
Pioneer the possible™
Let’s pioneer the possible together.

Zero net emissions of greenhouse gases into the atmosphere by 2045 at the latest. Achieve negative emissions thereafter.

Swedish government target

Towards carbon neutrality and a better life for all.

Pioneer the possible –
the movie.

88 sec.

Sweden is determined to live up to the commitments made in the Paris Agreement. Uniquely close cooperation between the government and the business community is making it happen. Brave, broad political decisions has paved the way forward for the long run. Policy instruments and generous innovation support companies to take action in the same direction. Together we pioneer the possible.

A climate policy built to last.

In 2017, the Swedish Parliament adopted a climate policy framework featuring national climate goals, a Climate Act and a Climate Policy Council.

1. National climate goals to drive progress.
Our national climate goals mandate zero net emissions of greenhouse gases by 2045 at the latest – and negative emissions thereafter. The goals, supported by a broad parliamentary majority, set long-term conditions for business and society. They also include milestone targets for emissions not covered by the EU Emission Trading System. From 1990 levels, emissions are to be 63% lower by 2030 and 75% lower by 2040.

2. A Climate Act designed to deliver results.
The Climate Act brings vital stability to Sweden's climate strategy. It obliges current and future governments to pursue policies based on the national climate goals. This gives the certainty and foreseeability that businesses need to innovate the solutions required for climate transition.

3. A Climate Policy Council to assure action over time.
To ensure that future governments continue to follow the act, an independent expert body, the Climate Policy Council, is tasked with overseeing implementation, recommending areas where further action is needed, and evaluating whether government policy conforms with the 2045 goals.

Per Lundström/imagebank.sweden.se.

Climate competitive through positive action.

It's risky to stand still in a fast-moving world. The UN's Agenda 2030 spurs and drives innovation. But further actions are needed to reach zero net climate emissions from Swedish territory by 2045.

We've made a strong start.

- Along with carbon pricing through tax and emission trading systems, government measures taken to accelerate climate progress and sustainable competitiveness include:
- Industrial Leap grants for climate-related feasibility studies, research programmes and pilot and demonstration projects.
- Emissions cuts through mandatory exchange of gasoline and diesel for biofuel. Fuel suppliers must reduce their emissions by a fixed percentage annually.
- Incentives that penalise high emitters with higher vehicle tax for three years initially.
- Green government credit guarantees to facilitate large-scale investments that help meet environmental and climate goals.
- Climate premiums for heavy goods vehicle electrification and a new premium for light commercial vehicles.

Spotlight on EU mechanisms

Key climate mechanisms for Sweden also include the EU's CO2 regulations and targets and its Emissions Trading System.

Photo: Lars Thulin/Scandinav/imagebank.sweden.se

From small steps come big leaps.

Sweden has high per capita GDP, a large industrial sector, long transport distances and cold winters. Factors generally associated with high greenhouse gas emissions. Yet since 1990 Sweden has successfully combined lower emissions with strong economic performance. Emissions have dropped by close to 30% at a time when GDP has jumped by 86%. Net zero and growth are not mutual opposites.

How did we do it? Introducing a carbon tax in 1991 was a turning point. But some initiatives started even earlier. Together they made quite a difference:

- Expansion of fossil-free electricity production from hydropower, nuclear and, more recently, bioenergy and wind power. Today, just 1% of Swedish electricity production comes from fossil sources.
- Extension of district heating networks and expanded use of biofuels and waste fuels in district heating production. Fossil sources account for only 1% of energy used in district heating.
- Phasing out oil-fired boilers in domestic heating in favour of heat pumps and district heating.
- Fuel shift in industry – less fossil, more renewable and sustainable.
- Reduction of organic waste sent to landfill.

Notable as it is, this progress is too slow to reach our goals. It's time to roll up our sleeves again.

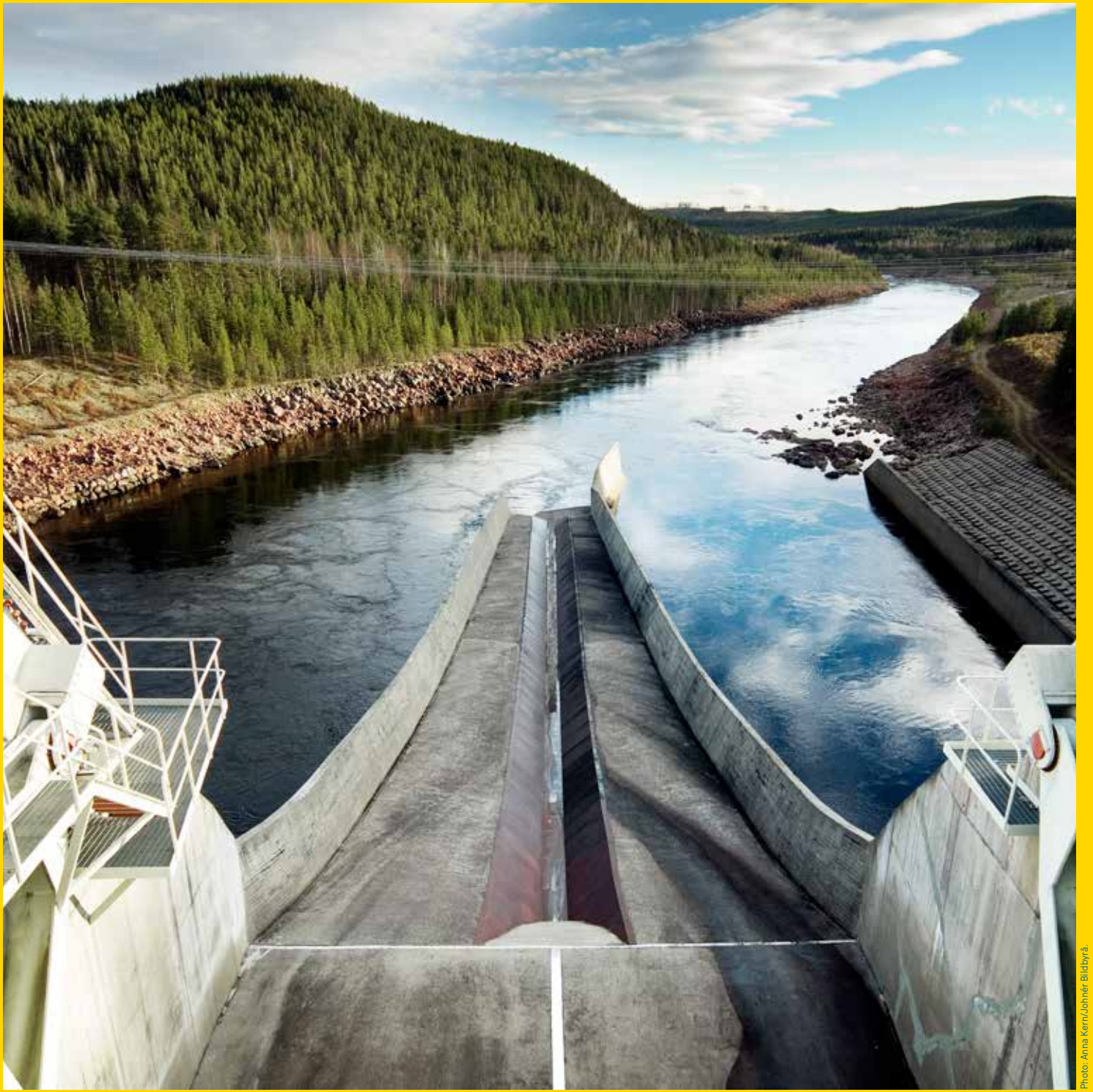
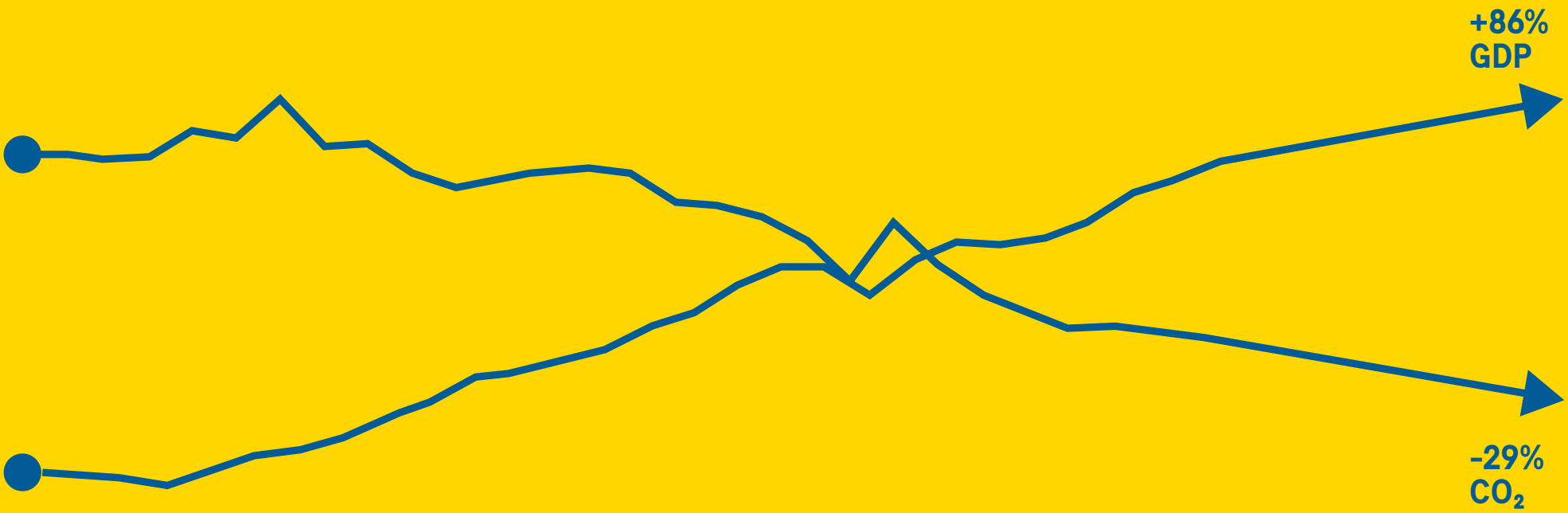


