

SUSTAINABLE IMPACT FRAMEWORK

# Chemicals

Sectors :

- Chemicals

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This document is not a promotional communication. This is a methodological document aimed at explaining how Mirova takes into account sustainable development issues in the framework of the environmental, social and governance analysis of each sub-sector of activity.

An affiliate of:



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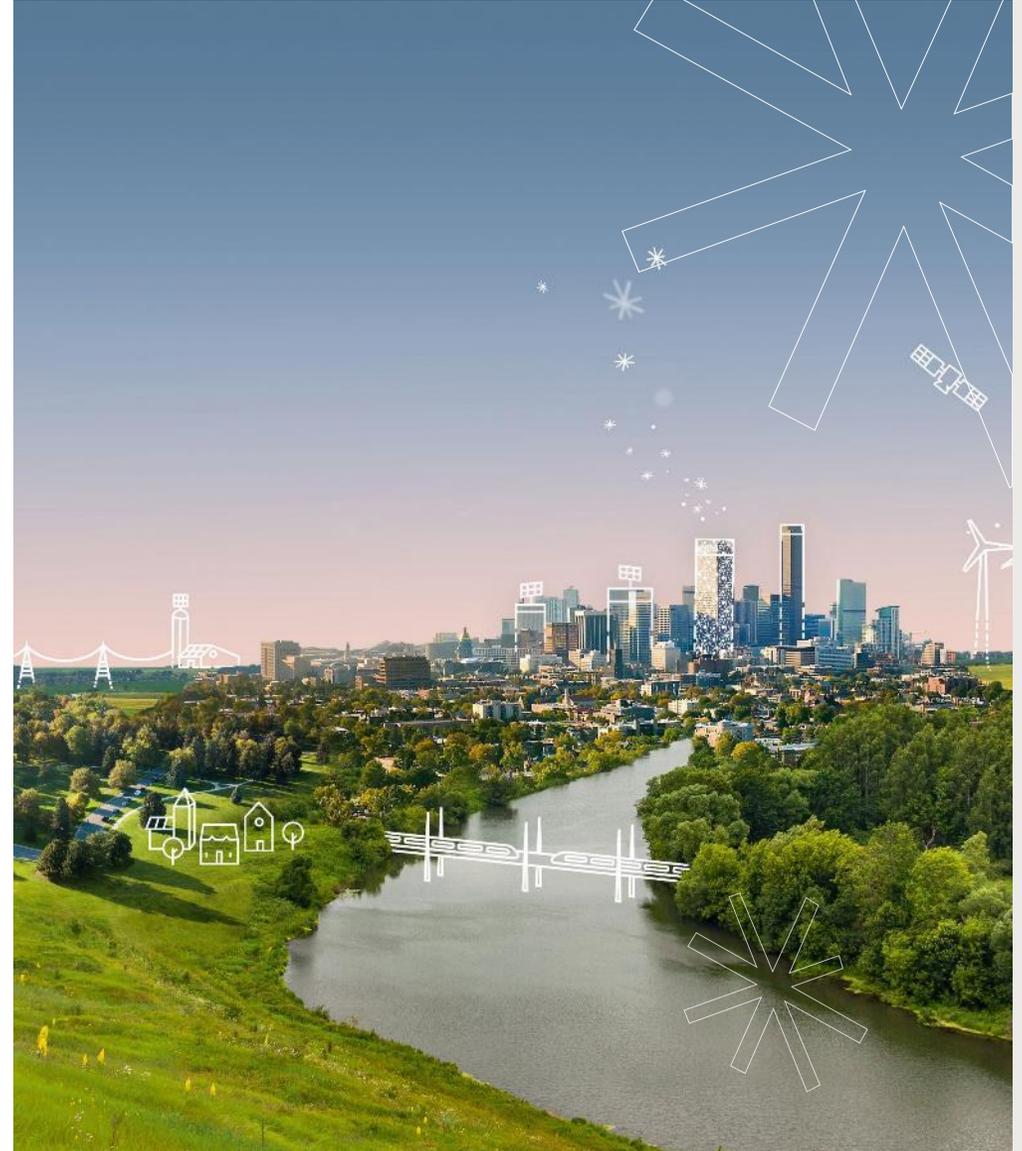
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# Executive Summary



# Chemicals

Chemicals are required in virtually all manufacturing sectors; yet 'novel entities' known as new chemicals substances meeting market demand are accumulating at a pace that is undermining our very capacity to assess their long term impacts. While industrial gases are key in climate transition, use of fossil resources or unsustainable agricultural biomass are causing climate warming and deforestation. Finally wastes such as plastics induce ocean pollutions. Achieving transition towards zero pollution will require sustainable-by-design substances, sustainable biomass supply chains, electrification of processes, and feedstock circularity.

Resource use could  
increase by **+60%**  
by 2060<sup>1</sup>

Insatiable use of resources has tripled over the last fifty years and without urgent and concerted action we could see resource use up by 60% from 2020 levels by 2060<sup>1</sup>. Manufacturing is causing 55% of greenhouse gas emissions<sup>1</sup> and chemicals are on the brink to become the first sector demand for oil<sup>2</sup>. While the sector started substituting feedstock by biomass, yet its production is responsible for 90% of biodiversity loss further jeopardizing carbon sinks and achievement of 1.5°C climate goals<sup>1</sup>. There is a need to quickly achieve a sustainable and circular bioeconomy prioritizing the use of biomass to maximize well-being and minimize impact, while conversion of biodiversity-and carbon-rich natural systems must be avoided. Within traceable and responsible value chains, plastics, wood and agriculture wastes can play a critical role as drop-in substitutes to fossil feedstock in material production but also heat generation. Biotechnologies providing microorganisms and enzymes can catalyze the transition provided they comply with high bioethics standards on genetic engineering.

In Europe, only **20%**  
of relevant substances  
have been screened for  
toxicity<sup>5</sup>

Waste and emissions have risen in tandem with the surge in material use. The shift towards a minerals-based economy has further exacerbated the challenges, leading to problematic waste streams and a rise in emissions and pollution. Beyond direct pollutions linked to manufacturing processes, chemicals embedded in products are responsible for 2 million casualties every year. Chemicals sector also causes plastics pollution with plastics use projected to triple between 2019 and 2060<sup>3</sup>. While flexible plastics are responsible for 80% of marine pollutions<sup>4</sup>. Therefore, chemical companies should remediate existing pollutions. Besides, only 20% of all substances commercialized are assessed for toxicity in Europe<sup>5</sup> illustrating the need to extend coverage not only of existing substances – persistent chemicals such as PFAS<sup>6</sup> induce long term risk for ecosystems – but also new ones. Overall, zero pollution is achievable through processes for sustainable-by-design chemicals development based on toxicity assessment and lifecycle analysis, deployment of best available technologies in emissions filtration and circular water infrastructure.

Almost **x2** reduction  
in carbon intensiveness  
of hydrogen is required  
by 2030<sup>7</sup>

Ammonia, methanol and polyolefins are the main chemicals commodities produced; they account for two third of energy demand in the sector mostly from fossil fuels<sup>2</sup>. Their manufacturing process often rely on intermediary chemicals such as syngas and hydrogen. Hydrogen is currently manufactured through carbon intensive streams, yet its carbon intensiveness must be divided by two by 2030 in a sustainable climate pathway<sup>7</sup>. Most of hydrogen is currently used in hardly sustainable industries such as refining and fertilization, yet it could catalyze the transition towards low carbon economy in new sectors where there is no alternative technology available, where hydrogen-based technology is mature, and where it can make the difference thanks relative to sector size : this includes power storage, direct reduction of iron, e-fuel for maritime transport and ammonia/methanol production. Nevertheless, manufacturing, generally, is responsible for 40% of particulates health related impacts<sup>1</sup> and air pollution induces 7m casualties every year<sup>8</sup>. The sector is also dependent on water, with climate change worsening the situation. Deployment of best available technologies and resilience plans are required to sustain sector contribution to a low carbon economy.



