Smart Energy and Smart Grids Market Study Denmark 2025

History of the energy system and smart grids in Denmark

In 1951 Denmark established a national grid to ensure nationwide distribution of electricity. The oil crisis in 1970s prompted a significant change in Danish energy policy, beginning to invest in wind power and energy efficiency, contributing to Denmark's rise as a pioneer in wind energy, and the establishment of the world's first offshore wind farm in 1991. Denmark has since developed into a global wind energy hub, being home to some of the biggest players in the global wind energy market.

During the 2000s, Denmark made significant strides in advancing smart grid technology through dedicated research and pilot projects. In 2010, the government formed a working group with key stakeholders to recommend strategies for enhancing smart grid integration across the energy sector. This led to the launch of the official Smart Grid Strategy in 2012 and the passing of legislation in 2013 mandating smart meter installations in all households — a goal that was successfully achieved in 2020. Over the years, smart grids, meters, and energy systems have become core elements of Denmark's energy transition.

With these initiatives Denmark's smart grid sector expanded rapidly, particularly within the technology segment of the value chain. The country gained recognition as a leading hub for testing and demonstrating intelligent power solutions, with a notable share - 22% in 2011 - of all EU smart grid R&D projects taking place in Denmark. This strong research and innovation environment solidified Denmark's role in shaping the future of intelligent electricity systems¹.

These efforts positioned Denmark at the forefront of flexible electricity markets and demand-response systems. The smart grid ecosystem in the country includes a diverse set of actors such as technology developers, energy providers, regulators, investors, and research institutions. Danish companies have tended to focus more on software and service solutions than on hardware, contributing to a well-integrated and adaptive smart energy landscape.

Additionally, the Danish electricity retail market has been going through a remarkable transformation in the same period, to stimulate competition, encourage innovation and to motivate the demand-side of the market to play an active role in Denmark's green transition².



¹ https://cdn.copcap.com/hubfs/Downloads/Dokumenter/Denmark_A_European_Smart_Grid_Hub_2011.pdf

 $^{^{2}\} https://en.energinet.dk/media/irmcgncr/danish-electricity-retail-market.pdf$

The integration of smart energy technologies is pivotal in optimizing energy use and enhancing grid resilience. Denmark's energy system has evolved to incorporate advanced metering, demand response, and real-time data analytics. These smart solutions have enabled more efficient energy consumption, better integration of variable renewable energy sources, and improved grid management. Generally, the initiatives and investments listed above (combined with initiatives in other areas) have paid off, and from 1990 to 2023 Denmark reduced its greenhouse gas emissions by 46%.

Key targets and numbers

Today, Danish energy consumers have electricity 99.99% of the time, and enjoy the third lowest electricity price in the EU. When looking forward, Denmark aims to achieve carbon neutrality in 2045, with a 70% reduction target for 2030, and a 110% emissions reduction target by 2050. According to the independent Danish Climate Council, 2025 is the first year where the council concludes that the 2030 target is indeed achievable, provided that existing climate policies are implemented as planned.³ This follows a historic decision in 2024 to tax emissions in agriculture.

In terms of electrification, the government expects that 100% of electricity will come from renewables by 2030. Today, electricity generation is primarily based on renewables, which accounted for over 82% of the electricity supply in 2023, with wind accounting for 58% of total electricity generation.⁴ However, it is necessary to note, that electricity only accounts for 21% of Denmark's total energy mix, highlighting the need to increase electrification. As the energy mix below indicates, Denmark is still largely dependent on fossil fuels, and there are severe need to speed up electrification. Only 20% of Danish energy consumption is currently powered by electricity, placing Denmark at the absolute bottom in Europe.

Coal Oil Wind, solar, etc. Biofuels and waste 4.7% 37.2% 14.2% 34.7% • Coal • Oil • Natural gas • Hydro • Wind, solar, etc. • Biofuels and waste Source: International Energy Agency. Licence: CC BY 4.0

Denmark energy mix

International cooperation

Denmark is closely connected to other countries, and electricity is traded across countries at all times via the Nord Pool power exchange, where electricity producers and suppliers report and trade production and consumption. Denmark is connected to Norway, Sweden, Germany and the Netherlands via cables, and consequently Danish electricity includes Norwegian hydropower, Swedish



 $^{^{3}\} https://klimaraadet.dk/sites/default/files/node/field_file/Klimaraadet_statusrapport 25_FINAL_ONLINE.pdf$

⁴ https://www.iea.org/reports/denmark-2023/executive-summary

nuclear power and German coal power, among other things. In 2023, the world's longest underwater electricity connector, Viking Link, was inaugurated, connecting Denmark with UK.

