Sustainability Scales

Title	Environmental Practices/Initiatives (formative)
Source	Gattiker, Carter (2007); Gattiker, Carter (2008); Carter (2004); Montabon, et al. (2007); Zhu & Sarkis (2004); Klassen (2003); Rao and Holt ,2005; Srivastava, 2007, Vachon and Klassen, 2008; some other items are new
Rationale	Descriptively, we need to know what plants are doing and not doing. Enables cross-country and longitudinal comparisons. Explore relationships between practices/initiatives and outcomes, institutional factors, sources of uncertainty, competitive priorities, industry, etc. Probably will enable the identification of "practice bundles." This would allow us to investigate potential relationships between other practice bundles (e.g. JIT practice bundles) and various environmental practice bundles. Following the article by Vachon and Klassen (2008), collaboration with suppliers is linked to superior operational performance, as well as environmental performance. The adoption of environmental collaborative activities is a key variable in the green supply chain.
Respondents	Environmental Affairs
Please indicate the degree to which your plant is engaged in the following initiatives/practices:	

	No extent whatsoever	**Little extent**	**Moderate extent**	**Great extent**	**Very great extent**	
ENVRTX01						Energy efficiency or renewable energy
ENVRTX02						Water efficiency
ENVRTX03						Reducing waste in internal processes (e.g., improving yield or efficiency)
ENVRTX04						Improving the workforce environment (e.g., indoor air quality)
ENVRTX05						Pollution prevention (eliminating emissions or waste)
ENVRTX06						Pollution control (scrubbing, waste treatment)
ENVRTX07						Remediation projects, such as cleanup or restoration from past practices

ENVRTX08						Decreasing the likelihood or impact of an environmental accident
ENVRTX09						Reduction/avoidance of land consumption
ENVRTX10						Improvements in inbound transportation, such as fuel efficiency or load matching
ENVRTX11						Improvements in outbound transportation, such as fuel efficiency or load matching
ENVRTX12						Seeking or maintaining ISO14001 certification
ENVRTX13						Complying with a customer's supplier code of conduct
ENVRTX14						Complying with an industry-wide code of conduct
ENVRTX15						Other compliance or auditing program focused on your plant (not on your suppliers)
ENVRTX16						Carbon tracking/carbon footprint calculation of internal operations
ENVRTX17						Carbon tracking/carbon footprint calculation of supply chain
ENVRTX18						Working with customers to help them achieve environmental objectives
ENVRTX19						Design of your organization's products for disassembly, recycling, reuse or durability
ENVRTX20						Life-cycle analysis of the "cradle to grave" environmental impact of materials/products
ENVRTX21						Environmentally preferable packaging for the products that you produce (recycled content, less volume, reusable packaging)
ENVRTX22						Substituting environmental preferable direct materials or supplies for harmful or non-renewable ones
ENVRTX23						Environmental improvements in the disposition of your organization's scrap or excess material (re-use, recycling, etc.)
ENVRTX24						Environmental improvements in the disposition of your organization's equipment
ENVRTX25						Prolonging the useful life of equipment
ENVRTX26						Employee commuting issues (e.g., carpooling, bike garage)
ENVRTX27						Substituting environmentally preferable indirect materials for harmful or non-renewable ones
ENVRTX28						Environmentally preferable inbound packaging, such as(recycled content, less volume or reusable packaging
ENVRTX29						Encouraging suppliers to improve the environmental performance of their processes

ENVRTX30						Giving preference to materials with third party certifications, such as Green Seal, FSC or Energy Star
ENVRTX31						Requesting that your suppliers sign a code of environmental conduct
ENVRTX32						Purchasing from minority- or women-owned business enterprise (M/WBE) suppliers
ENVRTX33						Starting or maintaining a formal M/WBE supplier purchase program
ENVRTX34						Visiting suppliers' plants or ensuring that they are not using sweatshop labor
ENVRTX35						Ensuring that suppliers comply with child labor laws
ENVRTX36						Asking suppliers to pay a "living wage"
ENVRTX37						Using a third party to monitor working conditions at supplier facilities
ENVRTX38						Incorporating environmental considerations in evaluating and selecting suppliers
ENVRTX39						Providing design specification to suppliers in line with environmental requirements (e.g. green purchasing, black list of raw materials)
ENVRTX40						Co-development with suppliers to reduce the environmental impact of the product (e.g. eco-design, green packaging, recyclability)
ENVRTX41						Involvement of suppliers in the re-design of internal processes (e.g. remanufacturing, reduction of by-products)
ENVRTX42						Cooperative investments with suppliers in order to create a more environmentally sustainable logistics systems (e.g. closed-loop supply chain, reverse logistics)

