

# SEMICON® EUROPA

NOV 15-18, 2022 | MUNICH, GERMANY



## Smart and Green Manufacturing Summit

### Welcome Note



L. Altimime  
President  
SEMI Europe, Berlin, Germany



### Abstract

Welcome Note

### Biography

As President of SEMI Europe, Laith Altimime leads SEMI's activities in Europe and the Middle East and Africa (EMEA). Altimime has P&L responsibility as well as ownership of all Europe region programs and events, including SEMICON Europa. He is responsible for establishing industry Standards, advocacy, community development, expositions, and programs. He provides support and services to SEMI members worldwide that have supply chain interests in Europe. He manages and nurtures relationships with SEMI members in the region and globally as well as with local associations and constituents in industry, government, and academia.

Altimime has more than 30 years of international experience in the semiconductor industry. Prior to joining SEMI in 2015, He held senior leadership positions at NEC, KLA-Tencor, Infineon, Qimonda and imec. Altimime holds an MSc from Heriot-Watt University, Scotland.

## Keynote Opening



A. Curioni  
IBM Fellow, Vice President Europe and Africa and  
Director IBM Research - Zurich  
IBM Zurich, Zurich, Switzerland



### Abstract

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### Biography

Dr. Alessandro Curioni is an IBM Fellow, Vice President of IBM Europe and Africa and Director of the IBM Research Lab in Zurich, Switzerland. On top of being responsible for IBM corporate research in Europe, he leads global research in Security and the Future of Computing.

Dr. Curioni is an internationally recognized leader in the area of high-performance computing and computational science, where his innovative thinking and seminal contributions have helped solve some of the most complex scientific and technological problems in healthcare, aerospace, consumer goods and electronics. He was a member of the winning team recognized with the prestigious Gordon Bell Prize in 2013 and 2015. His research interests now include AI, Big Data and novel compute paradigms, such as neuromorphic and quantum computing.

Dr. Curioni received his undergraduate degree in Theoretical Chemistry and his PhD from Scuola Normale Superiore, Pisa, Italy. He started at IBM Research – Zurich as a PhD student in 1993 before officially joining as a research staff member in 1998, where he had several research and manager roles, including being the founding manager of the Cognitive Computing and Computational Sciences department. He is a member of the Swiss Academy of Technical Sciences

## Intel RISE2030 and 2040 carbon neutral goals



T. Brady  
Director, Global Public Affairs and Sustainability  
Intel Corporation, Phoenix, United States of  
America



### **Abstract**

Coming Soon

### **Biography**

Todd Brady is the Director of Global Public Affairs and Sustainability for Intel Corporation. In this role he leads state and local government affairs, media and community relations, corporate volunteerism and sustainability at the company's major manufacturing and office locations around the globe. In addition to overseeing regulatory and community engagement strategies in the US, China, Southeast Asia, Israel, Ireland and Latin America, he directs Intel's global initiatives to make Intel "smart & green" by leading corporate-wide sustainability programs such as climate, energy and water conservation, green design and the integration of internet of things (IoT) solutions to create smart and green offices, buildings and facilities of the future. During his 20+ years at Intel, Todd has represented the company publicly in numerous forums and led industry-wide initiatives in many national and international committees. He has authored more than 20 papers in scientific journals and conference proceedings on a variety of sustainability topics. In 2009, he was named by *Scientific American* as one of ten outstanding leaders involved in research, business or policy pursuits that have advanced science and technology. Todd holds a BS in Chemical Engineering from Brigham Young University and a MS in Environmental Engineering from the University of Illinois at Urbana-Champaign.

## Collaboration - The challenge to reduce emissions during a period of growth



C. Jones  
Environmental Solutions Business Development  
Manager  
Edwards Vacuum, Burgess Hill, United Kingdom



### Abstract

A credible reduction in both direct and indirect, specifically energy-related, greenhouse gas emissions is needed to meet the global warming goals outlined by the Paris Agreement. This is one of the many environmental sustainability challenges the semiconductor industry must face. This reduction must be achieved during a period of substantial growth for our industry and must be met by innovation and unprecedented collaboration.

We will describe the scale of the challenge, the specific issues that need to be overcome, and outline some approaches to halve our emissions on a decadal basis, whilst the industry expects to double in size by 2030. We all must understand the magnitude of the challenge.

