Sustainable Markets Initiative

SMI Health Systems Task Force Supplier Targets Toolkit

2026 (V2.0)

CONTEXT

INTRODUCTION

The Sustainable Markets Initiative (SMI) Health Systems Task Force is a CEO-led public–private partnership focused on accelerating the transition to net zero health systems. Healthcare today accounts for ~5% of global greenhouse gas emissions, with more than 50% stemming from product supply chains, making supplier engagement and action critical to achieving sector-wide impact.

To address this, Task Force members have aligned on a set of joint, minimum targets for climate and sustainability which aim to reduce complexity for suppliers. These targets are designed to:

- Align expectations across multiple global healthcare companies
- Reduce fragmentation of supplier guidance and requests
- Accelerate decarbonisation and broader environmental action across the value chain

The targets were initially launched in 2023 (found here) and were revised in 2025 to broaden their scope, and strengthen those set with 2025 deadline. They were developed collaboratively by the SMI member pharma companies by evaluating industry best practices and engaging with a selection of suppliers to incorporate supplier perspectives.

Task Force members are now calling on suppliers to adopt these targets and to cascade them upstream to their own value chains, including through an open letter signed by Chief Procurement Officers.

As part of this, SMI members expect suppliers to maintain transparency on progress towards meeting these targets. Where possible, progress reporting should use existing reporting channels, public (e.g. CDP, ESG reports, SBTi dashboard) and/or bilateral - and recognised standards, as well as ongoing supplier engagement processes, rather than creating additional reporting requirements/channels.

These targets guide suppliers on the current and future expectations of the pharmaceutical industry, and support readiness for future customer requirements.

INTENDED USE OF THIS TOOLKIT

This toolkit is designed to support suppliers in understanding, prioritising, and implementing the SMI supplier targets.

Specifically, it:

- Provides clear guidance on what each target means in practice, providing industry-aligned definitions and endorsed standards
- Outlines concrete actions and pathways suppliers can take to progress
- Highlights available resources: tools, standards, and decarbonisation solutions

The toolkit is intended to be used alongside the SMI supplier targets as a practical implementation guide. In general, suppliers are encouraged to align expectations directly with their customers.

Next to this toolkit, Task Force members are also hosting webinars on specific targets, including solutions developed by the Task Force that help suppliers to implement these targets. More information can be found: https://www.sustainable-markets.org/supplier-engagement/

SUPPLIER TARGETS

Dimension	Supplier Targets
Emissions	**Assess and disclose scope 1, 2, and 3 emissions**[1]; **disclose product carbon footprints or LCAs for your top 10 products**[2] (ordered by annual GHG emissions impact) by 2028
Science Based Targets	Publicly **set third-party validated science based targets**[3] (both near-term and long-term) across scope 1, 2, and 3 by 2027
Electricity	**Source at least 80% renewable electricity** by 2030[4] and **publish annual interim progress**
Heat	**Reduce process heat emissions by at least 20%** by 2030[5]
Resource Efficiency	**Set targets, a credible supporting plan, and demonstrated action in the following areas**[6]: • Source **lower carbon and circular input materials**, including sustainable feedstocks for solvents and plastics • Minimise resources by **reducing material use** and manage unavoidable waste by **increasing recycling rates** • **Reduce emissions from solvent use** (e.g. via solvent reuse, solvent recycling)
Nature	By 2028, **assess dependencies, impacts, risks, and opportunities (DIRO) related to pressures on nature**[7] across the value chain and **take visible actions in response to the assessment** by 2030, incl. on sustainable and deforestation-free sourcing of key naturally-derived commodities
Water	By 2030, **set targets and demonstrate action on water** -- for high water stress/risk areas, **set absolute water reduction targets and adopt water stewardship practices**[8]; for all areas, **measure pollutant release and improve water efficiency**
Cascading	**Integrate these targets into contracting** for your suppliers

Note: These standards do not replace higher targets already set by individual SMI members
Note: "By 20XX" refers to the end of the stated calendar year (i.e., 31 December 20XX), unless otherwise specified
[1] Using methods aligned with the Greenhouse Gas Protocol
[2] For other providers (e.g., manufacturing service providers, materials providers), provide primary data compatible with standards (e.g., PAS2090 chapter 5.1.1); For pharmaceutical products, comply with the product category rules described in PAS 2090; see PSCI for an overview of LCAs
[3] E.g., SBTi, CSRD, ISO, IPCC-aligned – leveraging relevant sectoral guidance
[4] See RE100 technical criteria for more information on included technologies and credible claims requirements
[5] Based on your SBT base year – heat generated on-site or in third-party installations and used to manufacture products (often from stationary fuel use)
[6] SMI supplier toolkit to provide more detail
[7] E.g., land/water/sea use change, resource exploitation, biodiversity risk, pollution – see SBTN, TNFD, and WBSCD for more info – not all topics will be materially relevant for all suppliers
[8] Encourage adoption of globally recognized standard (e.g., Alliance for Water Stewardship) and seek certification where possible

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EMISSIONS

a. Assess and disclose scope 1, 2, and 3 emissions

b. Disclose product carbon footprints or LCAs for your top 10 products (ordered by annual GHG emissions impact) by 2028

1. DEFINITION: ASSESS AND DISCLOSE SCOPE 1,2, AND 3 EMISSIONS

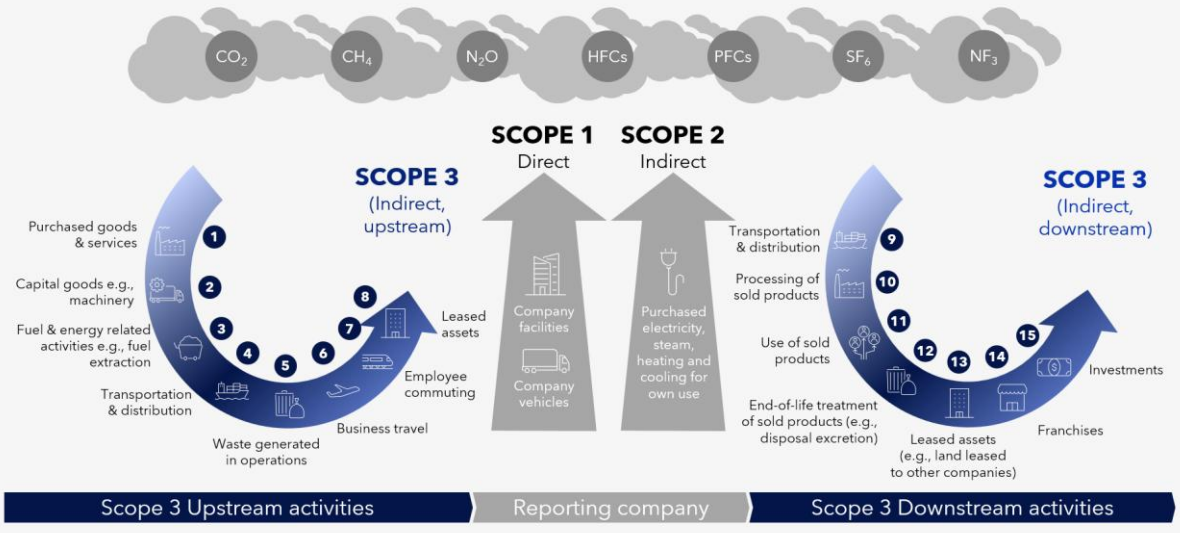
Note: A specific target year is not included since this is expected to be already in place and/or should be implemented as soon as possible.

- **Emissions** – Emissions refer to Green House Gases (GHGs), often expressed as CO2equivalent, which are defined by the GHG Protocol as: Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Hydrofluorocarbons (HCFs), Perfluorocarbons (PFCs), Sulphur Hexafluoride (SF6) and Nitrogen Trifluoride (NF3)

Emissions are a consequence of activities and fall under three scopes (Scopes 1, 2, and 3). Scope 1, 2 and 3 (**Figure 2**) as defined by GHG emissions protocol refers to:

- **Scope 1** – Direct emissions from owned or controlled sources (e.g., company facilities or company vehicles, burning fuel for heat, refrigerant leakage)
- **Scope 2** – Indirect emissions from the generation of purchased energy (e.g., purchased electricity, purchased heat or steam)
- **Scope 3** – All indirect emissions in the value chain, both upstream and downstream, with most of the emissions expected to be driven by categories 3.1-3.4. Categories definitions can be found here.

FIGURE 1: Scope 1, 2 and 3 defined as per the Greenhouse Gas Protocol



Commonly used definitions – relevant to disclosing emissions:

- **CO2 equivalent** – all greenhouse gas contribution to global warming from an activity, normalised to the equivalent impact of a kilogram of carbon dioxide
- **GHG footprint** – measure of greenhouse gases from a specific activity. This is found using the formula **activity or spend data x emission factor**
  - **Spend data** – the amount you spend on a function / activity;
  - **Activity data** – based on which activity you assess (e.g., power in kWh or fuel use in L) and hence the associated emissions over a period of time
  - **Approach** – While companies may use spend-based approaches initially, e.g. to identify emission hotspots, transitioning to other approaches (e.g. activity-based) that are more reliable should be a target for all companies

Emission factor – a figure that relates the amount of GHG gases to (the spend on) an activity, published in a database (secondary data), or shared directly by value chain partners as primary data (i.e., product carbon footprint for a specific good purchased)

2. ACTIONS TO TAKE TO MEET THE TARGET: ASSESS AND DISCLOSE EMISSIONS

ASSESS SCOPE 1, SCOPE 2 AND SCOPE 3 EMISSIONS

Suppliers are expected to **assess and disclose Scope 1, Scope 2 and Scope 3 emissions** using methods aligned with the **Greenhouse Gas Protocol**.

