Swedish delegation to Grenoble September 12 – 13, 2024 Background information

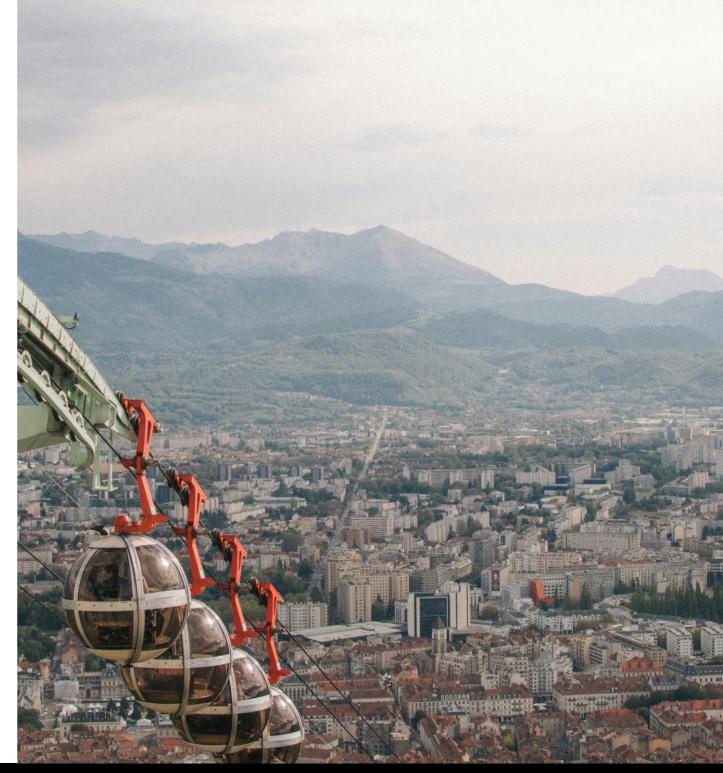
Embassy of Sweden



Grenoble Alpes

Agenda

- Delegation participants SE
- The Swedish Semiconductor Ecosystem
- Trilateral Innovation Platform TIP
- Why Sweden







Markus Karbach MD & BU Mhr. Europe & Asia Munters Euroform GmbH



Andrea Gatti Sales Manager Munters / Airprotech

Company Information	Munters is a global leader in climate solutions for mission-critical processes. They offer innovative, efficient and sustainable solutions for customers in industries where controlling indoor humidity, temperature and energy efficiency is mission-critical. Munters help support companies to more efficiently use energy or water resources, and thereby reduce their climate and environmental impact.
HQ	Kista, Sweden
Size	SEK 10,4 Billion – 3940 Employees – 19 plants – 30 countries
Established	1955
Semiconductor Value Chain	Solution Provider for Semiconductor manufacturers
Semiconductor offering	 Munters offers different dehumidification and climate control solutions for the semiconductor industry, such as : Desiccant dehumidifiers maintain humidity levels below 1%, preventing corrosion and failures in wafer and integrated circuit manufacturing processes Evaporative cooling systems and energy recovery technologies to improve facility energy efficiency and productivity Munters' solutions are suitable for different stages of semiconductor manufacturing, including assembly areas, wafer manufacturing areas, and photolithography rooms
News	Munters to acquire Airprotech Munters

I





Jean Francois Mabile General Manager CSC France Industry Trelleborg Sealing Solutions



Emmanuel Louison GKAM France & semicon segment Trelleborg Sealing Solutions

Company Information	Trelleborg Sealing Solutions offers everything from the versatile elastomer O- Ring to complex multi-faceted PTFE based and polyurethane geometries. In the unlikely event that none of these suit your requirements, Trelleborg Sealing Solutions can develop a specific product for your application.
HQ	Nacka, Sweden
Size	SEK 34 Billion – 6900 Employees (Sealing Solution) – 32 plants – 180 countries
Established	1952
Semiconductor Value Chain	Solution Provider for Semiconductor manufacturers
Semiconductor offering	 Range of leading-edge materials delivering sealing integrity in critical semiconductor processes. These can be manufactured in materials ranging from basic elastomer grades to high purity, plasma-resistant grades specifically developed for microchip manufacturers using the most advanced semiconductor technologies. Any size of O-Ring from micro to giant (standard or custom) Custom-molded designs and bonded products
News	<u>Trelleborg acquires manufacturer of aerospace components Trelleborg</u> <u>Sealing Solutions</u> <u>FFKM Materials at Semicon Europa 2022 Trelleborg Sealing Solutions</u>





Steffen Dilger VP of Sales for EMEA Central Hexagon



Laurent Francou Director Business Development South East France Hexagon

Company Information	Hexagon is the global leader in digital reality solutions, combining sensor, software and autonomous technologies to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector and mobility applications.
HQ	Stockholm
Size	EUR 5.2 billion (2022), ca. 24,500 employees
Established	1992
Semiconductor Value Chain	Software, Equipment
Semiconductor offering	 Hexagon's semiconductor manufacturing solutions increase autonomy and accuracy in processes to serve semiconductor businesses as they tackle transformation, shifting demands and disruption of supply chains. Non-contact inspection of semiconductor chips and lead frames Computational fluid dynamics Dimensional analysis Eterprise asset management Health and safety compliance Material management and warehousing OT/ICS cybersecurity Supplier management
News	https://hexagon.com/company/newsroom/press-releases/2023/hexagon- partners-with-sony-semiconductor-solutions-to-enhance-reality-capture





