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Spotlight on Digital Transformation
Global Summit 2026

Engineering-Driven Product Sustainability & Regulatory Compliance in Windchill with Makersite and Assent

Rafal Witkowski
Wolfgang Rüdell

ENGINEERING-DRIVEN PRODUCT SUSTAINABILITY & REGULATORY COMPLIANCE IN WINDCHILL WITH MAKERSITE AND ASSENT

1. Introduction
2. PLM and Sustainability & Compliance
3. Engineering Data Foundation for Sustainability & Compliance in Windchill
4. Product Impact Analysis with Makersite
5. Compliance Assessment with Assent Compliance
6. Conclusion and Outlook

ABOUT THE SPEAKERS

Wolfgang Rüdell

Spend my professional live in optimizing engineering activities to:

- Solve complex business problems with clever and simple solutions.
- Empower people to deliver outstanding results.
- Implement innovative and new ideas
- Be open minded to use new ideas in my live

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Rafal Witkowski

Helping discrete manufacturing companies for 20+ years to solve complex engineering challenges

- Software engineering & technical architect background
- Strong focus on PLM and enterprise integrations
- Leadership mindset: empowering people and teams
- Passion outside work: watersports, music

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INDUSTRIAL SUSTAINABILITY CHALLENGES – REGULATORY PRESSURE

- Mandatory environmental **regulations** and **compliance obligations**
- **Product-level environmental footprint reporting** (CSRD, ISSB)
- Alignment of **engineering decisions** with **SBTi** & **Net-Zero targets**
- **Digital Product Passport (DPP)** required under **ESPR**

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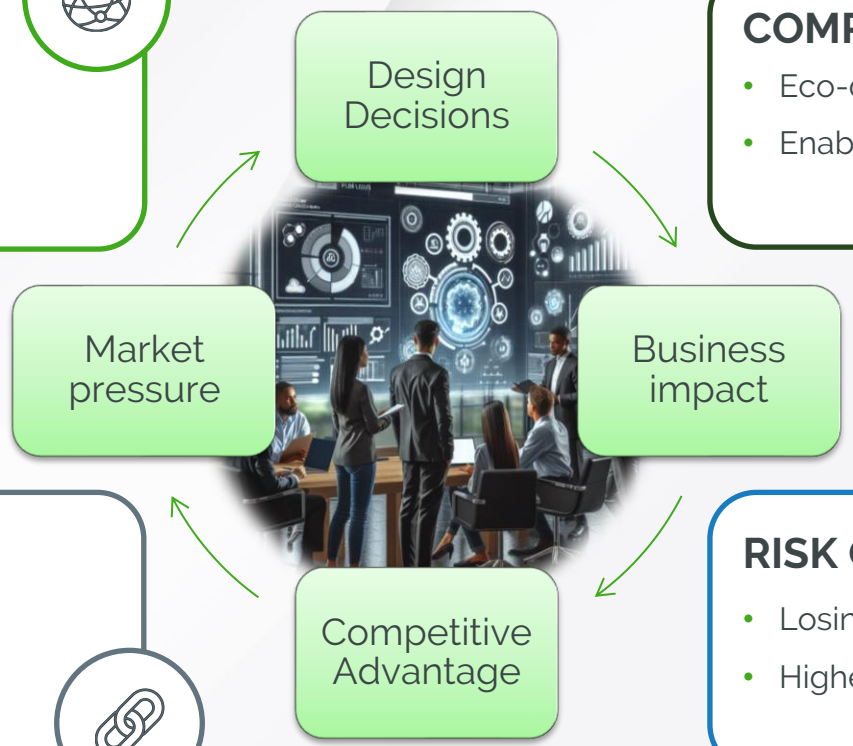
BEYOND COMPLIANCE: SUSTAINABILITY AS A MARKET DRIVER

CONSUMERS CARE MORE

- Growing preference for sustainable products
- Transparency influences decisions

COMPETITIVE ADVANTAGE

- Eco-designed products stand out
- Enables premium positioning



SUPPLY CHAIN PRESSURE

- CO_2 footprint & material transparency required
- Sustainability criteria in RFQs

RISK OF INACTION

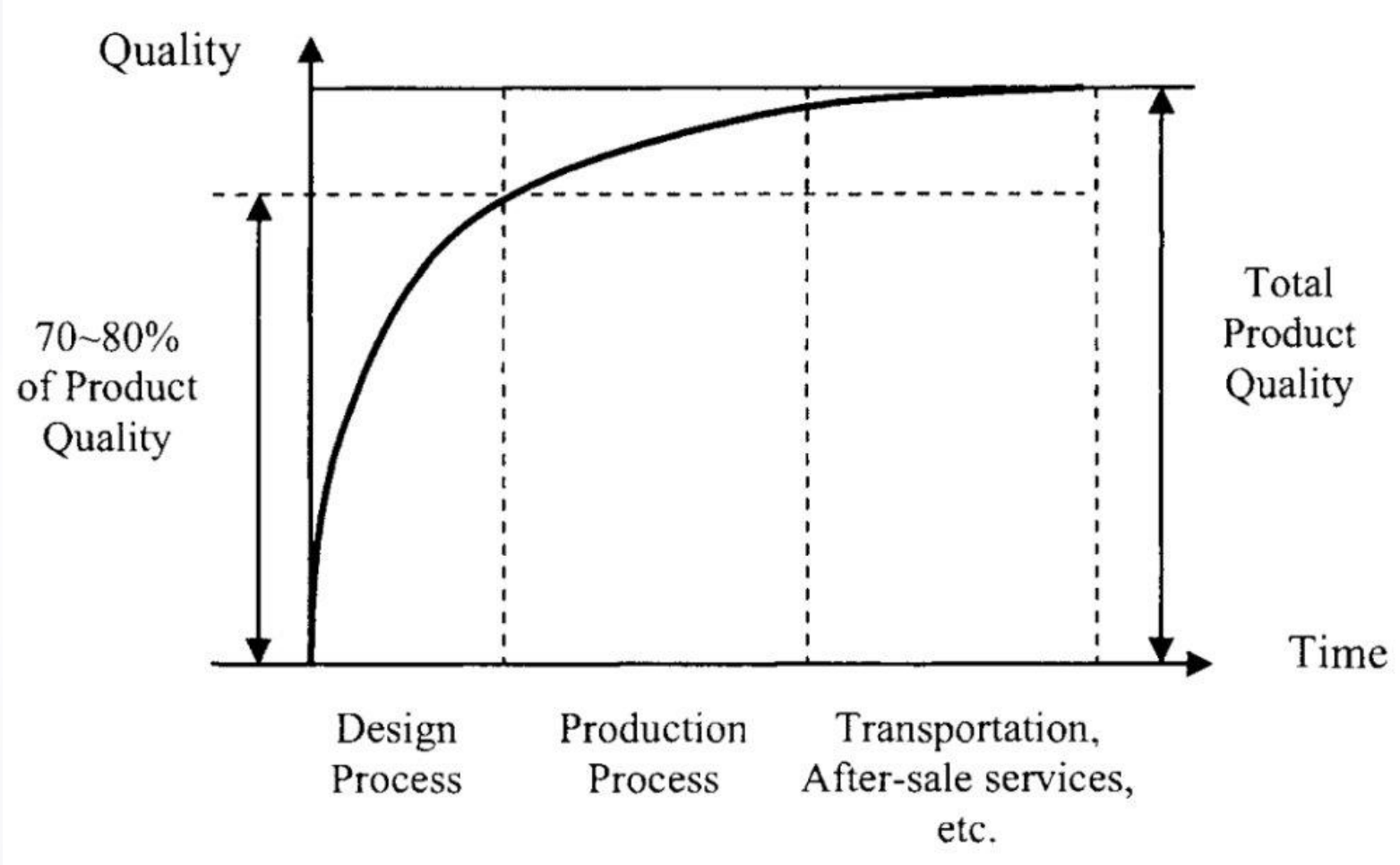
- Losing tenders
- Higher cost if reacting late

Sustainability is no longer just compliance —
it impacts revenue, market access and competitiveness.

Sources. McKinsey (Up to 80% of product's environmental impact is defined in the design phase
Gartner (86% of organizations say ecosystem partnerships are very of extremely valuable for achieving sustainability goals)

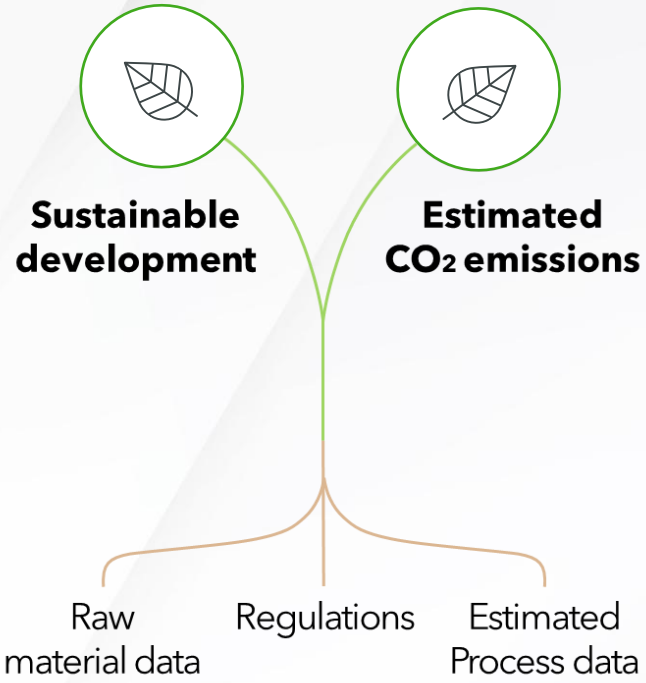
SUSTAINABILITY IS A PRODUCT DATA PROBLEM — DECIDED AT DESIGN TIME

- Design decisions offer the largest CO_2 reduction potential (**~30%**)
- Most environmental impact is locked in early (**up to 80%**)
- ESPR and **Digital Product Passports** require transparent, product-level GHG data



