Network development plan 2026–2035

About Svenska kraftnät

Svenska kraftnät is a state-owned transmission system operator, with the task of managing, operating and developing a cost-effective, operationally safe and environmentally sound transmission system. The transmission system includes 400 kV and 220 kV power lines with substations and interconnectors. Svenska kraftnät develops the transmission grid and the electricity market to meet society's need for a reliable, sustainable and cost-effective supply of electricity. Svenska kraftnät therefore plays an important role in the green transition.

Concepts and abbreviations

Day-ahead market – Also called spot market, auctions for each bidding area and hour the day before the electricity is to be delivered.

DSO – Distribution System Operator, entity responsible for distribution network (regional and local networks).

Power shortage – When there is not enough electricity generated to meet the electricity demand at a given moment.

Bidding area - Division into bidding areas is based on where there are transmission bottlenecks in the electricity grid. In Sweden, there are bidding areas SE1-SE4.

ENTSO-E - European Network of Transmission System Operators.

Flow-based capacity calculation - Method for calculating how much electricity can be transferred in the transmission grid, maximising the capacity available for trading.

Capacity constraints - Arise when the grid cannot transport enough electricity to a certain area, despite enough electricity in the system.

SMA- Short-term market analysis.

LMA- Long-term market analysis.

Target network - In this network development plan, refers to the measures that Svenska kraftnät is planning to meet capacity needs.

NTC - Net Transfer Capacity, a method whereby network limits are set without knowing how the market will trade, which requires safety margins to avoid overloads caused by market outcomes.

Network codes - Regulations from the European Commission, consisting of guidelines (minimum requirements) and network codes (detailed requirements).

Network development plan - Describes how the electricity grid of a network operator will develop over the next ten-year period.

PCI - Project of Common Interest, infrastructure projects of particular importance to the EU electricity and gas systems.

Region - In this network development plan, refers to Sweden's 21 regions, corresponding to earlier county councils.

Reinvestment - Renewal of infrastructure in line with current or new standards, technologies and technical specifications.

Series compensation - Equipment that increases the transmission capacity of lines and improves network stability.

Intersection - Boundary between bidding areas with limitations in transmission capacity.

Transmission grid - 400 kV and 220 kV grids for domestic and international transmission. Can also be called transmission network.

Synchronous area - Areas interconnected with AC power lines and thus having synchronised frequency.

Transmission network - See transmission grid.

TSO - Transmission System Operator, responsible for the national grid (in Sweden, Svenska kraftnät).

TYNDP - Ten Year Network Development Plan, European network development plan.

Foreword

Every two years Svenska kraftnät publishes a ten-year network development plan that focuses on the development of the transmission grid and reports on both ongoing infrastructure projects and ongoing needs assessments. In 2025, Svenska kraftnät received a new instruction that emphasises the societal development perspective, planning responsibility and security of supply, which entails a somewhat revised direction for our assignment. Svenska kraftnät will be responsible for coordinating the planning of the power system as a whole and having a long-term perspective on the electricity supply. With the 2026-2035 network development plan, we are taking an additional step in elucidating the conditions for the power system by creating a basis for dialogue about where in the power system large consumption centres should be located for fastest access to available capacity, where different types of generation are most beneficial for the system and where and when new establishments can be a part of the power system, and how the power system can thereby best benefit society and competitiveness.

Svenska kraftnät's well-functioning structural cooperation with regional grid operators on grid planning makes for efficient grid development. Structured forecasting development done jointly by Svenska kraftnät and the regional grid operators is the basis for planning and lay the foundation for increasing efficiency in the use of capacity in the electricity grids over time. This also makes it possible to establish a common view of future needs and connection possibilities.

The new instruction also highlights the need to deepen the societal development perspective. In recent years, Svenska kraftnät has established cooperation in energy planning with all counties and regions to enable faster processing of permits and connection. The goal of Svenska kraftnät is to create regional clarity and predictability, while focusing on ensuring security of supply and sufficient capacity in the power system. Our intention is to report changes and status regionally on an ongoing basis and for the overall network development plan to summarise the entirety every two years. Dialogue and collaboration are central to enabling the energy transition. In this, we need everyone’s contribution.

Thomas Pålsson
Director-General, Svenska kraftnät

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Summary

The 2026-2035 network development plan shows how Svenska kraftnät plans to support the energy transition and meet increasing electricity demand through measures in the electricity system over the next ten-year period. The plan also describes ongoing needs assessments based on long-term market analyses of future changes in the electricity system regarding electricity flows, electricity generation and electricity consumption.

There are four main motives for the development (share of Svenska kraftnät's planned investments in brackets):

- reinvestments in infrastructure reaching the end of its technical lifespan (45%)
- connections of new electricity generation and consumption (14%)
- system reinforcements for increased capacity and reliability (36%)
- market integration for more efficient electricity trading (5%).

