

Introduction to SustainableSCOR

Sustainable business models and environmental accounting are growing business concerns. The SCOR model, which is a proven framework for defining supply chain scope and process operations as well as measuring supply chain performance, provides an excellent foundation for environmental accounting in the supply chain. In that regard, APICS is proposing a set of strategic environmental metrics that can be added to the SCOR Model to effectively allow the SCOR Model to be used as a framework for environmental accounting.

These metrics are closely aligned with the GRI (Global Reporting Initiative) Standards. GRI has emerged as the go-to standard for corporate sustainability reporting. The GRI standards create a common language for organization and stakeholders, with which the economic, environmental, and social impacts of organizations can be communicated and understood. The Standards are designed to enhance the global comparability and quality of information on these impacts, thereby enabling greater transparency and accountability of organizations.

SCOR Sustainability uses the GRI definitions and measures when dealing with the sustainability environmental topics (GRI 300 series Topic-Specific Standards). This approach is being used to help supply chain professionals gain visibility of the environmental topics that are in their supply chain network and value chain network, and enable them to model and manage these impacts. A value chain covers the full range of an organization's upstream and downstream activities, which encompass the full life cycle of a product or service, from its conception to its end use.

Only GRI metrics that are within the realm of supply chain management, sourcing, and managing the risk related to supply chain operations will be included in the scope of the SCOR model.

When the SCOR model uses an element that aligns with a GRI disclosure, the specific GRI disclosure number will be cross-referenced at the bottom of the Sustainable SCOR metric page. Please note that the GRI reporting rules shall be followed when making any reporting claims by organizations.

GRI Standards are free to use and are available at www.globalreporting.org/standards.

GRI Standard	Category	Metric	Units	Basis
301	Materials	Material used	Weight or volume	Total weight or volume of materials that are used to produce and package the organization's primary products and services.
	Recycled input	Percent recycled input material	Percent	The percent of recycled input materials used to manufacture the organization's primary products and services.
	Reclaimed input	Percent reclaimed input material	Percent	The percent of reclaimed input materials used to manufacture the organization's primary products and services.

ISO standard	Category	Metric	Units	Basis
302	Energy	Energy consumed	Joules, Watt-hours or multiples	
		Energy intensity ratio	Ratio	The energy required per unit of activity, output or any other organization-specific metric.
		Reduction of energy consumption	Joules, Watt-hours or multiples	The amount of reductions in energy consumption achieved as a direct result of conservation and efficiency initiatives, in joules or multiples.
303	Water	Water volume withdrawn	Gallons, liters or multiples	
		Water intensity ratio	Ratio	The water withdrawal required per unit of activity, output or any other organization-specific metric.
		Water recycled and reused	Gallons, liters or multiples	The rate of water reuse and recycling is a measure of efficiency and demonstrates success in reducing total water withdrawals and discharges.
305	Emissions	Air emissions	Metric tons or equivalents	Emissions into the air, which are the discharge of substances from a source into the atmosphere.
		GHG emissions intensity	Ratio	The amount of GHG emissions per unit of activity, output, or any other organization-specific metric.
		Reduction of GHG emissions	Metric tons or equivalents	The amount of reductions in GHG emissions achieved as a direct result of elements or activities designed to reduce GHG emissions, such as carbon storage.
306	Effluents and waste	Liquid and solid wastes	Gallons, liters or multiples, Weight or volume	The amount of effluents and waste generated by an organization to produce and package the organization's primary products and services. This includes water discharges, hazardous and non-hazardous waste.

SustainableSCOR metrics can be measured for each of the SCOR level-3 processes and then aggregated to create a level-2 and level-1 metric. SustainableSCOR metrics are readily available for most organizations that are measuring and reporting upon GRI material topics. Environmental agencies and industry associations have developed emissions factors based on process throughput, energy consumption, etc. for calculating emissions. Alternatively, emissions values can be directly collected through monitoring programs or common documents (e.g., regulatory reports, waste shipping documents, environmental permits, etc.).

While many businesses are making progress optimizing their operations and improving their sustainability-related performance, if they remain reliant on an inefficient value chain, in the long run they will not be competitive. Developing value chain insights is an essential survival tool for businesses to avoid the risks and maximize on the opportunities from a resource constrained future.