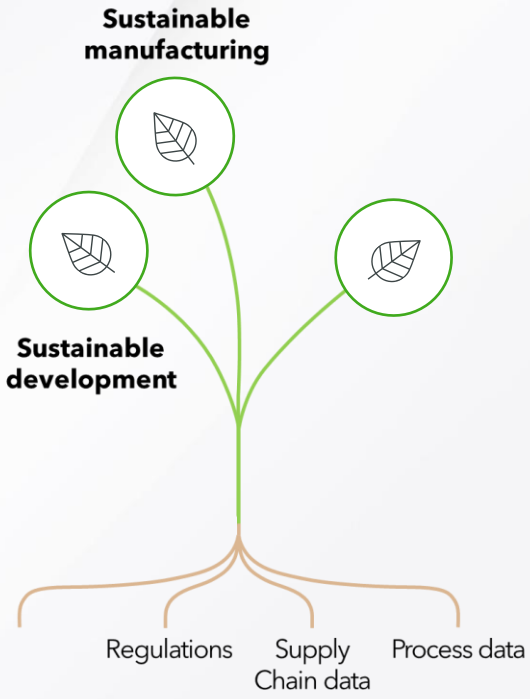
CO_2 FOOTPRINT INFORMATION AND PRODUCT LIFE CYCLE

Design Phase



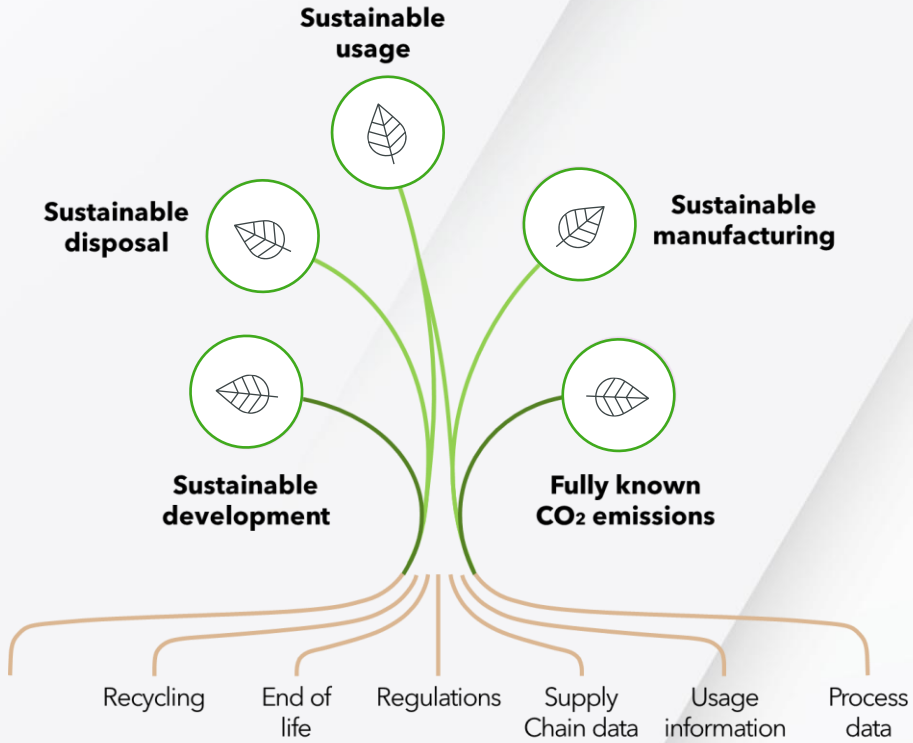
Estimates

Start of production



As Build values

Product in use



As maintained values

EMBEDDING SUSTAINABILITY & COMPLIANCE INTO ENGINEERING

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Engineering Data Foundation for Sustainability & Compliance

- **Product life cycle management**
- **Part management**
  - **Engineering Material**
  - Classification
  - Supplier
  - Alternates
  - Made from
- **Reporting**
  - **BOM Roll-up**
- Product change management
- CAD Data management
- Document management
- **BOM management**
  - As designed
  - As planned

- **UC1 — Sustainability example (Windchill + Makersite)**
  - Automated Product Impact Analysis

Makersite

- **UC2 - Compliance example (Windchill + Assent)**
  - Streamlined Compliance Assessmentt

Assent

Illustrative use cases for sustainability & compliance in engineering

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Engineering Data Foundation for Sustainability & Compliance in Windchill

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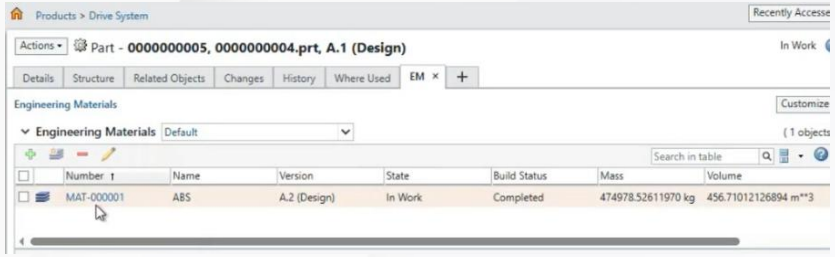
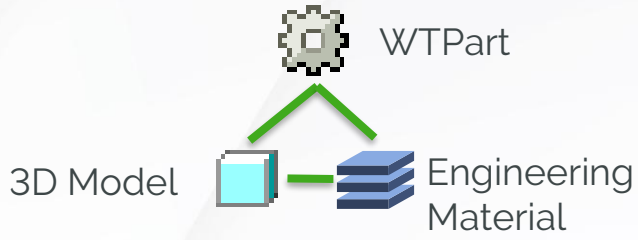
WINDCHILL AND CO_2 FOOTPRINTS

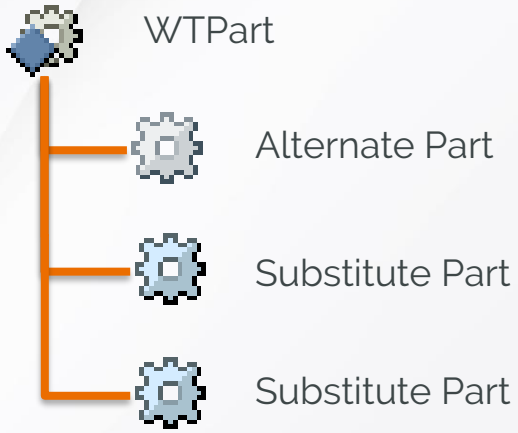
Engineering Material





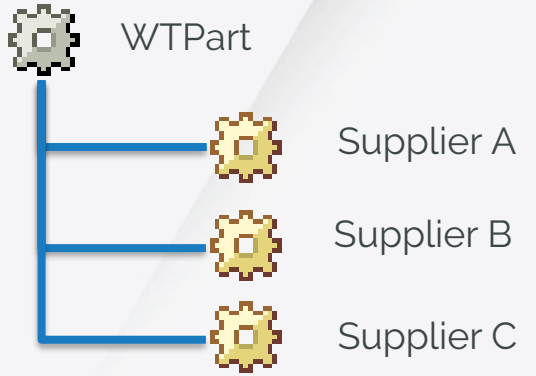
- **Mass** calculated based on **model geometry**.
- Estimated **CO_2 coefficient** managed at **material level**.
- Estimated **CO_2** of **component** calculated based on Mass and Material CO_2 footprint.

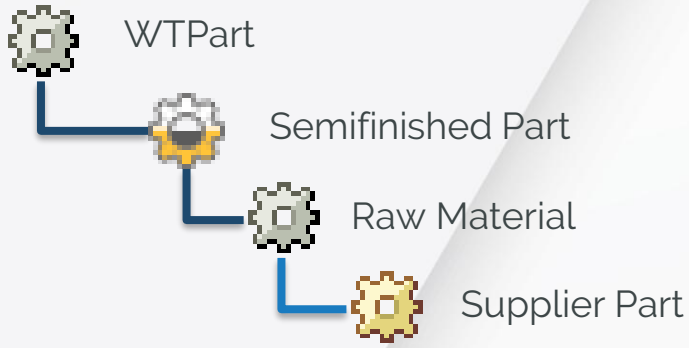
Alternate / Substitute management



- Estimated **CO_2 coefficient** managed for **each part**.
- Estimated **CO_2** of **component** including supply chain information.