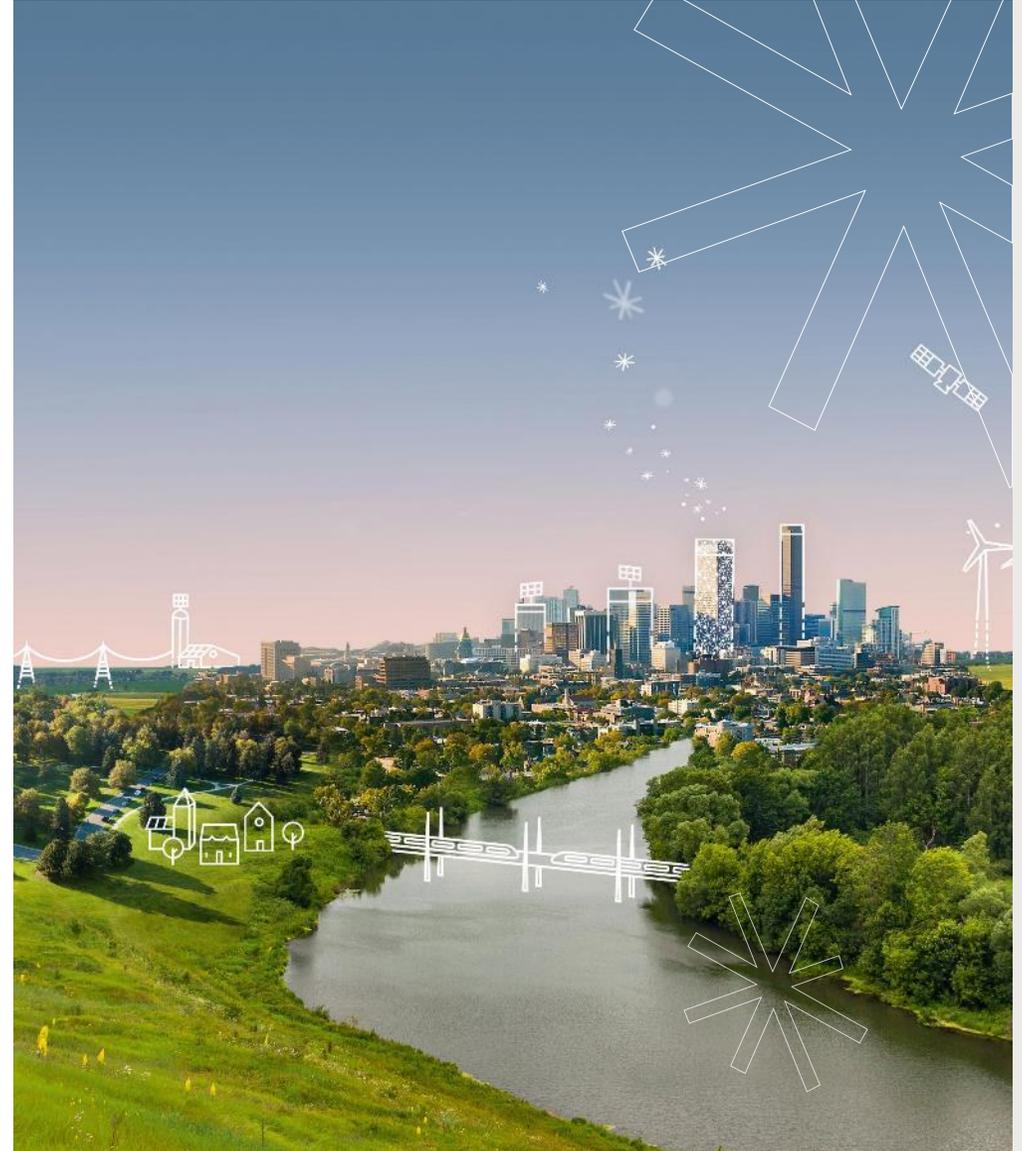
# Drivers of contribution and obstruction to sustainability goals

	Activities	Practices
Positive Impact	<p><b>Sustainable Activities</b> </p> <ul style="list-style-type: none"> <li>Eco products and processes</li> <li>Products from sust. raw materials</li> <li>Carbon emissions and energy efficiency</li> <li>Low carbon hydrogen</li> <li>Sustainably certified products</li> <li>Food &amp; water Safety</li> <li>Wellness</li> <li>Medical Treatment</li> </ul>	<p><b>Advanced Practices</b> </p> <p>Human Capital Management:</p> <ul style="list-style-type: none"> <li>Diversity and inclusion</li> <li>Job Quality</li> </ul> <p>Climate</p> <p>Biodiversity</p> <p><i>Advanced governance models</i></p>
Residual ESG Risks	<p><b>Harmful Activities*</b> </p> <ul style="list-style-type: none"> <li>Agrochemicals <b>PAI #8</b></li> <li>Chemicals <b>PAI #9</b></li> <li>Plastics</li> <li>Plantations and tropical timber</li> <li>Genetic engineering</li> </ul>	<p><b>Risk Mitigation</b> </p> <p>Environmental related risks incl.:</p> <ul style="list-style-type: none"> <li>Climate <b>PAI #1</b></li> <li>Biodiversity <b>PAI #7</b></li> </ul> <p>Social related risks:</p> <ul style="list-style-type: none"> <li>Working conditions &amp; Human Rights</li> <li>Products Safety</li> </ul> <p>Governance</p> <ul style="list-style-type: none"> <li>Governance of sustainability</li> <li>Business Ethics</li> <li>Taxes</li> </ul>

\*See: [Minimum standards and exclusions, Mirova](#)



# Positive Impact



# Sustainable Activities



	CONTEXT	SUSTAINABLE ACTIVITY
SOCIAL OPPORTUNITIES	<p>Considering long value chains and diverse end-uses, harmful chemicals used in manufacturing stage can find their way up to the consumer through multiple products incorporating a toxic component and affecting health. Certification of products builds on strict specifications supporting credibility of innocuity of products and traceability thanks to coordination between value chain players, from manufacturers to consumer goods industries.</p>	<p><b>Sustainably certified products</b> non-food products certified by credible and audited third-party standards ensuring non-toxicity for consumers and/or value sharing along the value chain.</p>
	<p>Harmful chemical substances are used in a wide array of consumer goods increasing risks of contamination of human body. Manufacturers have strong responsibility to support research and development of non-toxic alternatives thereby reducing risks. Alternatives are now emerging to the most plasticizers such as BPA, PFAS found in food &amp; beverage packaging and to preservatives such as paraben found in cosmetics</p>	<p><b>Food &amp; water safety</b> Low toxicity substances used as alternatives to plasticizers, water treatment homecare biocides</p>
	<p>The chemical industry is a key supplier of essential ingredients to pharmaceutical and consumer goods for the manufacture of key health, safety and disease prevention. Such products contribute to skin, dental, hygiene, female hygiene, and reduce risks of pandemics. The industry also enables access to oxygen in developing economies, thereby supporting treatment of lung diseases.</p>	<p><b>Wellness</b> Products enabling a healthy lifestyle, personal care and hygiene options, such as condoms, sunscreens, glasses, non-prescribed medicines, water services for residential customers.</p> <p><b>Medical Treatment</b> Contribution to development of innovative medical treatments, prescribed medicines or vaccines. Access to oxygen for pulmonary disease treatment in developing countries.</p>

