Denmark: A global role model

The Nordic country comes out of the pandemic with a stronger economy and as a leader of the digital and green transitions

The Danish economy overcame COVID-19 at a remarkable pace. It returned to its pre-pandemic level in spring 2021 and expanded by a total of 3.9 percent that year, according to Ministry of Finance forecasts.

It’s a scale of growth that the small nation hasn’t surpassed in over two decades, says Nicolai Wammen, Minister for Finance. “Our economy is very strong at the moment: we weren’t hit as hard as many other countries, but we’ve also rebounded faster than most. If anyone had said to me a year and a half ago that we would be in this situation, I’d have said let’s get back to planet Earth because, at the time, we dared not dream that we could be.”

As soon as the pandemic hit, the government started catalyzing this extraordinary recovery by implementing substantial health and economic measures to support businesses and citizens. It was able to take on the financial burden of these due to Denmark’s status as a triple-A-rated country with a robust banking system and one of the lowest ratios of debt to gross domestic product in the European Union. Another contributor was its productive industries, which kept running throughout the crisis. “When the world economy was gaining speed again, that meant our companies had their employees at work, ready to take the opportunities that came their way,” comments Wammen. “The biggest challenge we face now is if we get too much speed on the economy and it overheats, so we’re lifting our foot of the accelerator to deliver long-lasting growth for the economy.”

The minister, like most Danes you talk to, is convinced that a key weapon in the country’s battle against COVID was its unique socio-economic model rooted in trust, openness and collaboration. As David Briggs, CEO of the roof-window specialist VELUX Group, puts it: “There’s a real spirit of partnership between the government, corporate sector, workforce and general public. There’s no conflict, rather there’s an expectation that we ultimately have similar priorities: ‘In order to put Denmark in an even stronger position 5-10 years from now, I want to make sure we undertake reforms to make Denmark richer, greener and wiser, and that we invest further in the green and digital transitions.’

The Danish economy moved so fast and there’s a great sense of optimism, companies have all been hiring at the same time. We also see that, on a more structural level, we’ll need more hands. The good news is that we’ve taken steps and agreed initiatives that will make it easier for companies to hire the people they need and we’re also looking internationally to attract more people to Denmark.”

This approach to solving challenges collectively and with innovation has helped the country become a worldwide force not just in life sciences, but in a wide range of sectors, including wind energy and other green technologies, fintech, food ingredients and shipping, believes Brian Mikkelsen, CEO of the chamber of commerce Dansk Erhverv. “The simple answer behind the success of all our growing industries boils down to public-private partnerships.”

It has also given the country a huge lead in the two biggest global issues for the post-pandemic era: it’s one of the most digitalized countries in the world and it’s been ahead of the curve in the green transition for decades. “Denmark has shown it’s possible to reduce carbon emissions while still having economic growth and creating jobs. For businesses here, and for the political system, sustainability is a prerequisite for prosperity,” Mikkelsen says. Wammen agrees: “My job is to balance the budget and make sure we have growth, it’s also to do that in a responsible way when it comes to the climate and green transformation. We’re currently working on a green economic model, where we’re becoming much better at estimating what green initiatives mean for the economy and vice versa. Denmark has been used as an example of how to do this within the global Coalition of Finance Ministers for Climate Action.”

Mikkelsen highlights one challenge for the economy at the domestic level: “Denmark is an extremely good, stable place to do business, but right now there is a shortage of labor in almost all industries.” The Danish unemployment rate is currently at its lowest level in 12 years, Wammen explains. “Because the economy is moving so fast and there’s a great sense of optimism, companies have all been hiring at the same time. We also see that, on a more structural level, we’ll need more hands. The good news is that we’ve taken steps and agreed initiatives that will make it easier for companies to hire the people they need and we’re also looking internationally to attract more people to Denmark.”

As the country puts the pandemic behind it, the minister reveals his new priorities: “In order to put Denmark in an even stronger position 5-10 years from now, I want to make sure we undertake reforms to make Denmark richer, greener and wiser, and that we invest further in the green and digital transitions.”
Defensive economy equipped to withstand COVID

A boom in IPOs reflects Denmark’s strengths in resilient sectors and a stock exchange operator that has enabled effective trading

Danmark’s outstanding economic performance over the last two years can be explained by its industrial strengths, says Nikolaj Kossakewitsch, president of Nasdaq Copenhagen, the country’s stock exchange. “It’s a defensive economy with a lot of exposure to goods and services that will always be demanded, no matter what happens with the pandemic or global supply chains.”

The economy’s composition is replicated in the companies listed with Nasdaq Copenhagen, he adds. “The majority are defense by nature, meaning pharma, meditech, biotech, food ingredients and utilities. As a result, when COVID hit, we didn’t have a big drop in market capitalization. In fact, we’ve seen a 30 percent increase since the start of 2020.” One of four exchanges that global capital-market services provider Nasdaq operates in the Nordic region, Nasdaq Copenhagen has also seen an expansion in investor numbers, including many individuals who had never traded in stocks before the pandemic. This is benefiting both established businesses on the exchange’s main market and those on Nasdaq FirstNorth Growth Market for emerging Nordic firms, reveals Kossakewitsch. “It’s hugely advantageous for newly listed companies or those on the verge of an initial public offering (IPO) and in part the reason we’ve had such a big IPO boom in Copenhagen and across the region.”

“The Danish model: Transparency, trust and balance

Anne Hougaard, Director, Invest in Denmark, reveals why the country attracts innovative, life science and green technology investments

As the country’s investment promotion agency, Invest in Denmark advises international investors and facilitates their investments. What are some of the country’s unique advantages that make it a successful destination for foreign direct investment (FDI)?

The broad answer has to do with overall concepts such as transparency, trust and balance. To borrow a phrase from a former French ambassador, “Denmark is the country of balance.” It’s a country built on a high level of social trust and this pours over into our labor market: we have one of the world’s most flexible labor market regulations that is based on a transparent and trusting paradigm between employers and unions. In short, you can hire and fire more easily than you can in comparable European Union (EU) countries.