Despite a decrease in Svenska kraftnät's connection queue, demand is still more than twice as high as the current peak load hour in Sweden. We believe that the decreased queue is due to a postponement of needs rather than an adjusted level of ambition. Reduced connection rates may allow necessary grid reinforcements to be built in time, but it is still important to work proactively with grid planning and connection applications. For the plans to be realised, it is important to work closely with various stakeholders, such as authorities, regional grid operators, municipalities and regions.

Svenska kraftnät will reinvest and reinforce the transmission grid throughout Sweden and to other countries, but with special focus on the following areas:

- increased transmission capacity between northern and southern Sweden to manage bottlenecks and enable connection of new generation and electricity consumption
- strengthened electricity supply in Norrbotten and Västerbotten to meet the major increase in electricity consumption expected in industry
- strengthened electricity supply to Stockholm and parts of Västra Götaland, which already have a strongly growing electricity demand
- connection of Gotland to the transmission grid.

In 2025-2035, Svenska kraftnät plans to put into operation approximately 2,900 km of new lines and approximately 40 new substations. In addition, we will reinvest around 1,100 km of lines and half of our approximately 200 substations. Investments will increase sharply in the coming years and are expected to amount to approximately SEK 20 billion per year in 2027 and 2028. This can be compared with an expected outcome of approximately SEK 9 billion in 2025.

1. Introduction

The energy transition presents major challenges for the power system and requires extensive investments. At the same time as several existing industries are planning to electrify their operations, electricity consumption in the metropolitan regions is increasing and new industries want to set up operations. In recent years, new electricity generation has been connected to a large extent and there are plans for further connections. In order to connect new electricity generation and consumption, Svenska kraftnät needs to invest in new infrastructure. These new investments coincide with the need to renew large sections of the transmission grid. Svenska kraftnät is working to implement the investments as efficiently as possible. Our network development strategy is based on coordinating measures so that new lines and substations, when possible, both increase capacity and replace equipment that is approaching the end of its technical lifespan.

The network development plan presents Svenska kraftnät's major grid development projects and ongoing studies over the next ten-year period. The content of this publication is based on the needs that we know today and that have either been investigated or are under investigation. As needs change, the plans may be adjusted.

Not only does the network development plan include descriptions of ongoing studies and projects, it also contains information about the motives for grid development, the interaction between society and the expansion of the electricity grid, and how flexibility in the power system can be used to cope with increased electricity consumption in combination with a larger proportion of weather-dependent electricity generation.

Over the next ten-year period, Svenska kraftnät plans to reinforce the transmission grid by both building new and reinvesting older infrastructure. The complete list of all major measures in the 2026-2035 ten-year period can be found in the section 10-year grid investment plan at the end of the network development plan.

2. Motives for grid development

Svenska kraftnät is developing the transmission grid to meet several different needs as efficiently as possible. We have chosen to group and present measures based on their main motives, although many of the measures we implement meet several different needs. The motives we use are reinvestments, connections, system reinforcements and market integration.

Reinvestments: Parts of the transmission grid are approaching the end of their estimated technical lifespan. Svenska kraftnät needs to renew a large number of lines and substations in order for the transmission grid to remain safe for personnel, operationally reliable and capable of transferring the amount of electricity that society needs.

Connections: Connections include the grid measures linked to external applications for connecting new or increasing existing electricity consumption and generation. That electricity demand in Sweden is expected to drastically increase in the coming years is supported by the rise in the number of connection applications to Svenska kraftnät over a period of several years. In some parts of the country, the total power requirement will significantly exceed what is currently consumed if all requests for connection of electricity consumption become a reality.

System reinforcements: System reinforcements are mainly the investments in the transmission grid that are carried out to increase capacity within a bidding area. The flow-based calculation method, see section 4.3, means that system reinforcements can affect the capacity provided to the electricity market. As Svenska kraftnät is seeing a sharp increase in both generation and consumption, in many cases at new locations, the need for system reinforcements will continue to increase. System reinforcement also includes investments related to operational security, such as keeping the voltage within predetermined limits or measures to manage fault currents.

Market integration: Market integration aims to increase or maintain trading capacity domestically and between Sweden and its neighbouring countries. The measures enable increased transfer from surplus areas to deficit areas. This helps increase the security of supply and a more efficient use of generation resources.

2.1 Reinvestments

There is a clear correlation between maintenance needs, such as equipment inspections and component replacements, and reinvestment rate. The aim is to prevent breakdowns as they risk affecting the availability of the power system, causing a negative impact on the environment or, in the worst case, affecting personal safety. However, it is important not to replace well-functioning installation parts too early since doing so increases costs. Active and systematic maintainance create favourable conditions for the longest possible lifespan for Svenska kraftnät's infrastructure. This results in a lower reinvestment rate and longer intervals between resource-intensive replacements.