Supplier parts management





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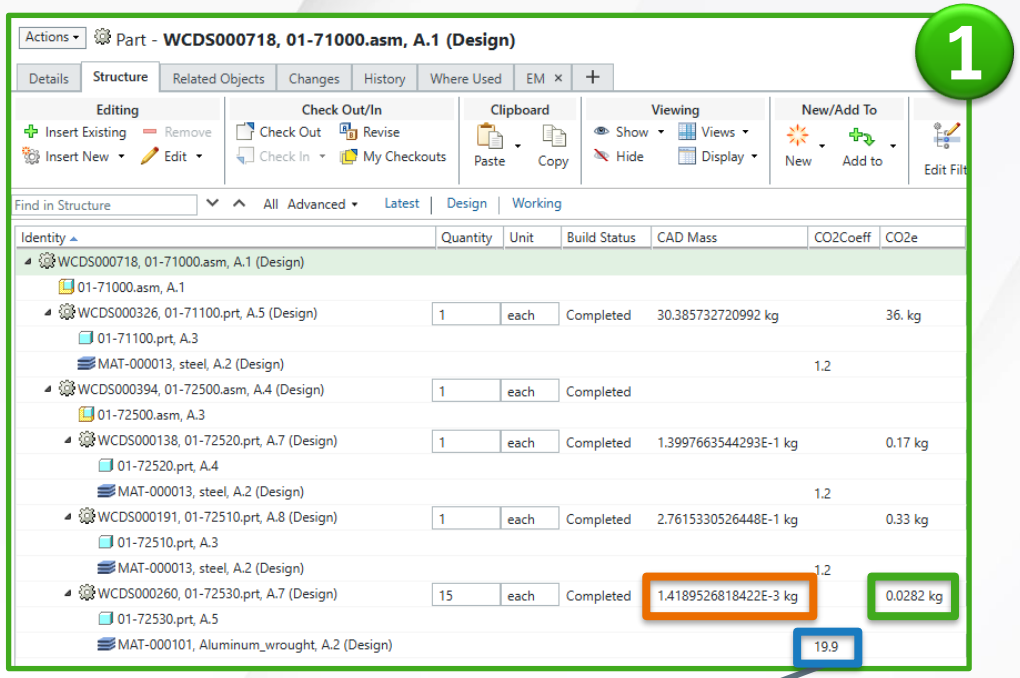
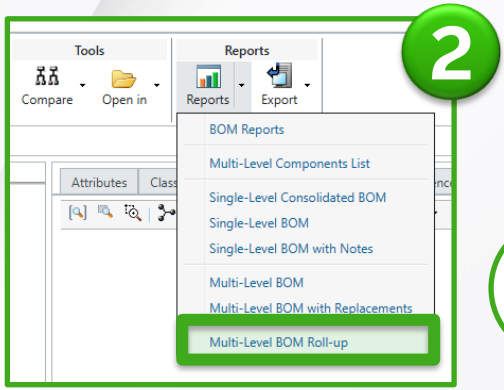
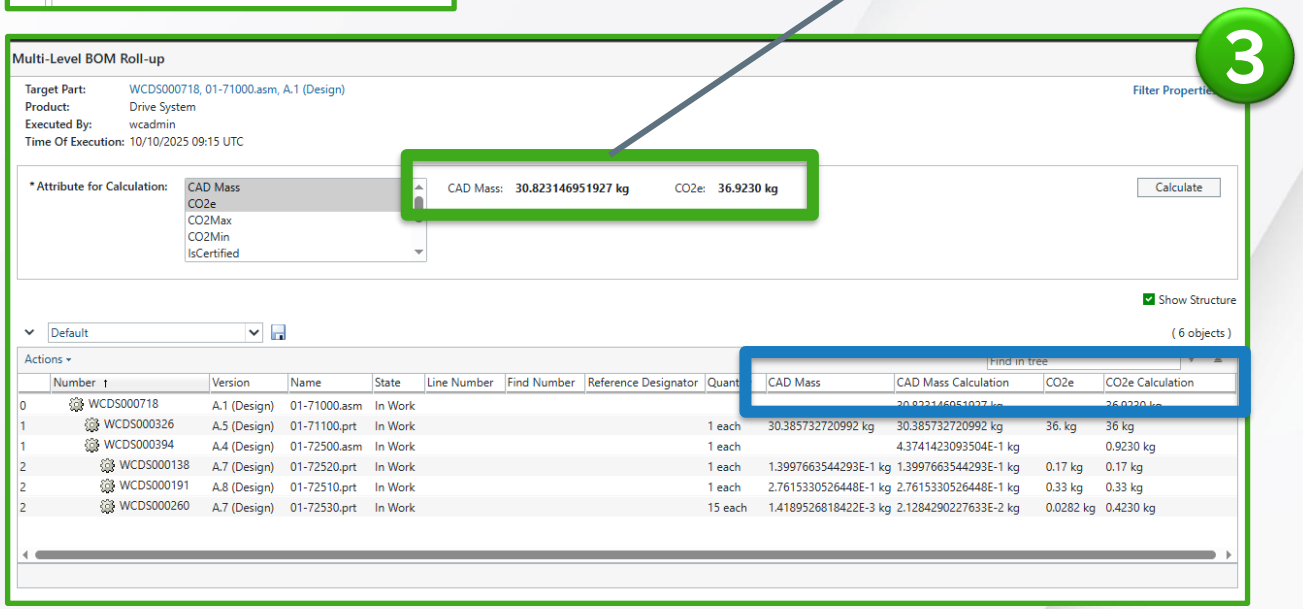
BOM ROLL-UP REPORTING - EMBODIED CARBON FOOTPRINT CALCULATION





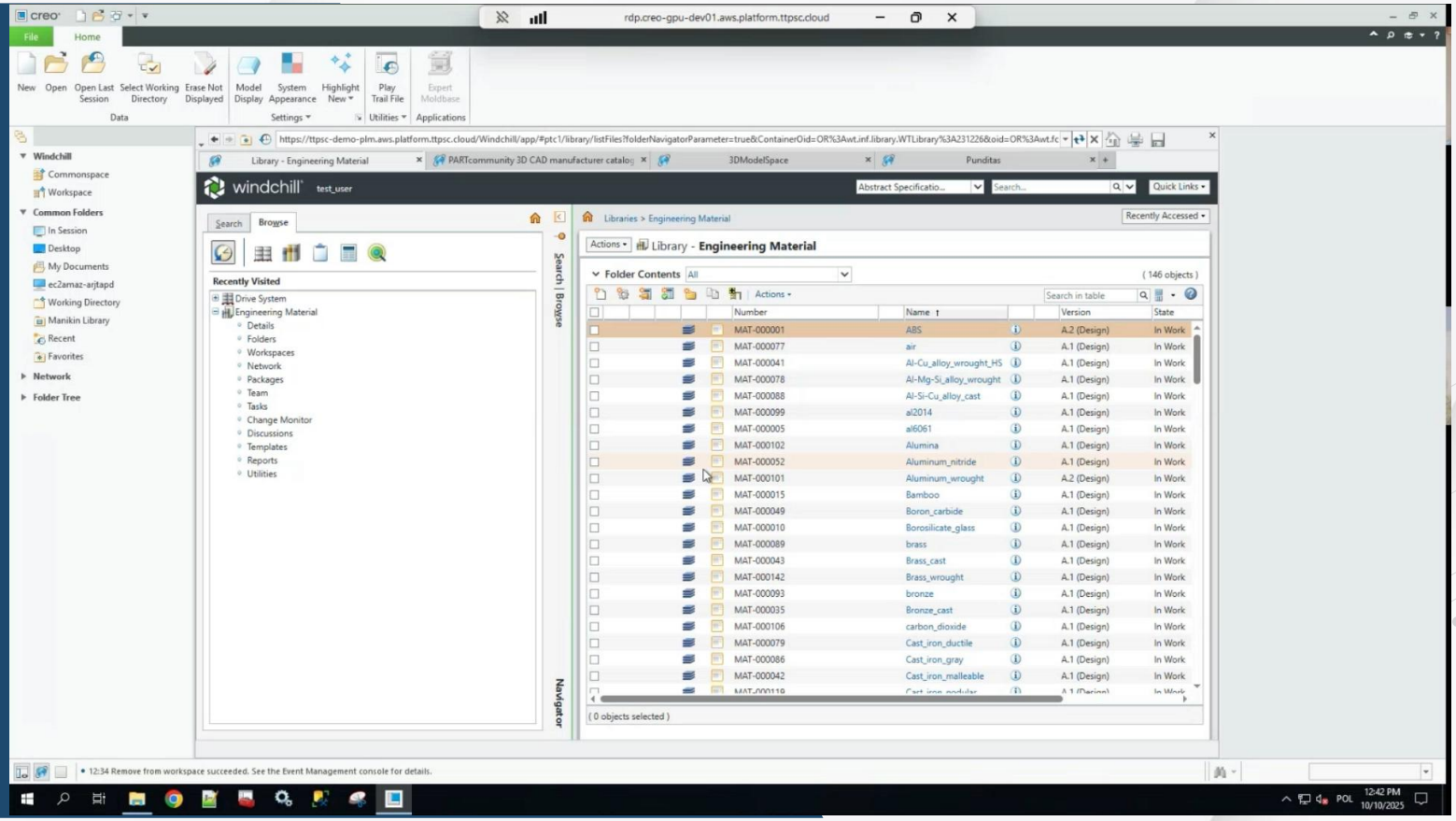
CO_2 footprint and **CAD mass** rolled up to assembly level



CO_2 footprint for component calculated based on **CO_2 co-efficiency** defined at Engineering Material level and CAD mass calculated from geometry.

