Business for Social Responsibility

Value Chain Approaches to a Low-Carbon Economy: Business and Policy Partnerships

A Discussion Paper for the World Business Summit on Climate Change in Copenhagen

May 2009

Executive Summary

This paper is prepared in support of a workshop at the World Business Summit on Climate Change (Summit) on leveraging value chains to reduce climate impacts and build a low-carbon economy.

It is widely acknowledged that making significant progress on mitigating the impact of climate change depends on reducing the impacts of supply chains. A recent McKinsey study shows that 40 to 60 percent of companies' total carbon footprints reside upstream in their supply chains,[1] suggesting the scale of the opportunity. Fundamental changes in consumer behavior, supply chain structure and management, and business models are needed for long-term success.[2] The scope of this challenge is reinforced by a current knowledge gap: most suppliers do not track or report carbon emissions data; buyers do not control suppliers' emissions or have access to accompanying data,[3] and there is disagreement on how to measure and apportion responsibility for supply chain emissions.

This paper aims to illuminate the development of value chain approaches that address current challenges and unlock opportunities to capture value.

First, we describe the economic and environmental pressures on existing value chain models. It is clear that the economic and policy conditions under which extended supply chains emerged in the past quarter-century are changing rapidly as a result of climate, and that these trends may accelerate soon. In this light, the ongoing viability of current supply chain models can no longer be assumed.

Second, we outline the distinct elements of the value chain model, to illustrate how climate change will impact all links in the value chain, from product development to assembly to distribution to end-of-life. The paper suggests that companies look at both the full lifecycle of their products and services, and individual elements of the value chain, to identify the opportunities for greatest impact.

Third, we identify promising examples of innovative action that—in collaboration with others along the value chain—are beginning to tackle the monumental challenges we face.

Finally, we raise questions about policy implications. Businesses face a parallel challenge of remaking their internal processes while engaging with public officials differently, to support the development of policy frameworks that can support the creation of value chains that will thrive and shape the low-carbon economy.

[1] McKinsey Quarterly (2008). "Climate Change and Supply Chain Management."
[2] The Carbon Trust (2006)."The Carbon Emissions Generated in All That We Consume."
[3] Carbon Disclosure Project (2009). "Sharing Value: Managing Climate Change in the Supply Chain."

1. Why Climate Change Threatens Existing Supply Chain Models

In the past two decades, global commerce has come to depend on an intricate web of supply chains that have revolutionized the way even the most basic products, components, and commodities are sourced, assembled, and distributed.

Supply chains are increasingly vertically integrated and intertwined; it is not uncommon for a company which produces 12,000 parts to source them from 6,000 suppliers who in turn have 4,000 partners. Supply chains can be key enablers of faster speed-to-market, larger and more efficient production quantities, and higher profits and sustainable growth. Refining supply chain performance has become so important that companies spend $1 trillion a year on such efforts.[4]

The growth of global supply chains has emerged in a world marked by low energy prices, diminishing barriers to global trade, and the entry of the world's most populous nations, India and China, into the world marketplace. Between 1995 and 2007, the number of transnational companies has more than doubled, and most are part of extensive value chains.[5]

While global integration of commerce has helped to improve efficiency and employ millions of people formerly outside the formal world economy, it is not clear if the model will remain viable in an era of climate constraints. As stated by Cap Gemini in its report "2016: Future Supply Chain," "Preserving energy and raw materials and other resources like water will become a crucial aspect in future supply chains, as costs will likely remain volatile and supplies will continue to dwindle." These conditions may well create substantial pressure on current supply chain models.

A recent report by the World Resources Institute (WRI) and AT Kearney, Inc. attached cost implications to climate policies and constraints on natural resources for a "representative set of companies in the fast-moving consumer goods sector." In the study's "ecoflation" scenario, a reduction of 13 to 31 percent in earnings before interest and taxes (EBIT) was projected by 2013, and 19 to 47 percent by 2018, "for companies [in this sector] that do not develop strategies to mitigate the risk posed by environmental pressures."[6]

It appears likely that energy prices will increase and a global price on carbon will emerge in the near future. This will have clear impacts on supply chains. According to the WRI and AT Kearney study, "the increase in energy prices from a $30/ton and a $50/ton price for greenhouse gas emissions would be 15 and 22% for oil, 25 and 40% for natural gas, and 24 and 45% for electricity. These sustained increases in energy prices would be felt throughout the value chains of every company."[7]

[4] Taylor, David A (2003). Supply Chains: A Manager's Guide, Chapter 1
[5] Global Chief Supply Chain Officer Study by IBM (2009). "The Smarter Supply Chain of the Future."
[6] World Resources Institute and A.T. Kearney (2008). "Rattling Supply Chains."
[7] IBID.

