



Webinar: A Rising Tide: Building a Climate-Resilient Semiconductor Value Chain

Welcome!

Mousumi Bhat Ph.D. VP SEMI Sustainability
May 2024

SUSTAINABILITY

Today's Participants



Alua Suleimenova
Senior Sustainability
Program Manager
Marvell



Michael Stiller
New Growth
Initiatives
Nasdaq



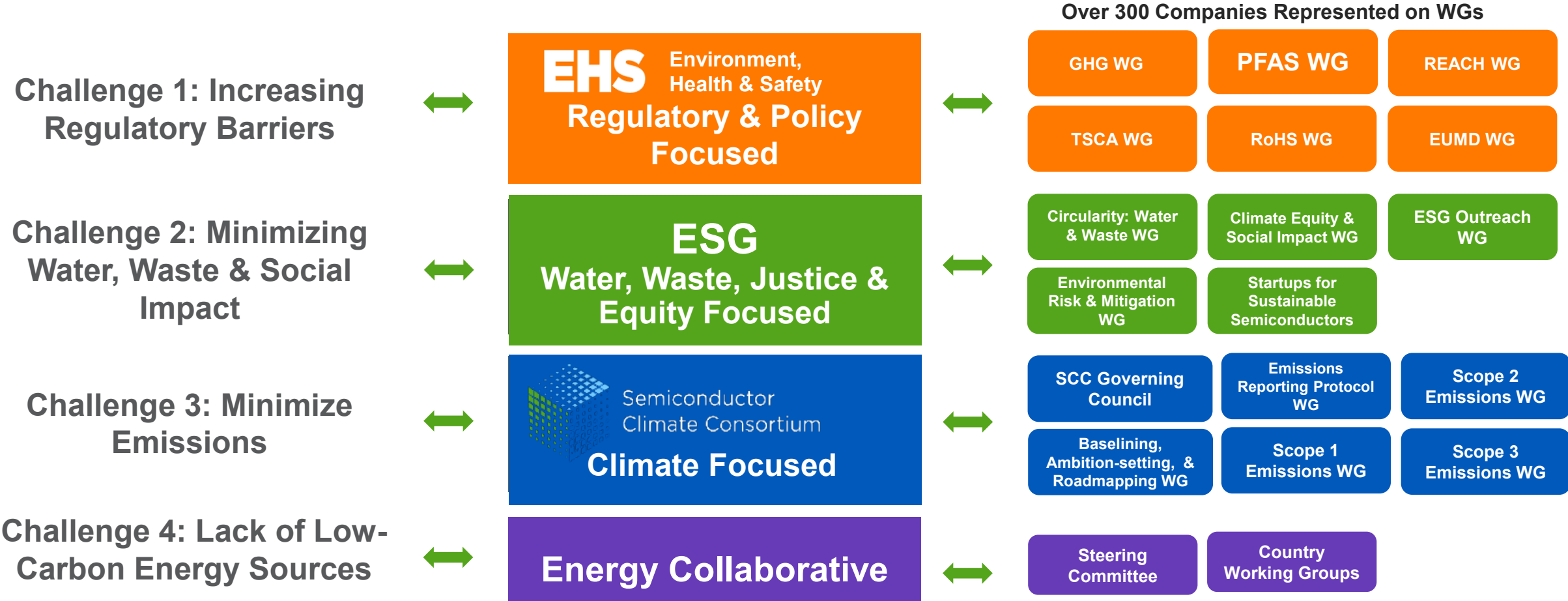
Jami Haaning
ESG Director
Lam Research



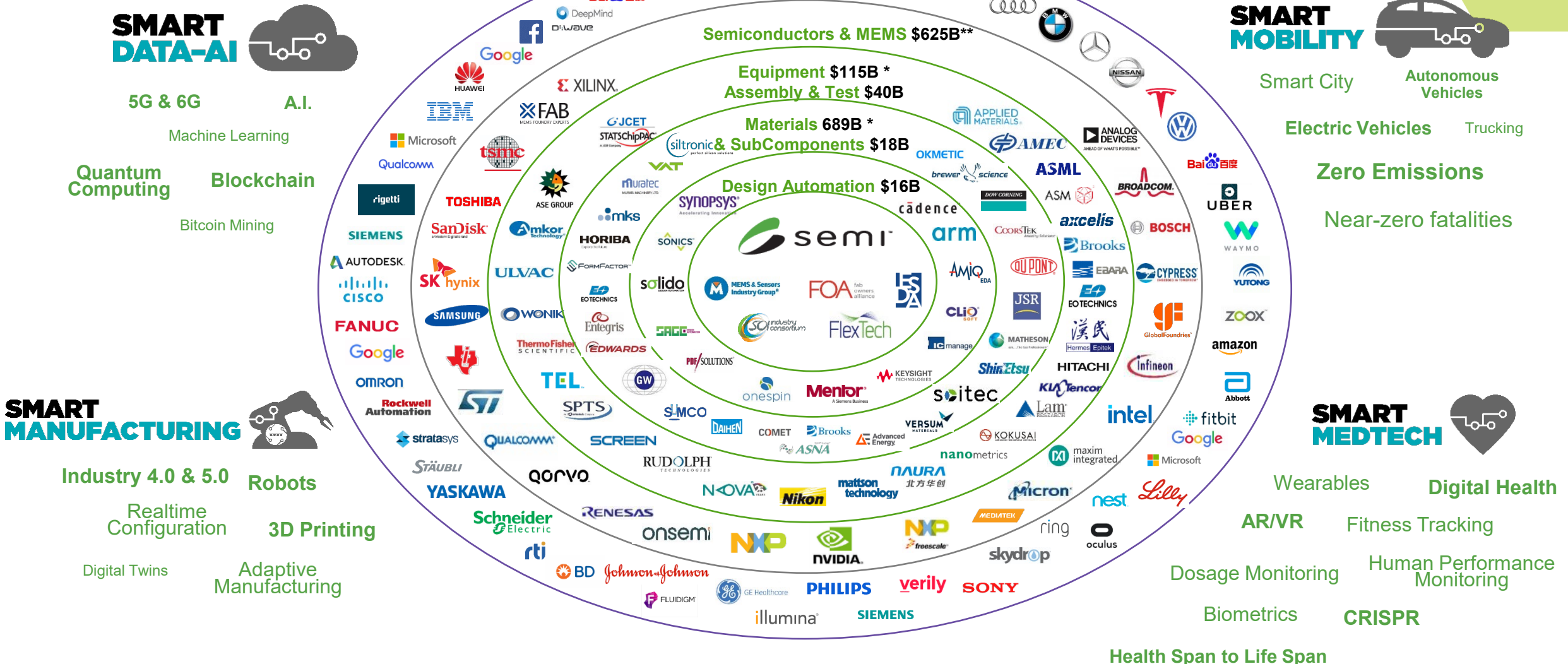
Mark Didden
Sr. Mgr. Sustainability
ASML