Calculating Scope 1 and Scope 2 emissions is typically easier as primary activity data is commonly available to companies, while that is not the case for Scope 3 emission categories. Availability of corresponding emission factors from suppliers may be even more challenging and the use of secondary data from recognized emission factors databases is common. (*See the list of such databases below – not exhaustive)*

Where companies begin with secondary data to establish a baseline, they then keep refining their accounting over time as primary data becomes available.

As far as scope 3 emissions are concerned, for the greatest impact, suppliers should focus their initial efforts on categories that represent the bulk of their emissions and use this foundation to improve coverage over time across other categories.

Example calculations (not exhaustive)

Scope 1: On-site natural gas combustion

- **Activity data**: Annual natural gas consumption (MWh) from meter or invoice
- **Emission factor**: Use country specific EF from IEA or national authority; if unavailable, use e.g. DEFRA or IPCC default factors
- **Calculation**: Emissions = Activity x Emission factor

Scope 2: Purchased electricity

- **Activity data**: Annual electricity consumption (kWh) from meter or invoice
- **Emission factor**: Use country grid factors from IEA, EPA or national authority
- **Calculation**: Emissions = Activity x Emission factor

Scope 3: Purchased raw materials

- If available, use supplier-specific product carbon footprint (PCF); else:
- **Activity data**: Quantity purchased (e.g., tonnes)
- **Emission factor**: Use LCA database (e.g., Ecoinvent, GaBi/Sphera) and sector-average factor
- **Calculation**: Emissions = Activity x Emission factor
- Companies may initially use EEIO (spend-based) data and refine later.

Databases

Average emissions factors and location emission factors are available from databases, but supplier-specific emissions factors are usually developed in house by the supplier / company of the product

Emission factors & conversion factor databases

Use these when calculating emissions from fuel use, electricity consumption, or standard transport activity data.

- IEA: Country-level energy and electricity grid emission factors (useful for location-based Scope 2 and fuel combustion)
- US EPA: Fuel- and grid-specific emission factors, widely used in North America
- DEFRA: Comprehensive conversion factors covering fuels, electricity, transport, and selected Scope 3 categories (publicly available)
- IPCC: Default emission factors for fuel combustion and energy carriers, often used where country-specific data is unavailable.
- GLEC Framework: Globally recognized methodology for freight emissions across modes (road, rail, sea, air). Useful for Scope 3 Category 4 and Category 9

LCA databases

Use these when supplier-specific product carbon footprint (PCF) data is not available and material-level lifecycle emissions must be estimated

- Ecoinvent: Large international LCI database covering thousands of processes and materials covering over 18,000 lifecycle inventories *(paid resource)*
- GABI/Sphera: Commercial LCA database widely used in industry *(paid resource)*

Environmentally Extended Input-Output (EEIO) databases

Use these for initial Scope 3 baselining; refine over time with activity-based or supplier-specific data

- CEDA: EEIO database representing over 400 industries globally
- WifOR: Online tool to calculate scope 3 emissions using GHG protocol aligned factor

Accounting Frameworks and Digital Tools

Utilize accounting frameworks and digital tools to support emissions calculation at both corporate and product levels, relevant ones include:

- **Greenhouse Gas Protocol (GHG) tools & standards**
  - Internationally recognized standards and guidance for calculating (accounting) and reporting scope 1, 2 and 3 emissions; EF database for high emitting geographies and sectors
- **Pharmaceutical Environment Group Scope 3 guidance**
  - Provides consistent guidance for pharmaceutical companies to calculate GHG emissions in their upstream and downstream value chains
  - Includes methodologies consistent with recommendations from GHG Protocol for calculating emissions which are tailored for each pharmaceutical category
- **Together for Sustainability (TfS) Supplier Toolkit**
  - Product Carbon Footprint (PCF) guidance specifically for chemical manufacturers aligned to international standards

- **BSI / PharmaLCA consortium LCA standard and technical guidance (PAS 2090)**
  - Framework to calculate product-level environmental impact of pharma products

    See next section for more details on use and resources
- **SMI Health Systems Task Force + Sustainable Healthcare Coalition (SHC) Guidance**
  - Clinical trials framework and Calculator for calculation the carbon emissions of clinical trials for Clinical Research Organizations
- **CDP x CO2 AI product ecosystem**
  - Paid resources providing accounting and reporting framework and calculator for scope 3 emissions (incl. product based)

3. DEFINITION: DISCLOSE PCF OR LCA FOR TOP 10 PRODUCTS

- **Disclose** – Sharing product carbon footprints and/or Product Environmental Footprints (calculated through an LCA) with customers of these products when requested
  - ***Note:*** This request may replace existing product-level data requirements, but will be additional to existing customer/public reporting such as entity-level scope 1, 2, and 3 emissions, use of renewables in manufacturing, etc.
  - Product-level data will support companies in making environmentally sustainable decisions (by understanding the impacts and impact hotspots of products) – e.g., on manufacturing practices, product design, procurement; it will also support compliance with environmental regulations, standards, and upcoming (customer-led) initiatives
- **Top 10 products** – Top 10 as ordered by annual GHG emissions impact. Suppliers should define their top 10 products by annual GHG emissions impact based on the total absolute emissions from that product (i.e. emissions factor x volume of product sold). This can be determined using one or a combination of the following approaches:
  - **Ranking products by forecasted volumes of doses** (or units, in the case of non-pharmaceutical products) sold/manufactured, multiplied by (generic) emission factors (if available for this product (type)); If emission factors are not available, products can be ranked simply by forecasted volumes of doses/units sold/manufactured
  - **Ranking products by forecasted costs of goods sold** (as a first, spend-based, estimate of high emitting products)
  - **Any other evidence-driven mechanism** that can help identify top 10 products (e.g. ranking based on inputs such as MWh of heat used for production, tonnes of solvents/high emission inputs used, etc.)

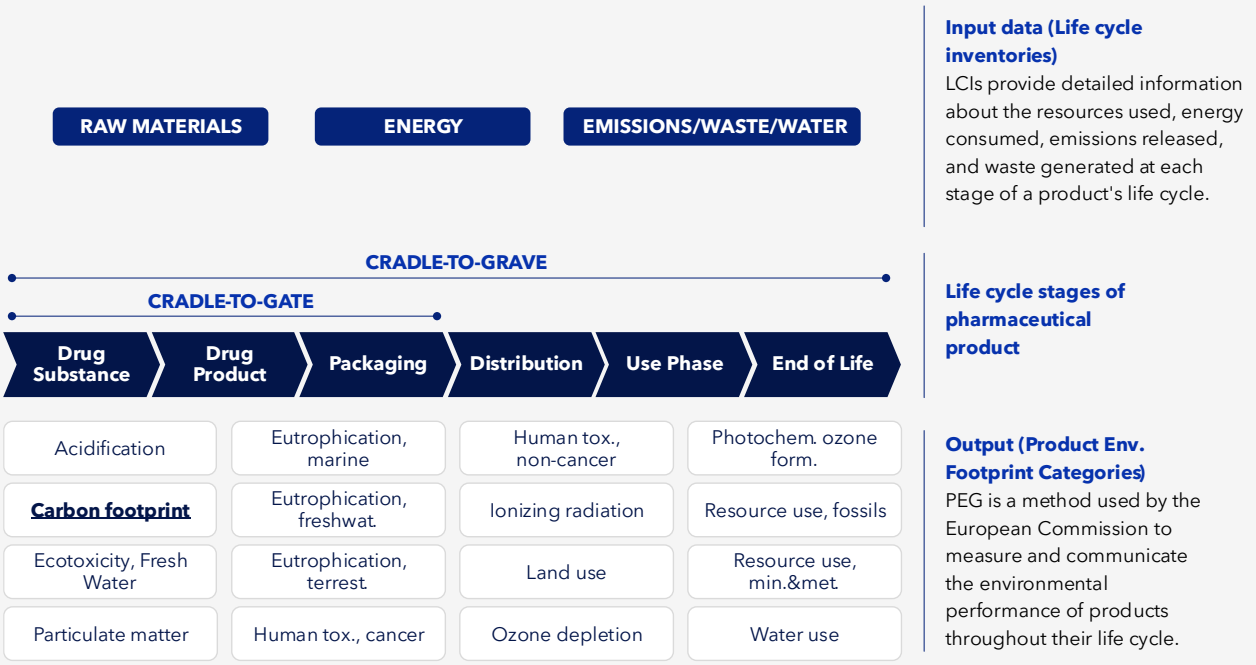
  Notes:

  - Suppliers are expected to do so for their top 10 products overall, not top 10 per customer; individual customers may still ask for LCAs and/or PCFs for specific products outside of top 10 products
  - If significant changes occur in the product portfolio, this ranking may have to be conducted again
  - High value does not always correspond to highest emissions impact, and suppliers are expected to move towards more activity-based footprint measures as data matures
- **Product Carbon Footprint** – Sum of GHG emissions and GHG removals in a product system, expressed as CO2 equivalents and based on a life cycle assessment using the single impact category of climate change, following e.g., the definition of ISO14067
  - ***Note:*** Where possible, suppliers are encouraged to opt for Product Environmental Footprints based on LCAs vs. Product Carbon Footprint, as these are more comprehensive, and cover broader environmental impacts (beyond carbon)

  - In case a supplier is only asked for a PCF by its customer, then a PCF (vs. a full LCA across environmental impacts) is sufficient to provide

- **LCA** – Method to evaluate the environmental impacts of a pharmaceutical product throughout its entire life cycle, from raw material extraction to end-of-life disposal. LCA analysis considers a wide range of environmental impacts beyond just carbon footprint.