The World Bank ranks Denmark first for ease of doing business, and we have a digital and transparent system for establishing and running a business. We have a long tradition in public-private partnerships as well, and you see many examples of companies, local and national authorities working closely in tailor-made partnerships. We also do well in education, skills and have the fifth-largest spend on research and development (R&D) in the EU in 2020. Additionally, we have a world-renowned work-life balance: there are a lot of employees here who want more than just a career. They also want a full life in livable cities, which Denmark offers—Transparency International’s rankings, we compete every year to be the happiest population in the world.

The Royal Danish Playhouse at Copenhagen’s Inner-city harbor

The Danish economy is estimated to have grown by 3.9 percent in 2021. What factors and sectors lie behind its resilient performance?

The most significant element driving our growth is that Denmark is among the most digitalized countries in the world and ranks first in the EU’s Digital Economy and Society Index. Because we are highly digitalized, we are well positioned to withstand shocks. In a health crisis, Denmark also has an advantage because we have very robust healthcare and life science industries. For example, we are home to some of the world’s largest pharmaceutical companies and have one of the strongest R&D environments for medical, pharmaceutical, biotech and healthcare. In addition, Denmark is ahead of the curve in many aspects of the green transition.

What are the most attractive investment opportunities in Denmark today?

The obvious opportunity would be in green solutions and technology. Our government has the ambitious goal of reducing our carbon-dioxide emissions by 70 percent by 2030. As a result, Denmark has the regulatory framework to test, develop and scale green solutions. We also have a big offshore wind investments and a shipping sector that is interconnected to the rest of Europe.

We’ve been successful in attracting investments in power-to-X, for example, because we have cheap green power and connections to Germany, which has adopted a strategy to use green hydrogen. This makes Denmark an interesting place to invest in areas like hydrogen, as well as carbon capture and utilization. In a historic moment, Germany’s IWE recently won a competition to build Denmark’s largest wind farm to date. For the first time, the state will be paid for the authorization to build an offshore wind farm, which demonstrates the competitive prices and capacity to create gigawatts of renewable energy that are present here.

Regarding life sciences, clinical trials is one area where Denmark has something unique to offer and the government has also created framework conditions enabling companies to produce cannabis for medicinal purposes, which has attracted a lot of investments. A third example is the result of Denmark being very digitalized, as we have comprehensive patient data that makes it attractive for testing medtech and digital health solutions.

What is Invest in Denmark’s strategy for attracting investments?

We have an extensive presence in Europe, Asia and North America, where we operate in New York, Silicon Valley and Toronto. The U.S. currently accounts for 25 percent of our inward investment flows. Life sciences and greentech are important sectors for these investments as the U.S. has a lot of innovative companies providing digital solutions that are looking to Denmark because of the framework conditions we offer. FDI stock in Denmark has been relatively robust in recent years: before 2019, stock increased by around 10 percent a year on average, although from 2020 to 2021 we saw only a 4 percent increase due to the pandemic. In 2020 we launched a new strategy that focuses on attracting investments that foster productivity and innovation, connect Danish companies to the rest of the world and make them competitive in a global market. Secondly, we want investments that support our green transition and our third priority is to attract investments all across Denmark. My main ambition is to grow the number of FDIIs while not compromising the quality of investments.
The Danish recipe for scientific innovation

Investment in research and public-private partnerships has nurtured a community that acts quickly to address societal challenges.

“Denmark has been at the center of a wide range of major scientific and technological breakthroughs. The root cause of this is that we have excellent researchers and universities, plus skilled experts in industry who translate their research into commercially viable global solutions,” states Anne-Marie Levy Rasmussen, CEO of Innovation Fund Denmark (IFD).

Since 2014, public agency IFD has been a major cornerstone of the nation’s research and development success, the “larvae” to the “active projects.” We invest in entrepreneurs, researchers and businesses, providing them with risk-willing, soft funding to develop workable solutions to pressing challenges, primarily the green transition, health, and the adaptation and use of new technologies. According to its CEO, a key strength of IFD is the breadth of its initiatives. “It’s a one-stop shop for innovation. For example, we have programs that target high-risk entrepreneurs, small and medium-sized firms and large partnerships. We have the fall back if you want to join a European Union (EU) research program, partner with international companies or universities, or get investment to spin out your business, it can all be done with IFD.”

The agency facilitates collaborations within the Danish innovation and research ecosystem to unlock its full potential. We create a community that acts quickly to get through it. We put out a call that resulted in the biggest number of applications we’ve ever received—the whole community mobilized around the challenge.”

As one of the world’s most digital societies, Denmark’s advanced use of technology, data analytics and digitalization helps radically with its creation of innovative solutions. Rasmussen highlights an impressive energy sector that includes renewable specialists Orsted and Vestas to illustrate this: “With IFD as an investor, Vestas in collaboration with our universities has achieved wind-power breakthroughs and commercialized them at scale. Another area to spotlight is agriculture and sustainable food, where we boast companies like Chr. Hansen, the food-ingredient developer.”

A further innovative stronghold is a vibrant life-science ecosystem that includes companies from pharma giants to high-tech startups, and Denmark’s long-term investment in health research has paid off during the pandemic, she says. “We felt a responsibility to support society to get through it. We put out a call that resulted in the biggest number of applications we’ve ever received—the whole community mobilized around the challenge.” Among other solutions, this initiative led directly to a COVID-19 vaccine, which emerged from a IFD-funded University of Copenhagen research group and is now being developed by biotech firm Biotron Nordic.

“It shows that when you invest in education and research, and foster collaborations between companies and universities, you’re nurturing a culture and environment that can act quickly,” Rasmussen enthuses, adding that IFD is now moving resources toward the worldwide green transition. “What’s critical is that we address the global climate challenge with the same mindset as we tackled COVID-19.”

Anne-Marie Levy Rasmussen, CEO, Innovation Fund Denmark

“A lot of the innovation we do and sponsorship is in the health and life sciences arena,” she says. “We’ve been able to support groundbreaking research right from the early start. We are now recognizing that a younger generation is thinking about health and sustainability and the Longitude Prize is an example of that.”

As the pandemic ended and society started to get back to normal, IFD partnered on the ‘Innomissions’ program with four research and innovation missions: carbon capture, green fuels, environment-friendly agriculture and food, and the circular economy, particularly in relation to plastics and textiles. “It’s a 15 percent improvement in overall progress on sustainability. ‘Blanket access translates into growth, while advanced infrastructure including high-speed access enables a 15 percent improvement in overall progress on sustainability in some industries. The benefits of digitalization are quite clear and it’s a priority on a national level.’”

