Sustaining values

The sustainability agenda of Industrial Manufacturing (IM) companies
Many manufacturing companies are sitting on a sustainability time bomb

1. Environmental impact
   - Bulk of greenhouse gas emissions originates from industrial production (~40%)
     - M&E machinery locks in carbon footprint due to long product life
     - Decarbonization required along entire value chain and life cycle
   - Machinery key enabler for circularity and reduce resource consumption

2. Social and people
   - Low diversity and inclusion in traditionally male driven industry
   - Skill shortage requires an attractive/sustainable employer brand
   - Health and safety regulations in the global value chain
   - Labor practices and human rights along entire value chain

3. Governance and compliance culture
   - Regulation exerts pressure for sustainability (e.g., CSR guideline, EU taxonomy, “Lieferkettengesetz”)
   - Importance of data protection and cyber security (digital business models)
   - Selected customer markets seen as critical (e.g. Defense, Tobacco)

Pressure from customers, financial institutions and competitors towards sustainability is growing
IM companies have started to push the sustainability agenda, however they lack behind other industries

Industrial Manufacturing have set science-based targets for greenhouse gas emissions …

<table>
<thead>
<tr>
<th>Company</th>
<th>Target Set Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyssenkrupp</td>
<td>Company developed and set science based target with clear milestones and continuous tacking</td>
</tr>
<tr>
<td>Cummins Inc.</td>
<td></td>
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<tr>
<td>Krones AG</td>
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<tr>
<td>SIG Combibloc</td>
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<tr>
<td>ABB</td>
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<tr>
<td>Trumpf</td>
<td></td>
</tr>
<tr>
<td>Atlantic Packaging</td>
<td></td>
</tr>
</tbody>
</table>

… while sustainability leaders in other industries go for net negative

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Icebug</td>
<td>The outdoor footwear company Icebug has been climate-positive since February 2019 and offsets more emissions than it produces</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Microsoft has set itself the goal of becoming CO₂ negative by 2030. This includes the use of electric vehicles, planting new trees, carbon capture and storage and direct air capture</td>
</tr>
<tr>
<td>AstraZeneca</td>
<td>AstraZeneca plans to be &quot;CO₂ negative&quot; across the entire value chain by 2030 by removing more carbon from the atmosphere than its 65,000 employees and its extensive network of subsidiaries and production facilities emit</td>
</tr>
</tbody>
</table>
IM companies have to take an holistic value chain view to understand the full ESG impact of their products and services.
IM have significant environmental impact not only within their own but even more on the customers value chain

**Environmental impact of industrial value chains**

(incl. upstream and own footprint excl. downstream)

<table>
<thead>
<tr>
<th>Selected industries</th>
<th>Air pollution (g/EUR)</th>
<th>Water use (l/EUR)</th>
<th>Land use (m²/EUR)</th>
<th>Greenhouse gas (kg/EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal production and processing</td>
<td>0,9</td>
<td>3,4</td>
<td>0,0</td>
<td>0,7</td>
</tr>
<tr>
<td>Paper industry</td>
<td>1,0</td>
<td>8,5</td>
<td>0,1</td>
<td>0,4</td>
</tr>
<tr>
<td>Electrotechnical industry</td>
<td>0,5</td>
<td>3,0</td>
<td>0,1</td>
<td>0,3</td>
</tr>
<tr>
<td>Mechanical and engineering</td>
<td>0,5</td>
<td>2,8</td>
<td>0,0</td>
<td>0,2</td>
</tr>
<tr>
<td>Chemicals</td>
<td>0,7</td>
<td>9,5</td>
<td>0,2</td>
<td>0,4</td>
</tr>
<tr>
<td>Automotive</td>
<td>0,6</td>
<td>4,1</td>
<td>0,1</td>
<td>0,3</td>
</tr>
<tr>
<td>Food retail</td>
<td>1,6</td>
<td>46,6</td>
<td>1,2</td>
<td>0,6</td>
</tr>
<tr>
<td>Clothing retail</td>
<td>0,8</td>
<td>13,6</td>
<td>0,3</td>
<td>0,3</td>
</tr>
</tbody>
</table>

[per euro of industry turnover]

Source: Adelphi – Umweltatlas Lieferkette; SBT Value chain report

**Example Mechanical & Engineering:** 2/3 of total M&E GHG emissions arise downstream during machinery usage

- **Long product life time** results high downstream emissions

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IM Sustainability Strategy

Source: Adelphi – Umweltatlas Lieferkette; SBT Value chain report
As a consequence IMs have to include multiple levers across value chains to improve their sustainability footprint.

