ESG Toolkit – Manufacturing Sector

# Introduction

This resource has been created to support ESG officers of Financial Institutions (FIs), to proactively address E&S risks associated with manufacturing facilities. Key risks for the manufacturing sector are highlighted and linked to relevant ESG categories. A general manufacturing due diligence checklist, alongside a selection of sector-specific extension checklists are included, to support the duties of FI ESG officers.

Manufacturing subsectors are often characterised as having medium-high to high inherent ESG risks, given the nature of the often dangerous and pollutive work undertaken. Having a risk-based and proportionate approach to ESG risk management is crucial for FIs that lend to the manufacturing sector.

This resource complements the [BII ESG Toolkit Manufacturing Sector Profile](https://fintoolkit.bii.co.uk/sector-profiles/manufacturing/).

Contents

[Introduction 1](#_Toc122355411)

[1. Manufacturing Sector Key Risks 2](#_Toc122355412)

[2. Manufacturing Sector Generalist Due Dilligence Checklist 3](#_Toc122355413)

[3. Manufacturing Subsector Due Dilligence Checklists 9](#_Toc122355414)

[3.1. Textiles 9](#_Toc122355415)

[3.2. Metal, Plastic, Rubber 11](#_Toc122355416)

[3.3. Foundries 12](#_Toc122355417)

[3.4. Ceramic Tile & Sanitary Ware 14](#_Toc122355418)

[3.5. Base Metal Smelting & Refining 14](#_Toc122355419)

[3.6. Pesticide Manufacturing, Formulation & Packaging 16](#_Toc122355420)

Manufacturing Sector Key Risks

The risk areas listed in Table 1 were identified as most material to the manufacturing sector, following consultation and review of relevant guidelines. The benefits of FI’s focussing on these issues include; increased resiliency of manufacturing clients, reduced costs, safeguarding against brand damage, all whilst supporting value creation. See the ‘business case’ section of the [BII ESG Toolkit](https://fintoolkit.bii.co.uk/transaction-cycle/cdc-guidance/business-case/).

Table 1: Key E&S Risks - Manufacturing Sector

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| **Key Risk Areas** | **ESG Categories** |
| **Resource Efficiency and Waste** | Energy Consumption |
| Water Consumption |
| Air Emissions |
| Wastewater |
| Solid Waste/Residue |
| Hazardous Waste |
| **Health & Safety** | Chemical Hazards |
| Physical Hazards |
| Respiratory & Airborne Hazards |
| Noise |
| Employee Training |
| **Stakeholders** | Emergency Preparedness / Response |
| Pollutants |
| **Labour & Working Conditions** | Wages and contracts |
| Freedom of association & collective bargaining |
| Gender-Based Violence and Harassment (GBVH) Risks |
| **Supply Chains** | Environmental impacts in the supply chain (material extraction, processing, and transportation) |
| Social impacts in the supply chain (labour standards & working conditions, health & safety, impact on local communities) |

Manufacturing Sector Generalist Due Dilligence Checklist

The generalist checklist below covers the 5 key risk areas to the manufacturing sector. It is not expected that all questions will be relevant for every manufacturing due diligence process. However, the checklists do provide ESG professionals with a guide that covers most integral ESG issues they should be aware of.