- Impact indicators**
- Use of ecolabels supporting products' climate-neutrality, eco-design, circularity, reparability. Reducing harmful chemicals, emissions, energy use
  - Thorough assessment of substances toxicity in R&D phase
  - Safety instructions mitigating handling use risks

In this sector, the positive contribution is mainly analyzed through **revenues exposure** but not only. We complement this exposure with a **qualitative review** of the solution's impact. KPIs to assess the level of impact generated can include among others: lifecycle assessment, toxicity to humans, reliance of feedstock on forced labor, recyclability in local markets

**LOW POSITIVE IMPACT**

> 10% sustainable activities

**MODERATE POSITIVE IMPACT**

> 20% to 50% sustainable activities

**HIGH POSITIVE IMPACT**

> 50% sustainable activities



# Sustainable Activities



	CONTEXT	SUSTAINABLE ACTIVITY
BIODIVERSITY	<p>Resource efficiency is key in curbing the current trend otherwise resource use will increase by +60% by 2060 driving further biodiversity loss.</p> <p>Chemical industry has a key role to play in supply of catalytic metals, additives, and enzymes supporting the circular economy through feedstock improvement and lifespan extension. Finally, chemicals help remove contaminants and remediate existing pollutions through filters and bioprocesses transforming and sequestering toxic air and water contaminants.</p>	<p><b>Eco Products and processes</b> Resource efficient equipment and/or gases such as intermediates extending final product lifespan, low-toxicity chemicals substitutes</p>
	<p>Switching from petrochemical feedstock towards waste and biomass can help reducing dependency on nonrenewable resources. Waste streams meeting the waste hierarchy help substituting feedstock while mitigating competition on prioritized uses once tracked using mass balance schemes. Similarly, biomass feedstock will play a role if commodity growing phase relies on sustainable agriculture and forestry practices.</p>	<p><b>Products from sust. raw materials</b> Products containing high level of post-consumer and contaminated waste recycled inputs in developed countries, recycled input in developing countries, manufacturing of sustainably sourced biobased ingredients.</p>
CLIMATE	<p>Chemicals are used in the formulation of materials that enhance energy efficiency, such as insulation materials in buildings and lightweight polymer in electric vehicles besides chemical processes can improve the efficiency of industrial operations, reducing overall energy consumption.</p>	<p><b>Carbon emissions and energy efficiency</b> Energy efficient intermediaries (polymers, ingredients) for the industry sector or CCS (Carbon Capture and Sequestration) technologies and services, aimed at reducing net greenhouse gases emissions</p>
	<p>Methanol, ammonia and polyolefins are the three majors building blocks of all chemicals worldwide. Clean hydrogen provides a green pathway to manufacture those chemicals. As an energy vector showing high energy density, hydrogen also contributes to green transition of power and transportation. Biggest opportunities are where technologies are mature, where H2 can take a large share and where no low carbon alternatives exist. This includes activities such as green shipping, direct iron reduction, chemicals manufacturing.</p>	<p><b>Low Carbon Hydrogen</b> production of hydrogen and/or its byproducts (such as ammonia and methanol) based on low-carbon processes (i.e. electrolysis of water, or steam methane reforming with CO2 capture), or providing key enabling equipment and services such as electrolyzers.</p>

- Impact criteria**
- “Sustainable-by-design” consideration for toxicity reduction in R&D phase
  - Verified circularity of materials, including wastes feedstock and biomass, design for reuse & recycling at end of life
  - Transparency on KPIs including lifecycle impact (LCA), material circularity index (MCI) and full toxicity assessment,

In this sector, the positive contribution is mainly analyzed through **revenues exposure** but not only. We complement this exposure with a **relevant impact KPIs** (ex: tons of waste avoided, the toxicity reduction, GHG emissions avoided etc...) to **assess the effectiveness of the solution in truly advancing environmental challenges**.

**LOW POSITIVE IMPACT**  
> 10% sustainable activities

**MODERATE POSITIVE IMPACT**  
> 20% to 50% sustainable activities

**HIGH POSITIVE IMPACT**  
> 50% sustainable activities



# POSITIVE IMPACT

## Sustainable Practices



### HUMAN CAPITAL

#### CONTEXT

#### SUSTAINABLE PRACTICE

##### Job Quality

Chemicals companies are uniquely positioned to participate to reduction of inequalities through work. First because manufacturing jobs have a typically highly technical profile inducing higher pay and conducive work-life balance. Second, because this industry is uniquely positioned to achieve the green jobs transition towards supporting circularity and lower emissions: Manufacturing will be 2nd highest ranked sector after building sector for green job creation. Yet workforce needs to be trained on those skills: both for the youth to acquire new skills and for senior profile to convert their competences. Companies willing to participate to the transition can provide balanced training programs, ie: covering 70/20/10 experience, social skills and formal knowledge. This can serve the purpose of internal promotion and motivate staff while improving improve faithfulness.

##### Diversity & Inclusion

The current global labor force participation rate for women is significantly lower than that of men, at 47% compared to 72%, with even wider gaps in developing economies. Chemical companies can help reduce this gap by creating a more inclusive work environment. Best practices include target-setting on female representation in executive committee, training of staff to combat gender-related discrimination, conducting studies to assess the wage gap, promoting women into leadership roles through dedicated training and mentoring, and offering comprehensive benefits.

#### Practices/measures expected:

#### Impact indicators examples:

1. **Develop employees' skills recognized on the labor market and anticipate shifts in skills.**
2. **Ensure fair remuneration and social benefits sufficient for good living conditions.**
3. **Ensure employee satisfaction and wellbeing.**

- Training hours per employees, % of workforce trained,
- Qualitative analysis of the training offering including, upskilling programs, mentorships focused on young talents, leadership development...),
- Creation of internal universities / academies targeting actionable skillsets and accessible to most employees,
- Analysis of employees', executives' and shareholders' remunerations
- Existing and effective employees' association mechanisms
- Workplace wellbeing measures: flexible work arrangements, mental health support, counselling etc

1. **Improve female and diverse representation especially at management/leadership level.**
2. **Ensure equal opportunities and increase awareness to overcome inequalities.**
3. **Ensure adapted and flexible career options.**

- Percentage of women in the Executive Committees, difference between women representation in the workforce and Executive Committee, C-Suite female representation (CEO, CFO, CIO, CTO, CCO)
- Wage gap or credible target to reach pay equality & unadjusted pay gap
- Succession planning including at least one woman as a possible candidate for every Senior position
- Roadmap to improve recruitment of minorities and ensure unbiased recruitment
- Gender-neutral leave policy
- Provision of daycare options (affordable and/or paid by the company) and work flexibility options

#### LOW POSITIVE IMPACT

- > Advanced practices - Medium Stake topic
- > Credible strategy to achieve advanced practices

