



Trucost Research Briefing:

Environmental Impacts in Hospital Supply Chains and Implications for Green Procurement Programs

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Context: On average, about 60% of all businesses' environmental impacts are embedded in the products and services they buy – their upstream supply chain. Because of this, hospitals' environmentally preferable purchasing (EPP) programs have an enormous opportunity to reduce the overall environmental impact of the health care industry. In addition, as a growing population puts greater demands on scarce resources (like water) and commodity prices remain volatile, supply chains are at risk from business disruptions and pass through costs. Forward thinking businesses are now using environmental data to determine how they can grow revenue and expand services in light of resource scarcity, build more risk resilient supply chains, and reduce the overall impacts from the products and services they buy.

Research Scope: Trucost's typical supply chain procurement analysis quantifies an organization's complete supply chain environmental footprint. This includes a detailed impact spend analysis that identifies and quantifies top suppliers, spend categories, and product categories most responsible for environmental impacts and the value of business risks. For this research, Trucost conducted a high level analysis of the environmental impacts of typical products and services procured by a hospital using overall industry average data. This information is generic and should be used as a starting point to help inform Practice Greenhealth's Environmentally Preferable Purchasing (EPP) strategy and program. Note also that this research only includes environmental impacts, and could be expanded to address social impacts. The results may vary significantly by region, by individual hospital, or group purchasing organization. Trucost recommends measuring supply chain impacts using actual spend and supplier data. Using organization specific procurement data is the best way to begin to manage supply chain risks that enable business growth and continuity.

Research Findings: The research results showing the top 25 categories of purchased goods and services with the highest supply chain environmental impacts are provided in Table 1, below. Key findings and implications of this high level analysis for hospital EPP programs are as follows.

- Purchased utilities (energy and water) are the largest source of overall supply chain environmental impacts, accounting for over 38% of environmental impacts associated with procurement and should be a top priority for hospital EPP programs. This is supported by the finding that greenhouse gas emissions are the most significant environmental impact category across the supply chain of a typical hospital. Possible follow-on activities to reduce these impacts could include:
 - the development of sample green purchasing guidelines for energy,
 - educational sessions for hospitals on green energy and renewable energy credits (RECs),
 - engagement with utility providers to review and discuss how they measure, disclose, and manage environmental impacts, or
 - engagement with largest suppliers to discuss how they reduce their energy use.
- The second largest source of supply chain environmental impacts comes from purchased agriculture and food products (e.g. meat, grains, fruits, vegetables). Over a quarter (28%) of typical hospital supply chain impacts come from purchased food products. Possible follow-on activities to reduce these impacts could include:
 - A commodity risk analysis to quantify and rank impacts by food commodity, taking into account where they are likely being sourced and whether local conditions (such as water scarcity) are important.
 - The results of this type of risk analysis should be used to set priorities for strategic sourcing and developing green procurement guidelines for specific products.



- Based on the results of the analysis, Practice Greenhealth can identify organizations and initiatives that are already working on sustainable agricultural practices and engage as appropriate with these groups.
 - Develop guidelines or programs to help hospitals:
 - Create local relationships with farms and food product manufacturers that reduce transportation impacts, or
 - Optimize food service operations to minimize waste and maximize utilization of purchased goods.
- Manufactured products are the third most impactful category of goods and services purchased by hospitals. This category includes a wide variety of products including medications, disinfectants, paper products, and medical equipment. These can be prioritized with more refined analysis. EPP programs could include:
 - Development of green purchasing guidelines for these product categories or the development of supplier scorecards that would provide a way for purchasing managers to review and engage with suppliers to discuss how they are working to reduce the environmental impacts associated with the manufacture of the products they are purchasing.
 - We also note that Practice Greenhealth's existing effort to develop a Total Cost of Ownership (TCO) tool is very aligned with this finding about impacts from manufactured products. The TCO tool allows hospitals to identify hidden environmental costs associated with these products, such as energy or water costs associated with product use and maintenance, and the expense of waste disposal.

