Welcome to SEMI EMG Webinar

June 21 | Wednesday | 10 AM Pacific Time

Push & Pull: How the Members of the Semiconductor Supply chain Drive a Sustainable Future

CONNECT - COLLABORATE. - INNOVATE. - GROW. - PROSPER

Jennifer Braggin

Director of Technology

Entegris Inc.

Jennifer Braggin is a Director of Technology for Entegris, Inc., and has held various roles in technical marketing and engineering management where she has focused on improving semiconductor manufacturing yields, enhancing training efforts, and communicating technical achievements to a range of international clients and partners. Jennifer was the inaugural recipient of the 2021 SEMI Foundation Excellence in Achievement Award.

Jennifer graduated from the Tufts Gordon Institute with an M.S. in engineering management and received the program's outstanding student award. She also holds an M.S. in engineering science, microelectronics manufacturing from Rensselaer Polytechnic Institute, and a B.S. in materials science and engineering from Lehigh University. Jennifer currently teaches the undergraduate engineering leadership course at the Tufts Gordon Institute.

AGENDA

10:00 AM	Introductions Jennifer Braggin, Entegris, Moderator
10:05 AM	Unleashing the Green Potential: Intel's Sustainable Journey in Digital Age Soley Ozer, Intel Corporation
10:25 AM	JSR Micro Sustainability: Following Our Customer's Footsteps Stallar Lufrano-Jardine, JSR Micro
10:45 AM	Q&A: Panel Discussion

Dr. Soley Özer

Strategic Assistant to Logic Technology Dept. GM

Entegris Inc.

Dr. Soley Özer is a Principal Engineer and the Strategic Assistant to the Logic Technology Development (LTD) group's Corporate-VP at Intel Corporation. Soley is responsible for coordinating Intel environmental and sustainability initiatives on future silicon technologies.

Soley has served in various engineering and supply chain roles including external research consortia management, process technology research, development, and high-volume manufacturing spanning multiple Intel technology nodes. Outside of Intel, Soley served as the co-chair of SEMI Pacific NW Chapter. Soley earned a Ph.D. from the Arizona State University and held a Postdoctoral Fellowship at the University of Texas at Austin, both in Physical Chemistry.

SEMI EMG Webinar series

Unleashing the Green Potential

Intel's Sustainable Journey in the Digital age

Soley Özer, PhD

Principal Engineer, Strategic Assistant to Logic Technology Department (LTD) CVP

6/21/2023

AGENDA

- Overview of Intel's commitment to sustainability and RISE goals
- Proof points of sustainability targets
- Opportunities for sustainable manufacturing and supply chain
- Collective challenges and opportunities for industry

Intel's Global Presence Is Expanding

Oregon | Arizona | New Mexico | Ohio | Costa Rica | Ireland | Germany | Israel | Chengdu | Vietnam | Malaysia

Intel Worldwide Headquarters

Santa Clara, California

Geographically Diverse Manufacturing Capacity

Wafer Fabs | Assembly and Test | Future Site

A history of taking action against Climate Change

1994
Intel begins voluntary environmental reporting.

1996
Intel leads agreement to reduce use of perfluorocarbons (PFCs) in our industry.

2006
Intel joins the US EPA Climate Leaders program and the EU Commission's Sustainable Energy Europe Campaign.

2008
Intel becomes the largest voluntary corporate purchaser of green power under the US EPA Green Power Partner Program.

2012
Intel reduces absolute GHG emissions more than 60% below 2007 levels, exceeding a 20% reduction goal.

2013
Intel achieves 100% renewable electricity in the United States.

2017
Intel achieves 100% renewable electricity in Europe.

2020
Intel commits to new operational, industry, and global challenge climate goals for 2030.

2022 >
Intel announces goal to achieve net zero Scope 1+2 GHG emissions by 2040.

