Sustainable IT application at Mercedes-Benz AG

Capgemini modernized a Mercedes-Benz AG widely used backend service for vehicle master data and buildability services. Several deployments were consolidated into a central shared service to reduce the CO2 footprint by approximately 50%.

Starting date of the project	March, 2018
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Application used worldwide
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	The project had the following goals: • Support the client's sustainability strategy of providing CO2 neutral mobility and becoming a CO2 neutral enterprise; • Prove that IT can contribute to the sustainability goals.
Detailed project description	As a key supplier for the premium automotive brand, **Capgemini identified the IT landscape as an area for potential sustainability gains**. Indeed, The Shift Project[1] calculated that the share of global greenhouse gas emissions attributable to IT is 4%: which represents half of the share generated by light vehicles globally (cars, motorcycles, etc.), and this trend is expected to rise in the coming years (+8% expected between 2015 and 2025). The datacenters and applications of large enterprises leave a sizeable CO2 footprint, meaning that application modernization can contribute to reducing energy consumption. That is why Capgemini proposed Mercedes-Benz AG to focus on the following technological levers to modernize and consolidate a backend[2] service used for vehicle master data and buildability services: • Providing an **application programming interface (API)** that is used by all frontend[2] applications. • Consolidating several **deployments of the application on dedicated servers into one central**, shared service[3] on a container platform. The **reduction of hardware** is significant, as each deployment has development, integration, and production stages. • Implementing a **modern microservice architecture, container technology[4], and advanced technical features** such as green/blue deployments for **better utilization of platform hardware.** • Introducing **detailed monitoring** on the container platform that allows for effective **capacity management** and **reduced spare capacity** in server hardware. The benefits of the project are: • Proof that **IT** can significantly contribute to corporate sustainability targets; • **CO2 reduction** of the application of approximately 50% per year; • Reduced **energy consumption, hardware,** and **operational efforts;** • Deployment on the **public cloud** enables even further energy savings (which are not yet included in the calculation). The project only considers one application out of hundreds that currently operate in the datacenters of large companies: it highlights the huge potential for further energy optimization in the IT industry. [1] The Shift Project - Lean ICT Report, 2019 [2] Backend / frontend services: services required by an application or website either for presentation layers and visible by the final user (frontend), or for data access layers (backend) [3] Shared services: consolidation of back-office business operations used by different parts of a same organization, often applied to eliminate service duplications [4] Container technology: method to package all services, scripts, API, libraries to allow an application to run on any isolated operating system

Main project's drivers for reducing the greenhouse gas emissions

Reduction levers	Details on the aspects of the project
☐ Energy and resource efficiency (including behaviour)	
☐ Energy decarbonisation	
☒ Energy efficiency improvements	Effective capacity management Implementation of a shared service on container platform: • Reduction of hardware through the consolidation of deployments • Better utilization of platform hardware • Reduction of spare capacity in server hardware
☒ Improving efficiency in non-energy resources	Reduced IT infrastructure needed
☐ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)	
☐ Financing low-carbon producers or disinvestment from carbon assets	
☐ Reduction of other greenhouse gases emission	

Emission scope(s) on which the project has a significant impact and quantification of GHG emission reductions per emission scope

	Aspects of the project contributing to the reduction of emissions by emission category	Quantification of associated GHG emissions by emission category Please follow the quantification methodology used in the Afep guidelines.
Reduction of the company's carbon dependency		
Scope 1 *Direct emissions generated by the company's activity.*		
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*	Implementation of a shared service on container platform	-50% emissions generated by the application per year
Scope 3 *Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.*	Hardware reduction	~50%
Increase of carbon sinks		
Emissions Absorption *Carbon sinks creation, (BECCS, CCU/S, …)*		
GHG emissions avoided by the company at third parties		
Avoided Emissions *Emissions avoided by the activities, products and/or services in charge of the project, or by the financing of emission reduction projects.*		

Clarification on the calculation or other remarks: Calculation based on the reduction of energy savings realized on the application

The calculation is based on the energy consumption of the IT infrastructure before and after the application modernization project:

- For the mainframe deployments, the basis for the calculation are the consumed CPU minutes
- For Linux environments, the basis for the calculation are the number of CPU cores.

Modality of verification of the quantification.

Calculation standard used (ADEME base, GHG protocol, etc.): GHG protocol

Verification of the calculation (internal or external): Calculation performed by Capgemini and validated by Mercedes-Benz AG

Other environmental and social benefits of the project

The project contributes to the following SDG:

- **SDG 12 – Responsible consumption and production**, by raising awareness on the importance and efficiency of application sobriety in terms of energy consumption within the IT department

Project maturity level	☐ Prototype laboratory test (TRL 7) ☐ Real life testing (TRL 7-8) ☐ Pre-commercial prototype (TRL 9) ☐ Small-scale implementation ☒ Medium to large scale implementation **Remarks**: **Cliquez ou appuyez ici pour entrer du texte.**
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	The project only considers one application out of hundreds that currently operate in the datacenters of large companies. The client now focuses all architects and development teams on the goal of CO_2 reduction. It highlights the huge potential for further energy optimization in the IT industry.
Amount of investment made (in €)	Confidential
Economic profitability of the project (ROI)	☒ ST (0-3 years) ☐ MT (4-10 years) ☐ LT (> 10 years) **Remarks:** The energy reduction was effective as soon as the project ended
Engaged partnerships	Joint team of Capgemini and client
Open comments from the project owner	The project is used as a role model for further application modernizations.
More about the project	
Contact the company carrying the project	Dr. Stefan Fütterling, Account Chief Architect, Capgemini - stefan.fuetterling@capgemini.com
Project URL links	• https://www.capgemini.com/de-de/client-story/it-unterstuetzt-die-nachhaltigkeitsziele-in-der-automobilbranche/ (English website to be published soon) • https://emercedesbenz.com/autos/mercedes-benz/corporate-news/mercedes-benz-to-be-carbon-neutral-by-2039/
Illustrations of the project