Reducing hardware, travels and CO$_2$ emissions.

Offering: Remote Testlab/RTL
Action Area: Virtual Connection replacing physical – E-Work
Contact & Info: Whitepaper Remote Testlab

Sustainability Challenges in Manufacturing
- A significant share in a manufacturer’s traveling activities occur to realize on-premise testing of software running on electronic control units (ECU’s)
- Usual testing binds human resources, is cost-intensive and leads to large carbon emissions of the company
- It also requires hardware that is specifically manufactured for that purpose and is therefore another cost and carbon driver

Our Solution
- RTL is a web application that allows remote testing of real physical test units
- Test units are accessed via the Open Telekom Cloud
- Testing processes can be automated through test automation and robot touch gestures
- Resources can be saved: people, hardware, transportation of test units and experts

Client Enablement Potential

| Reducing CO$_2$ emissions through remote testing: (test person does not have to travel around anymore via flight, car, etc.) | Avoidance of test unit transport because no hardware needs to be shipped (via flight, ship, truck, etc.) |

Reducing hardware: Less test units necessary (you can test 24/7 on one unit)

A detailed and exemplary impact measurement was done, please contact us for further information

Product Carbon Footprint

- Detailed Impact Analysis along whole value chain shows: low product-related carbon footprint
  → No additional hardware required for testing and 100% developed based on renewable energies

Supported Sustainable Development Goals:

Customer References:
- Automotive OEM
Offering: Low Carbon Mobility Management/LCMM

Action Area: Avoid unnecessary “waste” Mobility – Smart Logistics

Contact & Info: Sustainable traffic management

Sustainability Challenges in TT&L

- Fuel consumption and time as main levers to save costs in transport, logistics & fleet
- Transport Sector responsible for 25% of global CO₂ emissions and related air pollution
- Complying with EU Green Deal: decrease carbon emissions by 55 % by 2030, as compared to 2019

Our Solution

- LCMM measures vehicles in motion reflecting road characteristics and driving behavior
- Fuel reductions can be achieved through individual driving recommendations in app or laptop, and through an eco-drive training and the time-related route optimization
- Thus, LCMM provides an efficiency profile, which is fully compliant to the methodology described in the ISO/DIS-standard 23795-1

Customer References:

[Deutsches Zentrum für Luft- und Raumfahrt]

Client Enablement Potential

<table>
<thead>
<tr>
<th>Average of -10% fuel consumption</th>
<th>Savings for lightweight commercial vehicles:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly - 82,79 € per truck</td>
<td>Monthly - 206 kg CO₂ per truck on Ø distance</td>
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<td></td>
<td>+100,000 km duration of brake linings</td>
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</tbody>
</table>

Time savings: through feature of route and tour optimization

Product Carbon Footprint

- Detailed Impact Analysis along whole value chain shows: low product-related carbon footprint
  - No additional hardware required, standard electricity need of app
  - 100 % developed based on renewable energies

Supported Sustainable Development Goals:

Remark: all data have been gathered in the framework of a product impact analysis, which holistically considers a product’s value chain. Partly customer use cases have been integrated.
Offering: Environmental Sustainability Strategy

Action Area: Strategy to reduce CO₂ emissions – consulting and implementation support

Contact & Info: Sustainability consulting

Sustainability Challenges of Companies

- Companies will play an important role in achieving the EU’s net zero emissions target by 2050; therefore, Sustainability strategies that meet the requirements of regulators, customers and investors will continue to grow in importance.
- Comprehensive approach to measure CO₂ emissions as a starting point for reduction and internal and external fact-based reporting and communication.
- Transparency about the greatest potential levers for reducing CO₂ emissions.

Our Solution

- Evaluation of CO₂ emissions of a company’s whole value chain.
- Identification of ambitions, optimization levers and measures for significant CO₂ reduction potentials.
- Anchoring environmental sustainability into the overall company strategy and enable all relevant stakeholders to promote it.

