

## Basis of Reporting 2023

This document accompanies the Solenis 2023 Sustainability Report and includes details on definitions, reporting scope and methodology of the metrics reported in the report.

The report covers the Solenis activities that are under its Operational Control.

## Environmental Data

Metric	Method	Methodology
<b>General</b>		
Solenis owned manufacturing facilities	Operational Control	The total number of manufacturing sites that are owned and operated by Solenis. This excludes <del>small</del> manufacturing facilities that are operated on customer sites and the Diversey sites acquired in 2023.
Solenis owned manufacturing facilities on customer sites	Operational Control	The total number of manufacturing facilities that are owned and operated by Solenis on customer sites. This excludes facilities where the equipment is owned by Solenis but operated by the customer.
Total production volume	Direct measurement	Each site reports its monthly production volume into a central database.
Purchased raw materials	Spend report	The total volume raw materials purchased obtained from the SAP system. This excludes material shipped intercompany (e.g., raw materials, intermediates), packaging materials and raw materials used at contract manufacturers (tollers).
<b>Emissions</b>		
<b>Scope 1 - Direct emissions</b> These emissions include CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O emissions from fuel plus HFC emissions from refrigerant use. Solenis do not use or produce PFCs, NF <sub>3</sub> and SF <sub>6</sub> compounds. Emissions from biogas fuel is reported as biogenic emissions		
Fuel used in manufacturing	Fuel use	Activity data is collected from the manufacturing sites on the quantity and types of fuel used. The activity data is combined with emission factors from the US EPA Emissions Factors Hub <sup>2</sup> for non-UK sites and from UK DEFRA <sup>1</sup> <a href="#">Error!</a> <small>Bookmark not defined.</small> for UK sites.

Metric	Method	Methodology
Fuel used in vehicles	Fuel use and spend	<p>The emissions from vehicle use are based on the data available from the leasing companies and in the company expenses system. Information on fuel use, distance travelled, and vehicle type is combined with emissions factors from US EPA Emissions Factors Hub<sup>2</sup>, tables 2 and 3 to calculate the emissions.</p> <p>Some fuel is purchased directly by Solenis employees for use in company owned or Leased vehicles. Spend data for these transactions is converted to an equivalent fuel amount using regional fuel price information. The fuel use is converted to equivalent emissions with emissions factors from US EPA Emissions Factors Hub<sup>2</sup>. For this calculation it is assumed all fuel purchased is motor gasoline.</p> <p>Business travel in vehicles not operated by Solenis is reported in Scope 3, Category 6.</p>
Refrigerants	Refrigerant replaced	Emissions due to refrigeration losses from air conditioning and industrial refrigeration processes are calculated by taking the reported top up volumes of refrigerants from our operations and multiplying by the global warming potential of the specific refrigerant used.
Biogenic emissions	Fuel use	Activity data is collected from the manufacturing sites on the quantity and types of biofuels used. The activity data is combined with emission factors from the US EPA Emissions Factors Hub <sup>2</sup> .
<p><b>Scope 2 - Indirect emissions</b>            These emissions include CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions from electricity, steam, heat, and air consumption. Calculations are carried using both location and market-based methodologies.</p>		
Electricity	Energy use	Activity data on our total electricity purchased is multiplied by country specific emission factors published by Carbonfootprint.com. This source collates emission factors from recognized sources including UK DEFRA <sup>1</sup> , AIB <sup>3</sup> and US EPA eGrid <sup>4</sup> .
Steam	Energy use	Activity data is collected from the manufacturing sites on the quantity of steam used. The activity data is combined with emission factors from the US EPA Emissions Factors Hub <sup>2</sup> .
Heat	Energy use	Activity data is collected from the manufacturing sites on the quantity of steam used. The activity data is combined with emission factors from the US EPA Emissions Factors Hub <sup>2</sup> .
Compressed air	Volume use	Activity data is collected from the manufacturing sites on the quantity of compressed air used. The air is converted to an equivalent electricity use using published design data for electrical compressors. For the purposes of this calculation, it is assumed all air is provided at 7 barg. The emissions from the electricity used are calculated using emission factors published by Carbonfootprint.com. This source collates emission factors from recognized sources including UK DEFRA <sup>1</sup> , AIB <sup>3</sup> and US EPA eGrid <sup>4</sup> .