### Biography

Christopher Jones is a PhD-qualified chemist with more than 30 years of experience in the environmental protection arena. He has designed and implemented processes to manage wastes generated by the semiconductor, nuclear, military, and pharmaceutical industries and developed analytical methods for air and water quality monitoring. He is the Environmental Solutions Business Development Manager at Edwards. He aims to help owners of fabs better understand the local and broader environmental sustainability implications associated with the operation of their facilities.

## The Road To A Zero-Emission Subfab



G. Davies  
Director Business Development Global  
DAS Environmental Expert GmbH, Dresden,  
Germany



Environmental Experts.

### Abstract

The semiconductor industry has made a rather mixed response to the carbon neutral requirements as demanded by our current climate challenges. Semiconductor companies have relative conservatively committed to carbon neutrality by 2050 while others have been much more aggressive in their timelines. The subfab and its associated equipment has a considerable impact on the overall eCO2 emissions. This short presentation will discuss the opportunities, potentials and challenges to a carbon neutral footprint particularly focusing on the abatement requirements in the subfab and the interactions with the surrounding equipment.

### Biography

**Dr. Guy Davies**

**Director Business Development Global**

Dr. Guy Davies is Director Business Development Global and member of the management board of DAS Environmental Expert GmbH. He joined DAS in 2011 and since then is focussed on the company's strategies for product development, innovation management and internationalisation.

Prior to his employment with DAS he had 6 years experience working in Semiconductor Manufacturing at Qimonda. Between 1994 and 2003 he worked for ASML, a leading semiconductor equipment manufacturer in a variety of roles worldwide including Research and Development, Customer Support and Strategic Marketing. He completed his Doctorate in optical metrology in 1995 at the University of Edinburgh, a Masters degree at the University of Durham in 1990 and his undergraduate degree in Applied Physics and Electronics in 1989 at Lancaster University.

## The environmental footprint of Si chip manufacturing



C. Rolin  
Program Manager  
Imec, Compute and Memory Technologies,  
Leuven, Belgium



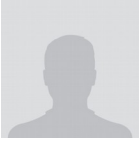
### Abstract

The climate crisis calls for urgent actions towards sustainability as an integral component of businesses and regulations. With its large and growing environmental footprint, the Information and Communication Technology sector is arguably a large part of the problem, but also a part of the solution. Fabrication of integrated circuits is an energy and resource intensive process and the drive towards higher performance and increased functionality increases the process complexity dramatically from node to node. Traditionally, the improvement between technology nodes is evaluated using Power, Performance, Area and Cost (PPAC) metrics in a Design Technology Co-Optimization (DTCO) completely neglecting sustainability. However, this established framework provides an opportunity to do early sustainability assessments of future technologies all the way from material sourcing and fabrication to end of life. To demonstrate this approach, we evaluate the environmental impact, more specifically the energy, ultra-pure water (UPW) and mineral consumption as well as the greenhouse gas (GHG) emissions from manufacturing logic, DRAM and NAND technologies from past to future nodes. Our analysis of logic scaling reveals how the environmental metrics normalized per transistor evolve along with improvements in performance and reduction in cell area.

### Biography

**Cédric Rolin** is Manager for the Sustainable Semiconductor Technologies and Systems (SSTS) Program at imec. He received his M.S. degree and his PhD degree in materials science from the Université Catholique de Louvain in 2004 and 2009 respectively. During the first 13 years of his career (including 2 years postdoc at University of Michigan), Cedric grew his expertise in the thin film growth and manufacturing of devices based on organic semiconductors. Then, from 2018 to 2021, he led a R&D team developing solutions to move flexible thin film circuit and display technologies from the Lab to the Fab. Part of this effort focused on the upscaling of the nanoimprint lithography patterning technology to a 300mm Fab tool. Since November 2021, Cédric has joined the sustainability effort of imec as Program Manager, focusing on the assessment and improvement of the environmental footprint of the semiconductor manufacturing industry.

## Green ICT



R. Wieland  
Project Manager  
Fraunhofer Research Institution for Modular Solid  
State Technologies EMFT, Dresden, Germany



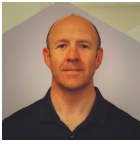
## Abstract

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## Biography

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## Green AI



J. Kelleher  
Professor  
TU Dublin, Dublin, Ireland

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### Abstract

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### Biography

John's core research expertise is in the areas machine/deep learning and natural language processing. He is the TU Dublin lead in the ADAPT centre and the scientific lead for the Digital Content Transformation Strand. Within the ADAPT centre he leads research projects on language modelling, lexical semantics, machine translation, novelty detection, image captioning, dialog systems, and making AI more environmentally sustainable. John has been the academic lead on numerous industry projects across a range of topics and domains, including: anomaly detection, transfer learning, customer segmentation and propensity modelling, dialog systems and chat bots, and information retrieval and natural language processing.



