

Market Access Report by **Sweden+Korea** **Green Transition** **Alliance**



4	Executive Summary
5	Introduction of the Sweden+Korea Green Transition Alliance
<hr/>	
6	Case: Environmental Sustainability Improvements by Alliance Companies
8	01. Solutions and Infrastructure in Circular City
10	Atlas Copco
12	Envac Korea
14	IKEA Korea
16	Orkla Korea
18	Scandinavian Biogas
20	Seaflex
22	SF Marina Korea
24	Tetra Pak Korea
26	02. Green Hydrogen Production and Its Application Solutions
28	Alfa Laval
30	Cell Impact
32	Impact Coatings
34	KraftPowercon
36	03. Smart Mobility and Transportation
38	Scania Korea
40	Volvo Cars
42	Volvo Group Korea (Volvo Construction Equipment Korea)
44	Volvo Trucks
<hr/>	
46	Conclusion
48	Appendix: Pledges of the Sweden+Korea Green Transition Alliance

Executive Summary

The **Sweden+Korea Green Transition Alliance** (“the Alliance”) is the first Alliance made up of foreign companies and the Swedish government to support Korea in becoming a green carbon neutral society by 2050. Starting on Earth Day in 2021, sixteen Swedish companies have set concrete pledges for carbon neutrality and Korea-specific action plans to support green growth and its transition in South Korea.

The Green Transition Alliance aligns itself with members’ corporate sustainability goals following international guidelines such as the UN Sustainable Development Goals (SDGs) and the Science-based target’s initiative (SBTi)¹. This helps companies foster greater collaboration between Sweden and South Korea and work with Korean partners in a fossil-free approach to business.

Although several difficulties have hindered the implementation of its sustainable policies and evaluation of the environmental impact of the entire value chain in South Korea (e.g., localised certification processes and standards) the Alliance has aligned its agenda with the South Korean government’s policy

towards green transition and will continue to support the new government’s 110-key policy tasks and derived opportunities.

This report aims to share experiences of how the Alliance, working together with the Swedish industry, government, and academia, identified challenges and leveraged opportunities to accelerate green transition. Moreover, we wish to encourage South Korea to step up action on climate action in order to secure green growth, investment, and collaboration. We believe it is possible to increase Korean competitiveness in the global market by working together.

Let us start with:

- Solutions and infrastructure in the circular city
- Green hydrogen production and its applicable solutions
- Smart mobility and transportation

¹SBTi is a joint initiative to ensure progress towards meeting the Paris Agreement goals of limiting global warming to 2°C above pre-industrial levels. The initiative is led by the Carbon Disclosure Project, UN Global Compact, World Resources Institute, and the Worldwide Fund for Nature (WWF)

Introduction of the Sweden+Korea Green Transition Alliance

Sweden and South Korea are both global innovation leaders; thus, businesses and industries have much to gain from in-depth cooperation over the next few decades. Swedish society in South Korea has witnessed Korea embarking on an increasingly green path with great interest. For example, the Korea Green New Deal and the 2050 Net Zero goal are game-changing developments.

On Earth Day in April 2021, Swedish companies in Korea launched the **Sweden+Korea Green Transition Alliance** (the “Alliance”) together with the Embassy of Sweden, Business Sweden, and the Swedish Chamber of Commerce in Korea.

Initially starting with thirteen Swedish companies, there are now sixteen companies in the Alliance. These companies are active in Korea in various fields of construction, marine, energy, manufacturing, retail, transportation, and waste management. The Alliance members are committed to working together with their Korean industrial partners to support Korea’s ambitious efforts for a Green and Carbon Neutral society before 2050.

Many Swedish and Korean companies have already committed to more ambitious climate targets than the national targets in their respective countries. The Alliance has presented its commitment to these individual pledges with its Mission Statement:

- **Take action.** Assess environmental risks and opportunities to commit to actions that support South Korea’s transition to a green and carbon-neutral society
- **Co-create.** Identify obstacles and mutual pathways to implement innovative solutions that will advance sustainability across major sectors
- **Raise ambitions.** Inspire bold action to bring forward South Korea’s target to become a carbon-neutral economy before 2050

Sweden is at the forefront of technology-led green transition and has shown that economic growth and reductions in carbon emissions can be achieved at the same time with Sweden’s GDP rising 50% while its carbon emissions fell 26% between 1990 and 2017. This was possible due to the industry, government, and research coming together to create a sustainable business environment, proving that green transition helps companies strengthen their competitiveness.

With Sweden’s best practice, the Alliance explores ways to set tangible actions with Korean stakeholders and partners. This report aims to share case examples of the companies within the Alliance that illustrate how investments in environmental sustainability will not only improve future living standards but are necessary to improve the international competitiveness of the Korean industry.

Case :



Environmental Sustainability Improvements by Alliance Companies

01

Solutions and Infrastructure in Circular City 8

02

Green Hydrogen Production and Its Application Solutions 26

03

Smart Mobility and Transportation 36

01

Solutions and Infrastructure in Circular City

Sweden has a long history of being an environmental pioneer. It is the first country in the world to pass an Environment Protection Act in 1967 and also hosted the first UN conference on the global environment in 1972. Sweden is a leader in taking actionable steps to a more sustainable future with developing cutting-edge solutions in areas such as waste management, biogas, renewable energy, and urban planning in addition to utilizing circular economy².

More than half of the Alliance companies are exemplary at enabling circularity and providing solutions for smart and sustainable communities. For example:

Atlas Copco, IKEA, Orkla, and Tetra Pak have been advocates in promoting environmental responsibility and climate impact by using renewable or recycled materials as well as reducing greenhouse gas emissions throughout the entire value chain.

Envac and Scandinavian Biogas have implemented waste handling systems and renewable energy production. They aim to expand their contribution to knowledge sharing in waste management over time to help achieve South Korea's climate goal.

SF Marina and Seaflex have provided advanced floating and mooring solutions, which can be used for marinas, floating solar parks, and real estate. Their technologies are eco-friendly with carbon zero-emissions and reduced environmental impact.