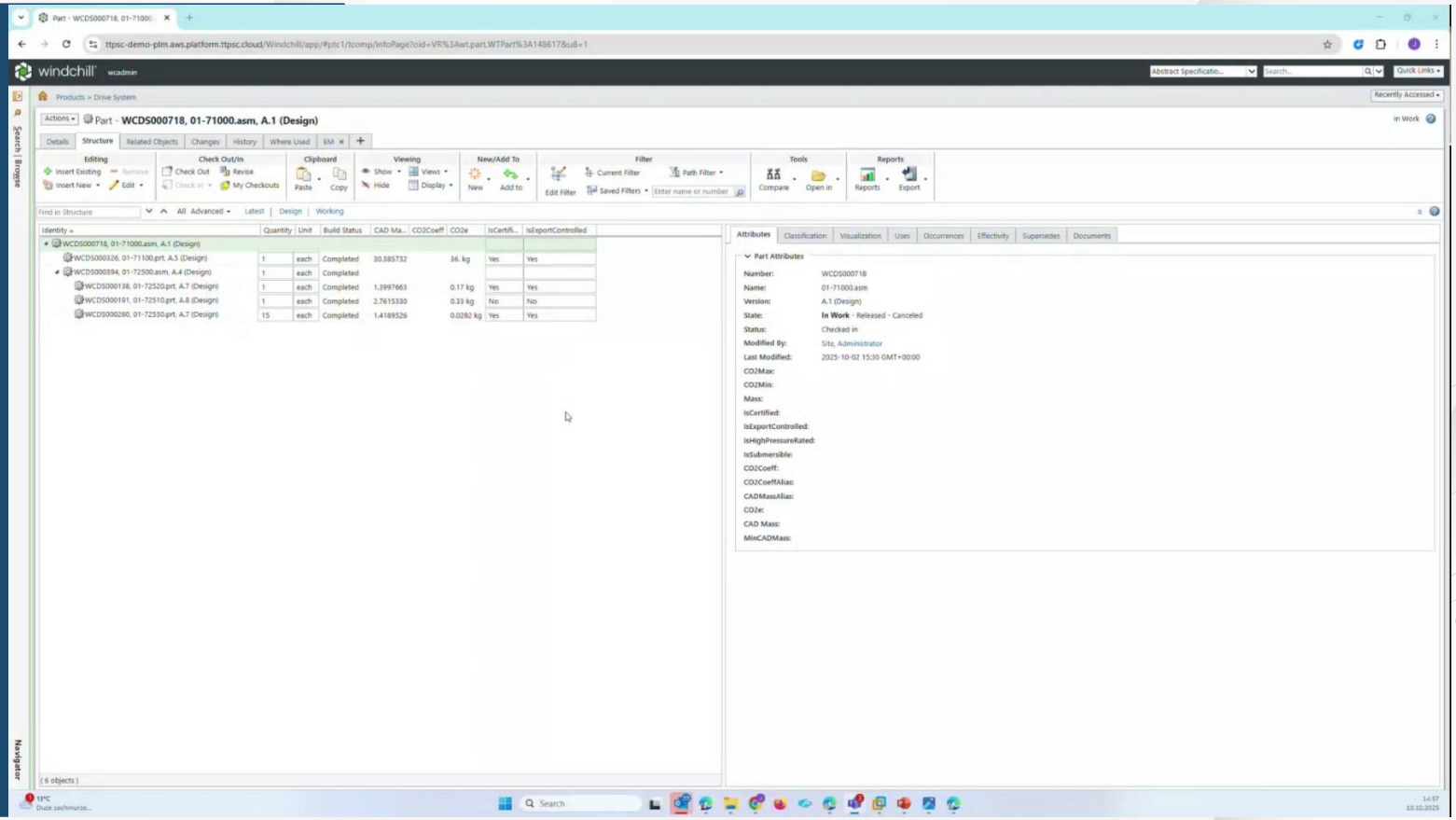
DEMO 1A. WIDCHILL SUSTAINABILITY CAPABILITIES

Engineering Material



DEMO 1B. WIDCHILL SUSTAINABILITY CAPABILITIES

BOM Roll-up Reporting



Product Impact Analysis with Windchill and Makersite

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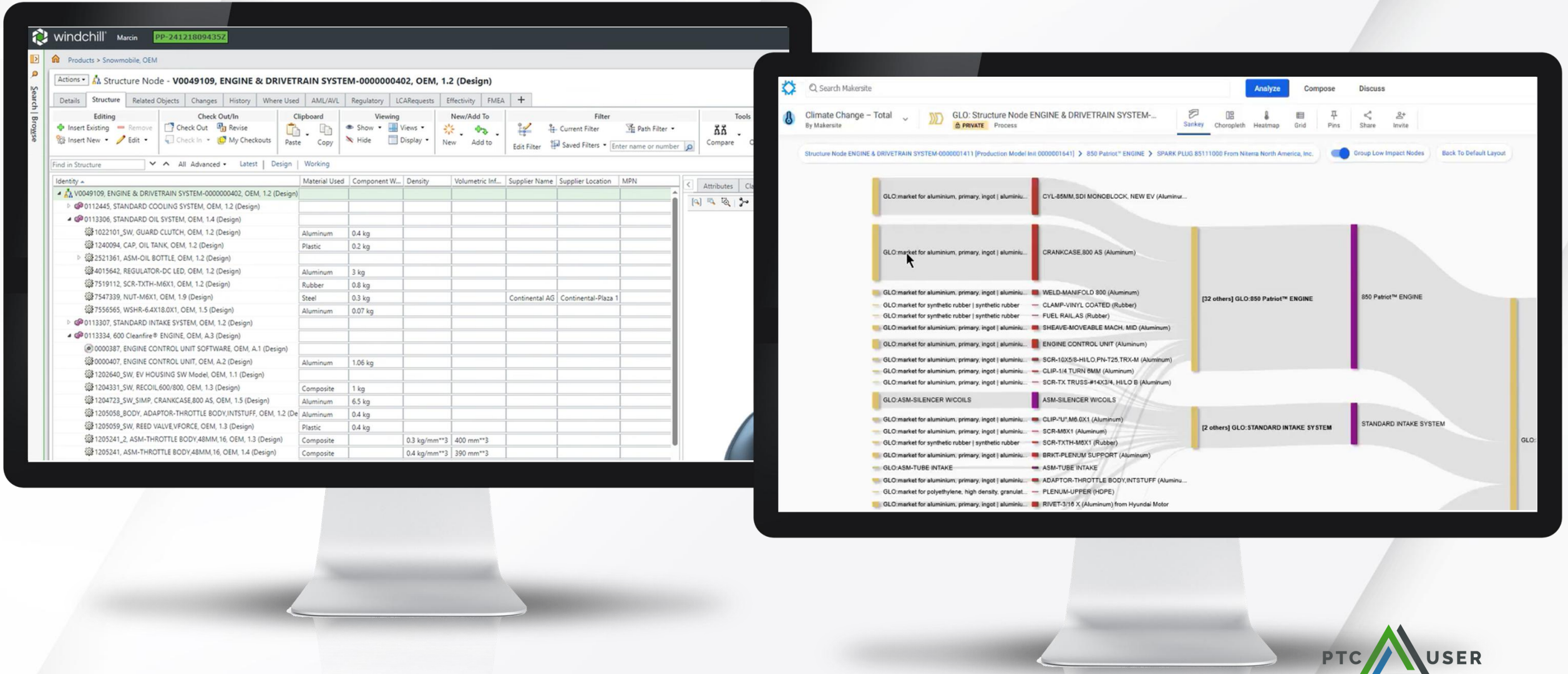
WINDCHILL AND MAKERSITE INTEGRATION



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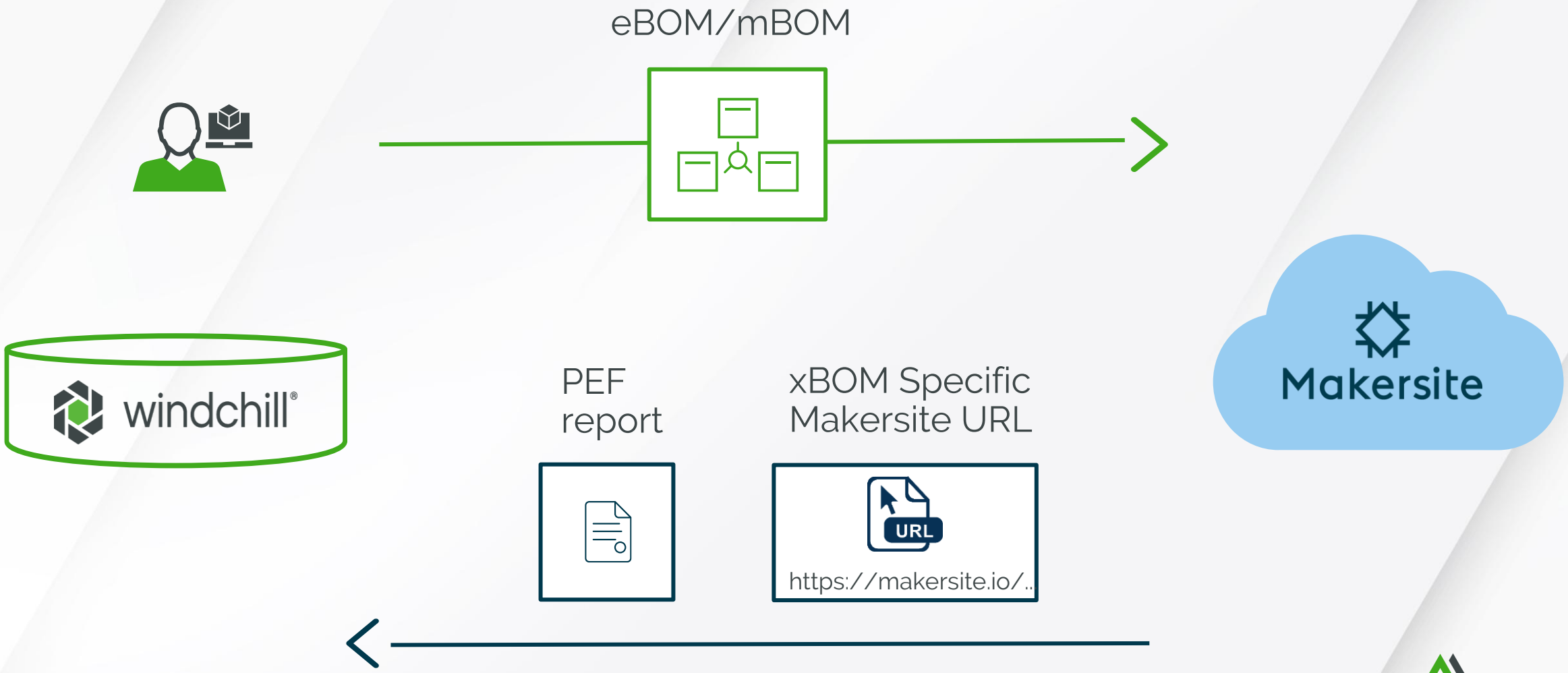
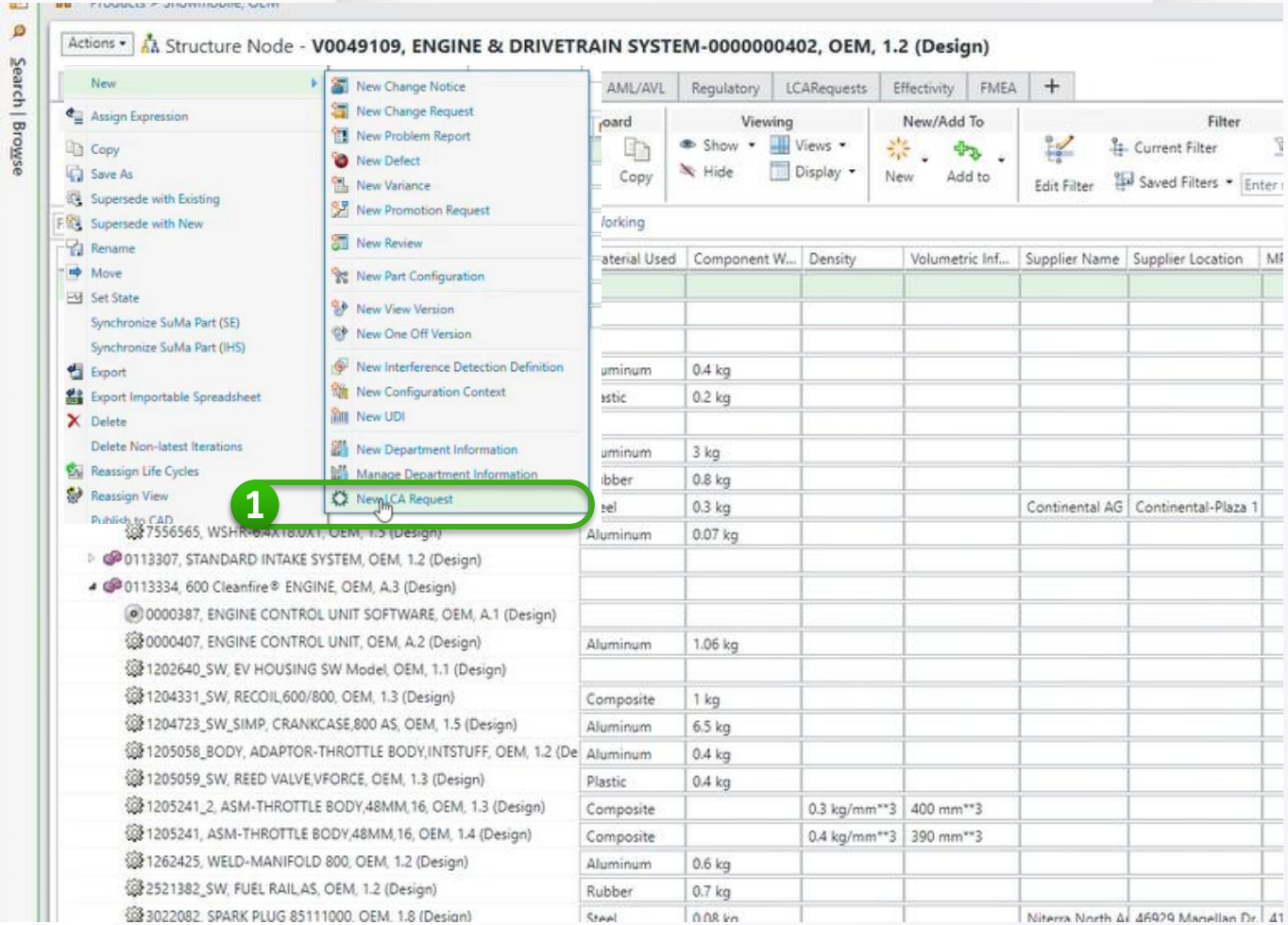
WINDCHILL AND MAKERSITE - HIGH LEVEL FLOW



