



Operational Excellence Services

Decarbonization Life Cycle Assessment/ Management (CO2 Footprint)



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Life Cycle Assessment/Management (CO2 Footprint)

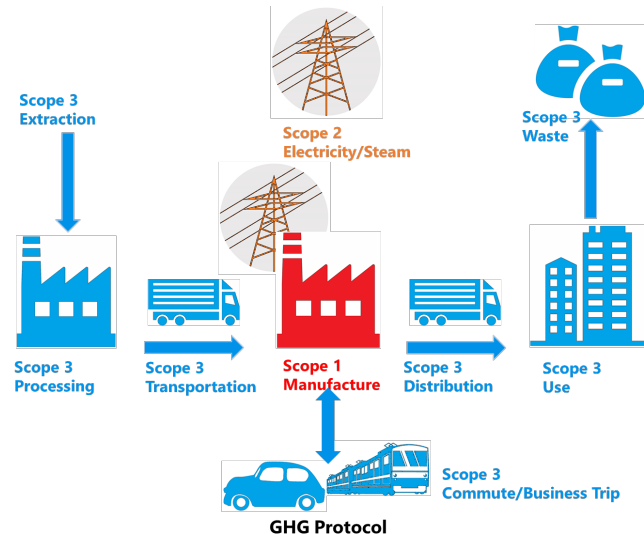
What is the Life Cycle Assessment (LCA)?

- LCA is a method of assessing the environmental impact of your product or service throughout its life cycle (or at a specific stage) :
Resource extraction, raw materials, product production, distribution, consumption, disposal, recycling
- LCA can objectively and quantitatively evaluate whether a product is "good" or "friendly" for the environment, human body, and society

Advanced Application of LCA (LCM) to



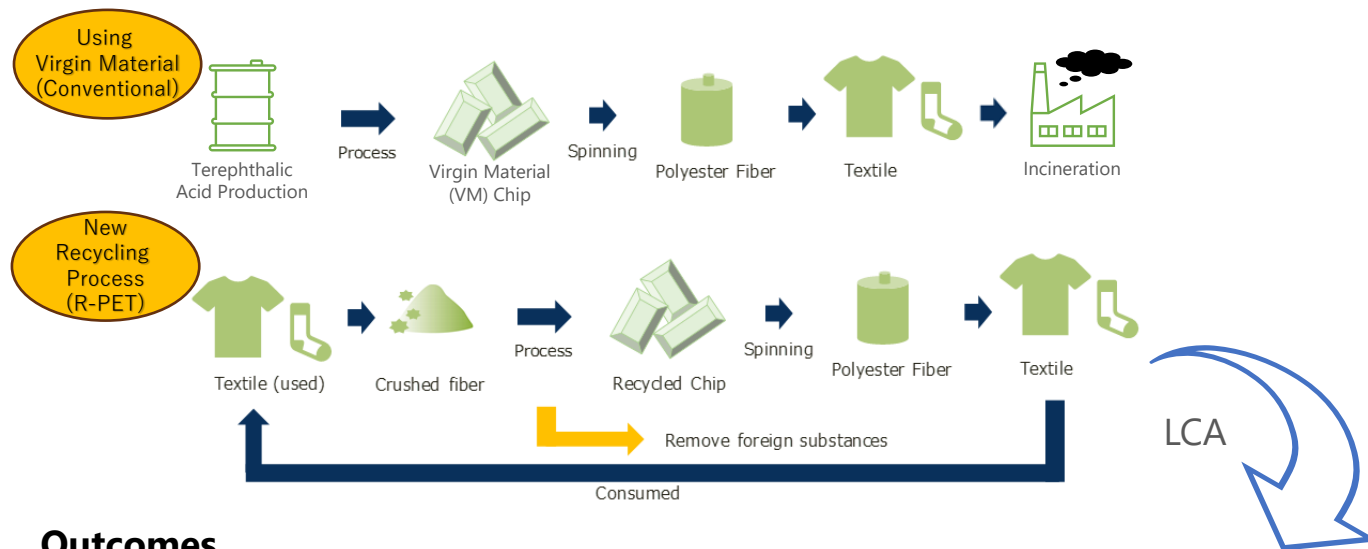
Concept of LCA



High Client Concern on Environmental Impact, Optimized Plant Life Cycle (Engineering, Procurement, Construction, Commissioning, Startup, Maintenance, Manning, Turnaround, Demolition) , GHG Protocol (Scope 1/2/3)

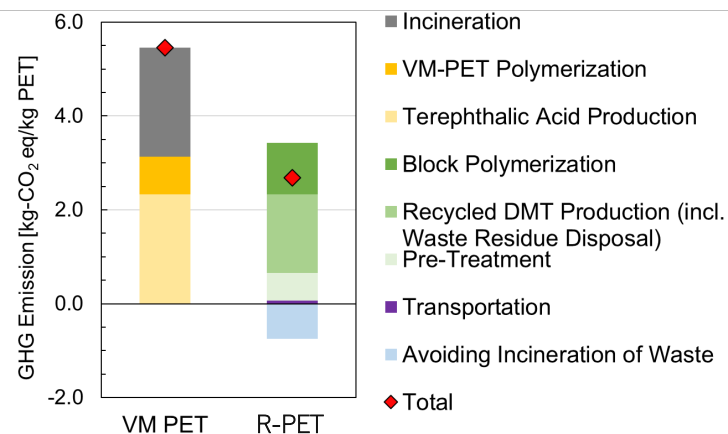
Life Cycle Assessment/Management (CO2 Footprint)

