



Environmental Considerations in Proposed Net Neutrality Regulations of Broadband Networks

Joseph P. Fuhr, Jr.*

Introduction

The benefits of telecommunications networks and new information technologies are realized in all sectors of the economy and in a variety of different value-creating ways. Current public policy deliberations respecting “Net Neutrality” in the Congress and at the FCC will have significant impacts on the magnitude, type and distribution of these benefits. At stake are jobs, investment, innovation, increases in productivity, economic growth and the general availability of the bounty of the Internet to all citizens, as envisioned in the emerging national broadband policy. These issues and consequences are all a part of the general “Net Neutrality” debate.

However, broadband networks are very helpful in achieving other worthy public objectives such as environmental preservation, quality education, public security, health care, senior welfare, and rural development. In the context of this special ability of broadband networks to create extraordinary distant and collateral benefits, development of broadband should be encouraged. Regulation and taxation of broadband can reduce supply and demand for broadband networks by reducing funds available for investment and by raising prices for broadband services. The result will ripple and reverberate economy-wide and be felt by citizens who are denied the benefits, recognized and pursued by governments at all levels and in most countries, sure to be generated by the Broadband Economy.

This ConsumerGram examines the positive effect that broadband can have on the environment and, by extension, some potential (unintended) environmental consequences of well meaning government market place interventions that have the effect of reducing investment and innovation in broadband networks.

The wide adoption and use of broadband applications can achieve a net reduction of 1 billion tons of greenhouse gas over 10 years, which, if converted into energy saved, would constitute 11% of annual U.S. oil imports.¹

Broadband’s Benefit to the Environment

The opportunity for broadband and information technology to reduce or avoid energy use, and thus help the environment, is evident in where we work, how we shop and what we consume. For instance, electronic communications are reducing the demand for first-class letters

* Dr. Fuhr is a Senior Fellow at the American Consumer Institute and Professor of Economics at Widener University.

¹ Figures cited in this ConsumerGram come from Joseph P. Fuhr and Stephen B. Pociask, “Broadband Services: Economic and Environmental Benefits,” The American Consumer Institute, October 31, 2007.

and newspaper subscriptions, which, in turn, reduces the need for paper, saves trees, conserves energy, pollutes less water and emits less greenhouse gases into the atmosphere. As workers telecommute, billions of gallons of gasoline are saved. E-commerce means that less square footage of commercial, retail and wholesale facilities are needed, which saves the energy required to build and operate these facilities. As workers teleconference, business travel is reduced, sparing carbon and other emissions as well. In short, high-speed Internet services and other technologies are affecting how people shop, travel, work and use products, and the benefits to the environment can be significant.

The following are our specific estimates of the emission savings that are likely to result from the cumulative “network” effects of wide adoption and use of broadband-based applications and forecast the additional environmental benefits if trends continue over the next ten years. In terms of greenhouse gas emissions, these activities are likely to produce the following cumulative incremental benefits:

- Business-to-Business and Business-to-Consumer e-commerce is predicted to reduce greenhouse gases by 206.3 million (U.S.) tons.
- Telecommuting will reduce greenhouse gas emissions by 247.7 million tons due to less driving, 28.1 million tons due to reduced office construction, and 312.4 million tons because of energy saved by businesses.
- Teleconferencing could reduce greenhouse emissions by 199.8 million tons, if 10% of airline travel could be replaced by teleconferencing over the next 10 years.
- Reduction in first-class mail, plastics saved from downloading music/video and office paper from emails and electronic documents could reduce emissions by 67.2 million tons. For example, over the next 10 years, shifting newspaper subscriptions from physical to online media alone will save 57.4 million tons of carbon dioxide and other greenhouse gas emissions.

In summary, a review of existing literature shows that the potential impact of changes stemming from the delivery of broadband is estimated to be an incremental reduction of more than 1 billion tons of greenhouse gas emissions over 10 years.