Björn Holmström CEO NSS Water



Bengt Wallin Head of production NSS Water

Company Information	NSS Water is specialized in eco-friendly, high-purity water solutions, used in advanced water management for high-tech industries such as semiconductors. NSS Water's solutions like the patented membrane distillation process fit various applications while supporting sustainable development goals by conserving resources and significantly reducing water usage in critical processes
HQ	Bengtsfors
Size	n.a.
Established	2020
Semiconductor Value Chain	Equipment
Semiconductor offering	 Nanopure Water Revolution by NSS Water is high purity pure water for semiconductor manufacturing. As a result, the semiconductor industry can reach significantly higher yield faster and reach profitability on new chips faster. Nanopure® water (NPW) removes all nano contamination above 5-10 nanometers. Water Enhancement Tool reduce water consumption with up to 90% in certain production steps, this is achieved thanks to the extreme purity of NPW. The amount of chemicals can also be reduced as it takes less water to dilute the chemicals with NPW.
News	https://www.longruncapital.com/updates/longrun-invests-in-nss-water- enhancement-technology-the-swedish-nanopure-water-revolution





Dr. Jonas Sundqvist Co-Founder & CEO AlixLabs AB



Rob Cadman Commercial Director & Advisory board member AlixLabs AB

Company Information	AlixLabs is an innovative startup enabling the semiconductor industry to scale down component sizes in a cost-effective manner.
HQ	Lund, Sweden
Size	SEK 666 Thousand – 12 Employees
Established	2019
Semiconductor Value Chain	Equipment
Semiconductor offering	Atomic Layer Etching technology (ALE). AlixLabs provides an ALE-based method (atomic layer etching) of manufacturing semiconductor nanostructures with a characteristic size below 20 nm. This enables atomic-level precision processing beyond the resolution limit for optical and electron beam lithography, enabling further down-scaling of
News	semiconductor devices Swedish startup secures funding to develop energy-efficient technology for semiconductor manufacturing – ArcticStartup





Tobias Tired COO NordAmps

Jan Andersson TBC NordAmps

Company Information	NordAmps is a startup that produces innovative nanowire transistors for high-frequency wireless communication using advanced nanotechnology
HQ	Lund, Sweden
Size	SEK 2,33 Million – 3 Employees
Established	2016
Semiconductor Value Chain	Nanowire transistor technology
Semiconductor offering	 NordAmps offers advanced nanowire transistor technology solutions for the semiconductor industry, such as: InGaAs nanowire transistors on silicon, enhancing high-frequency wireless communication and processor applications Technology license agreements to semiconductor device manufacturers, enabling the integration of advanced transistor technology NordAmps' solutions are suitable for different stages of semiconductor manufacturing, including high-frequency data processing, wireless communication, and advanced processor applications.
News	<u>NordAmps AB Raises SEK 14 Million for Revolutionary 5G and 6G Nano-</u> <u>Sized Transistor Technology</u>

1





Oskar Fajerson CEO Polar Light Technologies

Company Information	Polar Light Technologies was founded in 2014 and is based on research into nanostructures in semiconductor materials at Linköping University. Today Polar Light Technologies is a quantum opto-electronics developer that develops a new generation of microLEDs.
HQ	Linköping, Sweden
Size	SEK 8,29 Million – 8 Employees
Established	2014
Semiconductor Value Chain	Micro-LED manufacturer
Semiconductor offering	Polar Light Technologies develops the next generation of micro-LED and offers micro-LED frontpanels for next generation AR, HUD, HMD applications as well as micro-LED RGB wafers for next generation displays
News	<u>Polar Light Technologies Brings its Semiconductors to Silicon Valley – Polar</u> <u>Light Technologies (polar-light-technologies.com)</u>
	<u>Blue and green light – Polar Light Technologies (polar-light-technologies.com)</u>





Simona Laza Manager Strategic Public Partnerships Excillum AB



Fredrik von Hofsten Business Development Manager Excillum AB

Company Information	Excillum is active in the field of advanced microfocus and nanofocus X-ray sources and was founded in 2007 by researchers from the Royal Institute of Technology (KTH) in Sweden. Excillum aims to enable new science, improve medicine and enhance manufacturing by redefining the X-ray tube. Excillum is the inventor of the world's brightest microfocus X-ray tube.
HQ	Stockholm, Sweden
Size	SEK 150,6 Million - 75 Employees
Established	2007
Semiconductor Value Chain	Manufacturer of advanced microfocus and nanofocus X-ray sources
Semiconductor offering	Excillum develops, deploys, and refines X-ray sources for new and advanced applications and offers a growing range of X-ray tubes. Currently Excillum offers the Excillum MetalJet source, based on the company-founding metal- jet-anode technology, and the Excillum NanoTube source powered by refined e-beam technology.
News	VCbattery and Excillum join forces to bring high-speed 3D CT inline inspection to EV battery cell manufacturers – Excillum New game-changing inspection demonstrator for EV batteries - Excillum





