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Projecting the Evolution of the Internet, its Technologies, Communities and Management

Canadian stakeholders' understandings and perceptions of the issues

Tony Vetter
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Report on a pilot workshop held in Vancouver, British Columbia, March 26–27, 2009

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IISD recognizes the financial support of Industry Canada.

Published by the International Institute for Sustainable Development

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Executive Summary

IISD hosted a pilot workshop in Vancouver in March 2009 with the support of Industry Canada. This session brought together 32 Canadians with backgrounds ranging from the technical management of Internet infrastructure, applications and services; to government, civil society and private sector interests covering health care, academia, media, urban development, energy and corporate social responsibility. The participants were assembled to explore what the future of the Internet might look like, and the implications for Canadians. This gathering was unique in that the breadth of engagement included more than the community of stakeholders typically assumed necessary and sufficient for such a consultation. The outcome provided expanded insights into what Canadians value, want and expect with respect to future growth of the Internet and its role in supporting a more sustainable society.

In 2008, IISD conducted several scenarios-building exercises to identify critical uncertainties on the future of the Internet related to: the governance of the system: the evolution of the technology; and concerns over its security and stability. The 2009 workshop used these scenarios as a starting point to frame and advance a broader consultation; to help the participants identify for themselves what they think might be at risk; and thus, to identify their most critical issues for the future of the Internet.

The participants focused on a number of priority interests. While they considered Industry Canada an audience for their views, their recommendations served as a reminder to themselves that they share responsibility for—and have a stake in—the development of the Internet. The recommendations included the following:

- Canada needs to pursue a policy of universal access to broadband, as well as public support for some aspects of the infrastructure supporting the Internet. This needs to be matched by more computer and Internet training and awareness for Canadians.
- Canada needs to address the issues of trust of identity online and realize an open online society.
- Canada should consider how the application of information and communications technology (ICT) could be part of its national greenhouse gas (GHG) emissions reduction strategy. We should strive to use the Internet to enhance our connection to the biophysical world. We also need to answer the question of how the Internet can contribute to addressing sustainability concerns at the local level before we can consider how it can address global inequalities.
- The success of the Internet in Canada, as well as globally, should be measured by human measures of success—how the Internet is serving humanity and the environment.

- The Canadian government needs to avoid a rush to legislation for addressing issues associated with the privacy and anonymity of Internet users.
- All federal government departments and agencies should have consistent and coordinated Internet policies.
- The government needs to continue actively engaging a broad cross-section of Canadian citizens in a dialogue regarding the future of the Internet.

IISD made note of the fact that many of these recommendations are familiar territory for Industry Canada, having been extensively researched and debated among government and industry stakeholders and policy practitioners for some time. On further reflection, IISD's analysis yielded three notable insights from the workshop regarding public engagement on these issues.

- Engagement beyond the stakeholder group traditionally approached by Industry Canada on these issues was appreciated, welcomed and thought necessary. Internet policy practitioners need to look beyond the economic growth potential of the Internet and engage with environmental and social actors who are now dependent on, but also concerned by, how the Internet is developing and whether it will support or detract from long-term sustainability goals.
- There is a perceived gap in the Government of Canada's handling of Internet issues and the need for a more unified policy-making function within a single department like Industry Canada. The creation of such a focus would be welcome and would contribute significantly to improving the Government of Canada's capacity to engage the general public on Internet policy in a coordinated and holistic manner—especially given how people consider that they themselves have a shared stake in, and responsibility for, the future of the Internet.
- There is a frustration with the lack of progress in Canada on many of the issues the participants discussed. What's needed is government action that demonstrates not only that ICT policy is being approached as a national priority needing an appropriate management focal point, but that it has been specifically designed to address concerns regarding the competitiveness of Canada's ICT infrastructure.

IISD recommends two possible follow-up actions to the Vancouver pilot workshop:

1. Industry Canada should consider supporting further regional workshops across Canada.
   - Such an initiative would contribute to: expansion of the stakeholder group traditionally approached; a demonstration of the Government of Canada's interest in coordinated and holistic approaches to Internet policy; and a broadening public understanding of critical issues surrounding the Internet and the choices that may need to be made.
   - The consultations could also lay the foundation for creating a "Canadian Internet Model"—

an expanded vision of how ICT/Internet innovation could be managed and encouraged, and that focuses not only on infrastructure and technology development, but on the social and environmental benefits Canadians believe could be achieved with such innovation. This model could reflect a fresh approach to public/private sector collaboration in the continuous updating and expansion of ICT infrastructure in the interests of all Canadians.

2. This Vancouver pilot, as well as further potential regional workshops, could provide a foundation for establishing a Canadian Internet Governance Forum (IGF).
   - As a national forum, a Canadian IGF could be instrumental for responding to, and engaging with the public on issues arising from the current Canadian Radio-television and Telecommunications Commission (CRTC) hearings and other consultations on Internet policy.
   - Recognizing the different preparatory approaches that Industry Canada must take for a range of Internet and ICT forums, a Canadian IGF could also be a useful vehicle for gathering a broader cross-section of input for the government to consider in its preparations for multistakeholder forums such as the Internet Governance Forum (IGF), as well as intergovernmental meetings of the Organisation for Economic Co-operation and Development (OECD) and the International Telecommunication Union (ITU).

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1.0 Introduction

With the support of Industry Canada, IISD ran a pilot workshop in Vancouver in March 2009 to bring together civil society, academic, government and private sector participants to explore what the future of the Internet might look like, and the implications for Canadians.

1.1 Background

Scenarios are meant to prompt thinking not only about the future, but especially about necessary and possible decisions in the present to advance the most desired scenario. In 2008, IISD conducted several scenarios-building exercises as a mechanism to begin to identify critical uncertainties about the future of the Internet related to the governance of the system, the evolution of the technology, and concerns over its security and stability. Our intention was to stimulate thinking about how changes in the management of the Internet, from technical and policy perspectives, might affect the world's use of, and access to the Internet as a global infrastructure underpinning our societies and economies. A preliminary workshop was held in Ottawa in October 2008 with a cross-section of Internet experts from the Canadian public and private sectors, together with representation from the international development community. Two further workshops were held in India. These preliminary exercises were focused primarily at a global level, as a contribution to the work of the Internet Governance Forum (IGF).[1]

1.2 Objectives

IISD has proposed a new round of regional workshops in Canada that would explore and discuss implications of possible changes in the Internet that are of greatest relevance to a diverse group of Canadian stakeholders. The Vancouver workshop served as a pilot exercise, both to test our approach, and to engage and solicit the views of a broader stakeholder group based on the west coast.

Our broad objectives for the series of workshops are to:

- complement the views sought in the Ottawa and Hyderabad (IGF) workshops with a broader civil society constituency;
- identify what Canadians consider to be the most relevant critical uncertainties regarding the future of the Internet and explore their understanding and perception of these;
- identify what Canadians consider to be the most desirable future for the Internet and their thoughts on policies that could lead to that future;

[1] Creech, H., et al. (2009). *Mapping the Future of the Internet onto Global Scenarios: A preliminary view*, http://www.iisd.org/pdf/2008/internet_global_scenarios.pdf.

- explore how the future of the Internet could influence other challenges facing Canadians, including security, climate change, social and cultural diversity, economic equity and human rights; and
- explore the possible role global trends (economic, security and so forth) could play in decision-making regarding the governance of the Internet in Canada.

Specifically for the Vancouver workshop, we aimed for:

- a revision of critical uncertainties around the future of the Internet, based on the priorities and perceptions of the Vancouver group;
- Canadian reflections on previously developed Internet scenarios and the implications for policy development; and
- a refined consultation methodology, to be deployed in later workshops in 2009.

2.0 Workshop Design

2.1 Participants

The workshop organizers sought to bring to the table a breadth of viewpoints, and therefore organizational affiliations were a key consideration when extending invitations (see Appendix A: Participant List). Participants attended the workshop in a personal capacity and their comments were not intended to represent the views of any of the organizations with which they were affiliated. Participants brought the following backgrounds and expertise to the workshop:

A: Technical viewpoints on the Internet and Internet technology:

- Technical Internet and infrastructure community (Domain Name System,[2] Internet management policies, protocol and software development, Internet Service Providers (ISPs), community networks, broadband infrastructure, telecom and wireless industries).
- Technical applications and services community (entrepreneurship, Web applications, new media, community hosting).

B: Awareness of the interface between technical and broader social and economic issues:

- ICT for socio-economic development.
- Advocacy on Internet issues (digital divide, users' privacy rights, network neutrality).
- ICT and sustainability (IT support for SD, knowledge systems, SD media, stewardship).

C: Broader government, civil society and private sector interests:

- Regional government.
- Health care research.
- Academia (civic engagement, privacy, social software, K–12 curriculum).
- Traditional media.
- Foreign policy.
- Sustainability (investment, urban, energy, leadership).
- Private sector (corporate social responsibility, investment).

2.2 Backgrounder paper

A background paper was distributed to the participants prior to the workshop to stimulate their thinking on what they would consider a desirable future for the Internet; particularly in the context

[2] Every computer on the Internet has a unique numeric address. However remembering an address like 192.0.34.65 is difficult so domain names are used instead like www.google.com. The Domain Name System (DNS) allows any Internet user to reach a specific Web site address or send an e-mail by using its domain name rather than address directly.

of the role the Internet is playing in broader issues of global sustainability (climate change, poverty reduction, security and so forth).