FIGURE 2: Scope of an LCA



4. ACTIONS TO TAKE TO MEET THE TARGET: DISCLOSE PCF OR LCA FOR TOP 10 PRODUCTS

On a general level, suppliers are recommended to follow a recognized standard, and the hierarchy as outlined in The PACT standard (WBCSD). Suppliers should use "Product Category Rules (PCR)" when these are available for their product category – such as PAS2090 for finished pharma products.

CALCULATE THE PRODUCT CARBON FOOTPRINT

To calculate the Product Carbon Footprint companies may follow e.g., the definition and guidance of ISO14067, or other standards/methods depending on the type of product:

- **For Pharmaceutical Products**, comply with the product category rules described in PAS 2090 LCA Standard – including only carbon as impact. More details below.
- **For Chemicals** used as raw materials, comply with the TfS PCF Guidelines
  - **Base chemical** – any chemical molecule used as a building block to make all other chemical intermediates and final products
  - **Chemical** – compound generally considered as a small molecule which can have associated salts, solvates or ions and is described using a single definitive or representative structure
- **For Biologics and Consumables**, follow the BioPhorum PCF Framework which is currently in development
  - **Biologic** – pharmaceutical product whose active therapeutic effect is mainly due to a biological pharmaceutical function
  - **Consumable** – disposable equipment and materials designed for use in the manufacturing process

- **For Other Products** (other goods e.g., diagnostic devices, or services e.g., manufacturing services), provide primary data compatible with standards (e.g., PAS 2090 LCA Standard section 5.1.1), or PCFs using relevant standards/frameworks (e.g. EN50693 for electrical and electronic devices).

Additional PCF Resources

- Another resource suppliers may use is the WBCSD's PACT (Partnership for Carbon Transparency), including: The PACT methodology (v3 published in 2025): Harmonization of how to calculate carbon emissions and how to share these PCFs with e.g., clients – including through the solutions listed by PACT
- Please refer to the resource library for details on how to use PACT, calculate PCFs, and case studies

CALCULATE THE LIFE CYCLE ASSESSMENT

To calculate the LCA for the top finished pharmaceutical products, companies comply with the product category rules described in PAS 2090 LCA Standard.

For non-pharmaceutical products, please see the relevant frameworks / sections described in the "calculate the PCF" section above, and check with your customers on the need to go beyond carbon. If so, which frameworks to use.

PAS 2090 (LCA) Standard

The PAS 2090 LCA standard was published by BSI, and co-developed by the SMI-PEG LCA consortium to provide a harmonized, pharma-specific framework for conducting LCAs. The framework will help ensure that assessments are robust, science-based, and comparable across the sector. In parallel, the consortium has training sessions to build awareness and practical competence in LCA for suppliers.

In addition, a dedicated LCA tool to support consistent and efficient calculations of LCAs (or product environmental footprints of pharmaceutical products) is currently under development. This tool - similar to the standard, goes beyond carbon, including e.g. water and waste.

A technical guidance document, which supports PAS 2090 implementation by providing practical recommendations and illustrative examples, can be found here. Additional information and resources (incl. Supplier FAQ) can be found here

Ecoinvent Database – Life Cycle Inventory (LCI)

- Common averaged emission factors databases that may be used for product carbon footprinting include e.g.: Ecoinvent.
- The PharmaLCA Consortium, together with Boehringer Ingelheim, is collaborating with Ecoinvent to develop a dedicated life cycle inventory database tailored to the pharmaceutical sector
- The first release, comprising over 180 regionalized datasets, is planned for publication by the end of 2025 and will be accessible via Ecoinvent. Secondary datasets will also be included on EcoInvent over the course of 2026.

PSCI Resources

The Pharmaceutical Supply Chain Initiative (PSCI) recently launched an introductory course to LCAs in the pharmaceutical sector. The training includes the importance of LCAs in the pharmaceutical sector, the fundamentals of LCAs, the key steps to conducting an LCA, and the role of suppliers in supporting LCA. A webinar introducing this training can be found here.

SCIENCE BASED TARGETS

Publicly set third-party validated science-based targets (both near-term and long-term) across scope 1, 2, and 3 by 2027

1. DEFINITION

By 2027, publicly set science-based near-term and long-term targets that are aligned with the goals of the Paris Agreement (ideally aligned to a 1.5-degree pathway) across scope 1, 2, and 3, and have these validated by a third-party

- **Near-term targets** – targets that are maximum 10 years away from the point they are set (typically 2030 / 2035 targets) and act as interim target on the way to the long-term target
- **Long-term targets** – science-based targets for 2040+, e.g., Net Zero by 20XX, dependent on the standards/pathways used and the industry the company is active in
- **Science-based** – To be recognized as science-based targets, these targets should be aligned to e.g., SBTi, CSRD, ISO, or IPCC – leveraging relevant sectoral guidance (e.g., from SBTi) where available
- **1.5C pathway** – Defined by the Intergovernmental Panel on Climate Change (IPCC) Working Group and aligned with the commitments in the Paris Agreement; global average temperatures must be limited to 1.5C above pre-industrial levels to significantly reduce the risks and impacts of climate change
- **Third-party validation** – Independent confirmation by an accredited external body that a company's emissions-reduction targets align with recognized science-based pathways (e.g., SBTi "Verified")

2. ACTIONS TO TAKE TO SET AND MEET THE TARGET

Companies can leverage the SBTi website to set near-term and long-term targets via the below five-step process:

Note: The SBTi Corporate Net Zero Standard is currently under revision, however companies are still encouraged to pursue the existing standard to set targets.

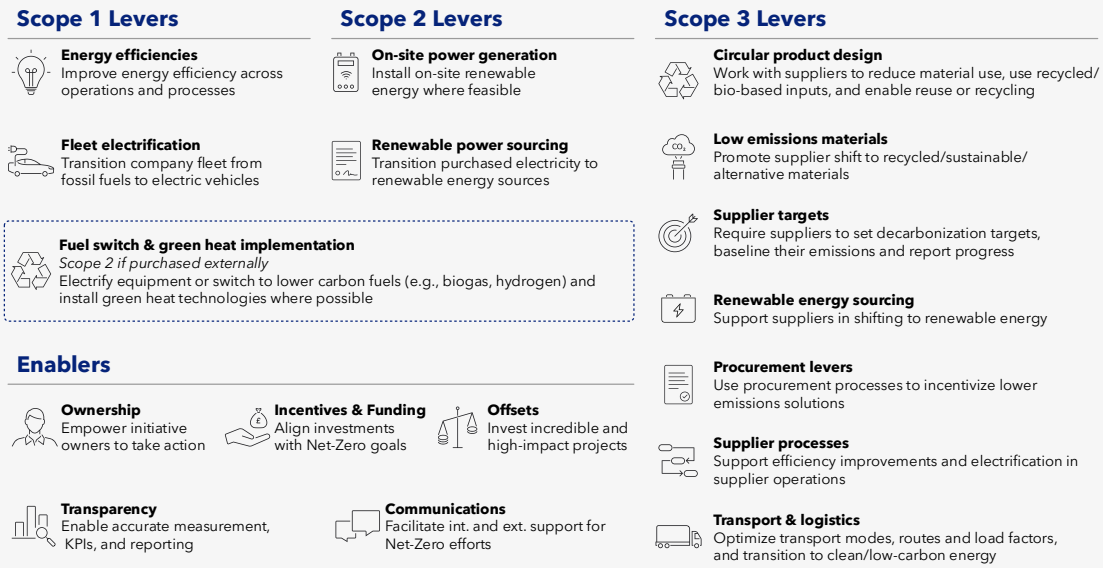
If companies do not wish to use SBTi to meet this target, the company may still use the SBTi (sectoral) pathway/standard, or derive its own emissions reduction pathway (e.g., building on the IEA, SBTi, or other industry pathways) and corresponding near-term and long-term target. In either case, the company will be expected to seek validation from a third-party to demonstrate alignment with the science-based pathway.