## **Green ICT**

N. Nissen  
Head of Department  
Fraunhofer Institute for Reliability and  
Microintegration IZM, Dresden, Germany



### **Abstract**

Coming Soon

### **Biography**

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## Sustainability Improvements in Semiconductor Manufacturing Using Smart Manufacturing Technologies



A. Neuber  
Director Environmental Services  
Applied Materials, Dresden, Germany



### Abstract

Coming Soon

### Biography

Andreas Neuber, Ph.D. has been a Senior Director at Applied Materials since 2008. He has published 80+ papers related to semiconductor fab and facility design, sustainable design and energy savings, water management and recycling, contamination control, and industrial engineering.

Prior to joining Applied Materials, Andreas Neuber was Vice President for M+W Zander. During his 18 years at M+W Zander, was involved in semiconductor fab construction and operation/optimization in many locations.

Andreas Neuber received a PhD degree in Chemical Engineering from University of Technology Dresden. He is co-chair of the SEMI ESEC task force and the IRDS EHS/S Energy and water reduction roadmap.

## Treading lightly: How a pandemic pivot to remote integrations helped reduce our carbon footprint



D. Suerich  
Product Evangelist  
PEER Group, Kitchener, Canada



### Abstract

When the pandemic hit its disruptive peak in 2020-21, the airline industry took a record-breaking tumble as countries restricted travel to limit the spread of COVID-19. For PEER Group, a company that supplies automation software to semiconductor OEMs and factories around the world and relies on onsite discovery, integration, and inspection to deliver and maintain its products, the limitation on international travel forced an immediate pivot to alternative ways of performing these critical functions.

As the business world moved to remote work and virtual communication platforms to stay connected with colleagues and customers, so too did PEER Group's integration and services team to ensure clients and partners continued to receive the same high level of service they were accustomed to pre-pandemic.

In this presentation, we'll share lessons learned from two years of performing remote discoveries, integrations, and inspections and how, in some instances, these lessons have become best practices for our customers going forward. We'll show how pivoting specific functions to remote platforms has decreased our reliance on air travel, reducing PEER Group's carbon footprint during the pandemic and, as we continue to improve and develop our remote capabilities, into the future.

### Biography

#### **Doug Suerich, Director of Marketing & Product Evangelist, PEER Group**

*Doug combines more than 20 years of experience creating manufacturing software with a deep desire to help customers find the best solutions to solve their biggest challenges. A passionate advocate for smart manufacturing, Doug is an active member of the SEMI SMART Manufacturing Technology Community, Americas Chapter, and co-chairs the Advanced Process Control Smart Manufacturing Conference.*

## Effect of Gas Abatement Selection and Destruction Efficiency on Carbon Neutrality Goals



A. Stover  
Chief Technology Officer  
centrotherm Clean Solutions, Blaubeuren,  
Germany



### Abstract

Process gas abatement is the backbone of any fab's environmental stewardship program. Proper abatement minimizes not only toxic and hazardous gas release to the environment, but also particulate matter and waste water. Increasingly, gas abatement is measured against its carbon footprint for the input power source, be it electrical or fuel. There is currently a push to go for "carbon free" abatement, using either hydrogen as the fuel gas or electrical systems powered by renewable energy. This goal is indeed laudable, however any carbon footprint calculation should also include the input fuel gas destruction, as they can have extremely high global warming potentials, far above and beyond the input electricity or methane.

To that end, this paper makes a full comparison of the carbon footprint for various abatement technologies, taking into account various process gas destruction efficiencies to determine if the power carbon footprint outweighs the non-abated process gases. Additional analyses for regional power generation carbon footprint are also performed.

### Biography

Dr. Stover is currently the Chief Technology Officer for centrotherm Clean Solutions USA, based in Albany NY. After completing his bachelors degree in chemistry from Haverford College and PhD from The Johns Hopkins University, he has spent the last 8 years in the semiconductor industry, focused on abatement and achieving sustainability goals.