Nils Bågenholm Co-founder, CEO Mat4green Tech AB



TBC TBC Mat4green Tech AB

Company Information	Mat4Green Tech is a R&D company on recycling and material technologies that specializes in Indium tin oxide (ITO) production and indium recycling. Mat4Green Tech has developed a technology that recycles Indium from industrial waste in an efficient and climate-neutral way. The technology for recycling and producing Indium has no CO ₂ emissions and recycle more efficiently and with a higher recycling rate than competitors can do today.
HQ	Göteborg, Sweden
Size	SEK 2,86 Million- 2 Employees
Established	2017
Semiconductor Value Chain	Indium tin oxide (ITO) production and indium recycling.
Semiconductor offering	Mat4Green Tech offers ITO powders and ITO sputtering targets.
News	<u>Mat4Green Tech återvinner värdefulla metallen Indium med noll</u> <u>klimatpåverkan Chalmers Ventures (mynewsdesk.com)</u> <u>Chalmers Ventures gör följdinvestering i Mat4Green Tech – tar in 9 miljoner</u> <u> Chalmers Ventures (mynewsdesk.com)</u>



Scalable optical metrology for the EUV era



Valentin Dubois Co-founder & CEO Dappler Labs



N. Raja Shyamprasad Co-founder Dappler Labs

Company Information	Dappler Labs AB is a startup from Stockholm, Sweden with the mission to create ultra-scalable, energy-efficient and cost-effective metrology solutions for advanced semi- conductor manufacturing. The technology was born in an academic lab to meet their own metrology needs.
HQ	Stockholm
Size	n.a.
Established	2023
Semiconductor Value Chain	Equipment
Semiconductor offering	Metrology and inspection technology that transforms conventional optical microscopes into state-of-the-art metrology tools for patterned test wafers.
News	





Patrik Lundström CEO Obducat AB

Company Information	Obducat is an innovative developer and supplier of micro-and nano lithography solutions. The company's technologies are used by companies within the LED, OLED, semiconductor, display, optical and photonics, biomedical and MEMS industries.
HQ	Lund, Sweden
Size	SEK 58,3 MSEK – 14 Employees
Established	1986
Semiconductor Value Chain	Equipment & Tooling
Semiconductor offering	Tools for Nanoimprint Lithography, Resist processing and Wet processing and Foundry Services. Obducat supplies technology, products and processes used for advanced micro- and nanopatterning, enabling realization of new applications and improved device performance.
News	<u>https://evertiq.se/news/43716</u> <u>Obducat receives order valued at 2.3 million SEK from an existing European</u> <u>customer – Obducat</u>

tera|si



James Campion CEO TeraSi AB

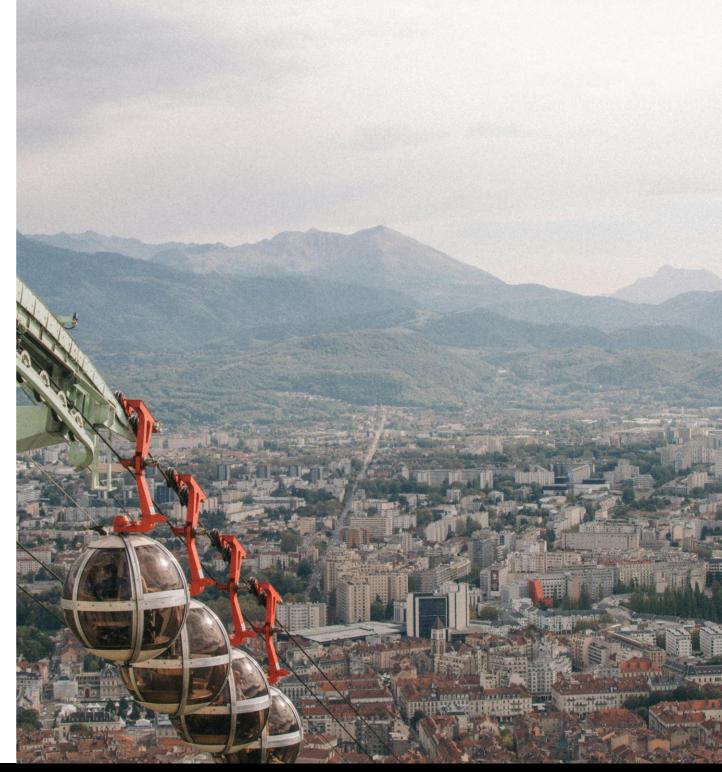


Bernhard Beuerle Co-Founder TeraSi AB

Company Information	TeraSi is a spin-off from the Royal Institute of Technology (KTH) in Stockholm, developing precise and compact components for 6G using silicon micromachining. TeraSi's technology provides a scalable hardware platform that revolutionizes how radio frequency technology components and systems are built.
HQ	Värmdö, Sweden
Size	SEK 387 Thousand
Established	2020
Semiconductor Value Chain	IDMs
Semiconductor offering	Silicon-machined components for 6G applications
News	