Anne-Marie Levy Rasmussen, CEO, Innovation Fund Denmark

“Digital tools ranging from apps and meeting platforms to robots are one of the most important reasons why Denmark managed the pandemic better than most,” believes Lars Sandahl Bureusen, CEO of the Confederation of Danish Industry, the country’s largest trade body.

The nation adapted to these tools seamlessly, as expected from such a highly digitalized country—last November, it was crowned champion in the European Union’s Digital Economy and Society Index (DESI), which has four benchmarks: human capital, connectivity, integration of technology and public services. “When it comes to public digitalisation, we’re probably the best in the world. All information goes through digital communication,” says Brian Mikkelsen, CEO of the chamber of commerce Dansk Erhverv.

Denmark continues to push digital boundaries forward, he states. “We’re focused on how to leverage the possibilities of technology in all industries and speed up the digitalisation of society. For instance, government ministries, the heads of our largest companies and other business leaders including myself, formed the Digitalisation Partnership last year to design new policies and guidelines in this area.” In October, the partnership presented a 46-point digital roadmap of legislative tools and other measures that aim to take the country to the next level in digitalization in order to, among other things, foster sustainable economic growth and the green transition.

Digitalization is in Denmark so far out the lead because it has the best connectivity in the European Union, according to the latest DESI report. A key contributor to that is TDC NET, the country’s largest telecoms infrastructure provider, which invests $600-$750 million every year in its high-speed networks. Denmark was the first mover into 5G within Scandinavia, CEO Henrik Clausen reveals. “In 2020, we swapped our mobile network to 5G. It’s been an extremely fast transition and the new network has proved very reliable.”

Brian Mikkelsen
CEO
Dansk Erhverv

“Exquisite seafood from the Arctic

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Well-connected infrastructure
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An ideal test bed for financial technology

Thomas Krogh Jensen, CEO, Copenhagen Fintech, introduces a thriving hub for innovators in finance

Copenhagen Fintech is a not-for-profit organization that has been central to the development of an entrepreneurial Danish fintech sector that now includes over 300 companies. Why is this cluster growing so rapidly?

Despite its small size, Denmark has a powerful fintech ecosystem. One reason is that it is highly digitized in terms of infrastructure and the financial services sector is driving a lot of that, for example, the national ID system is managed in a collaboration between the state and the financial industry. In global standings, the Nordics in general, particularly Denmark, are ranked among the countries with the most open public data and they are leading in one of the pre-requisites for financial innovation: the European Union’s (EU) Payment Services Directive 2, which gives third parties access to payment data in open-banking scenarios. You’ll find us high on the list of innovative nations as well and always among the top five in sustainability. We’re building on Denmark’s tenacious focus on sustainability and combining it intelligently with fintech, which has fueled a great deal of innovation in sustainable finance.

Another element that has driven our fintech industry is our interest in small and medium-sized enterprises (SMEs)—99 percent of Danish businesses are SMEs—and many Danish solutions are targeting this segment, which has been neglected by established financial players. The final factor is a focus on human-centered design that solves real problems that dates back to the 1970s. We’re building much of our tech out of solutions that has been thoroughly validated by major global players: fintech solutions can easily be brought to market after having been piloted in a society that adopts new digital solutions rapidly. Denmark is a low-risk country for companies looking to scale in Europe and beyond.

Copenhagen Fintech offers a co-working lab for 50 businesses as part of its wide range of services to support and advise local and international startups. It has also built extensive networks of private-sector partnerships to develop growth in the sector. How does it stand out as a hub for fintech?

We will never be the biggest hub in the world because this is such a small country, but we could be one of the most connected. The fintech sector doesn’t happen in one country and so we made the decision to build a globally connected ecosystem. We spent a lot of time connecting to other hubs, such as New York, London, Berlin and Singapore, to create an internationally connected hub that could efficiently help to scale companies. Copenhagen Fintech’s model is also quite unique: the original initiative was taken by financial institutions, pension funds, insurance companies and the country’s Financial Services Supervisory Authority. Later, the Confederation of Danish Industry, the trade body Insurance & Pension Denmark and the state-owned Danish Growth Fund joined, so our ecosystem covers all the main stakeholders. It’s a public-private partnership that aims to create jobs and growth, attract investments and enable businesses to scale. We do everything for our startups from incubation to helping them expand globally, we assist them to attract investments, validate ideas with financial institutions or tech companies, and we partner with universities and global investors. We’re also a community-funded organization, where the different stakeholders form a networking and matchmaking platform for Nordic startups. As its core, what drives growth in Copenhagen Fintech’s ecosystem is its attractiveness for talent and smart capital.

How is Danish fintech contributing to the global drive for sustainability?

People tend to only discuss the E in environmental, social and governance (ESG). Of course that is very important, but from a Danish tradition, the S and G are just as crucial and our fintechs are looking to be very specific about the positive impact their solutions have for their customers and the world.

Overall, the single biggest decision you can make to create a more sustainable world is to change your investments. Statistics show it’s 27 times more effective to shift your investments toward more sustainable industries than to take any other action, such as flying or driving less or eating less meat.

Our companies have a number of solutions that help people to invest more in sustainability. A lot of them concern the foundations for doing that, such as data for screening companies and their whole supply chains in order to make informed decisions about which to fund and invest in. Another focus is cybersecurity, as the financial sector is one of the most data-rich industries and this data is highly sensitive.

What are some of the current stars in Denmark’s fintech sector?

One could mention Lunar, a unicorn challenger bank created in Denmark, which targets private customers and SMEs. Another is Public.com, one of the biggest competitors to investment app Robinhood in the U.S., which has a Danish co-founder. Public offers a social network where you can own fractional shares of stocks and exchange traded funds, follow others and share ideas inside a community of investors. It’s building much of its tech out of Denmark—there’s a high degree of trust in Danish-built tech solutions. Interestingly, many of the unicorns and larger fintech companies coming out of Denmark are business-to-business focused and a good illustration is Pleo, which is helping SMEs to manage their spending. A noteworthy example in the blockchain space is Chainalysis, one of the first residents of the Copenhagen Fintech Lab, that is helping to create transparency in the crypto economy.