Aligning the Industry on Sustainability and Acting through Working Groups

SEMI Sustainability Initiative



SEMI Services Span a Huge Electronics Eco-System

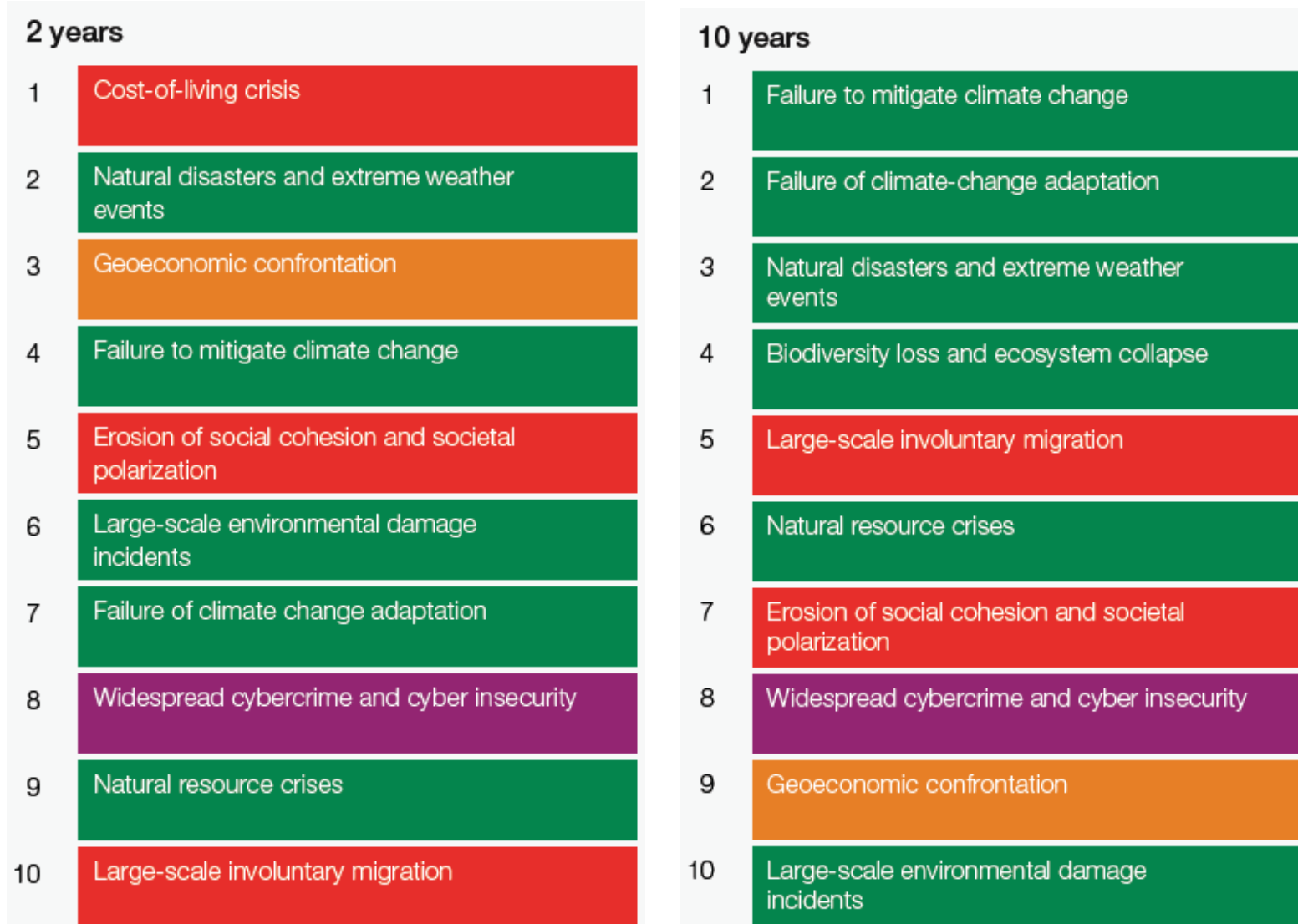


2022 Market Data Estimates Sources: SEMI, IC Insights and TechInsights

The Landscape: Risk and Resilience

- More than 50% of CEOs that participated in PwC's 26th Annual Global CEO Survey claim that their companies are likely to be exposed to climate risk in the next five years.
- During fiscal year 2022 reporting, 58% of companies disclosed in line with at least five of the eleven TCFD recommended disclosures
- **Only 4%** of companies disclosed in line with all eleven recommendations.
- According to CDP, just over 21% of companies that disclosed in 2023 had a climate transition plan
- And **only 0.4%** of those demonstrated best practice by disclosing against all key indicators that define a credible climate transition plan.

Global Risks Ranked by Severity Over 2 and 10 Years



New Report!

THE RISING TIDE: BUILDING A CLIMATE-RESILIENT SEMICONDUCTOR VALUE CHAIN



SEMI Environmental Risk Mitigation and Reporting Working Group in partnership with Nasdaq

The first study that provides a baseline of climate-related disclosures across all segments of the semiconductor value chain.



AGENDA

- 9:00 AM** **Welcome & Introduction**
Mousumi Bhat, SEMI
- 9:05 AM** **Environmental Risk Mitigation and Reporting in the Semiconductor Industry**
Alua Suleimenova, Senior Sustainability Program Manager, Marvell
- 9:20 AM** **Panel Discussion**
Moderator: Alua Suleimenova, Marvell
Michael Stiller, Nasdaq
Jami Haaning, Lam Research
Mark Didden, ASML
- 9:50 AM** **Future Activity & Q&A – Mousumi Bhat, SEMI**