In the coming years, much international cooperation will also go into the construction of hydrogen infrastructure with a pipeline that is going to connect Denmark with Germany by 2030.⁵ Denmark and Belgium have also collaborated on the creation of an undersea connection between the Danish and Belgian energy islands, the Triton Link. However, with existing uncertainties of the future of the energy islands in both countries, a potential interconnector is also up in the air. Nevertheless, together with like-minded TSOs, incl. Elia, Danish TSO Energinet in April 2025 announced the decision to assess opportunities to develop a joint European offshore grid in the North Sea.6

Current challenges in the Danish energy system and grid

Despite some of these achievements and targets, challenges remain. Some green energy projects, especially in offshore wind, hydrogen, and Power-to-X, have been delayed or canceled. The future of Denmark's planned energy islands is also uncertain. Meanwhile, biomass still makes up a large share of energy supply. Compared to other European countries, Denmark still has a relatively low level of electrification in some sectors.

Yet, Denmark is making moves in transitioning to green energy, with challenges as well as opportunities ahead. Electrification is key to Denmark's climate goals, but it needs to happen faster, especially electrification of the industry. Big industry groups are asking the government to act quick and create a clear plan for electrifying the country⁷.

Increased focus on electrification of the district heating network and the uptake in (industrial) heat pumps, is going to be central in balancing the electricity grid, as it is fairly easy to regulate up and down following unbalances in the grid. Heat pumps, electric vehicles (EVs), and greener industry are seen as major parts of the solution. EVs are becoming more popular – in 2024, for the first time, more electric cars were sold than petrol or diesel ones. Denmark's target is 1 million EVs by 2030⁸, but this could be reached by 2028. This fast growth is great for reducing emissions, but it also puts more pressure on the electricity grid.

As society becomes more electrified, especially in transportation, heating, and industry, the demand for (renewable) electricity is growing fast. In order to electrify these large parts of society, it is necessary that Denmark has a consistent inflow of affordable, renewable energy. In this aspect wind and solar play

⁸ https://skm.dk/aktuelt/presse-nyheder/pressemeddelelser/lovforslag-om-elbilsaftalen-fylder-4-aar-elbilerneer-braget-frem



⁵ https://www.kefm.dk/aktuelt/nyheder/2025/feb/bred-politisk-aftale-om-milliarder-til-brintroer-til-tyskland-

⁶ https://en.energinet.dk/about-our-news/news/2025/04/09/12-offshore-tsos-are-striving-for-integrated-offshore-grid-tostrengthen-european-energy-independence/

⁷ https://greenpowerdenmark.dk/files/media/document/Saet-Groen-stroem-til-Danmark.pdf

the most important role. This is currently under pressure, and industry organizations argue that especially the process to establish more wind energy is going too slow, both on- and offshore.

Additionally, major tasks are required for electrification to be successful:

- Updating existing cables and expanding the grid: According to a report by the European Parliament Committee on Industry, Research and Energy 'Electricity grids: the backbone of the EU energy system', more than 40% of the EU distribution grid is more than 40 years old, determining a need for short-term investments of € 375-425 billion in the distribution grid.⁹ A similar pattern is present in Denmark where many cables in the existing grid are reaching retirement age and need to be replaced, while there is also a need to further expand to avoid power grid overload¹⁰. Major investments in the electricity grid have already been planned to support increasing electricity consumption. By 2030, Energinet, Denmark's transmission system operator (TSO), plans to build an extra 2,700 kilometers of power lines, with 3-4000 km planned by 2050. Meanwhile, Energinet has also admitted that ongoing expansion of the grid have been significantly delayed.
- **Balancing and better utilize existing grid:** Smarter systems and better technology, like smart meters and predictive maintenance, will be needed to keep the power supply stable and reliable. The use of smart meters, combined with strong data analysis, will be necessary to help consumers use electricity more efficiently, as too much renewable energy is currently being wasted.
- **Storage and batteries to stabilizing the grid:** This includes growing focus on V2G (Vehicle to Grid) for balancing of the grid, as well as storage generally and connecting batteries to the grid etc.
- **TSO constraints:** Generally, the Danish TSO is under a lot of pressure, with many projects waiting to be connected to the grid. Currently approximately 100 projects are waiting for response on their request to be connected to the grid, and these long connection timelines are challenging energy developers, who are loosing money on their investments, when they are not able to connect to the grid as expected.