Agenda

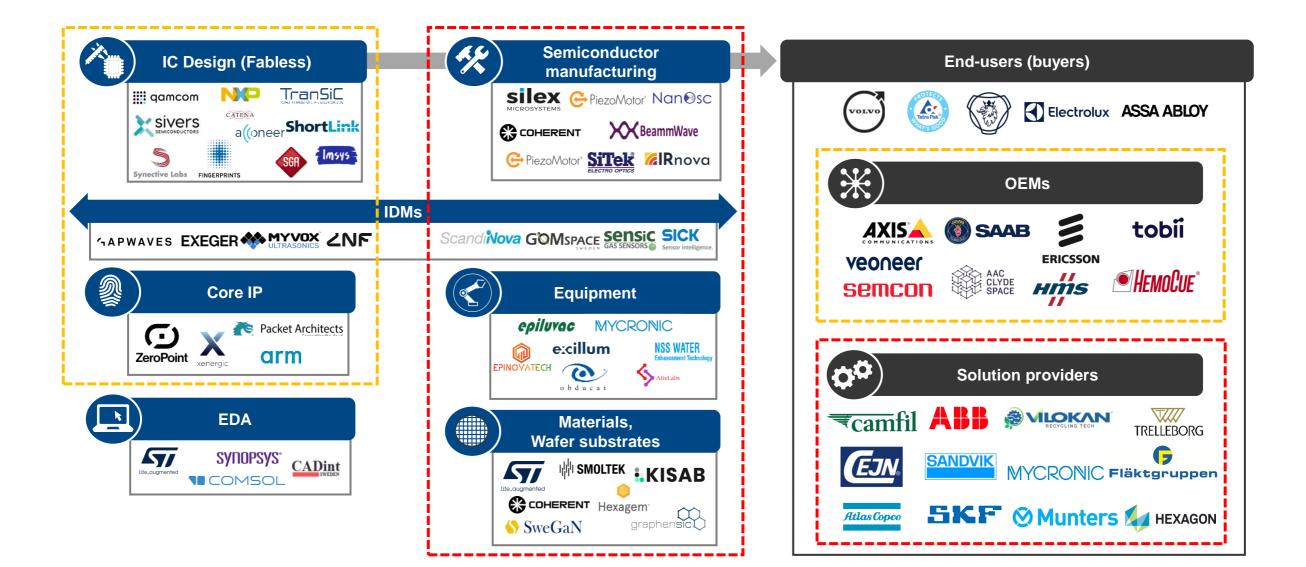
- Delegation participants SE
- The Swedish Semiconductor Ecosystem
- Trilateral Innovation Platform TIP
- Why Sweden



Sweden offers a highly innovative ecosystem, connected to academia and enduser industries



Sweden has an innovative core industry with over 70 companies across the value chain complemented by leading OEMs and industry solution providers



The three main strengths of the Swedish ecosystem are WBG technologies, Chip Design, and Industrial Semiconductor Solutions

Strength	Importance and the role of Sweden					
Wide Bandgap semiconductor technologies	 EU polices and initiatives is driving electrification and increases the demand for power semiconductors WBG semiconductors (as Silicon Carbide and Gallium Nitride) are key to improving the efficiency of power semiconductors Sweden's semiconductor ecosystem has a strong focus on WBG semiconductor technologies 					
Long legacy and competence base in Chip Design	 There is a crucial need to improve IC design capabilities in the EU to produce cutting edge chips The demand for advanced chips will vastly increase in Europe Sweden is home to leading chip design companies and large OEMs with in-house chip design capabilities, that can be developed further 					
Leading solution providers to the semiconductor industry	 Sweden is home to several of the world leading solutions providers to the semiconductor industry The offering includes industrial equipment such as robotics, filtration systems and sealing solutions There are huge business opportunities in the coming years for these companies as semiconductor investments in Europe are at a record high 					

Swedish companies are leading the way in the green industrial transition





Sweden has the potential to become a key actor in Wide Bandgap Semiconductor techs with the growing demand for power electronics

Key industry areas for power electronics

Strong focus on WBG semiconductor technologies





Energy

Equipment



EV/Smart Vehicles









Sweden is home to several large OEMs with semiconductor competencies that lead the technological development in their industry areas





Sweden is home to several global solution providers to the semiconductor industry that lead the technological development in their respective area

