

Environmental Implications of E-Commerce, the Internet and the New Economy

Some of the major concerns of e-commerce systems are the electricity used for infrastructure and the energy and packaging materials used for product delivery. Reductions in inventories and waste represent significant opportunities for environmental savings. This project is intended to assess the system-wide effects of the New Economy and to analyze policy options for reducing environmental problems.

The project is analyzing specific case studies of logistics networks, inventory and manufacturing changes. In addition, we are estimating the overhead cost of the Internet. Some specific issues of interest include:

Internet Infrastructure: The Internet does not come without cost. Estimates of the electricity cost of operating the internet routers, switches and computers in 1998 range from 1% of US energy use to an unlikely 8%.

Travel Mode Shifts: Air transport speeds up delivery times and shortens supply chain delays, but at significant environmental impact per ton-mile of transport.

Scale Economy Effects: E-commerce has encouraged smaller shipment sizes and shorter manufacturing production runs.

Growth Stimulation: The high growth rates in the US economy in the past decade have been attributed in significant part to E-commerce, the Internet and Information Technology. As the Gross Domestic Product (GDP) increases, so does environmental impact as consumers purchase more automobiles, larger houses, vacation trips, etc.

Dispersion: E-commerce and the Internet certainly have the potential for encouraging dispersion by encouraging tele-commuting and direct delivery of goods.

Environmental Information: E-commerce and the Internet can encourage socially conscious purchasing and consumer awareness.

Reduced Private Travel: Reduction in shopping costs is a widely anticipated impact of E-commerce. Private travel and retail store requirements can be affected.

Reducing Logistic and Manufacturing Inefficiencies: E-commerce companies have sparked venture capital and investor interest by their promise to reduce costs throughout the economy by removing transaction, logistic and manufacturing inefficiencies.

Reduce Waste: By better matching production and consumer demands, E-commerce and the Internet can have substantial environmental benefit.

New Manufacturing Possibilities: In the long term, E-commerce and the Internet may spawn new manufacturing approaches with substantial environmental benefit.

Contacts

Chris Hendrickson (cth@cmu.edu, 412-268-2941)

H. Scott Matthews (hsm@andrew.cmu.edu)

Luis Ochoa (lao@andrew.cmu.edu)

Acknowledgements

We thank AT&T, the AT&T Foundation and the Green Design Consortium for funding for this project.