To meet the climate goals, companies have set global targets based on the Science-Based Targets Initiatives (SBTi) and followed international standards in line with the Paris Agreement. However, there are local standards and certification systems in the Korean market that frustrate foreign companies in their path to achieve their global climate goals.

Companies with new technologies face difficulties in entering the Korean market due to the positive system, which leads to delays in achieving the carbon neutrality goal in South Korea. A well-founded partnership between the Green Transition Alliance and Korean stakeholders will build a pathway to achieving global climate goals together as the Swedish companies are already pursuing international climate goals.

² The Swedish government presented its national strategy for the circular economy in July 2020. The Swedish government will focus on sustainable production and product design; sustainable ways of consuming and using materials, products, and services; toxin-free and circular eco-cycles; and the circular economy as a driving force for the business sector and other stakeholders by promoting innovation and circular business models.

*50% Reduction in
CO₂ Emission
2030*



Atlas Copco is a global industrial company headquartered in Stockholm, Sweden, with almost 40,000 employees and customers in more than 180 countries. Atlas Copco's product portfolio includes compressors, vacuum solutions, generators, pumps, power tools, and assembly systems. Atlas Copco's mission is to achieve sustainability and to develop energy-efficient products in order to help customers meet their sustainability and climate targets.

South Korea's carbon neutrality announcement has affected Atlas Copco's customers who are now looking for energy-efficient compressors. These energy-efficient compressors are important as more than 70% of the operational costs in manufacturing can be attributed to energy costs. Compressors usually operate 24 hours a day at factories and simply replacing them with high-efficiency equipment can reduce carbon emissions. Atlas Copco has developed products that can reduce energy use with Permanent Magnet motors and Variable Speed Drive (VSD) technologies that can save energy costs up to 60% when compared to an equivalent fixed speed compressor. In addition, recovering waste heat generated from the compressor can further increase energy savings potential.

Atlas Copco's main customer base in South Korea thus far has been companies with large production facilities. However, Atlas Copco

is expanding to provide products for small- and medium-sized businesses. Small-sized companies can lack foresight on sustainability and often only consider capital expenditure (CAPEX). Atlas Copco's VSD products, which provide 60% lower operational costs when compared to equivalent 'fixed speed' products, lead to a clear return on investment (ROI) and lower operating expenses (OPEX) despite the higher CAPEX.

To fulfill its climate ambitions, Atlas Copco has set targets based on the Science-Based Targets Initiative (SBTi) to reduce greenhouse gas emissions in line with the Paris Agreement since Atlas Copco follows international standards. However, as South Korea tends to apply localized standards, products can be more difficult to sell and adjustments in price or product specifications must be made.

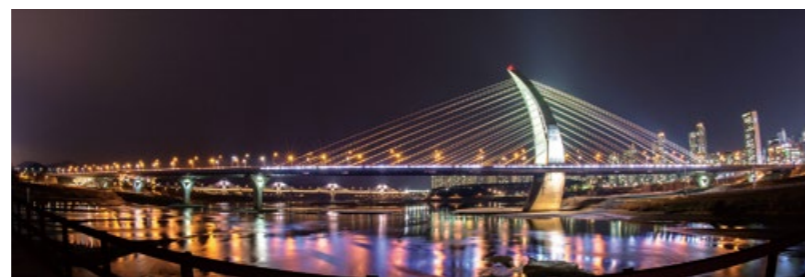
South Korea's recently updated carbon neutrality goals are aligned with Atlas Copco's goals. However, both carrot and stick methods need to be used to make a difference. For example, companies will not develop products to improve their energy efficiency if there is no incentive. Also, the Korean political system tends to incorporate changes on an ad-hoc basis, and it is difficult to predict them in advance. Consequently, it is difficult for companies to make decisions on sustainable investment strategies beforehand.

SUSTAINABLE DEVELOPMENT GOALS





20% Reduction in Energy Consumption 2030



Envac provides a comprehensive automated waste collection system called the pneumatic waste collection system. Envac offers operation and maintenance of the system including system software upgrades as well as the design, development, and supply of the optical waste sorting system. The system is used globally in cities, hospitals, and airports. Envac's system is mainly installed in high-rise buildings and residential complexes in South Korea.

Envac's goal in South Korea is to design and implement a resource-efficient waste handling system that consumes 10% less energy per collected waste (kWh per ton) by 2025 and 20% by 2030. Envac expects to reduce energy consumption in South Korea by upgrading previous system software installed 20 years ago and changing the spare parts, e.g., electrical control modules. Envac is redefining today's waste by enabling circularity and contributing to the development of smart and sustainable communities.

Novel solutions like the ones Envac provides need to be specifically defined in the legislation to be installed in hospitals or city-wide. Although Korea's 2nd New Town Development Law contains the definition and installation of an automated waste collection system, the latest New Town development projects did not include the automatic waste collection system. Therefore, the related Korean ministries - the Ministry of Environment; the Ministry of Land, Infrastructure, and Transport; and the Ministry of Trade, Industry and Energy - need

to collaborate for a circular economy. Envac Korea started to collect data for the energy consumption from all projects in full operation in 2021. Through this, Envac managed to take control over the system operation method as depicted in the following examples:

After the Envac system was installed in Sejong city, the energy consumption reduced 20% in terms of system operation despite an increase in the number of households from 57,000 to 73,000 and increase in the volume of waste generated from 1,600 tons/day to 2,000 tons/day.

Envac's machine learning Artificial Intelligence (AI) and data-driven insights have enabled the waste collection system to be efficient and minimized unplanned downtime in several municipalities.

For easier maintenance, Envac has initiated pipe pigging, which cleans the interior of the pipes for the entire network to reduce system operation energy consumption.

Envac is currently developing software called ReFlow with functionality that optimizes the system performance, displays the results of recycling, and improves the share of recycling through encouraging citizen engagements. Implementation of ReFlow is expected to lead to Envac's Alliance pledge contributing to 10% less energy use per collected waste (kWh per ton) by 2025 and 20% less by 2030.