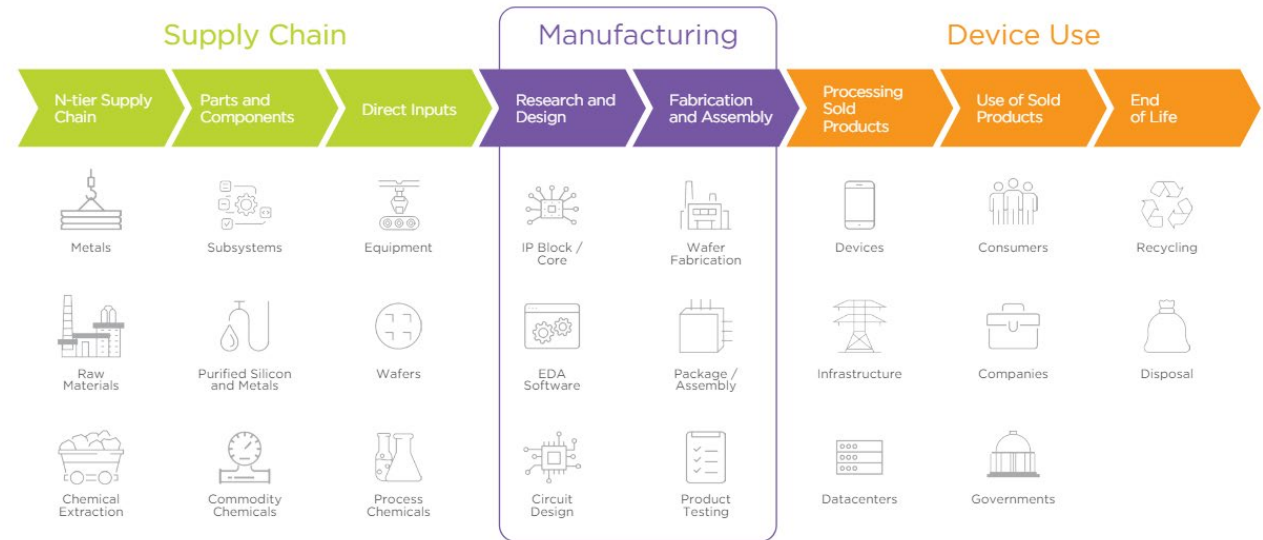
Environmental Risk Mitigation and Reporting in the Semiconductor Industry



Alua Suleimenova
Senior Sustainability Program Manager
Marvell

Why Climate Risk is a Business Risk?

- By 2030, the semiconductor market is expected to exceed 1 trillion USD in sales.¹
- Semiconductor industry has one of the most complex and segmented supply chains with a global operational footprint.
- To ensure global supply chain resilience, semiconductor companies need to understand the array of present and potential business risks, including climate-related risks.



¹Source: McKinsey, 2024.

Why Climate Risk is a Business Risk?

- According to the World Economic Forum's 2023 Global Risks Report, climate-related risks are in the top four of all global risks by severity over the next decade.



Climate Disclosure Assessment at a Value Chain Level

- Nasdaq Sustainable Lens evaluated climate disclosures against the TCFD recommendations (Taskforce on Climate-related Financial Disclosures).
- The TCFD outlays a framework of four core pillars that companies should follow to adapt their operational planning processes and strategies to climate risks and opportunities



Climate Disclosure Assessment at a Value Chain Level

- Depending on the disclosure alignment with the TCFD recommendations and the frequency of disclosures on a TCFD topic, the tool placed each company’s disclosure into one of the Nasdaq-defined TCFD maturity levels

TCFD Maturity Level	Description
Starting	A company has no or some climate–related information in its public disclosures, but it’s <i>not aligned</i> with TCFD guidance
Developing	A company has some climate–related information in its public disclosures and <i>some of it is aligned</i> with TCFD guidance
Established	A company has comprehensive climate–related information in its public disclosures and it is <i>mostly aligned</i> with TCFD guidance
Advanced	A company where almost all the climate-related information in its public disclosures is <i>fully aligned</i> with TCFD guidance

Climate Disclosure Assessment at a Value Chain Level

- The selected companies are distributed globally across the entire semiconductor value chain and represent top semiconductor companies by revenue.