Our RISE Sustainability Goals:

our global commitments as we continue to grow and increase nufacturing capacity

Climate Change, by 2030

- 100% renewable electricity
- $300 million to save 4 billion kWh of electricity
- 10% reduction of GHG[1] emissions
- New factories/facilities to meet USGBC® LEED® program standards
- Cross-industry R&D initiative to identify lower global warming potential chemicals and develop new abatement

Climate Change, by 2040

- Achieve net zero GHG"1" emissions
- Focused on absolute GHG reductions, credible offsets only where no feasible solutions

In 2021: Achieved 93% renewable electricity use

Net Positive Water, by 2030

- Achieve net positive water by conserving 60 billion gallons of water and funding external water restoration projects

In 2021: 9.6 billions of water conserved and net positive in the U.S. and India

Zero Waste, by 2030

- Achieve zero waste to landfill[2]
- Implement circular economy strategies for at least 60% of our manufacturing waste streams in collaboration with suppliers

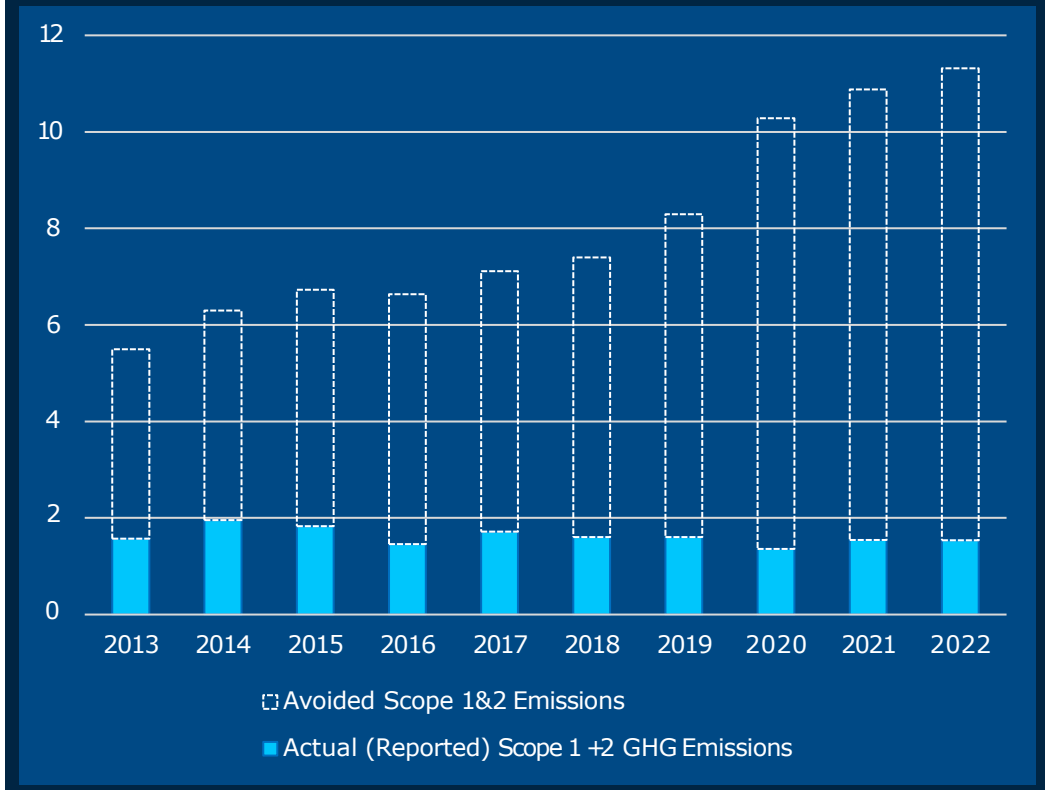
In 2021: 6.4% of waste to landfill

[1]Scope 1and 2 greenhouse gas emissions

[2]Defined as <1%waste to landfill

Reducing Our GHG* Emissions

Due to our long history of investment and action, we avoided >80% of our GHG* emissions over the last decade.