Svenska kraftnät's policy for asset management is based on an installation's entire life cycle. Decisions are based on facts about the specific installation and an understanding of risks and how they can be managed. In order to cope with the high reinvestment rate ahead of us, the operations will develop with the aim of finding a good balance between the technical status of the installations, possibilities for outages, personal safety, environmental impact and costs.

Future needs drive the renewal of existing infrastructure

The premise is that reinvestments should be an integrated part of grid development, which means that when Svenska kraftnät replaces infrastructure, we make sure to take future electricity needs into account. Our studies may for instance show, that we

can connect more generation and electricity consumption by building lines and associated substations with a higher transmission capacity. Most of Svenska kraftnät's substation projects have several parties to consider, such as grid operators and producers, and we coordinate the reinvestment needs with them.

Installations with extended lifespan

There are several challenges when Svenska kraftnät renews while focusing on meeting future needs. One such challenge is that renewals that involve changes to the technical design of an installation (new investment) often take longer to investigate and implement than if an installation retains the same design as before the renewal (reinvestment).

Sometimes this means that Svenska kraftnät needs to keep existing infrastructure in operation for several years longer than originally planned. In order to operate the installation with a high level of supply reliability and personal safety until it can be replaced, the entire installation or parts of it may need to be remedied.

The costs of such measures are not negligible. However, the alternative of not implementing new investments and reinvestments in a coordinated manner would lead to a significantly higher total costs.

Historically high rate of renewal

Much of Svenska kraftnät's infrastructure was built in the 1950s, 60s and 70s, and the oldest installations are now approaching the end of their technical lifespan. During the next ten-year period, reinvestment measures will therefore be carried out in most of our construction projects.

Over the next ten-year period, about half of Svenska kraftnät's nearly 200 substations will be reinvested. Nearly 50 of them will be replaced, and in addition to this, a large number of individual components, such as control systems, perimeter protection and switchgear equipment, will be renewed in another fifty substations. The remaining substations are not in need of reinvestments, instead we are working with preventive maintenance there.

During this period, around fifty lines, a total of over 2,500 km, will be replaced. In the future, these reinvestments will constitute a growing proportion of the planned line measures.

2.2 Connections

The motive for a connection application may be, for example, connection of larger generation plants or a need for increased output as a result of establishing industries or reconstruction of the existing grid.

Connecting new generation or electricity consumption - or increasing the current level - often requires more or less extensive adaptations of the transmission grid. These vary from case to case, but may include new lines and substations or expansion of existing substations.

Principles for connecting to the transmission grid

To promote efficient grid utilization and cost-effective expansion of the electricity grid, connection should be made to the lowest suitable voltage level. Svenska kraftnät primarily refers new connection needs to existing distribution systems[1]. The transmission capacity and operational reliability of the transmission grid are always affected to varying degrees by connected installations. By gathering several installations into a common system, coincidence effects and more efficient grid utilization are facilitated.

The distribution systems connected to the transmission grid are usually regional grids. Multiple distribution systems in a substation would mean parallel electricity grids in the same geographical location, leading to increased costs for the customer base, increased land use and inefficient use of existing or planned infrastructure.

In the absence of a distribution system, a new connection to the transmission grid in most cases means that the applicant needs to build a line that meets the requirements in the Electricity Act and associated regulations. This also includes future connections according to the principle of lowest possible voltage level. Against this background, Svenska kraftnät usually signs new connection agreements with existing regional grid operators.

The connection process

The basic principle for allocating available capacity is first come-first served. This means that the applicant who first submits a complete application for a new connection or an extended contract will be offered available capacity first. In order to ensure efficient grid utilization and an appropriate connection process, each connection must have a

1. Regional and local grids

clearly described need. Svenska kraftnät continuously monitors progress - a reserved allocation can be lost if progress or deadlines are not met.

For each application submitted, Svenska kraftnät needs to study whether capacity exists or measures are required. The applicant's actual position in the queue is only determined after the study has been completed, but the first come-first served principle always applies. When the study has been completed and Svenska kraftnät has determined that capacity is available, the applicant is offered a pre-design agreement. The capacity is *reserved* when the pre-design agreement is signed. When the connecting party signs a connection agreement, the capacity is *allocated*.

Connection principles are continuously being developed

To elucidate the conditions for connection to the transmission grid, Svenska kraftnät prepares regional network development plans[2] based on an overall system perspective that show how much capacity is available for generation, electricity consumption and flexibility resources in each area over the next 10-15 years.