Metric	Method	Methodology
<b>Scope 3 - Other indirect emissions</b>		
Category 1 Purchased goods and services	Hybrid	Where secondary emission factors are available, from sources such as Ecoinvent, these are multiplied by the respective global chemical volume purchased in the financial year. This accounts for 85% of the calculated emissions. The remaining 15% of the emissions are calculated on a spend basis using emission factors from US EPA Supply Chain GHG Emission Factors for US Commodities and Industries <sup>5</sup> . Spending for items such as travel, waste, utilities, and logistics has been excluded from this category to avoid double counting with other Scope 3 categories. The spend data is extracted from our SAP system monthly. This means that some transaction reversals may not be included in the spend file resulting in a small overstatement of emissions.
Category 2 Capital goods	Spend Based	The capital spend in the financial year is mapped to the commodity types in the US EPA Supply Chain GHG Emission Factors for US Commodities and Industries <sup>5</sup> . The spend for each category is then multiplied by the respective emission factor.
Category 3 Fuel and energy related activities	Average Data	Activity data from our total energy use is multiplied by country specific emission factors published by Carbonfootprint.com. This source collates emission factors from recognized sources including UK DEFRA <sup>1</sup> , AIB <sup>3</sup> and US EPA eGrid <sup>4</sup> .
Category 4 Upstream transportation and distribution	Hybrid	<p>The methodology for this category is the same as category 9. Logistics data is filtered for upstream shipments using the incoterms for the shipment.</p> <p>Where information on the shipment load, distance and mode are available from the transport providers then the emissions are calculated using this activity data and emission factors from the US EPA Emissions Factors Hub<sup>2</sup>. 10% of emissions in this category are calculated using this method.</p> <p>Where the start and end point of the delivery is known, the geodesic distance between the points is calculated and adjusted to reflect actual transport distance by applying a non-linear adjustment factor of 1.2. This distance is combined with the shipment weight and emission factors from the US EPA Emissions Factors Hub<sup>2</sup>. 30% of the emissions in this category are calculated using this method.</p> <p>The remaining 60%, where location data was not available, are spend based using US EPA Supply Chain GHG Emission Factors for US Commodities and Industries<sup>5</sup>.</p>
Category 5 Waste generated in operations	Waste Specific	Activity data from waste produced by each manufacturing site globally was multiplied by waste specific emission factors from US EPA Emissions Factors Hub <sup>2</sup> , table 9.

Metric	Method	Methodology
<p>Category 6 Business travel</p>	<p>Hybrid</p>	<p>This category covers all travel managed through the Solenis travel and expense systems. This includes travel of non Solenis employees where Solenis have arranged and paid for the travel.</p> <p>For air travel, distance and cabin class data for each is provided by our business travel partner, Egencia. This data is combined with emission factors published by DEFRA<sup>1</sup> to calculate the emissions.</p> <p>For rail travel, emissions data is provided directly by our travel partner Egencia. Egencia use a combination of DEFRA<sup>1</sup> emission factors and factors provided by the rail operating companies.</p> <p>Emissions from hotel stays are calculated using nights and rooms stayed data our internal travel expenses system. This is combined with country specific emission factors from DEFRA<sup>1</sup>. Where data gaps exist in emission factors for a specific country, emission factors from hotelfootprints.org are used.</p> <p>For taxi journeys emissions are calculated using spend data from the travel expenses system. Average taxi fare information is used to calculate the distance travelled for each transaction and then combined with emission factors for passenger cars from US EPA Emissions Factors Hub<sup>2</sup>, table 10.</p> <p>Business journeys made by our employees using their personal vehicles, with the fuel use claimed back through the expense system, are additionally calculated. Data from the internal expense system is used together with average fuel cost data to calculate the amount of fuel used by journey. Emission factors for US EPA Emissions Factors Hub<sup>2</sup> are used to calculate the fuel emissions. For this calculation, it is assumed that all personal vehicles are solely fueled by gasoline.</p> <p>Emissions from our fleet of leased vehicles are not included in Scope 3 Category 6 but are fully allocated in our Scope 1 calculation.</p>