SOLUTION HIGHTLIGHTS



Key Aspects:

- Triggered by **New LCARequest** action on Part (not applicable for configurable parts)
- **LCARequest** (sub-type of Managed Baseline) – was introduced to represent request for LCA and facilitate sending a BOM to Makersite.
- **Workflow Driven** – LCA publication is driven by Windchill workflow for monitoring
- **PEF PDF and Makersite URL** – stored as attributes on LCA Request associated to root part of the publication

Product Data:

Required	Ideally Sourced
Part Name	MPN
Part Number	Component Weight
Level of BOM	Material Used (for BOM leaves)
Quantity	Volume + Density (in case there is no weight)
Unit (eg kg, pcs etc)	Supplier Name and Location

WINDCHILL AND MAKERSITE – INTEGRATION ARCHITECTURE

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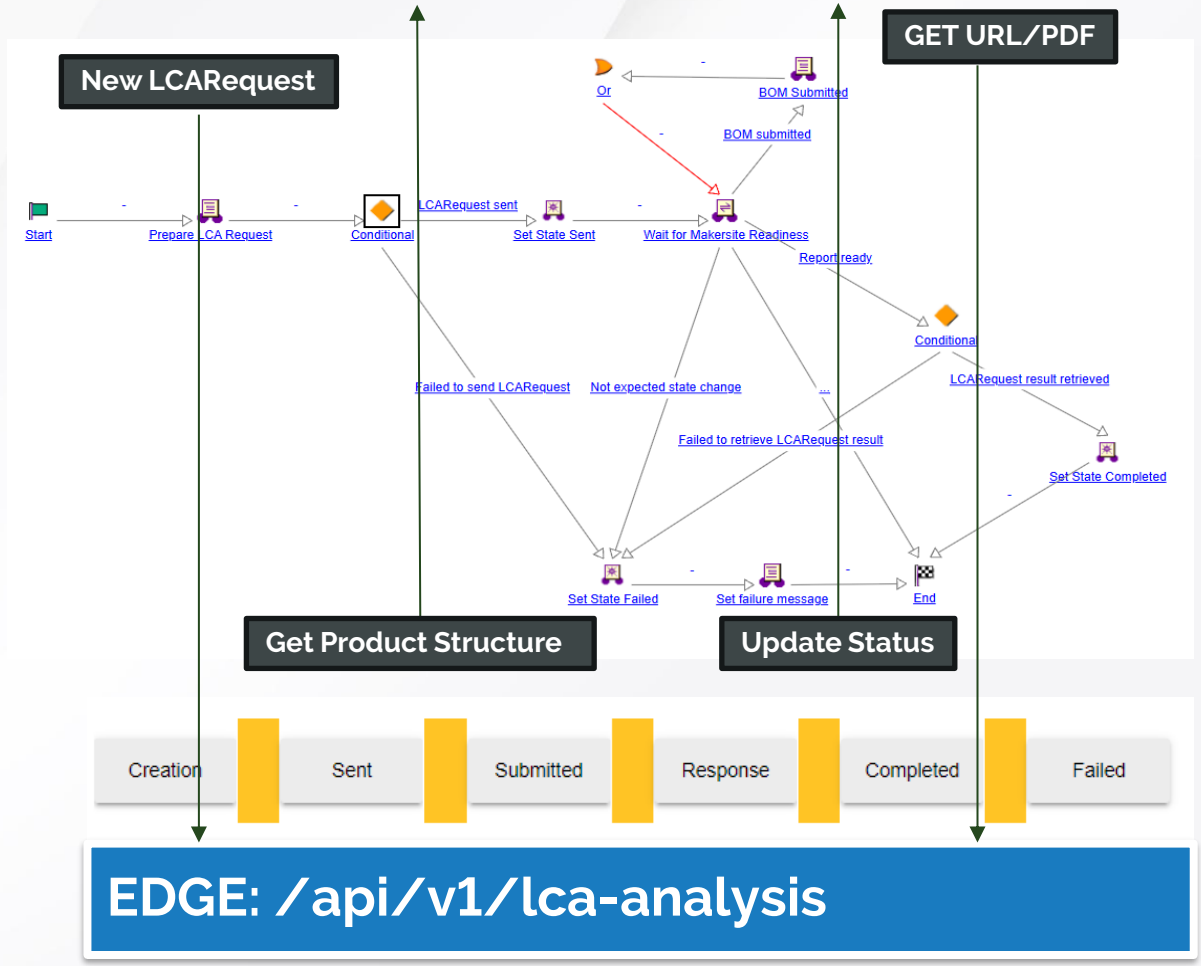
WRS: odata/v1/LifeCycleAssessment