- Chemical substitution
- Process optimization
- Abatement
- Energy conservation
- On-site alternative and renewable electricity
- Renewable electricity purchases

* Scope 1 and 2 greenhouse gas emissions

Sustainable Manufacturing

Climate Action- enabling Net Zero by 2040

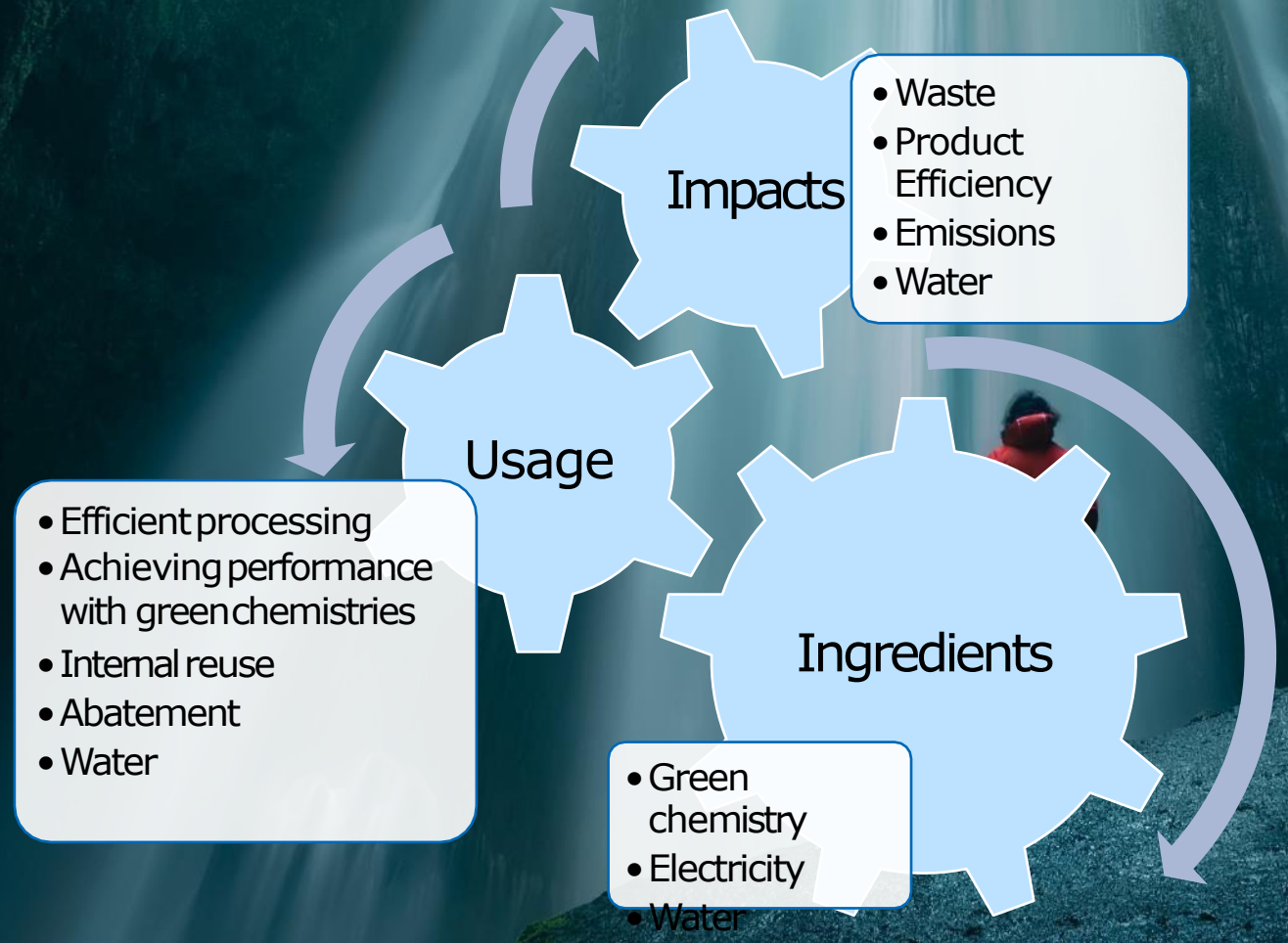
- Scope 1&2 Operational GHG reductions
  - Improvements in tool efficiency & facility usage, chemical usage
  - Migration to lower GWP chemistries (dry etch gases, refrigerants, heat transfer fluids)

Environmental Footprint Reduction

- Waste & Abatement Solutions
- Efficiency (lower energy, water, chemical consumption)

Readiness to meet emerging regulations (PFAS, PIP, F-gas)

Opportunities for a Greener Fab



Reducing Supplier Environmental Impact

We reduce our own environmental impact by working with our suppliers to decrease their waste generated, water usage, and greenhouse gas emissions.