Hot topics and opportunities on the Danish market

• **Battery Energy Storage System (BESS):** At the moment a recuring topic in relation to the grid, is the role that batteries and storage plays in stabilizing and balancing the grid¹¹. Currently, the policy conditions for batteries are challenged, but a small change in the tariff system in 2024 has already resulted in an increase in battery projects¹², and it is nevertheless an area that will gain a lot of attention in the coming years¹³, where there could be large potential on the Danish market, with opportunities for companies offering products and services in BESS.



⁹ https://www.europarl.europa.eu/doceo/document/ITRE-PR-768244_EN.pdf

¹⁰ https://energinet.dk/media/0rgldljv/lup22-behovsanalyse-el-engelsk.pdf

¹¹ https://stateofgreen.com/en/news/the-crucial-role-of-battery-storage-in-energy-grids/

¹² https://ing.dk/artikel/dyre-tariffer-bremser-batterier-i-elnettet-milliardtab-batteriejere-og-forbrugere

¹³ https://daces.dk/wp-content/uploads/2023/09/Policy_Brief_Final_Aug2023.pdf

- **Grid expansion and updating:** With the sizable plans to expand and update the existing grid (details above), this will also be an area with interesting opportunities and potential for relevant companies to play a role in Danish grid infrastructure and smart energy.
- IT and Al driven energy management: Better utilization of the existing grid is to a large sense dependent on the IT that is being used essentially a smart meter is only smart when the IT behind it is smart¹⁴. Al is already contributing to Energinet's operations, and helps the Danish TSO balancing the grid.¹⁵ Furthermore, several Danish distribution system operators (DSO) are a part of the EU project InnoCyPES¹⁶ which develops AI for use by electricity grid and energy companies, where data is used to train AI models in order to streamline replacement of old cables in the grid. Accordingly, large parts of the Danish smart energy and grid ecosystem are IT companies, just as much as they are energy tech companies. AI and IT is thus expected to play an important role in better utilizing the existing grid, providing great potential for foreign companies to contribute to this development.
- Vehicle-to-Grid (V2G) / E-mobility grid integration: Another area that has been looked into for the past years in order to stabilize the grid is the V2G system or E-mobility grid integration¹⁷. Based on significant amounts of research and research projects in the field¹⁸, there are generally positive feedback and outcomes, which could turn into interesting market opportunities. With the increasing amount of electric vehicles in Denmark, there is severe opportunity for this type of system to contribute to balancing the grid.
- Services to the wind energy industry
 Despite current challenges in relation to Denmark's ambitions to massively establish new
 onshore and offshore wind capacity, wind energy will nevertheless play a crucial role in
 Denmark's carbon neutrality targets and green transition. Even though existing 2030 wind
 targets appear difficult to reach, it is nevertheless an area where there will be opportunities in
 many years to come, which will include providing essential services to the industry, be it
 software, maintenance, or recycling.
- **Hydrogen pipeline from Denmark to Germany:** Finally, the hydrogen pipeline connect Denmark to Germany could also provide opportunities, as this will be a major energy infrastructure project that the Danish TSO Energinet will take upon them.



¹⁴ https://event.ing.dk/digitaltechsummit2025/session/2718301/keynote-debate-36-afbrudsminutter-%C3%A5rligt-i-2032-har-vi-styr-p%C3%A5-ai-styringen-af-vores-fremtidige-elnet

¹⁵ https://ing.dk/artikel/energinet-ai-kan-give-os-billigere-og-bedre-forsyningssikkerhed
¹⁶ https://innocypes.eu/

¹⁷ https://energinet.dk/media/qmhnfcam/vehicle-grid-integration-research-rethinking-energy-internationalalignment.pdf

¹⁸ https://www.powerlab.dk/industries/e-mobility

Key actors

Public sector and system operators

Danish Energy Agency

Government agency responsible for energy production, supply, and consumption, and Denmark's efforts in green energy transition. The Energy Agency is a part of the Ministry of Climate, Energy & Utilities.