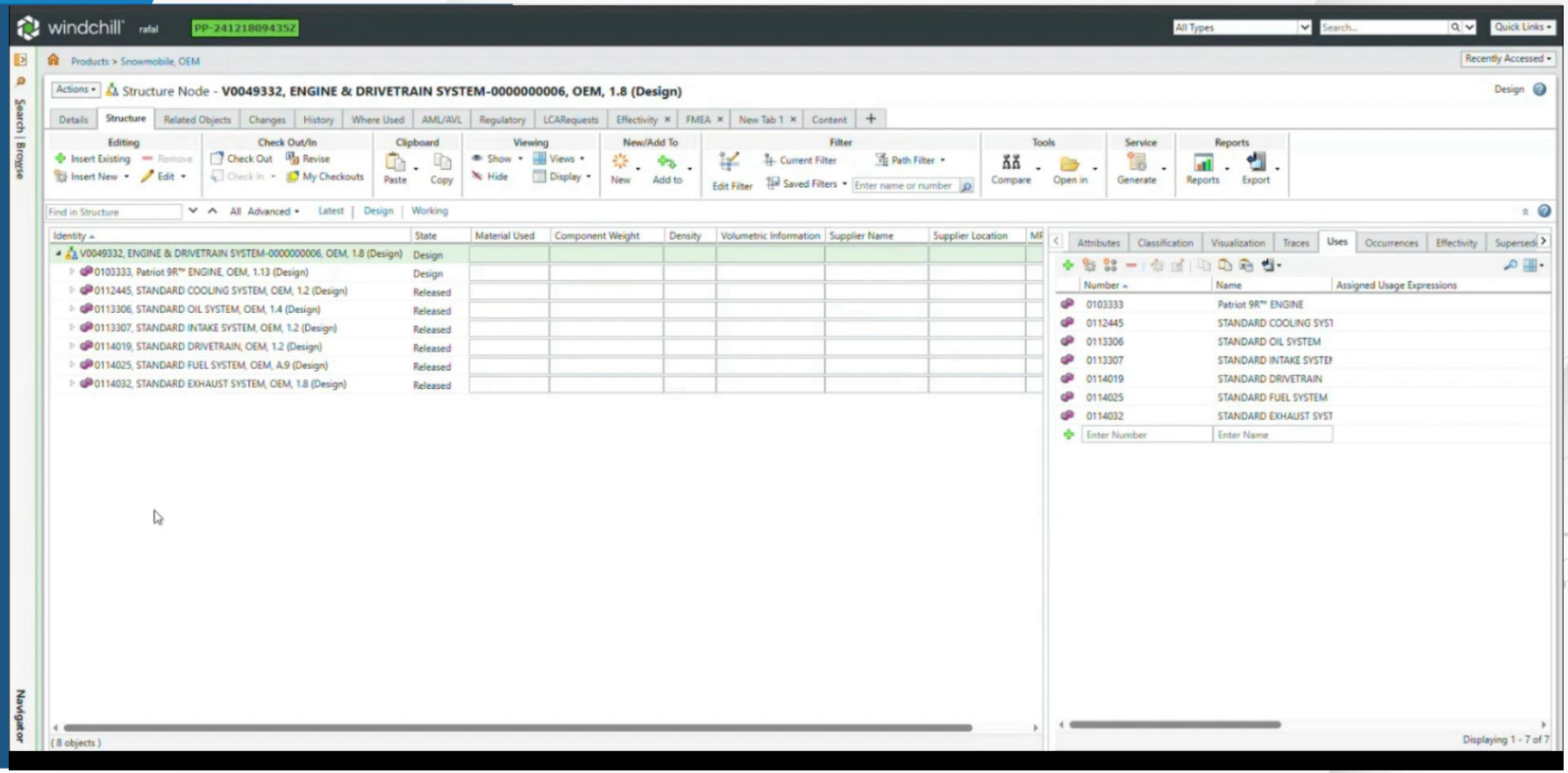
EDGE: /api/v1/lca-analysis

Makersite

- **Event-Driven**:
  - Lightweight push (POST/PUT) messagging
  - Heavyweight on pull (GET)
- **LifeCycleAssessment WRS**
  - Encapsulated ProductStructure served for LCA
- **Windchil Workflow**
  - Background execution
  - Basic monitoring in Windchill

DEMO 2. WIDCHILL AND MAKERSITE

Windchill and Makersite Integration



Illustrative integration demo using test data

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Compliance Assessment with Assent Compliance

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COMPLIANCE ASSESSMENT WITH WINDCHILL AND ASSENT COMPLIANCE

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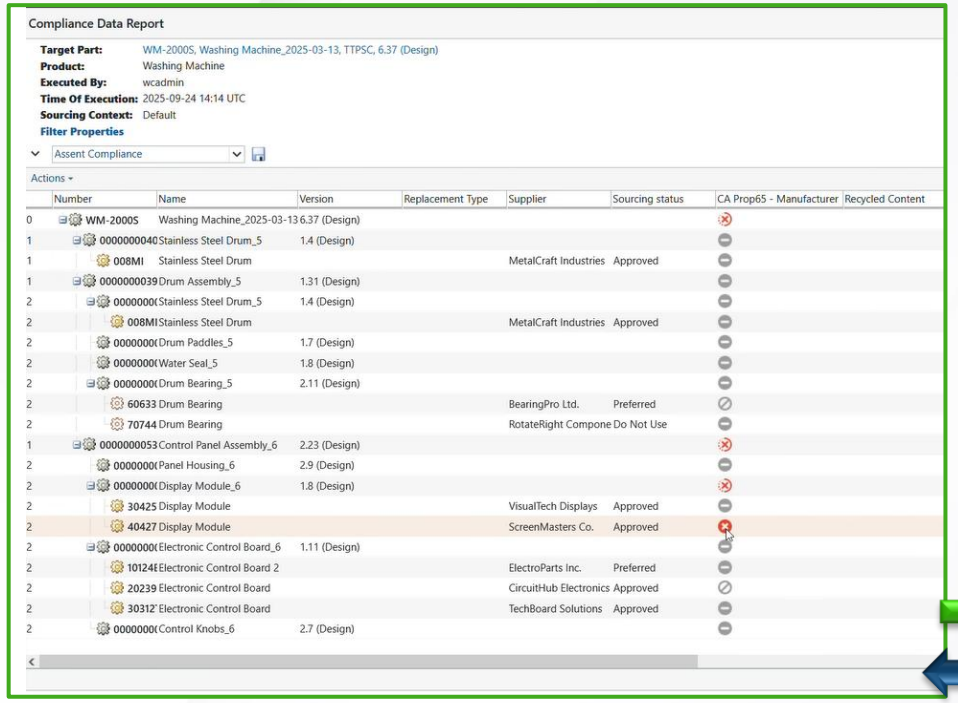
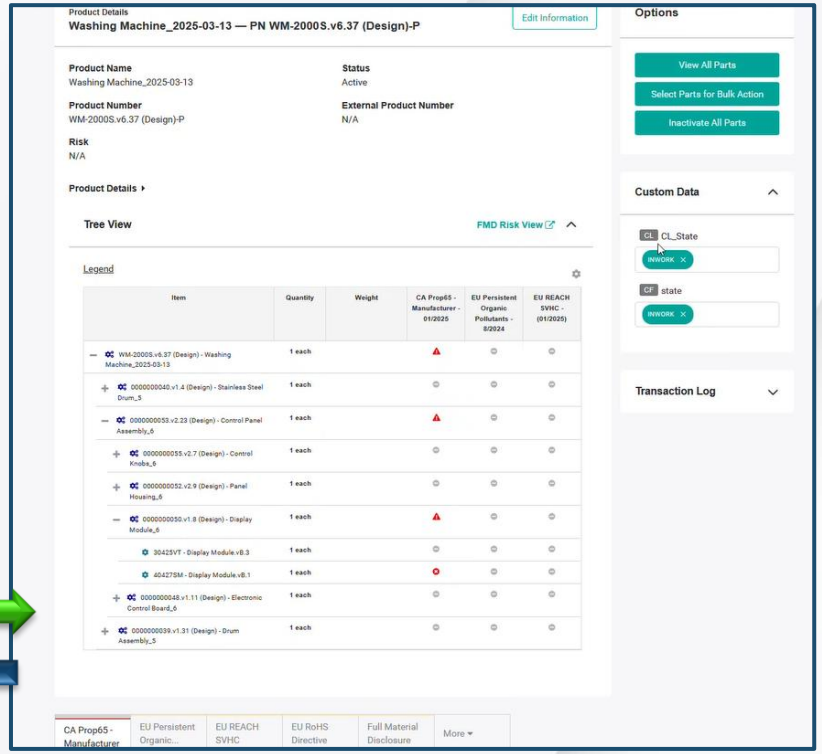


- **WT Parts:** Individual components that make up products.
- **Subassemblies:** A single part or group of parts
- **Supplier Parts:** Specific parts associated with suppliers..
- **Suppliers:** Information regarding the suppliers of the parts.
- **Regulation Statuses:** Compliance and regulatory information related to parts and manufacturers



