v2

Beyond NetZero

ICT Carbon Calculator

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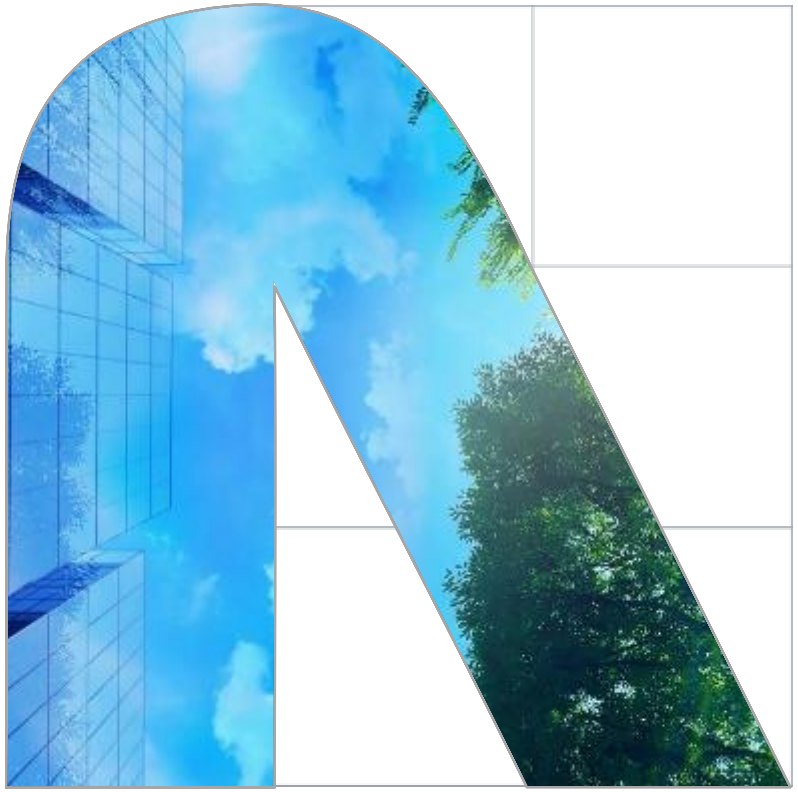


Sustainability trends and challenges in IT

Trends driving IT Sustainability

857TWh

projected consumption in 2028 of global **data centers**. This would be comparable to the current **electricity usage of** countries like **Japan**.

85%

of companies struggle with **consistent data on emissions** from IT operations.

5%

of global CO2e emissions come from IT. All studies agrees that these figures are expected to grow exponentially

64%

of **IT decisions** are made without visibility into carbon footprints, often leading to fragmented and incomplete environmental data

5x

Training large AI models can emit as much CO_2 as five cars in their lifetime.

74%

of IT and executive leaders agree that **sustainability is increasing enterprise's overall digital maturity.**

1 Global Economy, Japan Electricity Consumption (2022)
2 IDC, IDC Report (2024)
3 University of Massachusetts Amherst (2019)
4 Wall Street Journal, At Least 10,000 Foreign Companies to Be Hit by EU Sustainability Rules (2023)
5 The World Bank, Measuring the Emissions & Energy Footprint of the ICT Sector: Implications for Climate Action (2023)
6 2022 Gartner Sustainability Opportunities, Risks and Technologies survey

Common challenges facing IT departments

- Rising energy costs demand better energy management
- Greener must be cheaper; investments should cut operating costs
- Ensure regulatory compliance. Maintain processes to meet all regulations
- Lack of skills, awareness, and techniques for sustainability
- Data from hardware and cloud providers is immature and hard to grasp
- Emissions baselining is tough due to unclear standards and poor data quality.

50% of firms say they have an enterprise-wide sustainability strategy, but only 18% have a comprehensive **sustainable IT strategy** with well-defined goals and target timelines

why must the ICT sector track carbon emissions...