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| **ESG risk areas and corresponding categories** | **Response** |
| **Management of E&S risks and impacts** | |
| **Risk Governance**   * Please provide details of the team responsible for ESG risk management. |  |
| **General**   * Does the company have an Environmental and Social Management System (ESMS) in place? |  |
| **Emergency Preparedness**   * Is an Emergency Management Plan in place, and agreed with local authorities? * Does the company work with local communities to ensure that emergency response plans are understood, and they understand what to do in the event of an emergency? |  |
| **Resource Efficiency & Waste** | |
| **General**   * What are the key production processes used? Can these adversely impact the air, water, soil, local communities, biodiversity? * What waste and effluent streams does the company generate and how is the company actively reducing and managing these? * Could the company be associated with other forms of pollution (e.g. noise, electromagnetic fields, odours, pathogens, visual impacts)? * Where does the company dispose of its waste? * If contractors are used to dispose of waste, does the company monitor them and have documentary evidence of safe and legal disposal? |  |
| **Energy Consumption**   * What is the company’s energy sources? * Does the company have a clear understanding of energy usage and costs (or are they aggregated within a general operating budget)? * What renewable energy options are available to the company? |  |
| **Water Consumption**   * What is the company’s primary water source? Is this source scarce or in high demand from other users? * Does the company have a clear understanding of water use and costs? |  |
| **Air Emissions**   * How are airborne emissions tested, recovered, collected, and processed/cleaned? (Closed loop systems, recovery units, exhaust ventilation, air filtration systems, scrubbers etc.) |  |
| **Wastewater**   * What wastewater testing and discharge controls do you have in place? (Such as heat recovery, pollutant recovery/treatment) |  |
| **Solid Waste / Residue**   * How do you maximise re-use/recycling in the facility? (e.g. raw material re-use, recycle spent solvent) |  |
| **Hazardous Waste**   * Are biodegradable or bio-eliminable compounds/ agents used? Are there any cases where this is not the case? * Do you use any of the following chemicals (potential red flag)?   + Chemicals prohibited by the Oeko-Tex Standard 1000   + Heavy benzene compounds.   + Dichromates as oxidizing agents   + Chlorinated and fluorochlorinated solvents in open systems. |  |

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| **Health & Safety** | |
| **General**   * Does the company have an Operational Health & Safety (OHS) management system, and a suitably qualified person(s) with ownership of this? * Does the company have a process to record, and investigate near misses and accidents and to ensure that corrective actions are effectively implemented? * Are collective protective measures (e.g. installation of machine guards, buffer zones, guard rails) prioritised over the use of personal protective equipment (PPEs)? * Where residual risks remain after the implementation of collective protective measures, is PPE provided to help reduce the overall risk? * Do you use task rotation strategies to minimise worker exposure? * Is there sufficient segregation and distancing of process, storage, and safe areas? * Have emergency services been provided with a factory layout and list of products stored? Are alarms in place? |  |
| **Chemical Hazards**   * What are the arrangements for storage, handling and management of chemicals (training, control of spills, disposal of chemical containers, provision of PPE etc.)? * Do you unload toxic raw materials and products with a gas balancing system, to minimize fugitive emissions and prevent worker exposure? |  |
| **Physical Hazards**   * Have facilities been designed to minimise the crossover of different activities and processes? * Are there defined processes and procedures in place to ensure safe: load, material, liquid, and equipment handling? Are employees trained in this? * What is your approach to inspecting and maintaining equipment? |  |
| **Respiratory and Airborne Hazards**   * What are your biohazards control measures (choice of inputs, process modifications, material handling, ventilation etc)? * Do extraction, recycling and ventilation systems remove air emissions from work areas? Are [High Efficiency Particulate Air (HEPA) filters](https://www.epa.gov/indoor-air-quality-iaq/what-hepa-filter#:~:text=It%20is%20an%20acronym%20for,of%200.3%20microns%20(%C2%B5m).) used? * Do you conduct periodic personnel health checks? * Do you frequently clean work areas of dust? |  |
| **Noise**   * How do you monitor noise levels? * Are factory processes enclosed or insulated? * Are management controls in place to limit activity and transportation during the night? |  |
| **Employee Training**   * Are employees and contractors familiar with OHS precautions and is there sufficient buy-in to processes? What training is provided? |  |
| **Stakeholders** | |
| **General**   * Does the company impact local communities or environments? (air emissions, transport, water demand etc)? * If the company creates risks for local communities, how does it engage with affected parties? * Has the plant/factory location been appropriately located? (safe distances etc.). |  |
| **Pollutants**   * What risks are there that the company has historical or current contaminated land liabilities? * Have the effects of potential leaks on the surrounding areas been assessed? |  |