The innovative data platform that Chainalysis has developed is able to analyze billions of transactions in thousands of blockchains quickly in order to identify transaction patterns and illicit behavior, a process that was extremely hard or even impossible before the company launched in 2014. This means that its clients are now able to fully understand exactly how people are using cryptocurrencies. As a result, Chainalysis has grown to become a leading software provider for financial institutions, government agencies and businesses around the world that want to detect or prevent crypto crime and money laundering, and its platform has already been used to help solve a number of very high-profile criminal cases. The company now employs close to 500 staff, was valued at $4.2 billion last summer and has the backing of global investors like Accel and Benchmark.

Pleo, on the other hand, has devised an out-of-the-box digital business solution that combines smart payment cards for staff of SMEs with automated expense management and reporting, saving firms both time and money. Headquartered in Copenhagen where it was founded in 2015, today Pleo’s system has been adopted by over 20,000 companies in Europe’s countries, a number that is rising by 1,000 a month. In December 2021, Pleo successfully completed a $350-million Series C funding round and saw its valuation shoot up from $1.7 billion to $4.7 billion, making it one of Europe’s most valuable fintech startups and the fastest-growing company in terms of value in Denmark. The firm intends to use the new funding to help implement its ambitious plans for growth, which include expanding into another 14 European markets within the next 18 months and having a million users by 2025.

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“The sector accounts for 22 percent of Denmark’s exports, worth around $21 billion. If we continue to foster this ecosystem, that could exceed $55 billion by 2030,” says Kasper Bedker Mejlvang, general manager of Novo Nordisk, the healthcare giant that was founded in Denmark in 1923, which specializes in the treatment of chronic problems like diabetes, obesity, rare blood and endocrine disease. “The company is linked to the discovery of insulin in Canada, after which the Danish Nobel Prize winner August Krogh and his wife obtained the rights to sell the world’s first insulin in Scandinavia. We’ve been one of the leading companies in the fight against diabetes for almost 100 years,” he explains. Still headquartered in Denmark, where about 39 percent of its 45,000-strong workforce is located, Novo Nordisk produces and sells more than 500 different products to customers in 191 countries and it has a about 30 percent share of the global diabetes market.

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Bang & Olufsen: beautiful products encased in timeless designs

The iconic brand was launched almost a century ago by two engineers, Peter Bang and Svend Olufsen, in the coastal town of Struer where it’s still based. “The fact we’ve survived so long comes down to great people, great products and a passion for what we do. We’ve always tried to do things differently, rethinking how people use audio-visual products and experiences.”

“We’ve been designing the future since 1925,” Tær claims. The firm’s creations, including audio products and systems, headsets, speakers and televisions, are developed by designers and engineers in collaboration, he states.

Cutting-edge expertise in audio technologies. This core of design, audio craft and superior craftsmanship can’t be found anywhere else and we benefit hugely from it,” says Kristian Tær, CEO of Bang & Olufsen.

Bang & Olufsen’s innovation is dedicated to building long-lasting products that fit the lifestyles of new generations of customers, according to Tær. “We’re developing cutting-edge technology, but for instance, are growing ingredients for us. Most recently, we teamed up with Cisco to create a solution for the post-pandemic trend of working from anywhere.” You want a high-quality headset to use at work, to listen to music while commuting or to use at home when watching TV. “Why should you have to buy three different ones? We offer one product with all the enterprise business features you need for work that is also a fantastic audio product and it looks amazing when you wear it.”

Beyond current lifestyles, he reveals that Bang & Olufsen is focusing on how the world will change in the future and how it can push the boundaries of design and technology to help us with that future. “Immersive music and sound experiences will always be in demand and we see new opportunities with innovative flourishes, he states. “For example, the old industrial harbor in Aalborg has been transformed into a vibrant contemporary neighborhood and you can now enjoy a swim in its waters or unwind in a floating sauna.”

Another major incentive to visit is that Denmark is the current capital of gastronomy. It’s home to the two restaurants on the planet—Noma and Geranium—according to the World’s 50 Best Restaurants, as well as a host of other chefs holding Michelin stars that are turning seasonal and hyperlocal ingredients into culinary masterpieces. “Denmark’s strong focus on the environment is also playing a growing role in attracting tourists. It’s an important criteria for many,” Jan Olsen, CEO, VisitDenmark

For those looking to travel to untouched locations that are in tune with nature, where they can experience and learn more about the world we live in, Greenland is clearly a great answer. But how accessible is it? “There are now two flights a week to Greenland from Copenhagen and Kulusuk in Iceland. We also have two international airports under construction in the towns of Ilulissat and Nuuk that will be ready by the end of 2024. At that point, Nuuk will only be four hours from New York. For our goal is to open up new routes, with the aim of becoming one of the world’s leading sustainability destinations by the end of the decade,” he replies.

The country is committed to ensuring future tourism has no negative impact on the pristine environment, Smærason stresses. “The current government was voted in to stop radioactive mining, it has also stopped oil and gas exploration. Sustainability is the only way forward for our tourism in terms of the environment, economy and society. There are many small, fragile communities here and it’s very important that any development is on their terms and to their benefit. We don’t want to create an exploitative tourism economy as has happened in some countries.”

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A taste for organic food and carbon-neutral farming

Denmark’s largest competence cluster is its vast knowledge-based and highly efficient agriculture and food sector.

With an ideal temperate climate, fertile soils and flat landscape—61 percent of which is farmed—Denmark produces enough food to feed three times more people than its own population.

Agriculture generates about €2 billion in international sales annually, around a quarter of the nation’s total exports, mainly from its premium-quality meat and dairy products. “Our food sector occupies a strong position and has done for over 100 years. Denmark is our biggest market, followed by China, Sweden, the U.K., and Poland, while the U.S. is seventh or eighth,” states Flemming Nør-Pedersen, executive director of the trade body Danish Agriculture and Food Council (DAFC). Denmark stands out for its focus on organic and sustainable farming, with about 12 percent of its farmland being cultivated organically. But the country wants to go further, he says. “Our ambition is to double organic production over the next 10 years and to increase organic exports. We’re collaborating with the governments on programs to support this.” The sector also aims to become climate neutral by 2050 without impacting production volumes, he adds. “We see innovative technology as a hugely important answer for this and have research centers working together to find new technical and digital solutions.”