Since several key societal trends, including population growth, resource constraints, and social and market pressures, have direct implications for supply chains, understanding the impacts on raw material sourcing, manufacturing, logistics and other corporate functions is important. As societal conditions change, numerous elements of procurement strategies and business operations will likely change in the years ahead.

2. Remaking Value Chains in a Changing Environment

Societal trends and changes to global conditions have the potential for a fundamental revamp of value chains, which is critical in responding to climate change. The changing environment will reward companies that remake their products, services, and processes with climate change in mind, and will threaten companies slow to anticipate and embrace changing conditions.

Climate Affects Every Link in the Chain

To make this transition, it is essential to not only look at entire value chains, but also to consider how discrete changes can be made to specific elements of the process, beginning with product development, and concluding with end-of-life considerations.

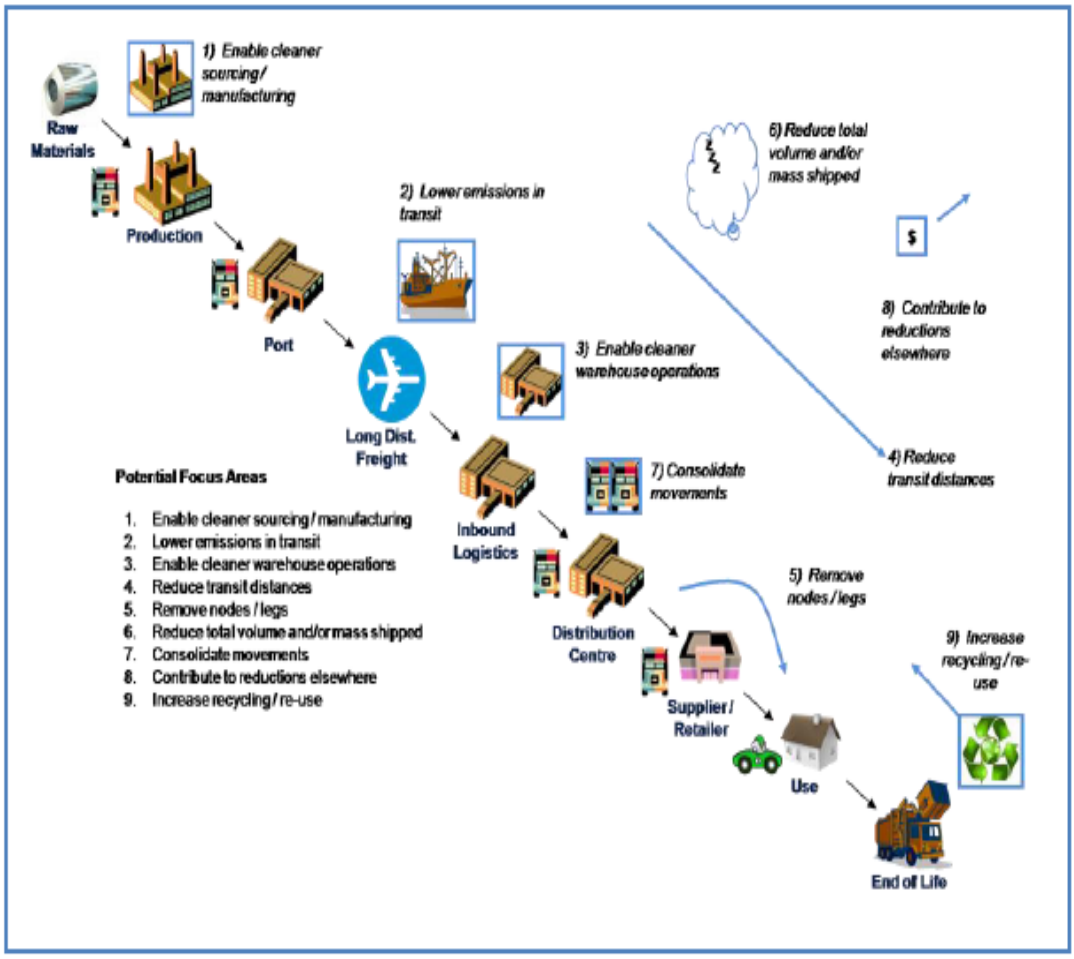
A few examples demonstrating how industries will need to reorient the supply chain at various nodes, or phases, include:

Supply Chain Phase	Potentially Impacted Industries
Raw Material Sourcing	• The food and beverage and consumer goods industries, which rely on environmentally pressured commodities (e.g. sugar, timber, oil). • The agriculture industry, due to emissions from livestock (e.g. methane) and other natural resource inputs. For example, agriculture accounts for 7-20% of North America and Europe's country-level Greenhouse Gas (GHG) emissions, especially in methane and nitrous oxide.[8]
Production	• Industries with heavy refining/manufacturing needs (e.g. automotive), due to their reliance on carbon-intensive operational machinery. • The food and beverage industry and others that have a heavy reliance on water and energy in production.
Distribution	• The transportation and logistics industry, due to its dependence on non-renewable sources of energy in delivering goods and services. • The retail and consumer goods industries, due to their dependence on energy-intensive buildings that warehouse or store products before they are sold and shipped.
Use	• The consumer goods industry, where the greatest energy requirements stem from product use. • The financial sector, which will face the need to analyze investments in order to account for the carbon intensity of projects.

[8] International Assessment of Agricultural Knowledge, Science and Technology for Development (2008). "Agriculture at a Crossroads."

In a recent report, the World Economic Forum (WEF) applied a similar climate lens while analyzing various nodes in the logistics and transportation sector's supply chain. The WEF report estimates that 5.5 percent of emissions resulting from human activity stem from this sector, and that roughly 60 percent of the potential carbon abatement comes from the sector's direct emissions; however, other abatement opportunities come from the broader supply chain and are achievable through investments in logistics and collaborations at various steps in the value chain.[9] The recommended focus areas are depicted in Figure 1:

Figure 1: Recommended Focus Areas for Emissions Reductions



Source: World Economic Forum (2009). "Supply Chain Decarbonization."

[9] World Economic Forum (2009). "Supply Chain Decarbonization."

The findings in the WEF report can be extrapolated to all industries, as many aspects of current value chain management need to be adapted to meet the challenge of effective climate action. Examples of current practices and considerations that will likely change include:

Sourcing Strategies

- Rising transportation costs may cause proximity to end users to re-emerge as a core criterion in procurement, causing pressure to shift to "nearsourcing";
- Labor cost advantages may decline in importance as natural resource considerations rise in importance;
- Volatile climate conditions could remake business continuity considerations, shifting the competitive advantage of different sourcing locations;
- Energy efficiency will become a distinguishing factor in selecting individual suppliers of raw materials, finished goods, and transportation and logistics;
- Procurement departments that rely on large quantities of natural inputs from areas at-risk (e.g. water-scarce areas) will need to diversify sourcing locations;
- Stability and effectiveness of public policy regimes for managing natural resources will become a critical criterion in selecting countries from which to source products.

Alignment of Commercial and Environmental Considerations

- In support of the changing societal conditions identified above, risk assessments will need to rely more heavily on climate-related factors, including stakeholder-driven risks;
- Increased attention must be given to alignment of sustainability and core procurement activities and functions, with alignment of incentives beyond current practice;
- Financial and risk modeling will be expanded to include considerations such as the environmental impacts of alternatives being considered;
- Early interventions, relying heavily on process and product innovation, will increasingly be seen as a critical tool in combating climate change. Product redesign will grow in importance.

The Buyer-Supplier Relationship

- Partnerships between buyers and suppliers will likely find new opportunities for collaborative innovation that drives new efficiencies;
- A greater emphasis will be placed on traceability of product chains and visibility into the impacts of product development;
- IT solutions will play a greater role in providing insights into the management of each node in the value chain;
- Greater demand for transparency and traceability will open up all aspects of the commercial relationship, with increased collaboration and possibly supply chain rationalization, with fewer suppliers in more stable relationships with buyers.

Solutions Outside the B2B Relationship

- Lifecycle analysis will replace the current, highly fragmented approach to the production process;
- Greater emphasis must be placed on the consumer interface to reduce climate impacts arising from product use, maintenance and disposal;
- Inconsistent methods of carbon accounting may create business and policy uncertainty;
- Public policy that reduces risk and inconsistency will increasingly influence multiple steps in the value chain.

These changing practices hold the potential for a fundamental revamp of value chains, where companies that are slow to anticipate and embrace the changing global conditions may be punished, and those companies who remake their processes to meet this challenge will be rewarded.

