Welcome

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The Semiconductor Sustainability Challenge

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Semiconductors help address Sustainability challenges

Electric Vehicles

Key Facts & Figures

~12% of world's Greenhouse Gas emissions caused by **road transportation** [1]

5-10x increase in amount of semiconductors between yesterday's car and tomorrow's Autonomous and Connected Vehicle

Smart Buildings

Key Facts & Figures

~18% world's Greenhouse Gas emissions from energy use in Residential and Commercial buildings [1]

10-20% emission reduction possible Accenture – Johnson Control case study

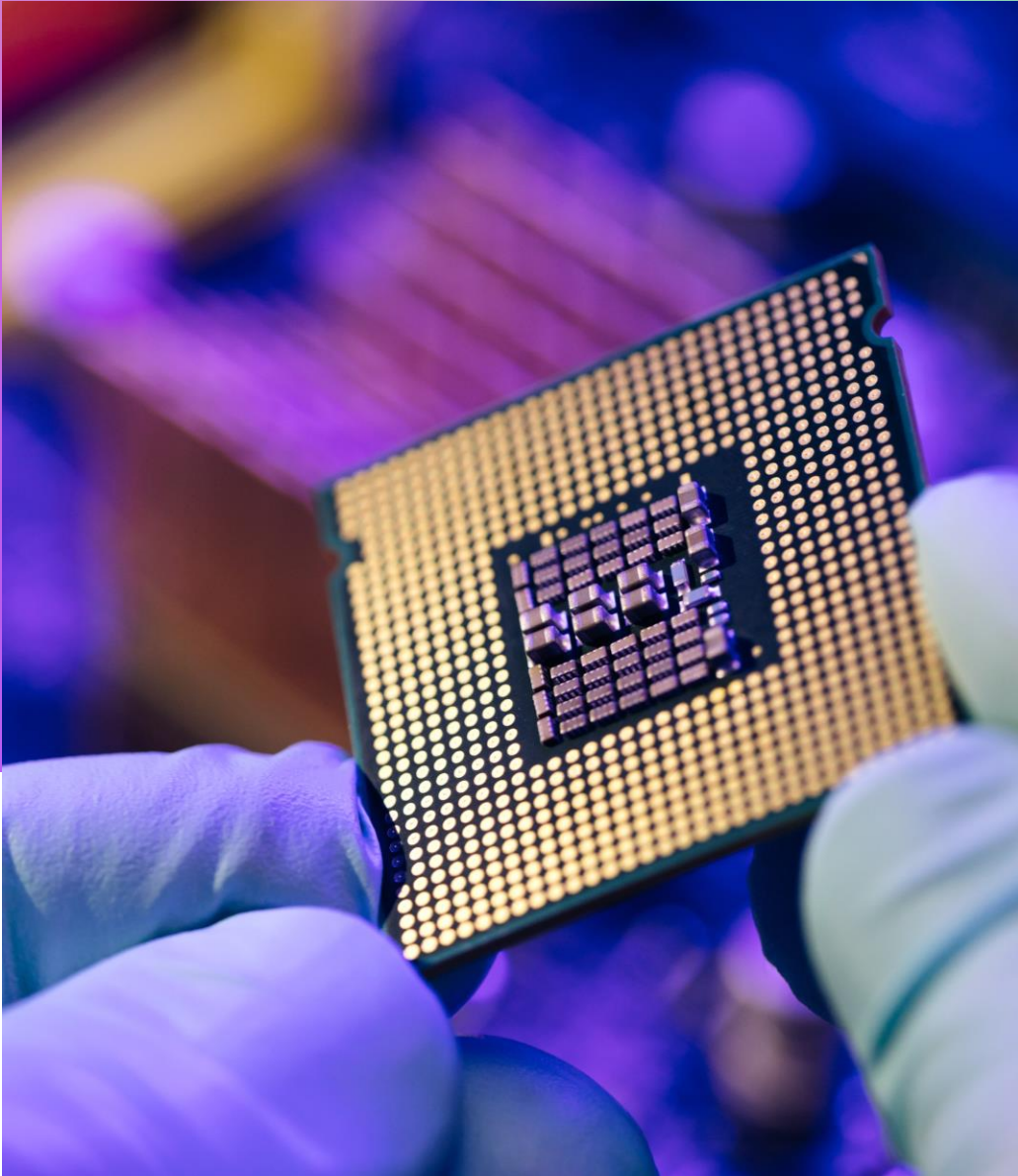## As-a-Service & circular business models

Key Facts & Figures

50 bln new IoT devices will be implemented

Example of **Michelin** moving to connected tires and pricing per kilometer 3 years

1. Source World Resources Institute, Our World in Data

Semiconductor industry own challenge

We need to work together as an industry

1 fab

can consume 1TWh of energy per year and 2-4 million gallons of ultra-pure water per day[1]