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| **Labour & Working Conditions** | |
| **General**   * Does the company comply with national employment regulations and core [ILO Labour Conventions](https://www.ilo.org/global/standards/introduction-to-international-labour-standards/conventions-and-recommendations/lang--en/index.htm)? * Are there specific requirements for minimum age, minimum wage, forced labour and discrimination? * Who has responsibility for HR in the company? Does this person or team have the necessary expertise and skills? * Does the company have a grievance mechanism for its employees and contractors, does this allow the receipt of anonymous complaints? * If asked, what does company management think the workforce would say are their primary concerns about working for this company? * What is the company’s turnover rate? What is the subsector regional average? |  |
| **Wages and Contracts**   * Are the terms and conditions of employment clearly defined, and do all employees have a formal contract? * Does the company use third party contractors or other workers who are not direct employees? How do their terms and conditions of work differ from full time employees? * What are the standard working hours? Is over-time work paid? |  |
| **Freedom of Association & Collective Bargaining**   * Does the workforce have organised associations or unions? * Are workers representatives democratically elected and free to carry out their duties within working hours? * Can employees freely express their opinions/concerns? * Are workers free to join a union? What proportion of workers are union members? Is this increasing or decreasing over time? * How many grievances have been filed by workers (or their representatives) in the past 12 months? How many have been resolved? |  |
| **Gender-based violence and harassment (GBVH) Risks and incident management**   * Do you have a policy/policies which clearly prohibits any form of GBVH, including sexual harassment? What is the scope of the policy? Do you have a senior level champion of this? * What are the mechanisms (such as risk assessments and remedial action) in place to prevent GBVH incidents? * Do you train and build awareness of GBVH for staff and contractors? Do staff and contractors sign a Code of Conduct? * Do you have a safe and official GBVH reporting system? What is the process followed in case of an incident? How do you ensure confidentiality? * Do you have secure and separate toilets and changing areas for women? * *Please* see [Addressing-GBVH-in-the-manufacturing-sector.pdf (bii.co.uk)](https://assets.bii.co.uk/wp-content/uploads/2020/07/14193355/Addressing-GBVH-in-the-manufacturing-sector.pdf) *for more details.* |  |
| **Supply Chain risk management**  Although the extent to which companies and their investors can influence supply-chain practices can be limited, it remains important to thoroughly map and track these risks. This is particularly the case in the manufacturing sector where the raw materials used are often attained though extractive practices, with challenging labour conditions. | |
| **General**   * How do you select your suppliers? Do you have a code of conduct/contractual requirements? What does it include & how you monitor it? |  |
| **Environmental Impacts**   * What are the key environmental impacts and risks in your supply chains? |  |
| **Social Impacts**   * What are the key social impacts and risks in your supply chains? |  |

Further Advice on Supply Chain risk management

* BII Supply Chain E&S Risk Guidance - <https://toolkit.bii.co.uk/esg-topics/supply-chains/?pdf=380>
* PRI – Managing ESG Risk in Supply Chains - <https://toolkit.bii.co.uk/wp-content/uploads/2018/10/PRI_Managing-ESG-risk-in-the-supply-chains.pdf>

Manufacturing Subsector Due Dilligence Checklists

These checklists are extensions of the ‘Generalist Manufacturing Sector Checklist’, with additional due diligence questions for the specified sub-sectors.

Textiles

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| **Resource Efficiency & Waste** |  |
| **General**   * What are the geographical sources of the fibres used? |  |
| **Air Emissions**  *Dust*   * Do you use dust extraction and recycling systems? * Have you installed fabric filters to prevent outdoor emissions?   *Air Pollutants – Fiber Manufacturing*   * Do you use any toxic cleaning solvents?   *Odours*   * Do you use any odour-intensive substances? * What systems are in place to capture and recover off-gasses? |  |
| **Wastewater**  *Scouring*   * Do you use readily biodegradable detergents/surfactants? * Do you recover heat from the final facility effluent?   *Finishing*   * Do you water soluble and biodegradable lubricants for knitted fabrics instead of mineral oil? * Do you use organic solvent washing? * How do you minimise residual liquid? (i.e. reduced application, dewatering equipment.)   *Desizing*   * Do you use bio-eliminable sizing agents? Do you recover water-soluble synthetic sizing agents by ultrafiltration? * Do you integrate desizing, scouring, bleaching in a single step to reduce effluent generation?   *Bleaching*   * Do you use hydrogen peroxide bleaching agents (rather than sulphur/ chlorine-based bleaches)? * Do you use biodegradable products where possible? What are the exceptions?   *Mercerizing*   * Do you recover and reuse the alkali from mercerizing effluent?   *Dyeing*   * Have you optimised your systems to minimise liquor-to-fabric ratios, water consumption, and maximise reuse inputs where possible? * Do you use carriers containing chlorinated organic compounds, phenyls, and biphenyls? If so, can these be replaced by less toxic compounds based on benzyl benzoate and N-alkylphthalimide * Do you use of dye formulations that contain highly biodegradable dispersing agents? (e.g. based on fatty acid esters or modified aromatic sulfonic acids) * Have you adopted a pH-controlled drying process? * What treatment processes do you use on dyeing wastewater? (Electrolysis, ultrafiltration, reverse osmosis, activated sludge, flocculation, oxidation/reduction)   *Process Wastewater Treatment*   * What treatment processes do you use?   + Grease traps, skimmers, or oil water separators for separation of floatable solids?   + Filtration for separation of filterable solid?   + Flow and load equalization; sedimentation for suspended solids reduction using clarifiers; biological treatment, typically aerobic treatment, for reduction of soluble organic matter (BOD)?   + Biological nutrient removal for reduction in nitrogen and phosphorus?   + Chlorination of effluent when disinfection is required?   + Dewatering and disposal of residuals in designated hazardous waste landfills.? * Do you use any other advanced engineering controls? |  |
| **Health & Safety** |  |
| **Chemical Hazards**   * Do you use automatic systems for dosing and dispensing dyes? |  |