3. Innovative Actions Shaping Climate-Friendly Value Chains

This section gives brief examples of how companies in a variety of industry sectors have taken steps to reduce their climate impacts by working through their value chains. Additional examples will be featured at the Summit. These cases illustrate innovative actions companies can take to create systemic change across value chains. Whether through efforts to design products, alter consumer perceptions or behavior, teach skills to suppliers, or align objectives with policy, these cases demonstrate the importance of leveraging collective knowledge and looking outside of a company's direct sphere of influence.

Company: Wal-Mart | Industry: Retail

With 60,000 suppliers, Wal-Mart quantified its indirect emissions to be 72% of the company's total in 2006,[10] and has been focusing on the value chain to reduce its footprint. The company's "Sustainable Value Networks"—renewable energy, zero waste and sustainable products—incent carbon emission reductions through partnerships that extend beyond Wal-Mart's walls to include collaboration from nonprofits, suppliers, and other environmental stakeholders spanning from governmental officials to academics. These efforts are supported by initiatives to facilitate information sharing throughout their supply chain, and the creation of economic incentives for suppliers that improve energy efficiency.

Organization: Clean Cargo Working Group | Industry: Cross-Industry

Business for Social Responsibility's Clean Cargo Working Group is a business-to-business collaboration between more than 20 ocean-going and other freight service providers (e.g. Maersk Line, Hapag-Lloyd), leading multinational manufacturers and retailers (e.g., Toyota, Chiquita). Carriers involved in Clean Cargo in 2008 accounted for approximately 68 percent of global containers shipped worldwide. Transportation providers in the group help cargo owners to manage their transportation emissions by reporting emissions data, which cargo owners use to inform their transportation decisions.[11]

Company: Nike | Industry: Apparel/Footwear

Nike estimates the embedded carbon in its products to be equal to 2.5 times the carbon emitted by the footwear factories making the products, a conclusion which led the company to consider alternative materials in the design process.[12] One of the company's

[10] 2006 Wal-Mart Sustainability Report.
[11] Retrieved online, from: http://www.bsr.org/membership/working-groups/clean-cargo.cfm
[12] Retrieved online, from: http://www.ceres.org/Page.aspx?pid=971.

most noteworthy endeavors has been targeting a "hot spot"—the removal of F-gasses from its shoe lines—which has reduced approximately 80 percent of Nike's footprint between 1997 and 2006.[13]

Company: Deutsche Post DHL (DHL) | Industry: Logistics

DHL is aiming for a 30 percent improvement in the Group's carbon efficiency by 2020. This entails reducing the carbon emissions caused by the transport of goods and fuel consumption), as well as services provided by subcontractors. Key performance levers for DHL include optimizing air and ground fleets, improving energy efficiency, developing innovative technologies, enhancing employee incentives and involving subcontractors.[14]

For example, DHL is investing in the optimization of its air and ground fleets, and vows to leverage hybrid engines and logistics technology, as well as replace 90 percent of the company-owned air fleet by 2020, to increase fuel efficiency. The company also has an innovation center and plans to use environmental technologies to enhance energy use associated with routing and warehousing. An example of this that is underway, is the "SmartTruck" project, where an "intelligent" vehicle processes dynamic route planning and live traffic data to enable pick-ups and deliveries to become more efficient in terms of time, cost, and emissions.

Company: Cadbury | Industry: Food & Agriculture

Cadbury has measured greenhouse gas emissions at all stages of the supply chain ("from farm to plate") including emissions from agriculture, transport, packaging and waste streams. Using Publically Available Specification (PAS) 2050[15] to calculate secondary emissions by inserting information from a random sampling of suppliers,[16] and publicly available data where appropriate, the company deduced that over 60 percent of its carbon footprint comes from dairy in its milk chocolate products.[17] Cadbury shared its data with key customers and suppliers, and is working with dairy producers in the United Kingdom to reduce emissions in chocolate manufacturing. The company is also engaging with suppliers to teach them sustainable practices for reducing emissions (e.g. changing feed types and other aspects of animal welfare).

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[13] Nike 2005-06 sustainability report.
[14] DHL 2009 sustainability report.
[15] Sponsored by the Carbon Trust and Defra, PAS 2050 builds on existing methods established through BS EN ISO 14040 and BS EN ISO 14044 by specifying requirements for the assessment of the life cycle GHG emissions of products.
[16] Clarke, Emma (July 2, 2008). "Supply Chain Emissions Special Report."
[17] Partos, Lindsey (March 2, 2009). "Cadbury Tackles Burping Cows To Reduce Milk Chocolate Carbon Footprint."