Photo: Anna Kern/Johnér Bildbyrå.

Swedish GHG emissions and GDP 1990–2019



1990 2000 2010 2019

A new type of dialogue is happening in Sweden. Businesses are asking the state to create conditions to accelerate green transition. The state then have the opportunity to pave the way for industry to act. The advantages are huge. Industry gets the chance to be more competitive by leading the transformation. The products and services created help many others to reach their own goals. And society everywhere wins.

22 goals from Swedish industry.

A bridge between public and private.
Fossil-Free Sweden is a government initiative that provides a unique bridge between business and the public sector. It brings together more than 500 key actors from business, municipal and regional government, the research community and civil society to create and nurture a competitive green transition.

Roadmaps for industrial leadership.
Working with Fossil-Free Sweden, 22 industrial sectors have published roadmaps for achieving climate neutrality by 2045. These action plans, presented to the government, include initiatives from large emitting sectors such as concrete and cement, steel, aviation and the petroleum and biofuel industries. The action plans also require the government to create conditions for lower emissions.

Government sets the tone.
To encourage technological leaps that will be profitable over time, the government helps reduce initial risk through measures like green state credit guarantees and Industrial Leap grants. Changing public procurement rules ensures that the most climate-smart technologies are rewarded. Government support also includes facilitating large-scale electrification by increasing grid capacity and subsidising charging station construction.

Climate neutrality by 2045.
Petroleum and biofuel industry

Fossil-free electricity production by 2030.
Electricity sector

50% electric trucks by 2030.
Sub-target by the automotive industry, heavy transport

Halve the climate impact of concrete for building construction by 2023.
Sub-target by the concrete industry

Fossil-free domestic sea transport by 2045.
Maritime industry

Halved CO2 emissions by 2030.
Sub-target by the construction and civil engineering industry

Replace fossil dependency with a bioeconomy by 2045.
Forest sector

No new oil in food retailers' plastic packaging by 2030.
Sub-target by the food retail sector

70% reduction of CO2 emissions by 2030.
Sub-goal by the heavy road haulage industry

A fossil-free value chain by 2045.
Fast-moving consumer goods industry

Fossil-free gas for energy by 2045.
Gas sector

Fossil-free steel production by 2045.
Steel industry

Zero net greenhouse gas emissions by 2040.
Recycling sector

Climate-neutral cement by 2030.
Cement industry

Fossil-free mining by 2035.
Mining and minerals industry

Fossil-free ski resorts by 2027.
Ski resort sector

80% rechargeable cars by 2030.
Sub-target by the automotive industry, passenger cars

Completely fossil-fuel-free by 2030.
Heating sector

Cut energy use by at least half by 2030.
Sub-target by the digitalisation consultancy industry

Fossil-free domestic air traffic by 2030.
Aviation industry

Fossil-free agriculture by 2030.
Agriculture sector

The Journey.
Lecture by Fossil Free Sweden.

10.40 min.

The first fossil-free OECD country in the world. How?

146 sec.

Action in every corner of society.

Policymaking in Sweden is highly decentralised. Municipalities have extensive responsibilities in everything from urban planning and public transport to district heating and waste recycling. Their involvement is crucial to achieving change on the ground – and many significant initiatives begin at local level before scaling up nationally.

From grassroots to global.
Civil society also plays a crucial role in implementing Agenda 2030 initiatives. So too in Sweden. Numerous non-governmental organisations, drawn from the widest possible spectrum of society, are engaged at all levels – from grassroots local to big-picture global. Their role is to create, stimulate and galvanise. Sometimes they shake the tree. We all know what happened when a 16-year-old girl started the first global climate strike.

People inspire the policymakers.
The public opinion of the kind that mobilised behind Greta Thunberg's activism is a strong driver for business and also for government – from policymakers in Stockholm to regional and municipal authorities around the country. The future of decision-making is assuredly circular.