1

Environmental Impact

The ICT sector uses substantial energy and emits significant greenhouse gases. Tracking emissions is vital for reducing its carbon footprint and adopting sustainable practices

2

Regulatory Compliance

Many countries are tightening environmental regulations. Accurate tracking ensures ICT companies comply and avoid fines or sanctions

3

Cost and Energy Management

By closely monitoring energy use, the ICT sector can immediately achieve greater efficiency, significantly lower operational costs, and rapidly increase the use of renewable energy

4

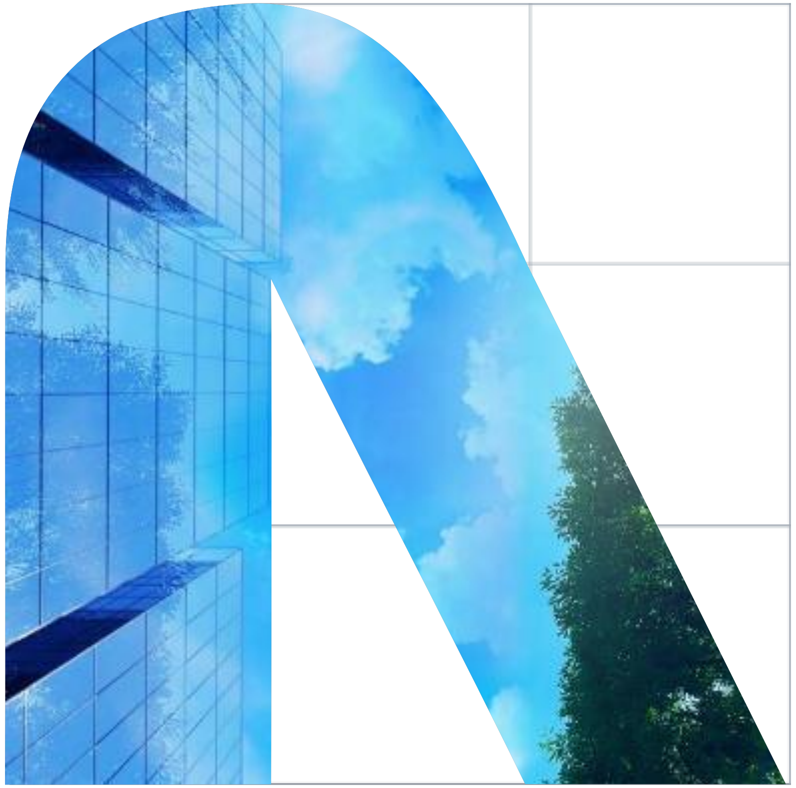
Corporate Responsibility

As sustainability becomes crucial, companies that track and cut carbon emissions can enhance their reputation and attract eco-conscious customers and investors

5

Innovation and Leadership

By leading in carbon tracking and reduction, the ICT sector can drive innovation in green technologies and establish a benchmark for other industries



NTT DATA's ICT Carbon Calculator Asset

Visibility for a Greener IT Future

The Gap in the carbon market

- **No single solution** fully tackles ICT emissions; each only addresses parts.
- Spend-based carbon accounting estimates IT emissions quickly but **lacks necessary accuracy**.
- Organizations lack tools to calculate **granular cradle-to-grave emissions** across their digital estate.
- **Inaccurate carbon reporting in IT estates** prevents effective environmental impact management and hinders the ability to make sustainable decisions.

A clear path forward

NTT DATA ICT Calculator: Your essential digital platform to assess the carbon footprint of your IT estate, providing baseline measurements and reduction plans across data centers, cloud, applications, networks, and hardware assets.

Paving the Way to a Sustainable IT Future

"Measure today, predict tomorrow, and ensure a sustainable future."

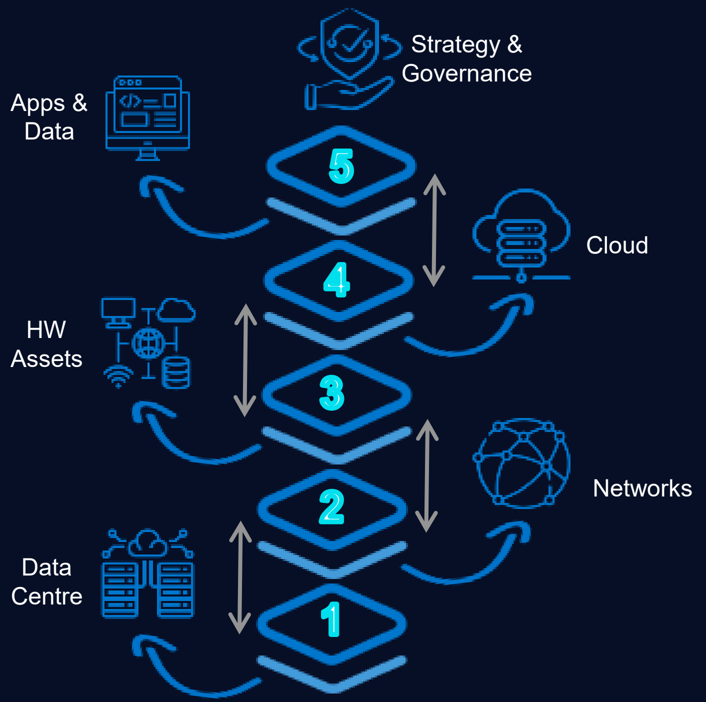
Leading offer:

Beyond NetZero

NTT DATA

Our approach to track carbon emissions

Service Level, activity-based emission calculation for the below service categories:



Delivering Scope Coverage as Recommended by ICT Sector GHG Guidance – Scope 1, 2, 3 (Categories 1, 10, 11 & 12)

Layered Approach

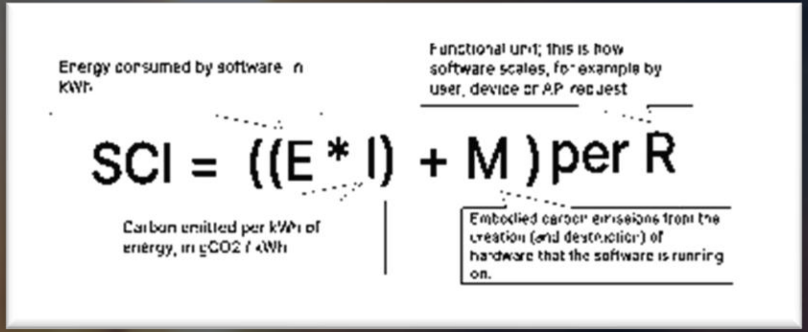
- Each domain builds on the sustainability improvements of the layer below it.
- Strategy and Governance provide guidelines and oversight across all domains

Carbon Intensity

- Measurable at each layer – Applications & Data, Cloud, Data Centres, Hardware Assets, and Networks
- Influenced by:
  - Energy Use
  - Resource Efficiency
  - Hardware Lifecycle
- Identify and pinpoint high-impact areas
- Guides targeted strategies to improve IT sustainability

ICT Carbon Calculator – Main KPIs

Use of Standards & Science-based Calculations



Operational Emissions:

GHGs from energy to run and maintain software infrastructure and devices.

Embodied Emissions:

GHGs from production, transportation, and disposal of materials and products.

Software Carbon Intensity (SCI):

Links **CO_2e** emissions to operational workload, showing environmental impact.

LCA Methodology:

Used to guide cradle-to-grave approach for ICT equipment. **(ITU-T L.1410)**

SCI Methodology:

Overlay the SCI methodology for Software assets

GeSI Guidance:

Alignment with ICT sector guidance for adherence to GHG Protocol.

Transform your IT estate with our intelligent platform—**engineered to** measure, report, and accelerate carbon reduction **across your digital footprint.**

Monitoring **200+** Microservices

Software Carbon Intensity ISO Std

+30% Reduction of CO2e emissions

Beyond NetZero: Carbon Calculator

Unlock deep insights into your IT estate's carbon footprint.

Go beyond basic CO_2 tracking with advanced analytics that drive smarter decisions and accelerate decarbonization

Delivering Scope Coverage as Recommended by ICT Sector GHG Guidance – Scope 1, 2, 3 (Categories 1, 10, 11 & 12)

Key Features include:

- **Forecast Emissions – Predict** future carbon output using historical trends
- **What-If Scenarios – Simulate** emission impacts of IT changes
- **Anomaly Detection – Spot** inefficiencies through pattern analysis
- **Compliant Reporting – Auto**-generate standards-based carbon reports

Beyond NetZero - ICT Carbon Calculator

CIO Dashboard

The CIO ‘Impact’ dashboard delivers a powerful, comprehensive view of emissions, breaking down data by type and scope, providing actionable insights, forecasts, and interactive tools for strategic target setting and optimization