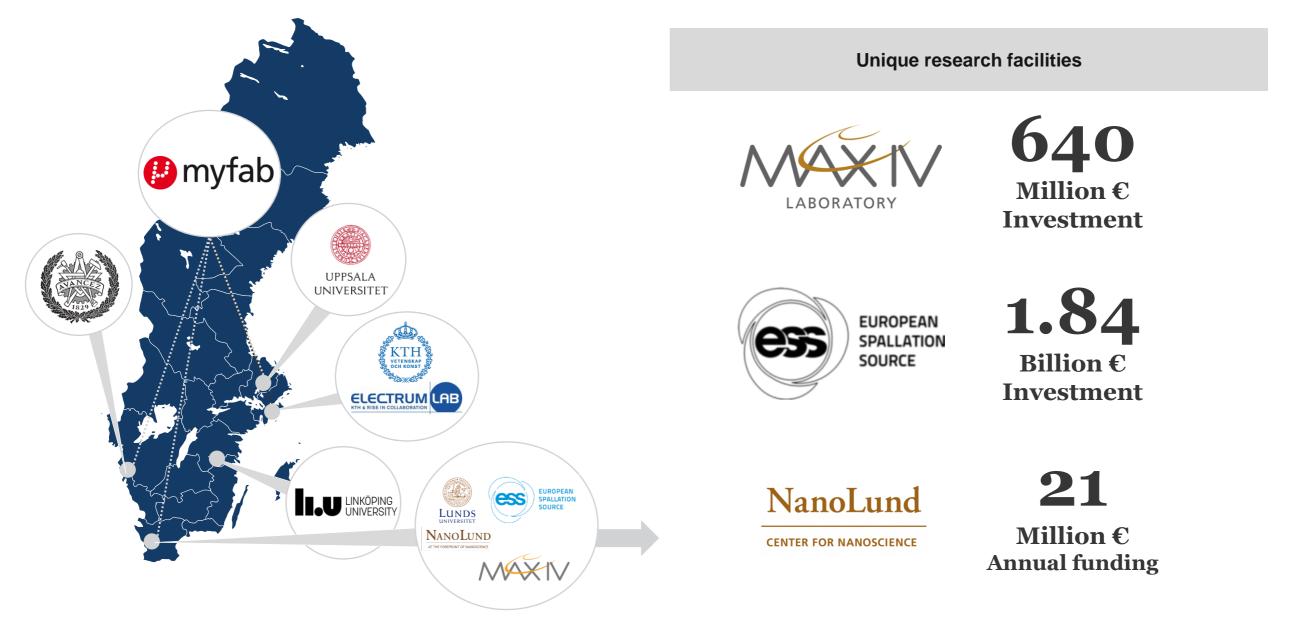


Sweden offers a large end-user market consisting of leading companies with a high demand for semiconductors

Several global companies within automotive, ICT and industrial equipment that lead the technological development. Companies with a high dependency on semiconductors include; Volvo, Scania, Ericsson and ABB



Semiconductor ecosystem includes a world-class R&D and test bed environment: academia and industry collaborate to create high-tech commercial applications





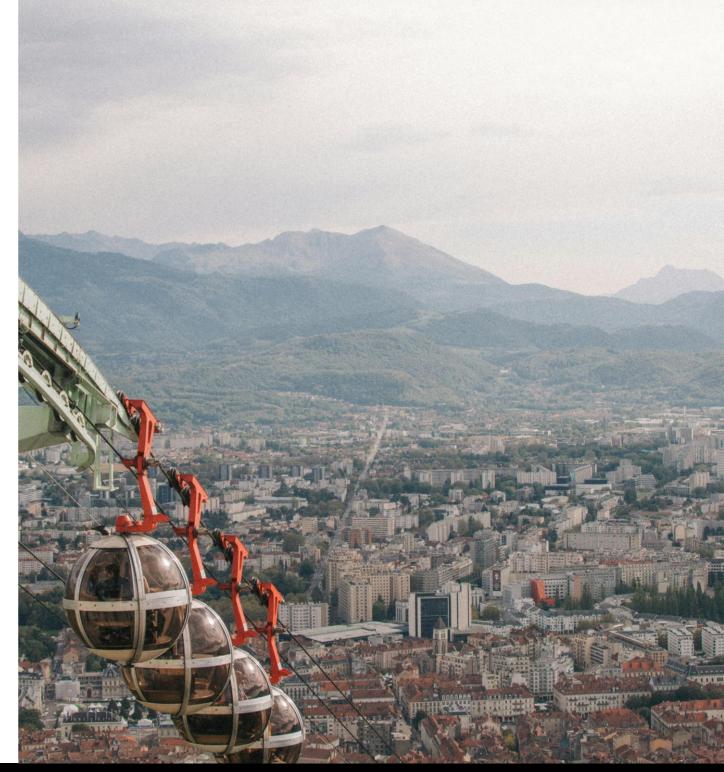


Semiconductors by Sweden Alliance



Agenda

- Delegation participants SE
- The Swedish Semiconductor Ecosystem
- Trilateral Innovation Platform TIP
- Why Sweden



A trilateral innovation platform between Sweden, France and Germany to foster long-term strategic partnerships for a competitive Europe



A trilateral business innovation platform between Sweden, France and Germany

Strategic innovation collaborations are increasingly important for **tackling global challenges** and for sustainable and competitive trade. The trilateral innovation platform between Sweden, France and Germany aims to **foster long-term strategic relationships – and thereby strengthening European competitiveness** – through collaboration projects for innovation, growth, and international development. By pooling the innovation power of these three countries, new and more innovative solutions addressing global societal and climate challenges can be developed faster.