Fridays for future. Youth protest against the lack of action on the climate crisis. Photo: Jann Lipka/imagebank.sweden.se.

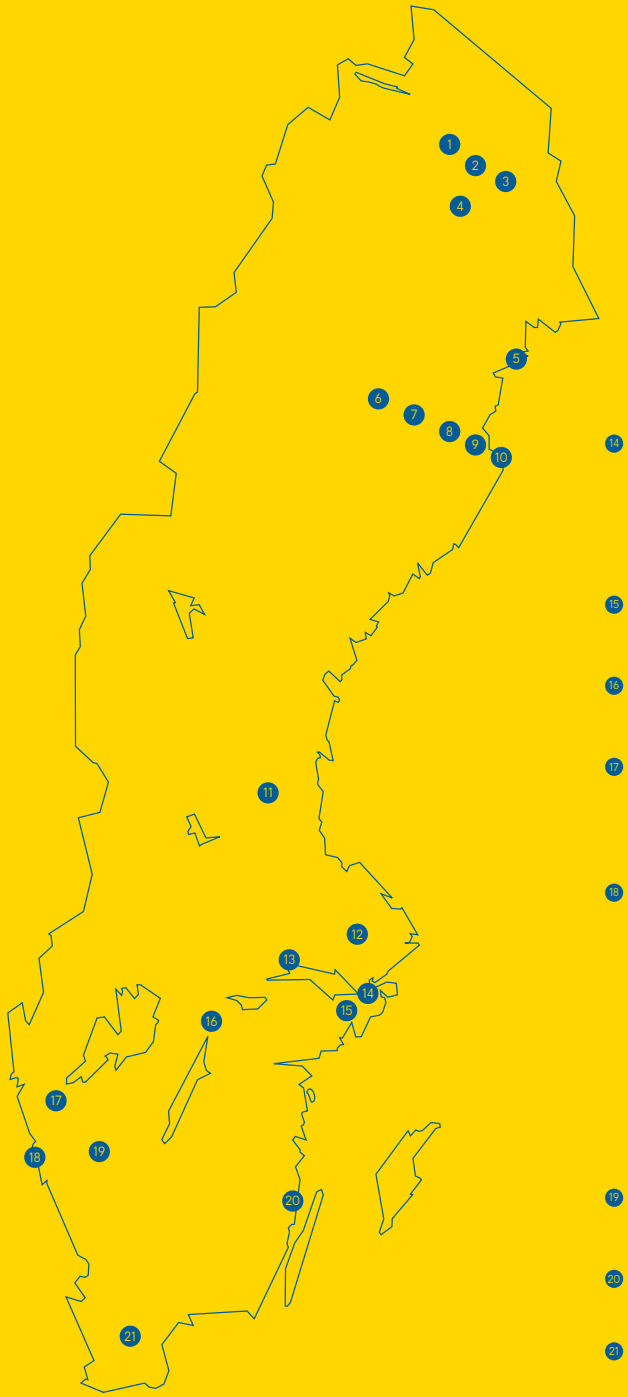
Our emissions are your emissions – and yours are ours.

Achieving climate neutrality isn't an optional extra. It's a matter of survival. And to succeed it requires the greatest co-lab of our times. Showing leadership, reaching out to others and working together to accelerate sustainability are our tools for attaining the results we need to prevail. This applies in all processes, in all areas and at all levels. Nobody's exempt.

Every link counts in a value chain.
As we accelerate the green transition, industry is where the transformational force must be greatest. The changes required go far beyond the scope of any one company or sector acting alone. Businesses that used to be competitors now need to work in the same direction. Companies that aspire to being sustainable must ensure their entire value chain meets the same high standards.

In others we trust.
Firms from different industries working in the same value chain are more connected than ever before. They must step up not just for their own survival but also for the common good because both are interlinked. That takes trust. And the realisation we're all in it together. Our emissions are your emissions – and yours are ours.

Connecting the dots: Sweden's battery cluster.



1. Mining
   Talga Resources
   City: Kiskama
2. Mining
   Talga Resources
   City: Vittangi
3. Mining
   Talga Resources
   City: Masugnsbyn
4. Mining
   Boliden
   City: Gällivare
5. Material refinery
   Talga Resources
   Research and development
   Luleå University of Technology
   Research and development
   EIT RawMaterials Innovation Hub CLC North
   Research and development
   SWERIM
   City: Luleå
6. Mining
   Boliden
   City: Kristineberg
7. Mining
   Boliden
   City: Renström
8. Mining
   Hannans Reward
   City: Varuträsk
9. Cell manufacturing, Active material manufacturing
   Northvolt Ett 32 GWh
   Cell manufacturing, Active material manufacturing
   Northvolt Ett 16 GWh
   City: Skellefteå
10. Material refinery, Recycling
    Boliden Rönnskärsverken
    City: Skelleftehamn
11. Mining
    Leading Edge Materials
    City: Edsbyn
12. Research and development
    Uppsala University
    City: Uppsala
13. Cell manufacturing, Research and development
    Northvolt Labs
    ActivitiesEquipment supplier
    Wuxi Lead
    Equipment supplier
    Tanabe
    Research and development
    Northvolt R&D
    City: Västerås
14. End user
    Epiroc
    Research and development
    EIT InnoEnergy
    Research and development
    KTH University
    City: Stockholm
15. Research and development
    SEEL
    City: Södertälje
16. Mining
    Zinkgruvan Mining
    City: Askersund
17. End user, Research and development
    NEVS
    End user
    NEVS/ Sonos Motors
    City: Trollhättan
18. Research and development
    Chalmers University
    Pack assembly
    Alelion
    Recycling, Research and development
    Stena Recycling
    Research and development
    SEEL
    End user
    Volvo AB
    End user
    Volvo Cars
    City: Göteborg
19. Research and development
    RISE
    City: Borås
20. Cell manufacturing
    SAFT
    City: Oskarshamn
21. Mining
    ScandiVanadium
    City: Hörby

Cut greenhouse gas emissions from domestic transport by 70% 2010–2030.

Swedish government target

Fast, furious and future friendly.

From road to rail and sea to air, electric solutions are our route to a low-carbon transport sector. The automotive industry has committed to making 80% of all new cars sold in Sweden rechargeable by 2030. Up to 50% of all heavy trucks above 16 tonnes will also be electric. Government and business are working together to realise these goals. In Sweden's north, Northvolt is building Europe's largest battery production and recycling facility. Electric charging infrastructure is being expanded. Electric roads are being built.
And climate gas pollution comes at a cost: cars with high emissions are taxed more heavily.

We optimise society.

A more transport-efficient society will be achieved through measures including punctual and reliable public transport, coordinated goods transport, higher use of vehicle capacity, route optimisation and a shift to less energy-intensive vehicles and modes of transport. Greater use of digital solutions enables more journeys to be shortened or replaced entirely. Or performed in a more energy efficient way, like using the Voi e-scooter app to get around the city.

Electric scooters to share. Photo: Voi.

The future is electric.

Across the transport sector, innovative partnerships are taking shape to commercialise the zero-emission vehicle solutions of the future. That future is electric and approaching fast.