Case Study : LCA for New Recycling Technology



Outcomes

- **Numerical Results^(*):** Detailed CO2 emissions data for each process stage
- **Higher CO2 Reductions:** The new recycling process is expected to achieve significantly higher CO2 reductions compared to the conventional process
- **Visualization of Hot Spots:** Identification and visualization of high CO2 emission hot spots



Achievements

- **Conference Participation:**
 - Attended the International Conference (EcoBalance 2022/24, LCM 2023)
 - Attended the 8th S-LCA Conference 2022 – Leave No One Behind –
- **CO2 Footprint Calculation:**
 - Calculated CO2 footprint (Scope 1/2/3) for CDP Report 2021, 2022, and 2023
 - JGC Holdings received a Score B



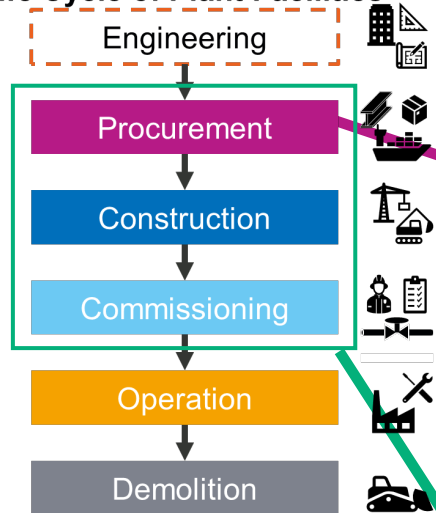
^(*)The scope of evaluation, methods, and assumptions that greatly affect the results, it depends on the implementers and companies

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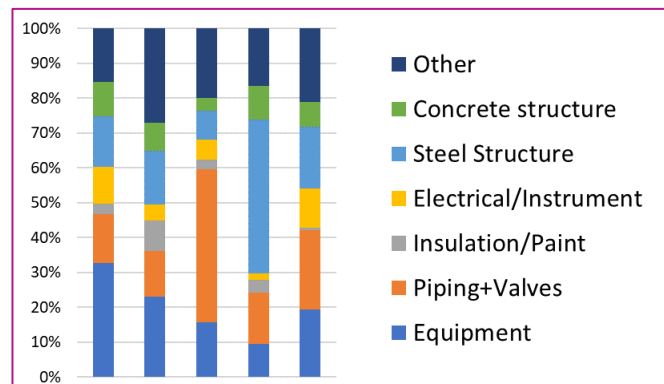
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Case Study : LCA for EPC Business

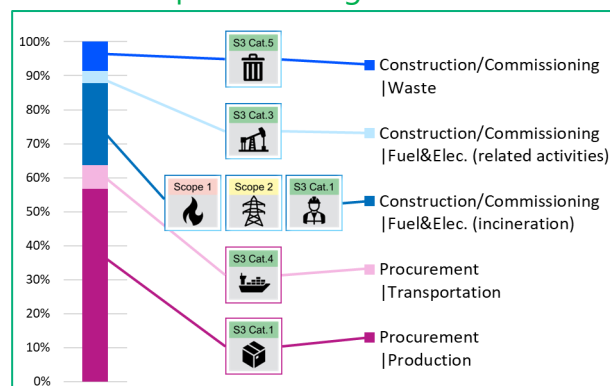
Life Cycle of Plant Facilities



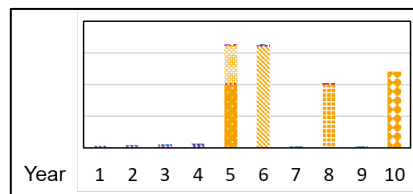
GHG emissions for procured equipment/materials across multiple projects.



GHG emissions from Procurement phase through to Commissioning



Report for annual GHG emissions of a contractor Scope 3



Outcomes

- **Numerical Approach for Plant Life Cycle:** A comprehensive assessment is applied to focus on for GHG Protocol scopes (1/2/3)
- **Real-Time Monitoring:** With a data-centric (DX) approach, both environmental impact and operational data can be monitored in real time, allowing for the identification of hotspots
- **Visualization of CO2 Emission Hot Spots:** High CO2 emission hot spots are visualized throughout the plant life cycle
- **CAPEX/OPEX and CO2 Emissions Relationship:** Understanding the relationship between CAPEX, OPEX and CO2 emissions

Our Strength

- **Broad LCA Expertise:** Conducting Life Cycle Assessment (LCA) not only for the manufacturing business but also for the construction industry
- **Process Engineering Perspective:** Utilizing a process engineering perspective to optimize material flow and reduce GHG emissions
- **Advanced Visualization:** Capability to visualize emissions using the in-house 3D maintenance viewer **INTEGNANCE VR** [See Details](#)