In order to meet the needs in time and ensure efficient use of the electricity grid, Svenska kraftnät is continuously developing the connection process and principles for handling applications. In parallel with the first come-first served principle described above, stakeholder pools are further developed. The latter are used for areas in which Svenska kraftnät deems a certain category of connections to be particularly suitable and that capacity can be reserved for that type of connection. Stakeholders express interest in available capacity in the stakeholder pool. The stakeholder to first reach maturity to connect based on a number of criteria, including obtained permits, will be granted available capacity. Stakeholder pools have already been developed for offshore wind power[3].

Svenska kraftnät also needs to develop prioritisations for connections that fit within the existing grid in areas with competition for capacity, as well as principles for reserving capacity for general societal growth.

2. Så planerar vi elnätet för framtiden | Svenska kraftnät

3. Anslutning av havsbaserad vindkraft | Svenska kraftnät

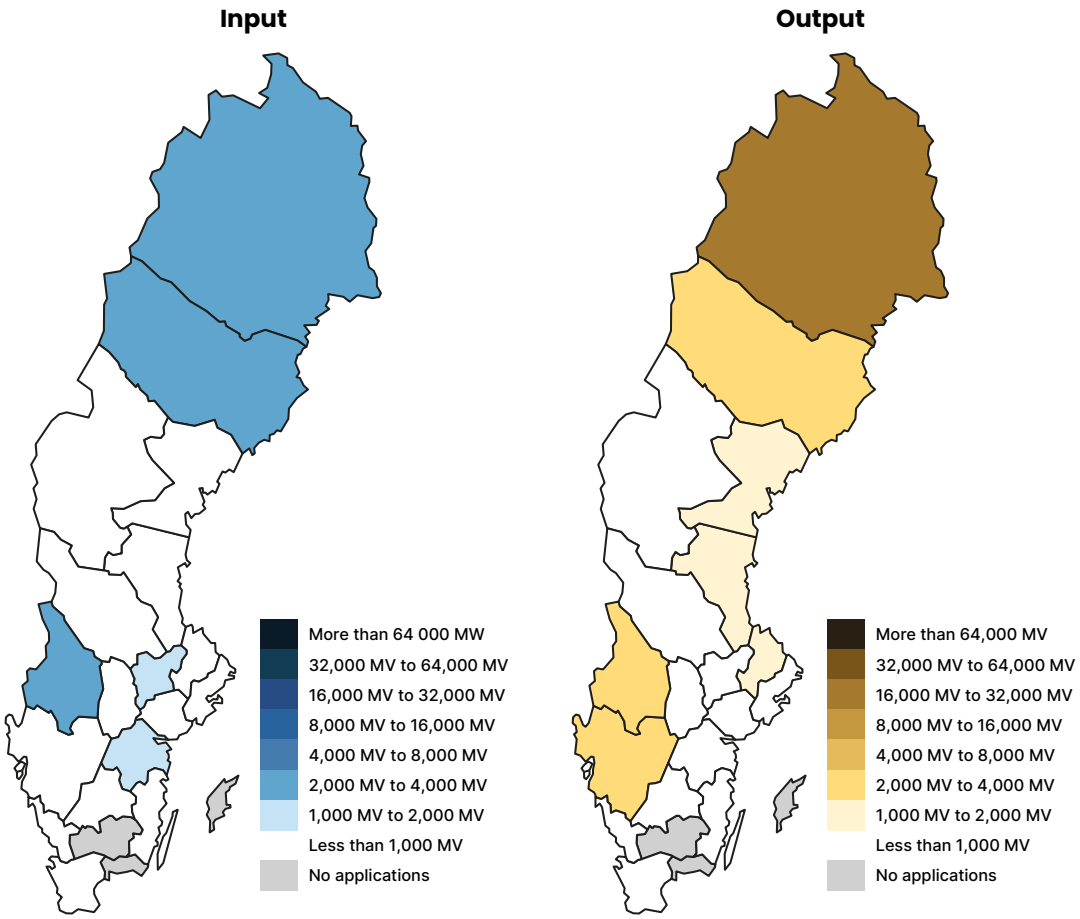


Figure 1. The maps show power applied for per region in Svenska kraftnät's application queue, i.e. until capacity has been reserved. Applications for offshore wind power are not included as they are handled in a separate process.

More and larger applications for connection

The number of applications for new connections to the transmission grid has increased both in number and, above all, in the total power per application.

The applications concern the connection of new generation, new electricity consumption and increased power consumption in existing connection points.

Application received, year	Power applied for, input, MW	Power applied for, output, MW	Number of applications
2020	19,411	7,624	38
2021	84,301	7,162	64
2022.	18,533	8,651	29
2023	34,605	23,501	58
2024	13,998	4,556	38
2025*	4,895	5,537	25

*up to and including September 2025

Table 1. Power for input (electricity generation) applied for, including offshore wind power, as well as output (electricity consumption) and total number of applications for the years 2020-2025.