CIO Dashboard: Drive Impactful Emissions Insights and Optimization Strategies

Outcomes

- ✓ **Unified Emissions Snapshot**: All service-level emissions calculated by the ICT calculator in single view
- ✓ **Emissions Breakdown**: Categorized by type and scope for precise analysis
- ✓ **Carbon Insights**: Highlights percentage breakdown and future forecasts.
- ✓ **Flexible Period Selection**: Opt for calendar year, fiscal year, quarter, or semester views to gain tailored carbon insights and trend lines.
- ✓ **CSO Target Setting**: Dynamic and Interactive goal setting for a selected period

CIO ‘Impact’ Dashboard

Delivering a powerful, comprehensive view of emissions, breaking down data by type and scope. Provides actionable insights, forecasts, and interactive tools for strategic target setting and optimization

Beyond NetZero - ICT Carbon Calculator

Applications Module

The **Applications Module** of the carbon calculator provides comprehensive carbon metrics for software assets. It is designed to deliver **granular, actionable, and correlated insights** across the entire **application ecosystem**

January 2024

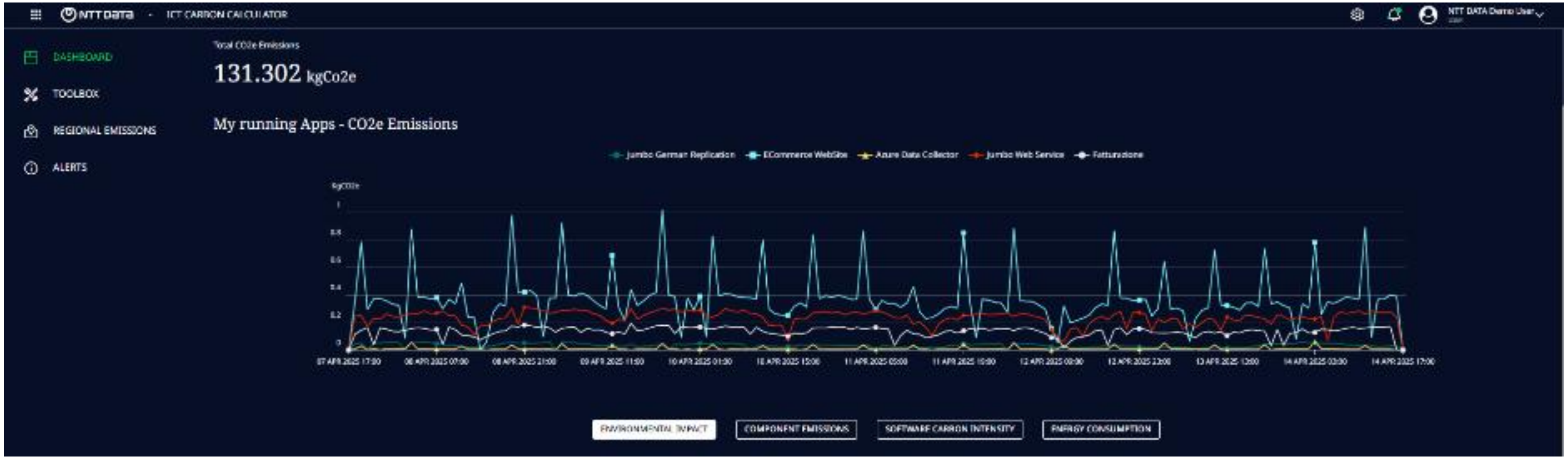
Superior Carbon Visibility: Uncover Emissions Across On-Premise and Cloud Applications