The sector’s commitment to quality, safety, animal welfare, the environment, research and other forms of added value has helped some of its food businesses, many of which are cooperatives, to become major global players. The pork industry is a key example of this. At one end of the value chain is DanBred, co-owned by DAFC, that has developed world-leading genetic testing systems for breeding pigs. At the other end is Tican, which produces fresh, frozen and vacuum-packed meat from high-quality local pigs. CEO Niels Jørgen Villesen expands on one reason for the Danish pork sector’s international success: “We’ve established a state-of-the-art root screening facility so we can study what’s happening below the ground—the size of roots plays an important role in drought tolerance and carbon sequestration.”

Damsgaard is confident there is a lot of potential for further expansion. “We still have many opportunities for growth in North America, for instance, and there are clearly opportunities for us to enter the tropical forage-seed business in South America and Asia.”

“Wild-caught fish is a superb way of getting sustainable healthy protein”

Mikael Thinghuus, CEO, Royal Greenland

Fisheries, take care of the ocean and act on what biologists tell you about where, when and how much to fish. “We’re very strict in following these criteria.” Indeed, the company aims to get the most value that it can from its catch, he adds: “Fillets make up only 35 percent of a fish’s weight. The challenge is what we do with the remaining 65 percent and we’re developing technologies for the many side streams that come out of our fishing. For example, we’ve taken our utilization of shrimp to almost 100 percent by using the peptides to make powdered meal.” The company takes an equally responsible approach to its economic role in Greenland. In recent years, it has returned solid year-on-year annual average sales of around $762 million and it recorded its best ever results in 2021. Royal Greenland has also doubled its employee numbers in the last decade, says Thinghuus. “We now employ around 2,500 staff and twice as many in the fishing season. So of paramount importance to us that we train and motivate our staff, and we maintain very high levels of employee satisfaction.”

“Art has many forms.”

Mikael Thinghuus, CEO, Royal Greenland

Roche we take the products out for distribution.” The company’s fishing methods may be traditional, but its processing facilities use the latest technology to guarantee the strictest quality, hygiene and safety standards. “We’re a successful enterprise because we have an exceptionally good reputation for food safety and production quality; if we say we’ll produce within certain specifications, we will,” he affirms.

Historically, nearly all of its exports were enjoyed in Europe but, today, over 30 percent are shipped to Asia, especially China and Japan, around 15 percent goes to North America and its recent investment in a Chilenian fishing business is now boosting South American sales. Royal Greenland’s customers are be assured that it only works with sustainable fish stocks, Thinghuus stresses. “Some people think all fishing is unsustainable—that’s inaccurate. Wild-caught fish is a superb way of getting sustainable healthy protein if you have well-managed
Mobilizing farmers to decarbonize agriculture

Denmark is cultivating innovative agtech solutions that are speeding up the adoption of regenerative practices in farming.

Agriculture is responsible for around one-fifth of Denmark’s total carbon-dioxide (CO₂) emissions and its decarbonization is a priority for a country seeking to become carbon neutral by 2050.

In October, the Danish parliament ratified plans to reduce the sector’s greenhouse-gas (GHG) emissions by 55 percent within 10 years, pledging funding of nearly $600 million for green farming technologies to help achieve this. One new solution that is rapidly being adopted by farmers in Denmark and Europe comes from the startup Agreena. “To achieve carbon neutrality, carbon removal is essential and nature-based solutions are the most cost-effective strategy for this,” says CEO and co-founder Simon Haldrup. “A lot of the answers can be found in agriculture and that latent potential needs to be unlocked, but it requires economic incentives at the micro level—and that’s Agreena’s focus.” In summary, Agreena mints, verifies and sells carbon credits generated and owned by crop farmers that are transitioning to regenerative practices, such as increasing use of cover crops and organic fertilizers, or reducing soil disturbance and fossil-fuel usage: methods that help reduce GHG emissions, keep carbon stored in soil and boost biodiversity.

“We’re a farmer-centric company and want to enable them to take on a new role in the climate battle. Our mission is to mobilize a scalable approach for farmers to adopt sustainable practices by plugging in a secondary income from carbon certificates. We launched a year ago in Denmark, have already scaled to eight countries and we expect that our farmers’ will be removing over 2 megatons of CO₂ a year from the atmosphere by the end of 2022,” Haldrup reveals.

A significant advantage of Agreena’s proprietary agtech platform is that it’s vertically integrated: farmers enter data about each of their fields, relating to what’s happening now and their plans for transition, and the platform calculates the impact of those changes using Agreena’s vast data resources, he states. “We capture a lot of data on farms and quantify it in terms of how much carbon each activity reduces.” Farmers can then track their shift to regenerative practices and, once a year, their carbon reductions are translated into CO₂ e-certificates that they can sell through Agreena’s platform or elsewhere on the voluntary market to, among others, organizations looking to offset their own emissions. Before issuing certificates, Agreena validates all data through farm visits, algorithmic analysis and satellite technology. It also goes through two layers of independent verification and its ISO-standard program is certified by the international accredited registrar and classification society DNV.

This month, Agreena raised €20 million in its Series A round led by Kionnevik, Giant Ventures and the state-owned Danish Green Investment Fund. Haldrup explains how those funds will be invested: “We want as many farmers as possible to participate in the carbon market and are looking to expand across the pan-European region over the next 24 months. Our second focus is to enhance our program, improving the technology, algorithms, specificity of the verification and increasing the number of farming practices. Our vision is to enable farmers to become climate heroes by giving them the tools to help build a green European economy. There’s a need for a fundamental shift in how food is produced, we need to build that tidal wave in collaboration with farmers and I really believe our efforts are beginning to crack that nut.”
What we can learn from Denmark’s energy transition?

The Nordic country’s pioneering creation of an energy system that’s green, stable, secure and affordable sets an example for the world.

“Denmark has shown that it’s possible to reduce emissions significantly while at the same time becoming more competitive, creating jobs, having better health and a higher living standard,” states Dan Jørgensen, Minister for Climate, Energy and Utilities.