By adding SustainableSCOR metrics to the SCOR Model, an organization can use the existing SCOR based methods for defining supply chain scope and configuration. Once this process is complete, SustainableSCOR metrics allow for targeted, structured data collection and calculation of metrics which ultimately provide a total view of supply chain environmental performance.

Using the SCOR Model as an environmental accounting framework has additional benefits as well. First, the framework clearly ties the various emissions to the originating processes. This provides a structure for not just measuring performance, but identifying where action can be taking to improve performance.

The hierarchical nature of the SCOR Model allows for strategic environmental footprint goals to be easily translated to targets in specific activities. Likewise, when strategic goals are not being met, the framework provides a structure for root cause analysis as well as end-to-end supply chain and value chain network optimization around environmental performance.

Lastly, as with other SCOR Model metrics, these metrics have clear definitions and a tie to process activities that provide a foundation for effective benchmarking. This capability allows companies to compare environmental performance of their supply chain using the same methods currently used for comparing business performance. Through benchmarking, managers can go beyond measuring environmental performance and understand that performance in the context of their industry peers' performance.

The remainder of this appendix details these environmental metrics and their decomposition levels in the same format used elsewhere in the SCOR Model.

APICS believes that this metrics structure provides an effective tool for environmental supply chain and value chain accounting. However, this approach is not currently in use, therefore, these metrics are not included as fully approved SCOR metrics. Please provide feedback to APICS on the effectiveness of this metrics structure as it is applied to your supply chain operations.

SustainableSCOR

	Total Supply Chain Materials Used	<i>MATERIALS</i>	SS.1.001
	Plan Materials Used		SS.2.001
	Source Materials Used		SS.2.002
	Make Materials Used		SS.2.003
	Deliver Materials Used		SS.2.004
	Return Materials Used		SS.2.005
	Total Supply Chain Materials Intensity Ratio		SS.1.002
<i>301-1</i>	Total Supply Chain Non-Renewable Materials Used		SS.1.003
	Plan Non-Renewable Materials Used		SS.2.006
	Source Non-Renewable Materials Used		SS.2.007
	Make Non-Renewable Materials Used		SS.2.008
	Deliver Non-Renewable Materials Used		SS.2.009
	Return Non-Renewable Materials Used		SS.2.010
<i>301-1</i>	Total Supply Chain Renewable Materials Used		SS.1.004
	Plan Renewable Materials Used		SS.2.003
	Source Renewable Materials Used		SS.2.004
	Make Renewable Materials Used		SS.2.005
	Deliver Renewable Materials Used		SS.2.006
	Return Renewable Materials Used		SS.2.007
<i>301-2</i>	Total Supply Chain % of Recycled Input Materials Used		SS.1.005
	Plan % of Recycled Input Materials Used		SS.2.008
	Source % of Recycled Input Materials Used		SS.2.009
	Make % of Recycled Input Materials Used		SS.2.010
	Deliver % of Recycled Input Materials Used		SS.2.011
	Return % of Recycled Input Materials Used		SS.2.012
<i>301-3</i>	Total Supply Chain % of Reclaimed Products and Their Packaging Materials		SS.1.006
	Plan % Products and their Packaging Materials Reclaimed		SS.2.013
	Source % of Products and their Packaging Materials Reclaimed		SS.2.014
	Make % of Products and their Packaging Materials Reclaimed		SS.2.015
	Deliver % of Products and their Packaging Materials Reclaimed		SS.2.016
	Return % of Products and their Packaging Materials Reclaimed		SS.2.017
	Total Supply Chain Energy Consumed	<i>ENERGY</i>	SS.1.007
	Plan Energy Consumed		SS.2.018
	Source Energy Consumed		SS.2.019
	Make Energy Consumed		SS.2.020
	Deliver Energy Consumed		SS.2.021
	Return Energy Consumed		SS.2.022
<i>302-1</i>	Total Supply Chain Non-Renewable Energy Consumed		SS.1.008
	Plan Non-Renewable Energy Consumed		SS.2.023
	Source Non-Renewable Energy Consumed		SS.2.024
	Make Non-Renewable Energy Consumed		SS.2.025
	Deliver Non-Renewable Energy Consumed		SS.2.026
	Return Non-Renewable Energy Consumed		SS.2.027
<i>302-2</i>	Total Supply Chain Renewable Sourced Energy Consumed		SS.1.009
	Plan Renewable Sourced Energy Consumed		SS.2.028
	Source Renewable Sourced Energy Consumed		SS.2.029
	Make Renewable Sourced Energy Consumed		SS.2.030
	Deliver Renewable Sourced Energy Consumed		SS.2.031
	Return Renewable Sourced Energy Consumed		SS.2.032
<i>302-3</i>	Total Supply Chain Energy Intensity Ratio		SS.1.010
<i>302-4</i>	Total Supply Chain Reduction of Energy Consumption		SS.1.011