Chemicals and materials



Equipment manufacturers



Fabless, hyperscalers, and end users



Fabs, direct manufacturing and Outsourced Assembly and Testing (OSAT)

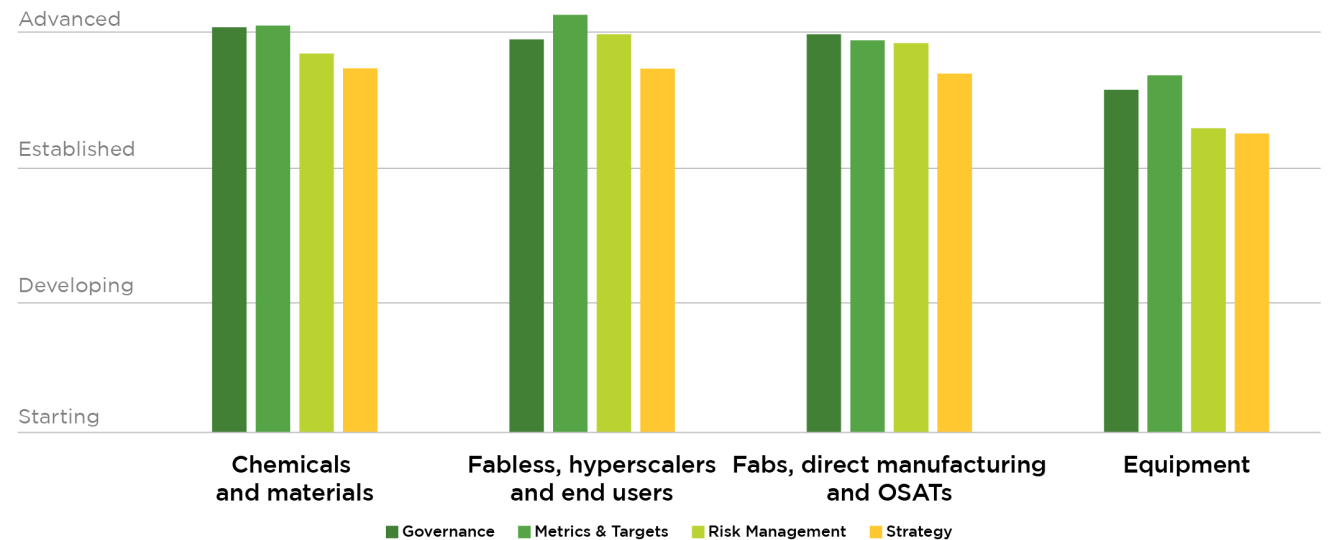
Takeaway 1: Maturity of corporate climate disclosures is in the 'Established' phase

- Semiconductor companies included in our assessment surpass the market average and is comparable to the performance of the largest 250 publicly traded global companies by market capitalization.