Our supplier initiatives address environmental impacts in areas such as:

Logistics

Green chemistry

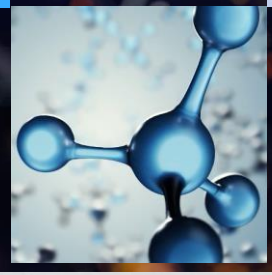
Product packaging

GHG emissions

Supply Chain Responsibility

Collaborating with Intel's world class supply chain to drive upstream GHGs 30% lower by 2030 than they would be in the absence of action

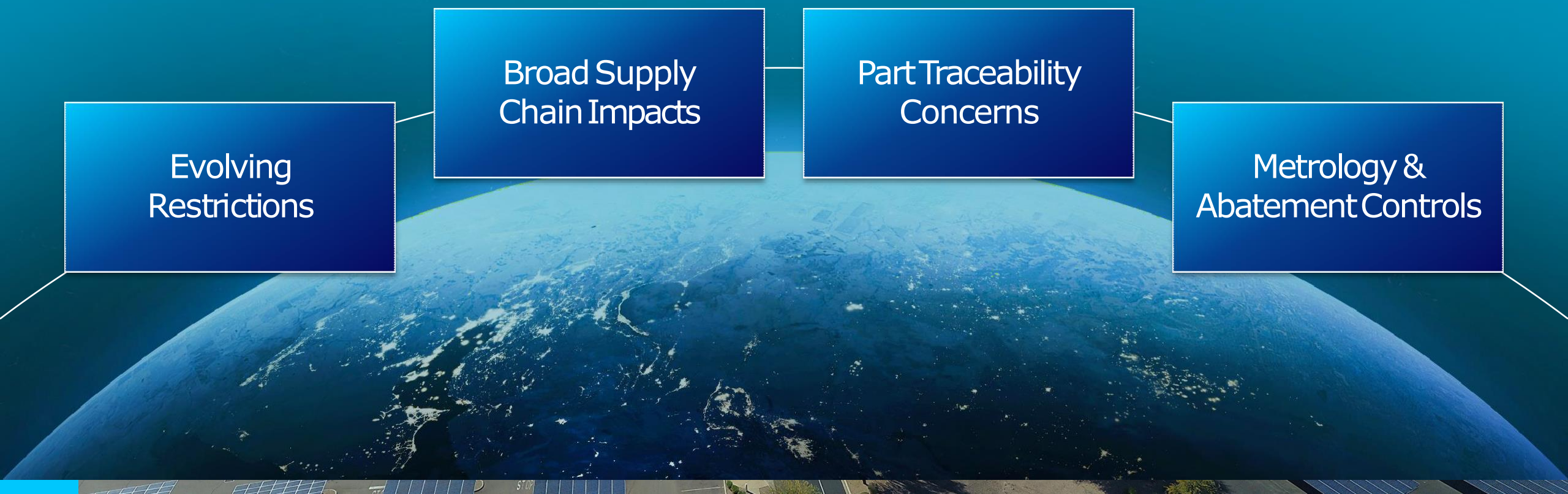
Leading the way with our Chemical Footprint program to lower impact and provide a lower total cost of ownership



PFAS Industry Challenges

CRITICAL INDUSTRY NEED:

PFAS-free research and replacement to enable greener more sustainable alternatives



Collective opportunities

March towards sustainable solution as industry Collaborate to realize shared sustainability goals

- Evaluation and promotion of low/no-GWP alternative chemistries
- Proactive replacement of chemicals of concern (i.e. PFAS, PIP)
- Advance the industry & be a catalyst for change
  - Active engagement in consortia (i.e. SEMI & SIA) to develop industry sustainability & regulatory solutions
  - Influence across value chain to provide proactive solutions