PSCI Resources

The PSCI has held a webinar on the key steps of a SBT aligned net zero program, challenges and opportunities, and roadmap to accelerate supplier decarbonization. Recording of this webinar can be found here. To support suppliers in setting SBTs, and meeting them through pulling decarbonization levers, PSCI also developed a decarbonisation playbook.

To achieve the targets there are several categories of levers where companies may implement initiatives to decarbonize as shown in **Figure 3.** The list of levers below is ***non-exhaustive***.

FIGURE 3: Levers for decarbonizing scope 1,2 and 3 emissions to reach science-based targets



RENEWABLE ELECTRICITY

Source at least 80% renewable electricity by 2030 and publish annual interim progress

1. DEFINITION

- **Renewable Electricity** – is defined by RE100 criteria, including what counts as a credible claim:
  - **Renewable Electricity** is defined by RE100 as:
    - Electricity from wind, solar, geothermal, marine (wave and tidal), sustainably sourced biomass (including biogas; Must ensure that feedstock meets sustainability criteria, incl. having low LULUCF[9] emissions), or sustainable hydropower
    - It excludes electricity generated from nuclear and biofuels
    - **Note:** The Task Force is monitoring evolutions of standard-setters (e.g., SBTi) on this topic, and may update the set of technologies included to be in line with the latest industry standards
  - **Credible claims** may differ by region due to local market context
- **Annual interim progress:**
  - Commitment requires companies to provide a publicly available annual progress update (e.g., via Sustainability report, website, CDP, etc.)
  - The annual progress update should at least include the % of renewable electricity sourced in the reporting/current year, and may further include e.g. advancements/plans for future renewable electricity sourcing

2. ACTIONS TO TAKE TO MEET THE TARGET

Suppliers should start by understanding the different methods available to source renewable electricity, using the RE100 technical criteria, and identify best options for their sites. RE100 recognizes several procurement methods, including self-generation, direct procurement, contracts with electricity suppliers, unbundled energy attributes certificates (EACs) and passive procurement. Further details on methods and technologies can be found in the RE100 technical criteria.

Companies often need a combination of procurement methods across their sites, as the ideal solution and availability will differ by location. On-site (e.g. rooftop) solar is often cost-competitive, but usually not sufficient for all demand. While PPAs (direct procurement) are seen as driving the highest additionality (i.e. driving build-out of new capacity), price-points may be very high and/or availability/access limited.

Companies often progress their strategy for RE, e.g. starting with unbundled EACs and on-site solar, transitioning to PPAs / longer-term supply contracts over time.

Note: Individual SMI members may prefer certain procurement methods (e.g. at minimum bundled) for their suppliers – please check this with you customers

[9] Land Use, Land-Use Change and Foresty

SMI Group Power Purchase Agreements Programs

The SMI Health Systems Task Force is currently running joint Power Purchase Agreements (PPAs) programs – open to suppliers - to support access to renewable electricity. These programs focus on geographies with high levels of manufacturing and limited access to green power and aim to provide competitive rates on renewable power. Participation in the program is easy for suppliers, and funded by SMI members to help you access renewable electricity.

Details of different geographies and how to get involved are below:

- **China:**
  - The Chinese renewables market is challenging with constrained renewable energy supply, and heavy industrial and state-owned enterprises having priority access. There is limited freely available renewable energy supply with shortages and price premiums expected to continue until the end of the decade.
  - The Task Force established an industry first collaboration in 2023 through which 20+ pharma companies and suppliers have already accessed renewable electricity at a discount vs. market rates (2023 and 2024 combined).
  - Suppliers with operations in China have an opportunity to join this program, in all Chinese provinces
- **India:**
  - In 2025 a "group captive scheme" was developed in India, allowing companies to secure renewable energy, while locking in cost savings vs variable grid tariffs for the longer-term (25 years)
  - A "group captive scheme" requires companies to co-invest in the renewable power plant. However, due to the savings on electricity rates, the payback period is relatively short
  - A first agreement – including both PharmaCos and suppliers – was successfully signed in 2025
  - Opportunity to join this program for companies with operations in Gujarat, Haryana, Maharashtra, Karnataka, Tamil Nadu, Madhya Pradesh, Andhra Pradesh, and Telangana – other states could follow pending regulatory developments
- **Japan:**
  - New program developed in 2025, expected to start supplying renewable energy from 2026 onwards
  - Aiming to source renewable power via PPAs and/or credits, with cost savings vs. individual procurement expected
  - Opportunity to join this new program and be part of the first cohorts of companies securing access to renewable power

If you would like to get involved in any of the PPA programs, please register to upcoming webinars here

Energize

Energize PPA Programs

Additionally, several of the Task Force's members collaborate in the 'Energize Program' which supports suppliers through education on renewable electricity and procurement methods, and enables suppliers to secure green power through buying cohorts, with a focus on Europe and North-America. Participation in the program is simple and funded by Energize partners to help their suppliers access renewable electricity.

PROCESS HEAT EMISSIONS

Reduce process heat emissions by at least 20% by 2030

1. DEFINITION

By 2030, reduce emissions from heat generation, either on-site and/or in third-party installations, used to manufacture products by at least 20% vs. the base year of your science-based targets

- **Process heat emissions** – Emissions that result from the generation of heat used to manufacture products. It includes emissions resulting from on-site generation of heat (e.g., boilers) or in third-party installations (e.g., steam from a combined heat-and power-plant). This means heat emissions in both scope 1 (on-site) and scope 2 (third-party) should be included in the target coverage.
  - Note: This does not include e.g. HVAC for office spaces.
  - Note: the 20% reduction should be achieved over the total process heat emissions, not over each source/scope (e.g., on-site) individually.
- **Base year** – Year in which the 'baseline' process heat emissions are measured/calculated (in CO_2e), and against which at least 20% reduction should be achieved by 2030. This year (typically 2015-2025 range) should be aligned to the base year used to set the science-based targets *(see target II)*.
- **Emission reduction** – Emissions from heat generation can be reduced through increasing efficiency and switching from fossil fuel-based heat (e.g., Natural Gas, Coal) to renewable heat
  - Energy efficiency can reduce both costs and carbon emissions, but it's unlikely to eliminate all process heat emissions. Transitioning to renewable heat solutions will help tackle remaining emissions
  - Renewable heat refers to heat energy produced from renewable, low-carbon, or carbon-neutral sources instead of conventional fossil fuels. Examples include geothermal, air, biomass/biomethane, and electrified heat sources, such as heat pumps and e-boilers
  - Renewable heat often requires a tailored mix of technologies adapted to company-specific process requirements, e.g., temperature needs, and site-level constraints

2. ACTIONS TO TAKE TO MEET THE TARGET

Heat is the second largest source of emissions in healthcare supply chains (>25% of supply chain emissions) but can be challenging to decarbonize as no single technology is optimal for all locations/processes.

IMPROVE EFFICIENCY

- Independent of current technology use, companies can reduce heat emissions by improving efficiency. This could be done through technological upgrades, process optimization (e.g., optimizing temperature requirements, pre-heating, etc.), or waste heat recovery.
  - The We Mean Business Coalition has a step-by-step process to measure heat emissions and identify energy efficiency measures that could be appropriate to put in place

EXPLORE RENEWABLE HEAT OPTIONS

- While efficiency gains can be significant, typically a switch from conventional heat sources (e.g., Natural Gas, Coal) to renewable heat will also be required to meet the target reduction. Exploring renewable heat options entails a **step-by-step approach**:
  - **Develop a company-wide renewable Heat strategy** that outlines preferred technologies based on company-specific priorities e.g., cost, efficiency, availability, risk
  - **Conduct technology assessment at site level** to identify green heat technology mix based on heat demand, heat supply, space constraints, site-level constraints, regulations, and electrical infrastructure
  - **Develop site-level heat switch plan** including implementation timeline, prioritizing sites with depreciated heat generation assets reaching end-of-life/requiring replacement
- More information about technologies, including case studies, can be found on the Renewable Thermal Collaborative's website.

Green Heat Technologies

There are many green heat technologies but the below were identified in a cost-benefit analysis based on maturity, feasibility, and cost as the most suitable for biopharma temperature needs.

- **Commercial heat pumps**: Provide efficient, low-carbon heat for temperatures <100°C when powered by renewable electricity. Well suited for HVAC and low-grade heat and can deliver cost savings due to high efficiency
- **Industrial heat pumps**: Enable zero-carbon heat for temperatures up to 200°C when paired with renewable electricity. Require suitable waste-heat sources to operate efficiently, which can limit feasibility for some sites
- **E-boilers**: Supply zero-carbon heat across a wide temperature range (from 100°C up to ~500°C) using renewable electricity. Broadly applicable but typically come with higher operating costs than heat pumps
- **Biomass**: Biofuel option suitable for heat up to ~500°C. Simple concept but constrained by local feedstock availability and onsite storage requirements
- **Biomethane**: Cover full BioPharma temperature range (up to 1950°C); "drop-in" solution for Natural Gas but has practical drawbacks regarding procurement, including growing competition for feedstock, and the importance of sourcing locally

A summary of the five technologies is presented in **Figure 4**, with details on maturity, costs, and other considerations in **Figure 5**.