The paper was based on the premise that that policy decisions that affect the governance of the Internet, the evolution of the technology, and issues of security and stability have the potential to enhance or restrict "the creativity, innovation and flow of information."[3] This enhancement or restriction could have a bearing on the world's collective efforts to achieve sustainable development. The paper identified the following Internet policy areas that may turn out to be critical for sustainable development.

Table 1: Summary of critical Internet uncertainties

Critical Internet uncertainty	Key issue(s)
Ecological footprint	▪ Internet with growing ecological footprint including rapid increase in CO_2 emissions vs. net contributor to CO_2 reductions, energy sustainability and dematerialization.
Network neutrality	▪ ISPs controlling or inhibiting uses of Internet vs. regulated neutral treatment of all network traffic.
Intellectual property rights	▪ Strictly controlling use of digital content and knowledge vs. freer use as a public good and driver of innovation.
Tethered devices	▪ Manufacturer control over how access devices are used vs. device owner freedom to leverage Internet openness.
Aging models for regulation	▪ Adapting existing regulatory regimes to services migrating to Internet vs. complete rethink of regulations for Internet.
Universal broadband	▪ Broadband as a public vs. a luxury service.
IPv6 vs. IPv4	▪ IPv4 addresses running out: Laissez-faire transition to IPv6 – hope public Internet survives in all possible outcomes vs. regulated transition.
The future of ICANN	▪ ICANN Domain name management and accountability with United States government role vs. internationalization.
Sustainability and scalability of decision-making by the voluntary Internet Engineering Task Force	▪ Voluntary governance over the development and promotion of Internet standards vs. regulated approach.
Security	▪ Internet security as individual, market and/or national strategy vs. international conventions or agreements.

Four storylines of the future of the Internet and sustainability were presented in the background paper. In brief, they described the following situations:

2.2.1 *Government-regulated Internet scenario*

The Internet has evolved in a world where decision-making has been guided by strong government policies developed through a recognized need to harmonize economic growth with a broad set of social and environmental goals. Government regulations control the environmental impact of the Internet, its neutrality, its security, as well as accessibility to content and knowledge as a public service.

[3] Core Values of Internet Corporation for Assigned Names and Numbers (ICANN), http://www.icann.org/en/about/

2.2.2 *Unregulated market Internet scenario*

Governments have chosen a laissez-faire approach to most aspects of public policy. Sustaining economic progress through the promotion of free and unregulated markets has been prioritized over environmental and social policy concerns. Private sector interests have freedom to determine environmental impact, as well as access availability, quality and content on the basis of profitability.

2.2.3 *VIPnet scenario*

Energy, environmental and/or political-economic stresses have caused a breakdown of order. Elites have used their wealth and power to co-opt society's institutions and manipulate them to protect their way of life. The remaining majority of society has descended into poverty and chaos. The Internet has become a private communications network available only to the elites.

2.2.4 *Internet commons scenario*

Other visions for globalization emerge in response to energy, environmental and/or political-economic stresses. Concepts such as global citizenship, sustainability, and the well-being of present and future generations are embraced as guiding principles for achieving a more humane and equitable global civilization. The Internet has become a key infrastructure designed to help us manage our energy and ecosystem needs, universally available as a secure public service supporting a commons of digital content and knowledge.

2.3 Methodology and process

The intent of the workshop was to use the scenarios summarized above as a means to frame and advance the consultation; to help the participants identify for themselves what they think might be at risk; and thus, to identify the most critical issues for the future of the Internet. The workshop did not seek to revise or refine the scenarios themselves. Participants said they found the scenarios, particularly outliers like VIPnet, a very helpful starting point for stimulating creative thinking. The agenda for the workshop was as follows:

Day 1 – Evening

- Introductions
- Overview of critical uncertainties around the future of the Internet and Internet scenario storylines
- Soliciting priorities and perceptions on critical uncertainties around the future of the Internet in Canada
    - Soliciting one key question from each participant
- Identification of emerging themes

Day 2

- Discussion, in breakout groups and by theme, to consider possible changes in the Internet

under each scenario, highlighting when possible their plausibility and relevance in the Canadian context

- Reporting in plenary, followed by a discussion of deeper implications for Internet policy development
- Formulation, in breakout groups, of recommendations for our future Internet
    - Key questions: What should be sustained/protected? What should be changed? What should be created?
- Plenary discussion

3.0 Driving Questions about the Future of the Internet

After a brief presentation on critical Internet uncertainties previously identified by IISD, and the four Internet scenarios, the workshop participants were asked the following open-ended question: "What is your burning or key question related to the future of the Internet in Canada, especially as it relates to sustainability?"

A total of 36 questions were posted by participants (see Appendix B). IISD grouped these questions on the future of the Internet in Canada into the following five major issues:

- Quality of community (building or degrading)
- Equity of access
- System design and governance (resilience and scalability)
- Barriers and enablers to social and environmental change
- Security and identity

3.1.1 Quality of community (building or degrading)

"Will the Internet contribute to, or detract from, organizing around local concerns, common values and social cohesion?"[4]

The key concern in this theme was that fostering sustainable local communities is critical for achieving overall sustainability, but that the future growth in use of the Internet might harm local social cohesion. It may be wonderful to chat with friends around the world about issues of concern, but less and less responsibility may be taken for what is going on in one's own backyard. Whether the Internet is a contributing factor to a deterioration of local social cohesion, or simply a symptom of other trends was raised. Participants also discussed the potential for targeted Internet uses to positively contribute to local community building. The importance of using the Internet as a vehicle to build global learning and awareness for achieving sustainability was also discussed. In the end there was rough consensus that the role of the future Internet in community building could be considered both in terms of support for real on-the-ground action from local to global, as well as more virtual exchanges.

3.1.2 Equity of access

"Will options for accessing the Internet, both in terms of technology as well as online content and services, unduly discriminate against users based on their physical location, economic status or cultural background? And conversely, can the Internet be used to resolve social inequities and the prosperity imbalance between rural and urban regions?"

[4] This and subsequent opening questions in the paragraphs below are generalizations of specific questions asked by participants.

The assumption underlying these questions was that there is an important relationship between economic and social inequities, and unequal access to information and communication infrastructure and services. One of the questions suggested a parallel between the provision of public infrastructure such as streets, sidewalks and transit systems and the need for a similar public investment in the provision of Internet access.

3.1.3 System design and governance (resilience and scalability)

"Will the infrastructure supporting the Internet, how we want to use it and how we make decisions about managing it, prove resilient and scalable as it evolves?"

The questions in this theme touched on a range of technical concerns and related broader considerations. These included the resilience and scalability of the infrastructure in the face of challenges like top level domain name expansion and IPv4 to IPv6 transition, as well as governance mechanisms for managing them, and their transparency and accountability. Broader considerations included how can we "maintain" access to resources housed on the Internet in the face of disruptive social and environmental change; whether expansion of the Internet, including the ability to assign IP addresses to all inanimate objects (the "Internet of things") could help lead to sustainability; or whether we need to slow technology down.

3.1.4 Barriers and enablers to social and environmental change

"How will the Internet affect barriers to, and enablers of, social and environmental change?"

All these questions originated from a concern for social and environmental challenges and asked whether the Internet will be "with us or against us?" As such, the questions touched on the Internet's role in changing governance structures, innovation, social transformation and education. Questions also considered the interplay between online and face-to-face processes as well as the system's environmental footprint.

3.1.5 Security and identity

"How does future Internet technology, as well as government regulation, treat the privacy and anonymity of Internet users, including the authentication of user activity?"

The questions in this theme varied widely, according to participants' unique perspectives. For instance, participants asked whether a totally transparent society would be liveable; how security and identity inequalities resulting from varying levels of digital competency could be prevented; how one could digitally forgive and forget online actions; and whether it is even possible for governments to regulate security and identity in a borderless world.

4.0 Canadian Perspectives on Internet Scenarios

In breakout groups, participants next reviewed how these major issues would be affected in each of four possible scenarios for the future of the Internet. An interesting outcome from this stage of the process was that only one participant initially chose the security and identity breakout topic and they subsequently joined another group. Security and identity issues were reflected in what was reported back from each of the groups, having emerged as a significant cross cutting concern. That is not to say that security and identity were of secondary importance to the participants: a number of participants felt so concerned that this issue needed equal treatment that they formed a discussion group over lunch to review how security and identity concerns would play out in each of the four scenarios.

While participants used the scenarios to shape their discussions, a number of them questioned whether the scenarios provided were sufficiently grounded and internally consistent. There was also some confusion regarding whether their discussions of the scenarios should be descriptive or prescriptive. The participants were reassured that the scenarios were only meant to frame and advance a discussion of what they thought might be at risk and that it was not the objective of the exercise to revise or refine the scenarios themselves.

4.1 Quality of community (building or degrading)

The breakout group considering the Internet's impact on quality of community explored whether individuals would be less likely to express more extreme or polarizing points of view in an Internet moulded by strong government policies. The group envisioned a possible growth in the quality of online community interaction if this were to occur, but acknowledged possible drawbacks from decreased individual expression.

In the case of an unregulated, market-driven Internet, the group considered how commercial incentives could fuel the formation of online communities based on shared individual interests. Such groups would be high-value marketing targets for corporations and therefore a financial incentive would exist for encouraging their formation and sustainability. The concern was in the potential of such a model to drive a decline in local communities. It was felt that online communities representative of place could emerge, but their formation and sustainability, without some kind of catalyzing event, would be unlikely in this environment. The group also speculated that the formation of online communities based on shared malicious interests could also be more likely in this future Internet where user authentication would likely be absent.