INVITATION

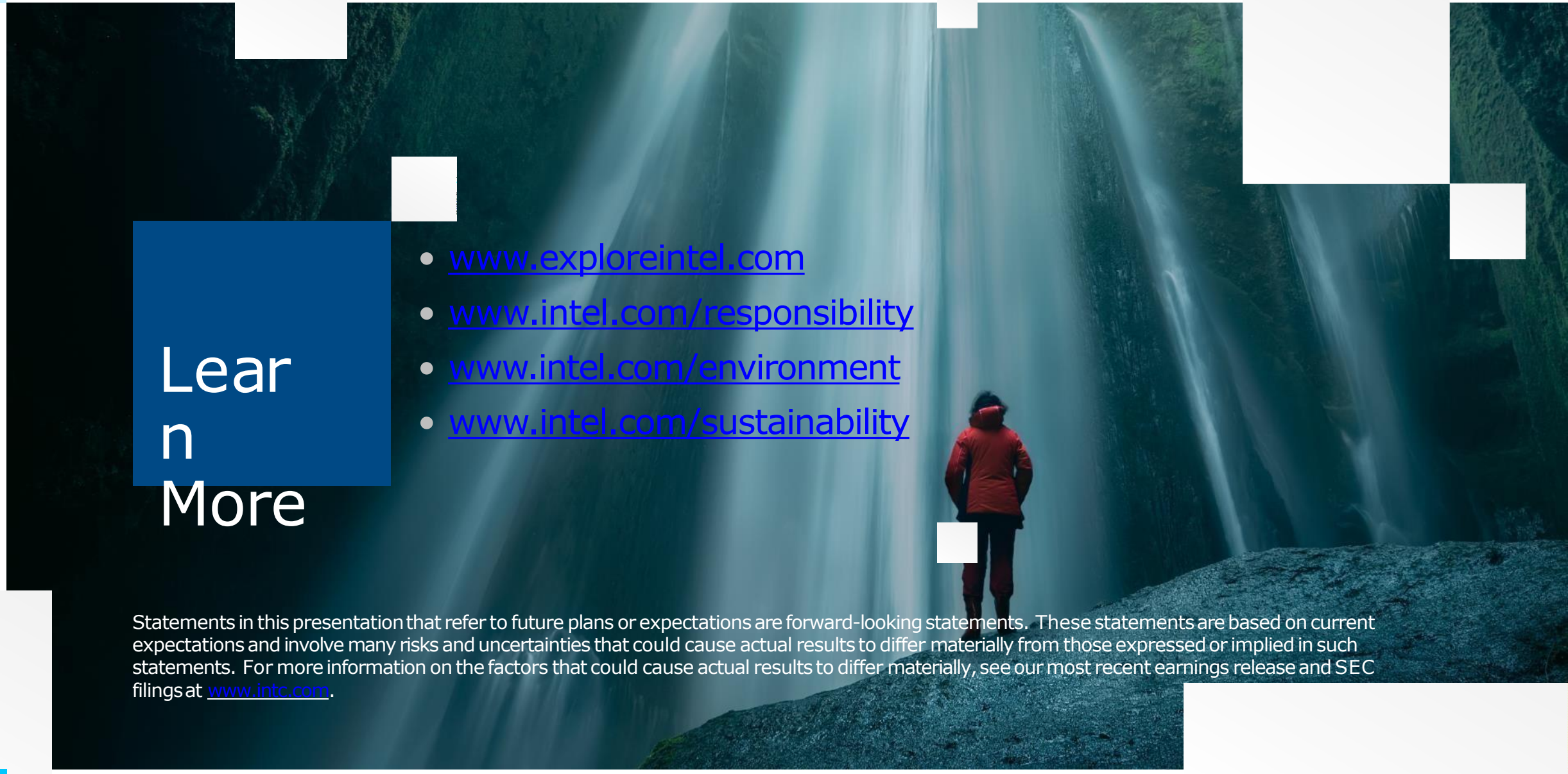
SEMICON® WEST Sustainability Summit, Workshops GHG and PFAS