#### MODERATE POSITIVE IMPACT

- > Advanced practices - High Stake issues



# POSITIVE IMPACT

## Sustainable Practices



	CONTEXT	SUSTAINABLE PRACTICE	
CLIMATE	<p>The chemicals sector is already responsible for significant share of world GHG emissions and may become the top consumer for fossil fuels due to use as feedstock. Considering carbon sequestration in products, resource circularity is critical to avoid additional emissions at products end of life. In fact, 45% of global GHG emissions abatement opportunities lie in improved circularity. Emissions also stem from combustion for furnace heating purpose. Best practices on climate mitigation transition include Scope 3 emissions reduction through use of a share of pre and post consumer wastes as feedstock. Use of sustainable biomass is also at stake provided low carbon impact can be evidenced over lifecycle. Other opportunities stem from electrification of processes, thereby reducing Scope 1 and sourcing of renewable power contributing to Scope 2 emissions reduction.</p>	<p>Practices/measures expected:</p> <ol style="list-style-type: none"> <li><b>Short and long term decarbonization targets</b></li> <li><b>Plan for decarbonization, capital allocation plan</b></li> <li><b>Implementation: Increasing feedstock circularity, Electrification and energy efficiency, renewable power procurement</b></li> </ol>	<p>Impact indicators examples:</p> <ul style="list-style-type: none"> <li>Short, medium and long term GHG<sup>1</sup> reduction targets aligned with the Paris Agreement, all scope possible covering biogenic emission SBTI-FLAG<sup>2</sup> (biomass)</li> <li>Comprehensive, transparent and audited climate disclosures, including climate risks exposure and avoided emissions</li> <li>Decarbonisation plan including the description of key levers and sub-targets and a plan to reduce exposure to fossil fuel assets</li> <li>A coherent capital allocation plan</li> <li>A track record of emission reduction</li> </ul>
BIODIVERSITY	<p>The chemical sector is responsible for pollution-related pressures on biodiversity but also land use change caused by biomass / wood fiber sourcing and freshwater use for cooling processes. Companies can make the difference and reduce pressures by committing to systematically assess the impacts of new substances and polymers, prioritizing development of sustainable-by-design substances that avoid use of the most harmful ones, prior to developing substances that help reduce use of toxic substances and products that remediate existing pollutions. Regarding biomass sourcing best practices includes improved traceability and engagement with suppliers to deploy regenerative fiber and agriculture practices. Finally, companies engaging in water stewardship assess their water use over supply chain, prioritize low water footprint commodities and deploy resilience plans on high-risk manufacturing sites.</p>	<ol style="list-style-type: none"> <li><b>Assessment of Dependence, impacts risks and opportunities on Nature</b></li> <li><b>Issuance of strategies covering material impacts: pollutions, resource circularity, water risk and engaging with stakeholders</b></li> <li><b>Setting science-based targets on water, land, circularity or substitute hazardous substances</b></li> </ol>	<ul style="list-style-type: none"> <li>Deploy a TNFD-LEAP<sup>3</sup> compatible approach on interactions with nature in value chain, assess impacts dependances risks and opportunities in value chain.</li> <li>Issue dedicated strategies covering identified material issues deforestation, water stress, pollutions from persistent substances, circularity of feedstock and actual reusability/recyclability of products</li> <li>Set science-based targets (such as SBTN<sup>4</sup>) or industry relevant frameworks (chemical footprint project) on material issues, land, water, pollutions, circularity and define performance indicators</li> <li>Audit results and disclose progress towards targets using complying with TNFD<sup>3</sup> recommendations from sector guide and Chemsec</li> </ul>

**LOW POSITIVE IMPACT**

- > Advanced practices - Medium Stake topic
- > Credible strategy to achieve advanced practices

**MODERATE POSITIVE IMPACT**

- > Advanced practices - High Stake issues



# Advanced governance model

CONTEXT	ADVANCED GOVERNANCE MODEL DETAILS	
<p>Mirova aims to promote the development of a corporate vision focused on the creation of collective value over the long term. Corporate governance should be shaped to include the interests of its key stakeholders. We believe that the creation of wealth requires a long-term perspective, which takes into account sustainability issues. Mirova encourages companies to include environmental and social issues in its purpose, and to adapt their articles of association accordingly. We feel that shareholders have a role to play in spreading this vision of what a company should be. Thus, we are promoting the development of a long-term shareholder base, the creation of governing bodies that serve all stakeholders and address CSR<sup>1</sup> issues, the introduction of a compensation policy which is not only fair to its stakeholders, but which also promotes sustainable growth, and -increased transparency and a better quality of both financial and extra financial information, through annual audited reports covering all these issues. Advanced governance practices only foster sustainability but is not a standalone driver of impact.</p>	Practices/measures expected	Impact indicators examples
	<p><b>Commitment to long-term shared value creation</b></p>	<ul style="list-style-type: none"> <li>• Disclose policy around shared value creation.</li> <li>• Strive towards the model of a purpose-driven organization or/and a B-Corp organization.</li> </ul>
	<p><b>Integrate stakeholders in the decision-making process</b></p>	<ul style="list-style-type: none"> <li>• Create of a Sustainable Development Committee or sustainability representative at Board-level.</li> <li>• Integration of sustainability criteria – assessed through pre-determined, quantifiable metrics– into the variable compensation of top executives.</li> <li>• Publish value-addition sharing breakdown among stakeholders to demonstrate how value created is shared fairly amongst company stakeholders.</li> </ul>
<p><b>Fair taxes &amp; governance</b></p>	<ul style="list-style-type: none"> <li>• Disclose breakdown of value creation among stakeholders, improving transparency around employee remuneration and payroll.</li> <li>• Provide country-by-country reporting on tax payments.</li> <li>• Provide disclosure that contemplates the company’s approach to employee remuneration within the context of economic fluctuations such as inflation and/or cost of living pressure.</li> </ul>	



# Focus on Ingredients



## CONTEXT

The ingredients sector is playing a key role in the transition towards sustainability goals. This sector provides essential chemicals driving the appeal of vegetarian dishes elaborated by the food industry as plant proteins taste is particularly unappealing for consumer yet (good) taste is the first criterion to convince them to switch to plant proteins dishes. Yet the industry also supplies food additives that are fueling a pandemics of chronic diseases cause by the excess consumption of ultra processed food. The ingredients sector also participates in public health thanks to Ingredients for skincare and toothcare in the pharmaceutical sector yet some of the substances induce forged health claims (probiotics) and other substances such as micro silica are causing water pollutions. Finally, the large spectrum of fragrances sourced by the industry induce enhancement of cultivated biodiversity in upstream value chain ; yet induces risks of deforestation, generation of wastes from search for substance purity, biopiracy by generating revenues from living genome as well as forced labour in developing countries, at the expense of local communities.