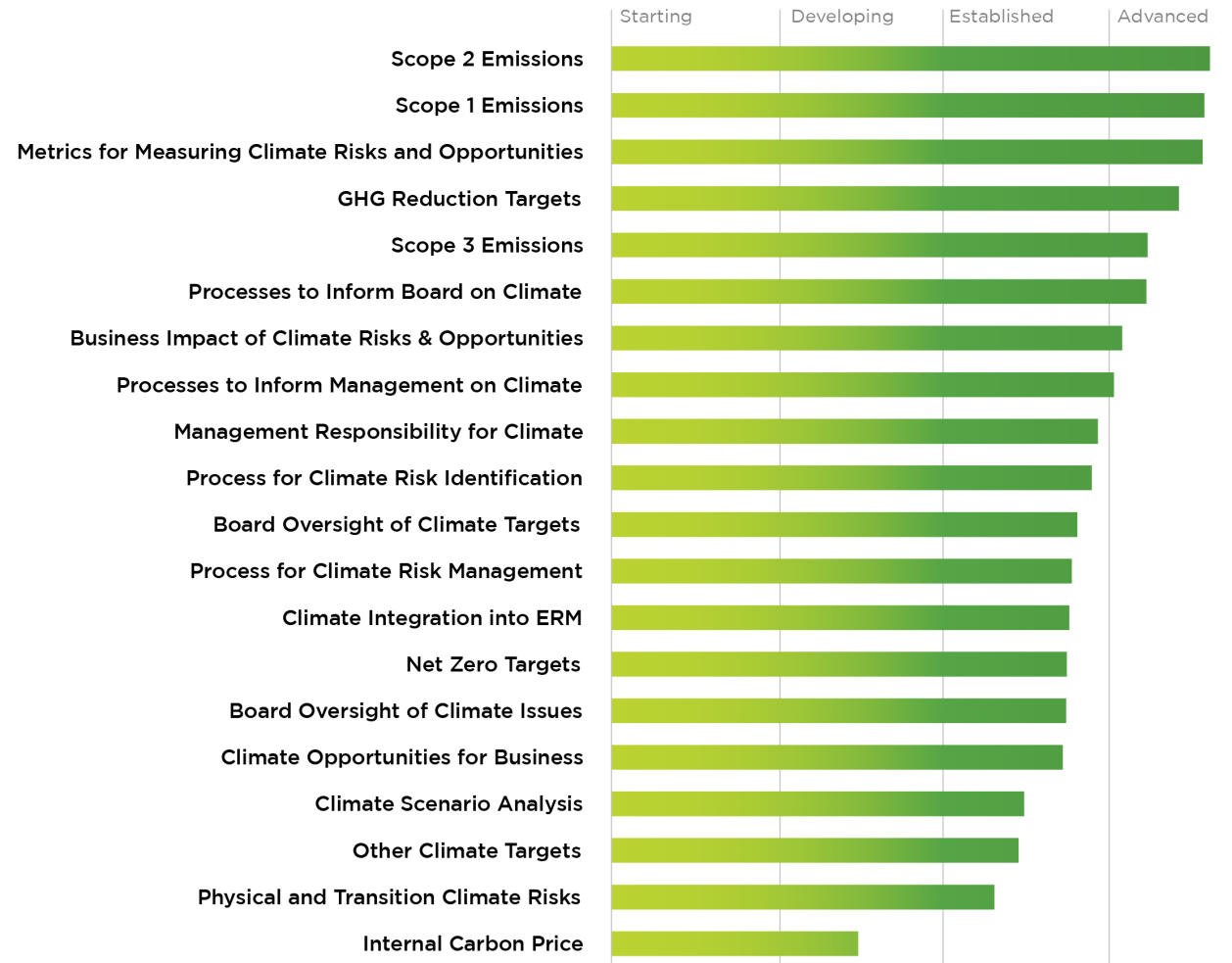
Takeaway 2. Corporate climate reporting varies by semiconductor value chain segment

- There is variability in the disclosure maturity within segments and across the value chain
- On average, fabless companies, including IC design, hyperscalers, and end users, have demonstrated leadership in TCFD-aligned climate disclosures.