Title	Environmental Practices (formative)
Source	Developed based on content contained in Gonzalez, Sarkis & Adenso, 2008; Melnyk, Sroufe & Calantone, 2003; Sroufe, 2003; Klassen & Whybark, 1999; Rao & Holt ,2005;
Rationale	Following the article by Gonzales et al. (2008), firms who implement an Environmental Management System (EMS) are more likely to adopt other environmental practices, corresponding to environmental product design, reduction of material usage and managerial aspects.
Respondents	Environmental Affairs

In the last 3 years, our plant has been engaged in the following environmental practices:

	To no extent whatsoever	To a little extent	To a moderate extent	To a great extent	To a very great extent	
EPRACX01						Implementation of a certified environmental management system, such as ISO 14000
EPRACX02						Implementation of internal environmental management procedures (e.g. environmental training program, internal environmental audit, newsletter)
EPRACX03						Use of cleaner technologies in the production process (e.g. abatement equipment) to reduce pollution emissions and/or resource use
EPRACX04						Environment-friendly product design
EPRACX05						Environmental improvement of packaging
EPRACX06						Use of environment-friendly raw materials

Title	Environmental Performance (formative)
Source	Svoboda, S "Note on life cycle analysis," in Russo, M. Ed Environmental Management, Sage, 2008 GRI Standard Disclosures: http://www.globalreporting.org/NR/rdonlyres/DDB9A2EA-7715-4E1A-9047-FD2FA8032762/0/G3_QuickReferenceSheet.pdf
Rationale	Most of the other environment-related constructs (e.g. practices, drivers, barriers, enablers) that we are examining with this survey need to be linked to performance. Please see the rationales for these constructs (above).
Respondents	Environmental Affairs

How does your plant compare to others in your global industry on:

	Much worse	**Somewhat worse**	**Average**	**Somewhat better**	**Much better**	
EPERFX01						Overall environmental performance
EPERFX02						Raw materials consumption
EPERFX03						Energy consumption
EPERFX04						Water consumption
EPERFX05						Emissions to air
EPERFX06						Releases to water
EPERFX07						Solid waste generation (e.g. landfill capacity consumed)
EPERFX08						Waste recovery (e.g. recycling)
EPERFX09						Fines or other violations of environmental rules/regulations

Title	Equipment Layout
Source	Used in Rounds 1, 2 and 3.
Rationale	
Respondents	Process Engineering
LAYOUTN01 (JSPLN02)	We have laid out the shop floor so that processes and machines are in close proximity to each other.
LAYOUTN02 (JSMHN06)	The layout of our shop floor facilitates low inventories and fast throughput.
LAYOUTN03 (JSMHN07)	Our processes are located close together, so that material handling and part storage are minimized.
LAYOUTN04 (JSMHN08)	We have located our machines to support JIT production flow.

Round 3 Cronbach's Alpha Values Overall: .74									
Austria	**China**	**Finland**	**Germany**	**Italy**	**Japan**	**South Korea**	**Spain**	**Sweden**	**U.S.A.**
.44	.76	.66	.75	.84	.73	.71	.75	.86	.70

Title	JIT Delivery by Suppliers
Source	Used in Rounds 1, 2 and 3.
Rationale	
Respondents	Upstream Supply Chain Management
JITDELN01 (JSVNN01)	Our suppliers deliver to us on a just-in-time basis.
JITDELN02 (JSVNN02)	We receive daily shipments from most suppliers.
JITDELN03 (JSVNN10)	Our suppliers are linked with us by a pull system.

Round 3 Cronbach's Alpha Values Overall: .67									
Austria	**China**	**Finland**	**Germany**	**Italy**	**Japan**	**South Korea**	**Spain**	**Sweden**	**U.S.A.**
.46	.66	.74	.46	.81	.68	.73	.62	.69	.69

Title	Kanban
Source	Used in Rounds 1, 2 and 3.
Rationale	
Respondents	Production Control
KANBANN01 (JSVNN03)	Suppliers fill our kanban containers, rather than filling purchase orders.
KANBANN02 (JSVNN06)	We use a kanban pull system for production control.
KANBANN03 (JSVNN07)	We use kanban squares, containers or signals for production control.

Round 3 Cronbach's Alpha Values Overall: .80									
Austria	**China**	**Finland**	**Germany**	**Italy**	**Japan**	**South Korea**	**Spain**	**Sweden**	**U.S.A.**
.78	.77	.82	.70	.83	.89	.74	.78	.86	.80