Sponsored by Intel

Invitation only

Send an email to soley.ozer@intel.com

July 13, 2023 I San Francisco



Learn More

- www.exploreintel.com
- www.intel.com/responsibility
- www.intel.com/environment
- www.intel.com/sustainability

Statements in this presentation that refer to future plans or expectations are forward-looking statements. These statements are based on current expectations and involve many risks and uncertainties that could cause actual results to differ materially from those expressed or implied in such statements. For more information on the factors that could cause actual results to differ materially, see our most recent earnings release and SEC filings at www.intc.com.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Dr. Stallar Lufrano-Jardine

Sustainability & Supplier Diversity Program Manager

JSR North America

Dr. Lufrano-Jardine brings over a decade of environmental and social leadership experience to JSR North America. As the Sustainability & Supplier Diversity Program Manager, she has focused on providing sustainability and program development expertise across several fast-paced industries. She also develops and implements strategic initiatives to reduce environmental impact and increase social responsibility, while conducting comprehensive assessments and audits to identify improvement and solutions.

Prior to joining JSR, Dr. Lufrano-Jardine held various positions at the University of Nevada, Reno with a notable history of creating innovative frameworks and programs to optimize business planning, improve relationships within and outside organizations, and increase global cooperation. In addition to her professional roles, Dr. Jardine continues to advise and mentor numerous sustainability and climate focused organizations throughout NA.

She holds a Ph.D. in environmental leadership and an MBA in business sustainability from the University of Nevada, Reno.

JSR Micro Sustainability: Following In Our Customer's Footsteps

Dr. Stallar Lufrano-Jardine

Sustainability & Supplier Diversity Program Manager

JSR's Starting Point

- Intel led the change and raising expectations
- Asked for a CSR report in 2010
- Did not have a dedicated sustainability department
  - Employees from Quality and EHS
  - Train them in the GRI Framework
  - Wrote a report and released in it 2012
- Continued business until another report two years later
- Employees cared about what JSR was ACTUALLY DOING to address these concerns
- What started as a customer request led to employees expecting more from JSR