Public Policies and Direction

It is important to note that the promise of these advancements and their contribution to improving the environment can only be fully realized with the widespread use of broadband services. In fact, it is likely that more widespread use of broadband services will lead to further innovation of services and applications that will produce even greater benefits for the environment. These innovations may include even faster Internet speeds, advances in wireless broadband networks, increased reliability and features that make online activities and transactions safer and more secure. To the extent this is true; the figures above underestimate the potential for greenhouse gas reductions and other environmental benefits that can result from the transformation of U.S.’s communications infrastructure from narrowband to broadband.

Expanding the availability of broadband can reduce energy use and lower greenhouse gas emissions and deserves to be an important consideration in developing a comprehensive energy policy. Focusing on ways to use these technologies as a tool to change behavior and energy use may achieve even greater savings. More research and ideas are needed to incorporate information technology solutions into the nation’s energy policies. And even on a personal level, as people and businesses consider their own carbon footprints, they should be aware of the solutions that broadband and information technology can bring.

1. Energy Policy

U.S. legislators are trying to balance tough economic and environmental issues. On the one hand, energy is necessary for a vigorous and growing economy, but it has significant environmental effects including carbon and other emissions that have been linked to global warming. In addition, the U.S. economy is heavily dependent on foreign oil that has been subject to volatile prices. That leaves the U.S. with three challenges, which are high energy prices, high energy use and high environmental impacts, not to mention national security issues.

Carbon dioxide from combustible fossil fuels represents 82% of greenhouse gas emissions,² and from 1990 to 2000 greenhouse gas emissions have increased 16%.³ Actions to stem this threat have to date been modest at best and some proposed actions will most certainly affect economic growth and the basic standard of living of American consumers.⁴ However, to do nothing simply would contribute to another set of problems – namely, pollution and global warming, which will affect our health and welfare.

As the adage goes -- *there is no silver bullet*. Most energy specialists concede that fixing the energy problem will be very difficult and that any success will require actions on a number of fronts – creating many alternative energy sources, imposing taxes to curb consumption,⁵ encouraging energy efficiency, expanding recycling and encouraging domestic production. Public policies need to adopt standards that reduce pollutants, protect green areas and invest in clean energy research. These commonsense measures may not by themselves be enough. Some hard choices need to be made that address a comprehensive energy policy that deals with our consumption and production of energy on many fronts. Unfortunately, these choices will likely come at a cost to consumers.

2. Broadband Policy

Advanced technologies, including broadband services and telecommunications technologies, can have significant effects on energy use and the environment. Telecommunications services are changing our lives for the better. Broadband services and applications provide new ways to communicate and transfer information, including voice, data and video services. These services can facilitate telecommuting, teleconferencing, e-commerce, telemedicine and other applications that will save consumers and businesses travel expense, traffic congestion and time, as well as reducing greenhouse gas emissions. These technology solutions can increase business and personal productivity, while discouraging some of the migration to offshore jobs and encouraging what is called *homeshoring*, at little or no additional costs to consumers or economic welfare.

The transmission of bits of information, for example, means that consumers can download the content of books, CDs and videos, sparing the transport costs between manufacturer, warehouse and retail store, as well as reducing the production of paper and plastics. Broadband services in homes reduce the need for workers to commute to the office. Nurses can

² According to the Department of Energy's National Information Administration, available online at <http://www.eia.doe.gov/oiaf/1605/gccebrow/chapter1.html>.

³ This is a 2001 estimate from the Department of Energy. For more information, visit the Energy Information Administration's environmental website at www.eia.doe.gov/environment.html.

⁴ "A Bargain," *The Economist*, May 4, 2007. A 0.1% reduction in worldwide GDP in each of the next 43 years is estimated to be the cost to "stabilise greenhouse-gas concentrations at 550 parts per million," according to www.economist.com/world/international/PrinterFriendly.cfm?story_id=9135283.

⁵ Robert J. Shapiro, "Addressing the Risks of Climate Change: The Environmental Effectiveness and Economic Efficiency of Emissions Caps and Tradable Permits, Compared to Carbon Taxes," The American Consumer Institute, Feb. 2007, downloadable at www.aci-citizenresearch.org.

use remote health monitoring equipment to check the vital signs of some homebound patients. Students can attend class without ever leaving home.