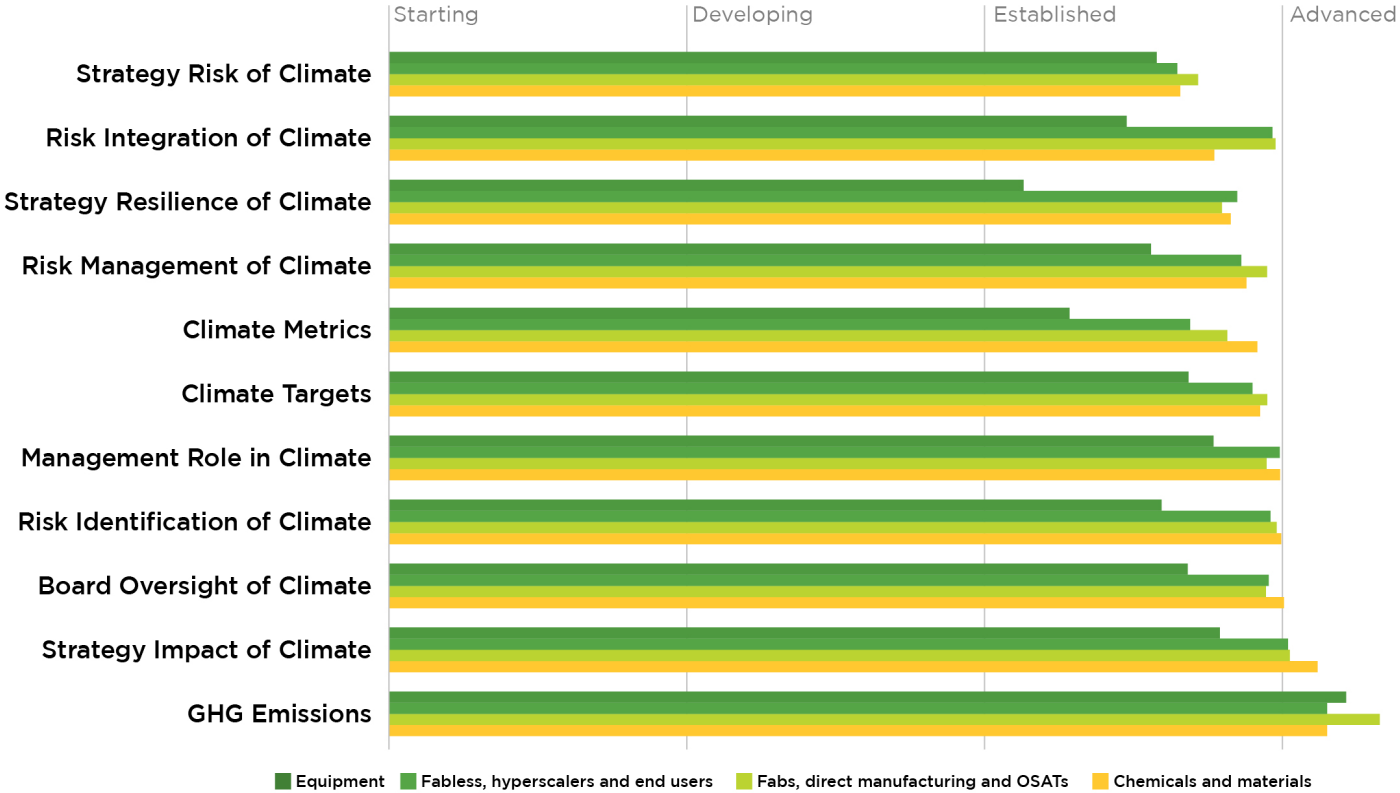
Takeaway 3. Corporate roadmaps need additional clarity on short-term climate targets towards the path to net zero

- Companies focus on GHG reporting, near-term climate targets and establishing processes around governance and communication of climate-related matters
- Fewer companies have set longer-term, more ambitious net zero commitments
- Very few companies started to consider internal carbon pricing.



Takeaway 4. Addressing resilience to climate change appears to be the biggest challenge

- The biggest gaps in TCFD alignment are tied to categories that require a quantitative assessment of the current and future impacts of climate change on businesses.



Takeaway 5. Ensuring climate resilience of the value chain is a business imperative

- Semiconductor companies are paying closer attention to evaluating their organizational exposure and vulnerability to climate risks
- Direct manufacturers exhibited the strongest performance in climate scenario analysis
- It is important that companies in the Asia-Pacific region take action to stress test their assets and enhance operational resilience.



Panel Discussion



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Semiconductor
Climate Consortium