Overcoming Challenges

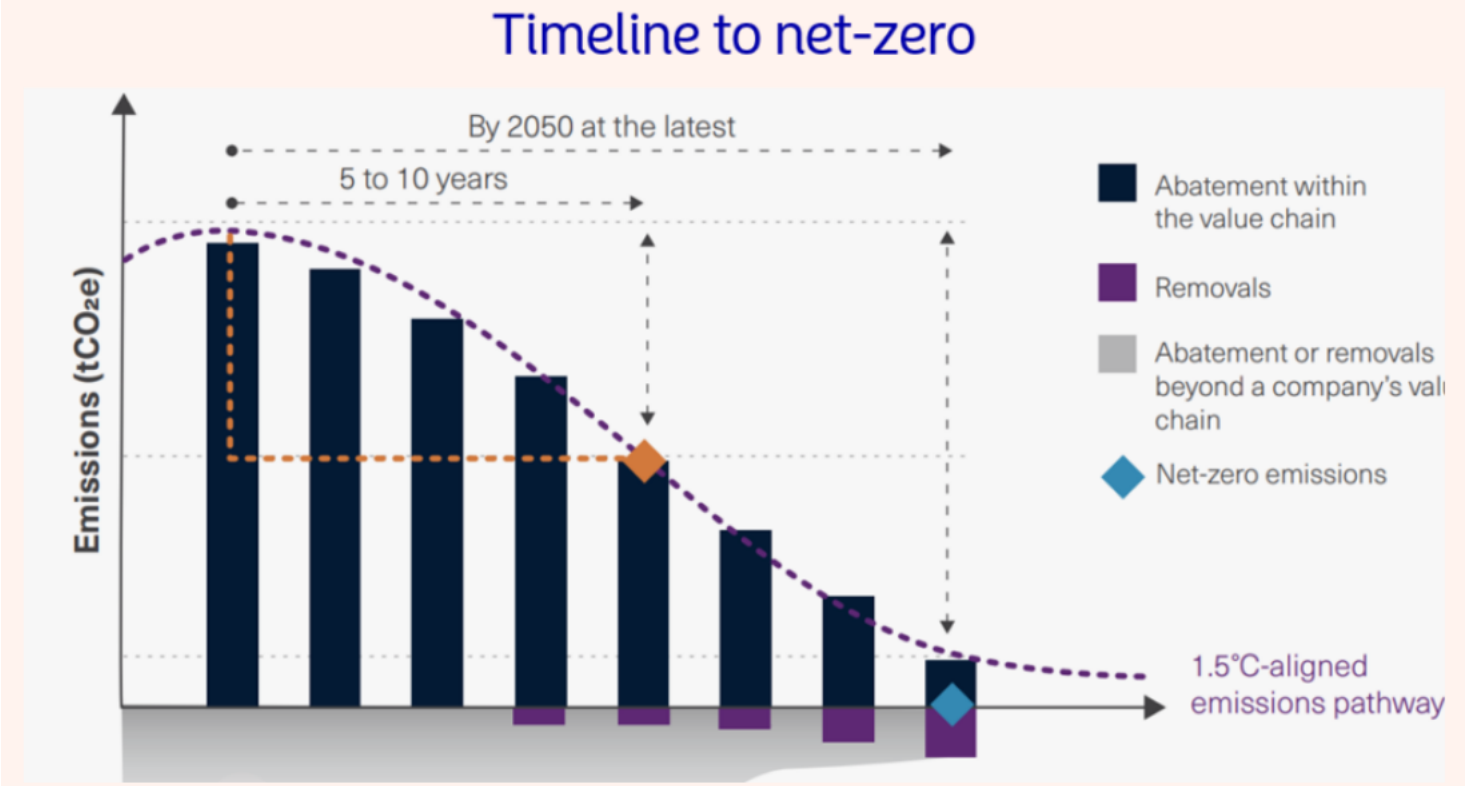
- Biggest challenge was resources
  - Complying because Intel told us to
  - More requests from customers now
- Did not know how to attack the problem
- Collecting data
  - Develop meaningful programs
  - Leadership must set the tone and expectations
  - Greening our portfolio, not our operations
  - Building a company-wide and global strategy
  - Keep that knowledge in JSR to share lessons learned

Setting Sustainability Goals

- Just “greened” when divesting our biggest polluter
- Goals are set by customers
  - Reactive instead of proactive
- We must get serious of measurements
- Cannot set reduction efforts, programs, communication, or employee engagement until we can see where we need to go
- Smaller programs are being executed
- Developing our sustainability mission and values to define its importance from leadership
- Share our specific goals - SBTi, water management, waste reduction, supply chain sustainability

Science Based Target Initiative

- Highest level and then moves across all divisions
- SBTs are emission pathways that are aligned with the 1.5ºC Paris Agreement
  - Solely GHG focused
- 5 to 10-year near-term goal
  - 30-50% GHG reduction
- 2050 net zero
  - 90% GHG reduction minimum
  - 10% offsets maximum
  - Scopes 1, 2 & 3
- Sizable undertaking
  - 12+ months for verification
  - Annual reporting thereafter



Source: Science Based Targets initiative

Collaboration and Partnerships

- From Intel to AstraZeneca and then back down to our suppliers
  - Higher expectations from life sciences (pharma)
  - Collaboration with stakeholders, suppliers, and customers
  - Highlight strategic partnerships established with JSR
  - Record best practices
  - Share the benefits and outcomes of collaboration
- Building a program for everything under JSR
- Our partnerships must expand beyond our industries
- Sustainability is difficult in semiconductor manufacturing
- Set realistic expectations but also drive innovation