## POSITIVE IMPACT

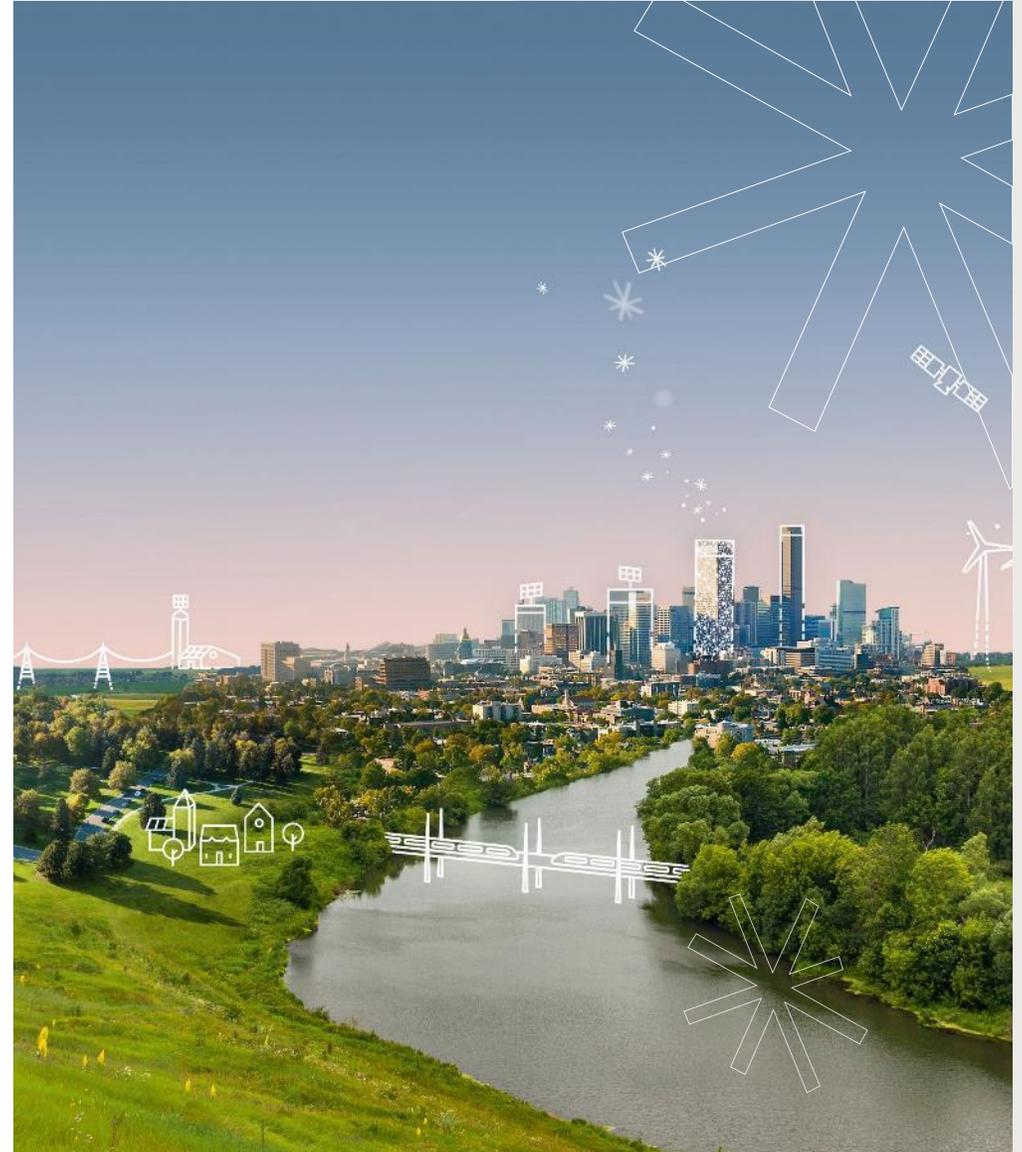
## CONDITION FOR ELIGIBILITY

SUSTAINABLE ACTIVITY	IMPACT CRITERIA
Ingredients	<ul style="list-style-type: none"> <li>• <b>Vegetarian food additives</b></li> <li>• <b>Certified ingredients for skin/tooth care</b></li> <li>• <b>Sustainably grown biobased ingredients</b></li> </ul>

- No deforestation commitment with clear milestone, audit, traceability key commodities
- Commitment to regenerative agriculture with scorecard of good practices and targets
- Approval by chemicals regulator on safety of substances
- Commitment to circular use of manufacturing wastes stream
- External assessment of suppliers in line with SA 8000 standard



# ESG Risks



# Climate & Biodiversity

## CONTEXT

Chemical manufacturing induces significant greenhouse gas emissions throughout the value chain, starting from the sourcing of commodities. This includes emissions from leaks of fossil gases, fertilization, and the transport of biomass, as well as reliance on carbon-intensive power sources. Direct emissions occur in furnaces due to the combustion of coal, natural gas, and oil. Additionally, there are emissions downstream in the value chain from the release of high global warming potential (GWP) greenhouse gases, such as nitrogen oxides and refrigerant gases. Poor waste management, including the incineration of polymers, also contributes to these emissions.

Chemical industry is excessively dependent upon freshwater besides this sector induces deforestation and pollution in upstream and downstream value chain respectively. Biochemicals and heating process may rely on biomass feedstock inducing risks of deforestation. Cooling processes and energy sources are intensive in water, inducing worsening scarcity risk in high water stress regions. The industry generates hazardous solid wastes which require treatment before landfill. Industrial processes induce direct air pollutants responsible for fine particulates, nitrogen and sulfur oxides themselves interacting with climate change to generate ozone detrimental to ecosystems. A few polymers are the main input in flexible plastics which cause 80% of ocean pollution. Plastics residues include microplastics, which are vehicle of contamination of marine biodiversity by harmful plasticizers.

## MINIMUM STANDARDS

### Type of ESG risk:

#### Climate footprint

### Risk assessment indicators examples:

- Definition of a decarbonization strategy to reduce direct sources of emissions such as process heat, livestock, fertilization
- Initiatives in place to reduce Scope 2 emissions including energy efficiency, switch to renewable power and cogeneration
- Inventory of GHG<sup>2</sup> Emissions on all 3 scopes
- Assessment of high global warming potential gases

PAI #1  
PAI #2  
PAI #5

#### Upstream and direct value chain biodiversity footprint

- Zero deforestation, zero conversion policy with milestone for high-risk commodities
- Water dependence assessment covering supply chain & energy sources
- Participation in supplier engagement platforms
- Existence of a Code of Conduct for suppliers that includes Environmental considerations & KPIs

PAI #7

#### Pollution from wastes

- Reduction of eutrophication potential of fertilizers (inhibitors)
- Measures to curb hazardous wastes and local pollutions
- Transparency on air, soil and water pollutants and trends year on year
- Deployment of best available technology for air pollution
- ISO-certified environmental management system in place

*Due to the risks induced by deforestation in sourcing of biomass and, separately, to marine litter from plastics wastes; exclusion applies to:*

**Plantation and tropical timber :** For companies operating in down-stream value chain, we expect companies to implement credible supply chain traceability systems up to the farm / point of production.

**Plastics:** We expect transparency on controls, audits, and panies failing to set: (i) recycled feedstock targets for polymers used in single use plastics LDPE<sup>4</sup>, LLDPE<sup>5</sup>, PS<sup>6</sup>, PET<sup>7</sup> (ii) recycled contents targets above industry/local average<sup>8</sup> for PET bottle manufacturers (iii) Polymer recyclability targets for those involved in plastic packaging, cutlery, fishing nets polymer.



# Product Safety

CONTEXT	MINIMUM STANDARDS	
	Type of ESG risk	Risk assessment indicators examples
<p>The production and use of chemicals in the last decades has generated accumulated pollutions. This is likely to result in greater negative effect on health if sound chemicals management is not ensured. 10 chemicals are known to induce particular health concern including arsenic, asbestos, benzene, cadmium, dioxins, fluorides, lead, mercury, and pesticides. Chemicals companies in upstream part of the supply chain can participate in minimizing risks through avoidance, reduction, substitution, remediation of polluted sites thereby preventing harmful residues.</p>	<ul style="list-style-type: none"> <li>• <b>Contaminations</b></li> <li>• <b>Residues in wastes</b></li> <li>• <b>Chronic disease</b></li> </ul>	<ul style="list-style-type: none"> <li>• Value chain assessment of potential contamination</li> <li>• Engagement with waste management companies and remediation of past pollutions</li> <li>• Participation in chemicals sector platform on safe chemicals</li> <li>• Absence of manufacturing of bespoke products for controversial application (lead pipes, asbestos insulation, single use plastics)</li> </ul>
<p>While new substances are commercialized every year few are assessed for their hazardousness. Yet this step is essential as part of precautionary principle to mitigate long-term risks induced by potentially toxic substances such as persistent organic pollutants (POPs). Corporates adopting adequate approach not only disclose at least SVHC<sup>2</sup>, and banned substances. For new substances they provide a self assessment of hazardousness meeting SVHC<sup>2</sup> descriptions</p>	<ul style="list-style-type: none"> <li>• <b>Hazardous chemicals and agrochemicals</b></li> <li>• <b>GHS<sup>4</sup> labeled substances</b></li> <li>• <b>Chemicals lacking toxicity assessment</b></li> </ul>	<ul style="list-style-type: none"> <li>• Publication of scorecards of company chemical footprint aligned with Chemsec, TNFD<sup>5</sup> sector guide, retailer report card, SASB, WBCSD-PSA<sup>6</sup>, ingredient intelligence report</li> <li>• Self assessment of non-regulated chemical meeting SVHC<sup>2</sup> criteria and of those listed as GHS<sup>4</sup> 1&amp;2 and disclosures</li> <li>• Issuance of a list of banned chemicals and transparency on the list of regulated chemicals used</li> </ul>
<p>Risk exposure to chemicals is influenced by factors such as the duration and combination of exposures, as well as the ability to understand chemical safety instructions. Workers in certain industries and those in developing countries, often facing literacy challenges, are particularly at risk. Mitigation measures include making safety instructions widely available, recommending protective gear, and implementing hazardous labeling but also labeling on food products as additives are likely to reach vulnerable populations, especially children.</p>	<ul style="list-style-type: none"> <li>• <b>Chemicals handling risks</b></li> <li>• <b>Contamination</b></li> <li>• <b>Chemicals overuse</b></li> </ul>	<ul style="list-style-type: none"> <li>• Issuance of a chemicals safety policy</li> <li>• Availability of Instruction material under various media (written, video etc.)</li> <li>• Clear labeling under GHS<sup>1</sup> standard</li> <li>• Food labeling</li> </ul>