In recent years, several major industries have begun an energy transition. It is often difficult to handle large electrical connections without implementing grid measures, which means that it can take time to meet the desired capacity requirement.

Total power applied for per connection type, 2020–2025

	Solar power generation	12,113 MW
	Onshore wind power	27,744 MW
	Offshore wind power	124,710 MW
	Other inputs	8,182 MW
	Energy storage	5,922 MW
	Industry	30,348 MW
	Other electricity consumption	23,755 MW

Table 2. Power applied for per connection type in 2020-2025, up to and including September. Other electricity consumption refers to data centers, general societal growth and electricity consumption not defined in the application. Other input refers to nuclear power, hydro power and input not defined in the application. In comparison, the peak load hour in Sweden in 2024 was approximately 25,000 MW and the total installed generation capacity was approximately 50,800 MW[4].

2.3 System reinforcements

System reinforcements mainly include investments in the transmission grid to increase capacity within bidding areas. For example, this could pertain to measures that involve adapting the transmission grid to increase the possibility of transferring more electricity generation from an area. It can also be measures that need to be taken to be able to increase the power consumption.

System reinforcements can be made, for example, by upgrading existing lines or building new lines and substations. System reinforcements also include components that stabilise the grid, such as voltage-regulating equipment.

As Svenska kraftnät is seeing a sharp increase in both generation and electricity consumption, in many cases at new locations and with an increased proportion of power electronics, the need for system reinforcing measures will continue to be high. It is important that individual parts of the electricity grid, so called bottlenecks, do not restrict the possibility of transferring the increased electricity generation in an operationally reliable manner.

In addition to the expected increase in electricity generation and consumption, flows through the electricity grid have also changed in recent years. This presents a challenge for both operating and planning the transmission grid. The previously typical north-south flow through Sweden has changed and an east-west flow has become more common. In the long term, for example, when offshore wind power is built along Sweden's coast, there may also be south-north flows on the eastern side of the country as well as west-east flows in the southern parts of the country.

Svenska kraftnät is currently working on identifying suitable connection points and available transmission capacity for offshore wind power[5]. There is also development and change within other types of power generation such as solar and nuclear power. With regard to nuclear power, Svenska kraftnät is studying connection of new nuclear power in Ringhals. Depending on the amount of additional input in the area around the Värö peninsula, further system reinforcements may be necessary. This is to enable transfer of power and to handle possible changes in flow that occur as a result of the establishment of new major sources of electricity generation. Solar power generation is often combined with battery storage and usually has less impact on the grid as the installations are geographically dispersed.

An increasing and more variable flow places higher demands on the transmission grid and can make it more difficult to predict future flows and probable scenarios, which is important as basis for long-term grid planning. Svenska kraftnät is therefore working to automate the use of simulated market outcomes from the long-term market analysis, see section 3.2, in grid planning.

4. Svensk elproduktion och installerad effekt 2024 – en regional översikt – Energiföretagen Sverige

5. Anslutning av havsbaserad vindkraft | Svenska kraftnät

2.4 Market integration

Market integration aims to increase or maintain trading capacity domestically and between Sweden and its neighbouring countries. The measures enable increased transfer from surplus areas to deficit areas and are becoming increasingly important as the proportion of weather-dependent electricity generation increases. Market integration contributes to increased security of supply and more cost-effective use of generation resources, resulting in smaller price differences.

Svenska kraftnät analyses the need for transmission capacity using electricity market models based on long-term scenarios for the Northern European power system, see section 3.2. Studies carried out in the international planning collaboration are also often an important part of the basis for decisions on grid investments that lead to increased market integration, see section 3.3.

In the coming years, changes that increase market integration within Sweden and with neighbouring countries will be put into operation. A new line between SE1 and Finland was put into operation at the end of 2025 and Svenska kraftnät will gradually reinforce the transmission capacity between SE2 and SE3, see section 4.6.1.2.

Svenska kraftnät's latest short-term market analysis[6] (KMA) came to several conclusions on power flows. The analysis is based on the data that was available at the time, such as additional electricity consumption, but that was in some cases subsequently revised by the relevant actors. Svenska kraftnät has received many applications to connect electricity-intensive industry in northern Sweden. Several of these are planned to be commissioned during the period 2025-2030, and we therefore expect the north-south flows to decrease at every intersection until 2029. From 2026, there will also be periods of northbound flows from SE2 to SE1. This is due to a significant increase in electricity consumption in SE1, while wind power in SE2 in particular is being expanded rather drastically during the period. The phenomenon will also intensify leading up to 2029.