SUSTAINABLE DEVELOPMENT GOALS





IKEA is a global home furnishing brand founded in Sweden in 1943. It offers well-designed, functional, low-priced, sustainable, and high-quality home furnishing products with consideration for people and the environment. There are several companies with different owners working under the IKEA brand, but they all share the same vision to create a better life for everyone. IKEA has a presence in over 63 markets and opened its first store in Korea in 2014.

Goyang, Giheung, and DongBusan have received the 'Very Good' BREEAM (Building Research Establishment Environmental Assessment Method) certification.

IKEA aims to ensure that all IKEA products are made of 100% renewable or recycled materials by 2030. Today, over 40% of all items are classified as sustainable products and the sales of these products are tracked separately. IKEA Korea is one of the top markets that sells the highest share of sustainable products and is ranked at the top in sustainable product sales shares in the fiscal year 2021.

IKEA Korea joined the Alliance to support the green transition of Korea while pushing forward its global ambition to become climate positive by 2030. To follow up on its pledge, IKEA Korea has introduced and expanded the use of electric vehicles for furniture delivery in South Korea. IKEA Korea aims to transition to 100% electric or zero-emission home deliveries by 2025. As of December 2021, 30% of home deliveries were made by EV trucks since the first rollout in August 2020.

IKEA continuously supports the development of external credible standards for definitions and reporting to eliminate greenwashing and unsubstantiated claims as well as to secure common frameworks in comparing the progress like the GHG Protocol and the FLAG project by the Science Based Targets Initiative. During the fiscal year 2022, IKEA plans to align its climate goals across the value chain with the recently launched Net Zero Standard by the Science Based Targets Initiative to secure that the goals are in line with the scientific standard of increasing temperatures less than 1.5°C.

To increase energy efficiency at its stores, IKEA has decreased the use of energy and water, and reduced waste in its operations. At the same time, it has generated renewable energy through solar panels and geothermal heating and cooling systems. As a result, IKEA

*100% EV
Furniture Delivery
2025*



SUSTAINABLE DEVELOPMENT GOALS





Orkla is a supplier of branded consumer goods and concept solutions to the consumer, out-of-home, and bakery markets in the Nordics, the Baltics, and selected markets in Central Europe and India.

Orkla has developed healthier food products, which has reduced food waste and greenhouse gas emissions. Orkla has also launched products that contribute to circular loops and promote responsible business practices throughout the value chain to take on their share of responsibility and resolve the global health and environmental challenges.

Orkla Korea distributes part of Orkla's product portfolio and aims to distribute only sustainable products in the South Korean market by 2025. An example of sustainable products is the Jordan Green Clean line, which are oral care products made from used recycled plastic. The sales of such sustainable products increased by 300% in 2021, the year

Carbon Net Zero was declared. Compared to 2020, Orkla Korea experienced improved environmental awareness and understanding of sustainability and climate impact among their customers as well as local partners and retailers (Korean companies). Due to the positive effect on sales, Orkla Korea plans to expand its distribution of sustainable products and launch its vegan snack product this year.

The challenge for Orkla has been the Korea-specific certification system for environmentally friendly products. The Korean Ministry of Environment issues a marking system to classify environmentally sustainable products. However, it is not easy for foreign companies to adapt to and accommodate the factory inspections as the production is done abroad. The benefit of getting the products locally certified is that it is recognized by the local retailers who can then promote the products as sustainable in their stores.



*100%
Sustainable Products
2025*

SUSTAINABLE DEVELOPMENT GOALS



Double Up Renewable Energy Production 2024



Scandinavian Biogas produces biogas with a mission to help achieve society's goal of converting organic waste from households, agriculture, and relevant industries to renewable energy. Biogas is a renewable and carbon-neutral alternative energy that is technically 100% identical to natural gas. Scandinavian Biogas has facilities in Sweden, Norway, and Korea.

Scandinavian Biogas is the first company to receive a 100% "dark green shading" rating – the highest possible rating from CICERO shares of Green AS – for all its revenue streams and investment, making the company the first dark green share listed on Nasdaq Stockholm in 2020.

Scandinavian Biogas pledges to double up renewable energy production. As 92% of CO₂eq emission is reduced compared to fossil fuel, its success directly contributes to Korea's green transition. Scandinavian Biogas provides engineering competence focusing on process and operation know-how based on the understanding of microbes to efficiently produce high-quality biogas. Scandinavian Biogas has invested, constructed, and operated the Ulsan Biogas plant for ten years. The plant was named the most efficient biogas plant in South Korea and was selected as a best practice of consolidation by the Ministry of Environment. Scandinavian Biogas is

exploring further business opportunities and development with various types of local stakeholders and partners in the construction or energy industries to create synergies and operate the plant sustainably.

Biogas is most efficiently used with minimal energy loss in the form of biomethane or bio-LNG as it can replace natural gas that is used for city gas or fuel for LNG vehicles or maritime. The availability of well-functioning technologies for bio-LNG production opens up new markets and customer segments. With a well-established infrastructure for natural gas in South Korea, biogas is relatively cheaper to produce, easy to store, and to distribute. This can complement other renewable energy sources, such as solar or wind power.

The current subsidy and incentives scheme of the government is not favorable to the biogas production business. However, to achieve national climate agendas, e.g., Korea's Net Zero goals and Nationally Determined Contributions (NDC) plan, Korean central and local governments need to consider the beneficial properties of biogas as increasing biogas production could stimulate positive circularity. The Scandinavian Biogas facilities can carefully identify the positive environmental impacts and minimize the negative environmental impacts.



*50MW
Renewable Energy
2030*



Seaflex has expertise in sustainable mooring technology, providing long-lasting, environmentally friendly solutions to all types of floating applications around the world since 1981. Seaflex products can be used for marinas, floating solar parks, hydro-/aquaponics, floating real estate, and more.