Trilateral collaboration between the **two European power houses France and Germany** as well as the **innovation frontrunner Sweden**. The three countries all are leading innovation nations in the EU.



The thematic focus of the trilateral innovation platform will be on the tracks: **smart health, smart mobility** and **smart industry**. Within each track, multiple-helix actors will be gathered from **academia**, **industry** and **government**.

Facilitated by:



Vinnova is Sweden's innovation agency. Vinnova helps building Sweden's innovation capacity, contributing to sustainable growth, with the vision of Sweden as an innovative force in a sustainable world.



Business Sweden is the official Swedish Trade & Invest council with a unique governmental mandate to support Swedish companies grow global sales and international companies invest and expand in Sweden. TIS

The innovation platform consists of three main tracks, with chosen subtracks as focus areas going forward

Smart Health

Spearheaded healthcare has the power to unlock the major health and societal challenges and opportunities of today, and tomorrow. Sweden's unique digital technology capabilities and maturity, high innovation level and adoption rate, and health data access make it an unrivalled partner for expansive innovation projects aimed at optimizing health outcomes.

Prioritised sub-tracks:

- Data sharing and optimization
- Medical imaging

Smart Industry

Smart Industry is revolutionizing the way products are made, distributed, reused and recycled. Sweden is at the global forefront of Industry 4.0. With clean energy, advanced technologies and a thriving culture of collaboration, there are no better circumstances to lay the groundwork for sustainable and digitally powered operation.

Prioritised sub-tracks:

- Hydrogen
- Semiconductors
- Automation & Robotics

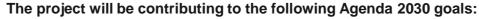
\longleftrightarrow

Smart Mobility

Transformation of the transport sector is one of the cornerstones in achieving the UN global goals for sustainable development. Sweden's rapid advances in electrification, alternative fuels, selfdriving vehicles, connectivity, and platforms for shared mobility provide a powerful springboard for change.

Prioritised sub-tracks:

- Autonomous vehicles
- E-mobility incl. battery technology





TID

Participate to gain access to relevant actors, benefit from a proven innovation concept and take advantage of pre-scouted funding opportunities



Gain access to complementing state-of-the-art actors, identified and engaged through thorough exploration of the Swedish, French and German ecosystems



Benefit from the proven innovation concept "multiple helix", creating synergies between private (large corps, SMEs and start/scale-ups), public players as well as academia



Take advantage of pre-scouted national and/or EU funding opportunities relevant to the different innovation projects

The foundation of the trilateral innovation platform will be the creation of working groups within each of the prioritized sub tracks



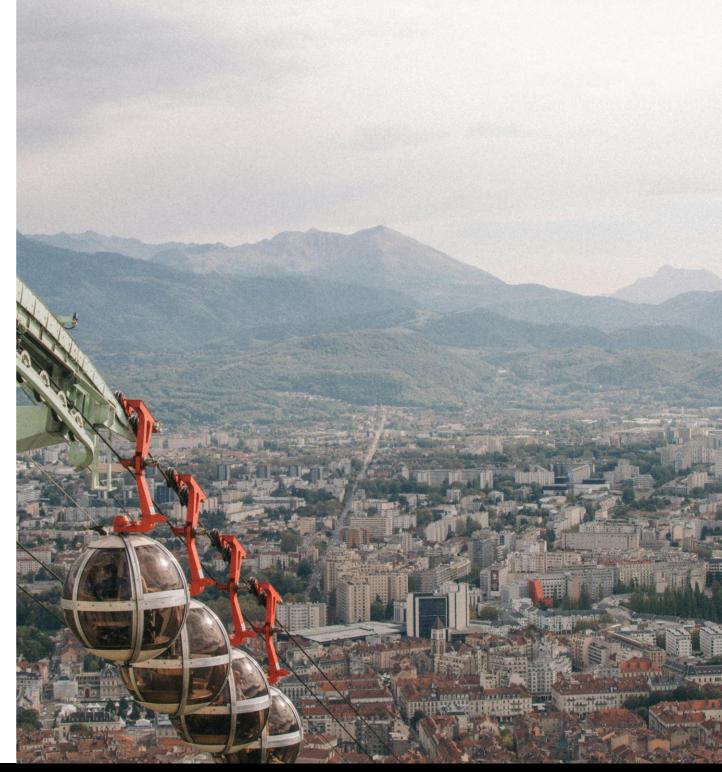
	Launch	Working groups	Consortia	
Purpose	Ensure commitment from selected key-actors	Define thematic pain points and areas of common interest suitable for collaboration and formulation of project plans	Formation of joint innovation projects run by complementing members, that are eligible for external funding (national or EU level)	
Participants	CXO or equivalent	Assigned company representative (from R&D or equivalent)	Assigned company representative with subject- matter expertise	
Participant role	Ensure commitment and general direction and anchor internally	Represent company innovation agenda, jointly define working group plan and areas of common interest as basis for project and consortia	Active participation in consortium from the creation of the consortium to finalizing the application process as well as driving the project	