302-4 Energy Consumption outside organisation

Total Supply Chain Water Withdrawn

WATER

SS.1.012

Plan Water Withdrawn

SS.2.033

Source Water Withdrawn

SS.2.034

Make Water Withdrawn

SS.2.035

Deliver Water Withdrawn

SS.2.036

Return Water Withdrawn

SS.2.037

Total Supply Chain Water Reused or Recycled

SS.1.013

Plan Water Reused or Recycled

SS.2.038

Source Water Reused or Recycled

SS.2.039

Make Water Reused or Recycled

SS.2.040

Deliver Water Reused or Recycled

SS.2.041

Return Water Reused or Recycled

SS.2.042

Total Supply Chain Water Intensity Ratio

SS.1.014

Total Supply Chain GHG Emissions

SS.1.015

Total Supply Chain Direct (Scope 1) GHG Emissions

SS.1.016

Plan Direct (Scope 1) GHG Emissions

SS.2.043

Plan Supply Chain Direct (Scope 1) GHG Emissions

SS.3.001

Plan Source Direct (Scope 1) GHG Emissions

SS.3.002

Plan Make Direct (Scope 1) GHG Emissions

SS.3.003

Plan Deliver Direct (Scope 1) GHG Emissions

SS.3.004

Plan Return Direct (Scope 1) GHG Emissions

SS.3.005

Source Direct (Scope 1) GHG Emissions

SS.2.044

Supplier Management Direct (Scope 1) GHG Emissions

SS.3.006

Material Acquisition Management Direct (Scope 1) GHG Emissions

SS.3.007

Make (Production-related) Direct (Scope 1) GHG Emissions

SS.2.045

Deliver Direct (Scope 1) GHG Emissions

SS.2.046

Sales Order Management Direct (Scope 1) GHG Emissions

SS.3.008

Customer Management Direct (Scope 1) GHG Emissions

SS.3.009

Return Direct (Scope 1) GHG Emissions

SS.2.047

Source Return Direct (Scope 1) GHG Emissions

SS.3.010

Deliver Return Direct (Scope 1) GHG Emissions

SS.3.011

Total Supply Chain Energy Indirect (Scope 2) GHG Emissions

SS.1.017

Plan Energy Indirect (Scope 2) GHG Emissions

SS.2.048

Plan Supply Chain Energy Indirect (Scope 2) GHG Emissions

SS.3.012

Plan Source Energy Indirect (Scope 2) GHG Emissions

SS.3.013

Plan Make Energy Indirect (Scope 2) GHG Emissions

SS.3.014

Plan Deliver Energy Indirect (Scope 2) GHG Emissions

SS.3.015

Plan Return Energy Indirect (Scope 2) GHG Emissions

SS.3.016

Source Energy Indirect (Scope 2) GHG Emissions

SS.2.049

Supplier Management Energy Indirect (Scope 2) GHG Emissions

SS.3.017

Material Acquisition Management Energy Indirect (Scope 2) GHG Emissions

SS.3.018

Make Energy Indirect (Scope 2) GHG Emissions

SS.2.050

Deliver Energy Indirect (Scope 2) GHG Emissions

SS.2.051

Sales Order Management Energy Indirect (Scope 2) GHG Emissions

SS.3.019

Customer Management Energy Indirect (Scope 2) GHG Emissions

SS.3.020

Return Energy Indirect (Scope 2) GHG Emissions

SS.2.052

Source Return Energy Indirect (Scope 2) GHG Emissions

SS.3.021

Deliver Return Energy Indirect (Scope 2) GHG Emissions

SS.3.022

Total Supply Chain Other Indirect (Scope 3) GHG Emissions

SS.1.018

Plan Other Indirect (Scope 3) GHG Emissions

SS.2.053

Plan Supply Chain Other Indirect (Scope 3) GHG Emissions

SS.3.023

Plan Source Other Indirect (Scope 3) GHG Emissions	SS.3.024
Plan Make Other Indirect (Scope 3) GHG Emissions	SS.3.025
Plan Deliver Other Indirect (Scope 3) GHG Emissions	SS.3.026
Plan Return Other Indirect (Scope 3) GHG Emissions	SS.3.027
Source Other indirect (Scope 3) GHG Emissions	SS.2.054
Supplier Management Other Indirect (Scope 3) GHG Emissions	SS.3.028
Material Acquisition Management Other Indirect (Scope 3) GHG Emissions	SS.3.029
Make Other Indirect (Scope 3) GHG Emissions	SS.2.055
Deliver Other Indirect (Scope 3) GHG Emissions	SS.2.056