Each Seaflex installation is custom-designed to handle specific on-site loads and forces to offer a safe system that can withstand even typhoon-strength winds without damaging the floating application. The elastic and taut flexible mooring system provides a progressive dampening effect that neutralizes shocks (or peak load effects). This is beneficial from both a safety and durability perspective against wave, current, and wind forces. Until today, over 1,800 Seaflex projects have been installed and over 1,500 of them are still functional after 40 years.

Seaflex recently joined the Green Transition Alliance (2022) and pledged to provide 50MW of renewable energy in South Korea by 2030 through providing their solutions to offshore solar power.

Public tenders are often appointed based on the lowest price, failing to consider the longevity of the products or services offered. If the longevity of a sustainable mooring

system is taken into consideration, the Seaflex system generally yields a much lower total cost of ownership (TCO) over the lifespan.

Using Seaflex lowers the total life-cycle cost of an installation, while simultaneously reducing the carbon footprint due to the materials used as well as ease of transportation and installation.

Often, there is a lack of coordination and coherent push to establish standards and regulations to develop more sustainable solutions, a better economy, and more environmentally friendly solutions. It is a misconception that sustainability leads to higher costs. Ideally, the initiatives in South Korea are driven coherently with the government in the lead and companies jointly working toward carbon neutrality.

Seaflex in South Korea is suitable for offshore solar platforms that are installed in deep waters with high variation. Seaflex will be the best or the only alternative for tougher conditions like with hydroelectric dams, irrigation dams, or drinking water dams as it will lower costs, give better control, and be long-lasting compared to traditional solutions.





Carbon Zero Floating Village **2025**



SF Marina provides tailor-made, premium marinas and advanced floating solutions around the world. The company has in-house knowledge and experience to design, permit, manufacture, install, and operate marinas and floating villages. SF Marina's floating concrete pontoon marina system has withstood the test of time and forces of nature since 1918.

SF Marina's pledge to build a carbon-zero floating village has investments from SF Marina Group (i.e., foreign investment from South Korea's perspective) and partnerships with Korean conglomerates.

The concept of carbon zero in this sense is to produce the energy that is consumed within the village, or energy self-sufficiency. The technology is available and can be applied with several examples in Sweden, e.g., storing energy during summer to use during winter. Being energy self-sufficient also means that the village does not have to be connected to the energy grid. This enables the village to be built on water like an island. Building such a carbon-zero village on a floating structure can have less impact on the environment since it does not disturb the marine ecosystem, compared to building on land.

Due to Korea's positive regulatory policy, off-grid storage of energy and offshore housing is not allowed. To be more precise, South Korea lacks relevant regulations and permits.

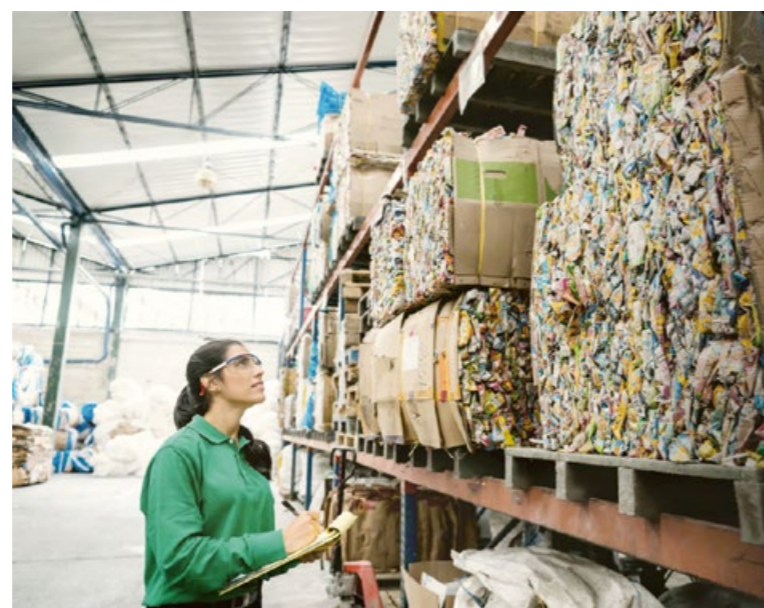
In 2019, South Korea introduced the regulatory sandbox program, a policy initiative that allows time-bound testing of new solutions under government oversight without having to change the related regulations or laws. The Carbon Net Zero floating village may or may not apply in the sandbox program, so SF Marina is communicating with the Ministry of Trade, Industry, and Energy; Ministry of Land, Infrastructure, and Transport; and Ministry of Oceans and Fisheries to find the responsible regulatory body. SF Marina is hoping for support from the Ministry of Environment as it supports Carbon Net Zero 2050.

The project will be conducted in collaboration with Korean partners and with mostly local production. Hence, it will contribute to the competence and capacity building of Korean companies, becoming the basis for cooperation between Sweden and Korean companies abroad. Waterfront tourist destinations and developing countries with limited infrastructure for energy supply can be possible business expansion opportunities through a partnership with Korean conglomerates.

After Korea's Net Zero commitment, SF Marina has felt a difference in the interest and commitment to environmentally friendly solutions among their business partners.



Net Zero GHG Emissions in Own Operations 2030



Tetra Pak has been a food processing and packaging solutions company since 1951. Working closely with their customers and suppliers, Tetra Pak provide safe, innovative, and environmentally sound products that meet the needs of hundreds of millions of people in more than 160 countries daily. Although Tetra Pak was established in Korea in 1983, Tetra Pak's packaging solution was already introduced to Korea in 1974. The solution has revolutionized the food and beverage industry with paper-based, aseptic cartons that can store liquids for months without refrigeration. Tetra Pak accounts for 75% of the distribution volume of domestic aseptic cartons.

Tetra Pak aseptic carton packaging typically consists of 70% paper, 24% polyethylene (plastic), and 6% aluminum, which can be difficult to recycle since each material is often processed through separate channels. Whereas paper materials from aseptic carton waste are recycled, the composite materials (polyethylene and aluminum) are only incinerated or landfilled.