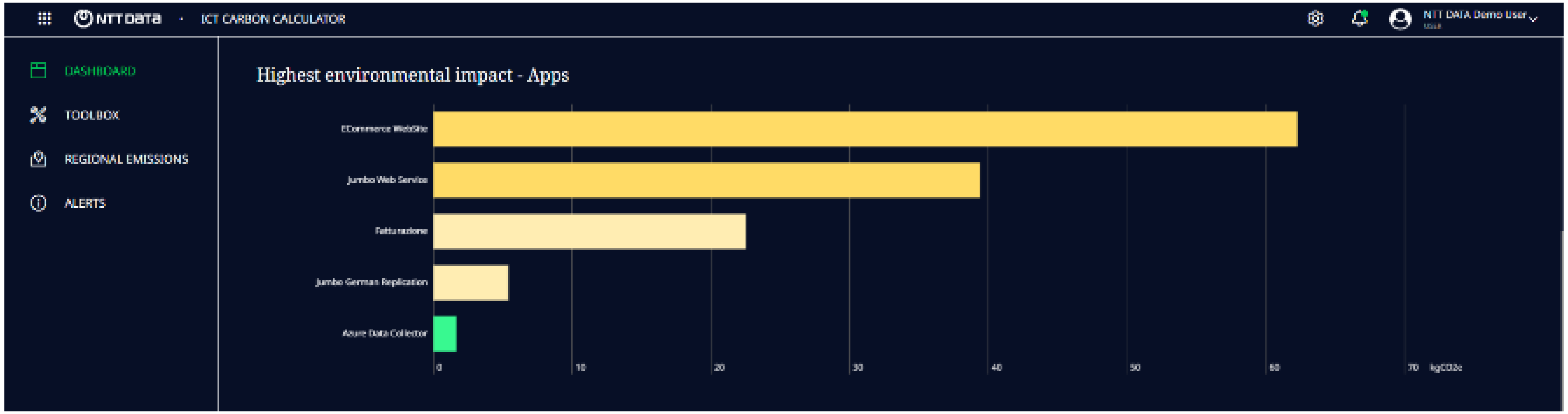
Outcomes

- ✓ **CO2 Emissions:** Across application landscape (on-premise/cloud).
- ✓ **Comparative views:** Environmental vs. Energy vs. Component vs. Software Carbon Intensity
- ✓ **Application Ranking:** Highest environmental impacting apps.
- ✓ **Emission Breakdown:** Embodied and resource emissions
- ✓ **What IF:** Workload placement optimization.
- ✓ **Reporting:** Regulatory GHG compliant outputs for formal reporting

Application Module of the Carbon Calculator

Provides comprehensive carbon metrics for software assets. Designed to deliver granular, actionable, and correlated insights across the entire application ecosystem.





Beyond NetZero - ICT Carbon Calculator

Cloud Module

The **Cloud Module** of the carbon calculator provides comprehensive carbon metrics for cloud environments. It is designed to deliver **granular, actionable**, and **correlated insights** across the **entire cloud ecosystem.**

Superior Visibility: Gain Insight into Private and Public Cloud Workloads

Outcomes

- ✓ **CO2 Emissions**: Across entire cloud landscape
- ✓ **Environmental vs. Energy Impact**: Comparative views
- ✓ **Cloud Ranking**: By total emissions produced.
- ✓ **Emission Breakdown**: Embodied and resource emissions
- ✓ **What IF**: Workload placement optimization.
- ✓ **Reporting:** Regulatory GHG compliant outputs for formal reporting

Beyond NetZero - ICT Carbon Calculator

Hardware Assets Module

The **HW Assets Module** of the carbon calculator provides actionable insights into your IT hardware's carbon footprint, pinpoint energy and GHG savings, and optimize emissions by manufacturer and product type.

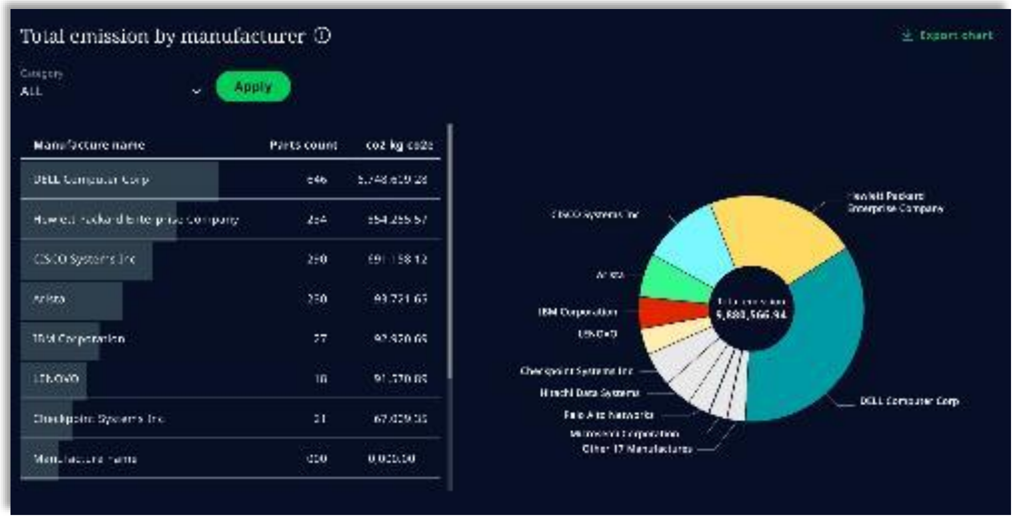
Superior Visibility: Gain Insight into the product carbon footprint of ICT assets

