SCC Heidi

Powering Sustainable AI

F. Carson
CMO and SVP
onsemi, Scottsdale, United States of America

Abstract
We stand at a critical tipping point in the realm of power. Over the past year, the convergence of artificial intelligence (AI) and electrification, two global mega trends, have sparked an unprecedented demand for energy. This surge presents both a significant challenge and an extraordinary opportunity. Central to this development are power semiconductors, which are now in high demand due to their ability to enhance energy conversion and management. Power now represents the new frontier, with the rate of innovation in this area set to determine the growth trajectory of these markets.

The intensive computational needs of AI learning models are well-known, necessitating vast amounts of power and contributing to increased carbon emissions. However, the integration of AI data centers with cutting-edge power semiconductor technology offers a viable solution to drastically cut energy use and costs, all while supporting the escalating computational needs of AI. As AI's presence grows, so does the importance of semiconductor innovation in mitigating its environmental footprint and promoting a sustainable, digital future. As a keynote speaker at SEMICON Europa, Felicity Carson will offer her insights on the responsible deployment of AI and the importance of transparency in energy requirements to ensure AI's sustainable expansion.

Biography
Felicity Carson joined **onsemi** in August 2021 as senior vice president and chief marketing officer. Felicity is a seasoned global marketing leader with extensive B2B experience spanning across middleware, applications and industrial software, and technology. Her wealth of experience comes from leading multiple marketing functions, from demand generation to brand and portfolio marketing. She is an accomplished executive with a successful track record of delivering results and effectively leading cross-functional teams across many business units.

Felicity joins **onsemi** from AVEVA, where she was the senior vice president of global performance marketing. Prior to AVEVA, Felicity had a two-year tenure at SAP where she was the Head of Customer Experience and Global Events and received several awards including the Marketing Excellence Award for Great Leadership. Felicity also spent over 17-years at IBM where she led several marketing functions, including as the CMO for IBM Watson Customer Engagement, a $1.4 billion business unit responsible for SaaS and on-prem customer experience applications. She was instrumental in leading IBM’s marketing transformation and was recognized for her data driven insights and execution excellence, which led her to be

voted as one of the top 10 most influential women in MarTech by B2B Marketing in 2016.

Felicity is a graduate of Damelin College and School of Business Management in South Africa and is certified by the Public Relations Institute of South Africa (PRISA).

References

Advancing Sustainability in the Semiconductor Value Chain: A Data-Driven Approach

A. Muesch
Head of Transformation and Strategic Programs
Merck Electronics KGaA, Darmstadt, Germany

Abstract

In recent years, the semiconductor industry has shifted significantly towards environmental sustainability, driven by regulatory pressures and consumer demand for eco-friendly products. As a key player in the semiconductor materials supply chain, we are adapting to this evolving landscape, aligning our practices with sustainability goals.

Suppliers now face the challenge of delivering sustainable materials and technologies while fostering cleaner production processes. Transparency in greenhouse gas emissions is increasingly expected, necessitating efforts to understand and mitigate emissions across the value chain.

A critical component of this effort is optimizing manufacturing processes to address Scope 1 and Scope 2 emissions. At Merck Electronics, we embrace a comprehensive approach to greener chip production, integrating data-driven methodologies with fundamental engineering principles.

Our approach at Merck Electronics combines data analytics with predictive modeling to reduce environmental impact throughout the production lifecycle. Utilizing machine learning (ML) algorithms, we aim to reduce scrap and optimize production efficiency, thus curbing greenhouse gas emissions. This proactive approach to process design and optimization supports our climate footprint goals and maintains data integrity in sensitive environments.

To illustrate our approach's effectiveness, we present a case study showing how data and technology provide insights into product climate impact. Leveraging data analytics and predictive modeling, we identify opportunities for improvement and implement targeted control mechanisms in production processes. This case study exemplifies Merck Electronics' commitment to sustainable innovation in the semiconductor industry.

Biography

Anja Muesch has been Head of Use Case Management at Merck Electronics since 2022 focusing on data & digital portfolio management for the Semiconductor Materials Business with preceding experience in managing a sector-wide digital transformation project focusing on advanced data analytics, data access and data automation.

Prior to her role, Anja Muesch was Associate Consultant at Merck Inhouse Consulting managing strategy projects for Merck’s Electronics, Life Science and Pharma business.

Anja Muesch received a Master of Science degree in Business Chemistry from Heinrich-Heine-University in Düsseldorf, Germany and the Universiteit van Amsterdam, The Netherlands, focusing on environmental chemistry and financial investments.