Metric	Method	Methodology
Category 7 Employee commuting	Average Data	<p>The employee commuting behavior of the Solenis facility-based workforce totaling 4701 employees is covered in this category. Non-facility-based employees, totaling 2087, are considered as working remotely and are excluded from the calculation.</p> <p>Employee commuting emissions are calculated using the distance from the employee home zip code to their facility location. Based on company policies the assumption is made that manufacturing site workers commute 4 times per week and all other employees commute 3 times per week. An average number of working weeks of 46 per year is used in the calculation. Transport mode is calculated using statistical data for each region. The data on transport mode and distance is combined with emission factors from US EPA Emissions Factors Hub<sup>2</sup>, table 10.</p>
Category 8 Upstream leased assets	Average Data	<p>Floor area and building type data for all our leased assets is reviewed and combined with intensity data from the U.S. Energy Information Administration, Commercial Buildings Energy Consumption Survey (CBECS)<sup>6</sup>. The resulting energy use is used to calculate emissions using emission factors from U.S. EPA eGRID<sup>4</sup> for electricity and US EPA Emissions Factors Hub<sup>2</sup>, table 1, for natural gas.</p>
Category 9 Downstream transportation and distribution	Hybrid	<p>The methodology for this category is the same as category 4. Logistics data is filtered for downstream shipments using the incoterms for the shipment.</p> <p>Where information on the shipment load, distance and mode are available from the transport providers then the emissions are calculated using this activity data and emission factors from the US EPA Emissions Factors Hub<sup>2</sup>. 18% of emissions in this category are calculated using this method.</p> <p>Where the start and end point of the delivery is known, the geodesic distance between the points is calculated and adjusted to reflect actual transport distance by applying a non-linear adjustment factor of 1.2. This distance is combined with the shipment weight and emission factors from the US EPA Emissions Factors Hub<sup>2</sup>. 4% of the emissions in this category are calculated using this method.</p> <p>The remaining 78%, where location data was not available, are spend based using US EPA Supply Chain GHG Emission Factors for US Commodities and Industries<sup>5</sup>.</p>



Metric	Method	Methodology
Category 10 Processing of sold products	Average Data	Most chemical products sold by us are processing aids improving our customers' processes, reducing energy consumption and processing. Very few of our products require additional energy by the customer. For these products an estimate has been made of the additional energy used when the product is applied at the customer site. This combined with sales volume data and electricity emission factors from U.S. EPA eGRID <sup>4</sup> is used to calculate the emissions.
Category 11 Use of sold products	Direct use-phase	Very few of our products create direct use phase emissions. The exception is the dosing and monitoring equipment we supply. For these products the number of units sold is combined with average electricity consumption data and emissions factors from U.S. EPA eGRID <sup>4</sup> . An average product life of 5 years is used for this calculation.
Category 12 End of life treatment of sold products	Waste Specific	As our products are chemicals that are consumed at the customer, our end-of-life emissions only relate to the single-use packaging our products are supplied in. Data on the amount and type of packaging material supplied is combined with emissions factors from US EPA Emission Factors Hub <sup>2</sup> , table 9.
Category 13 Downstream leased assets	Not applicable	Solenis didn't lease any of its assets to other entities in financial year 2023.
Category 14 Franchises	Not applicable	Solenis didn't operate any franchise in financial year 2023.
Category 15	Spend	Solenis has one joint venture. Our revenue from the joint venture was combined with emission factors from US EPA Supply Chain GHG Emission Factors for US Commodities and Industries <sup>5</sup> to calculate the emissions.
<b>Other emissions</b>		
Emissions of ozone-depleting substances (ODS)	Refrigerant replaced	Emissions due to refrigeration losses from air conditioning and industrial refrigeration processes are calculated by taking the reported top up volumes of refrigerants from our operations and multiplying by the ozone depleting potential of the specific refrigerant used.
NO <sub>x</sub>	Direct measurement and Fuel use	Where the site measures its NO <sub>x</sub> emissions directly, they are entered into a central database. For sites without direct measurement the emissions are calculated using the known fuel use, combustion method and emissions factors from the National Atmospheric Emissions Inventory <sup>9</sup> .
SO <sub>x</sub>	Direct measurement and Fuel use	Where the site measures its SO <sub>x</sub> emissions directly, they are entered into a central database. For sites without direct measurement the emissions are calculated using the known fuel use, combustion method and emissions factors from the National Atmospheric Emissions Inventory <sup>9</sup> .