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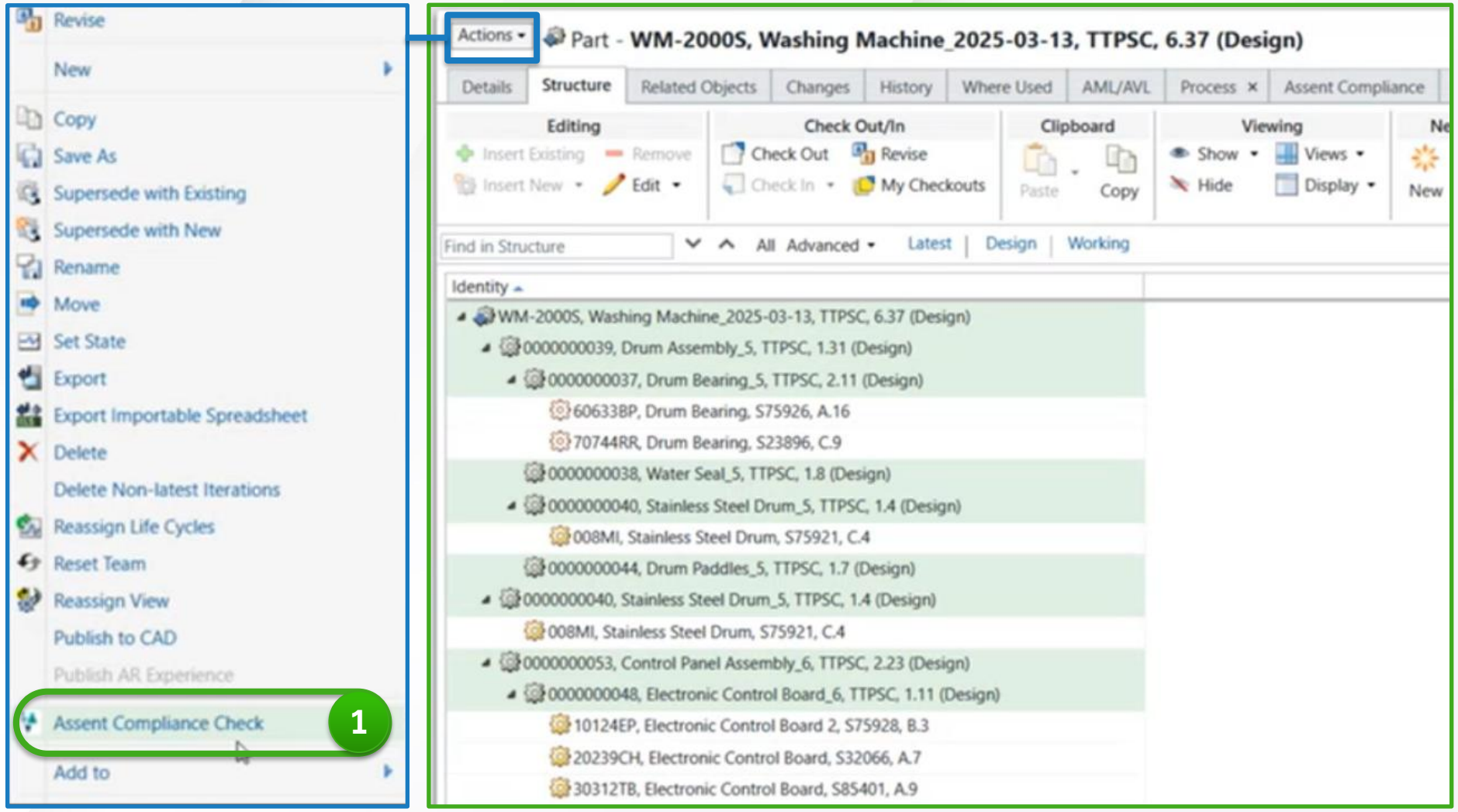
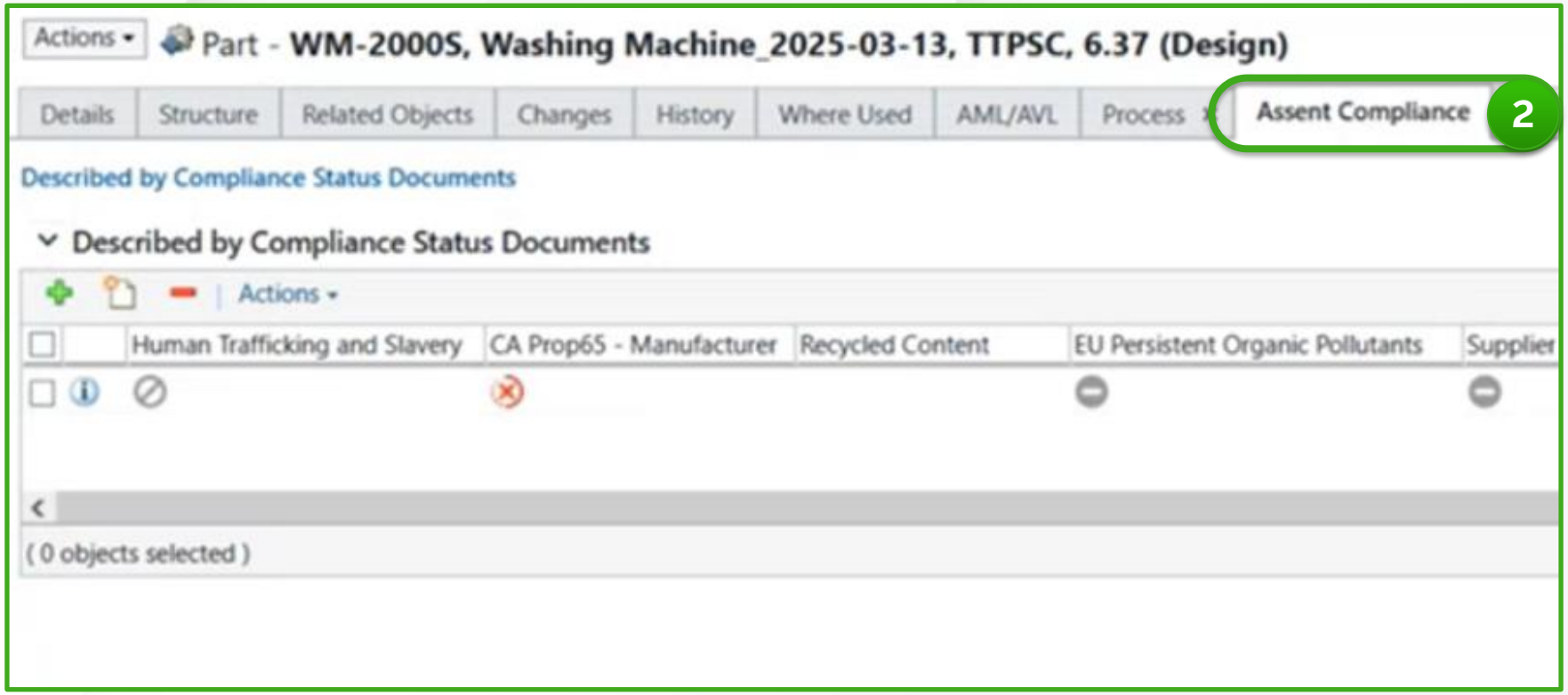
WINDCHILL AND ASSENT COMPLIANCE – IN ACTION



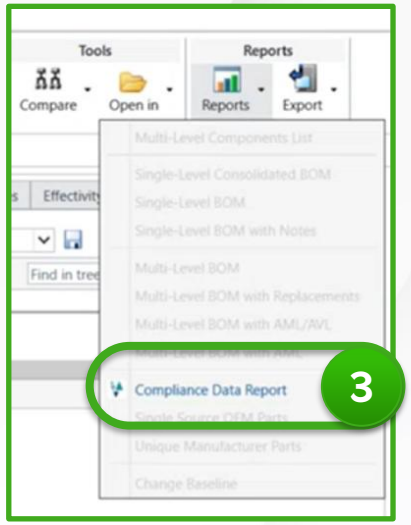
Sync structure between Windchill and Assent Compliance manually using **Assent Compliance Check** action or configure automated **state change triggered sync**.

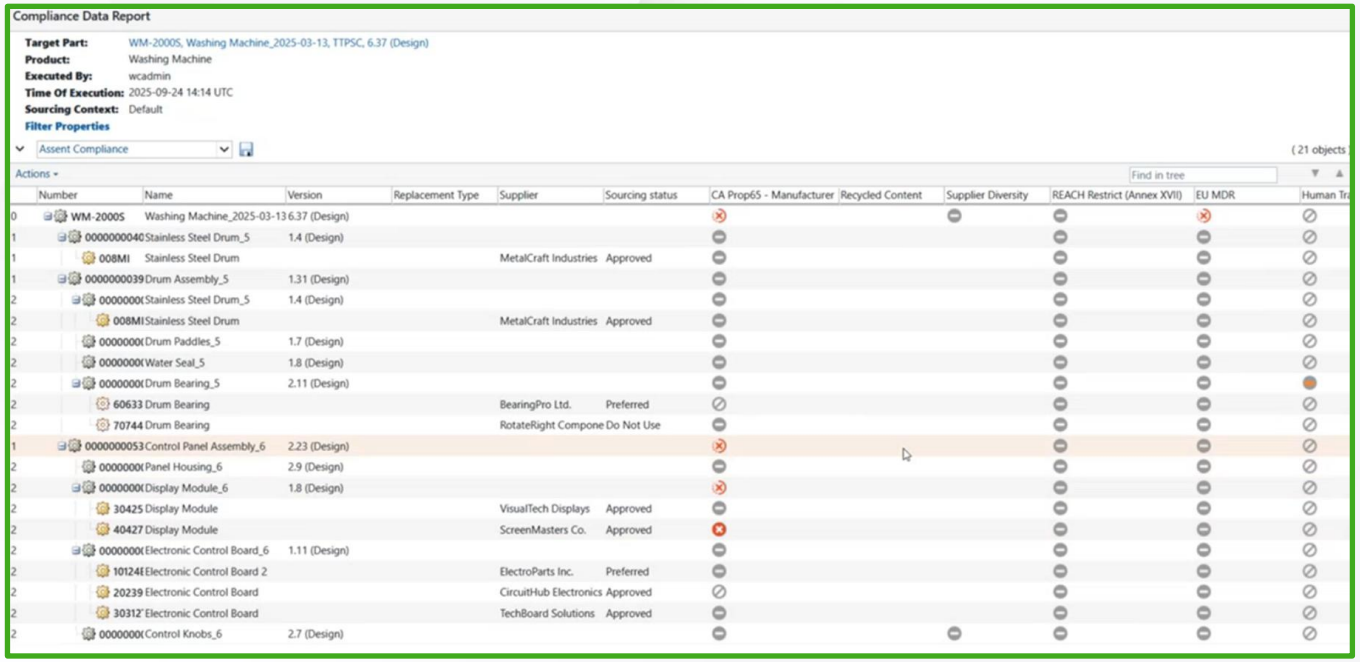
WINDCHILL AND ASSENT COMPLIANCE – IN ACTION



Access compliance status information of part via **Assent Compliance tab**.