Metal, Plastic, Rubber

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| **Resource Efficiency & Waste** |  |
| **Energy Consumption**   * Do you use efficient combination of operations, such as scouring and bleaching, and/or heat recovery? |  |
| **Air Emissions**  *Dust*   * Do you use dust extraction and recycling systems?   Volatile Organic Compounds (*VOCs) & Oil Mists*   * Are VOCs recovered, through vapor recovery units, and use of a fully closed-loop system? * What control technologies are in place (scrubbers, active carbon absorbers etc..)?   *Odours*   * Do you use any odour-intensive substances? * What systems are in place to capture and recover off-gasses? |  |
| **Wastewater**   * Do you recover heat from final facility effluent? * Have you adopted low VOC emitting solvent wash for removal of water insoluble oils? * How is wastewater treated? |  |
| **Health & Safety** |  |
| **General**   * Is all electrical equipment rated for ignition prevention? |  |
| **Air Emissions**  *Dust, VOCs*   * Do extraction, recycling and ventilation systems remove air emissions from work areas? (Important for reducing explosion risk) * Is equipment enclosed? |  |

Foundries

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| **Resource Efficiency & Waste** |  |
| **Air Emissions**  *Dust*   * Are all dust producing equipment enclosed where possible and regularly cleaned? Do you have exhaust ventilation in place? * Where do you store stockpiles? Are these indoor where possible or sufficiently covered if not? * What type of furnace is used? Induction furnaces are preferred, open heart and traditional cupola furnaces should be avoided.   *Air Pollutants*   * What measures are in place to minimise Nitrogen Oxides, Sulphur Oxides, and Carbon Monoxide? * What measures are in place to prevent dioxin emissions? (clean scrap, fabric filters, use of activated powers)   *VOCs & Oil Mists*   * Are VOCs recovered, through vapor recovery units, and use of a fully closed-loop system?   *Greenhouse Gases*   * What energy efficiency measures do you have/aim to have in place? I.E. type of furnace, heat recovery, etc..) |  |
| **Wastewater**   * Have you adopted low VOC emitting solvent wash for removal of water insoluble oils? * Do you route stormwater from process areas into the wastewater treatment unit? |  |
| **Solid Waste / Residue**   * Do you reuse/repurpose slag, and are valuable metals extracted from this? |  |
| **Health & Safety** |  |
| **Air Emissions/Respiratory**  *Dust, Volatile Organic Compounds (VOC*)   * Do extraction, recycling and ventilation systems remove air emissions from work areas? (This is also important for reducing explosion risk) * Is equipment enclosed? * Do you conduct periodic personnel health checks? |  |
| **Chemical Hazards**   * What are the arrangements for storage, handling and management of chemicals (training, control of spills, disposal of chemical containers, provision of PPE etc.)? |  |
| **Physical Hazards**   * Have facilities been designed to minimise the crossover of different activities and processes? * Are there defined processes and procedures in place to ensure safe: load, material, liquid and equipment handling? Are employees trained in this? * What is your approach to inspecting and maintaining equipment? |  |