“As a small country, we’re probably only responsible for around 0.1 percent of the world’s greenhouse gas (GHG) emissions, so you might question if it matters what we do. We think it does, because we believe we have a chance to inspire other countries.” Between 1990 and 2019, Denmark’s total carbon emissions plummeted by over 44 percent, driven by a huge increase in its production of green energy. In 2020, 68 percent of Danish electricity came from renewables, with the majority being generated by wind. Already one of the least carbon-intensive countries in the OECD, in 2019 the government introduced a Climate Act with ambitious new goals that included cutting GHG emissions to 70 percent of their 1990 volumes by 2030 and achieving carbon neutrality by 2050 at the latest. “With regard to our 2030 emissions target, the gap between how much we need to reduce when we set it and where we are now has been cut in half so far, which is great progress. We were also the first country with a stable oil production to say we would cancel all new licensing rounds and put an end date on oil and gas exploration of 2026,” says Jørgensen.

“The pressure is now on to rapidly install and connect a lot of additional renewable generation capacity, he adds. “We have to innovate, develop new technologies and put an end date on oil and gas exploration of 2050,” says Jørgensen. “We have to talk about making the hydrogen business case work.”

Reaching the energy trilemma

Denmark’s fast build out of renewable capacity and the changes to its energy mix present challenges to its transmission system operator for electricity and gas, Energinet, states president and CEO Thomas Egberg. “What we’re trying to build is a future energy system based on renewables, with a high level of secure supply that is affordable: what we call the energy trilemma. In short, we’re talking about an energy system that is electrical, integrated and digital.” One challenge is adapting the electricity grid for renewable energy, he comments. “We’ve come far in integrating fluctuating energy sources. Some 50 percent of our electricity consumption is matched on average by fluctuating production from wind and solar, a penetration rate that’s the highest in the world. People would have said it was impossible 10 years ago, but we’ve been able to do it by developing solutions as we go along, such as sophisticated forecasting systems. Denmark is also among Europe’s top performers for security of supply and our wholesale electricity market prices are quite competitive in general as well.”

Egberg notes that a distinctive characteristic of the Danish electricity system is that it’s well integrated with those of nearby countries. “We’re directly linked to Norway, Sweden, Germany and the Netherlands, and are currently building a new interconnector to the U.K. You can only have an energy system that’s more or less 100 percent green and based on fluctuating renewables by integrating across countries and we have a great deal of experience doing that.”

Denmark’s experience in green-energy collaborations extends a long way beyond its neighbors, according to Knud Rasmussen, director general of the Danish Energy Agency, the government body responsible for developing and implementing policy for the sector. “If Danes really want to do something regarding international climate issues, we need to go abroad to show the rest of the world that it’s doable and that’s what we’re doing. The best platforms for us are the European Union and the United Nations climate conferences. We also have 19 partner countries around the world, including giants like China, India and the U.S., as well as developing countries like Kenya. Our role is to inspire them and share our knowledge, so that they can leapfrog from the Danish experience and thereby spread the global renewable transition.” Böttzauw is confident that Denmark will have reached its objectives for greening its energy sector by 2030 and is now focusing on the second half of the green transition. “That means areas like transport, industry and agriculture. We’re going into the second half and that is about forming the future. Many Danish companies are currently doing a lot of planning in terms of how to form that future, and I see my agency’s role as giving them the best opportunities of doing that.”

“Denmark has shown that it’s possible to reduce emissions significantly while at the same time becoming more competitive.”

Dan Jørgensen, Minister for Climate, Energy and Utilities

A green energy and utility sector

![A green energy and utility sector](image)

- 58% cut in CO2 emissions 1990-2019
- >95% cut in CO2 emissions possible 1990-2050
- Potential for 40GW extra offshore wind
- Green energy demand could grow 64% to 125TWh by 2030

Our wholesale electricity market prices are quite competitive in general as well.”

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COWI
Ørsted develops, constructs and operates renewable energy production facilities worldwide. Most notably, it is the global leader in offshore wind. What is the group’s role in the green transformation of energy?

I like to compare Ørsted’s role to Tesla’s in the automotive sector. Electric vehicles would have happened anyway, but nowhere near as fast if Tesla hadn’t proved it was possible to make them technologically safe, high quality and affordable. This is what Ørsted has done for offshore wind. Before 2008, nobody really believed it could be a scalable technology. Ørsted started to build one wind farm after another, each bigger than the last: we’ve built the largest wind farm in existence repeatedly; we have the biggest currently and next year will open an even larger one, Hornsea Two in the U.K. We’re proved that it’s possible, that it’s scalable technology. It’s part of the transformation of the world’s energy systems, and that’s something from which the value chain can make money. We’ve been an agent for change that has accelerated investment. This creates competition as a CEO, I hate competition, but as leader of a company with a vision of a world that runs entirely on green energy, I love that everybody is copying us now.

Ørsted’s goal is to become the world’s top green energy producer. Beyond offshore wind, what other sectors are you focused on?

The world’s three years in a row. We run many sustainability programs, and among the most impactful is what we do to be a role model in decarbonizing our own value chain. By 2025, our energy production will be carbon neutral and, by 2040, our entire value chain will be net zero. Moreover, we are one of only seven companies in the world to have that verified by the global Science Based Targets initiative. One way we help other companies is by selling corporate power purchase agreements. For example, in Germany, we are building a large wind farm and selling its power to corporations like Amazon, Google, BP and the REWE Group. We’re also engaging in strategic partnerships with some of the industries most challenged by decarbonization by building a market for and an impact from green hydrogens and fuels.

One of our sustainability program areas I’m very excited about relates to biodiversity. Building out green energy requires cleared, a lot of land and many cables, and we are concerned as to how to ensure that this massive build has a positive impact on nature. That’s why Ørsted has committed to, not biodiversity neutral, but biodiversity positive.

Having pioneered the first offshore wind farm in 1991, Ørsted is at the front in the climate crisis, says Mads Nipper, Group President and CEO of Órsted, builds gigawatts of renewable energy capacity each year

Construction of the world’s first energy island is planned to start in 2025. 100 kilometers off the Danish coast in the turbulent waters of the North Sea, the vast artificial island will connect over 10 gigawatts of energy generated by 670 offshore wind turbines to the grids of Denmark and neighboring countries, and will also host facilities for technologies like large-scale energy storage and green hydrogen generation.