Announcements & Calendars



SEMICON[®] WEST

JULY 9-11, 2024
MOSCONE CENTER
SAN FRANCISCO, CA

**FIND SEMI SUSTAINABILITY AT THE
SUSTAINABILITY STAGE – 3 FULL DAYS
OF PROGRAMMING**





Sustainability Programming

MONDAY JULY 8	The Business Impacts of Sustainability TUESDAY JULY 9	Sustainability Innovations WEDNESDAY JULY 10	Advancing Sustainability Across Workplace & Community THURSDAY JULY 11
<div data-bbox="132 839 573 1320" style="background-color: #0070C0; color: white; padding: 10px; text-align: center;"> SEMICONDUCTOR CLIMATE CONSORTIUM MEETINGS </div>	<div data-bbox="662 582 1116 714" style="background-color: #92D050; padding: 5px; text-align: center;">CEO KEYNOTES</div> <div data-bbox="662 728 1116 859" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">1. BUSINESS RISKS & CLIMATE CHANGE</div> <div data-bbox="662 873 1116 1005" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">2. ENERGY: TRIPLING UP AND DOUBLING DOWN</div> <div data-bbox="662 1019 1116 1150" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">3. BRINGING CIRCULARITY TO THE VALUE CHAIN</div> <div data-bbox="1126 873 1202 1288" style="background-color: #0070C0; color: white; padding: 5px; text-align: center; writing-mode: vertical-rl; transform: rotate(180deg);">EHS & PFAS TOPICS</div>	<div data-bbox="1299 596 1753 702" style="background-color: #92D050; padding: 5px; text-align: center;">SUSTAINABILITY KEYNOTES STAGE</div> <div data-bbox="1299 731 1753 953" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">4. STARTUPS FOR SUSTAINABLE SEMICONDUCTORS – PITCH EVENT</div> <div data-bbox="1299 968 1717 1116" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">4A. INNOVATIONS FOR ABATEMENT, F-GASES AND PFAS MANAGEMENT</div> <div data-bbox="1299 1130 1717 1262" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">5. EHS INITIATIVES & UPDATES</div> <div data-bbox="1737 968 1814 1288" style="background-color: #92D050; color: white; padding: 5px; text-align: center; writing-mode: vertical-rl; transform: rotate(180deg);">SMART MFG – SUS Sessions</div>	<div data-bbox="1941 582 2395 714" style="background-color: #0070C0; color: white; padding: 5px; text-align: center;">SCC Governing Council Meeting</div> <div data-bbox="1941 728 2323 859" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">6. ACCOUNTING FOR OUR HANDPRINT</div> <div data-bbox="1941 873 2323 1059" style="background-color: #673AB7; color: white; padding: 5px; text-align: center;">7. BUILDING GREEN LITERACY & AWARENESS</div> <div data-bbox="1941 1073 2323 1310" style="background-color: #4CAF50; color: white; padding: 5px; text-align: center;">8. BUILDING INDUSTRY AWARENESS & IMPACT ERGS EQUITY MORE</div> <div data-bbox="2339 925 2471 1239" style="background-color: #0070C0; color: white; padding: 5px; text-align: center; writing-mode: vertical-rl; transform: rotate(180deg);">GREEN FACILITIES WORKSHOP</div>
	<div style="display: inline-block; width: 15px; height: 15px; background-color: #4CAF50; margin-right: 5px;"></div> Sustainability Stage	<div style="display: inline-block; width: 15px; height: 15px; background-color: #0070C0; margin-right: 5px;"></div> Private Room	<div style="display: inline-block; width: 15px; height: 15px; background-color: #92D050; margin-right: 5px;"></div> Other Event Stages

Scan to Join the Environmental Risk Mitigation & Reporting Working Group



SEMI Membership Required

* **FIRST NAME:**

* **LAST NAME:**

* **EMAIL:**

* **COUNTRY/REGION:**

* **ORGANIZATION:**

* **I AM INTERESTED IN...**

<input type="checkbox"/> CAST (Collaborative Alliance for Semiconductor Test)	<input type="checkbox"/> Cyber Security
<input type="checkbox"/> Display	<input type="checkbox"/> EMG (Electronic Materials Group)
<input type="checkbox"/> ESD Alliance (Electronic System Design Alliance)	<input type="checkbox"/> EHS (Environment, Health & Safety)
<input type="checkbox"/> FOA (FAB Owners Alliance)	<input type="checkbox"/> FlexTech (Flexible & Printed Electronics)
<input type="checkbox"/> Heterogeneous Integration	<input type="checkbox"/> ITL (Information Technology Leadership)
<input type="checkbox"/> MSIG (MEMS & Sensors Industry Group)	<input type="checkbox"/> NBMC (Nano-Bio Materials Consortium)
<input type="checkbox"/> SEMI General	<input type="checkbox"/> SEMI Standards
<input type="checkbox"/> SCIS (Semiconductor Component, Instrument & Subsystems)	<input type="checkbox"/> Silicon on Insulation (SOI) Consortium
<input type="checkbox"/> Smart Data & AI	<input type="checkbox"/> Smart Manufacturing
<input type="checkbox"/> Smart MedTech	<input type="checkbox"/> Smart Mobility
<input type="checkbox"/> SCM (Supply Chain Management)	<input type="checkbox"/> Sustainability

* **TELL US ABOUT YOURSELF AND WE'LL CONTACT YOU WITH MORE INFORMATION ABOUT OUR TECH COMMUNITIES AND INITIATIVES.**

JOIN A COMMUNITY

Get involved in SEMI Technology Communities and Initiatives, and see the network multiplier effect afforded to those who participate. Community and committee participants explore MORE business, technical, and professional opportunities.



THANK YOU

SUSTAINABILITY