FIGURE 4: Detailed technical descriptions of five green heat technologies

	TECHNOLOGY	TEMP RANGE	DESCRIPTION OF TECHNOLOGY
ELECTRIFICATION	Commercial Heat Pumps	<100°C	• Use electricity to transfer heat from source (air/hot water) to process • Very efficient, generate heat with 500% "efficiency" • Typically used for HVAC needs
ELECTRIFICATION	Industrial Heat Pumps	<200°C	• Can produce low-pressure steam up to 200 °C, in comb. with compressors • Efficiency heavily dependent on ΔT between waste heat source & process • Economic potential requires in-depth assessment on available waste heat
ELECTRIFICATION	E-Boilers	<500°C	• Uses electricity to heat water, similar to an electric kettle • Inefficient (<100%) given the plain and simple "physics" involved • Electrification solution that covers all temperature ranges
BIOFUELS	Biomass	<500°C	• Burn biological material (feedstock) in a solid burner to generate heat • Simple concept, but stable (local) feedstock supply required • Requires more real estate on-site due to storage and pre-processing
BIOFUELS	Biomethane	<1950°C	• Drop in solution when currently using natural gas • Produced from biological material, similar to biomass • Expect future competition from hard-to-abate sectors

FIGURE 5: Considerations when selecting one or multiple of the five green heat technologies

	TECHNOLOGY	FEASIBILITY	MATURITY
ELECTRIFICATION	Commercial Heat Pumps	• Mature technology achieving COP[1] of 3–4. • Cutting GHG by at least 20% vs. gas boiler, even when running on emissions-intensive electricity. • High upfront costs can deter consumers despite long-term savings.	●
ELECTRIFICATION	Industrial Heat Pumps	• Proven technology for low-to-medium temperatures (<200 °C), with higher temperatures becoming feasible through ongoing innovation and advanced designs. • Capital-intensive, upfront costs vary widely by systems; financial incentives enhance viability. • Economics highly sensitive to availability of a suitable waste heat source.	◔
ELECTRIFICATION	E-Boilers	• Mature technology, delivering diverse temperature/pressure levels limited only by design and materials. • Low upfront costs but high operational expenses due to electricity consumption. • Easily optimized with heat storage; commonly used for peak loads, backup, or off-peak power use	●
BIOFUELS	Biomass	• Mature and well-established technology for generating high-pressure steam at elevated temperatures. • Feedstock supply constraints: limited sustainable biomass availability, competing demands (e.g., wood pellets for power plants), and already high utilization (~40% in Europe) could raise costs with increased demand.	●
BIOFUELS	Biomethane	• Mature and scalable technology, capable of replacing natural gas as a drop-in fuel without requiring equipment or infrastructure modifications. • Supply constraints, as current biomethane production remains limited relative to potential demand; substantial growth requires investment, logistical enhancements, and expanded access to organic feedstocks.	●

1. COP: Coefficients of performance; Source: EHPA, IEA

SMI Biomethane Group Purchase Program

The SMI Health Systems Task Force is planning to launch a group biomethane purchase to aggregate demand amongst members and suppliers, enabling access to biomethane at competitive rates through strong economies of scale.

The different geographies currently in scope of the initial biomethane group purchase are:

- United States
- Northern Europe (focus on Germany/France, but able to supply neighboring countries through the interconnected European gas network)
- United Kingdom & Republic of Ireland

If you would like to get involved in the biomethane purchase, please reach out to your contact within the SMI Health Systems Task Force that provided you with this toolkit or register to upcoming webinars here

CASE STUDY: BIOMETHANE PROCUREMENT - ASTRAZENECA

Context

AstraZeneca identified biomethane as the most viable near-term route to decarbonise their process heat where electrification was not yet feasible

Actions

- Reduced heat demand by consolidating real estate footprint, upgrading utilities and other assets to be more efficient
- For the residual heat demand, partnered with Future Biogas to build the UK's first unsubsidised biomethane plant, supplying renewable gas to four manufacturing sites
- Added a carbon-capture unit to reuse biogenic CO2
- Expanded biomethane procurement to other geographies: with Vanguard Renewables in the US and pilot projects in China
- Use of crops sourced locally in UK and food and dairy cow manure in the US as feedstocks, avoiding diversion from food chains

Impact

- Biomethane UK agreement to cover up to ~20 % of AstraZeneca's global gas consumption
- In the UK alone, this is expected to save 18k tCO2e per year
- Built a replicable model for industrial-scale green-heat procurement

Key Learnings

- Internal stakeholder alignment, buyer-seller partnership, and transparency in GHG emissions are key for success
- Plan for time to completion – can be 2-3 years from project initiation to gas supply
- Ensure connections to the gas grid are possible
- Understand what feedstocks are used and where they come from – different feedstocks have different CO2 reductions
- Stay close to policy as renewable-gas standards evolve

RESOURCE EFFICIENCY

Set targets, a credible supporting plan, and demonstrated action in the following areas:

a. **Source lower carbon and circular input materials, including sustainable feedstocks for solvents and plastics**
b. **Minimise resources by reducing material use and manage unavoidable waste by increasing recycling rates**
c. **Reduce emissions from solvent use (e.g., via solvent reuse, solvent recycling)**

1. DEFINITION: LOWER CARBON AND CIRCULAR INPUT MATERIALS

Set targets to source lower emissions and/or circular input material – including for solvents/plastics where relevant, supported by a credible plan on how to switch to more sustainable/circular feedstocks, and demonstrate action through interim progress updates

- **Targets** – these should be measurable commitments that are regularly tracked (ideally at least annually) – e.g., % of material sourced from sustainable feedstocks, or a % emissions reduction, etc.
- **Lower emissions** – materials with lower life cycle emissions (including End of Life emissions, Indirect land use change, etc.) than the 'conventional' (typically fossil based) alternative
- **Circular materials** – materials that are either renewable (i.e., not from fossil inputs) or recyclable

2. ACTIONS TO TAKE TO MEET THE TARGET: LOWER CARBON AND CIRCULAR INPUT MATERIALS

REDUCE PROCESS EMISSIONS

Carbon emissions of materials production can be reduced by e.g., using renewables and low-energy cracking. While this does not change the emissions related to the feedstock, it does lower the carbon footprint of the product.

***Note*:** This is applicable to all types of products e.g., plastics, solvents, glass, aluminium

CASE STUDY: LOW CARBON EMISSION GLASS BY SCHOTT

Context

- Glass tubing is the key raw material for primary glass packaging and a major driver of the container's Product Carbon Footprint (PCF).
- Glass melting is highly energy-intensive; emissions stem predominantly from:
  - Raw material production
  - Melting process, which dominates the PCF

Actions

- Redesigned the melting process by transitioning from fossil-fuel-fired furnaces to electric melting technology.
- Switched electricity supply to 100% renewable energy.
- Developed FIOLAX® Pro with optimized batch formulation to ensure efficient low-carbon melting while meeting strict pharma requirements and supporting next-generation sensitive drugs.
- Implemented transparent carbon accounting, including:
  - Critical review of methodology and specific PCF calculation
  - Independent evaluation and certification by an accredited third-party auditor
- Provided product-level carbon footprint documentation to enable pharma supply chain to assess climate impact in their own value chains.

Impact

- ~80% reduction in melting-related emissions through electrification and renewable power.
- Overall, 50% lower cradle-to-gate PCF compared to the market average for borosilicate glass tubing.
- Full compliance with pharmaceutical standards and maintained all functional and quality properties.

Key learnings

- Decarbonizing melting is essential to reduce the cradle-to-gate footprint of tubular primary packaging
- Electrification is a highly effective decarbonization lever, even for energy-intensive pharmaceutical glass production; renewable electricity is available at scale.
- Cross-functional coordination is essential, with engineering, energy procurement, sustainability, and quality teams collaborating to redesign core processes.
- Upfront investment in electric furnaces and renewable power is needed but delivers long-term emissions and cost stability.
- Product quality must be safeguarded through careful process redesign and validation.
- Transparent, third-party-verified accounting builds trust and supports broader adoption of low-carbon materials while making Scope 3.1 impacts measurable.

COMPARE FEEDSTOCKS

While switching to sustainable feedstocks, companies will often face a selection of feedstocks to choose from. These may differ in material characteristics, but will also differ in terms of emissions saved vs. the conventional feedstock

- To accurately compare and measure emissions reduction of the switch, companies need to **look at the full life-cycle assessment** of the feedstock used
  - Organisations like the "Bioplastic Feedstock Alliance" have tools and factsheets to support this selection
  - Through the Greenhouse Gas Protocol list of Life Cycle databases, companies can further seek to identify how different feedstocks compare
  - It is important to include the LULUCF emissions in this – as some of the sustainable feedstocks, while low in emissions, may still have a large impact through the emissions generated by the 'Indirect Land use Change' (e.g., deforestation for land to grow the feedstock on)
- **Ensure sustainable and responsible sourcing** of bio-based feedstocks, **using certification mechanisms such as ISCC+**
  - Companies should assess potential nature and social impacts of biomass use (e.g., competition with food supplies, unsustainable agricultural practices, biodiversity loss, or land-use pressures).
- **Typically, "2nd generation" (e.g., waste) and beyond will have a lower emissions footprint** vs. 1st generation feedstock (e.g., palm oil)
  - Companies may opt to set a policy/target around e.g., only sourcing 2nd generation or higher and/or setting a threshold for a minimum emission reduction, which prevents sourcing feedstocks with high indirect land use change emissions

SOURCE LOWER EMISSIONS PLASTICS

Procuring plastics made from sustainable feedstocks (e.g., bio-based plastics) or recycled inputs is already possible today, but not all options are as mature (**Figure 6**).