Up to 2029, exports from SE1 to Finland will continue, but will weaken sharply from 2028. Net imports from Finland to SE3 will vary during the same period, but decrease and shift to marginal net exports from SE3 in 2029 as prices equalise between the areas. Over time, net exports to Denmark and Norway will also decrease slightly.

With the exception that the net flow between Finland and SE3 will change direction in 2029, the east-west flows will remain for the entire period, even if they will be lower in 2029. Sweden is estimated to remain a net exporter of electricity, but electricity exports will decrease from 52 TWh in 2025 to 16 TWh in 2029.

There are also factors that may contribute to changes in flows through the Swedish transmission grid in the longer term, including:

- Increased consumption flexibility and energy storage can help improve resource adequacy in southern Sweden.
- Establishment of new electricity generation in southern Sweden.
- Significantly increased electricity consumption in northern Sweden, also in the longer term, may lead to a need for increased capacity available for trading, primarily in intersections 1 and 4, but also towards Finland and Norway.

6. Kortsiktig marknadsanalys 2024

3. External developments and future outlook

The long-term design of the power system is influenced by political decisions, technological development and market conditions. Svenska kraftnät has two main responsibilities in this work:

- to ensure a robust and operationally reliable transmission grid with sufficient transmission capacity
- to develop the transmission grid by balancing societal benefits and impact on the environment.

Svenska kraftnät shall coordinate the planning of the power system as a whole and take a long-term perspective on electricity supply.

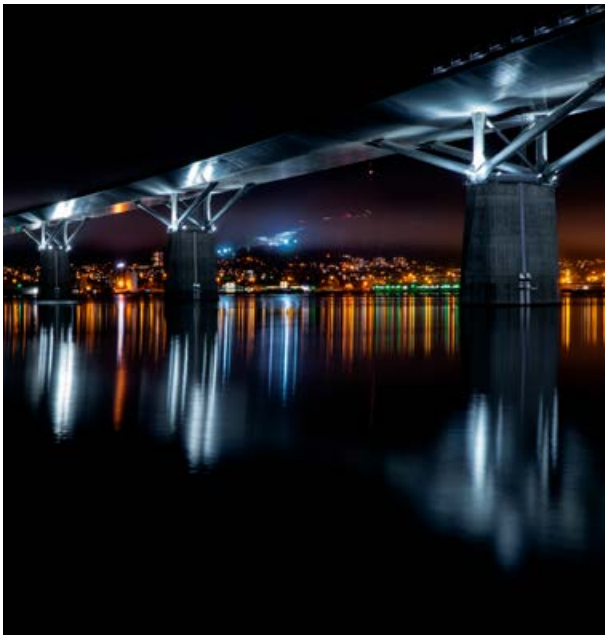
3.1 Interaction between society and infrastructure

The measures taken by Svenska kraftnät are not only changing the power system itself, but also society. We build lines and substations that affect both the environment and residents in the vicinity, and we connect renewable electricity generation that will reduce the climate impact. Increased transmission capacity has an impact on electricity prices and enables the energy transition and society to grow. All of these factors affect Svenska kraftnät's decisions on which measures to implement.

The societal benefit of Svenska kraftnät's mission is a secure electricity supply that enables welfare and growth, now and for future generations. The energy transition is central to solving the climate challenge, and Svenska kraftnät, together with other stakeholders in the sector, is critical for the ability to meet climate goals.

There is a clear expectation from the government, the various actors in society and the energy sector that Svenska kraftnät takes the overall responsibility for developing the power system and advocates proactive planning. This is also evident in Svenska kraftnät's updated instruction, where we get the responsibility for coordinating the planning of the power system as a whole and for the long-term electricity supply perspective. Many regions and companies have concerns regarding power shortage, that could impact business competitiveness and the ability to implement the energy transition.

In 2024, Sweden stated a planning target for meeting an annual electricity demand of at least 300 TWh by 2045, which is more than double the current electricity consumption. The most substantial increase is expected in industry. However, the energy transition has been heavily affected by continued recession and several companies have announced that they have revised their plans. At the same time, there are additional projects in the queue that have not yet been allocated capacity. Overall, there is considerable uncertainty about the future national electricity demand, both in terms of volume and time. Svenska kraftnät plans on an overall level based on the national planning target.



3.1.1 Measures for future electricity supply

While Svenska kraftnät meets new needs in the transmission grid, we need to maintain operational reliability, personal safety and power quality. When developing the transmission grid, Svenska kraftnät is upgrading existing lines and substations, building new ones and implementing other measures. One such example is the use of high temperature conductors. By replacing the existing phase conductors with conductors that can handle higher loads, we can increase transmission capacity in a resource-efficient way, without using more land or replacing towers.