Metric	Method	Methodology
VOC	Direct measurement	VOC emissions are reported for the sites that measure their VOC emissions directly. 11 sites currently report VOC emissions representing 33% of our production volume.
<b>Energy</b>		
Fuel consumption	Direct measurement, supplier invoices and spend data	<p>Each site reports its monthly fuel use into a central database. This information is based on a combination of local meter readings and supplier invoices depending on the situation at the site.</p> <p>Information on fuel use in leased vehicles is collected from the leasing companies.</p> <p>Some fuel is purchased directly by Solenis employees for use in company owned or Leased vehicles. Spend data for these transactions is converted to an equivalent fuel amount using regional fuel price information. For this calculation it is assumed all fuel purchased is motor gasoline.</p> <p>Fuel data is collected on a volume basis and converted to the equivalent energy value using conversion factors published in the US EPA Emissions Factors Hub<sup>2</sup></p>
Electricity consumption	Direct measurement and supplier invoices	Each site reports its monthly electricity use and sales into a central database. This information is based on a combination of local meter readings and supplier invoices depending on the situation at the site.
Steam consumption	Direct measurement and supplier invoices	Each site reports its monthly steam use and sales into a central database. This information is based on a combination of local meter readings and supplier invoices depending on the situation at the site. Steam data is collected on a mass basis and converted to an energy value using published steam tables. It is assumed all supplied steam is saturated at 4 barg.
Heat	Direct measurement and supplier invoices	Each site reports its heat from district heating schemes into a central database. This data is entered directly in energy units
Compressed air consumption	Direct measurement and supplier invoices	Sites that have a pipe compressed air supply report the volume of compressed air used in the central database. It is assumed all air is provided at 7 barg. The air is converted to an equivalent electricity use using published design data for electrical compressors.
Energy Intensity	Calculation	The total energy consumed is from all our operations is divided by the total reported production from our manufacturing sites.
<b>Water</b>		
Water withdrawal	Direct measurement and supplier invoices	Each site reports its monthly water withdrawal into a central database. The data is entered into the categories specified in GRI303-3 <sup>7</sup> .

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Metric	Method	Methodology
Water discharge	Direct measurement and supplier invoices	Each site reports its monthly water discharge into a central database. The data is entered into the categories specified in GRI303-4 <sup>7</sup> .
Water consumption	Calculation	Water consumption is calculated by calculating the difference between the water withdrawn and the water discharge.
Water consumption intensity	Calculation	The total water consumed from all our operations is divided by the total reported production from our manufacturing sites.
Water reclaimed	Direct measurement and supplier invoices	Water reclaimed is the quantity of cleansed water that is safely discharged from Solenis manufacturing facility direct to surface water
<b>Waste</b>		
Waste generated	Direct measurement and supplier invoices	Each site reports the waste it generates into a central database. The data is entered into the categories specified in GRI306 <sup>8</sup> .
Waste generation intensity	Calculation	The total waste generated from all our operations is divided by the total reported production from our manufacturing sites.
Waste disposal intensity	Calculation	The total waste sent to disposal from all our operations is divided by the total reported production from our manufacturing sites. This excludes any waste that is recycled or recovered for reuse.
<b>Incidents</b>		
Environmental Incident Classification (EIC) Score	Calculation based on Internal Reporting	Each incident is classified according to its severity and assigned a score. The total score is the sum of the individual incident scores. The methodology is detailed in our sustainability & regulatory library <sup>12</sup> .
Process Safety Management Incidents	Internal Reporting	A process safety incident is an unplanned event arising from the manufacturing process that results in a product release, fire, explosion, injury or community event. Reporting is done in line with the American Petroleum Institute (API) Recommended Practice API754 <sup>11</sup>