2g chip

uses 1.6 kg fossil fuel, 72g of chemicals and 32Kg water[2]

1. https://www.accenture.com/_acnmedia/PDF-166/Accenture-High-Tech-Sustainability-Final-v2.pdf
2. http://news.bbc.co.uk/2/hi/technology/2444675.stm

Semiconductor following Big Tech sustainability initiatives

Microsoft

Carbon negative across scope 1, 2 and 3 by 2030. [1]

Google

By 2030, it aims to run all of its data centers worldwide 24/7 on 100% clean energy—no offsetting required. [2]

ASM INTERNATIONAL

ASM announces its target to achieve Net Zero emissions by 2035. [3]

intel.

Intel commits to achieve net-zero greenhouse gas emissions in its global operations by 2040. [4]

1. https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/
2. https://www.cnbc.com/2022/04/13/google-data-center-goal-100percent-green-energy-by-2030.html
3. https://www.asm.com/Pages/Press-releases/ASM-INTERNATIONAL-AIMS-TO-ACHIEVE-NET-ZERO-BY-2035.aspx
4. https://www.intel.com/content/www/us/en/newsroom/news/net-zero-greenhouse-gas-emissions-operations.html

Leadership in emissions reductions can be an opportunity for differentiation

Willingness to Pay Premium from the Private Sector

Companies that purchase power from utilities also have set targets to reduce their scope 3 emissions and those companies are starting to ask and to include in tenders GHG life-cycle assessment of solar panels used in PPAs.

Willingness to Pay Premium from the Public Sector

Governments are setting green criteria into the procurement process – what is generally called Green Public Procurement.
Green Public Procurement is especially powerful catalyzer for decarbonization of hard-to-abate sectors in risk of carbon leakage as steel or cement.

Reduced Cost of Capital

Pressure from finance sector and institutional investors means higher cost of capital for companies not aligned with climate targets.
The trend on ESG funds, green-bonds or ESG-linked loans and insurance represent opportunities to access capital at lower costs.

Private buyers:

Companies as Microsoft[1] have very ambitious emission targets. The American tech company has set targets for carbon negative across cope 1, 2 and 3 by 2030, that lead to high ambition on reduction of supply chain emissions.

Green Public Procurement:

France[2] sets a maximum embodied carbon footprint for PV modules depending on the size of the project, and the carbon footprint can represent up to 30% of the final score on grading a company's tender application.

Sustainability-linked derivative:

The interest rate that European real estate investor Eurocommercial Properties (ECP) will be paying ABN AMRO is partially dependent on how well ECP score on their sustainability targets[3].

1. https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/;
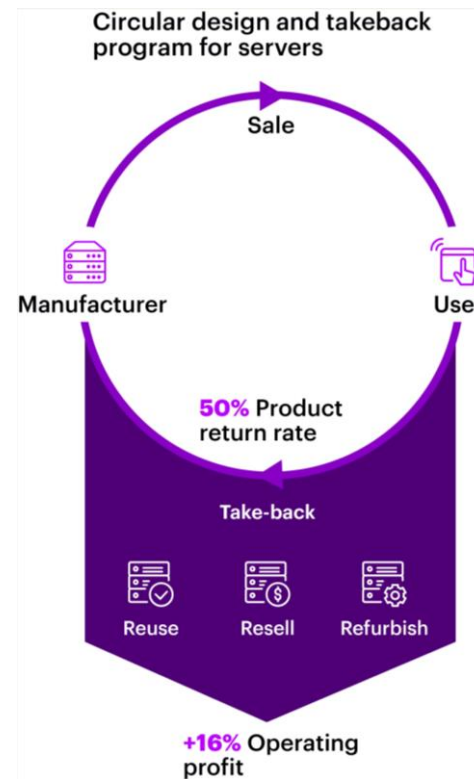2. https://ultralowcarbonsolar.org/blog/reducing-carbon-footprint-of-solar/;
3. https://www.abnamro.com/en/news/abn-amro-trades-its-first-sustainability-linked-derivative

The journey to zero net carbon

Some key areas

- **Innovate** in process technologies (energy, water, material)

- **Apply** Data & AI in Smart Manufacturing

- **Adopt** circular design to prevent e-waste

- **Optimize** green cloud journey

Circular design and takeback program for servers

Sale

Manufacturer — User

50% Product return rate

Take-back

Reuse — Resell — Refurbish

+16% Operating profit

>50%
Reduction in machine downtime

5-10%
Improvement in manufacturing yield by deploying machine and deep learning techniques

Let's collaborate across the value chain for sustainability

... and not only be applauded for our innovations but also for the reduction in environmental impact of those innovations

Reach out at
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Thank You