FIGURE 6: Options for sourcing lower emissions and circular plastics

Most mature	Technology	Definition	CO2e savings	Comments
1	Mechanical plastic recycling	Grinds plastics into flakes ready for remoulding for lower-grade products	~40-60%	• Quality depends on input • May not always meet product requirements
2	Bio-based inputs sourcing	Uses biological material to make plastics via petrochemical processes	~40-60%	• Drop-in solution with identical properties • 1st gen feedstock may raise nature and land-use concerns
3	Chemical plastic recycling	Uses reactions or catalysts to convert plastic waste into raw materials	~30-60%	• Quality varies by process and feedstock • Best suited for high-quality rigid plastics
4	Carbon recycling	Uses captured CO2 from waste or the air with green energy to produce new plastics	~70-100%	• Very promising technology, some availability • Relies on access to low-carbon CO2 and green power
5	Low/zero carbon manufacturing	Uses renewables and low-energy cracking to decarbonize plastic production	~50%	• Reduces production emissions only • Does not address end-of-life emissions
6	Bio-degradable substitutes sourcing	Develops new biodegradable materials via bio- inputs and reactors	~60-80%	• Different material properties vs fossil plastics • Limited suitability for healthcare in the near term

CARBON ACCOUNTING APPROACHES

Carbon accounting approaches enable companies to scale the use of lower emissions materials by tracking how low carbon materials – or investments in them – flow through the value chain. These methods allow companies to credibly claim CO2 reductions even when supply chains are complex or when lower emissions materials are not physically segregated

***Note**:* These accounting approaches are relevant for plastics and other commodities/materials (e.g., solvents, aluminium). **The appropriateness and acceptability of any approach should be discussed and agreed with customers,** and aligned with applicable standards, regulations and customer requirements.

There are three commonly used carbon accounting approaches available today: **physical procurement, mass balance, and book-&-claim**, each offering different levels of traceability, operational burden, and flexibility. (**Figure 7**)

- **Physical procurement** relies on a direct physical link between lower emissions material and the final product. Lower emissions inputs are kept separated and fully traceable, offering the highest level of assurance, but typically requiring operational changes such as segregation and additional logistics.
- **Mass balance** allows lower emissions and conventional inputs to be mixed, while tracking their proportional share through certified chain-of-custody systems. This can support scaling of lower emissions materials, subject to customer acceptance and certification requirements
- **Book-&-claim** enables companies to purchase certificates associated with lower emissions material production, even if that material does not physically enter their own products. This approach offers the greatest flexibility, but **claims and use cases vary significantly by customer, application, and standard**, and should be validated with customers in advance.

FIGURE 7: Carbon accounting methods

	PHYSICAL PROCUREMENT	MASS BALANCE	BOOK-AND-CLAIM
DEFINITION	**Separated, traceable low carbon physical material used in product**	**Certificates attributed to physical share of mixed feedstock**	**Certificates not linked to physical low carbon product**
CONNECTION TO PHYSICAL PRODUCT	**Direct** – Low-carbon material delivered physically	**Partial** – Proportional allocation	**None** – Attributes decoupled
TRACEABILITY	**High**	**Medium** - Documented via chain of custody	**Low** - Registry-based only
EASE OF IMPLEMENTATION	**Low** – Requires segregation	**Medium** – Allows mixing	**High** – Lowest logistics burden; No need to meet pharma-specs
COST IMPLICATIONS	Could be higher due to e.g. physical transportation	Some additional costs such as site certification	Can be cost-efficient due to e.g. competition / ability to switch provider
ACCEPTANCE	Accepted under SBTi and GHGP[1]	Proportional mass balance more allowed; SBTi moving towards acceptance; GHGP/ISO position evolving	SBTi moving towards acceptance (latest draft); GHGP/ISO position evolving

1. Greenhouse Gas Protocol

Note: May be outdated, always refer to latest version of standards and protocols; SBTi: Science Based Targets Initiative; GHGP: Green House Gas Protocol; Sources: SBTi, GHGP, GMA

Leverage further guidance on Sustainable Plastics

Further guidance on alternatives to fossil-based plastics for the production of medical devices with a focus on decarbonization available here: Sustainable plastics and their potential to reduce carbon footprint in injection devices - Alliance to Zero

SOURCE LOWER EMISSIONS SOLVENTS

Procuring solvents from sustainable feedstocks is not (yet) possible for all types of solvents. For Acetonitrile for example, green alternatives are not yet (widely) available. However, for some of the most used solvents like ethanol, green alternatives are available, and suppliers can choose from a range of options and providers – with similar considerations (e.g. ISCC+ certification) as for lower emissions plastics.

3. DEFINITION: RESOURCES AND WASTE

Set a target to minimise resources (e.g., raw materials used for manufacturing, transportation, storage, etc), supported by a credible plan on how to reduce material use and manage unavoidable waste from operations, and demonstrate action through interim progress updates

- **Targets** – these should be measurable commitments that are regularly tracked (ideally at least annually) – e.g., % reduction on total waste / most relevant types of waste, % of materials re-used, etc.
- **Plan / actions** – include actions to e.g., use less materials, send less material to landfill, move away from single-use plastics, etc.
  - For example, diverting paper waste away from landfill to recycling plants, reducing the use of single-use plastics by decreasing the amount of packaging material used or switching to compostable alternatives

4. ACTIONS TO TAKE TO MEET THE TARGET: RESOURCES AND WASTE

SET TARGETS TO REDUCE WASTE AND REUSE MATERIALS

Waste targets can take various shapes and forms and focus on different metrics. Many pharmaceutical companies have already set targets on circularity, waste reduction and recycling. Some **non-exhaustive examples include**:

- 100% of sites landfill free by 2030
- % reduction in waste by 2030
- Eliminate specific types of plastics by 2030
- Achieve certified zero-waste manufacturing and warehouse sites by 2030

Companies can also set **Product-level targets** such as:

- % less material by mass of product
- % recyclability of xx product
- Replacement of multiple products with one
- Specified minimum % of recycled content
- Number of products/tons taken back for refurbishment/resale

Leverage guidance and resources to set targets

- **Ellen MacArthur Foundation**
  - Plastics Pact network details targets on packaging redesign, moving to reuse and improving recyclability
  - The Global Commitment provides key targets to manufacturing companies
- **Healthcare Plastics Recycling Council**
  - Design Guidance for Healthcare Plastics to improve recyclability
- **Pharmaceutical Supply Chain Initiative**
  - Guidelines on waste expectations
    - Waste vendor vetting checklist - Webinar
    - Waste vendor vetting checklist - pdf version
    - Waste vendor vetting checklist - excel version

REDUCE MATERIAL USE AT SOURCE

Focus on eliminating unnecessary materials and improving material efficiency early in the product- or packaging-design process.

- Remove redundant components or accessories from products or assemblies.
- Lightweight products and packaging to reduce total material mass.
- Transition to compact or modular designs that minimise material intensity

REDESIGN PRODUCT TO IMPROVE RECYCLABILITY

Use design principles that ensure materials remain valuable and recoverable at end-of-life.

- Select materials that have established recycling pathways.
- Reduce the number of different polymers or material types in a single product.
- Avoid mixed materials, difficult-to-separate layers, or problematic dyes/additives.
- Provide clear disposal or recycling guidance to end users.

IMPLEMENT REUSE, TAKE-BACK AND CLOSED LOOP SYSTEMS

Create systems that keep materials in use and reduce the volume of end-waste.

- Develop refillable or reusable product or packaging formats.
- Establish internal pooling or reverse-logistics systems to recover components.
- Offer packaging or device take-back programs for refurbishment, remanufacturing, or recycling, e.g., Novo Nordisk returpen™
- Pilot closed-loop systems where production scrap or returned materials feed back into manufacturing.

MANAGE RESIDUAL WASTE RESPONSIBLY

For waste that cannot be eliminated, improve segregation and management to maximise diversion from landfill.

- Strengthen waste segregation practices to separate clean, recyclable, and hazardous streams.
- Transition waste from landfill to recycling, material recovery, or reuse routes.
- Conduct due-diligence checks on waste vendors to ensure responsible handling.
- Set internal targets to increase diversion rates and reduce landfill volumes.