Currently, the aseptic carton recycling rate is about 6% in South Korea with a target of achieving over 70% by 2030. Tetra Pak Korea established cooperation projects with SK Global Chemical, Maeil Dairies, and Jushin Trading in 2021 to increase the recycling level. By extracting the plastics and aluminum composite materials, the aseptic carton wastes are 100% recycled, leading to a broad range of resource circulation systems. The project will

recycle 3,000 tons of composite materials and reduce 19,000 tons of CO₂/year.

Furthermore, the Korea Aseptic Carton Recycling Association (KACRA) was established in September 2021 for final aseptic carton producers and initial producers to share social responsibility and create a resource circulation society through aseptic carton recycling. The association plans to take the lead in creating and expanding an environment to improve the recycling rate of aseptic cartons and enhance the awareness of producers and citizens about recycling aseptic cartons. It also aims to establish an aseptic carton collecting system as well as develop and disseminate recycling policy tasks and new technologies. The association will collaborate and cooperate on projects with various related organizations for recycling by supporting aseptic carton collecting and recycling companies.

With the recent advancements in prioritizing sustainability combined with the fast adaptation of technology by South Korea, Tetra Pak can support improvements in the recycling process. The Ministry of Environment leads the Korean government's efforts to change the waste collection and recycling system.

Tetra Pak witnesses that the consumer group is one of the driving forces in solving South Korea's climate change problem in recent years.



Sweden's national goal is to achieve a climate-neutral society by 2045. It has been declared that hydrogen would play an important role in supporting the transition to a Net Zero greenhouse gas emission, which is five years ahead of other EU countries.

In this context, the Swedish government has cooperated with businesses and other actors in the hydrogen value chain to present its national strategy for fossil-free competitiveness in 2021 to use hydrogen to achieve climate goals. As part of Fossil Free Sweden³, 22 different industries have produced roadmaps to show how they can contribute and enhance their competitiveness by going fossil-free or climate-neutral.

South Korea has also set ambitious targets for hydrogen use by 2040 by seeing hydrogen as a potential driver for economic growth and job creation. Starting with the Hydrogen Economy Roadmap in 2019, the Korean government has supported key industrial stakeholders like automobile manufacturers, e.g., Hyundai Motors Group, through R&D subsidies, loans, tax exemptions, etc.

Following the government's initiatives and market potential, KraftPowercon and Impact Coatings entered the Korean market through their own entity. Furthermore, Cell Impact is to enter the Korean market for open

collaboration with local stakeholders and contribute its know-how in green hydrogen production and fossil-free application to the market. Alfa Laval also joined the green transition movement by utilizing its experiences in Sweden to introduce its solutions in the green production field.

However, the hydrogen industry is seen as in its early stage. The hydrogen value chain in South Korea is more focused on the applicability, especially in mobility. It is challenging to build reference cases not only in the automotive industry, but also in other industries in South Korea due to the long decision-making process driven by a hierarchical business culture and personnel changes overturning decisions. This hindered the adoption of new technologies and the building of long-term networks with Korean stakeholders.

As the Korean government heavily invests in the hydrogen economy, it must seek and build optimized partnerships with local stakeholders, which requires a multilayer approach to the players in the industries. Therefore, we expect the Green Transition Alliance, as a public-private coalition, to open up more opportunities for Swedish companies.

Green Hydrogen Production and Its Applicable Solutions

02

³ Fossil Free Sweden was started as an initiative by the Swedish Government in 2015 ahead of the major UN climate conference in Paris to bring together actors - in the form of companies, municipalities, regions, and organizations - to back Sweden as one of the first fossil free nations in the world.



*30% Increase in
Clean Energy Solution
2030*



Alfa Laval is a leading global provider of first-rate products in heat transfer, separation, and fluid handling. Alfa Laval delivers sustainable products and solutions to their customers mainly within the energy, environment, food, and marine industries throughout the world. In the Korean market, about 70% of their sales are within the marine sector.

Alfa Laval's long company history is based in Sweden where sustainability is at the core of its business. Their products and solutions are used in treating water, improving energy efficiency, reducing carbon emissions, and minimizing environmental pollution in addition to food heating, cooling, separating, and transporting.

Alfa Laval decided to join the Alliance to expand its technology in the South Korean clean energy area by 2030. Alfa Laval hopes to apply their green transitional solutions in the Korean market by utilizing its experience in Sweden. However, despite the green transition movement and investments in the hydrogen economy, Alfa Laval experienced difficulties getting their sustainability aspects to reach their customers and stakeholders, who tend to stay with traditional methods. Alfa Laval will focus on marketing activities and education sessions to actively build its cases and introduce capabilities for the Korean green transition.

SUSTAINABLE DEVELOPMENT GOALS



Green H2 Capacity 4 Times Faster 2023



Cell Impact is a flow plate supplier for hydrogen fuel cells and electrolyzers. With their patented green, cost-efficient, and scalable forming technology, Cell Impact Forming™, the company offers high-quality forming of flow plates. Cell Impact Forming is low cost and has a small floor print. Therefore, it is suitable for both low-volume and high-volume production, with significant cost savings compared to conventional plate forming methods.

Cell Impact Forming is cost-efficient, because it consumes comparatively less power, water, and factory space. Additionally, the tools have a comparatively longer life in an environmentally friendly way. Thus, Cell Impact Forming consumes fewer resources for flow plate production.

By providing customers with flow plate design and manufacturing services, Cell Impact contributes to green hydrogen production and fossil-free transportation on the ground, water, and air as well as in stationary applications where direct or backup power is supplied.

Cell Impact joined the Alliance in 2022 to reach green hydrogen capacity 4 times faster by 2023 in South Korea. Cell Impact is ready to scale up the green hydrogen industry with its clean and cost-efficient manufacturing and know-how. As South Korea is one of the leading countries in the green hydrogen industry, Cell Impact expects to collaborate with Korean partners to accelerate their business.