• Energinet

Denmark's state-owned transmission system operator (TSO) for electricity as well as natural gas. A new role for Energinet will be establishing and operating the Danish hydrogen infrastructure of the future, ensuring connection of PtX plants to the grid and cooperation with Danish and German stakeholders in relation to the construction of the Denmark-Germany hydrogen pipeline.

• State of Green

State of Green is a not-for-profit, public-private partnership, that connects international partners with Danish companies, changemakers, agencies, experts, and researchers to accelerate the global transition towards a sustainable, net-zero future, and essentially promotes Danish green technologies and solutions.

• Distribution System Operator (DSO)

The DSOs owns the network between the transmission grid and the consumer. The DSO also has the exclusive right to transport electricity in its geographically demarcated grid. One of the DSO's responsibilities is to measure electricity consumption and generation within its grid area. Denmark has approximately 40 different DSOs, covering the entire country.

Clusters and industry organizations

• Energy Cluster Denmark

Energy Cluster Denmark is Denmark's cluster organization for the entire energy sector. Therefore, Energy Cluster Denmark is a neutral, value-creating and member-driven innovation platform for establishing and facilitating innovation collaborations between small and large companies, knowledge institutions and public players throughout the energy sector.

• DI Energy (Confederation of Danish Industry)

Confederation of Danish Industry is one of Denmark's largest industry organizations, and DI Energy specifically works to represent members' interests towards politicians and public authorities and offer advice, professional networking and the opportunity to be updated on the energy and climate policy agenda. Members' business areas cover the entire energy value chain from extraction, production, distribution of energy resources to the production of technology and consultancy, design and development in the energy field.

• Green Power Denmark (Intelligent Energy)



Green Power Denmark is a non-commercial business organization gathering around 1,500 members from across the green energy value chain. As a part of Green Power Denmark's the value chain community Intelligent Energy, brings together key players in and around the energy sector for a concrete and effective rollout of an intelligent energy system.

• Danish Centre for Energy Storage (DaCES) A partnership that covers the entire value chain from research and innovation to industry and export in the field of energy storage and conversion

Research and Innovation

Denmark is a global leader in smart energy research, with several universities and research institutes focusing on intelligent energy systems, sector coupling, and digitalization.

• Danish Technical University (DTU)

DTU is a leading engineering university with strong expertise in smart energy. Their Centre for IT-Intelligent Energy Systems (CITIES) develops AI-driven solutions for energy system flexibility, sector coupling, and digital infrastructure. Other relevant centers and departments include the Center for Electric Power and Energy, Department of Energy Conversion and Storage and DTU Wind and Energy Systems.

- **PowerLabDK**¹⁹ is also located at DTU. PowerLabDK is an experimental platform for electric power and energy. PowerLabDK supports technology development, testing, training and demonstrations that contribute to the development of a reliable, cost efficient and sustainable energy system based on renewable energy sources. PowerLabDK carries out experiments within electric equipment, renewable energy sources, smart grid technologies, smart home and electric appliances, control and ICT-solutions in energy systems, wind power, e-mobility, real-time grid analysis, control center tools and many other areas.
- University of Southern Denmark's (SDU)

SDU's Faculty of Engineering conducts research in energy production from renewable sources, energy storage, and the use of digitalization and AI in energy systems. SDU's Center for Energy Informatics²⁰ hosts the Nordic Energy Informatics Summit.

• Aarhus University (AU)

AU's Department of Engineering engages in research related to intelligent energy systems and flexible markets, with an emphasis on the integration of renewable energy sources and the development of energy system models.

• Aalborg University (AAU)

¹⁹ https://www.powerlab.dk/



²⁰ https://www.sdu.dk/en/energyinformatics

AAU is renowned for its Smart Energy Systems Laboratory²¹, which offers a real-time, hardware-inthe-loop platform for testing intelligent energy systems. AAU's research group iGRIDS focuses on sector coupling, energy flexibility, and smart grid market mechanisms²².