LEVERAGE PHARMA INDUSTRY EXPERTISE ON HOW TO MEET WASTE REDUCTION AND MATERIAL RE-USAGE TARGETS

- European Federation of Pharmaceutical Industries & Associates (EFPIA) on Circular Economy
  - White paper on actions pharmaceutical companies have taken to reduce waste
  - The paper also provides links specifically for the chemicals industry

5. DEFINITION: SOLVENT USE

Set target(s) on reducing emissions from solvent use, supported by a credible plan to achieve these, and demonstrate action against this target/plan via interim progress updates

- **Targets** – may include e.g., an emissions reduction (in CO2e), a solvent use target (e.g., in volume/weight), a recycling %, a % sourced from lower emissions sources, etc.
- **Plans** – could include actions linked to solvent reuse, solvent recycling, and/or procuring solvents made from sustainable feedstocks (e.g., bio-waste)

6. ACTIONS TO TAKE TO MEET THE TARGET: SOLVENT USE

Solvents are key processing aids in API manufacturing (synthesis) and drug formulation. They are often derived from the petrochemical value chain, meaning they account for high emissions in the pharmaceutical value chain. Suppliers are encouraged to identify their main types of solvents used, to identify emission hotspots.

Emissions from solvent use can be reduced through three main levers: Reuse, Recycling, and Sustainable feedstock procurement. The procurement of sustainable feedstock is covered in sections 1 and 2 of this chapter.

REUSE SOLVENTS

Recover a solvent used in production to be re-used for its intended purpose without significant modifications. Small adjustments and cleaning of the component or product may be necessary to prepare for the next use.

RECYCLE SOLVENTS

Collecting and distilling used solvents, to ready them for use in manufacturing processes. Can be done off-site or on-site.

CASE STUDY: SOLVENTS AT GSK

Context

GSK challenged established production processes after identifying solvents, especially acetone, as a major contributor to its operational emissions

How

Conducted a data-driven analysis of solvent use and optimised API process steps to reduce acetone process intensity and unnecessary solvent cycles

Impact

- Reduced reliance on virgin raw materials and cut waste volumes
- 10 million fewer litres a year of solvent used within processes compared to 2024
- Lower energy use from reduced solvent recovery distillation and recovery loads
- Improved circularity through higher solvent recovery rates
- A low-cost, low-capital solution that can be easily scaled across sites

Lessons learned

- Challenge established processes, major wins often come from revisiting long-standing recipes
- Use data to prioritise the highest-impact solvent streams
- Optimise both use and recovery to maximise emissions and cost savings.
- Importance of holistic measurement of emissions – both incoming material (Scope 3) and onsite energy usage (Scope 1 and 2).

CASE STUDY: OPTIMIZATION OF SOLVENT USE, REUSE AND RECYCLING – LONZA

Context

Lonza's Small Molecules Division sought to reduce solvent waste and related emissions from API production

How

- Reduced environmental footprint by minimizing consumption of fresh solvents and amount of waste that is generated and treated
- Implemented on-site distillation and pervaporation units to recover solvents
- Cross-functional team (production, EHS, MSAT, process technology and innovation) optimized recovery processes using simulation tools
- Expanded reuse both in-house and through resale to other industries

Impact

- 47% of solvents were recycled or reused in 2024, saving ~45,000 t CO_2e and 10,000 t of solvent
- Reduced Scope 1 and 3 emissions through avoided incineration and virgin production

NATURE

By 2028, assess dependencies, impacts, risks, and opportunities (DIRO) related to pressures on nature across the value chain and take visible actions in response to the assessment by 2030, incl. on sustainable and deforestation-free sourcing of key naturally-derived commodities

1. DEFINITION

Dependencies, Impacts, Risks, and Opportunities – DIROs related to nature that the company has, e.g., impacts such as land/water/sea use change, resource exploitation, and risks such as biodiversity risk, pollution, water availability

Value chain – Including own operations, downstream (e.g., product use, End of Life), and upstream (e.g., mining, agriculture); Focus on parts of the value chain / geographies with material DIROs (see guidance SBTN (Steps 1-2) / TNFD (LEAP) on what counts as "material")

Visible Actions – Actions to address the material DIROs in the value chain, e.g., regenerative agriculture practices, ecosystem restoration/protection/sustainable management, sustainable sourcing, use of alternative materials/ingredients, increasing material efficiency, etc.

Sustainable Sourcing – Purchasing raw materials that are traceable, produced responsibly, and compliant with environmental and social standards

Deforestation-Free – Procuring products that have not caused or contributed to deforestation, and derived from land that has not recently been subject to deforestation. Companies that are subject to e.g., the EU Deforestation Regulation may implement more stringent measures and are guided on e.g., a specific date regarding deforestation of the land sourced from. SBTN step 3 also has guidance regarding what "no conversion of natural ecosystems" implies for businesses.

Naturally-derived commodities – Raw materials of natural origin with a high environmental impact (e.g., on biodiversity, land-use, ecosystem services, etc.) , e.g., lactose, palm-oil (derivatives), soy, wood fibre; Companies can use the High Impact Commodities List from SBTN to identify priority commodities for them to address.

2. ACTIONS TO TAKE TO MEET THE TARGET

ASSESS DIRO

Assessing dependencies, impacts, risks and opportunities related to pressures on nature can be done following guidance from e.g., SBTN (see Step 1,2), TNFD (see LEAP). For examples of impact (drivers), risk and dependencies related to specific ecosystems, companies can refer to the TNFD guidance on biomes.

Through the support of several SMI Health Systems Task Force members, WBCSD has developed a roadmap to nature positive foundations for the pharmaceutical sector, which includes a sector-wide view of where the most material DIROs are. This can be used as a starting point for suppliers, to be further tailored to company/location-specific context. For other sectors such as chemicals, roadmaps and broader guidance can be found here.

Suppliers can define **visible actions** to undertake by e.g., looking at the response options database SBTN (Step 4) has developed.

INCLUDE ACTIONS AROUND SUSTAINABLE/DEFORESTATION FREE SOURCING

Specifically for key nature-derived commodities with a high environmental impact, suppliers are encouraged to include actions around **sustainable / deforestation-free sourcing** of these commodities. The first step is typically to improve traceability for the sourced commodities, especially for commodities at risk (e.g., those with a high likelihood of resulting in deforestation). Further actions may for example include:

- For Palm Oil (derivatives) – companies may consider joining RSPO and report annually on progress regarding sustainably sourced palm oil (derivatives – e.g., glycerine)
- For Timber, Paper, Pulp, etc. companies can consider procuring these commodities with the FSC label, while non-timber forest products (e.g., medicinal plants) could be procured using for example the Rainforest Alliance label and standard
- For Soy – companies may consider joining the round table on responsible Soy (RTRS) and/or seek to buy RTRS certified soy
- For Aluminium – companies may consider sourcing aluminium certified under the Aluminium Stewardship Initiative (ASI) to ensure responsible production and supply-chain practices
- For Sugar – companies may consider procuring sugar certified under Bonsucro, which provides assurance of sustainable sugarcane production and processing
- For several of these naturally derived commodities, including e.g., lactose, PSCI has developed supplier pathways to guide suppliers on sustainably sourcing:
  - Lactose
  - Palm Oil
  - *More pathways for commonly used commodities are likely to follow*

WATER

By 2030, set targets and demonstrate action on water – for high water stress/risk areas, set absolute water reduction targets and adopt water stewardship practices; for all areas, measure pollutant release and improve water efficiency

1. DEFINITION: WATER STRESS AREAS AND WATER STEWARDSHIP

By 2030, for high water stress/risk areas, set absolute water reduction targets and adopt water stewardship practices

High-water stress/risk areas – All areas where the company has operations (encouraged to go beyond own operations – e.g., also consider key sourcing areas), that are indicated as high water stress (i.e. high water scarcity) / risk by e.g., WRI's Aqueduct tool, WWF's Water Risk Filter

Absolute water reduction targets – An absolute (i.e. in m^3 of water withdrawn, or similar) water quantity target, for example:" Company *will reduce its water Withdrawals / Use / Consumption [in XX (place)] with XX m^3/yr by 20XX*"

Water stewardship practices – Adopt best-practices in water stewardship, i.e. site- and catchment-based actions (e.g., water efficiency measures, ecosystem protection / restoration, stakeholder engagement, participation in catchment/basin governance mechanisms, etc.) that address the shared challenges faced in the area; Suppliers are encouraged to adopt a globally recognized standard (e.g., Alliance for Water Stewardship – AWS Standard) and seek certification where possible

2. ACTIONS TO TAKE TO SET AND MEET THE TARGET: WATER STRESS AREAS AND WATER STEWARDSHIP

IDENTIFY AND PRIORITISE HIGH WATER STRESS/RISK AREAS

To identify and prioritise high-water stress/risk areas, suppliers can map – at a minimum – their manufacturing locations – to the maps provided by WRI's Aqueduct tool, WWF's Water Risk Filter, or by the SBTN. Additional areas to prioritize could be based on the identification of (proximity to) e.g., key biodiversity areas and Ramsar Sites.

SET ABSOLUTE WATER REDUCTION TARGETS

To set absolute water reduction targets, suppliers can opt to set a science based freshwater quantity target through SBTN (step 3).