SUSTAINABLE DEVELOPMENT GOALS



Quadruple Green H2 per Electrolyser 2025



Impact Coatings is a global supplier of clean coating solutions, developing highly efficient coating systems, coating technology, and world-class coating services. Their core expertise is PVD, or physical vapor deposition, which is a vacuum-based coating technology for enhancing surface properties with minimal environmental impact.

Impact Coatings' qualified products, featuring INLINECOATER® equipment and MAXPHASE® coating materials, create value for customers and save the planet's resources by extending component lifespans, improving product performance, and contributing to the transition to a fossil-free society.

For more than a decade, Impact Coatings has been supplying cost-efficient coating solutions that accelerate the development of green hydrogen production and fuel cell electric vehicles. Compared to other coating solutions found in the industry, their solutions have significantly less impact on the environment as they don't use harmful chemicals in the process.

Impact Coatings joined the Alliance in 2022 and pledged to quadruple the green hydrogen per electrolyser by 2025. Since hydrogen is

emerging as an important solution for energy and transport systems free from fossil fuels, it can contribute to national energy security. This is especially important for South Korea, which imports most of its energy.

To access the Korean market, it is very important to be present in the country to hold physical meetings as well as overcome language barriers and cultural differences. Therefore, the company opened an office in Seoul in 2020 to work more closely with Korean partners and customers. In particular, Impact Coatings has an ongoing Joint Development Agreement with Hyundai Motor to jointly research and develop a new generation of materials, processes, and equipment for fuel cells and hydrogen production. Impact Coatings' team in Korea has grown to four people to better support the Korean market, which doubled the team from the previous year. The company also had an exhibition in Korea for the first time at the H2 Mobility trade show. Finally, Impact Coatings shipped and installed the first coating equipment in Korea in 2021.

SUSTAINABLE DEVELOPMENT GOALS



30% Reduction in Air Pollutant Emission 2030



KraftPowercon offers solutions, products, and services for industrial power supply and is active in areas such as electrolysis and hydrogen, air pollution control (electrostatic precipitators), marine, PCB and semiconductors, general metal finishing, and uninterruptible power systems. Headquartered in Sweden, KraftPowercon was established in 1935 and today has five production facilities in Sweden, China, and India with sales offices around the world.

Relatively new industry sectors, such as green hydrogen production, are open for collaboration. Compared to companies in neighboring countries like China and Japan, Korean companies tend to be open to various types of solutions and technologies without specific preferences. This is one of the reasons why the Korean market is important. In addition, there are several Korean EPC

and system integrator companies that KraftPowercon can collaborate with and expand together in the greater global market. KraftPowercon believes that their experience in Sweden can help contribute to the development of the relevant Korean industry.

KraftPowercon was established in Korea in 2018 to supply power to ballast water treatments that prevent invasive micro-organisms from wreaking havoc in the sea. KraftPowercon's solutions can also be used in green hydrogen production, which helps in their pledge to reduce 30% of air pollutant emissions. Industries that create air pollution in terms of particulate matter (PM), e.g., coal power and cement plants, can reduce their emission through cost-efficient solutions like the electrostatic precipitator.

SUSTAINABLE DEVELOPMENT GOALS



**ELECTRIC
POWERED**

03

Smart Mobility and Transportation

The transport sector in Sweden holds the highest share of total greenhouse gas emissions across all industries. However, Sweden reduced its level by over 23% from 2005 to 2019. To achieve Sweden's goal of a climate-neutral society by 2045, the government has set a robust target of a 70% emissions reduction by 2030 (excluding national aviation) when compared to 2010 values.

Sweden announced that one of the milestones of reaching the national goal is by achieving a fossil-independent transport sector by 2030, mainly through the general electrification of the sector, taxes on vehicles, a bonus-malus system, improvements to the charging infrastructure, and support for EV manufacturers.

Sweden has taken part in many global initiatives to hasten the climate transition in the transport sector and is rapidly becoming electricity-driven by the industry. Volvo announced in 2021 its plan to become a "fully electric car company" and will phase out any cars in its global portfolio with an internal combustion engine, including hybrids, by 2030. In South Korea, Volvo Cars was the first mover in the automotive industry and ceased selling diesel cars by 2020. In addition, Volvo started to diversify all the new models to hybrid and electric cars to reach its global goal. Volvo Trucks also took the lead for a more sustainable future and reorganized its sales portfolio to include electric trucks and increased sales of re-used spare parts.

In addition to restructuring the portfolio, the Swedish automotive giant is strictly following the Paris Agreement in the long-term. Scania

has long been aware of the need for a joint effort across the entire value chain to achieve Net Zero greenhouse gas emissions. To reach the goal, Scania installed solar panels at maintenance centers nationwide and changed to LED lighting, which reduced the electricity consumption by nearly 80%. Additionally, Scania has educated drivers and adopted operation software to reduce direct and indirect emissions.

Despite these efforts, several challenges have delayed the adoption of new technologies and products in the Korean automotive market in reaching climate goals. The number of registered electric vehicles quadrupled from 2018 to 2022, but accounts for only 0.8% of total registered cars in the market. Consequently, the lack of regulation and support has led to weak charging infrastructure (both for passenger and commercial cars) and lack of favourable subsidies for the consumer.

Although EVs can be more eco-friendly than combustion vehicles, the fact that coal power generation still maintains the largest proportion of domestic power generation overshadows the Net Zero carbon emission goal. Building sustainable transport and infrastructure for zero carbon emission is possible when the private and public sectors collaborate with innovative technologies and take action. Through such a collaboration, Volvo Group was able to produce the world's first vehicle using fossil-free steel. Therefore, the Green Transition Alliance is ready to further share this type of experience with Korean partners.

20% CO₂ Reduction on Operating Trucks 2026



Scania is an international provider of transport solutions, including trucks and buses for heavy transport, as well as an extensive product-related service offering. Scania offers vehicle financing, insurance, and rental services in addition to industrial and marine engines.