• Danish Technological Institute (DTI)

DTI is a leading independent research and technology organization in a range of topics. Its extensive expertise and facilities make it an ideal partner for international research delegations seeking to explore (smart energy) solutions. DTI's EnergyFlexLab is a state-of-the-art testing facility that evaluates the flexibility and integration of energy components such as heat pumps, battery storage systems, electric vehicle chargers, and solar panels. The lab conducts real-life scenario testing to optimize the performance and interoperability of these technologies within smart grids.

Energy developers and investors

Ørsted

Major, global developer and investor in renewable energy, in particular in offshore wind energy, but also in solar, hydrogen, biomass-fired power plants and energy storage solutions, as well as network integration and smart energy.

• Copenhagen Infrastructure Partners

Copenhagen Infrastructure Partners is a global leader in energy infrastructure investments, specializing in developing and constructing large projects. CIP manages 13 funds and have raised approximately EUR 32 billion. The funds focus on investments in offshore and onshore wind, solar PV, biomass and energy-from-waste, transmission and distribution, reserve capacity and storage and Power-to-X.

European Energy

Renewable energy company focusing on wind and solar projects across Europe, with an increased focus on storage facilities and batteries for balancing the grid.

Solution providers

Vestas

Vestas designs, manufactures, installs, and services wind turbines across the globe, and with +154 GW of wind turbines in 87 countries, Vestas has installed more wind power than anyone else.

WELCON A/S

WELCON A/S is a Danish company specializing in the manufacture of steel components and turnkey solutions, with a key focus on towers and other steel structures for the wind turbine industry.

Kamstrup
 Specializing in intelligent metering solutions for water and energy.



²¹ https://www.energy.aau.dk/laboratories/smart-energy-systems-laboratory

²² https://www.energy.aau.dk/research/research-groups/igrids

• Linak

Manufacturer of electric linear actuator systems for various industries, incl. smart energy, energy efficiency etc.

Danfoss

Danfoss engineers solutions that increase machine productivity, reduce emissions, lower energy consumption, and enable electrification. Solutions are used in such areas as refrigeration, air conditioning, heating, power conversion, motor control, industrial machinery, automotive, marine, and off- and on-highway equipment. Provide solutions for renewable energy, such as solar and wind power, as well as district-energy infrastructure for cities.

NKT Cables

Manufacturer of power cables and accessories for energy infrastructure.

• Topsoe

Offer for transforming renewable resources into fuels and chemicals for a sustainable world, and for efficient and low-carbon fuel production and clean air. Active in a range of intelligent energy activities.

Batteries and storage

- Stiesdal Storage Technologies
 Stiesdal Storage Technologies focuses on delivering true integration of renewable energy through innovative storage solutions like GridScale technology, enabling efficient energy storage and distribution.
- BattMan Energy

BattMan Energy is a clean energy developer specializing in deploying Battery Energy Storage Systems (BESS) on the utility grid. They also partner in technologies such as photovoltaics (PV), electric vehicle chargers, carbon capture, wind, and Power-to-X.

Lithium Balance (Sensata Technologies Denmark A/S)
 Provider of battery management systems for lithium-ion batteries, in Automotive, Industrial Machines and Energy Storage.

IT and AI

• Systematic A/S

Software company specializing in systems supporting decision-making, software is used to manage complex data and to make critical decisions in sectors incl. utilities.

• FlexShape

FlexShape develops intelligent energy management solutions, such as the Energy Planner and Aggregator-as-a-Service platforms, to optimize decentralized energy systems. Their technology



enables real-time monitoring and control of energy flows, integrating various energy sources and storage systems.

Consultancies

Rambøll

Consultancy in engineering, architecture, energy and environment, with strong background in energy infrastructure and grids, incl. agreements with Energinet (DK TSO)

• COWI

Consultancy in engineering, architecture, energy and environment.

• Niras

Consultancy in a range of business areas, incl. renewable energy grid integration, smart grids, microgrids and distributed generation.

• PlanEnergi

Consultancy firm specializing in sustainable energy solutions, incl. storing energy in water. Involved in a range of research projects.

In addition to the companies listed above and in the attached Excel document, noteworthy international companies in the area include Siemens Energy, Siemens Gamesa, ABB, IBM, Hitachi Energy Denmark, Schneider Electric, Philips and Sweco.