Fast-forward for fuel cells.
Volvo and Daimler have joined forces to develop a new generation of long-haul trucks that run on hydrogen-based fuel cells. Their first fuel-cell systems will launch commercially in 2025. Already today, both Volvo and Scania have their first fully electric trucks commercially available and on the road. Scania, which has also launched its newly-electric Citywide bus, expects half of all vehicles sold to be electric by 2030. Volvo Group aims for all its products to be 100% enabled for fossil-free fuels from 2040

Ship ahoy!
Things are happening at sea, too. The maritime industry has set a target for domestic shipping to be fossil-free by 2045. Stena Line is building the world's largest all-electric roll-on roll-off passenger ferry, a 200-metre-long ship with capacity for 1,000 passengers. At the leisure end of the market, XShore and its partner Rolls-Royce have designed an electric boat that can travel faster than 30 knots and reduce carbon emissions to a minimum. Plain sailing is here!

Electric truck. Photo: Hans Berggren/imagebank.sweden.se

All-electric by 2030.

Fast, affordable and sustainable transport for local and regional travel is happening. Forty percent of all new cars sold in Sweden are already electric. But there's still much more to do. Stockholm is aiming for a fully electric public and private transport system by 2030. The city authority is working intensively with Scania, Volkswagen and grid provider Ellevio to create the electric infrastructure needed, including electric charging stations that are accessible for all.

The first electric airliner.
Sweden's aviation industry has a goal of fossil-free domestic air traffic by 2030. Biofuel will be an important part of the solution. Electric flights are also about to take off. Startup Heart Aerospace plans in 2026 to deliver the first fully electric airliner certified for commercial flights. Its electric plane will carry 19 passengers for trips of 400 km.

On-road and off-road, electric is coming.
The quest for net zero should be fun as well as fast. Electric bike company Cake has created a new generation of high-performance electric two-wheelers that will help redefine bike riding. With very few moving parts compared to a combustion engine, its bikes take simplicity – and sustainability – to a new level.

High-performance electric motorbike. Photo: Cake.

Heavy industry

Fossil-free steel at scale by 2026. Cement production at net zero by 2030.

Hybrit and Cementa targets

Big bang for low carbon.

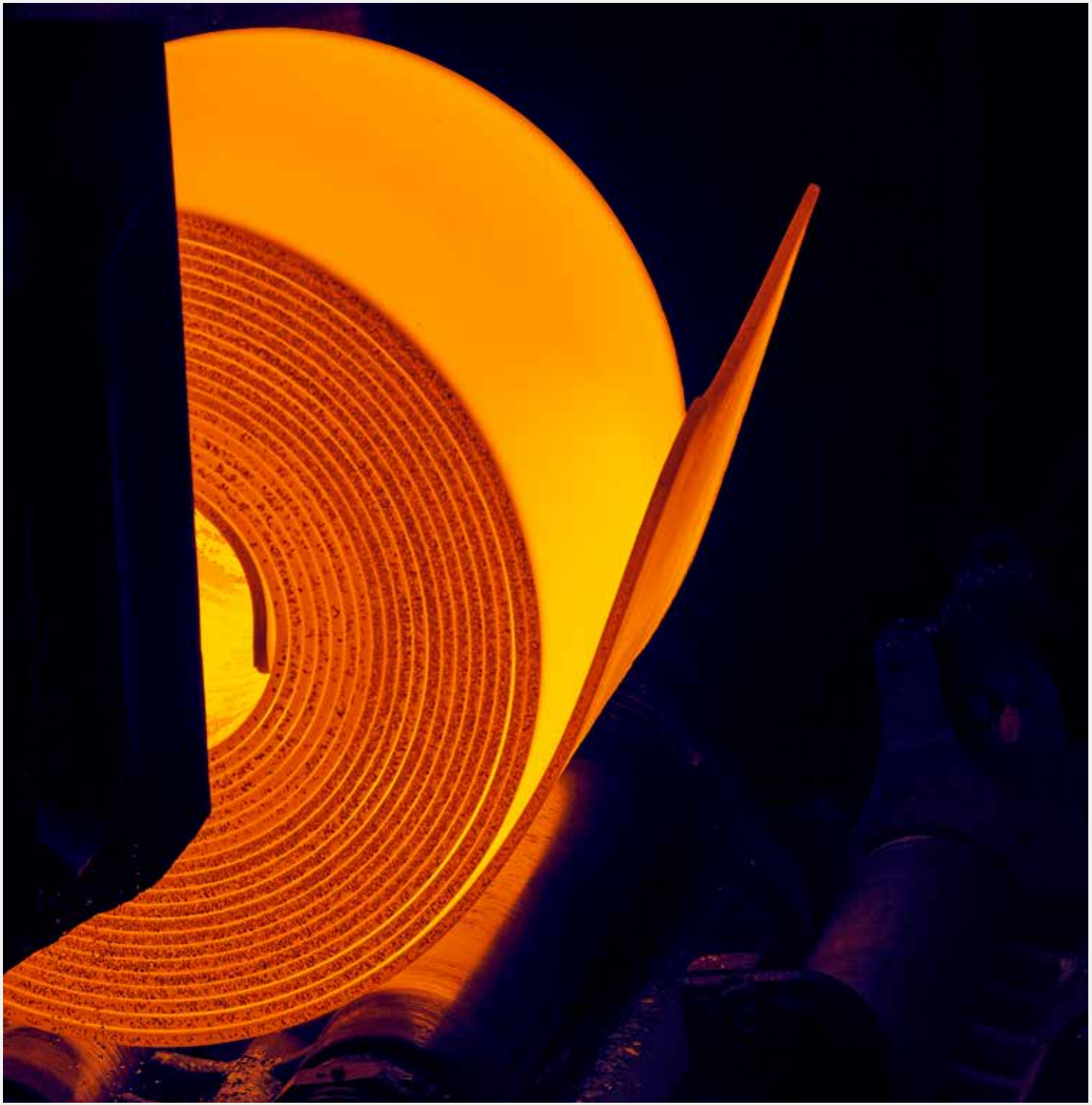
Steel production is Sweden's most carbon-intensive industry – and cement is one of the world's largest CO2 emissions sources. Now, Swedish producers are shifting to fossil-free production by phasing out fossil fuels, switching to cleaner technologies and, for those processes too hard to abate, capturing and storing the carbon. Put on your hard hat and find out how!

Big is beautiful in CO2 reduction.