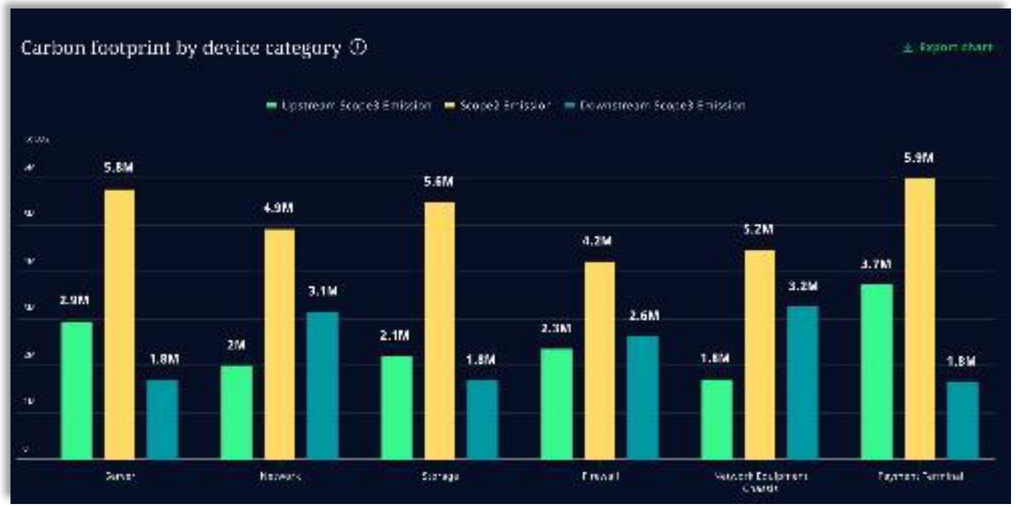
Outcomes

- ✓ **Embodied CO2 Emissions**: Across the entire ICT hardware asset estate
- ✓ **Environmental vs. Energy Impact**: Comparative views
- ✓ **Manufacture Ranking**: By total emissions produced.
- ✓ **Comprehensive database**: Supporting 10 Million Products and 380+ Product Categories
- ✓ **What IF**: Calculate potential energy and carbon savings from upgrading to newer, more efficient models.
- ✓ **Reporting:** Regulatory GHG compliant outputs for formal reporting

HW Asset Module of the Carbon Calculator

Provides comprehensive carbon metrics for hardware assets. Designed to deliver granular, actionable, and correlated insights across the entire IT hardware asset landscape.



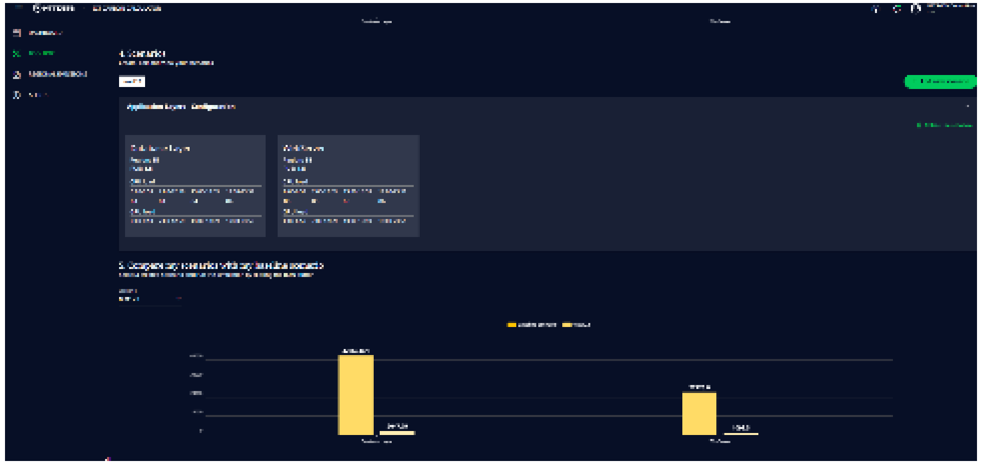


Beyond NetZero: Transformative Reporting Capabilities

The **ICT Carbon Calculator** is meticulously crafted to deliver transformative reporting capabilities, divided into two powerful features:

1. Actionable Insights

- **Granular Data Points:** Dive deep into detailed metrics.
- **Optimization Opportunities:** Pinpoint areas for improvement.
- **Carbon Footprint Reduction:** Identify and implement strategies to lower carbon emissions



2. Compliant Reporting

- **Confidence in Compliance:** Generate GHG-compliant reports effortlessly.
- **Carbon Reporting**: Ensure accurate carbon footprint tracking.
- **Formal Reporting & Auditing:** Guarantee precision and reliability for official purposes.

ISO Compliant Methodology

GHG Compliant Reporting

Client stories

Monitoring and management of the IT services' carbon emissions

Designed and implemented a decarbonization strategy for Intesa Sanpaolo's IT with NTT DATA's proprietary assets and sustainable IT framework

Business need

As a result of the growing attention to IT emissions, which are particularly relevant for the banking sector, Intesa Sanpaolo sought to become compliant with international regulations and identify opportunities for cost reductions through a comprehensive solution for the monitoring of energy consumption and carbon emissions related to its IT systems.

Solution

- NTT DATA's "CO2 & SCI Monitoring tool" empowers the bank to analyse and optimize the resource consumption of its IT applications. This translates to a deeper understanding of software's environmental impact at a granular level.
- The tool calculates emissions associated with each major server component – CPU, memory, storage, and network – offering a clear understanding of software's environmental footprint.
- NTT DATA helped the client to identify and prioritize key improvement areas, implemented targeted solutions and continuously monitored and optimized performance with NTT DATA's proprietary assets.
- This tool allows precise emission data analysis and helps identify improvement opportunities and support the implementation of strategies to optimize IT energy consumption and GHG emissions.
- Built on GHG Protocol Scope 2 specification and ISO compliant methodology to ensure compliance with the latest international standards.

Outcome

- Software environmental KPIs hourly monitored for over **100 applications**.
- The use of KPIs such as CO2eq and SCI enables the bank to **monitor the efficiency of its software and hardware**, letting it continuously identify areas for improvement.
- Identification of **CO2 reduction opportunities**, with **potential savings reaching up to 30%.**

Read the article

Read the paper

Smart Sustainability for NTT DATA Global Data Centers Americas

Measurement, reporting, and data driven optimization actions in NTT DATA Data Centers Americas

Business need

NTT DATA is the 3rd largest data center provider globally. Due to the increasing of new data centers and the energy demand accelerating rapidly, managing and monitoring them more efficiently is a critical need for NTT DATA:

- Manage power and make power purchase decisions more efficiently.
- Anticipate stringent regulations.
- Comply with increasing demand from customers for sustainability reporting.
- Automate and streamline manual processes for carbon accounting and compliance reporting.
- Have access to analytics engine for better utilization planning and assessing the impact of Power Purchase Agreements, etc.

Solution

NTT DATA evaluated existing carbon footprint tracking process and created a blueprint for a modern data management platform

We developed a Digital Twin with NTTDATA proprietary Smart Management Platform to:

- Create a carbon footprint baseline and set up a performance management platform to manage the ongoing sustainability transformation across 14 Data Centres in America.
- Automate energy, water and waste data capture, monitor and reporting for GHG Scope 1, 2, and 3 emissions.
- Provide predictive insights using data from multiple sources and intelligent scenario management with 'what if' analysis to evaluate the impact on carbon footprint, efficiency and costs.

Outcome

- **Improved granularity** and quality of **CO2e emissions data.**
- **Faster baselining and tracking of carbon footprint** and KPIs for organization and hosted tenants.
- **Enhanced visibility and what-if analysis** to identify and act on opportunities to optimize carbon footprint and reduce wastage.
- **Streamlined compliance reporting** to support internal audits and external GRI reporting, with the option to comply with other international sustainability reporting standards.
- Enabled **smarter decisions** for sustainability transformation roadmap.
- Enabled **energy optimization decisions** through scalable smart energy modelling solution.