The key priority of Scania's Global 2025 Strategy is to reduce the climate impact of products and operations in line with the Paris Agreement. The majority of Scania's total climate impact, both direct and indirect emissions, is generated when products are in use. To reduce CO₂ emissions from the rolling fleet, Scania has set clear volume targets for biofuel and electrified buses and trucks by educating the drivers and urging partners to join the efforts. It is important to ensure that the fuel and electricity used are sustainable, i.e., the gas should be biogas and the electricity should come from renewable sources.

Scania Korea's pledge for the Green Transition Alliance is to reduce CO₂ on operating trucks by 20% until 2026. This is based on Scania's SBTi-approved climate

targets (joined in April 2020), which include a 50% CO₂ reduction from its operations when compared to 2015. To reach these lofty goals, 30% of the disposable containers have been changed to dispensers while 20% of the paper use has been reduced through full automation and digitalization of the ERP system. Furthermore, installing solar panels on the nationwide service workshops and changing to LED lighting have reduced the electricity bills by 70-80%.

Scania Korea's Strategy is to reduce our customers CO₂ with at least 20% until 2025 for vehicles sold that year, compared to 2015 sold vehicles. Since there is no biofuel for Heavy Duty Trucks in Korea, nor any infrastructure for electrified trucks, Scania Korea needs an alternative approach.

To ensure that the goal of 20% CO₂ reduction is achieved in the Korean market, Scania not only promotes innovative technology, putting the brand in a best-in-class position for fuel consumption, but also offers a software-based solution which uses map data and GPS positioning to calculate and adjust for the most energy-efficient

vehicle speed and gear shift strategy. This combined with mandatory driver training and driver coaching, so customers can see huge CO₂ reductions for every driven kilometer. This solution is branded Ecolution 1.0 by Scania Korea.

Scania states that the software functionality Cruise Control Active Prediction (CCAP), which includes functions such as 'Pulse & Glide', ECO-roll, Platooning and smart cruise control in combination with driver training reaches up to 10% fuel savings (CO₂ savings). Normally better result is achieved after some time when drivers get used to the functionality, but already now we can see an average saving in Korea of 6% for the target group compared to the reference group. Some customers from the pilot testing group are saving over 20% fuel consumption (CO₂), which is over 5,000 kg of CO₂ per month and vehicle.

"We are sending a clear signal that we need to take a collective ownership of the climate change and that we will turn every stone to transform the world of transport to become sustainable."



SUSTAINABLE DEVELOPMENT GOALS





*100%
Rechargeable Cars
2030*



Volvo Cars was founded in Sweden in 1927. It is a global car company selling cars in about 100 countries. Volvo Cars aims to offer customers the freedom to move sustainably and safely for a better future.

As a leader in safety technologies, Volvo Cars has continued to make safety for the families using their cars a priority, and now the focus has shifted to include efforts for the planet's safety. By 2030, Volvo Cars will phase out car models with an internal combustion engine, including hybrids, from its global portfolio. Volvo Cars will continue to reduce carbon emissions with a vision to achieve climate neutrality by 2040.

Volvo Car Korea's new model portfolio now includes only hybrid and electric cars. The last diesel car sold was in 2020, which was the first in the South Korean car industry.

In 2022, Volvo Car Korea launched the new SUV C40 Recharge and XC40 Recharge, bringing in the new era of electric cars. The C40 and XC40 Recharge combine the convenience and safety options with Volvo Cars' ambition to achieve climate neutrality by 2040.

Volvo Car Korea has been hosting 'Hej, Plogging' in Korea since 2019, which started in Sweden as a campaign for the environment. Participants jog and pick up trash on the streets, which improves health and keeps the surrounding environment clean. Funds generated through the campaign are donated

to the Korean Green Foundation to raise awareness of the issues with disposable plastic waste.

Volvo Car Korea is aware of the serious consequences of climate change and are committed to offering various meaningful campaigns for a better and safe environment.

Volvo Car Korea ushered in the new era of electric cars by launching the C40 and XC40 Recharge, positively changing consumer perspectives about hybrids. This was proven when the C40 Recharge allocated for the Korean market was completely sold out in just 5 days.

In addition, Volvo Car Korea recently launched the new XC60, XC90, and S90 Recharge PHEV with an 80% improved electric mileage through battery upgrades. This means Volvo Car Korea provides a wide range of electric cars from electric vehicles to PHEVs, creating a detailed motorized roadmap and lowering entry barriers for consumers purchase high-performing electric cars.

'Hej, Plogging' is Volvo Car Korea's flagship eco-friendly campaign held annually. This year, Volvo Car Korea will work more actively with the Korean Green Foundation to promote the plogging and continue to spread the idea of creating a safe planet through small life changes.





*30% CO₂ Reduction
2030*



Volvo Construction Equipment (hereafter “Volvo CE”) has become one of the world’s oldest and leading construction equipment manufacturers since its establishment in 1832. Volvo CE supplies construction equipment like excavators, wheel loaders, and haulers produced through 15 factories in Europe, North/South America, and Asia, which are distributed to nearly 150 countries. As a total-solutions provider, Volvo CE also offers services, financing, used equipment, rental, and other related services.

In South Korea, Volvo Group Korea (Volvo CE Korea) was founded in 1998 through the acquisition of the construction equipment business of Samsung Heavy Industries. It has shown continuous growth, exporting over 80% of its production and contributing to the local communities by hiring 15,000 employees and partnering with nearly 20,000 people through its suppliers.

Volvo Group Korea’s philosophy of “tomorrow depends on the choices we make today” shows its commitment to sustainable

development through reducing climate footprint and use of resources by considering people’s health, safety and wellbeing.

Volvo Group Korea pledged two action plans by 2030: reducing 30% of CO₂ emissions by focusing on electric and fuel cell machines in product development and reducing 50% of CO₂ emissions in its own operations.