It was clear to the breakout group that in VIPnet, the elites would interact online with their controlled access to high-quality systems, but commoners would be sidelined to slower

communications or excluded altogether. A point of concern raised by the group was the impact that this tiered access could have on open knowledge movements. It was felt that online open knowledge movements like Wikipedia and open source software would not be sustained. Motivation among the masses to maintain these public goods would disappear as only the elite would be allowed full unrestricted access to these commons.

When it came to contemplating an Internet commons future, the breakout group agreed that decision-making that gave priority to what makes sense for the planet, rather than what makes money, would be the path to this scenario. However the group had difficulty agreeing on what kind of community would be desirable, or "good" in this scenario.

4.2 Equity of access

The breakout group considering equity of access believed that the Internet, or the connectivity supporting it, would likely be managed as a public utility in this future, guided by strong government policies. Equitable use of this public utility would likely be guaranteed through the enforcement of network neutrality regulation and the creation of community access points. The group also felt that the government would relax copyright law to promote more equitable access to content online. Public funding of translation services was also seen as a possible strategy for overcoming language as a barrier to achieving equitable access. The group pointed out that as more services like education moved online, Canadians' expectations for free public education to the end of Grade 12 could translate into a demand that universal access to the Internet be treated as a matter of public policy as well. The challenge of guaranteeing the accessibility of online education services in light of mobile technologies possibly becoming the predominant means of accessing the Internet was raised as a question that would require resolution. It was not clear to the group that all online education services could be appropriately adapted to current mobile user interfaces.

An Internet developed through an unregulated market raised several concerns for this group regarding the deepening of already existing divides. It is difficult for the market alone to equitably meet the access needs of everyone, particularly in countries as economically, culturally and geographically diverse as Canada. The group felt that in this environment urban access would continue to evolve towards super broadband access services while certain rural populations could remain on dial-up as their only affordable access option. The group was also concerned that there would also be an increase in the digital competency divide as those with digital skills, and the financial rewards gained in using them, would claim increasingly higher digital ground. This scenario resonated with the group as being closest to our current world in terms of the inequities we witness. They also felt that the trends this environment would promote would eventually lead to VIPnet, and in reference to the current world, should serve as a warning that we had better guard against making current inequities any worse than they already are.

The breakout group thought that the exclusion of the masses entirely from accessing the Internet in the VIPnet scenario was not likely. Rather, stratified access based on different levels of privileges seemed more plausible given they felt that it would not be in the best interest of the elites to completely exclude the masses. The concern raised by the group was that total exclusion would have negative implications for the ability of decision-makers to manage public security and health issues. The example of epidemics like SARS was offered as an example of a public health issue that would be difficult to manage without at least a basic means of communicating with the masses. Having the masses plugged into the infrastructure would also serve an important monitoring function. The current example of Google Flu Trends[5] was cited as an example. What is more likely is that access to the communication infrastructure would be permitted but that civil liberties would be curtailed via access limitations and authorization requirements.

The breakout group had difficulty accepting the plausibility of the Internet commons scenario and considered it an unlikely utopia. They discussed possible extensions of the World Wide Web, new uses of the Internet and changes in our relationship with technology that could be a part of this future; however questions remained regarding how they would be realized and/or their practical relevance for sustainability. Examples of two potential futures were given: a "Semantic Web"[6] might emerge that could be used for better understanding the environmental implications of certain social behaviours, and guide decision-making to achieve more sustainable outcomes; and "Twitter"-like networks could become valuable sources of "community" answers to sustainability challenges by enabling real time Q&A dialogues with experts on specific topics.

4.3 System design and governance (resilience and scalability)

The breakout group considering the resilience and scalability of the Internet and its governance felt that a future government-regulated Internet would have to have been guided by a balance between central planning and free market approaches. In terms of infrastructure, they speculated that this would involve strong regulations treating the connectivity layer as a public utility with market freedoms at higher layers. The group also thought that a central planning solution to security issues threatening the resilience of the Internet might involve some form of government validation of applications and content through some authentication of their source. The group, however, wondered whether national governance would be the best way to regulate this future Internet. Would rural versus urban or regional differences in Internet requirements be better managed through forms of regional Internet governance?

When considering a future Internet guided by an unregulated market, the breakout group also acknowledged the challenge this environment presents for equitably meeting the access needs of everyone, but particularly in countries as economically, culturally and geographically diverse as

[5] Google Flu Trends, http://www.google.org/flutrends/
[6] Semantic Web – Wikipedia, http://en.wikipedia.org/wiki/Semantic_Web

Canada. This group also raised the concern that technological advances such as deep packet inspection would be employed by ISPs as tools to profit from content traversing their networks. However, a scenario completely free from government regulation was deemed unrealistic for Canada as participants felt we could never break ourselves free from at least some government presence. It was thought that this scenario could provide lessons for reducing Canadian government involvement in media and telecommunications for the better. For example, disruptive technologies —unexpected technological breakthroughs that force established corporations to radically rethink their business models—would encounter a lower barrier to market in this environment and would eventually lead to a breaking up of the telecommunications oligopoly in Canada.

Interestingly this breakout group drew parallels between VIPnet and the current realities of Internet access in Canada. They pointed to the fact that "elite" corporations, government agencies and advanced researchers enjoy very high quality, and, in some cases, subsidized access. In contrast, many public schools, rural homes and the poor have very limited access to the Internet, or none at all. The group pointed to the CRTC as being too politicized and responsive to "elite" special interests as contributing to Canada's Internet disparities. In the opinion of this group, Canada's competitiveness depends on access to the infrastructure of the knowledge economy and that these current realities need to change.

In an Internet commons future, the breakout group felt that intelligent design and using the Internet as a means for achieving sustainability objectives would figure prominently. For example, the group envisioned that software design principles could evolve that would guide the development of applications with fewer resource demands, having the effect of reducing technology turnover. Archiving on the Internet could also become an important tool for preserving, and making more available, collective knowledge and information about our historical and cultural roots. Generally, it was thought that this future Internet would likely become an integral part of the social safety net; becoming the primary medium for delivering health, safety, education and community support services. The group however had concerns regarding how infrastructure would scale to service these demands, and it was thought that content and online activities might possibly require prioritization. For example, in order to ensure universal access to standard services a guaranteed access ratio might be required that reserved a percentage of network bandwidth for public good uses. The group discussed a desire that Canada take a leadership role as much as possible in helping to realize a global Internet commons, however the borderless nature of the Internet and Canada's size relative to other nations were acknowledged as practical limitations. In the context of current CRTC hearings to examine broadcasting in the new media environment,[7] some felt that incentives or regulatory measures for the creation and promotion of Canadian broadcasting content in new media

[7] CRTC to examine broadcasting in the new media environment, http://www.crtc.gc.ca/eng/NEWS/releases/2008/r081015.htm

would need to be abandoned to be consistent with supporting a global Internet commons. Different ways of supporting Canadian identity would need to be explored.

4.4 Barriers to and enablers of social and environmental change

The breakout group considering how the Internet will impact barriers to, and enablers of, social and environmental change did not have a lot of faith in a future government-regulated Internet. The participants agreed that, in theory, the government could enable the Internet we want, but the likely reality is that it could not and they feared the execution of such government policies.

In the case of an unregulated market Internet future, there was disagreement among the participants regarding whether this scenario would be conducive to the empowerment of civil society action online. On one hand, the free market can promote positive change when consumers choose to vote with their money to demand and endorse more sustainable approaches. On the other hand, monopoly capitalism, which would be more likely to occur in this scenario than others, could suppress consumer empowerment and be a barrier to positive social change.

This group considered more nuanced outcomes for the VIPnet scenario than those of the storyline provided in the background paper. They questioned whether reduced access, resulting in reduced demand for Internet infrastructure, would necessarily result in a net reduction in environmental footprint. It was thought that re-materialization could emerge as demand previously met by e-services and e-commerce was diverted to material equivalents. It was also suggested by the group that the VIPnet scenario could use some fine-tuning to consider how community resistance might emerge in response to the masses being excluded from the Internet, pointing out that mass resistance movements had no trouble emerging prior to the Internet.

This breakout group was also more optimistic about realizing an Internet commons future than some of the other groups. They felt that the emergence of corporate social responsibility (CSR) could be the early signs of a trend in this direction. The group considered how setting the establishment of an Internet commons as a policy priority would drive more social change through conscious recognition of the philosophy behind the commons movement. Seeing the Internet commons take form could help society to step back and consider the bigger picture. The concern or uncertainty this scenario raised for this group was that we do not know yet what the Internet in its current form is good at; it is possibly good for making connections, but a poor and possibly dangerous substitute for deeper and meaningful dialogue. The group also contemplated whether we need an Internet "social contract" to unlock its potential?

4.5 Security and identity

The breakout group that formed to consider how issues of security and identity would be treated in each of the Internet futures thought that a government-regulated Internet would feature processes

that would give users recourse to have content removed from the Internet they believe to be misrepresentative of their identity. They did, however, voice concern that this scenario might present a higher probability of catastrophic outcomes arising from failures or breaches of centralized security and authentication solutions championed by government regulation.

When considering a future Internet guided by an unregulated market, this breakout group felt that full disclosure of user identity would likely become the norm as people accepted over time the reality of ever present prying digital eyes. Accompanying this would also be the reality that users would lose total control of their digital footprint; the Internet would never forget. The group also foresaw the emergence of productized security, identity and anonymity solutions; however, they also expressed concern that such capabilities and service would only be accessible by the wealthy or digital elites. The group even speculated that some private enterprises could go as far as to create pay-per-use "privacy zones" where users with sufficient financial resources could engage in online activities away from prying digital eyes.