## Social Data

Metric	Method	Methodology
<b>Employees</b>		
Employee data	Workday system	All data relating to the number and classification of employees is collected in the Workday system. The employee numbers are the numbers reported at end of financial year 2023.
<b>Work related injuries for all employees</b>		
High-consequence work-related injury	Internal reporting	Number of injuries from which the worker cannot, does not, or is not expected to recover fully to pre-injury health status within six months
Recordable Injuries (OSHA criteria)	Internal reporting	OSHA recordable incident as defined by Occupational Safety and Health Administration in the U.S. <sup>10</sup>
Total recordable rate (OSHA criteria)	Calculation	Calculated by multiplying the total number of incidents which meet the criteria of being recordable by the U.S. Occupational Safety and Health Administration (OSHA) in one year by 200,000 hours and divided by the total number of hours worked by all employees. 200,000 hours are the expected hours normally worked in a year by 100 workers.
Days away from work cases (OSHA criteria)	Internal Reporting	OSHA recordable incident that involved days away from work as defined by Occupational Safety and Health Administration in the U.S. <sup>10</sup>
Days away from work rate (OSHA criteria)	Calculation	Days Away from Work Rate (DAWR) – Calculated by multiplying the total number of OSHA recordable incident that involved days away from work in one year by 200,000 hours and divided by the total number of hours worked by all employees. OSHA days away from work incident as defined by Occupational Safety and Health Administration in the US <sup>10</sup> . 200,000 hours are the expected hours normally worked in a year by 100 workers.
Lost time injury frequency rate (LTIFR)	Calculation	Lost time injury frequency rate (LTIFR) for direct workforce - (total number of lost time injury events) x 1,000,000 / total hours worked company wide.
Lost time injury severity rate (LTISR)	Calculation	Lost time injury severity rate (LTISR) for direct workforce - (number of days lost due to injuries) x 1,000 / total hours worked.
Number of hours worked	Internal Reporting	Total hours worked by all Solenis employees and directly supervised contractors

## Governance Data

Metric	Method	Methodology
<b>Management Systems</b>		
% RC14001 Certified Facilities	Calculation	The number of certified facilities as a percentage of the total number of facilities. This excludes newly acquired sites that have been part of Solenis for less than three years.
% ISO 14001 Certified Facilities	Calculation	The number of certified facilities as a percentage of the total number of facilities. This excludes newly acquired sites that have been part of Solenis for less than three years.
% ISO 45001 Certified Facilities	Calculation	The number of certified facilities as a percentage of the total number of facilities. This excludes newly acquired sites that have been part of Solenis for less than three years.
% SEDEX Certified Facilities	Calculation	The number of certified facilities as a percentage of the total number of facilities. This excludes newly acquired sites that have been part of Solenis for less than three years.
# ISO 50001 Certified Facilities	Calculation	The number of certified facilities. This excludes newly acquired sites that have been part of Solenis for less than three years.

## References

- <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023>
- US EPA Emission factors Hub 2023, [ghg-emission-factors-hub.xlsx \(live.com\)](#)
- [Home | AIB \(aib-net.org\)](#)
- US EPA eGRID 2021 published 30 January 2023, [Historical eGRID Data | US EPA](#)
- [Supply Chain GHG Emission Factors for US Commodities and Industries v1.1.1 - Catalog \(data.gov\)](#)  
These factors have been adjusted for inflation using the U.S. Bureau Of Labor Statistics Producer Price Indexes.
- [Energy Information Administration \(EIA\)- Commercial Buildings Energy Consumption Survey \(CBECS\)](#)
- GRI 303: Water and Effluents 2018. [GRI - Home \(globalreporting.org\)](#)
- GRI 306: Waste 2020. [GRI - Home \(globalreporting.org\)](#)
- National Atmospheric Emissions Inventory <https://naei.beis.gov.uk/>
- [Recordkeeping - Overview | Occupational Safety and Health Administration \(osha.gov\)](#)
- [API | Recommended Practice 754](#)
- <https://www.solenis.com/globalassets/resources/sustainability--regulatory-library/sl-wrk-005-007-determining-environmental-incident-classification.pdf>