Table 1. Products and Services with Highest Embedded Environmental Impacts in a Typical Hospital Supply Chain

Rank	Category of Purchased Goods and Services by Hospitals	Specific Business Activity	Examples of Product Categories	Greenhouse Gas Emissions	Water Use	Air Pollutant Emissions	Land & Water Pollutants	Waste Disposal	Total Env. Impact (Natural Capital Cost, \$ per mUSD of procurement)	Percent of procurement Natural Capital Costs
1	Utilities	Coal Power Generation	Purchased Energy						5,460	24%
2	Agriculture and Food Products	Cattle ranching and farming	Beef, Leather						1,610	7%
3	Agriculture and Food Products	Grain farming	Cereal, Bread, Rice						1,520	7%
4	Utilities	Natural Gas Power Generation	Purchased Energy						1,330	6%
5	Agriculture and Food Products	All other crop farming	Rubber, Tea, Palm Oil						1,200	5%
6	Utilities	Petroleum Power Generation	Purchased Energy						930	4%
7	Utilities	Water, sewage and other systems	Purchased Water, Wastewater Treatment						740	3%
8	Manufactured products	Paper mills	Paper, Cardboard						530	2%
9	Agriculture and Food Products	Dairy cattle and milk production	Milk, Yogurt,						520	2%
10	Mining, Quarrying, and Oil and Gas Extraction	Bituminous Coal and Lignite Surface Mining	Purchased Electricity						420	2%
11	Agriculture and Food Products	Animal production, except cattle and poultry	Pork, Lamb, Rabbit						400	2%
12	Mining, Quarrying, and Oil and Gas Extraction	Bituminous Coal Underground Mining	Purchased Electricity						390	2%
13	Agriculture and Food Products	Fruit farming	Bananas, Pears, Oranges						390	2%
14	Manufactured products	Iron and steel mills and ferroalloy manufacturing	Pipes, Tubes, Wires						360	2%
15	Agriculture and Food Products	Oilseed farming	Soybean, Sunflower, Canola						330	1%
16	Manufactured products	Sanitary paper product manufacturing	Toilet Paper, Tissue Paper						320	1%
17	Manufactured products	Pharmaceutical preparation manufacturing	Pharmaceutical medications						310	1%
18	Manufactured products	Paperboard container manufacturing	Cardboard Containers						270	1%
19	Manufactured products	Other basic organic chemical manufacturing	Disinfectant, Medications						250	1%
20	Utilities	Nuclear Electric Power Generation	Purchased Energy						240	1%
21	Agriculture and Food Products	Poultry and egg production	Chicken, Eggs						230	1%
22	Real Estate and Rental and Leasing	Real estate	Hospitals, Laboratories, Parking Facilities						230	1%
23	Agriculture and Food Products	Vegetable and melon farming	Potatoes, Lettuce, Tomatoes, Corn						190	1%



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24	Transportation and Warehousing	Truck transportation	Product Delivery, Waste Removal Services						170	1%
25	Manufactured products	Petroleum refineries	Purchased Electricity						160	1%

Data Source: *Trucost Extended Economic Input-Output (EEIO) Model.*

Trucost has analyzed the impacts associated with purchasing for over 150 public and private sector entities, 500,000 suppliers and over \$100B in spend. For example, in 2007, Trucost analysed the city of London public procurement representing \$8B in procurement expenditure, 120,000 suppliers, and 31 different councils, including an analysis of the UK’s National Health System.

Trucost’s supply chain analyses are conducted using the Trucost Extended Economic Input-Output (EEIO) model and actual supplier data from the Trucost Environmental Register, the world’s largest data base on supplier environmental performance. Over the last decade, Trucost has developed and maintained its advanced environmental profiling EEIO model which accounts for 464 industries worldwide and tracks over 100 environmental impacts. The model also examines the interactions and cash flows between sectors in order to map each sector's supply chain.

With the help of our international academic advisory panel, Trucost has built an environmental profile for each of the 464 sectors. These profiles quantify the environmental impacts associated with a sector, based on the nature of its business activities. This data model is the foundation for the assessment that Trucost does of an organization's environmental supply chain impacts.

Trucost also converts quantity data into financial values. The price applied to each impact is formulated by our academic panel and derived from environmental economics literature. The price reflects the damage each environmental impact causes and the consequential costs borne by society. This standardized, quantitative and complete data can then be used to assess risks, opportunities and relative environmental performance.

About Trucost:

Trucost has been helping companies, investors, governments, academics and thought leaders to understand the economic consequences of natural capital dependency for over 12 years. Our world leading data insight enables our clients to identify natural capital dependency across companies, products, supply chains and investments; manage risk from volatile commodity prices and increasing environmental costs; and ultimately build more sustainable business models and brands. Key to our approach is that we not only quantify natural capital dependency, we also put a price on it, helping our clients understand environmental risk in business terms. It isn’t “all about carbon”; it’s about water; land use; waste and pollutants. It’s about which raw materials are used and where they are sourced, from energy and water to metals, minerals and agricultural products. And it’s about how those materials are extracted, processed and distributed.

For more information about measuring supply chain impacts or environmentally preferred purchasing: please contact Libby Bernick (libby.bernick@trucost.com) or northamerica@trucost.com