This breakout group also picked up on the idea that the VIPnet scenario was more likely to feature stratified access based on different levels of privileges. They speculated that access to everything would require some degree of authorization, however they felt that elite access privileges would command fuller disclosure and more intrusive authorization. The group went further to share the concern that constant knowledge of people's identities and whereabouts could result in a streamlining of due process in the justice system as evidence placing people at the scene of a crime would be taken as a given.

This breakout group felt that the biggest challenge to achieving an Internet commons would be solving the problem of authenticating user identity in a way that builds online trust, and is at the same time respectful of privacy. They felt that preferred solutions in this scenario would allow for user control and portability of identity information, as well as user-consent-driven authentication processes that do not rely on a central authority. They speculated that with the embedding of processors in all things, authentication could be extended to all forms of public access (e.g. transit, airline travel, buildings).

5.0 Implications for Internet Policy Development

After the theme breakout groups finished reporting back on possible changes in the Internet under each scenario, a larger group discussion considered what insights had been gained in the process regarding deeper implication for Internet policy development and sustainability. The analysis of the outputs from this plenary has been organized for clarity under the following headings:

- Regulation
- Equity of access
- E-governance
- Education
- Information management
- Social cohesion
- Internet's relevance to sustainability

5.1 Regulation

In the plenary discussion, participants noted parallels between past conversations on the emerging medium of television and what might be in the public interest, and current conversations regarding the Internet. It was felt that the dialogue about television never really went anywhere and the medium and its regulatory environment evolved with very little conscious public intervention. Are we happy with the outcome? Are there any lessons in this for our approach to Internet policy?

The opinion was also shared that aspects of Canada's broadcast and telecommunication services regulatory environment were inhibiting the evolution of the Internet in Canada. It was suggested that we need to start thinking about the Internet the same way as we think about water in that it should be a public policy priority to ensure that every citizen has access to it. Approaching Internet policy from this perspective would challenge regulatory barriers inhibiting its evolution and guide necessary regulatory renewal.

In considering Internet policy it was also felt important to emphasize how innovations that have driven the evolution of the Internet have come from private efforts. The government should do everything to avoid getting in the way of this and contain its role to only:

- facilitate affordable access options in unsustainable markets;
- support making public services available online; and
- protect the civil liberties of its citizens online.

5.2 Equity of access

A key access consideration raised in plenary was whether equity of access to the Internet will, over time, increasingly become an access to education issue as more educational opportunities move to, and are created online. More broadly, participants discussed how the Internet is still in the very early stages of its evolution, in terms of our understanding of how to realize the potential of the Internet, as well as the impacts it will have on society. Some thought more effort should be made to understand what the Internet is good for to guide access considerations.

5.3 E-governance

It was observed in the plenary how the Internet is increasingly being explored by governments as a convenient tool for public consultation. It was felt however that we need to be on guard against governments using it as a substitute for face-to-face public consultation and possibly diluting the process. We need to ask ourselves what we stand to lose by not having deeper offline engagements with government.

5.4 Education

Awareness is emerging of a whole new set of skills, both technical and social, that directly impact the quality and productivity of our online experience. Some argued as well that being an online citizen comes with both rights and responsibilities. Many young people, unaware of the consequences of their actions, engage the online world in ways that are damaging to themselves. Should we be preparing people for life online? If we do not, do we risk suffering as a society through: avoidable damage to the promising futures of youth; increasing divides between digital "haves" and "have not's"?

Youth are hungry for online experiences and this is now an undeniable part of their coming of age. Formal education plays a critical role in the coming of age process, however the guiding of youth's curiosity of the online world has yet to be properly integrated. As most youth only have the opportunity and freedom to explore the online world in their homes, learning in the classroom is being seen by youth as increasingly irrelevant. At the same time, some cautioned against relying too much on computers in the classroom believing that human-to-human exchange is critical to the quality of the education process. How do we tap into and satisfy this curiosity as part of a "quality" education in the classroom?

5.5 Information management

Thinking about information as a "noun" encourages its commoditization which does not necessarily serve the public interest. We need to think about information as a "verb"—i.e., in an active sense; as part of an emerging community of practice, or process of social learning. For example, supporting the filtering and contextualizing of "good" information from the increasing "noise" will be important for maximizing benefits from the Internet. This discussion generated several questions in the plenary. Should digital information management be an essential skill developed in our education

systems to encourage critical thinking and productive online citizenship? Should a new professional role be supported by society (e.g., should business models be encouraged or subsidized to turn reporters into Internet sense-makers?)? Should standards for tagging information on the Internet be encouraged to stimulate innovation on reframing and contextualizing data?

5.6 Social cohesion

We are living longer and, as a result, are witnessing a breakdown of the intergenerational transfer of values and wealth. Many are also concerned about the apparent loss of community being observed in industrialized nations. Some worry the Internet might further compound this problem; others believe that anything that facilitates communication is unambiguously good. The Internet makes it possible to communicate with anyone else online around the world but there is little incentive for it to be used as a tool for community building to guard against social decay. It was felt that strong communities are needed to complement the global Internet. Should public policy be used to create incentives for the Internet to be used as a community building tool (e.g., government-sponsored online social networks organized by postal code)?

At the same time, we need to be cautious about treating the online world as disconnected from the offline world. The Internet has the potential for enabling people to bridge geographic, sovereign, cultural and linguistic boundaries that would normally be formidable barriers in the offline world. Virtual connections can also lead to meaningful "real" connections and contribute to community building at all scales. Technology is good if it is used in a good way.

5.7 Internet's relevance to sustainability

Some argue that humanity is increasingly divorced from reality: there is little awareness of where our water, food and energy come from; where our waste goes. Should we be wary that having all aspects of our lives digitally contextualized and instantly accessible might further divorce us from reality?

Rather than considering how the Internet in its current form can be used as a tool to meet our needs, perhaps we need to first consider what it is we want, or need to achieve, as a society. From that perspective, we may find that it is not relevant to our needs and not serving us in its current form. The example was raised how some very innovative solutions to sustainability challenges have been demonstrated at a neighbourhood-scale; but their effectiveness is diminished or lost at larger scales. However if many neighbourhoods, each on their own, adopted their own similar solutions the net impact would be significant. Does the Internet need to be organized at that level to contribute to sustainability?

The industrial revolution brought benefits such as raised life expectancy, reduced working hours, and no work for children and the elderly. Some argue though that as capitalism has picked up its pace we are increasingly working longer hours and are less happy. Many feel the information

revolution has been making the situation even worse, and bringing with it new challenges such as a reduction in meaningful human contact. At issue is the fact that humanity is vulnerable; we are very adaptable and adjust too easily to incremental changes without being conscious that we are heading towards increasingly undesirable outcomes. When are we going to stop? Can we get on a path of incremental positive changes leading to more desirable outcomes?

6.0 Recommendations for the Future of the Internet

Following the plenary exploring deeper implication for Internet policy development and sustainability, the group was asked to formulate recommendations for Canada's future Internet; specifically, what in their opinion should be sustained/protected, changed and/or created? The group reflected that they should consider their recommendations as a note to themselves as having a stake and a responsibility in the shared development of the Internet. Therefore the group itself (and any future groups like this one) is an audience for these recommendations, in addition to Industry Canada. The analysis of the outputs from this plenary has organized for clarity under the following headings:

- Readiness, capability and use
- Trust online
- Sustainability
- Measurement and assessment
- Legislation
- Policy

6.1 Readiness, Capability and Use

Recommendation #1A: Canada needs to pursue a policy of universal access to broadband, as well as public support for some aspects of the infrastructure supporting the Internet.

In the 20th century, roads, bridges and railways were developed as public infrastructure to support the growth of the industrial economy. The same approach should be taken to support the growth of the knowledge economy. It is recommended that there be public ownership or regulation of the physical layer of the networks servicing the Internet such that it serves public interests in a manner analogous to our road systems. In this model, Canada would need to carefully consider what it means to be connected in remote communities. Equitable standards of access would need to be agreed to and the capacity requirements of wireless or satellite connectivity to remote communities considered accordingly. The government should institute ambitious goals to achieve a baseline level of connectivity for Canadians, such as universal "ADSL-like" access by 2020.

ISP reform would also be an important consideration in public ownership, or regulation, of the physical layer. A regulatory concept that has been successfully implemented elsewhere is the "functional separation" of services from networks. Such reforms have benefitted various European markets such as Britain, leading to more competition and faster adoption of other services.[8] Functional separation is also considered by many to be a better way to guarantee network neutrality than regulations that attempt to define and legislate it.

[8] iTWire - Functional separation works for broadband U.K. communications regulator, http://www.itwire.com/content/view/19250/1154/

Recommendation #1B: Canadians need to attain more computer and Internet training and awareness.

As mentioned earlier, it is clear that there are skills, both technical and social, that directly impact the quality and productiveness of our online experience. Canadians need more computer literacy training in K–12 as well adult education. Such training should not only seek to build technical capacity but also inform people, particularly youth, of the potential consequences of their online activities.

6.2 Trust online

Recommendation #2: We need to address the issues of trust of identity online and realize an open online society.