Leading the project that will provide renewable power to over 10 million households is the Danish Energy Agency, which has enlisted the expertise of domestic firms to help realize the pioneering concept. One of those is COWI, the global full-service consulting company with world-class competencies in engineering, economics and the environment that has been a strategic partner for Denmark on transformative development projects since it was founded in Copenhagen in 1930.

In 2020, COWI recorded an impressive net turnover of $973 million and $48 million in earnings before interest and taxes, and Søbye notes that global investors are increasingly targeting green development projects as significant prospects with good returns. “Within COWI, we’re taking a long-term perspective to our green investments and we want to make a real difference. In the meantime, we need to accumulate capital and be sustainable as a company through acceptable returns of investments. We’re expecting a growing turnover in the meantime, we need to accumulate capital and be sustainable as a company through acceptable returns of investments. We’re expecting a growing turnover in the meantime, we need to accumulate capital and be sustainable as a company through acceptable returns of investments. We’re expecting a growing turnover in the meantime, we need to accumulate capital and be sustainable as a company through acceptable returns of investments. We’re expecting a growing turnover in the meantime, we need to accumulate capital and be sustainable as a company through acceptable returns of investments. We’re expecting a growing turnover in the meantime, we need to accumulate capital and be sustainable as a company through acceptable returns of investments. We’re expecting a growing turnover”
Danish companies step up against climate change

Denmark’s private sector is taking the lead in supporting both the country and the world to meet their targets for sustainability and reducing greenhouse gas emissions.

At the Glasgow Climate Change Conference, COP 26, Denmark presented its model for accelerating the global green transition: partnerships that combine the ability of governments to set optimal framework conditions with that of businesses to innovate and invest in new solutions, as well as to reduce emissions throughout their value chains.

In 2019, the Danish government initiated 14 industry-specific Climate Partnerships in which the heads of those industries and relevant ministries were tasked with devising roadmaps for how their sector could contribute to Denmark’s climate goals. Last year, the Climate Partnerships produced a combined report with over 400 recommendations, many of which are now being implemented.

Denmark’s private sector is taking the lead in supporting both the country and the world to meet their targets for sustainability and reducing greenhouse gas emissions.

Waiting to act is not an option anymore

Denmark’s 34,250 retail and wholesale companies are directly responsible for only 0.15 million tons of carbon-dioxide emissions a year. But that’s not the full story, says Jan Bøgh, president and CEO of JYSK, the home and garden furnishing retailer which counts over 3,000 stores in 51 countries. “We’ve set the goal of halving our scope 1 and 2 emissions by 2030, but about 95 percent of our footprint comes from our supply chain. Raw materials are important and an area where a big company like JYSK can make a difference. For example, one of our goals is that the cotton used in our textiles is more responsible before the end of 2024. It’s a problematic crop, as it requires a lot of water and pesticides, and we’re working with non-governmental organizations on this.”

Another Danish driver of sustainability in retailing is Flying Tiger Copenhagen. The chain has successfully established presence across 26 countries on the back of an ever-changing portfolio of original products ranging from kitchen tools to gifts, toys and party decorations—all in-house designed with the aim of generating smiles and good feelings from customers. “Flying Tiger is built on the Danish heritage, which is design-led, simplistic and very sustainable. As Denmark is a frontrunner in sustainability, it was natural for us to say we also wanted to be a leader in the green movement,” CEO Martin Jermiin discloses. For the retailer, that meant fully understanding and precisely calculating how every element in its value chain impacts the environment, he asserts. “We’ve sought out the very best data and authorities on every dimension we could find within sustainability. On emissions, we’ve signed up to the 1.5 degree Paris Agreement goal, we’ve had our targets validated by the Science Based Targets initiative and we’re on fire in terms of meeting them.”

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DENMARK

Danish Energy Agency, more than 40 percent of the carbon emission reductions the lead in supporting both the country and the world to meet their targets for sustainability and reducing greenhouse gas emissions.

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**Mission-based universities**

Denmark is home to eight public universities, which provide world-class, industry-focused education and are also the country’s main centers of research excellence.

“Our universities are very international, highly ranked and one of their great advantages is they’re free. If you have the ability and yearning to get a university education, you can, no matter what social background you come from,” says Per Michael Johansen, rector of the University of Aalborg (AAU).

Based in vibrant Aalborg city in the industry-rich north of the country, AAU is one of the most prestigious of those institutions. Across three modern campuses, it generates research with global impact, while around 20,000 students a year undertake its degree programs that are based on a unique problem-based learning platform, he states. “Our vision is for education in close collaboration with the surrounding world and, from day one, students work on real problems with industry or the public sector. We see ourselves as a mission-based, collaborative university that is equipped to take on global challenges,” he explains.

AAU takes an interdisciplinary approach across its faculties that cover engineering and science, IT and design, medicine, social sciences and humanities, plus a new business school that encourages innovation, particularly in small and medium-sized firms. Within those areas, the university concentrates on fields where it has proved to be among the very best, notes Johansen. “For example, we’re thriving in digital health research, and in engineering, we’re among the world’s top universities for power electronics, we’re extremely strong in digital signal processing and we have over 200 researchers in the field of energy and sustainability. Based on the quality of its research and education, AAU is one of Europe’s leading universities. We also tap into European Union (EU) research programs, such as Horizon 2020, where we collaborate with other European universities and businesses—in fact, about half of all EU energy grants are attracted by AAU and the Technical University of Denmark. We may be small, but we’re agile, focused and we’re making a difference by creating knowledge for the world.”

**Denmark’s place in global education**

- **5th for expenditure on tertiary education**
- **2nd for scientific journal articles**
- **15th combined ranking of universities**
- **10th for relevance of education to the economy**

**What’s next?**

Insulin treatment and diabetes care have evolved significantly since insulin was discovered in 1921. Yet more can be done. Continued innovation is imperative to address the significant challenges that diabetes still presents to individuals and society worldwide.