*Due to the risks induced by long-term impact of persistent chemicals on ecosystems and health and separately, hazardous pesticides specifically on developing countries' farmers due to lack training on safe use: Exclusion applies to:*

- **Chemicals:** Manufacturing of below 5 persistent organic chemicals (POPs) or a time-bound phase-out plan exists or evidence that there is no alternative
- **Agrochemicals:** Exposure of sales to Highly Hazardous Pesticides<sup>1</sup> is below 5% sales or time-bound phase-out plan exists or there is no alternatives



# Working conditions, Human Rights

CONTEXT	MINIMUM STANDARDS	
	Type of ESG risk	Risk assessment indicators examples
<p>Chemical sector activities induce heightened safety issues. Workers are exposed to explosion, corrosion risk and contamination by hazardous chemicals. Long-term exposure to hazardous chemicals and cocktail effect induce increased hazard level. Workers are also exposed to heat caused by proximity with furnaces.</p>	<p><b>Employees' labor rights &amp; workers safety</b></p>	<ul style="list-style-type: none"> <li>• Basic measures in place for employees impacted by restructuring (financial severance, re-training, job-search assistance etc)</li> <li>• Measures to promote fair working conditions and a sustained social dialogue in countries with less stringent regulations</li> <li>• Anonymous reporting channel to report non-ethical behaviors in the workplace</li> <li>• Frequency and severity of health &amp; safety accidents (direct workers and contractors) decreasing overtime</li> <li>• Seasonal workers risk reduction policy</li> </ul>
<p>Chemicals sector is increasingly exposed to agricultural and forestry commodities caused by their transition to organic biomass as substitute to petrochemicals. Tropical commodities in particular, are linked with field worker abuses and child labor. Plastics waste streams also frequently originates from disadvantaged plastics pickers exposed to detrimental working conditions. Companies sourcing from developing or emerging area and high risks raw commodities should deploy specific risk monitoring measures.</p>	<p><b>Human Rights in the Supply-chain</b></p>	<ul style="list-style-type: none"> <li>• Existence of a Code of Conduct for Suppliers that includes Human Rights and Labor Rights considerations</li> <li>• Join a multistakeholder industry initiative (ecovadis, amfori, Sedex) and promote and deploy ambitious standards in the supply-chain SA 8000</li> <li>• Implementation of a policy, audits and reports on remediation measures on suppliers not complying with forced labour standards</li> <li>• Violation of UNGC principles and OECD guidelines for Multinational Enterprises and implementation of corrective measures</li> <li>• Implementation of a vigilance plan and policy to monitor compliance with UNGC principles or OECD guidelines for multinational enterprises</li> </ul>

PAI #10  
PAI #11  
PAI #16



# Focus on Genetic Engineering

## CONTEXT

Genetic engineering has emerged as a pivotal tool in biotechnology, offering innovative solutions to some of the world's most pressing challenges. By altering the genetic material of organisms, it can help meet food security issues against the challenge of climate change through crops adaptation to harsh conditions, such as drought, pests, and diseases while reducing the use of irrigation and pesticides. In health applications, engineered microorganisms fed by specific medium support production of essential drugs such as vaccines and gene therapies. It paves the way for personalized medicine, where treatments can be tailored to an individual's genetic makeup. Engineered microorganisms participate in production of biomaterials and biofuels from our wastes. Yet genetic engineering induces risks: there are ethical challenges in altering life form in the objective of species extinction as illustrated by genome editing to artificially regulate mosquito populations. Besides the most invasive engineering techniques such as transgenesis may induce unforeseen consequences by altering genes not targeted in experiment. The widespread cultivation of genetically modified crops may lead to adaptation to agrochemicals inducing competition with native plants. Such risks require applying precautionary principle before all consequences are identified. Finally, monopolization of benefits from patenting of endemic species' genetic material and commercialization of competing substances manufactured from genetic engineering may harm populations relying on traditional exploitation of substances extracted from such endemic species. Mirova deploys a case-by-case approach based on the magnitude of risks entailed by the genetical engineering techniques and subsector.

## MINIMUM STANDARDS REQUIREMENTS

### Scope

- Companies in the agrochemical sector developing seeds, traits, microorganisms, enzymes for fertilization and biocontrol
- Companies in the specialty chemical sector developing essential inputs for drugs, vaccines, or engaged in genes sequencing, meat culture
- Companies in life science sector developing biomass processing products, selective breeding for cattle, insects, algae etc.

### Regulation compliance criteria

- Bioethics regulation are in place in the country of operation and wherever extraction of natural genome takes place
- Compliance committee is in place for Nagoya Protocol on benefit sharing and where relevant principles of Cartagena protocol on biosafety are complied with
- Full cooperation with regulatory body and investigation teams in biopiracy litigation case

### Environmental and social risk management

- Transparency on impact of techniques including (i) Risk assessment on the potential impact of GMOs<sup>1</sup> including invasive species, gene leaks (ii) Transparency on specificities of engineering techniques including NBT (new breeding techniques : CRISPR, cisgenesis, intragenesis) and generic ones such as transgenesis, mutagenesis
- Bioethics policies including (i) Policies mitigating excessive use of living organisms (ii) 3R (replace, reduce, refine) policies in use of lab animals (iii) Efforts to deploy in silico or in vitro techniques
- Benefit sharing compliance including (i) Engagement with local communities claiming traditional use of targeted species (ii) Alignment of lobbying practices on benefit sharing and sustainability targets



# Governance

CONTEXT	MINIMUM STANDARDS	
<p>The credibility and robustness of the company’s sustainability strategy is supported by a comprehensive ESG governance structure and the integration of ESG criteria in the management remuneration. Moreover, business ethics is an important issue and companies must be able to prevent the risk of detrimental practices (corruption, fraud, bribery etc.). Chemicals companies can be exposed to lack of transparency on products toxicity and detrimental lobbying practices aiming at relaxation of hazardousness testing constraints. As such, it is still important that companies be transparent with regard to their lobbying practices and anti-corruption, anticompetitive and bribery policies and initiatives. The risk assessment on this subject is essentially based on a detailed analysis of companies’ controversies and reactions. Because of its strong propensity to generate intellectual property-related revenue, the sector is also keen to aggressive tax optimization strategies, which makes transparent tax communication essential.</p>	Type of ESG risk	Risk assessment indicators examples
	<p><b>Governance of sustainability</b></p>	<p>Existing governance structure enabling the mitigation of environmental and social risks</p> <p>Unadjusted gender pay gap <span style="float: right;">PAI #12</span></p> <p>Board Gender Diversity <span style="float: right;">PAI #13</span></p>
	<p><b>Business Ethics</b></p>	<p>Robust Business ethics policies covering lobbying practices, anti-corruption, anti-competitive and bribery policies</p> <p>Evidence of effective whistleblower channels and transparency around cases reported and actions implemented</p> <p>Systematic training on Company’s and Suppliers’ Code of Conduct <span style="float: right;">PAI #17</span></p>
<p><b>Tax practices</b></p>	<p>Effective tax rate vs. equal statutory tax rate</p> <p>Absence of controversies or evidence of aggressive tax optimization practices</p> <p>Estimated exposure to tax havens* or tax non-cooperative jurisdictions with no real activity in the country</p>	