Ceramic Tile & Sanitary Ware

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| **Resource Efficiency & Waste** |  |
| **General**   * Do you use any glazes that contain lead or other toxic metals? |  |
| **Air Emissions**  *Particulate Matter*   * Where do you store stockpiles? Are these indoor where possible or sufficiently covered if not? * Do you use dust extraction / scrubbing systems?   *Air Pollutants*   * What measures are in place to minimise Nitrogen Oxides, Sulphur Oxides, and Carbon Monoxide?   *VOCs & Oil Mists*   * Are VOCs recovered, through vapor recovery units, and use of a fully closed-loop system?   *GHG’s*   * What energy efficiency measures do you have/aim to have in place? I.E. type of kiln, kiln insultation, heat recovery, etc..) |  |
| **Solid Waste / Residue**   * How do you maximise re-use/recycling in the facility? (E.g. increased plaster mould lifespan, rese sludge created) |  |

Base Metal Smelting & Refining

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| **Resource Efficiency & Waste** |  |
| **Energy Consumption**   * Do you use efficient combination of operations, such as scouring and bleaching, and/or heat recovery? |  |
| **Air Emissions**  *Particulate Matter*   * Are all dust producing equipment enclosed where possible and regularly cleaned? Do you have exhaust ventilation in place? * Where do you store stockpiles? Are these indoor where possible or sufficiently covered if not? * Do you use dust extraction / scrubbing systems?   *Air Pollutants*   * What measures are in place to minimise Nitrogen Oxides, Sulphur Oxides, and Carbon Monoxide? * What measures are in place to prevent dioxin emissions?   *VOCs & Oil Mists*   * Is solvent use minimised? * Are VOCs recovered, through vapor recovery units, and use of a fully closed-loop system? * What control technologies are in place (scrubbers, active carbon absorbers etc..)?   *GHG’s*   * What energy efficiency measures do you have/aim to have in place? I.E. type of kiln, kiln insultation, heat recovery, etc..) |  |
| **Wastewater**   * Do you recover heat from final facility effluent? * What water usage controls do you use – do you have a closed-circuit water reuse system? * How is wastewater treated? |  |
| **Solid Waste / Residue**   * How do you maximise re-use/recycling in the facility? (e.g. re-use sludge) |  |
| **Health & Safety** |  |
| **General**   * Is all electrical equipment rated for ignition prevention? * Is shift and task rotation in place to minimise worker exposure? |  |

Pesticide Manufacturing, Formulation & Packaging

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| **Resource Efficiency & Waste** |  |
| **Air Emissions**  *VOCs*   * Are non-halogenated and non-aromatic solvents (e.g. ethyl acetate, alcohols and acetone) used instead of more toxic solvents (e.g. benzene, chloroform and trichloroethylene)? * What control technologies are in place (reactors enclosed, vapour detection equipment, regular monitoring of pipes, valves, seals, and tanks) * How are VOC’s cleaned/removed (activated carbon absorption, biofiltration)?   *Particulate Matter*   * Are/how are fine particulates of pesticides collected? (air filtration unit etc..) * Where do you store stockpiles? Are these indoor where possible or sufficiently covered if not? |  |
| **Wastewater**   * How is wastewater treated and are solvents recovered? (pH neutralisation, reverse osmosis, biological treatments) |  |
| **Solid Waste / Residue**   * How do you maximise re-use/recycling in the facility? (I.e. raw material re-use, recycle spent solvent) |  |
| **Health & Safety** |  |
| **General**   * Is all electrical equipment rated for ignition prevention? * Are hazard analysis studies undertaken on materials and reactions? * Are activities suitably separated and isolated from others? |  |
| **Air Emissions/Respiratory/Pathogens**   * Are Positive-pressure respirators available in addition to PPE where highly toxic solvents area handled? * What are your biohazards control measures (non-pathogenic microbes utilised, process modifications, material handling, ventilation etc..)? |  |
| **Fire & Explosions**   * Is smoking band in and around facilities? * Have the local fire department been provided with a list of products stored? * Is sufficient segregation and distancing of process, storage, and safe areas in place? |  |
| **Stakeholders** |  |
| **General**   * Is an Emergency Management Plan in place, and agreed with local authorities and potentially the affected communities? |  |
| **Pollutants**   * Have the effects of potential leaks on the surrounding areas been assessed? * What processes are in place to minimise the risk of hazardous material transportation? |  |