Flexibility in terms of increasing generation or reducing consumption regionally, can mitigate capacity shortages, meaning that demand for electricity may be met during critical hours. To utilise this type of resource, it may be necessary to guarantee the availability of the flexibility resources in the long term, and in some cases directly control the resources when the measure needs to be implemented.

Svenska kraftnät assesses that all these measures, combined with the requirements we make on the equipment our customers connect, will be needed to meet the challenges we face. However, it is important to continue to expand the grid infrastructure in order to create a robust grid that meets requirements from a civil preparedness perspective and the various requirements set for developing electricity generation and consumption. More electricity generation is also required to meet the expected increase in electricity demand in the long term.

3.1.2 Socio-economic cost-benefit analysis

Svenska kraftnät's mission includes developing a socio-economically cost-effective transmission grid. Part of how we do this is by basing our investment decisions on socio-economic analyses and cost-benefit assessments.

Socio-economic analyses describe the effects of Svenska kraftnät's measures. When there are several measures that meet the needs, the socio-economic profitability determines which are chosen, among other things. The assessment includes costs for grid investments and other measures, socio-economic benefits such as, for example, a better functioning electricity market and improved security of supply, as well as the impact of the electricity system on the climate and the environment[7]. An investment is deemed to be socio-economically cost-beneficial if the benefits for society outweigh the costs and negative impacts that arise. Not all effects can be priced, i.e. described in SEK, but are then included as qualitatively assessed effects in the cost-benefit analysis. Svenska kraftnät's socio-economic analyses are similar to what many other public actors, such as the Swedish Transport Administration, base their decisions on.

Depending on the type and size of the grid measure, the scope of the socio-economic cost-benefit analysis may vary. However, regardless of the detail level of the analysis, Svenska kraftnät always ensures in the study and preparation phases that the planned measures are the most appropriate and cost-effective in relation to the impact they entail.

Ongoing efforts are being made to develop the methods used in the socio-economic analyses. In this work, Svenska kraftnät also follows the development of the analysis methods used within the European Network of Transmission System Operators, ENTSO-E, and adapts its methodology to governing requirements and directives from the Swedish Energy Market Inspectorate and the government.

When Svenska kraftnät makes investment decisions, the socio-economic cost-benefit analysis is an important aspect, but there are also other relevant factors. For example, there may be requirements or regulations, resource limitations, dependencies on other projects, etc. In other words, policy and investment decisions are made on the basis of an overall assessment that also covers aspects other than socio-economic cost-benefit.

3.1.3 Stakeholders and considerations

When Svenska kraftnät plans measures, there are several stakeholders to consider, such as landowners, national defence and a robust electricity supply. Some stakeholder interests are designated as national interests, which means areas, functions or resources that are particularly important for society as a whole, and should therefore be prioritised

7. Indirect consequences, such as climate benefits through the energy transition of industries or the labour market impact of new connections, are not assessed.

in spatial planning. The transmission grid is of national interest for the civilian part of the total[8] defence, as it is of crucial importance for the electricity supply of the civilian defence. This means, among other things, that permit processes for modernising or reinforcing infrastructure are facilitated.

At the beginning of 2025, the government decided on an amendment to the regulation on grid concessions, which clarifies that AC lines in the transmission grid should be built as overhead lines, unless special reasons justify underground cables[9]. There are several reasons to use underground cables restrictively. Overhead lines have higher availability, a longer service life and are more cost-effective for the AC connections of the transmission grid. The proportion of underground cables that can be built into the electrical system without risking power quality problems is also limited. Therefore, cables should only be used where it is not possible to use overhead lines.

Due to the sharply increased rate of expansion of the transmission grid, it can be expected that the current conflicts of interest between the need for electricity infrastructure and society's acceptance of it may persist or increase. Svenska kraftnät plays an important role in reducing potential conflicts of interest. That is why we work together with other stakeholders in society, such as county administrative boards, regions and municipalities, to identify conflicts of objectives at an early stage and, as far as possible, find solutions for differing interests.

Access to electricity and power is currently a prioritized issue at the national, regional and local levels. The national planning target involves a major expansion of the electricity grid, which has an impact both regionally and locally. Municipalities, which have decision rights in how land and water areas are used and built, need to make adjustments for the electricity grid to be expanded and to make it possible to achieve the planning goal.

Many of Sweden's municipalities are planning for new electricity-intensive operations, which in several cases means that the electricity grid must be reinforced to accommodate increased power consumption. At the same time, the expansion of the electricity grid entails considerable land requirements, which can pose a challenge for municipalities in balancing interests.

3.1.4 Regional and local collaboration

The expansion of societal critical infrastructure such as electricity grids and generation plants affects many stakeholders: municipalities, regions, authorities, electricity grid operators, business owners and property owners. The task is complex and bigger than each stakeholder and organisation can resolve on their own, which is why collaboration is crucial for success.