(Research) Projects

A range of relevant energy projects are either undergoing to have concluded, in areas such as batteries, storage, smart energy and grids.

Project Name			Description
Bornholm	Smartgrid	Secured	The goal of the BOSS Project (Bornholm smartgrid secured - by
Project			grid connected battery systems) is to develop and demonstrate
			advanced battery energy storage system (BESS) solutions
			utilizing existing strength positions of Danish industries. BOSS
			will develop and demonstrate cost-effective and market-based
			BESS services opening new Danish business opportunities in a
			fast growing global market. A full operational grid-connected
			1MW/1MWh BESS will be integrated in the Bornholm power
			system.



Underground Pumped Hydro	The Underground Pumped Hydro Storage (UPHS) project aims to
Storage (UPHS) project: Large-	develop and test critical parameters for a technology that stores
Scale Electrical Energy Storage	energy in water according to the Pumped Hydro Storage principle
	with a buried geomembrane, for example by establishing a 10 ${\sf x}$
	10-meter test facility. The innovation project focuses on the
	geotechnical conditions and membrane design. During the
	project, a number of studies and analyses will be carried out of
	the technology's integration into the electricity grid in
	combination with renewable energy sources as well as analyses
	of the business model using the system.
Leveraging Smart Meter Data to	This project, managed by the University of Southern Denmark's
Optimize Grid Investments	Centre for Energy Informatics, seeks to develop tools that enable
	distribution system operators to improve grid maintenance and
	asset management. By utilizing smart meter data and predictive
	analytics, the initiative aims to extend asset lifespans, reduce
	maintenance costs, and facilitate the transition to green energy
	sources. The project involves collaboration with Danish DSOs
	and is funded by the Energy Technology Development and
	Demonstration Program (EUDP).
2LIPP - 2nd Life for Power Plants	Bornholms Energy and Distribution (BEOF) will convert an old
	fossil fuel power plant into a hybrid energy storage based on
	green energy. The purpose is to demonstrate a scalable, hybrid
	energy storage solution that utilizes existing plant infrastructure,
	thereby achieving lower costs for implementing energy storage.
	The project will target scalable storage within three
	technologies: A high-temperature hydroxide salt energy storage
	for combined heat and electricity production, which will
	demonstrate long-term energy storage at grid scale; a battery
	storage consisting of used car batteries; and a high-tech
	flywheel for short-term energy storage. Tied together by a hybrid
	energy management system, the entire storage will balance the
	grid and deliver stored energy when needed.
Frederiksberg Forsyning V2G	Frederiksberg Utility has a fleet of 10 electric vehicles which are
	used in the everyday operations of the utility, such as
	transporting employees and equipment to work sites. In the
	evening and at night, when the cars are not in use, they are
	nooked up to the grid through bi-directional chargers and thus
	provide flexible services to the grid.
Hydrogen storage caverns	Memorandum of Understanding to investigate cooperation
	opportunities in the development of salt caverns for energy
	storage in Denmark.



Battery Parks	Battery parks 3 locations. Renewable energy sources, including
	solar and wind, contribute more to the Danish power supply
	every day. Often, the availability of these renewables varies
	based on the weather. Therefore, to integrate these resources
	into the grid, new technologies like battery energy storage are
	added to ensure availability and reliability.
Risø Gateway	Research environment to find energy solutions that are efficient,
	safe and future-proof, with research in a range of topics incl.
	storage.
Risø Hybrid Power Plant: DTU-	Hybrid power plant facility, Risø Hybrid Power Plant, integrating
TotalEnergies Excellence Centre	wind, solar, batteries, hydrogen, and power electronics
for Clean Energy (DTEC)	technologies is a crucial part of DTU's research into a more
	sustainable energy supply and an essential tool in the work to
	develop and test new technologies before they are scaled up.
Batter Energy Storage Systems	One of Denmark's largest battery energy storage systems (BESS)
(BESS)	as part of an advanced hybrid power plant. The facility, part of
	GreenLab Skive, is expected to be operational by the end of
	2025, providing ancillary and frequency control services to
	Danish TSO Energinet. This project will contribute to stabilizing
	the national grid while maximizing the efficiency of wind and
	solar power.
Second-Hand Tesla Battery for	Utilising batteries from damaged Tesla vehicles for grid
Grid Connected Energy Storage	stabilization, peak shaving. By combining several batteries
	together and implementing the needed control software and
	user interface to bring the batteries online on the grid. Battery
	management, control software, and interfaces will take
	advantage of existing solutions from the hardware vendors and
	enable integration with the smallest possible footprint.
The Kragerup project	Battery storage project that will provide operational experience
	in integrating battery solutions with the grid. Enabling European
	Energy to manage increasing volumes of renewable energy
	generated in Denmark, positioning itself to enhance the stability
	and resilience of the electricity grid.
Battery Storage Concept project	The Battery Storage Concept project develops and tests an initial
	concept for a container-based energy storage system using
	batteries (BESS). This is achieved through the flexible integration
	of commercially available battery packs designed for
	electromobility and the second-life application of these
	batteries. The Battery Storage Concept is being developed and
	tested in an experimental setup to create a concept for a
	Minimum Viable Product (MVP) that delivers enhanced