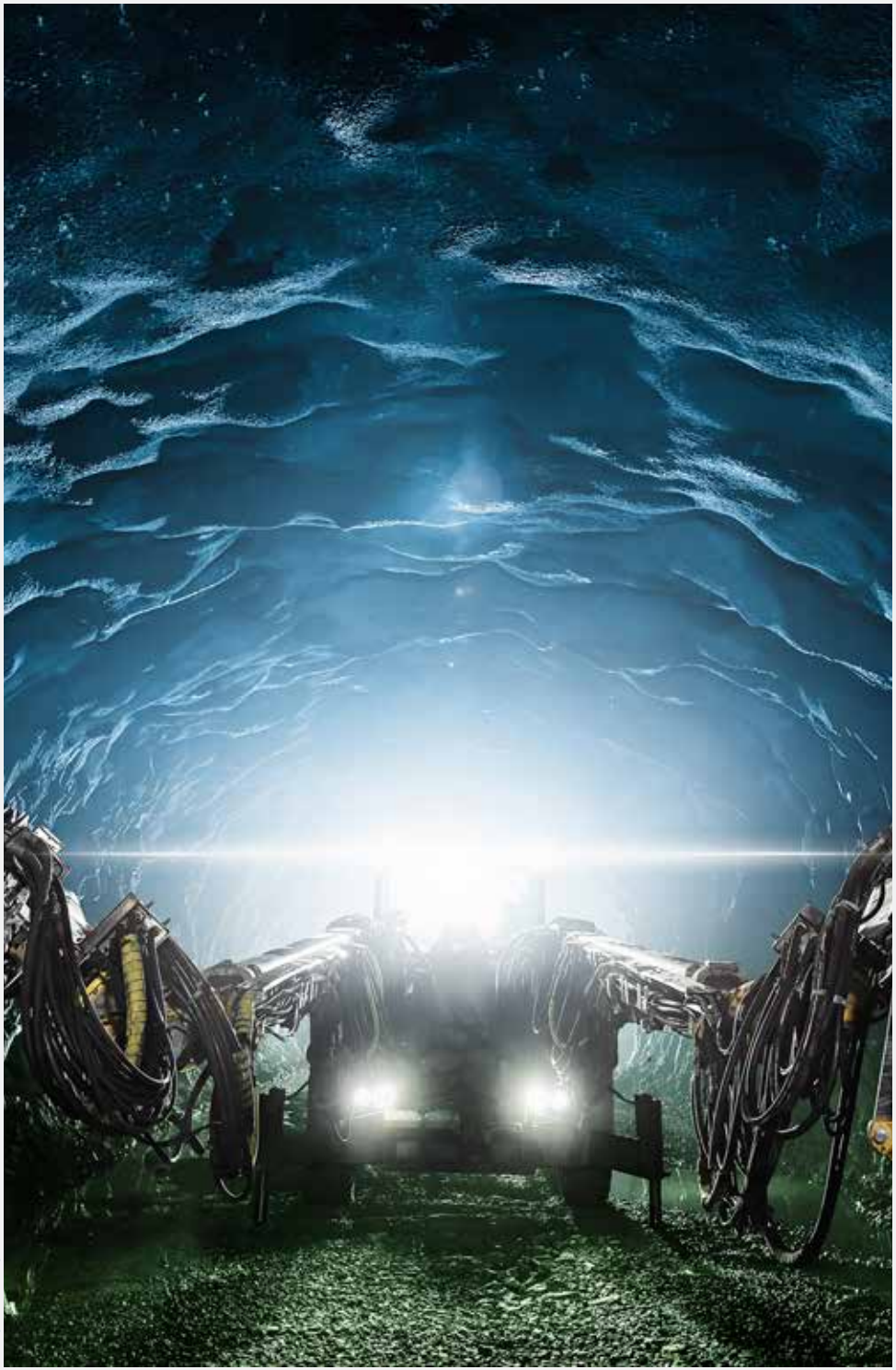
Steel and cement are two of the most carbon-intensive sectors on the planet. What better place to start the transition to low carbon? Making a successful leap in such big industries will help crack the challenge in others too. Steel industry leader SSAB is targeting fossil-free green steel on an industrial scale by 2026. Cementa is aiming for net-zero cement production by 2030.

New deal for steel.
Until now, ore-based steel makers have relied on coking coal to fuel their production. Today we're replacing coking coal with renewable electricity and hydrogen. The first customer delivery of coal-free steel recently landed. Full commercial production is due in 2026. Talk about rapid transformation!

Cementing our gains.
Concrete, and the cement used to make it, is the top global building material. Getting emissions to net zero is essential to climate health. Our decarbonisation push centres on replacing fossil fuels with biobased alternatives, adopting carbon capture technologies, and promoting a life cycle approach to our built environment.



Fossil-free steel. Photo: SSAB.



Underground mining in the Kiruna mine. Photo: Fredric Alm/LKAB.

A unique partnership model.

Unique partnerships between central government and public and private actors across the entire value chain are breaking new ground in the quest for carbon-busting solutions. These never-seen-before collaborations across sectors are leading the way as we embrace transition.

Fossil-free steel – from mine to truck.
Hybrit, a partnership of two state-owned enterprises – mining company LKAB and utility Vattenfall – and private steelmaker SSAB, has pioneered new technology that can produce green steel without coal. Instead it uses hydrogen and renewable electricity. In August 2021 truck maker Volvo received the world's first delivery of carbon-free steel. It plans to use it full-scale in new vehicles from 2026.

Hydrogen – a crucial ingredient.
Hydrogen is a vital fuel source in this green transition. Storing it successfully will allow us to stabilise our future fossil-free energy system. Private company H2 Green Steel is building the world's largest hydrogen storage facility and a non-fossil fuel steel plant. The times really are a-changing!

Building a fossil-free society.

Manufacturing the climate-friendly infrastructure of tomorrow means seeing old materials through a new lens. Concrete and cement are essential building blocks in every society. But making them emits vast quantities of CO2. Turning concrete and cement production fossil-free requires imaginative solutions along the entire value chain – from quarry to construction site.

Zero carbon in the cement chain.
Cement producer Cementa is committed to climate neutrality in its production chain by 2030, meaning zero carbon emissions throughout the lifetime of all concrete products. To get there, Cementa is switching to new fuels, new materials and is creating a purpose-built facility to capture carbon.

Green concrete and asphalt.
Construction company Skanska is already using green concrete that halves CO2 emissions by replacing some of the cement in the mix with slag while retaining identical functionality to standard concrete. Skanska has also developed a carbon neutral asphalt that uses a bio-derived binder to replace fossil-based bitumen.

Green asphalt. Photo: Tomas Arlemo/Skanska

Energy production

100% fossil free electricity production by 2040. Energy consumption 50% more efficient by 2030 compared to 2005.

Swedish government targets

Charging the future.

Our mission is to achieve net-zero emissions of greenhouse gases by 2045. And to boost energy efficiency by 50% from 2005 to 2030. But industrial electrification and the transition to low-CO2 transport will themselves demand a great deal of energy. Electricity consumption is expected to at least double by 2045.

Fossil-free and cost-effective.

How to square the circle? Our objective is to generate fossil-free energy within a cost-effective electricity supply, with low negative impacts on health, environment and climate.

Flexibility the key.
To do so, we will need hyper-modern, flexible elec- tricity grids that utilise multiple non-fossil energy sources with maximum efficiency. We also need state-of-the-art battery technology that allows for gridscale storage. This is being developed at Northvolt. Across Sweden, our regions are working at pace to prepare for this shift in technology and infrastructure. Maybe you'd like to work with us? Let's feel the buzz together!

Northvolt's mission is to build the world's greenest battery. Photo: Northvolt.

Battery bonanza.