TID

Agenda

- Delegation participants SE
- The Swedish Semiconductor Ecosystem
- Trilateral Innovation Platform TIP
- Why Sweden



High rankings in innovation, digitalisation and sustainability, makes Sweden one of the world's most attractive countries for business in global comparisons

	Innovation				Digital adoption		Sust	
Global rank	Innovation Union Scoreboard	Network Readiness Index	Global Innovation Index	Best Countries for Business	Digital Competitive- ness Index	World Competitive- ness Index	Country Sustainability Index	Corruption Perception Index
1	Sweden	Sweden	Switzerland	UK	USA	Singapore	Sweden	New Zealand
2	Finland	Denmark	Sweden	Sweden	Singapore	Denmark	Finland	Denmark
3	Denmark	Singapore	USA	Hong Kong	Denmark	Switzerland	Norway	Finland
4	Netherlands	Netherlands	UK	Netherlands	Sweden	Netherlands	Denmark	Singapore
5	Belgium	Switzerland	Netherlands	New Zealand	Hong Kong	Hong Kong	Iceland	Sweden
6	Germany	Finland	Denmark	Canada	Switzerland	Sweden	Switzerland	switzerland •
7	Austria	Norway	Finland	Denmark	Netherlands	Norway	New Zealand	Norway
8	Ireland	USA	Singapore	Singapore	Republic of Korea	Canada	Luxembourg	Netherlands
9	France	Germany	Germany	Austria	Norway	UAE	Canada	Germany
10	Estonia	UK	Republic of Korea	Switzerland	Finland	USA	Netherlands	Luxembourg
Source:	EIS 2020	Portulans Institute 2020	Cornell, INSEAD, WIPO 2020	Forbes 2019	IMD 2020	IMD 2020	Robeco 2020	Transparency International 2020



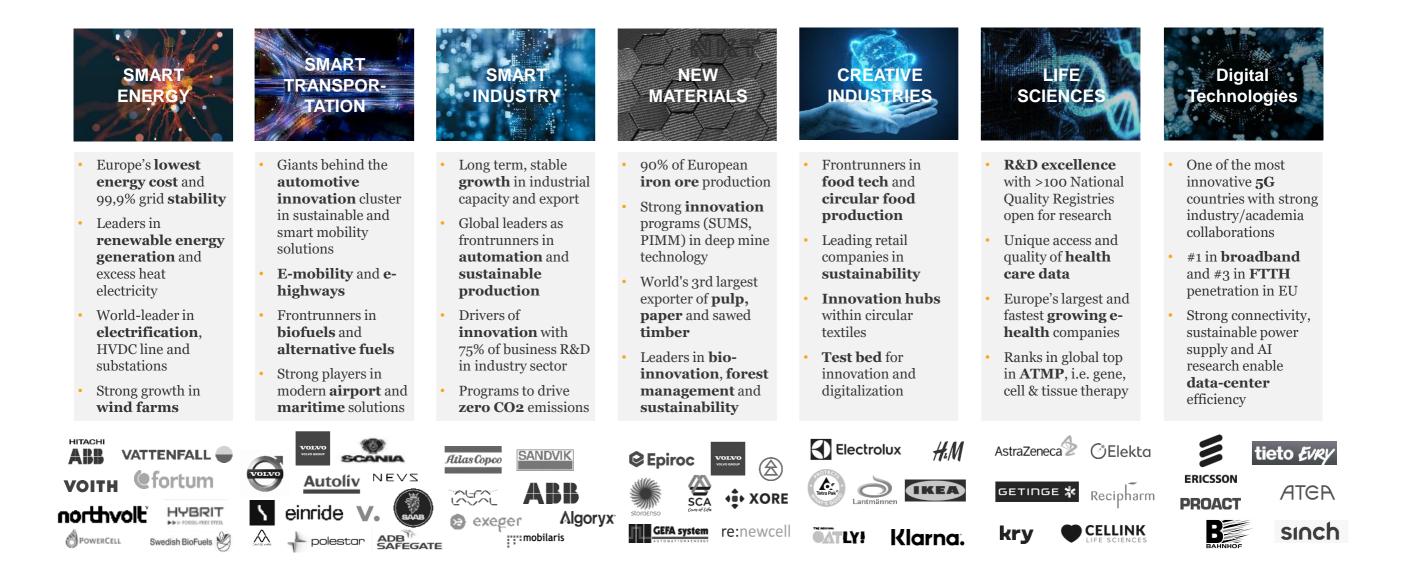


- Sweden has had a successful track record over the past 30 years of decoupling growth from CO2 emissions, and is today a global leader in sustainable development
- Sweden aims to become the world's first fossil free welfare nation, by 2045
- Swedish companies are industry frontrunners and sustainability leaders within fields of relevance to the Paris climate agenda, such as renewable energy, electric vehicles, and grid and transmission infrastructure

"Sweden is a small country with a large voice. Sweden needs to become an even larger influencer for the global climate."