# Appendices

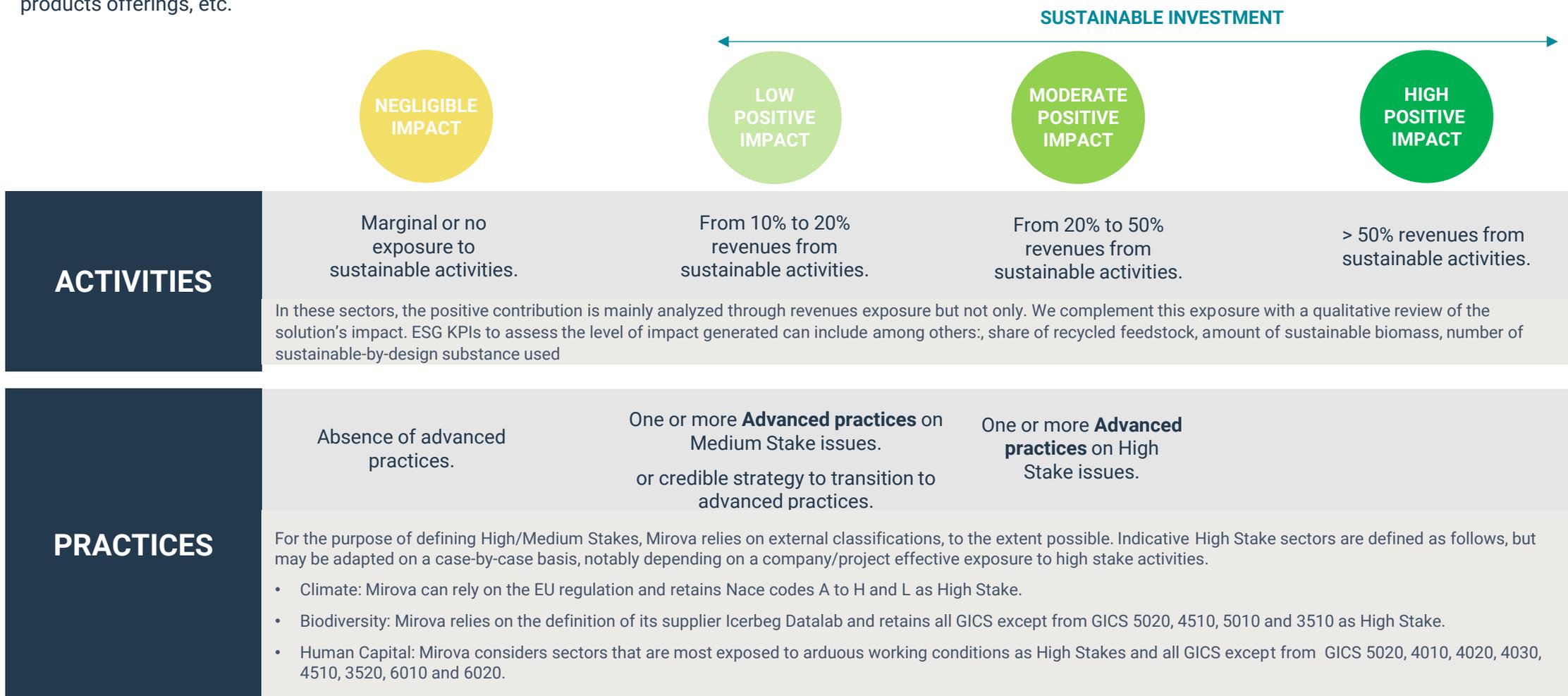


## EXECUTIVE SUMMARY

# Positive Impact

According to Mirova's internal methodology\*, contribution to the SDGs can be grouped in two main categories, which are often complementary.

- The “**activities**” ie. the. products and services they offer.
- The “**practices**” ie. the way operations can contribute to create sustainable and inclusive jobs, or by having strong commitments to net zero targets beyond their green products offerings, etc.



## EXECUTIVE SUMMARY

# Residual ESG risk

### SECTOR INHERENT RISK LEVEL: HIGH

For the chemicals sector, most material risks relate to GHG emissions from processing of petrochemicals feedstock, use of carbon intensive power and biomass but also nitrogen oxide from fertilizers. In the upstream value chain use of biomass induce exposure to deforestation-linked commodities such as oil seeds. Manufacturing of new substances induce potential high risks on health and the environment as they are unassessed; of particular concern are persistent pollutants and their residues.

Manufacturing of polymers used in single use plastics induce marine pollution.

In the upstream value chain, reliance on biomass and wastes feedstock induce forced labour risks in crop harvesting and waste picking. Handling of hazardous & explosive substances, exposure to heat and cold induce heightened worker safety issues. In the downstream value chain, lack of safety instructions induce inadequate management of chemicals while long-term exposure induce risks of injuries on consumers. Finally lack of transparency on chemicals' toxicity relate to governance risks.

### COMPANY INHERENT RISK LEVEL

A company inherent risk level may differ from the inherent risk level of the sector.

The definition of the company inherent risk level may also be determined by the specificities of the business model, the nature of the activities and their locations as well as that of their suppliers (incl. country specific risks).

### MAIN ESG RISKS FACTORS

Climate

Biodiversity

Working conditions & Human Rights

Products Safety

Genetic engineering

Governance of sustainability

Business Ethics

Tax practices

### RESIDUAL ESG RISK LEVEL

#### LOW RESIDUAL RISK

Satisfactory management of the company's or project's main sustainability risks on most material issues.

#### MEDIUM RESIDUAL RISK

Current management in place does not fully cover all ESG risks but these are considered as moderate and current practices are deemed acceptable.

#### HIGH RESIDUAL RISK

Companies demonstrating significant mitigation efforts operating in sectors with industry-wide complex and unaddressed challenges - systematically under targeted engagement.

#### SIGNIFICANT HARM

Not eligible for investment.