Sales Order Management Other Indirect (Scope 3) GHG Emissions	SS.3.030
Customer Management Other Indirect (Scope 3) GHG Emissions	SS.3.031
Return Other Indirect (Scope 3) GHG Emissions	SS.2.057
Source Return Other Indirect (Scope 3) GHG Emissions	SS.3.032
Deliver Return Other Indirect (Scope 3) GHG Emissions	SS.3.033
Total Supply Chain GHG Emissions Intensity Ratio	SS.1.019
Reduction of GHG Emissions	SS.1.020
Total Supply Chain Emissions of ozone-depleting substances (ODS)	SS.1.021
Plan Emissions of ozone-depleting substances (ODS)	SS.2.058
Plan Supply Chain Emissions of ozone-depleting substances (ODS)	SS.3.034
Plan Source Emissions of ozone-depleting substances (ODS)	SS.3.035
Plan Make Emissions of ozone-depleting substances (ODS)	SS.3.036
Plan Deliver Emissions of ozone-depleting substances (ODS)	SS.3.037
Plan Return Emissions of ozone-depleting substances (ODS)	SS.3.038
Source Emissions of ozone-depleting substances (ODS)	SS.2.059
Supplier Management Emissions of ozone-depleting substances (ODS)	SS.3.039
Material Acquisition Management Emissions of ozone-depleting substances (ODS)	SS.3.040
Make Emissions of ozone-depleting substances (ODS)	SS.2.060
Deliver Emissions of ozone-depleting substances (ODS)	SS.2.061
Sales Order Management Emissions of ozone-depleting substances (ODS)	SS.3.041
Customer Management Emissions of ozone-depleting substances (ODS)	SS.3.042
Return Emissions of ozone-depleting substances (ODS)	SS.2.062
Source Return Emissions of ozone-depleting substances (ODS)	SS.3.043
Deliver Return Emissions of ozone-depleting substances (ODS)	SS.3.044
Total Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.1.022
Plan Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.063
Plan Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.045
Plan Source Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.046
Plan Make Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.047
Plan Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.048
Plan Return Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.049
Source Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.064
Supplier Management Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.050

Material Acquisition Management Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.051
Make Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.065
Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.066
Sales Order Management Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.052
Customer Management Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.063
Return Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.067
Source Return Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.054
Deliver Return Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.055
Total Supply Chain Air Emissions	SS.1.023
Total Supply Chain Water Discharge	SS.1.024
Plan Water Discharge	SS.2.068
Source Water Discharge	SS.2.069
Make Water Discharge	SS.2.070
Deliver Water Discharge	SS.2.071
Return Water Discharge	SS.2.072
Total Supply Chain Non-Hazardous Waste	SS.1.025
Plan Non-Hazardous Waste	SS.2.073
Source Non-Hazardous Waste	SS.2.074
Make Non-Hazardous Waste	SS.2.075
Deliver Non-Hazardous Waste	SS.2.076
Return Non-Hazardous Waste	SS.2.077
Total Supply Chain Hazardous Waste	SS.1.026
Plan Hazardous Waste	SS.2.078
Source Hazardous Waste	SS.2.079
Make Hazardous Waste	SS.2.080
Deliver Hazardous Waste	SS.2.081
Return Hazardous Waste	SS.2.082