Electrification relies on battery power. The new batteries powering the climate transition must store and deliver green energy and also be produced sustainably. One of the companies making this leap possible is Northvolt, from northern Sweden. With support from names like BMW, Fluence, Scania and Volkswagen, Northvolt aims to produce 150 gigawatts of battery cells annually by 2030. Right now it's building Europe's largest battery production plant and is ramping up its R&D efforts to meet demand for decarbonised, electric solutions.

Winds of change.
Some of the power stored in Northvolt batteries will come from wind, where companies like 0X2 are leading the charge to build wind farms that can generate electricity at industrial scale, including offshore and on artificial coastal islands. Technological innovation is all around. Modvion builds wooden wind turbine towers as an easier-to-transport alternative for 100 metre-plus turbines as these become difficult to transport when made of steel.

Eighty wind turbines in 70 square kilometers. DanTysk is one of the largest marine wind farms in the North Sea. Photo: Vattenfall.

Lysekil refinery. Photo: Preem.

A few can achieve for many.

It just needs a few engaged leaders to work together to move an entire sector forward. Collaboration shares risks and creates a ripple effect through the value chain. Gothenburg, Scandinavia's largest commercial port, has teamed up with shipping company Stena Line and truckmakers Volvo and Scania to cut the port's CO2 emissions by 70% by 2030. Their Tranzero Initiative addresses the 1 million truck transports and 55,000 tonnes of carbon emissions generated by road transport to and from the port each year. It also includes electrification of sea transport.

From oil to renewables.
Large-scale decommissioning of fossil fuels means even oil companies must change their business models. Sweden's biggest petrochemicals group, Preem, is responding to the market shift away from fossilfuels by converting part of its oil refining capacity to commercial production of renewable fuels. This will reduce greenhouse gas emissions from Preem's operations and products by 1.7 million tonnes per year. The plant, which today produces diesel, will become one of Scandinavia's biggest renewable fuel production sites.

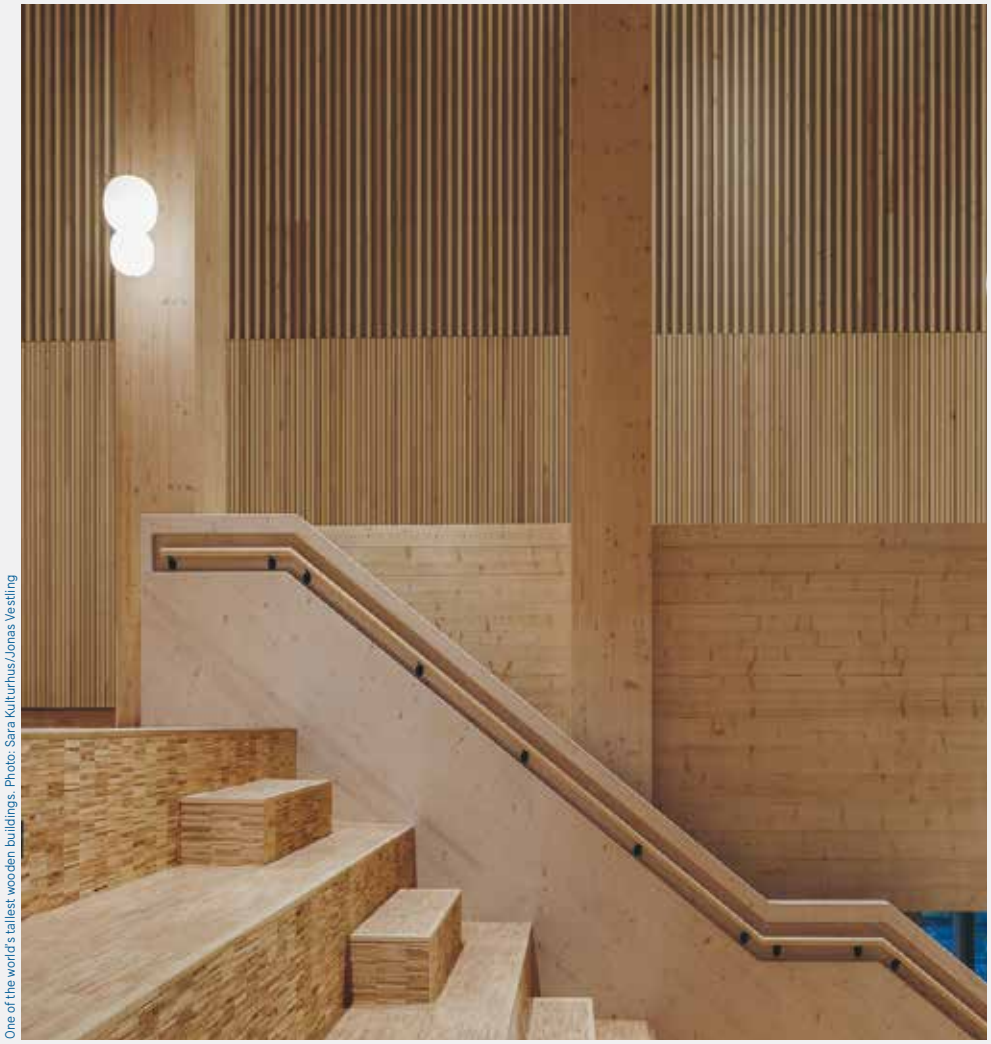
Bioeconomy

Fossil-free agriculture by 2030 and halved CO2 emissions from forest value chains 2018–2030.

Swedish forest and agricultural sector targets

Bright ideas from field to forest.

The equation's simple: we must grow more food to feed a growing population – and we need to reduce climate emissions while doing so. To get there we're harnessing innovative technologies, from AI and smart sensors to the internet of things. And we're doing so at scale across the agriculture sector. Dairy farmers today use heat-seeking cameras, robots and advanced management systems to monitor their herds and optimise production while keeping emissions down. With great results. Swedish meat has a 25% lower CO2 footprint than the EU's. And the EU's is 60% lower than the rest of the world.



One of the world's tallest wooden buildings. Photo: Sara Kulturhus/Jonas Vestling

Forward with forests.

In forestry, we're leading the way in production and use of renewables like biogas. Pulp and paper production is already 96% fossil-free. Our forests, growing faster than the annual wood harvest, are aiming to increase biomass deliveries tenfold. And wood is more versatile than ever. Sara Kulturhus in Skellefteå recently became the world's tallest building made entirely of wood – a 20-storey structure that uses artificial intelligence to minimise its CO2 emissions.

The world's strongest thread.

Sustainably managed forests are one of the most renewable resources on the planet. Inside wood lies a vast potential for discovery and innovation. Nanocellulose, produced by processing wood fibre down to its smallest component, has exceptional biomechanical properties and can be used to make a range of fully renewable materials.

Researchers at the Royal Institute of Technology and Research Institutes of Sweden have developed cellulose fibres that are not only ultra-strong but also lightweight, renewable and energy-absorbent. The cellulose nanofibrils – eight times stronger than spider silk – could be used to make anything from wind turbines to artificial ligaments in humans.