Without effective online processes for establishing trust of identity, e-commerce and applications such as online voting will never reach their full potential. Regardless of what degree the government should be involved in such solutions, some government oversight of the process for getting there is likely required given that all other aspects of our official identity are already government controlled. The government should take on the challenge of realizing the potential of online voting as a sign of their commitment to, and success overseeing the development of trust online.

Protection of identity is equally important. Individuals should have the right to protection of digital forms of their identity including the use of their identity in domain names (e.g., www.tonyvetter.com).

6.3 Sustainability

Recommendation #3A: Canada should consider how the application of ICT could be part of its national GHG emissions reduction strategy.

There have been several recent studies that have detailed how the application of ICT has the potential to play a significant role in achieving GHG emission reductions.[9,10] In terms of how this could contribute to a national GHG emission reduction strategy, Canada should take note of a Telecommunication Technology Committee (TTC) study which demonstrated that it is possible for Japan to reach 90 per cent of it Kyoto target through the application of ICT to various everyday activities, especially de-materialization and trading e-products and e-services for their physical counterpart (e.g., e-books).[11] As carbon markets emerge, the economic savings from GHG emission reductions as a result of these strategies could be significant for offsetting the expense of investment in public network infrastructures like those mentioned in recommendation #1A above.

[9] SMART 2020: enabling the low carbon economy in the information age, http://www.theclimategroup.org/assets/resources/publications/Smart2020Report.pdf
[10] Innovating toward a low-carbon Canada: Using technology to transform tomorrow, http://wwf.ca/newsroom/reports/hitech_lowcarbon.cfm
[11] Climate Change and ICT Standardization, The Telecommunication Technology Committee (TTC), http://www.itu.int/dms_pub/itu-t/oth/06/0F/T060F0060080025PDFE.pdf

Canada also needs to consider such initiatives from the standpoint of what kind of society we ultimately want. The intelligent application of ICT to various everyday activities will yield a significant efficiency dividend and government policy needs to be mindful of how society will spend this dividend. Often, increased efficiency translates into increased consumption.[12] Therefore it is also important to consider how possible rebound effects from such initiatives can be offset such that they contribute to achieving a sustainable economy rather than drive more unsustainable consumption.

Recommendation #3B: We should strive to use the Internet to enhance our connection to the biophysical world.

With Internet access increasingly available via mobile devices, wireless transmitters being embedded in objects and the emergence of sensor networks, there is significant potential for connectivity to the Internet to enhance our awareness of the biophysical world we inhabit. For example, mobile applications could be developed that help explain and interpret our physical surroundings as we pass through them. E-newsletters should also be established for all local communities providing their citizens status updates on environmental indicators such as local air or water pollution.

Recommendation #3C: We need to answer the question of how the Internet can contribute to addressing sustainability concerns at the local level before we can consider how it can address global inequalities.

Being able to monitor the destruction of the Amazon rainforest from your laptop is great for raising awareness of sustainability challenges elsewhere around the globe, however equivalent capability and content is often lacking for sustainability concerns at the local level. As mentioned earlier, very innovative solutions to sustainability challenges have been demonstrated at a neighbourhood scale. It is believed that in some cases the best way to scale those benefits is for other neighbourhoods to do the same rather than scale the solutions themselves. Innovative ways of using our connectedness to encourage local Net-mediated communities need to be encouraged. These can help bring focus to local issues of sustainability and foster community empowerment to develop grassroots solutions. Online tools for community building need to be developed. Multidisciplinary discussions at the local level on how to leverage our connectedness for encouraging such outcomes should be explored; get sustainability activists and ICT experts to the same table and you will find they share many of the same values and are eager to collaborate.

6.4 Measurement and assessment

Recommendation #4: The success of the Internet in Canada, as well as globally, should be measured by human measures of success—how the Internet is serving humanity and the environment.

[12] See Jevons paradox – Wikipedia, http://en.wikipedia.org/wiki/Jevons_paradox

We should consider the success of the Internet on the basis of how it serves humanity, not simply in terms of the meeting of our technical demands, but the survival needs of humanity and the environment. Here are some examples of indicators with direct or indirect ties to ICT outcomes or impacts that should be considered:

- increase in technology repair and reduction of obsolescence;
- dematerialization of organizations and processes;
- achievement of a closed loop economy (cradle to cradle);
- jchievement of very low or zero energy society and Internet; and
- jobs; literacy; happiness; collegiality; health.

Understanding whether our approach to becoming an information society is truly serving our needs should include a systematic assessment of how ICT outcomes are impacting such sustainability indicators.

6.5 Legislation

Recommendation #5: The Canadian government needs to avoid a rush to legislation for addressing issues associated with the privacy and anonymity of Internet users.

There is concern that attempts to legislate solutions to issues associated with the privacy and anonymity of Internet users could lead to an erosion of user rights and privileges. The courts already have legal mechanisms to effectively deal with issues associated with user privacy and anonymity and a rush to legislation should be avoided.

6.6 Policy

Recommendation #6: All federal government departments and agencies should have consistent and coordinated Internet policies.

The Government of Canada is globally recognized for its online initiative to provide seamless access to government information regardless of the source. However, there is a perception that individual federal government departments and agencies are not all consistently and effectively using the Internet as a tool for improving their own efficiency and effectiveness; for developing policies and executing programs; and for partnership and public engagement. Government departments and agencies should be leading on these fronts, and currently they are viewed as being behind. Regular monitoring and reporting on such policies using indicators, such as those mentioned in recommendation #4, should be considered by the government to assess how effectively and efficiently departments and agencies are meeting their Internet strategy goals.

Recommendation #7: The government needs to continue actively engaging a broad cross-section of Canadian citizens in

a dialogue regarding the future of the Internet.

It is worth noting that several participants of the Vancouver workshop remembered the important work that had been done by the Information Highway Advisory Council (IHAC) during the mid-'90s. Their experience with this workshop, however, prompted a reflection on the closed nature of the IHAC process where ICT experts had been sought for counsel through invitation only. What the participants had appreciated about this workshop was it also included people not directly involved in the ICT sector but who nonetheless had a vested interest in Internet technology and its implications for broader economic, societal and environmental concerns. It was felt that relevant and important views on the future of the Internet can come from all walks of life as the Internet in one way or another touches everyone. Attendees also wanted to emphasize that participation by people who are educated and committed to active social change is not a critical variable for soliciting productive insights into the social impacts of the Internet. For example, some participants shared how in their own work they had heard opinions from B.C. interior First Nations youth on the implications of Internet technology that paralleled those of prominent experts. A gap that was also noted by one person who had participated in the work of IHAC was that some of the content examining the social implications of the Internet was never released. Participants strongly believed that the government has an important role to play in participating in, moderating and publishing the outcomes of such discussions.

7.0 IISD Analysis

In reviewing the outcomes of this workshop, IISD made note of the fact that many of the implications considered and recommendations made by the participants are familiar territory for Industry Canada. Many of the participants were aware of this and sought their consideration as much as a note to themselves **in the context of their own stake and responsibility in the shared development of the Internet.** These issues of course have been extensively researched and debated among government, industry stakeholders and policy practitioners for some time. In particular, the IHAC (created in 1994); the National Broadband Task Force (NBTF) (established in 2001); as well as the Telecommunications Policy Review Panel (TPRP) (formed in 2005), all mandated by the then Ministers of Industry delivered many similar recommendations. On further reflection, IISD believes that three notable insights regarding public engagement on these issues emerged from this exercise that could be of value to ongoing efforts.

1. The value and need for broader engagement, and the assertion of shared responsibilities for building, using and managing the Net.

In addition to Internet industry and policy stakeholders, this workshop purposefully sought the participation of broader government, civil society and private sector interests. The feedback IISD received on this approach was clear: engagement beyond the stakeholder group traditionally approached by Industry Canada on these issues was appreciated, welcomed and thought necessary. It was observed by one participant that when we set out to tackle complex issues such as how to best manage the growth and evolution of the Internet and what the role of government should be, the necessary stakeholders are often defined too narrowly. The result is that the stakeholders involved can tend to look inwardly towards the institutions they inhabit, rather than outwardly into society where the true picture of impact will emerge. As the Internet increasingly underpins our societies and economies as a global infrastructure, its effects extend beyond private sector interests and, as such, there is real value in soliciting the views of a broader cross-section of concerned stakeholders. Internet policy practitioners need to look beyond the economic growth potential of the Internet and engage with environmental and social actors who are now dependent on, but also concerned by, how the Internet is developing and whether it will support or detract from long-term sustainability goals. Getting to the future Internet we all want will require broad public demand and support—and an evolving understanding of our shared responsibilities in building, using and managing the Net**.**

This will only be achieved by consistently informing and engaging the public; and by broadening the understanding of critical issues surrounding the Internet and the choices that may need to be made that will influence the role the Internet could play in economic and societal change. It is interesting

to note that many participants were surprised to discover the extent to which others from significantly different backgrounds had thought about many of these issues and had formed opinions similar to their own. This demonstrated to IISD the value that engagements could bring to developing a shared vision—and shared ownership—for the future Internet.

2. The need for a unified ICT policy function within the Government of Canada and the opportunity for Canadian leadership on ICT.