Customer References:

Client Enablement Potential

Enablement of environmental sustainability ...

Transparency on CO₂ emissions and support in implementing measures to reduce CO₂ emissions in scope 1, 2 and 3 according to the GHG Protocol (sector-specific approach) within the exemplary levers:

- Green IT & Energy
- Supplier Management
- Smart Mobility
- Digital Products & Solutions
- Smart Production / Manufacturing
- New Normal

Product Carbon Footprint

- Consulting and implementation support can be realized completely virtually to avoid travel-related CO₂ emissions.
- Consultants use existing infrastructure, which runs on electricity generated by 100% renewable energies.

Supported Sustainable Development Goals:
Offering: SAP Cloud Services
Action Area: Low Carbon IT-Setup – Cloud Enabling
Contact & Info: Cloud Solutions for SAP

Customer’s Sustainability Challenges
- On-premise SAP systems are not only cost-, time- and resource-intensive, but they are usually responsible for high CO₂ emissions
- On-premise SAP systems are oversized because of spare capacity, unused data and peak load sizing, therefore they are usually never fully utilized
- Complying with EU Green Deal: reduce the greenhouse gas emissions by at least 55% until 2030, as compared to 1990 levels
- Lacking transparency regarding carbon footprint of products & improvement potentials

Our Solution
- Partly or full migration of classic or on-premise SAP systems into Public/Private Cloud operation models, combined with hardware refresh or the migration to SAP S/4HANA.
- End-to-End SAP Services that cover ITIL processes & services, application maintenance and infrastructure management.
- We offer the flexibility of our Private & Public SAP Platform with our ZERO OUTAGE and Run-on-Satisfaction guarantee.

Client Enablement Potential
- On average 8 t carbon footprint reduction per customer in cloud (Study: British Telecom 3:1 carbon abatement methodology 2020)
- SAP operation with 75% less servers conserve natural resources (T-Systems 20+ years of experience with SAP Managed Services)
- SAP PCFA* supports clients to optimize their Carbon Footprint in their operation (* SAP PCFA = Product Carbon Footprint Analytics)
- Time & energy savings through zero outage

Carbon Footprint of our SAP Cloud Solutions
- Detailed Impact Analysis along entire value chain shows that we provide high quality SAP-services with less energy and fewer IT- and human resources
- Our Cloud infrastructure uses 100% renewable energy

Supported Sustainable Development Goals:

Remark: all data have been gathered in the framework of a product impact analysis, which holistically considers a product’s whole value chain. Partly customer use cases have been integrated.
Offering: Airport Collaborative Decision Making
Action Area: Avoid unnecessary time and fuel consumption – Smart Airport
Contact & Info: Digitalization of the airports ecosystem

Sustainability Challenges for Airports

- Fuel consumption and time as main levers to save costs and reduce CO₂ emissions for airports
- Global aspirational goals for the international aviation sector (responsible for ~65% of fuel consumption in aviation) of 2% fuel efficiency improvement every year until 2050 and carbon neutral growth from 2020 onwards*

Our Solution

- Airport CDM is a concept that facilitates intense collaboration between all stakeholders, using improved quality and more timely exchange of information. Another result in better capacity management.
- Fuel reductions can be achieved through improved pre-departures sequencing, resulting in taxi-out time savings and reduced delays in air traffic flow management (ATFM)

Client Enablement Potential

| Average of - 92 kg CO₂ per departure | Taxi time: 9% fuel consumption (1 min)
(29 kg fuel consumption savings per departure) | ATFM Delays: 14% fuel consumption (2.5 min)
savings per departure |
<table>
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<td>Time savings through optimized flow and resource management</td>
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Product Carbon Footprint

- Detailed Impact Analysis along whole value chain shows low software-related carbon footprint (average of 0.09 kg CO₂ per departure)
  → Existing airport infrastructure (servers, screens) can be used.

Supported Sustainable Development Goals:

... with more than 224 Mio passengers (2019) in total