**Changing diabetes**

**Mission-based universities**

**Denmark’s place in global education**

**What’s next?**

**Changing diabetes**

Source: The Global Talent Competitiveness Index 2021, IMD
Transition in transportation accelerates

Denmark is rapidly electrifying its existing transport systems, while also investing in expansive new road-and-rail infrastructure

Last year, the Danish government announced a plan to spend $17 billion on transport infrastructure projects by 2035 to support the country’s ambitious goals for decarbonization, as well as to improve its road and rail systems.

“The core of that investment is electrification. All public transport needs to be electrified and we need to get a hold on road transport, the largest contributor to carbon-dioxide (CO2) emissions,” reveals Minister for Transport Benny Engelbrecht.

To cut road-related emissions by over 2 million tons a year by 2030, his ministry wants to increase the number of electric cars on the road from just over 100,000 to a million, he says. “We’re doing well; electric car sales are booming and we’ve accelerated investments in charging infrastructure.”

A harder part of the equation is reducing emissions from heavy-duty vehicles before the automotive industry has developed a firm alternative to fossil-fuel-powered trucks, he states. “Developments might overtake us if we decide on a technology to invest in too soon. Therefore, from 2025, we’ve decided to tax CO2 emitted by heavy-duty vehicles. Trucks will pay a per kilometer fee to drive on Danish roads plus a surcharge equivalent to the approximate cost per ton of CO2 that they emit. This is actually the first true CO2 tax we’ve had in Denmark. The details need to be ironed out, but the basic principle is that you get a 75 percent discount if you don’t emit CO2.”

“The answer to greener rail, on the other hand, is clearly electrification. All trains in Denmark will be carbon neutral, which means electrifying our major core rail network and equipping it with a digital signaling system that is up to European Rail Traffic Management System standard,” asserts Engelbrecht.

Most of the ferries that link Denmark’s many islands also have the potential for direct electrification, which the government is encouraging through a financial incentive that brings the price of an electric ferry down to that of a diesel one, he adds. “This is also something that can support Danish industry as we are frontrunners when it comes to electrifying ferries. Once demand increases prices will fall, making it much easier to export our technologies.”

One way the government plans to boost the use of more sustainable forms of transportation is to increase the capacity and accessibility of public transport networks by investing in mass urban transit systems. “At present, everyone traveling by rail in and out of Copenhagen, for instance, must pass through its central station, which creates a massive bottleneck. Our idea is to have a number of central hubs, allowing you to shift between train lines,” he notes.

Europe’s new shortcut

Denmark’s largest infrastructure project, however, is a critical segment of the Scandinavian-Mediterranean Trans-European Transport Network core corridor. “The Fehmarnbelt link will be the world’s longest immersed tunnel with a length of 18 kilometers and will create a link between Copenhagen and Hamburg in Germany. The tunnel will include a four-lane motorway that will cut around 160 kilometers off the drive between those cities and two electrified high-speed rail tracks will link Sweden, Norway and Copenhagen to Hamburg and wider Europe,” explains Mikkel Hemmingsen, CEO of Sund & Bælt Holding, the public company responsible for designing, constructing, operating and maintaining Denmark’s biggest transport infrastructure investments, including Fehmarnbelt.

Sund & Bælt started constructing the Danish section of the vast tunnel in 2018 and aim to complete it by 2025. The company’s track record in developing world-class infrastructure strongly suggests that Fehmarnbelt will be its next socio-economic success story. In largest project to date is the 18-kilometer Storehults road-and-rail link between east and west Denmark. Among the world’s longest bridge and tunnel constructions, Storehults has become one of the country’s most important traffic arteries since it opened in 1998 and is estimated to directly benefit Danish society by $1.5 billion a year. Another similarly impactful achievement is the 16-kilometer road-and-rail Øresund Bridge linking Sweden and Denmark via a bridge, an artificial island and a tunnel, which was inaugurated in 2000.

Sund & Bælt’s responsibilities extend to establishing financing for its projects, for which it has devised an innovative, user-financed model, states Hemmingsen. “Bridges and tunnels are very expensive for the state’s budget; so we invented this model of a state-owned company borrowing the financing at a very low interest rate with a state guarantee. These loans are paid back by taking fees from the road and, to a lesser extent, rail users.” The solidity of its model having been proved by the Storehults and Øresund Bridge developments, both of which are on track to beat their loan-repayment dates, Sund & Bælt’s financing of the $7.9-billion Fehmarnbelt is following the same system. However, he cautions, “If the model were to be exported, it’s important that governments create entities with a super-efficient monopoly to run the projects. Sund & Bælt is an example of this: we operate as a private company, we have to meet all benchmarks, we have to be efficient. That gives you a very powerful instrument to transform a country.”

With over 20 years experience in constructing and maintaining complex infrastructure, the company has developed digital technologies that have enormous potential in the wider industry, believes Hemmingsen. “Substantial investments in artificial intelligence (AI), drones and sensors have resulted in us being able to double the lifespan of our infrastructure to 200 years. For example, we’ve equipped drones with cameras and developed an algorithm so that AI can analyze concrete for cracks. We can tell where future problems spots will be, carry out repairs at the right time and have a continuously accurate view of the condition of our infrastructure. Being able to determine the state of concrete or steel to double life expectancy is going to change the way infrastructure is maintained worldwide. In partnership with IBM, we’re rolling out this innovative technology globally.” Sund & Bælt has also developed advanced data-driven technology for its toll systems, which incorporate camera-based automatic number-plate recognition for digital user payments and control of, for example, congestion and environmental zones.

Sund & Bælt sees itself as a green company tasked with providing infrastructure as sustainably as possible. The construction of its link projects has had no lasting negative impact on the environment, while building artificial reefs and islands as part of them has a hugely positive effect on biodiversity. In one upcoming innovative project, Sund & Bælt will take another step toward sustainability by raising the factory with which it is building Fehmarnbelt to create a 10-kilometer tunnel around Copenhagen. “We’re trying to work with infrastructure like a shipyard operates: you build one ship, then you use the same mold for the next. We want to transform infrastructure from projects into more industrialized fabrication, which would reduce risk and cost. It’s a new way of thinking in the infrastructure business,” Hemmingsen says. According to the CEO, the company’s project pipeline consists of more innovative infrastructure schemes and technologies for Denmark, but it would welcome further international partnerships with players like IBM. “Exporting our innovations is a way of contributing to other countries. We are open about sharing everything, because we would like others to be as successful as we are.”
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