Other feedback IISD received from workshop participants worth noting was a perceived lack of engagement by Industry Canada, in particular with civil society organizations, on many of these issues. It might be argued that a number of the issues discussed in the workshop fall outside the objectives of Industry Canada, to promote a fair, efficient and competitive marketplace; an innovative economy; and competitive industry and sustainable communities.[13]

Nevertheless, the concern of participants speaks to a perceived gap in the Government of Canada's handling of these issues and the need for a more coordinated and holistic approach to policy impacting the knowledge economy and society. This is consistent with the findings of the Telecommunications Policy Review Panel, which noted a lack of a multifaceted approach to ICT policy, like that originally developed by the former Department of Communications, and identified a need to re-establish ICT policy as a national priority.[14] The report recommended, *inter alia*, that an output of a review of Canadian broadcasting policy be to assign a converged policy-making role to either a single division within Industry Canada or Canadian Heritage; or to a separate new "Department of Information and Communications Technologies." In either case, the goal would be to establish a unified centre, within the Government of Canada, for all major policy-making and programs related to building and maintaining Canada's leadership in ICT. We would suggest, based on this consultation, that Canadian leadership not only focus on infrastructure and technology development, but on the social and environmental benefits—the full "triple bottom line"—possible with ICT/Internet innovation. This could in effect become the "Canadian Internet Model." But this will require a more unified approach to ICT policy-making within the Government of Canada.

IISD's workshop experience suggests that the creation of a unified policy-making function would be welcome. This would contribute significantly to improving the Government of Canada's capacity to engage not only with business, but with community development groups, other civil society actors as well as the general public on the issues tackled by the workshop participants. In fact, it could be argued that Industry Canada's focus on "sustainable communities" already provides a strong alignment with many of the recommendations made by the participants. Industry Canada's work to support participation in the digital economy aims to provide Canadians with access to education,

[13] Industry Canada Site – Mandate, http://www.ic.gc.ca/eic/site/ic1.nsf/eng/h_00018.html.
[14] Telecommunications Policy Review Panel, http://www.telecomreview.ca/eic/site/tprp-gecrt.nsf/eng/Home

knowledge, commerce and opportunities in the communities in which they reside—and this is an important starting point for community sustainability. But recognizing the impacts and unintended consequences (e.g., possible loss of social cohesion; increased digital divides; failure to address GHG emissions reduction opportunities) will also impact community sustainability and, therefore, should also be considered by Industry Canada as part of a more unified policy approach to ICT and the Internet.

3. The need for national ICT policy development and implementation, particularly with respect to the link between infrastructure and competitiveness.

The third observation that IISD made was of the frustration among participants—particularly with those aware of the work of the IHAC, the NBTF and the TPRP—with the lack of progress in Canada on many of the issues they had discussed. Most of the recommendations made by the participants addressed issues that currently are, or have been, on the policy agendas of the federal government and provincial governments for the past decade or more. Broadband; education, training and skills development; regulatory reform of the telecommunications sector; security and trust in online transactions; and the use of the Internet by government departments and agencies all fall into this category. As alluded to above, the distribution of portions of this knowledge economy agenda across many Industry Canada divisions was raised as a concern and perceived as a contributing factor for the fragmented and slow development of policy. It is also clear however that many government departments, federal and provincial, have simply not been convinced of the policy case for making ICT policy a national priority, or seen a political advantage in doing so. In its mandate, Industry Canada makes the point of highlighting how

> "In a global, knowledge-based economy driven by rapid technological change, success is determined by the power to innovate. Connectedness is pivotal in empowering Canadians with the skills, competencies and tools necessary to innovate and take advantage of Canada's world-class ICT infrastructure."[15]

In this context, it is worth noting that some of the frustration voiced by participants regarding lack of progress in Canada was based on perceptions regarding the state and development of Canada's ICT infrastructure in comparison to other nations. Canada clearly has a comparatively world-class ICT infrastructure, however some disturbing trends along the following lines were cited by the participants.

- As of 2007, 37 per cent of Canadian communities still did not have access to broadband.[16]

[15] Industry Canada Site – Mandate, http://www.ic.gc.ca/eic/site/ic1.nsf/eng/h_00018.html
[16] Rural and Remote Broadband Access Presentations, Communications Research Centre Canada, http://www.crc.gc.ca/en/html/crc/home/research/rrba/presentations

- Between 2002 and 2007, Canada dropped from 9th to 19th out of 154 countries according to how advanced its use of ICT is; Canada improved in both ICT access and usage, but less than other top countries in Europe.[17]
- The U.K. passed Canada in 2008 to become the country in the G7 with the highest broadband penetration.[18]
- Although Canada has the second lowest relative fixed broadband prices in the world, this indicator is based on a 256 kbits threshold[19]; Canada only ranks 27th in terms of average broadband monthly price per advertised Mbits[20]
- Canadian mobile broadband lags significantly at 1.5 per cent penetration compared to an average 14 per cent in developed countries; our mobile cellular penetration of only 62 per cent versus 100.3 per cent in developed countries is a likely contributing factor

The frustrations expressed by the participants, and the public in general, regarding lack of progress in Canada needs to be addressed by government action that demonstrates not only that ICT policy is being approached as a national priority with an appropriate management focal point, but that it has been specifically designed to address concerns regarding the competitiveness of Canada's ICT infrastructure.

In terms of the specific recommendations made by the participants, IISD made the following additional observations.

Recommendation 1A suggests that there should be public ownership, or regulation, of the physical layer of the networks servicing the Internet such that it serves public interests in a manner analogous to our road systems. An immediate question that comes to mind is whether the participants meant to imply that the fibre optic, wireless and satellite infrastructure that is currently privately owned, be nationalized. Clearly this would be a disruptive and politically contentious undertaking. The likely thinking behind making this recommendation was that more public control of the physical layer would be advantageous for stimulating competitive transport offerings through public policy that ensured that all potential transport service providers had equal access to the infrastructure physically connecting together network nodes across Canada. This could be accomplished in many ways potentially involving a mix of regulation of existing and new private infrastructure builds, as well as national investment in some new fibre optic, wireless and satellite infrastructure. Another example at the local level could involve community ownership of fibre optic or wireless connectivity to

[17] Canada drops in UN communications technology ranking, http://www.cbc.ca/technology/story/2009/03/02/canada-ict-ranking.html
[18] UK to pass Canada in Broadband Penetration in 2008 – US Broadband Penetration Grows to 91.8% among Active Internet Users – October 2008 Bandwidth Report, http://www.websiteoptimization.com/bw/0810/
[19] Measuring the Information Society – The ICT Development Index 2009, http://www.itu.int/ITU-D/ict/publications/idi/2009/index.html
[20] OECD Broadband Portal, http://www.oecd.org/sti/ict/broadband

businesses and homes. Possible benefits to users would include the freedom to choose which service provider they connected to which would drive competition and innovation of those services in their community.

In the same recommendation the participants also referred to a desirability of "functional separation" of services from networks which can lead to more competition and faster adoption of other services. The Telecommunications Policy Review Panel also made mention of this as having been affected in telecommunications policies in the European Union and elsewhere.[21] This of course raises questions regarding whether Canadian companies that own infrastructure and provide services would be required to split into separate businesses. The participant discussion did not touch upon alternative approaches to stimulating more competition and faster adoption of other services. It is worth mentioning that the TPRP recommended that wholesale and retail service lines of business be regulated differently instead of requiring them to split into completely separate businesses.

Recommendation 1B emphasized that Canadians need more computer and Internet training and awareness. This recommendation was born out of concern shared by many participants over the growing divide between the digitally literate and illiterate in Canada. Such concerns have been expressed for many years however are increasingly relevant in the context of emerging Web 2.0 applications and peer-to-peer file sharing. Illiteracy on these technologies in particular further limits individuals from realizing benefits from content generation as well as sharing resulting in a further digital "have" and "have not" divide.

Recommendation 3A suggested that as carbon markets emerge, the economic savings from GHG emission reductions as a result of the application of ICT could be a source of return on investment in public network infrastructures as per recommendation 1A. One consideration however is whether publicly owned infrastructure would have to be carbon neutral as a matter of policy, and that it would be the service providers who would be able to trade credits for GHG emission reductions as a result of the services they provide. How the public would share in such benefits could be a contentious issue which should be considered in advance by any policy considering the promotion of publicly owned network infrastructure.

Finally, recommendation 4 suggested that the success of the Internet in Canada, as well as globally, should be measured by human measures of success. Public discussion of how advanced our use of ICT is[22] often references indicators such as the International Telecommunication Union's (ITU) ICT Development Index[23] or the Organisation for Economic Co-operation and Development's

[21] Telecommunications Policy Review Panel, http://www.telecomreview.ca/eic/site/tprp-gecrt.nsf/eng/Home
[22] Canada drops in UN communications technology ranking, http://www.cbc.ca/technology/story/2009/03/02/canada-ict-ranking.html
[23] Measuring the Information Society – The ICT Development Index 2009, http://www.itu.int/ITU-D/ict/publications/idi/2009/index.html

(OECD) Information Technology Outlook.[24] The ITU ICT Development Index measures countries' progress towards becoming information societies by looking at indicators such at ICT readiness (infrastructure, access); ICT capability (skills); and ICT use (intensity). These indicators however do not help us to see how becoming an information society is serving our needs. Simply put, humanity needs to urgently overhaul the global economy with the aim of achieving environmental and socio-political sustainability. Many indicators have been developed to measure our sustainability progress, some of which were touched upon by the participants in their recommendations. However it is worth considering whether relevant sustainability indicators might be best selected on the basis of possible correlations between indicators of ICT adoption and use and indicators of direct, indirect and systemic effects on sustainable development outcomes. Examples might include the greening of ICT, the enabling of dematerialization, controlling for rebound effects, and the adoption of sustainability values, goals, principles and processes. If correlations among such factors can be understood and demonstrated then the selection of different ICT policy choices impacting the evolution of the Internet could be guided by consideration of their connection with desirable sustainable development outcomes. Such a systematic assessment would be an important advance towards understanding of whether a given approach to becoming an information society is truly serving our needs.