Larry Fink, CEO, Blackrock

Sweden has a strong industry base and leading, global companies in several ecosystems creating innovation in new tech and sustainable solutions



By 2040 Sweden aims to run 100% on renewable renergy

Sweden's green, affordable and stable energy is attracting energy intensive industries

Even the steel industry is aiming to be fossil free by 2035, single-handedly reducing Sweden's CO2 emissions by 10%

Key strength and challenges

- **Sustainable energy** as 97% of energy produced in Sweden is fossil free
- Affordable energy as Sweden has among the lowest energy prices in the EU
- **Stable energy** with 99.99% reliability in the system and continuous investments in the grid ensures low network costs
- Challenge to **maintain stability** while **replacing nuclear** with renewables
- Need to expand the grid to make use of renewable energy sources

Climate commitment

- The target of **10% share of renewable energy in the transport sector** by 2020 was reached by 2017
- Sweden's target for 2040 is **100% renewable** electricity generation
- By **2030** Sweden shall have **50% more efficient** energy consumption than in 2005
- Sweden's total CO2 emissions have decreased by 33,74% since 1990

Source: IEA, Business Sweden Data and Analysis

Share of energy produced in Sweden that is fossil free

⁶⁶ Sweden is leading the way towards a low-carbon society. In recent years, the country has adopted an energy and climate framework with ambitious long-term and interim goals, including a target of 100% renewable energy in electricity generation by 2040. ⁹⁹

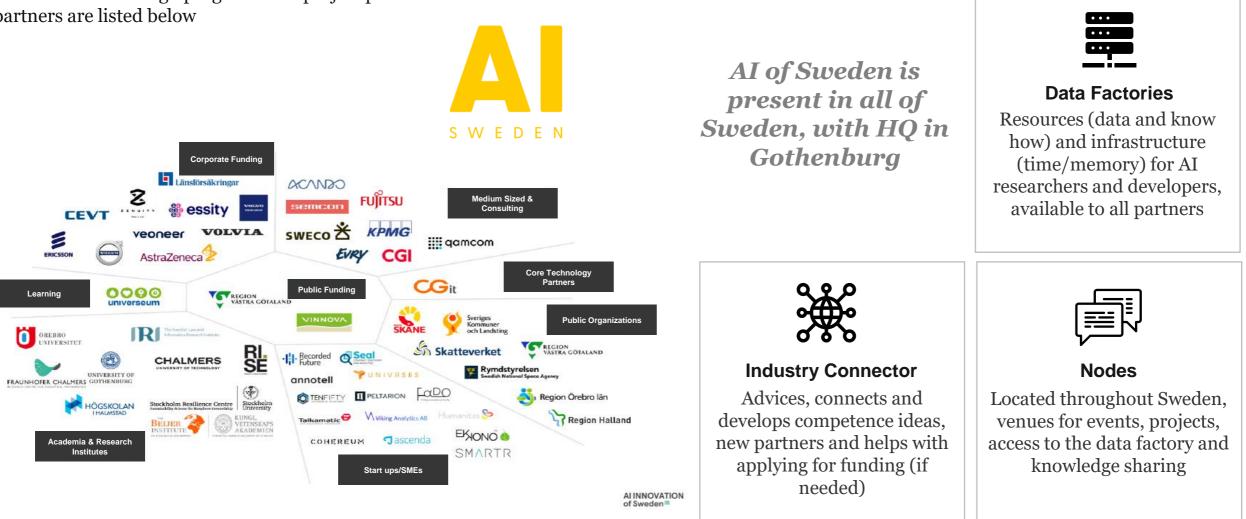
International Energy Agency

Implications

- Large investments in the Swedish grid in order to incorporate renewables
- Energy access varies across the country – make sure to understand the local conditions
- Challenge to maintain stability while replacing nuclear with renewables

Al Sweden, one of the major Al clusters that provides resources such as data factories to develop standards across various industries

Partners across all industries can join and get access to 50M-100MSEK value creation through programs and project portfolio. Some of the partners are listed below



Overview of AI of Sweden

Services to International companies looking to Invest and Expand in Sweden

BUSINESS OPPORTUNITY IDENTIFICATION

- Identification of market, industry and innovation opportunities in Sweden.
- Key industry stakeholders
- Establishment strategies
- Hosted fact-finding visit to Sweden

BUSINESS CASE DEVELOPMENT & DATA COLLECTION

Customised information and benchmarking services on the Swedish market, including:

- Business climate, industry sectors and clusters.
- Legal framework and operating costs
- Market entry alternatives

ESTABLISHMENT GUIDANCE

- Rules & regulations on setting up in Sweden
- Legal entities
- Employment mattes
- Taxes and more

INTRODUCTIONS & CONNECTIONS

- Key stakeholders (government, authorities, etc.)
- Potential partners and service providers
- Partners for R&D collaborations

SITE SELECTION

- Identifying location and premises for facilities
- Coordination of site selection processes based on requirements.
- Site screening throughout Sweden based on access to detailed data.

RETENTION & EXPANSION

- Build the business case to support an expansion.
- Benchmarking of international locations.
- Facilitating operating conditions needed for expansion