Organization: Electronics Industry Citizenship Coalition (EICC) | Industry: Technology

The EICC, a 40 member coalition of consumer electronics brands and their suppliers (including Hewlett Packard, Intel, and IBM), has developed a standardized industry accounting tool for greenhouse gas emissions that enables a streamlined, objective process for measuring emissions in the supply chain. In addition to developing common metrics, the group utilizes a shared database that allows efficient data reporting and access. This initiative promotes not only operational efficiencies, but clearer shared understanding of allocation and responsibility issues with respect to supplier GHG emissions, and where institutional weaknesses create barriers to improvement initiatives. Through this work, the EICC is working to illuminate key legislative priority areas for governments and other policy influencers.

Company: Levi Strauss & Co. (Levi's) | Industry: Retail

Levi's is engaging in public policy as a member of the Business for Innovative Climate and Energy Policy (BICEP), and is working to reduce its direct emissions with the eventual aim of increasing carbon reduction efforts in its supply chain.[18] The company also recently undertook a "cradle to grave" Lifecycle Analysis (LCA) on select high-volume products, including its 501 jeans and Dockers Khakis lines, which revealed that the largest carbon impact was in washing and drying (consumer use). Taking ownership for indirect emissions, the company chose to engage its consumers through product labeling. Clothing labels on these products were altered to encourage consumers to reduce emissions by washing the product in cold water versus hot water.

[18] Retrieved online, from: http://www.ceres.org/Page.aspx?pid=971

4. Public Policy Implications

The previous examples demonstrate leadership on climate with respect to value chains, and serve as valuable models that can be replicated and deployed widely. Yet, business cannot act alone. If the goal is to reduce global emissions, government policy must be a central part of the solution because the nature of the problem is entrenched market failure on a global scale. As a result, most economists agree that significantly reducing GHG emissions will require putting a price on carbon, incenting low- and no-carbon alternatives, creating environments that foster shared investments, and creating new incentives for significantly greater efficiency.

Therefore, in addition to the strategic and operational decisions companies can take with respect to their own value chains, engaging in public policy frameworks is important for both stabilizing the global climate and staying credible. Further, given the disaggregated nature of global value chains, it is essential that policy steps be as collaborative and consistent as possible. Without collaboration, incentives will vary, and their impacts will be reduced. Indeed, one of the most useful advocacy positions companies can take is to urge for maximum clarity and consistency between national regimes.

Companies can contribute to the development of policy regimes that create positive, consistent incentives and reinforce business initiatives to leverage value chains, by supporting the following steps:

- The establishment of a consistent international price for carbon, without which price and incentives will be distorted at different points of the value chain;
- The creation of consistent means of measuring value chain emissions, and "ownership" of those emissions;
- The creation of wider and more consistent means of reporting on carbon emissions by all enterprises;
- Government procurement policies that integrate carbon reductions into purchasing criteria, to add the public sector's weight to commercial incentives to reduce emissions;
- The provision of consumer information on energy intensity and other GHG data to help create market demand for low-carbon products;
- The creation of incentives for energy efficiency and interactive knowledge transfer for enhanced communications and carbon abatement along value chains; for example, investing in IT infrastructure, energy efficiency (particularly in buildings), and transportation networks that mandate and enable more efficient processes.

5. Conclusion

The distributed nature of value chains presents both a challenge and an opportunity to make meaningful progress in de-carbonizing our global economy. The multi-faceted nature of value chains offers a ready-made systems-based approach to a more climate-efficient economy, and a chance to leverage business relationships to create commercial incentives for the great transition that is needed to avert truly disruptive climate impacts.

Efforts to revamp value chains can make a valuable contribution if the following five practices are adopted:

- Product and process innovation that enables companies to meet human needs with lower-impact products and services
- Re-aligned incentives both within and between companies
- IT, transportation and building infrastructures that maximize efficiency
- Consumer behavior, supported by transparent information and price signals that internalize costs, supporting more sustainable consumption
- Public policy frameworks that support and reinforce the steps outlined above.

We hope this paper provides the basis for a creative and useful dialogue in Copenhagen, and sparks the development of a shared vision that can be presented as part of business' contribution to a successful outcome to COP-15 later this year.