Next-Generation Internet to reduce global warming (Green NGI)

A research and commercialization initiative

Why a Green NGI (G-NGI) initiative?

Having grown from a scientific research tool to the world's most powerful economic and social communications medium, the omnipresent Internet is at an important transition point. While new applications in health, environment, security, entertainment etc., are now in demand, they remain out of reach due to the performance limitations of today's Internet. The major ongoing push in various parts of the world to develop the NGI is based on the growing recognition that the Internet has become a critical infrastructure essential to a variety of social and commercial endeavours.

As unapparent as it may seem at first glance, the design of a new Internet paradigm and its ensuing use could also yield a significant positive impact on global warming which is one of the greatest challenges facing this planet. In fact, until very recently, it was thought that Information and Communications Technologies (ICT) would be at best a minor player in reducing GreenHouse Gas (GHG) emissions. However, two very recent sets of reports indicate that in fact, ICTs may offer far greater opportunities to reduce GHG emissions than previously thought and that this potential GHG emission reduction may be more important than what could be achieved through carbon taxes or cap and trade schemes.

The first indications of the new found importance of ICTs with respect to climate change were presented earlier this year at two symposia [1] organized by the International Telecommunications Union (ITU). The first symposium was held in Kyoto, Japan in April 2008 and the second was held in London, U.K. in June 2008. Prompt participated in both events and Chaired one of the six sessions at the Kyoto symposium. As an example of ICT's potential impact on climate change, a presentation from Japan [2] showed that it is possible for Japan to reach 90% of its Kyoto targets strictly through the application of ICT. As with all economic forecasting models, there are a lot of untested and unproven assumptions, and this study is no different. But even if the application of these models only result in 50% or even 25% of the Kyoto targets, this is still a very, very significant development, and means that ICT will still have the biggest impact in reducing CO2 emissions compared to any other conventional approach such as carbon taxes and cap and trade.

The other study [3] that indicates the significance of Internet and ICT was just published in June 2008 by the Climate Group and the Global e-Sustainability Initiative (GeSI) and states that "The Smarter technology use could reduce global emissions by 15 per cent and save global industry $US 800 billion in annual energy costs by 2020.

The report - SMART 2020: enabling the low carbon economy in the information age - is the world's first comprehensive global study of the Information and Communication Technology (ICT) sector's growing significance for the world's climate.

The report's supporting analysis, conducted independently by international management consultants McKinsey & Company, shows that while ICT's own sector footprint - currently two per cent of global emissions - will almost double by 2020, ICT's unique ability to monitor and maximize energy efficiency both within and outside of its own sector could cut CO2 emissions by up to five times this amount. This represents a saving of 7.8 Giga-tons of carbon dioxide equivalent (GtCO2e) by 2020 -greater than the current annual emissions of either the US or China.

Prompt's proposed initiative

Prompt's proposal is to create a distributed center of excellence devoted to the research, development and commercialization of ICTs and applications to reduce global warming. As such, the mission of the proposed center will to perform R&D on the next-generation internet as a green technology and to support commercialization of existing and emerging ICTs through carbon offsets.

The Prompt Green NGI center will thus provide a unique and novel approach for the commercialization of Next Generation and ICT technologies. Rather than proceeding with a traditional licensing and royalty scheme to commercialize products or the results of research, Prompt will setup a center of expertise to allow researchers, institutions and businesses to earn carbon offset dollars for their intellectual property.

The negotiation of carbon offset dollars will be similar to negotiating royalty and licensing fees, but the payment will be based on the actual amount of greenhouse gases that are avoided or reduced by the application or the potential application of the ICT technology.

Another aspect of the PROMPT initiative is to help universities and businesses "virtualize" their existing network services, applications and research tools to also earn offset dollars. Although this is not strict commercialization in the narrowest sense of the word, it also help earn carbon offset dollars for the institution. More importantly the same process and tools might be adapted by other organizations around the world where Prompt and its partners in the initiative will hope to negotiate carbon offsets as well. This will become critically important as governments around the world mandate universities and other public sector institutions to become carbon neutral.

The Prompt Green NGI center will focus on:

- Network technologies to deploy zero carbon networks i.e. wired and wireless networks, new router and optical architectures and new distributed computing architectures.
- University, business and consumer applications i.e. distributed grids and clouds using zero carbon data centers, use of Web services and SOA with virtualization, consumer applications on zero carbon data networks, etc.
- The deployment of a zero carbon network testbed to test and validate research and products by linking participating partner sites.

The prompt Green NGI center is to operate as a distributed, virtual center with activities coordinated through all partners in Prompt with a very low overhead. The center will rely upon a strong industry-university partnership. Industry cash and in-kind commitments to the center will matched by various sources of public funding for which Prompt and its partners are in the process of applying. Commercialization activities will be supported by partners with the appropriate expertise in the environmental and economic realms.

Around the world, there are many research initiatives exploring the challenges of building the Next-Generation Internet. These include European projects such as Federica and 4WARD as well as major clean slate initiatives such as the $350 million GENI program in the US and NGN 2 in Japan.

To date, none of these initiatives are focused on how the Next Generation Internet and ICT can help reduce global warming. Through the Prompt initiative, Canada will be seen as the global leader in this area. This 'NGI to reduce global warming' proposal plays to Canada strengths in terms of technology industry base, geography (proximity to the US) and abundance of renewable energy sources.

About Prompt

Prompt is both a private corporation and a non-profit organization whose efforts are supported financially by the Quebec government and industry in the ICT sector. Its objective is to reinforce the Quebec innovation system and increase the benefits of public investments to research. Prompt's mission is to enhance the competitiveness of companies in the ICT sector through research partnerships with universities and Quebec public research centers. These research partnerships are jointly financed by the private sector, the Quebec government and the government of Canada.

http://www.promptinc.org

Contacts:

Jacques McNeill, Prompt NGI coordinator, jmcneill@promptinc.org

Charles Despins, President & CEO, Prompt, cdespins@promptinc.org

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[2] http://www.itu.int/dms_pub/itu-t/oth/06/0F/T060F0060080025PDFE.pdf.

[3]http://www.theclimategroup.org/news_and_events/news_and_comment/smart2020pressrelease