The general benefits of these technologies and their effects on workers and consumers can be substantial. The *environmental benefits* of these technologies in addressing the nation's energy problem and reducing greenhouse gas emissions can be far reaching. Broadband services can achieve better and cleaner energy use, without stifling economic output, worker productivity and the standard of living of American consumers. The benefits are likely to be widespread, accruing to broad groups such as consumers, employees and employers, as well as specific niche groups, such as the special needs and the elderly.

A number of activities that advanced telecommunications and other technology-based services support can help the environment without sacrificing economic output, including e-commerce, telecommuting, e-materialization, telemedicine, teleconferencing and distance learning.

Workers and consumers routinely send and receive electronic documents that were once printed on paper, thereby saving trees, reducing air and water pollution and saving the energy needed for manufacturing, distribution and sales. Newspaper circulation is declining, in large part because of increased electronic forms of news. Home-monitoring of patients is leading to fewer emergency room visits and readmissions, while reducing the air pollution associated with some home visits by nurses. This is particularly beneficial to those with special needs and the elderly for whom travel is difficult, costly and potentially dangerous. These trends are likely to continue.

Having reviewed the literature and estimated the current level of the environmental effects, the forecasted 10-year cumulative incremental environmental benefits are immense – exceeding one billion tons of greenhouse gas emission reductions over the next ten years. The greatest potential for greenhouse reductions appears to be in e-commerce (206 million tons), telecommuting (over a half a billion tons), teleconferencing (200 million tons) and paper reduction (57 million by reductions in newspaper circulation alone). If all of the greenhouse reductions noted were converted into energy saved, that could save 555 million barrels of oil by year 10, or roughly 11% of the oil imported into the U.S. today.⁶ Also, there are countless other potential benefits that were not measured which suggest that the potential environmental benefits of these technologies could be even greater. More research is needed to analyze and quantify these other benefits.

In general, the evidence shows that broadband-driven technologies can make a sizable contribution to reducing carbon emissions, as well as many other environmental benefits. This suggests that technological innovations such as these should be part of any comprehensive energy policy.

On the other hand, since public policy for energy and environmental quality is shaped by a different set of regulators than those who govern information technology and specifically broadband, it is in the public interest that they collaborate in preserving the promise of information technology in curtailing greenhouse gas emissions at the same time as they foster

⁶ This assumes that a gallon of oil is equivalent to 40.5 kWh, 42 gallons per barrel and similar standard measures and calculated the annual savings in year 10. For comparison, there were approximately 5 billion barrels of oil imported into the U.S. in 2006. These assumptions and U.S. crude oil and petroleum products imports come from www.eia.doe.gov and our estimates are only approximate.

economic growth. In a sense, the need for a “best of both worlds balance” is the main policy lesson learned from the information technology’s and broadband’s contribution to environmental preservation.

3. Regulations that may Impede Investment will Harm the Environment

In terms of policy development, the promise of these advancements and their contribution to the environment cannot be fully realized without the encouragement of ubiquitous advanced technologies and widespread use of broadband services by consumers and businesses. The extent, to which these environmental benefits can be fully realized, depends in large part on the ubiquitous deployment and widespread use of broadband services. That requires policies that encourage investment on the supply side and greater subscribership on the demand side.

On the other hand, public policies that impede the deployment of these technologies, such as net neutrality regulations and taxes, would slow broadband investment, reduce consumption and deployment of broadband services, and threaten the potential environmental benefits – most notably the reduction in greenhouse gases. However, while acknowledging the link between broadband development and environmental benefits, further policy discussions of how to best encourage adoption of broadband is beyond the scope of this study.

Conclusion

In summary, telecommunications and information technologies can play an important role in improving the environment and reducing greenhouse gas emissions. Further work is needed to explore policies that would encourage advances in telecommunications technologies, along with a sound and comprehensive energy policy that encourages energy efficiency, clean energy sources, independence, and conservation. Such policies can make a meaningful and sizable improvement in our environment by slowing energy use, conserving our water and natural resources and reducing greenhouse gas emissions. However, policymakers need to take steps to encourage investment that would benefit consumers and lead to large scale adoption of these important environmental applications.