References

Collaboration in Sustainability

K. Westrich
Global VP of Electronics, Semiconductors &
Simulation Digital Industries
Siemens AG, Munich, Germany

Abstract
Coming Soon

Biography
Coming Soon

References

K. Westrich
Global VP of Electronics, Semiconductors &
Simulation Digital Industries
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Biography
Coming Soon

References

Climate-aware semiconductor manufacturing and what that means to lithography

E. Gallagher
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imec, Sustainable Semiconductor Systems and Technologies, Leuven, Belgium

Abstract
The semiconductor industry has been fueled by innovation. We have come to rely on disruptive innovations like new exposure wavelengths or directional etch processes. Driving to wafer measurables is the norm but given the human-induced impacts on our environment, we must also be aware of the climate impacts. This is not possible without quantitative assessment. To provide that information, imec has developed a cradle-to-gate life cycle analysis technology nodes based on bottom-up modeling of a generic high-volume semiconductor fabrication fab. The resultant virtual fab is used to identify major process contributors to emissions, to provide sensitivity analysis, and to enable future patterning decisions with a quantification of their environmental ramifications. Overall technology data will be shown, along with a more targeted examples relevant to lithography.

Biography
Emily Gallagher is a program director for SSTS at imec, focusing on sustainability in semiconductor manufacturing processes. Emily earned her PhD in physics from Dartmouth College where she studied free electron lasers. After graduation, she joined IBM and became immersed in semiconductor technology. She held many wafer fabrication roles at IBM from functional characterization to process integration, to leading the EUV mask development effort. She joined imec in 2014 to continue EUV development work. Emily has authored over 100 technical papers, holds over 20 patents, is an SPIE Fellow and co-leads the SEMI Semiconductor Climate Consortium Scope1 Working Group.

References

SCC Panel Discussion

L. Orsati
Head of Sustainable Products & Environment Management
STMicroelectronics, Grenoble, France

Abstract
Panelist

Biography
Since June 2023, Laurent Orsati has been the Head of Sustainable Products & Environment Management at STMicroelectronics. In this role, he focuses on aligning sustainability programs with customer roadmaps, developing product eco-labels, optimizing customer request processes, and standardizing reporting.
Laurent began his career at STMicroelectronics in 1999 as a Methods & Projects Engineer in Crolles. Over the years, he has held various roles in the Facilities and Procurement departments. In 2018, Laurent took responsibility for the Materials/Products Compliance & Supplier Ethics team, expanding and digitalizing these activities.
Laurent holds an engineering degree from the Ecole Nationale Supérieure des Arts et Métiers, specializing in production systems management, methodologies, and project management. His career is marked by a strong commitment to sustainability, efficiency, and continuous improvement, making him a key contributor to STMicroelectronics' success.

References

The Energy Needs of the Semiconductor Industry and how to Meet them

A. Fournier
Global Market Executive
TotalEnergies, Puteaux, France

Abstract
The Energy Needs of the Semiconductor Industry and how to Meet them

Biography
Aude Fournier is Global Market Executive at TotalEnergies.
She joined the company in 2017, following the acquisition of Direct Energie, a French energy supplier.
She has 20 years of experience, including 16 years in Energy and 4 years in Strategy and Management consulting.
Aude is part of OneB2B Solutions, a team aiming at supporting global companies in their decarbonation journey.
Dedicated to the Semiconductor & Electronics industries, her objective is to provide her partners with all the solutions they need, globally, based on TotalEnergies' portfolio (renewable electricity, aggregation or flexibility services, biogas, cooling fluid…).

References

Addressing Nature-Related Risks and Regulations in Semiconductor Landscape: Circular Economy as Key to Transforming the Semiconductor Industry

K. Kirr
Associate Partner
Porsche Consulting GmbH, Frankfurt, Germany

Porsche Consulting

Abstract
As the semiconductor industry navigates the complexities of a rapidly changing world, the state of nature presents significant risks and disasters that cannot be ignored. This keynote will delve into the critical intersection between the semiconductor sector and the natural environment, highlighting how the industry's consumption of water, electricity and land use impact key threats to nature while simultaneously relying on essential ecosystem services. The semiconductor industry requires to exploit this opportune momentum by proactively develop pragmatic and standardized indicators to monitor and improve the nature conservation using state-of-the-art digital solutions.
We will explore the transformative potential of circular economy strategies — reduce, redesign, recycle, and reuse—as effective solutions to mitigate the industry's environmental footprint. These strategies not only address the pressing nature impacts but also offer pathways to innovation and resilience.

Biography
Klaus Kirr, Associate Partner at Porsche Consulting, combines industry know-how and operations strategy. With 15 years of experience in diverse industries across various leading OEMs and 7 years in consulting, Klaus specializes in circular economy, and zero impact factory context. His profound industry knowledge and strategic acumen position him as a key driver of sustainable transformation. Klaus's innovative methodologies and forward-thinking approaches are pivotal in steering organizations towards enhanced efficiency and sustainability.

References