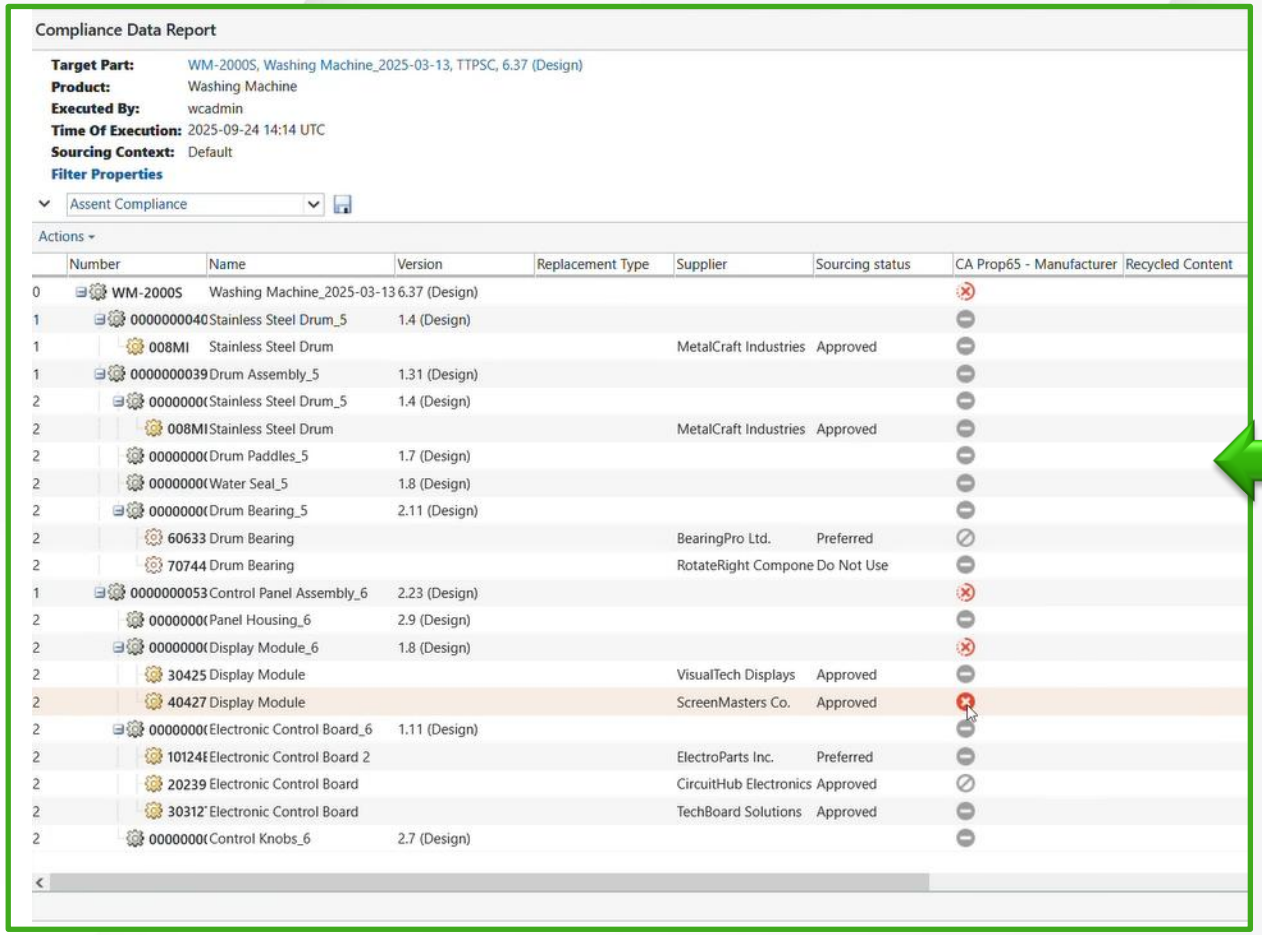
WINDCHILL AND ASSENT COMPLIANCE – IN ACTION

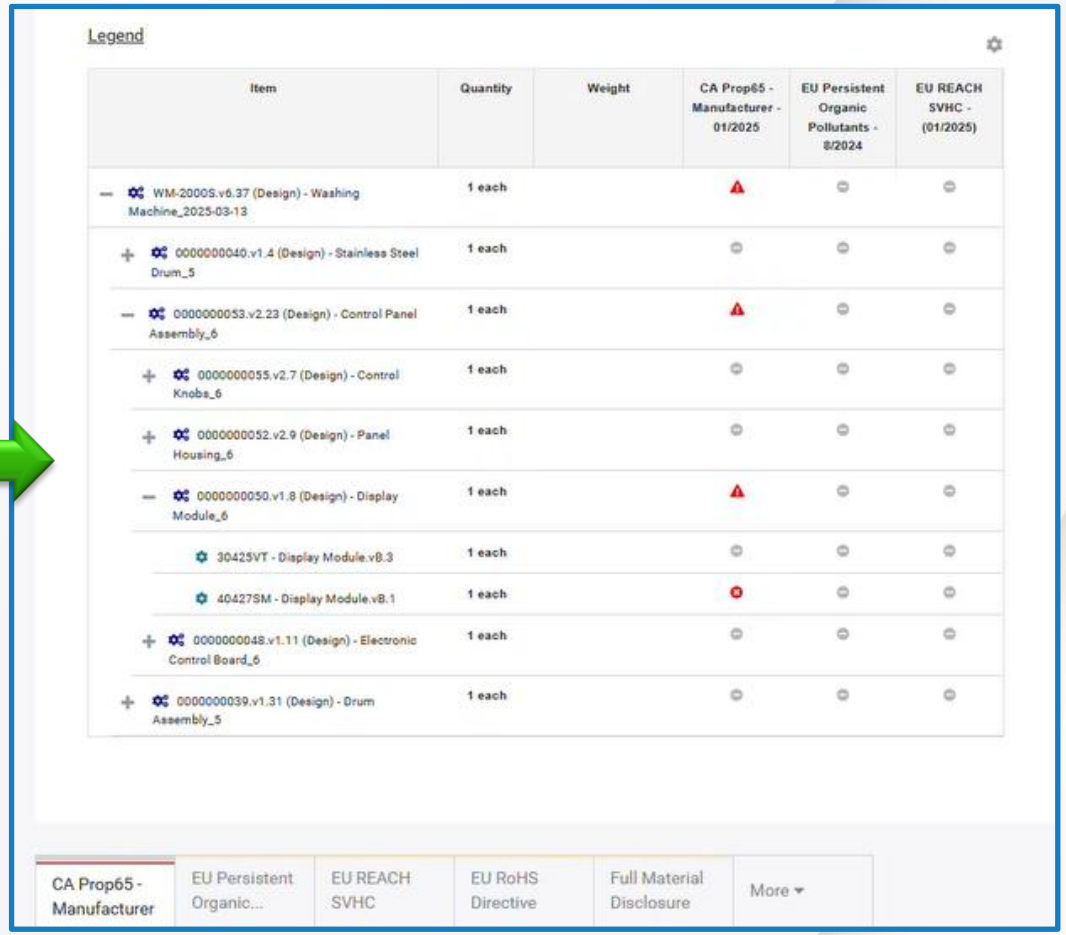




Access **Compliance Data report** via Reports at **Structure tap**

WINDCHILL AND ASSENT COMPLIANCE – IN ACTION

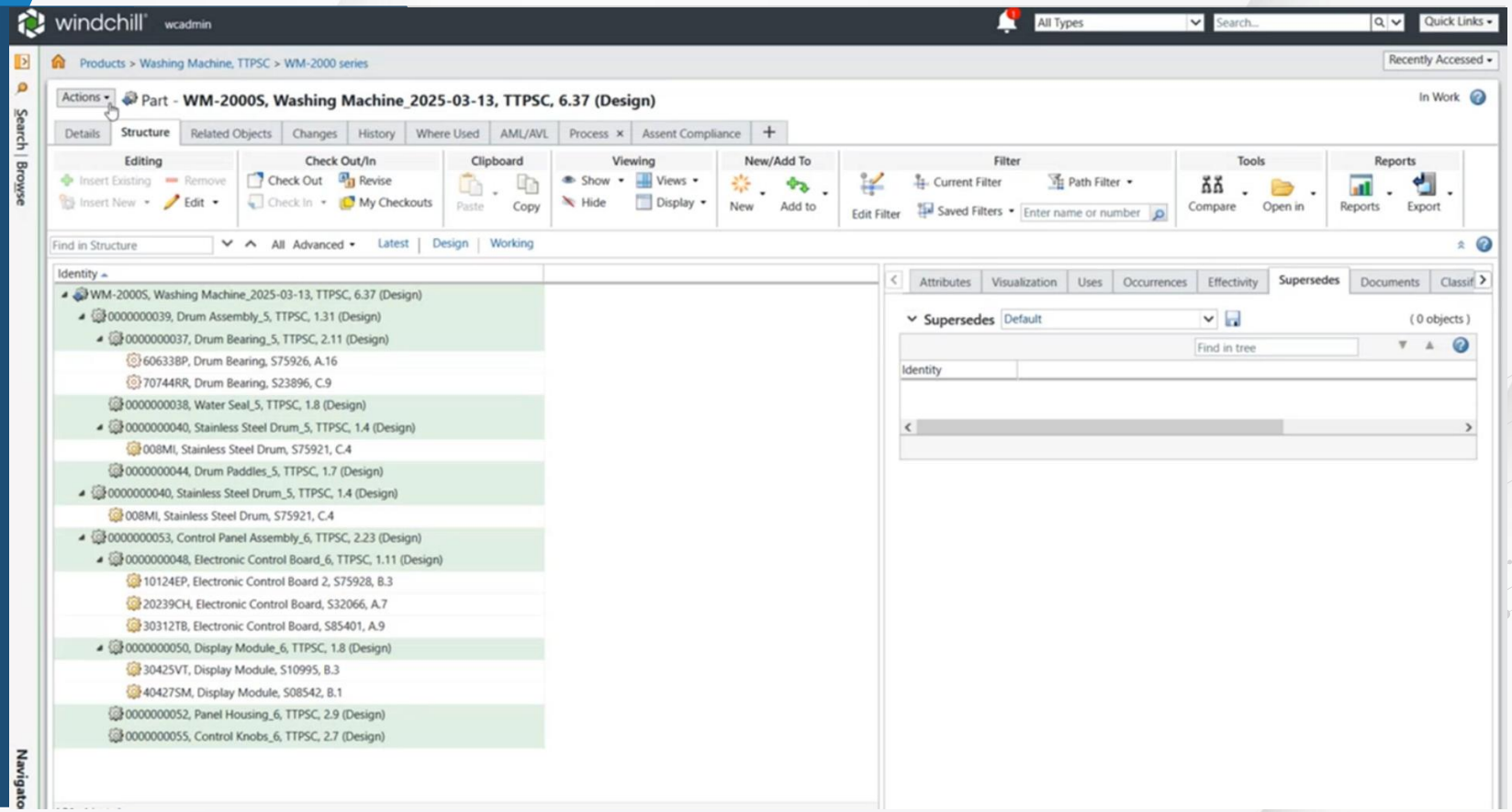




Synchronized structures between Windchill and Assent Compliance with compliance statuses calculated and rolled-up in Assent and transferred to Windchill.

DEMO 3. WIDCHILL AND ASSENT COMPLIANCE

Windchill and Assent Compliance Integration



Illustrative integration demo using test data

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CONCLUSION AND OUTLOOK

- Sustainability and compliance decisions must be made **early in the product development process**
- Design-time **product data** is the foundation for reliable footprint calculation and regulatory compliance
- **PLM (Windchill)** acts as the system of record, orchestrating sustainability and compliance across the digital thread
- Footprint and compliance intelligence must be **embedded into engineering workflows**, not handled as an after-the-fact activity
- Windchill's **open and extensible architecture** enables seamless integration with specialized LCA and compliance solutions
- Outlook: Sustainability and compliance initiatives will **increasingly require integration beyond technology — connecting systems, processes, and people**

Q&A

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