Build a Sustainable Company

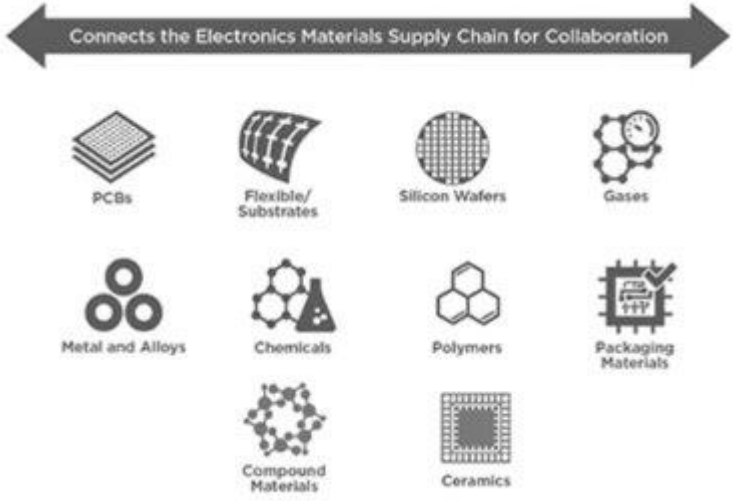
- Ensure we act by reporting data yearly
- Global consistency
- Investing on data software and Scope 3 experts
- Big focus on supplier diversity
- Tackling waste
- Putting effort into biodiversity
- Finding champions through out JSR
- Stepping up our communication
  - Keep departments in the loop (sales, marketing, procurement, mergers and acquisitions)
  - Highlight the initiatives and projects
  - Share how to integrate sustainable practices
  - Show examples of successful sustainability programs and their impact
- We work closely with our supply chain

Thank you!

www.linkedin.com/in/stallar

Electronic Materials Group (EMG)

Webinar Organized by: EMG Webinars Subcommittee



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EMG Mission

EMG represents SEMI Member Companies that provide substrates, polymers, metals, organics and inorganic materials, chemicals and gases that are developed or in use for the electronics manufacturing.

Help facilitate on matters that our members believe are best undertaken as an industry association

- Promoting awareness of the technical, regulatory and business issues the materials industry encounters in meeting the expectations of our customers and the industry at large
- Planning and sponsoring seminars, SEMI exhibits and other events relevant to the markets we serve
- Serving as a forum for discussing safety and environmental issues
- Being a voice to legislation and lobbying efforts on issues our industry faces

Contact Mayura at mpadmanabhan@semi.org to join SEMI EMG.

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EMG Tech Talk on July 11 @ SEMICON WEST

10:30 – 12:30 PM | TechTalk Stage

Sustainable Synergy: Balancing Semiconductor Growth and Environmental Responsibility

Session Description: This session addresses the challenge of balancing increased demand for electronic materials for semiconductor manufacturing with increasingly stringent regulatory requirements for greenhouse gases. Panelists will discuss how current regulatory standards and emerging climate policy trends align with opportunities to reduce emissions in the near term and invest in the development of climate-friendly substitutes over the longer term. Drawing on relevant examples from other industries, the panel will explore how a new policy framework for the semiconductor industry could guide an orderly transition to a more sustainable future that attracts new investment, enhances global competitiveness, and powers continued growth.

Lu Gan	Katherine Hutchison	Ben Siegl	Colin Brough	Scott Stone
Director of R&D Sustainability	Exec Dir, Head of Technology Strategy and Roadmap	Flurospecialities Business Mgr	Product Compliance and Advocacy	President and Founder
EMD Electronics	EMD Electronics	Arkema	TEL	Glencoe Strategies

SEMICON WEST Sustainability & EHS Events Calendar

July 11-13 | Moscone Center| San Francisco

July 11- Tuesday

10:30- 5:30 PM
Climate Equity and Social Impact

July 12 - Wednesday

8:30- 10:50 AM

CEO Summit: Path to Net Zero

12:30- 5:20 PM
Sustainability & EHS Forum

5:30- 6:30 PM
Sustainability and EHS Forum Reception

July 13 - Thursday

10:30 – 2:00 PM

Intel Sustainability Summit (Invitation only)

10:30 – 3:30 PM

Startups for Sustainable Semiconductors

SEMICON WEST AGENDA