Glorious graphene.
Then there's graphene, a wood derivative with the highest electrical conductivity of any known material. It can be used to make wooden batteries that can in principle be recycled as compost. Stockholm-based Bright Day Graphene has developed a green variety that's climate-neutral and suitable for multiple cutting edge applications, including energy storage.

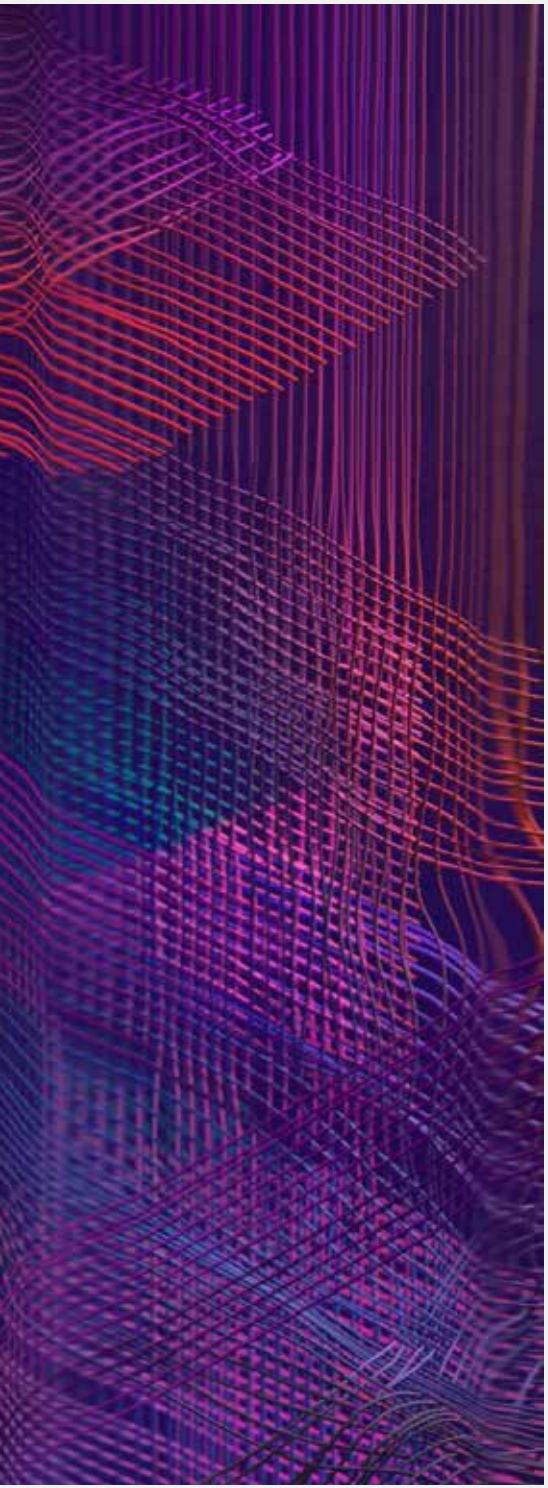


Illustration: Wang & Söderström.

More food, less CO2.

Food production gives rise to substantial climate emissions. How to address them? For Sweden's Oatly the answer was to develop a plant-based alternative to dairy milk. The oat drink went viral, transforming the company from niche upstart into global brand. Oatly has encouraged a whole generation to embrace oat drinks and helped drive and inspire the plant-based revolution. Bon appetit indeed!

Swapping seaweed for methane.
That's not to say dairy products are on the way out. Our taste for beef, milk and yoghurt means cows will remain a farmer's best friend for many decades to come. What, then, to do about the methane emissions from cattle that are such a potent greenhouse gas? Swedish company Volta Greentech has an ingenious solution: feeding seaweed to cattle can cut their methane discharge substantially. Right now the company is commercialising a product derived from the red alga Asparagopsis after a successful commercial pilot on a Swedish beef farm tested the product in feed.

Seaweed to make cows discharge less methane gas. Photo: Volta Greentech.

Circlularity

We aim to be 100% circular by 2030, using only recycled or sustainably sourced materials in our ranges.

Ikea and H&M Group targets

Making the world go round.

We're shifting our take-make-use-dispose model towards a circular economy approach. This conserves resources, uses materials for longer and maximises value. How do we do it? By closing the consumption loop through repairing, recycling and remanufacturing. Come and be part of our very virtuous circle!

Leftover food is saved and sold at a discounted price in the Karma app, then picked up in a pink fridge. Photo: Lieselotte van der Meijs/imagebank.sweden.se

Waste not, want not.

In Sweden we're reducing waste in everything from food to fashion. By 2035, two-thirds of municipal waste must be processed for recycling or reuse. Recycled content in all packaging will rise by 30% from 2022 to 2030.

We throw away 1.3 billion tonnes of edible food globally every year. Food waste is now being minimised throughout the food chain. Helping to make this happen are waste-busters like Karma, whose food waste app sells surplus food from cafés and restaurants at a discount.

Zero carbon gets fashionable.

The fashion and textile industries account for 10% of global CO2 emissions and have an important role to play. Recycling textiles is a challenge, but now we have solutions.

Pulp fiction no more.
Forestry company Södra has pioneered the world's first commercial scale process for recycling mixed textile waste made from different materials. The OnceMore® process adds wood cellulose to textile bales to create a dissolving pulp that can be used to produce new clothing and other textile products. Another company, Renewcell, dissolves used cotton and other cellulose fibres to transform them into a biodegradable pulp that's used to make virgin-quality viscose or lyocell textile fibres. Södra and Renewcell both rely on textile raw material supplied by companies like Sysav, which in 2020 opened the world's largest textile sorting plant and supplies partners like Södra and Renewcell.

Garments remade.
And then there's upcycling. Rave Review transforms discarded fashion items into new garments that prove that fashion, recycling and exclusivity can all go hand in hand.

Old shirts upcycled as haute couture. Photo: Rave Review.

Redesigning business models.

The shift from linear to circular challenges the norms of business as usual. It requires new types of partnership. It means working with direct competitors as well as with businesses from very distant sectors.

From here to infinity.
Electrolux and Stena Recycling are two companies from very different industries who've come together to develop a prototype vacuum cleaner that's not only made of recycled plastic but is also 90% recyclable at end of life. The "2-Infinity" is now being evaluated for commercial sale.

Making new from old.
To close the loop, Ikea in Sweden has begun leasing kitchens to consumers as an alternative to selling them. It's also teamed up with flooring company Tarkett to recycle and reuse discarded plastic flooring from its stores. Tarkett's technology successfully removes adhesives and other agents from old floors to allow reprocessing and reuse in other stores.

Big plans for plastic.
Site Zero in Motala will be the world's biggest plastic recycling plant when it opens in 2023. Capable of recycling 200,000 tonnes of plastic waste annually, it will have a zero carbon footprint thanks to a fully circular process and renewable-only energy setup.

Ikea's Kungsbacka kitchen fronts are made from recycled wood and PET bottles. Photo: Inter IKEA Systems B.V.

Digitalisation

Mission: Be the global frontrunner in grasping the decarbonisation opportunity offered by digitalisation.

Swedish government

Data for breakfast.