To reduce carbon emissions, Volvo set up an electric excavator product line in 2020 in Changwon, the world’s largest manufacturing facility for excavators. The factory was certified landfill-free status to reduce the impact on climate and resources with consistent improvements in its waste management process based on the reuse and recycling priorities. Volvo plans to launch more of its electric and hydrogen construction equipment in its effort to accelerate the green transition for both customers and manufacturers with the Korean government’s support.

SUSTAINABLE DEVELOPMENT GOALS





50% Electric Trucks 2030



Volvo Trucks was founded in Sweden in the late 1920s and is one of the world's leading truck brands. Volvo trucks are assembled in 13 countries across the globe and delivered approximately 123,000 trucks in 2021. As a total solution provider, Volvo Trucks also offers servicing, financing, used equipment, rental, and other related services with 2,200 service points in more than 130 countries. Volvo Trucks' core values are quality, safety, and environmental care.

Volvo Trucks Korea, a Korean subsidiary of Volvo Trucks Corporation, was established in June 1996 and oversees import, sales, and marketing activities in South Korea.

As part of Volvo Trucks' sustainability strategies for the green transition and to take the lead toward a more sustainable future, 50% of the South Korean sales portfolio will consist of electric trucks by 2030.

Volvo Trucks has increased the sales of re-used spare parts to save about 6.2% of energy used. There have been continuous efforts in technical development to increase energy efficiency. For instance, the I-Save transmission solution can reduce CO2 by up to 10%. However, due to the regulations in Korea regarding the allowed maximum width and the vehicle energy consumption calculating scheme, introducing the latest energy-sufficient and fossil-free trucks in the Korean market has been delayed.

Apart from e-mobility, Volvo Trucks plans to introduce alternative driveline products in the Korean truck industry for fuel cells and LNG.

An alternative driveline has been seriously considered in the commercial vehicle industry for many years. However, there are challenges such as social acceptance, regulations, and charging standards. Heavy-duty trucks have a significant impact on the environment, so Volvo Trucks suggests the following proposals as top priorities:

a) Infrastructural investment for commercial vehicles

There are 25,000+ charging devices in South Korea, but very few are accessible for heavy-duty trucks due to space. Charging infrastructures are critical for BEVs as they need frequent charges to transport goods for long-distances.

b) Financial support for logistics companies

Battery and/or fuel cell systems have a heavy impact on the commercial vehicle price, which is the main barrier for logistics companies to adopt alternative drivelines. Financial support, such as purchase subsidy programs, will help considerably for a timely and open acceptance in the industry.



Conclusion

Despite coming from a wide range of industrial backgrounds, the companies in the Alliance have contributed to the green transition from its foundation. The Alliance does not take a top-down approach of taking orders from the government, but a multi-helix model driven in Swedish society. The Swedish government has gathered ideas from the public, industry, academia, and civil society to implement much needed legislation that accelerates the transition to a carbon-neutral society. This has led to Swedish businesses to adopt long-term sustainable solutions and consider the climate impact within the entire value chain.

The Alliance is committed to working together with Korean industrial partners to implement and reach Korea's goal of achieving a Green and Carbon Neutral society before 2050.

To pave the way for fruitful collaboration and *take action* within the framework of the climate agenda, the Alliance will assess environmental risks and opportunities and take actions that support South Korea's transition to a green and carbon-neutral society.

Additionally, the member companies will continue to identify obstacles, share best practices and know-how, and *co-create* mutual pathways with the Korean partners to implement innovative solutions that will advance sustainability across various fields and industries.

The Alliance will also broaden its communication channel between the public and industry with the government to *raise ambitions* to reach its carbon neutrality goal before 2050.

Several difficulties, e.g., local certification processes and standards, delay the implementation of sustainable solutions and evaluation of the environmental impact of the entire value chain in South Korea. However, the Alliance has aligned its agenda with the South Korean government's policy towards green transition and has identified relevant Korean ministries⁴ to inspire bold action to bring South Korea's target forward in becoming a carbon-neutral economy. Sweden+Korea Green Transition Alliance expects to continue the journey with the new government's 110-key policy tasks and derived opportunities in order to reach Carbon Neutrality by 2050.

⁴ Relevant ministries include, but are not limited to, the Ministry of Trade, Industry, and Energy; Ministry of Environment; Ministry of Land, Infrastructure, and Transport; Ministry of Economy and Finance; and Ministry of Foreign Affairs.



**SWEDEN + KOREA
GREEN TRANSITION
ALLIANCE**

<p>Alfa Laval</p> <p>30% Increase in Clean Energy Solution</p> <p>2030</p>	<p>Atlas Copco</p> <p>50% Reduction in CO₂ Emission</p> <p>2030</p>	<p>Cell Impact</p> <p>Green H2 Capacity 4 Times Faster</p> <p>2023</p>	<p>Envac Korea</p> <p>20% Reduction in Energy Consumption</p> <p>2030</p>
<p>IKEA Korea</p> <p>100% EV Furniture Delivery</p> <p>2025</p>	<p>Impact Coating</p> <p>Quadruple Green H2 per Electrolyser</p> <p>2025</p>	<p>KraftPowercon</p> <p>30% Reduction in Air Pollutant Emission</p> <p>2030</p>	<p>Orkla Korea</p> <p>100% Sustainable Products</p> <p>2025</p>
<p>Scandinavian Biogas</p> <p>Double Up Renewable Energy Production</p> <p>2024</p>	<p>Scania Korea</p> <p>CO₂ Reduction on Operating Trucks</p> <p>2026</p>	<p>Seaflex</p> <p>50MW Renewable Energy</p> <p>2030</p>	<p>SF Marina Korea</p> <p>Carbon Zero Floating Village</p> <p>2025</p>
<p>Tetra Pak Korea</p> <p>Net Zero GHG Emissions in Own Operations</p> <p>2030</p>	<p>Volvo Cars</p> <p>100% Rechargeable Cars</p> <p>2030</p>	<p>Volvo Group Korea</p> <p>30% CO₂ Reduction</p> <p>2030</p>	<p>Volvo Trucks</p> <p>50% Electric Trucks</p> <p>2030</p>



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