industry-to-reduce-greenhouse-gas-emissions-by-45-percent-by-2030.aspx>

40. It seems obvious that stopping robocalling should be a priority. Many countries, in particular the USA, have taken steps in this regard, and ITU has published some information on the topic, see:

<https://www.itu.int/pub/T-TUT-TRUST-2021>

41. The present economic model of the Internet is based on surveillance capitalism<sup>51</sup>, that is the collection of large quantities of personal data in order to produce targeted advertising.

42. Taxes on online advertising could reduce the volume of collected data, and thus reduce the consumption of electricity, see for example:

<https://www.technologyreview.com/2021/06/14/1026207/taxing-digital-advertising-could-help-break-up-big-tech/>

<https://adtax.paulromer.net/>

<https://www.jstor.org/stable/j.ctv5vddv><sup>52</sup>

<https://www.jstor.org/stable/j.ctv5vddk0>

43. Undesirable international data flows can also be reduced by enabling users to control what data are collected and stored, as is done by the European Union's General Data Protection Regulation (GDPR).

44. Unnecessary international data flows can also be reduced by promoting data localization, and customs duties on international data flows, including for e-commerce.

45. Consequently, the current WTO moratorium on customs duties for e-commerce should be abrogated, and there should be no international agreements limiting data localization requirements, or preventing national limitations of cross-border data flows.

46. At present, the Internet is a "best effort" network, that does not allocate priority to any particular type of traffic<sup>53</sup>, so reasonable quality of service is achieved by allocating the bandwidth that will likely satisfy peak demand.

47. Use of a signaling network might achieve higher efficiency, and thus less use of electricity for the same throughput. It is worth recalling that most mature networks have a separate signaling network: traffic lights for cars and trains, air traffic control for airplanes, SS7 for telephone calls, etc. The use of the signaling network allows optimization of the transport network. Thus it is suggested that studies be initiated on the use of signaling networks to improve the efficiency of Internet traffic.

---

<sup>51</sup> [https://en.wikipedia.org/wiki/Surveillance\\_capitalism](https://en.wikipedia.org/wiki/Surveillance_capitalism)

<sup>52</sup> Also at:

<https://library.oapen.org/bitstream/id/9b1e656e-a839-4b03-b215-55d76906bb17/UWP-024-fuchs.pdf>

<sup>53</sup> With some exceptions, see:

[https://en.wikipedia.org/wiki/Multiprotocol\\_Label\\_Switching](https://en.wikipedia.org/wiki/Multiprotocol_Label_Switching)

### C. What role should stakeholders play in shaping the environmental impacts and benefits of the Internet?

48. The respective roles of stakeholders are clearly set forth in paragraph 35 of the Tunis Agenda:

The management of the Internet encompasses both technical and public policy issues and should involve all stakeholders and relevant intergovernmental and international organizations. In this respect it is recognized that:

- a. Policy authority for Internet-related public policy issues is the sovereign right of States. They have rights and responsibilities for international Internet-related public policy issues.
- b. The private sector has had, and should continue to have, an important role in the development of the Internet, both in the technical and economic fields.
- c. Civil society has also played an important role on Internet matters, especially at community level, and should continue to play such a role.
- d. Intergovernmental organizations have had, and should continue to have, a facilitating role in the coordination of Internet-related public policy issues.
- e. International organizations have also had and should continue to have an important role in the development of Internet-related technical standards and relevant policies.

49. This could be refined as follows:

The management of the Internet encompasses both technical and public policy issues, which may be inter-related, and should involve all stakeholders and relevant intergovernmental and international organizations. Decisions should always be informed as appropriate by inputs from stakeholders. In this respect it is recognized that:

- a. Policy authority for Internet-related public policy issues is the sovereign right of States. They have rights and responsibilities for ~~international~~ Internet-related public policy issues, and in particular for the protection of all human rights. Decisions should be informed by inputs from other stakeholders as appropriate.
- b. The private sector has had, and should continue to have, an important role in the development of the Internet, both in the technical and economic fields, and in providing objective factual information to policy decision-makers, so as to further the public interest and to achieve the shared goal of an equitable information society.
- c. Civil society has also played an important role on Internet matters, ~~especially at community level~~ at both the national and international levels, and should continue to play such a role. Further, it should provide views, opinions, and information to policy decision-makers and should be invited to comment, as appropriate, regarding public policy issues at both the national and international levels. Representatives, if representation is needed, should be selected through open, democratic, and transparent processes. Internal processes should be based on inclusive, publicly known, well defined and accountable mechanisms.
- d. Intergovernmental organizations have had, and should continue to have, a facilitating role in the coordination of Internet-related public policy issues and in the harmonization of national laws and practices.
- e. International organizations have also had and should continue to have an important role in the development of Internet-related technical standards and relevant policies.

**D. What are the policy, regulatory and other relevant matters associated with the environmental impacts and benefits of the Internet?**

50. See above.

---