[24] OECD Information Technology Outlook 2008, http://www.oecd.org/sti/ito

8.0 Next Steps

IISD recommends two follow-up actions to the Vancouver pilot workshop:

1. Industry Canada should consider supporting further regional workshops across Canada.
    - It was clear from the Vancouver pilot that engagement beyond the stakeholder group traditionally approached by Industry Canada on concerns regarding, and expectations for, the future of the Internet was appreciated, welcomed and thought necessary. Strong attendance at the Vancouver pilot, despite significant schedule sacrifice for many of the attendees, stands as evidence of this.
    - Such an initiative by Industry Canada would be a welcome response to perceptions of a lack of open public engagement by Industry Canada on questions of the economic and social implications of the Internet, as well as a perceived lack of Government of Canada action taken in response to previous engagements such as that of the Telecommunications Policy Review Panel.
    - Getting to the future Internet we all want will require broad public demand and support. This will only be achieved by consistently informing and engaging the public; broadening the understanding of critical issues surrounding the Internet and the choices that may need to be made that will influence the role the Internet could play in economic and societal change.
    - Such regional consultations could lay the foundation for creating a "Canadian Internet Model"—an expanded vision of how ICT/Internet innovation could be managed and encouraged that focuses not only on infrastructure and technology development, but on the social and environmental benefits Canadians believe could be achieved with ICT/Internet innovation. This model could reflect a fresh approach to public/private sector collaboration in the continuous updating and expansion of ICT infrastructure in the interests of all Canadians. Realizing this would require not only a unified policy centre within the Government of Canada championing such a vision, but an openness as well to considering and supporting alternative models for managing the different layers of Internet infrastructure that would accommodate more public sector and end user involvement. The CRTC model for engaging the public on telecommunications and Internet policy was viewed by the workshop participants as being too controlled and politicized. There is a clear desire for more open and collaborative public engagement with the objective of realizing a shared vision—and shared ownership—for the future Internet. For example, such a process could provide inputs into the formulation of national sustainability strategies such as for the reduction of GHG emissions that include consideration of contributions that Canadians believe could be made through the application of ICT.

2. This Vancouver pilot, as well as further potential regional workshops, could provide a foundation for establishing a Canadian Internet Governance Forum.
    - If inclusive of Canadian-specific Internet issues arising from convergence, such a forum with broad participation could be instrumental in helping Industry Canada respond to and engage with the public on issues arising from the current CRTC hearings and other consultations on Internet policy. Feedback from the Vancouver pilot was that there is a tendency to define the necessary stakeholders too narrowly when tackling complex issues such as how to best manage the growth and evolution of the Internet and an appropriate role for government in that. A Canadian IGF could learn from this and set an example for other national and regional IGFs by encouraging broad-based participation beyond the usual participants.
    - Recognizing the different preparatory approaches that Industry Canada must take for a range of Internet and ICT forums, a Canadian IGF could also be a useful vehicle for gathering a broader cross section of input for the government to consider in its preparations for multistakeholder forums such as the Internet Governance Forum (IGF), as well as intergovernmental meetings of the OECD and the ITU. A number of countries have already established national, or are participating in regional IGFs; examples include the U.K. IGF, the Spanish IGF, the European Dialogue on Internet Governance (EuroDig), the East African IGF, the West African IGF, and the Latin American and Caribbean IGF.[25] Such developments have been viewed as potentially very positive contributions to the quality of the global IGF as well as being potential vehicles for taking action on the basis of IGF discussions and deliberations. From the point of view of individual countries and regions, organizing national and regional bodies is a proven technique for enhancing their influence in global fora. The Vancouver consultation demonstrated that a broad and unique stakeholder base exists, eager to speak to what Canadians value, want and expect with respect to future growth of the Internet and the role it could play in other challenges facing Canadians; offering visions of what a "Canadian Internet Model" might consist of. A national IGF that could help advance this, and further Canadian Internet interests and innovations internationally, is warranted.

[25] Regional and National IGF meetings, http://www.intgovforum.org/cms/index.php/igf-regional

9.0 Appendix A: Participant List

1. **Steve Anderson**	**New media consultant and Co-founder, Save Our Net Coalition** Steve Anderson is also the founder of the Centre For Information Awareness; Coordinator of Canadians for Democratic Media; and Publisher for COA News.
2. **Ruben Anderson**	**Futureproof Consulting** Ruben Anderson currently works for Metro Vancouver, helping to integrate sustainable behaviour in multifamily buildings. Ruben consulted on future-proofed locally resilient systems for the City of Vancouver's Sustainability Group and Planning Department, as well as for B.C. Housing and Industry Canada. He recently co-taught Ecological Perspectives on Design at the Emily Carr University. Ruben won the Cascadia Green Building Council's Closing the Loop Energy Award in 2006, for a passive shading system designed for local manufacture and the use of cradle-to-cradle materials.
3. **Trevor Bowden**	**Co-founder, Big Room** Trevor Bowden is a co-founder of Big Room Inc., a company that helps people make green choices. Prior to Big Room, he consulted extensively to the United Nations and international banks on environmental lending and investment practice. Trevor developed the United Nations Environment Programme's Finance Initiative Roundtable series and launched the United Nations Principles for Responsible Investment (UN PRI) at the New York Stock Exchange in 2006.
4. **Tim Bray**	**Director, Web Development, Sun Microsystems** Tim Bray is a Canadian software developer and entrepreneur. He co-founded Open Text Corporation and Antarctica Systems. Tim co-edited the XML and XML namespace specifications, and has served as a Tim Berners-Lee appointee on the W3C Technical Architecture Group.
5. **John Crocock**	**President, Western Canada Computer Industry Association**
6. **John Demco**	**Director, webnames.ca** John Demco conceived the .CA country code domain name in 1987 and served as its initial registrar, chairing the CA Domain Committee until 2000. He participated in the Canadian Domain Name Consultative Committee which made recommendations concerning the structure and organization of the .CA and helped establish the Canadian Internet Registration Authority (CIRA). John was recognized by the Prime Minister in 1997 as a founder and builder of the Canadian Internet
7. **Ali Farshchian**	**Founder, Editorial & Operations, CircleID** Ali Farshchian's active involvement with the Internet dates back to 1991. He has worked on various commercial and academic projects related to Internet-based applications, software development, database design, publishing and collaborative online platforms. He has a keen interest and extensive experience in developing online communities and the collaborative Web. He has played a key role in developing CircleID into what is now globally recognized as a leading online destination for the Internet infrastructure.
8. **Garth Graham**	**Director at large, Telecommunities Canada** As a policy research consultant and community networking activist, Garth Graham has extensive Canadian and international experience in enabling communities and governments to apply ICT in community development and to

	plan national strategies for ICT use. In a career that spans work in Yukon Territory, East Africa, Vietnam and the Philippines, he has been dedicated to ensuring that decision-making about the development choices that communities face occurs at the community level. His work as a policy researcher is directly informed by his participation in associations engaged in grassroots social action through Internet use. Via his work with Telecommunities Canada, a national voice for the practices of community networking, and with a variety of other community networking associations and government agencies, he now has 17 years experience in the collaborative development of community Internet projects and networks. He has also been active in a variety of Canadian citizens' organizations concerned with the public policy debate on Canada's transition to an Internet Economy.
9. Calvin Jang	**IT Manager, David Suzuki Foundation**
10. Craig Lam	**Communications, International Centre for Sustainable Cities**
11. Zoe le Good	**Corporate Social Responsibility Advisor, Canadian Business for Social Responsibility (CBSR)** Zoe le Good has worked at CBSR as the Advisory Services Coordinator and a CSR Advisor since 2007. She works primarily on Advisory Services projects involving CSR assessments, developing CSR strategy frameworks, value chain analyses, stakeholder engagement strategy development, social risk assessments, and human rights assessments in the retail, extractive and financial services industries. Prior to joining CBSR, Zoe worked as an operations analyst, process improvement consultant and project manager across several industries.
12. Norm Leech	**Chair, First Nations Technology Council** Norm Leech is also the administration services manager, T'it'q'et First Nations
13. Brian Leroux	**Software architect, Nitobi**
14. Caroline Lewko	**Founder and CEO, Wireless Industry Partnership (WIP)** Caroline Lewko has been in the wireless/ telecom industry since 1995, as a coder, funder, business developer and entrepreneur. She started WIP to make the path easier for mobile developers, reduce cycle times and increase innovation in the mobile ecosystem. Caroline founded the Wireless Innovation Network of B.C. (WINBC) in 2001, and Wavefront, a wireless development centre, and is Past Chair of both organizations. Caroline was in the Telecommunications Industry Group of Anderson Consulting (Accenture).
15. Jacob Malthouse	**Co-founder, Big Room** Prior to Big Room, Jacob Malthouse was Liaison to the Caribbean and Canada at the Internet Corporation for Assigned Names and Numbers (ICANN). Previous to ICANN, Jacob was Head of Investment at the United Nations Environment Programme's Finance Initiative (UNEP FI). At UNEP FI he was responsible for the Principles for Responsible Investment, the Materiality Series, and the creation of a legal framework for the integration of environmental, social and governance issues into institutional investment.
16. Wendy McAvoy	**Steering Committee, B.C. Sustainable Energy Association**
17. Warren McKay	**Consultant, and former CIO, B.C. Hydro** From the late '80s until 2000, Warren McKay started and grew a broadcast engineering company. During this period Mr. McKay sat on the board of Power

