



THE FINANCIAL & SUSTAINABILITY CASE FOR CIRCULARITY

Maximize the life of your IT hardware and gain environmental and TCO benefits

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SUMMARY

This report presents a new way to think about the economic and environmental value of data center equipment. Based on research, interviews and ITRenew's market expertise, the report focuses on a circular data center model that maximizes the economic life of hardware in the data center environment. The developed model shows clear benefits for primary and secondary equipment users that can be quantified with sustainability and financial metrics. The adoption of this business model by the global IT hardware industry can lower total cost of ownership (TCO) by 24% or more and decrease the greenhouse gas impact (measured in equivalent carbon dioxide, or CO₂e) of the data center industry by as much as 24% or more.

24% LOWER
TCO AND GHG IMPACT

Impact of Global Circular Data
Center Industry.

1. INTRODUCTION

The amount of data around the world has grown significantly in recent years and is projected to reach 175ZB in 2025 compared to 33ZB in 2018.¹ This growth is fueled by greater data collection and computation required for advanced analytics and machine learning (especially deep learning). One often overlooked consequence of this growth is the massive physical infrastructure that's required in the form of data centers to enable flow, storage and availability for all users of these highly connected and data-dependent services. This high concentration of compute power and data storage has led to an immense growth in the number of such hyperscale data center facilities.

At the same time, the data center market is projected to be worth over \$520bn by the end of 2023,² which is more than double the current market size. Alongside the massive growth, the market evolution is also projected to result in more than 46 million servers reaching end of life (EoL) in the world's data centers with 50 racks or more between 2019 and 2023.³ The aforementioned growth will also further drive up consumption of 2% of the world's electricity to 8% by 2030⁴, and generate an additional 920,00 metric tons of waste⁵ that result from discarding servers at the end of their life.

When it comes to more sustainable data center practices, we have to emphasize that a lot is already being done to tackle these issues, especially in the Open Compute Project (OCP) community. This includes Power Usage Effectiveness (PUE), computational efficiency, utilization and power scaling, cooling, power efficiency, and use of renewables in data centers.⁶ However, the embodied energy (the environmental burden caused by producing the equipment and sourcing the required materials) and to a lesser extent the post-use phase (end of life) are not yet accounted for.

Quantifying the carbon footprint of these wasteful practices is time-consuming and expensive due to a lack of extensive data sets⁷ and complex and secretive supply chain practices. To overcome these barriers and help the industry to run better analyses in this space, we applied academic methods to collect, evaluate and use data for our model. Throughout our project, we consulted over 50 papers, more than 10 expert interviews, engaged a third-party to consult and review our processes, and used our own expertise, knowledge and data sets in the data center space.

Our expertise and research show that the data center industry is ready to tackle the wasteful practices mentioned above. In recent years, the "circular economy" has gained popularity and has found many early adopters across various industries. At its core, a circular economy aims to end our take-make-dispose economy, which is a very linear approach, and instead keep products at their highest possible value for as long as possible.

To continue reading, download the full report at:
<https://itrenew.com/resources/the-global-circular-data-industry/>



920,000
METRIC TONS
OF WASTE

Additional waste from projected growth of data center market by 2023.



The Open Compute Project is already tackling many issues related to sustainable data center practices.