ICT Standardization and Climate Change – A Canadian View

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http://www.isacc.ca

Who We Are

- ISACC is an Industry/Government initiative founded in 1991
- Mission: *recommend strategies for domestic and international ICT standards development, implementation and promotion which will meet the needs of Canadian users, industry and government*
- Members include SDOs in Canada, related industry associations and a wide representation of private sector industry, consumer and government interests

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What We Do

- Provides a forum that bridges among the components of the domestic ICT industry including standards stakeholders, government and users
- Enables members to exchange information on standards topics, facilitates collaboration, builds awareness of the role of standards and gains commitment for standards development
- Develops strategies for ICT standardization in Canada and provides a focus for the development and implementations of Canadian ICT standards
- Canadian participant in Global Standards Collaboration

ISACC 38th Plenary (January 29, 2008)

- ICT and the Environment
  - Industry Canada
- Electronics Product Recycling Standards
  - Electronic Product Stewardship Canada
- Smart Metering
  - Triacta Power Technologies
- Saving the Planet at the Speed of Light
  - CANARIE
- Energy Efficient Ethernet
  - IEEE 802.3az

The Standards Challenge

What can SDOs do on environmental standards?

- Reduction of power requirements of telecommunication equipment including terminal devices and networking equipment.
- End-of-life recycling of ICT products, materials disclosure standards

Environment A Key Issue for Canadian IT and Electronics Firms

E-waste a problem that needs action now:

- End-of-life consumer electronics and IT equipment going to Canadian landfills
- Potential for toxicity increases if products are not processed responsibly
- Material recovery opportunity for use in next generation products
- Infrastructure to divert and recycle these products at nascent stage in Canada
- Must prevent North America's e-waste being exported without proper controls

Industry Takes Responsibility and Action

- Founded ***Electronics Product Stewardship Canada***
- Non-profit organization, 100% industry-financed
- Mandated to design and develop harmonized stewardship programs for waste electronic products
- Working with regulators to implement shared responsibility stewardship model with roles for industry, government, and consumers.
- Unique to have industry to step-up and advocate sustainable solutions to regulators

The Electronics Recycling Standard

- Establishes basic criteria electronics recyclers must meet
- Incorporates concerns and feedback from electronics manufacturers, environmental groups, and electronics recyclers
- Goes beyond provisions of ISO 14001 and addresses specific issues resulting from recycling electronics
  - *Enhanced requirements for Environment, Health & safety*
  - *Prohibits use of prison labour*
  - *Prohibits shipping material to developing/non-OECD countries*
  - *Reinforces downstream accountability of waste*

The Recycling Guidance Document

- Developed to serve as an educational document on the environmental, legal, health and safety hazards associated with end-of-life equipment
- Intent is to provide guidance to recyclers looking to develop environmentally sound recycling processes, and environmental auditors with a knowledge base for conducting assessments of electronics recyclers
- Document provides details on:
  - Material Separation
  - Substances of Concern
  - Health Safety and Occupational Hygiene
  - Transportation and Export
  - Smelting, Energy Recovery and Disposal
  - Environmental Management System
  - Material Processing and End use Acceptability Table

Next Generation Internet to Reduce Global Warming

- Any future Internet network, project, program or application must have as its primary objective of a zero carbon footprint
- Incremental energy efficiency improvements on existing technology is not sufficient. Radical changes in Internet architecture and applications are needed
- Zero carbon condition applies to
  - all optical, wireless and last mile networks
  - all routers, switches, and web servers
  - all cyber-infrastructure, HPC computers
  - and all customer devices such as PCs, mobile phones, PDAs etc

Canada Ideal for Zero Carbon Data Centers

- Most renewable energy sites are very remote and impractical to connect to electrical grid
- But can be easily connect to an optical network grid
- Also enables deployment of broadband networks to remote areas
- Canada is well suited to locate data centers in far north for cooling
- Iceland, Lithuania and others have announced similar strategies

Possible Research Areas

- Dynamic all optical networks with solar or wind powered optical repeaters
- New Internet architectures with servers, computers and storage collocated at remote renewable energy sites such as hydro dams, windmill farms, etc
- New routing and resiliency architectures for wired and wireless networks for massively disruptive topology changes due to setting sun or waning winds that power routers and servers
- New stats and measurement analysis of bits per carbon (bpc) utilization, optimized “carbon” routing tables, etc

ICT Standards and the Environment – Future Development

- Energy reduction/efficiency
  - CANARIE vision of zero carbon ICT – intensive use of new technologies and architectures to dramatically reduce carbon footprint is worthy of further study
  - Measure of value? – watts normalized per bit, per line, per subscriber; busy vs. idle values; network element vs. end-to-end application; instantaneous vs. time integrated; test specification
- Recycle ICT products
  - Harmonize recycling standards for waste electrical and electronic equipment and associated reduction of harmful substances
  - Harmonize materials of concern disclosure standards
    - what: naming conventions
    - how much: threshold amounts, units of measure