Digital technologies have transformational power to help achieve the solutions we need to reach net zero. Information and communication technology (ICT) solutions have the potential to reduce global greenhouse gas emissions by an estimated 15% according to a study by Ericsson. Digital services can increase resource efficiency through smart electricity networks or by cutting food waste. In transport, they can spur behavioural change and optimise traffic flows for reduction of CO2 emissions.

Climate-friendly data.

We've already built the world's first net-zero data centre, not only powered by renewable energy but which also delivers recycled heat to local homes. Via AI, robotics and the internet of things, we're mining the potential of electronic medicines and vertical farming.

Sharing is caring!
With digitalisation we boost the sharing economy. H&M brand Arket rents out children's clothes to encourage reuse. Hygglo app users can rent out anything to anyone. At Sege Park in Malmö an entire climatsmart suburb is being built where residents will own less and have access to more. The list is long and growing!

Surveillance of 5G infrastructure by drones saves journeys and reduces risky climbing. Photo: Bertrand Bouchez / Unsplash.

Innovation above and below ground.

The race is well and truly on to phase out carbon from every part of the industrial value chain. And the sprint is happening below ground as well as above it.

Decarbonising mining.
In the mining industry, electrifying every truck in every mine worldwide would remove 198,000 tonnes of CO2 from the air. Every day. To achieve that goal, engineering company ABB is helping mines to go fully electric – from pit to port. Its Ability eMine initiative seeks to decarbonise by electrifying mining equipment across hauling, hoisting, grinding and material handling. It digitally integrates the entire mine to optimise energy use and performance.

Pods, drones and automobiles.
In Gothenburg, bearing manufacturer SKF uses driverless electric trucks to transport parts between its factory and warehouse. Known as "pods", the trucks are monitored from above by drones without a human face in sight. They are the brainchild of Stockholm autonomous vehicle designer Einride. Change truly is in the air – above ground and below it.

This is Pod, a fully autonomous and electric heavy transport vehicle made by Einride. Photo: Einride.

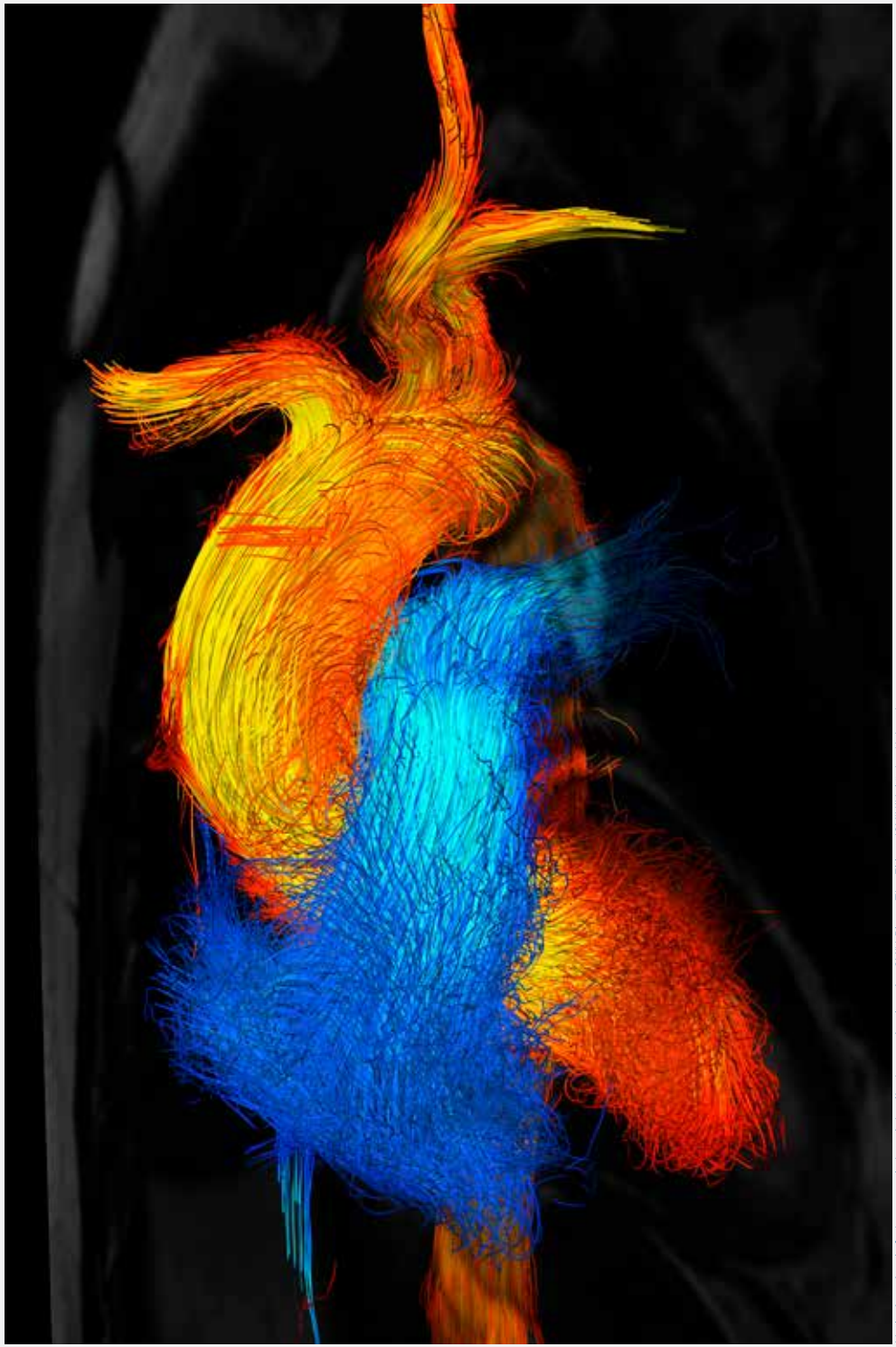
Big data, big progress.

Data and digital solutions like artificial intelligence, smart sensors, advanced diagnostics and intelligent metering are playing a pivotal role in optimising behaviour, reducing travel and improving health – all while eliminating unnecessary climate emissions.

The direction is up.
Increasingly, we use urban spaces to grow food close to consumers. Grönska Stadsodling operates the world's largest vertical farm at an indoor plant in Stockholm, where sludge from biogas plants is used as fertiliser to produce ready-made salads and herbs for local sale.

Smart homes, wise consumption.
Electrolux has partnered with IBM to use location-based AI to make its home appliances more energy efficient. Hyperlocalised data on air quality, pollen levels, humidity and temperature supports smart app recommendations for when to use appliances like clothes dryers and air conditioners.

Healthy habits.
The digital transformation is well advanced in medicine. Electronic prescriptions are the norm, with all pharmacies connected to a national database. E-services include online appointment bookings and medical records access.
At CMIV within Linköping University,scientists have developed a digital computed tomography technology that scans heart muscle and major arteries – a potential lifesaver for patients unaware they have a life-threatening condition.



Methods and tools for image analysis and visualization are developed at CMIV. Photo: Tino Ebbers/CMIV/Linköping University.

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