	customer value in segments like electric vehicle charging and
	renewable energy production.
HeatCheck Project	Coordinated by the Technical University of Denmark (DTU),
	HeatCheck focuses on developing AI-driven services to optimize
	heating systems in apartment buildings. By analyzing data from
	district heating companies and residential sensors, the project
	aims to enhance energy efficiency and support the integration of
	renewable energy sources. The project is funded by Innovation
	Fund Denmark and involves multiple partners, including DTU
	and various industry stakeholders.
Best4Grid	Best4Grid aims to enable the widespread implementation of
	green transport and the vehicle-to-everything technology. The
	project aims to enable the widespread implementation of green
	transport and the vehicle-to-everything technology, by providing
	technical solutions, a common legislative framework, business
	strategies, and a roadmap tailored for the Nordics. The project
	will strengthen the leading position of the Nordic region within
	green transport, while also providing a novel solution to attain
	grid stability.
Smart Fault - Prediction and	This project will develop a Diagnostics Tool for Automatic, Smart
Location for Distribution Grids	and Cost-effective Fault Prediction and Location in the Power
	Distribution Grids using data from smart meters. The tool will
	enable predictive maintenance which is more proactive and
	efficient than the currently used "wait until it breaks"
	maintenance approach in the electric power distribution grid.
EnergyLab Nordhavn	A Copenhagen residential area called EnergyLab Nordhavn is
	exploring innovative energy solutions for urban areas. A full-
	scale smart city energy lab, it demonstrates how electricity and
	heating, energy-efficient buildings and electric transport can be
	integrated into an intelligent, flexible and optimised energy
	system.
EcoGrid 2.0	The objective of the project is to demonstrate how end
	consumers through demand response can provide service that
	help the operation of the power system and overcome
	help the operation of the power system and overcome challenges introduced by renewable energy and new
	help the operation of the power system and overcome challenges introduced by renewable energy and new consumption from heat pumps and electric vehicles. The project
	help the operation of the power system and overcome challenges introduced by renewable energy and new consumption from heat pumps and electric vehicles. The project will be demonstrated on the unique Bornholm EcoGrid



GridScale	The energy storage reservoir that comprises crushed stones the
	size of peas stored in insulated steel tanks. When there is excess
	supply of electricity in the electricity grid, the storage is charged
	using a specially designed heat pump system which moves heat
	energy from one set of tanks to another. The stones get colder in
	the tanks from which the energy is taken, while they get a lot
	hotter in the tanks that receive the heat, up to a temperature of
	approx. 600 degrees C.
RemoteGrid	Smart Monitoring Makes the Grid Sustainable and Stable:
	Development of an effective method that uses existing
	electricity meters to ensure a stable supply of sustainable
	energy. Method that can help power companies ensure a secure
	and stable electricity supply using existing electricity meters.
	European energy project Net2DG.

Conclusion

Strengths

- Advanced integration of smart grids enables efficient balancing of fluctuating renewable sources, combined with high penetration of smart meters and a digital energy system
- General large supply of renewable energy providing opportunities for further grid integration

Weaknesses

- Grid Bottlenecks and Storage Limitations
- Increasing renewable penetration stresses the grid, especially in peak production.
- Energy storage solutions (e.g., batteries) are still scaling up (opportunity).