	DirecTV, a subsidiary of Power Corporation. He was actively involved in the NetWork B.C. initiative whose goal was providing broadband connectivity to 151 small rural communities in British Columbia. Mr. McKay has just completed (February 2009) a five-year IT strategy for the Translink group of companies. Mr. McKay was a founding Director of CIO Canada and was a member of the Technical Advisory Board of Sierra Ventures (2005–2007), a private venture capital firm managing over $1.1 billion of committed capital. He was also a member of the Bell 2010 technical advisory board. With a focus on the strategic value of information technology, IT governance, security, privacy and change management, he has spoken at numerous industry events. He has been a proponent of "green" IT for many years and has long had a personal interest in sustainability.
18. Georgette Parsons	**Chief Information Officer, Mountain Equipment Co-op**
19. Lyndsay Poaps	**Greater Vancouver Regional District** Lyndsay Poaps currently works for Metro Vancouver (the regional government), helping integrate sustainable behaviour into multifamily buildings. She is a Board member of ThinkCity. Lyndsay was the youngest elected official in Vancouver's history, and the former city park board commissioner is passionate about engaging her generation in community building and decision-making. She has worked as Lower Mainland coordinator of the Sierra Club of B.C. and co-chair of the B.C. Environmental Network.
20. Dom Repta	**Corporate Social Responsibility Analyst, Telus**
21. Jim Sayer	**Board member, Vancouver Community Network (VCN)** Jim Sayre is the staff lawyer responsible for workers' compensation and Employment Insurance law at the Community Legal Assistance Society (CLAS), a VCN community information provider. He has been a member of the Steering Committee of PovNet since it was formed in 1997.
22. Gayle Scarrow	**Program Coordinator, Networking Programs, Michael Smith Foundation for Health Research** Gayle Scarrow's background is in health care and research. She has worked as a medical radiation technologist, a research writer and a research coordinator in the area of bipolar disorder working on both national and international research studies. She was the National Research Coordinator for the Canadian Consortium for Bipolar Disorder. Gayle currently coordinates the Networking Program at MSFHR. The Foundation's mandate is to build health research capacity and competitiveness in British Columbia. Gayle is responsible for the coordination, support, and monitoring of operations for the Foundation's two currently funded Networking Programs, the Health of Population Networks and the Technology/Methodology Platforms.
23. Richard Smith	**Board of Directors, Vancouver Community Network and Simon Fraser University School of Communications**
24. Esther Speck	**Director of Sustainability, Mountain Equipment Co-op**
25. Eric Tamm	**Communications Manager, EcoTrust**

26. Joyce Thayer	**Executive Director, Electronic Stewardship Association of B.C.**
27. Dagmar Timmer	**Co-host, The Sustainable Region TV program and Managing Director, One Earth Initiative** Dagmar Timmer is a co-founder and Managing Director of One Earth Initiative, a non-profit research and advocacy group that seeks to transform unsustainable consumption and production patterns locally, nationally and internationally. In 2007, she and her sister Vanessa became the co-hosts of The Sustainable Region, an award-winning television show in Canada. Dagmar is also an Associate with the International Institute for Sustainable Development and Principal of Resourceful Solutions Consulting, based in Vancouver. Prior to her return to Vancouver, Dagmar was Program Associate and Political Scientist with the World Agroforestry Centre (ICRAF, www.asb.cgiar.org) in Nairobi, Kenya. Dagmar has also worked as a member of the Forest Conservation Programme team at the International Union for Conservation of Nature in Switzerland.
28. David Vogt	**Director of Digital Learning Projects, University of British Columbia Faculty of Education** David Vogt is working with the Vancouver Olympic Committee on the design and implementation of their education programs for K–12. He has held UBC's Robitaille Chair in Math and Science Education. Vogt founded Brainium Technologies, the first online game-based curriculum company in the K–12 market, and has served as Director of Science World in Vancouver, responsible for the creation and implementation of most of their core community and school outreach programs.
29. David Waldron	**Business and sustainability consultant** David has served as Director, Sustainability for the David Suzuki Foundation. Before joining the Foundation, he led a team of internationally-recognized experts in the design and delivery of a science-based Master's program in Sweden entitled "Strategic Leadership towards Sustainability." He has also initiated and led a series of sustainability initiatives involving the public, private and non-governmental sectors in Whistler, B.C. David brings over 20 years experience in environmental management, strategic planning, municipal engineering and community change processes.
30. Bill Weaver	**CEO, Across Border Media; Founder, Media that Matters** Bill Weaver is a media strategist, Peabody Award-winning filmmaker and journalist, with over three decades of experience creating content for U.S. and Canadian television. For the past five years, he has been producing Web-based film shorts that promote the missions of values-based businesses and social profits. Bill is founder and facilitator of Media that Matters, a yearly conference at Hollyhock committed to sparking new ideas, broadening collective wisdom, and building a stronger, smarter community among media professionals from all disciplines of conventional and unconventional media. His current work includes promotional films and strategic advice for Royal Roads University, the Hollyhock Foundation, Dockside Green, and Robert and Judith Gass.
31. Milton Wong	**Chancellor Emeritus of Simon Fraser University, and IISD Board of Directors** Milton Wong has served as non-executive chairman of HSBC Asset Management (Canada) Ltd. He was founder and chairman of M.K. Wong and Associates until it was sold in 1996 to HSBC. He serves as a director on the boards of the Aga Khan Foundation Canada, the Canada-U.S. Fulbright Program, the Pacific Salmon Endowment Society, Genome BC and the Pierre Elliott Trudeau Foundation. He is

	a member of the Canadian Judicial Council. He is the founder and past-chairman of The Laurier Institution, a non-profit organization for advancing knowledge of the economics of cultural diversity.
32. Reilly Yeo	**Online Community Facilitator and Editor, Canada's World: National Dialogue on Canada's role in the world** Reilly Yeo brings to Canada's World her expertise in comparative politics and Canadian foreign policy, dialogue, literary theory and social media, and the conviction that these things are all related. With an eclectic professional and academic background that includes work with The Walrus magazine, the United Nations Office of the High Commissioner for Human Rights, and facilitating online and in-person dialogue with Canada's World, Reilly is a specialist in communications on complex issues.

10.0 Appendix B: "What is your burning or key question related to the future of the Internet in Canada, especially as it relates to sustainability?"

10.1 Quality of community (building or degrading)

- What can we do to ensure that the future growth of the Internet does not erode local communityship and accelerate local/urban decay?
- What if the Internet did NOT cause the transformation we see? What if it is a symptom of a change already in being?
- Can my students learn (in new ways) in a world of distraction, confusion and misdirection; and how can I teach to enable that?

10.2 Equity of access

- How do we best ensure that the public can use the Internet as freely and anonymously as we use the streets, sidewalks and transit system?
- How can the Internet bring social equality to all communities and nations?
- How are mobile devices going to impact the opportunity of access?
- How can Internet connectivity reduce the prosperity gap between rural and urban communities?
- How can we use the Internet to reduce the digital divide in developing countries?
- What does the future hold for non-profits (or people based in remote areas/developing countries) who use the Internet to connect globally? ("Global citizenship")

10.3 System design and governance (resilience and scalability)

- Twin oxymoron: "managed Internet" and "managed sustainability"?
- The explosion of TLDs—where will that take us?
- Internet of things + sustainability =?
- Where does the Internet address crunch fit into sustainability, and can we make a transition without too much pain?
- Should we have a "slow technology" movement?
- How can we "maintain" access to the resources housed on the Internet in the face of disruptive social and environmental change? (e.g., physical destruction of infrastructure; carbon regulation; nationalization of electrical generation systems)
- How will the Internet expand with its limitations?
- How do we increase transparency and accountability for Internet infrastructure?
- How do we preserve and enhance the Net's utility as a tool to aid in working together to address the planet's problems?

10.4 Barriers to and enablers of social and environmental change

- How will the Internet impact future governance of global, national, community and family entities?
- How do we use online and offline together better to connect and activate people for social change?
- Is the expansion of online consultation process really a tool that will help governments increase the scope and depth of their public consultation, or will it further entrench the divide between those who participate and those who don't?
- How do we best enable social, cultural and economic innovation?
- What are some characteristics of the Internet itself that block the social transformation necessary for sustainability?
- How do we harness the Internet to connect and "activate" people for social change?
- How do we ensure the Internet remains a tool for innovation to promote commercial, environmental and social sustainability?
- How can the Internet sustain human health equitably while limiting the environmental impact?
- How do we understand the Internet's purpose well enough to gain benefit from the social changes that its existence expresses?
- How will we harness the power of the Internet to educate, mobilize and build community to reach the "apathetic" and "preach" to the unconverted?
- How can the Internet reconnect us with our most basic forms of communication with ourselves, with one another and with nature?
- How can the Internet promote effective computer-based education in the developed and developing world?
- How will increased global access be a benefit or detriment to the security of economic, social and environmental sustainability?

10.5 Security and identity

- How can we best ensure maximum privacy and anonymity for Internet users, including those not aware of the risks?
- How can we (or do we) provide a universal level of credibility throughout the Internet (authentication) for developing projects?
- How do we become more forgiving?
- Could we live in a totally transparent society?
- How will governments react to a system without borders?