# Principal Adverse Impact Indicators

ADVERSE SUSTAINABILITY INDICATOR		MOST RELEVANT	Thresholds / Criteria
<b>CLIMATE AND OTHER ENVIRONMENT-RELATED INDICATORS</b>			
<b>Greenhouse gas emissions</b>	1. GHG emissions	X	Systematic integration in qualitative internal analysis
	2. Carbon Footprint	X	
	3. GHG intensity of investee companies		
	4. Exposure to companies active in the fossil fuel sector		
	5. Share of non-renewable energy consumption and production	X	Systematic integration in qualitative internal analysis
	6. Energy consumption intensity per high impact climate sector		
<b>Biodiversity</b>	7. Activities negatively affecting biodiversity sensitive areas	X	Systematic integration in qualitative internal analysis
<b>Water</b>	8. Emissions to water	X	Systematic integration in qualitative internal analysis
<b>Waste</b>	9. Hazardous waste and radioactive waste ratio	X	Systematic integration in qualitative internal analysis
<b>INDICATORS FOR SOCIAL AND EMPLOYEE, RESPECT FOR HUMAN RIGHTS, ANTI-CORRUPTION AND ANTI-BRIBERY MATTERS</b>			
<b>Social and employee matters</b>	10. Violations of UN Global Compact principles and Organization for Economic Cooperation and Development (OECD) Guidelines for Multinational Enterprises	X	Exclusion of companies violating UNGC and OECD principles Systematic integration in qualitative internal analysis Part of controversy monitoring
	11. Lack of processes and compliance mechanisms to monitor compliance with UN Global Compact principles and OECD Guidelines for Multinational Enterprises	X	
	12. Unadjusted gender pay gap	X	Systematic integration in qualitative internal analysis
	13. Board Gender Diversity	X	Engagement plans / ESAP with investees
	14. Exposure to controversial weapons (anti-personnel mines, cluster munitions, chemical weapons and biological weapons)		Exclusion (any involvement)
<b>INDICATORS FOR SOCIAL AND EMPLOYEE, RESPECT FOR HUMAN RIGHTS, ANTI-CORRUPTION AND ANTI-BRIBERY MATTERS</b>			
<b>Human Rights</b>	16. Number of identified cases of severe human rights issues and incidents	X	Systematic integration in qualitative internal analysis Part of controversy monitoring
<b>Anti-corruption and anti-bribery</b>	17. Number of convictions and number of fines for violation of anti-corruption and antibribery laws	X	Systematic integration in qualitative internal analysis Part of controversy monitoring



# Useful Resources

## SFDR

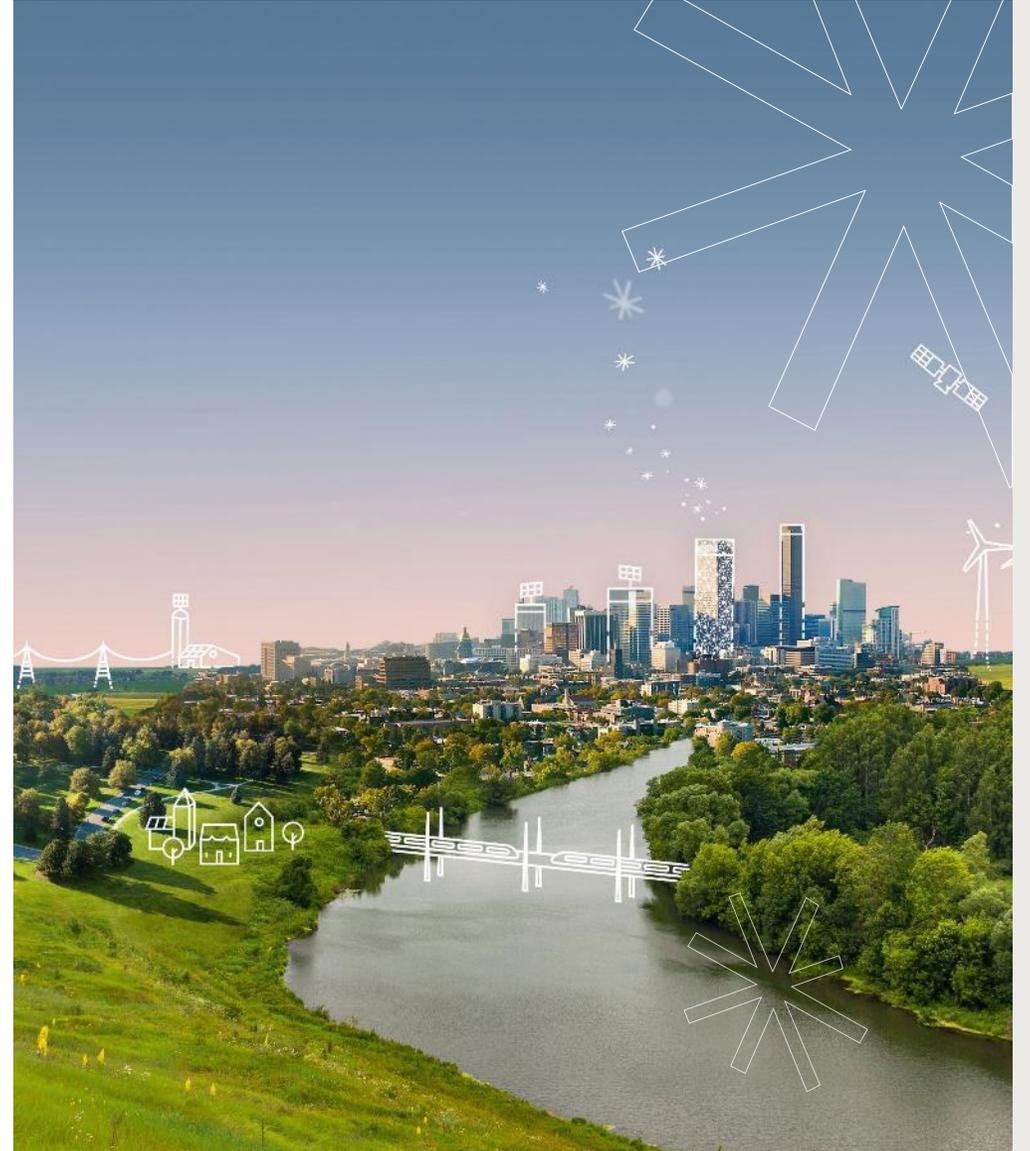
- [Sustainable Finance Disclosure Regulation \(SFDR\): positioning of Mirova Funds](#)
- [Description of the principal adverse impacts on sustainability factors](#)

## POLICIES AND METHODOLOGIES

- [Our approach to impact](#)
- [Our approach to impact & ESG assessment](#)
- [Minimum standards](#)
- [Voting and Engagement policies](#)
- [Temperature alignment of listed investment portfolios](#)
- [Transparency codes](#)



# Disclaimers



## MAIN RISKS

### ESG Investing Risk & Methodological limits

By using ESG criteria in the investment policy, the relevant Fund's objective would in particular be to better manage sustainability risk and generate sustainable, long-term returns. ESG criteria may be generated using Mirova's proprietary models, third party models and data or a combination of both. The assessment criteria may change over time or vary depending on the sector or industry in which the relevant issuer operates. Applying ESG criteria to the investment process may lead Mirova to invest in or exclude securities for non-financial reasons, irrespective of market opportunities available. ESG data received from third parties may be incomplete, inaccurate or unavailable from time to time. As a result, there is a risk that Mirova may incorrectly assess a security or issuer, resulting in the incorrect direct or indirect inclusion or exclusion of a security in the portfolio of a Fund.

### Sustainability risks

The Sub-Funds are subject to sustainability risks as defined in the Regulation 2019/2088 (article 2(22)) by environmental, social or governance event or condition that, if it occurs, could cause an actual or a potential material negative impact on the value of the investment.

Sustainability Risks are principally linked to climate-related events resulting from climate change (i.e. Physical Risks) or to the society's response to climate change (i.e. Transition Risks), which may result in unanticipated losses that could affect the Sub-Funds' investments and financial condition. Social events (e.g. inequality, inclusiveness, labor relations, investment in human capital, accident prevention, changing customer behavior, etc.) or governance shortcomings (e.g. recurrent significant breach of international agreements, bribery issues, products quality and safety, selling practices, etc.) may also translate into Sustainability Risks. Sustainability factors consist in environmental, social and employee matters, respect for human rights, anti-corruption and anti-bribery matters (the "Sustainability Factors"). Portfolio investment process includes binding and material ESG approach to focus on well rated securities from an ESG viewpoint in order to mitigate potential impact of Sustainability Risks on portfolio return. More information on the framework related to the incorporation of Sustainability Risks is to be found in the sustainability risk management policy of the Management Company on its website.



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