**Customer value chain (B2C)**
- **Design**
- **Source**
- **Make**
- **Deliver**

**Customer sustainability**
- **(Re-)Use**
- **Re-cycle**

**IM value chain (B2B)**
- **Engineer**
- **Source**
- **Make**
- **Deliver**

**Upstream sustainability**
- **Consult and collaborate**
- **Use sustainable materials/resources and design-to-manufacture**
- **Choose ethical sources and create transparency**

**Production sustainability**
- **Save resources during production**
- **Minimize emissions from transport and distribution network**

**Downstream sustainability**
- **Lower energy consumption, scrap and increase equipment life**
- **Re-manufacture and re-use components**

**Downstream sustainability (circular economy)**
- **Manufacture sustainable consumer products by using the right equipment/services**
- **Save cost from reduced resource consumption within the B2B value chain**

**Potential levers to increase sustainability**
A materiality assessment helps to identify the right focus

**Materiality assessment – client example**

**Environment**
- Greenhouse gas emissions
- Climate change mitigation/adaptation
- Avoid loss of biodiversity
- Material sourcing efficiency
- Waste management
- Avoidance of hazardous substances

**Social capital**
- Data protection
- Respect for property rights
- Fair competition
- Engagement with local communities
- Ban on child and forced labor
- Supplier’s respect for human rights
- Supplier’s observance of labor rights

**Human capital**
- Occupational health and safety
- Good working conditions and social protection
- Equal opportunities and non-discrimination

**Leadership and governance**
- Fight against corruption
Example 1: A site specific roadmap paves the way to net zero production

Production sustainability – client example net zero roadmap

Assessment and calculation of the carbon footprint

Scope 1
Direct CO₂ emissions
Heat generation from oil and gas; fuel combustion of company cars etc.

Scope 2
Indirect CO₂ emissions from purchased electricity, district heat and cooling
Electricity consumption of own (electric) vehicles and office/production space etc.

Scope 3
Indirect upstream and downstream emissions
Business travel; waste; downstream/upstream emissions of fuel/electricity; employee commuting etc.

Transition roadmap for continuous decarbonization

- Digital processes
- Heat pump project and district heat to city
- Upgrade process heating network
- Decommission of old production line
- 100% use of recyclables

Scope 1
Direct CO₂ emissions

Scope 2
Indirect CO₂ emissions from purchased electricity, district heat and cooling

Scope 3
Indirect upstream and downstream emissions

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Indirect upstream and downstream emissions
Business travel; waste; downstream/upstream emissions of fuel/electricity; employee commuting etc.
Example 2: Circularity reduces the environmental footprint plus can lead to significant material cost savings

Circular Economy – client example machinery producer

Circular Economy production concept

- Produce new product
- Lease/rent
- Get back
- Buy back
- Sell
- Refurbish whole machines
- Recycle
- Reuse components
  - Disassemble
  - Recycle consumables
  - Systematically check valuable components for re-usability
  - Clean components
  - Send back to production
  - Clean
  - Exchange components
  - Conduct functional test
  - Package
  - Lease/rent products
  - Send not usable old products to recycling company

Results achieved

Annual rebuild savings [% of total material costs]

- Components re-used: 55%, 35%, 30%
- Savings per product: 60%, 30%, 60%

- Positive CO₂ impact by reusing components and systems
- Top-line potential by introducing *green-label* on market
- Strengthened of *cross-functional communication* between Sales, Operations and R&D

IM Sustainability Strategy
The ESG journey should start with a pragmatic baselining and setting the strategy with the right and measurable focus.

**Sustainability journey**

<table>
<thead>
<tr>
<th>Evolving vision and target picture</th>
<th>Improvement and scaling</th>
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<tbody>
<tr>
<td>1. Baselining</td>
<td>2. Strategy</td>
</tr>
<tr>
<td>ESG ecosystem</td>
<td>Materiality assessment</td>
</tr>
<tr>
<td>Status-quo assessment</td>
<td>Strategic principles, opportunities and integration</td>
</tr>
<tr>
<td>Benchmarking</td>
<td>Ambition/target/KPI setting</td>
</tr>
<tr>
<td>Pilot(s)</td>
<td></td>
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</tbody>
</table>

| 3. Transformation roadmap        | 4. Operationalization and implementation |
| Transformation lever selection and prioritization | Governance, organization and culture |
| Transformation activity development and timeline | Business process, functional integration and technology backbone |

| 5. Reporting and marketing       | |
| Internal reporting and steering | External reporting and assurance |
| Communication                    | |

IM Sustainability
Strategy
ESG transformation starts with a few key questions

• How **transparent** is our ESG **footprint** today?
• What are **material ESG topics** for your business?
• Are you aware of **ESG opportunities and risks** for your business?
• Do you consider ESG to create a **competitive edge**?
• What is your **ambition for “doing good” and “doing well”**?
• Is ESG an integral **part of your strategy**?
• Do you have a clear **roadmap** and the **right initiatives** in place to achieve your sustainability goals?
• Are you **ahead of ESG regulation**?
• How do you **report on ESG**? Do you anticipate upcoming reporting obligations?
Please contact our team to learn more

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