ADOPT WATER STEWARDSHIP PRACTICES

To consider which water stewardship practices to adopt, suppliers can be informed by guidance through the Alliance for Water Stewardship – including through the Collective Action Accelerators – and the CEO Water Mandate. Suppliers can also find local projects/partners to join through the water action hub.

Adopting water stewardship practices such as freshwater ecosystem restoration/protection/sustainable management, as well as improving water efficiency, will also help to build resilience against climate change induced physical risks such as floods and droughts. The earlier highlighted resources from WRI/WWF can also help to identify areas that are flood/drought-prone, both now, as well as in the future, to further prioritise locations and actions.

3. DEFINITION: POLLUTION AND WATER EFFICIENCY

Pollution: By 2030, for all manufacturing locations, measure the release of pollutants with material environmental impacts (e.g., those listed as "substance of (very) high concern")

Pollutants – Only pollutants with material impact are asked to be measured through this target, and measurement is only expected for companies where wastewater from manufacturing or service provision contains pollutants

- By performing the DIRO assessment (see chapter VI (Nature) above), companies will be informed about which pollutants are material to the company, and thus which should be measured

All companies should have safeguards in place to prevent improper handling/disposal of harmful substances, in line with relevant HSE policies, ISO standards, and (local) regulation (e.g., EU Water Framework Directive, EU Environmental Quality Standards, and the USA's Clean Water Act)

Water Efficiency: By 2030, for all manufacturing locations, improve water efficiency through reducing and/or reusing, leading either to a lower intensity of water consumption per production unit / economic unit, or a lower absolute volume of water used in manufacturing

4. ACTIONS TO TAKE TO MEET THE TARGET: POLLUTION AND WATER EFFICIENCY

DETERMINE POLLUTANTS TO MEASURE

Companies can determine which pollutants to measure (i.e., those with a high environmental impact) through mapping their waste(water) streams to e.g.:

- Presence of Active Pharmaceutical Ingredients (APIs) and risk of impacting Antimicrobial Resistance (AMR)
- Harmful chemicals – e.g., through List of substances of (very) high concern
- Impact on nutrient levels / toxicity of freshwater bodies (especially in places with a lack of good wastewater treatment)

PSCI resources

PSCI has developed several resources and best practices concerning measuring effluents, including:

- Pharmaceutical in the Environment (PiE)/ Anti-Microbial Resistance (AMR) Tools Deck – Comprehensive, consolidated PDF resource, featuring essential resources such as the PEC:PNEC calculator tool, exposure tools, and other key documents aimed at supporting environmental risk assessments and compliance efforts
- Guidance for Managing Effluent Averaging to Ensure Effluent PNEC Target Values Protect the Environment
- Guidance For Calculating Dilution Factors Considering Mixing Zones
- Guidance for Mixing Zones for Wastewater Discharges

ADRESS THE MEASURED POLLUTION

The roadmap that WBCSD developed in collaboration with several of the pharmaceutical companies in the Task Force also guides companies and suppliers on how to address the measured pollution, including:

- **Minimize the release of APIs**, chemicals and other substances from pharmaceutical manufacturing processes and meet and exceed requirements and regulations for specific production sites wherever possible.
- **Mitigate the environmental impacts** of antibiotics released into wastewater discharge by certifying according to standards, such as the British Standards Institute (BSI) Antibiotic Manufacturing Standard
- **Work with regional and municipal wastewater treatment plants** to ensure that their systems can adequately support the removal of ecotoxic chemicals and their decomposition techniques can mitigate downstream accumulation.
- For chemicals that are not APIs or antibiotics**, transition to circular models in the sourcing of reagents, solvents, buffers and other feedstocks**, as well as in the design and manufacturing of products.
- **Address the advancement of AMR** (Anti-Microbial Resistance) in the environment by prioritizing measures to mitigate antibiotic pollution. This includes actions such as implementing robust waste management systems and ensuring responsible antibiotic use along with storage, disposal and treatment practices.

CASCADING THE TARGETS

Integrate these targets into contracting for your suppliers

1. DEFINITION

The SMI Health Systems Task Force supplier targets are integrated into contracting for your tier 1 suppliers and proactively communicated through ongoing supplier engagements.

- **Integrated into contracting** – Companies have a variety of ways to integrate the targets into supplier contracting (see more under 2), but may e.g., choose to visibly communicate these targets in the supplier code of conduct and/or contracts, embed in the RfP process, etc.

2. ACTIONS TO TAKE TO MEET THE TARGET

Suppliers are encouraged to engage their Tier 1 suppliers to cascade the SMI supplier targets further upstream, so that each tier of the value chain makes an ask to their own suppliers to adopt the targets, and the end-to-end value chain address their environmental impacts.

WORK WITH SUPPLIERS TO IMPLEMENT STANDARDS

There are a range of ways companies can work with suppliers to implement standards in addition to embedding the targets in supplier code of (see examples below on science-based targets),. Each company can decide independently about their approach towards their suppliers.

Example of codes of conducts

- **AstraZeneca**: *"Every company that AZ spends over 250k USD annual spend shall set science-based carbon reduction targets SBTI-validated by end-2025 […]"*
- **Novartis:** *"Supplier and its affiliate shall establish and maintain public commitment related to carbon emissions and shall align its targets with and have them approved by the science-based targets initiative by the end of 2025"*

Both incentives and requirements (**Figure 8**) can be used to implement standards depending on the level of stringency the company wants to implement with its suppliers.

FIGURE 8: Incentives and requirements companies can implement to encourage suppliers to adopt standards

INCENTIVES ("CARROTS")

Engagement Lever	Description
Sponsored Upskilling	Fund/provide climate and ESG education for (priority) suppliers
Funded appraisals	Co-invest in private appraisals to assess suppliers' performance
Prioritized allocation of sustainability funds	Carve out funding for suppliers' sustainability-related initiatives
Prioritized access to resources	Priority access to resources (e.g., market reports)
Preferred contract terms	Offer e.g. early payment
Increase size of business	Increase scope/volume of products
Financing support	Support access to financing solutions / better finance rates
Recognition programmes	Recognize suppliers through defined criteria / journey

REQUIREMENTS ("STICKS")

Engagement Lever	Description
Binding contractual terms	Detail sustainability requirements with non-compliance consequences
Relationship management	Integrate sustainability requirements in relationship management decisions

For example, standards can be set as guiding principles only, or they can be set as mandatory and enforced on a strict timeline for suppliers to comply. For more details see **Figures 8 and 9.**

FIGURE 9: Options to implement standards from least to most stringent

LEAST STRINGENT → MOST STRINGENT

Set as guiding principles, no mandatory compliance

- Suppliers **recommended, but not mandated, to disclose** against standards
- No assessments to incentivize those who have made most progress

Best performers rewarded, no mandatory compliance

- All suppliers **must disclose** against standards, **but no mandatory compliance**
- **Incentivize most-progressed** suppliers, e.g. higher volume deals, better payment terms

Standards are mandatory, but flexible on degree & timeline

- All suppliers **disclose activities against standards** when contracting/renegotiation
- If non-compliant, **offered education & asked to show progress** (or risk future delist.)

Standards are mandatory, enforced on strict timeline

- All suppliers **disclose activities against standards** when contracting/renegotiating
- **Repercussions** (e.g. delisting in 1-2 yrs) in case of failure to comply

The level of relationship a company has with its suppliers can also dictate the range of tactics used as detailed in **Figure 9.**

CASE STUDY: THERMO FISHER SCIENTIFIC SUPPLIER ENGAGEMENT

Context

- To reach net zero by 2050, Thermo Fisher integrated climate targets into supplier management

Actions

- Launched a supplier decarbonization program requiring science-aligned targets, supported by SaaS partnerships to increase supplier-specific emissions factor (SSEF) data coverage and connect suppliers to renewable electricity procurement.
- Established protocols for engaging suppliers on lower carbon / more sustainable materials and capability development.
- Embedded emissions disclosure and net zero commitment into the Supplier Code of Conduct, sourcing surveys and contracts
- Provided external guidance and training via supplier decarbonization guide and annual Supplier Sustainability Summit
- Delivered annual procurement training on supplier sustainability; the initiatives, why they matter and how to engage with suppliers on sustainability business requirements.

Impact

- Clear, measurable expectations now embedded in all new supplier agreements
- Accelerated adoption of SBTs, improved emissions reporting and reduction capabilities
- Scaled accountability for supply chain decarbonization beyond the sustainability function and into the procurement organization

Lessons learned

- Enable your suppliers: training and templates drive adoption at scale but bespoke 1:1 conversation with priority suppliers can move the needle, faster
- Ensure sustainability expectations are consistently incorporated into supplier agreements.
- Train and educate procurement and sourcing partners to navigate sustainability contracting terms and drive suppliers up the sustainability maturity curve

Additional resources

- **WWF and AstraZeneca Water Stewardship Report**

  AstraZeneca has published a report that guides how suppliers can be engaged on water stewardship, which includes a "Supplier Collaboration Toolbox" that can also be applied to the broader set of targets.

- **SMI HSTF Education Materials**

  Suppliers can leverage the materials developed by the SMI HSTF (incl. this toolkit) to support their own suppliers to set targets. Additional resources can be found on the Task Force website.

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