To implement the energy transition and the expansion of the electricity system required by the transition, Svenska kraftnät is developing its planning process to clarify the coordination between national, regional and local levels.

An important tool for developing and clarifying the planning process is the network development plans that both Svenska kraftnät and the operators of local and regional grids prepare. At the same time, there is a need for both interaction and collaboration between the grid operators' planning and the spatial planning that is based on the Planning and Building Act, and municipal energy planning. This creates predictability and facilitates effective coordination. Svenska kraftnät plays a central role in supporting municipalities and regions in this work.

Svenska kraftnät is strengthening the local and regional dialogue with new ways of working and work roles such as community contact, municipal contact and client relationship manager. Through dialogues, we establish and strengthen contact channels with county administrative boards, regions, municipalities and other important stakeholders in society. The aim is to create long-term relationships and, at an early stage, remove obstacles and find solutions that shorten the lead times for expanding the grid. This has been shown to lead to more efficient project execution with faster permitting processes. The aim is for Svenska kraftnät to be able to deliver capacity in line with needs.

Svenska kraftnät's extended planning responsibility means that we analyse any additional needs for structured collaboration to also cover national societal development perspectives.

8. MSB pekar ut elnät som riksintresse för totalförsvarets civila del | MSB

9. Regeringen pekar ut luftledning som huvudalternativ för utbyggnad av elnät på högre spänningsnivåer – Regeringen.se

Svenska kraftnät and the regional grid operators have been working together for some time to develop power forecasts for additional electricity consumption and generation. Well-founded forecasts create the conditions for having electricity grids in the right place, at the right time and with the right capacity, regardless of whether it is local, regional or transmission grids. Forecast collaboration also provides better conditions for co-planning regional networks and the transmission grid.

3.1.5 Consultation and permits

Consultation[10]

When Svenska kraftnät's analyses have shown that a new power line needs to be built, we study several alternative corridors - i.e. wider areas within which the new power line could be located. We collect data and engage in dialogues with concerned municipalities and county administrative boards, as well as other actors that may have decisive interests in accessibility, such as the Swedish Armed Forces and Sami villages. The corridor(s) that Svenska kraftnät deems most suitable go on to the next step: consultation.

Those concerned by the selected corridors will be invited to participate in the consultation and review the documentation prepared. The consultation documents are available on Svenska kraftnät's website, and we inform the public about the consultation through announcements in the local press and a public notice. The consultation documents describe, among other things, each corridor and our proposal for the positioning of the power line within it, the technology and type of towers we plan to use and how the power line can affect the surrounding environment.

During the consultation process, those affected by Svenska kraftnät's plans may submit statements. The consultation process is valuable for selecting a power line route with the least impact on residents and the environment.

When the consultation period is over, Svenska kraftnät compiles and responds to all received statements in a consultation report. However, the fact that all comments are addressed does not always mean that they lead to a change in our routing proposal. In any case, we explain our position in the consultation report.

Permits

A permit, known as a grid concession, is needed to build and operate electricity grids and is granted by the Swedish Energy Market Inspectorate. In addition to the grid concession, a number of other permits are required.

Svenska kraftnät is working intensively to shorten the lead times between identifying needs and commissioning a power line. A prioritised measure for permit work is increasing processing capacity. As a result of the sharply increased need to reinvest and reinforce the transmission grid, Svenska kraftnät has submitted significantly more permit applications than before. To achieve the goal of halving lead times, we are working with several processes in parallel instead of one after the other and have close discussions with the authorities concerned, such as the Swedish Energy Market Inspectorate.

Several important legislative proposals have been implemented to improve the effectiveness of the permit processes. The fact that the government has identified overhead lines as the main alternative for expanding the transmission grid is one such example. This makes it easier for the permit process to focus on ensuring that the solution that is ultimately chosen is the best one possible.

3.2 Long-term needs

3.2.1 Future scenarios

Investments in the transmission grid are often large, complex projects that take many years from identified need to commissioned installation. In order to put the right measures in place for the future at the right time, it is important to identify at an early stage what needs may arise in the longer term. To this end, Svenska kraftnät uses future scenarios that are updated every two years. Among other things, we use the scenarios in the long-term market analyses, LMA, that we prepare. The overall goal of LMA is to make it easier for us to plan and implement measures in time to meet the power system's needs.

Svenska kraftnät uses simulations in electricity market models to do analyses. The models are based on assumptions about, for example, electricity consumption, generation and transmission capacities, fuel prices and flexibility. Since the Swedish electricity system is interconnected with the European one, the models also need to include areas outside Sweden in order to provide usable results.

10. Samråd | Svenska kraftnät

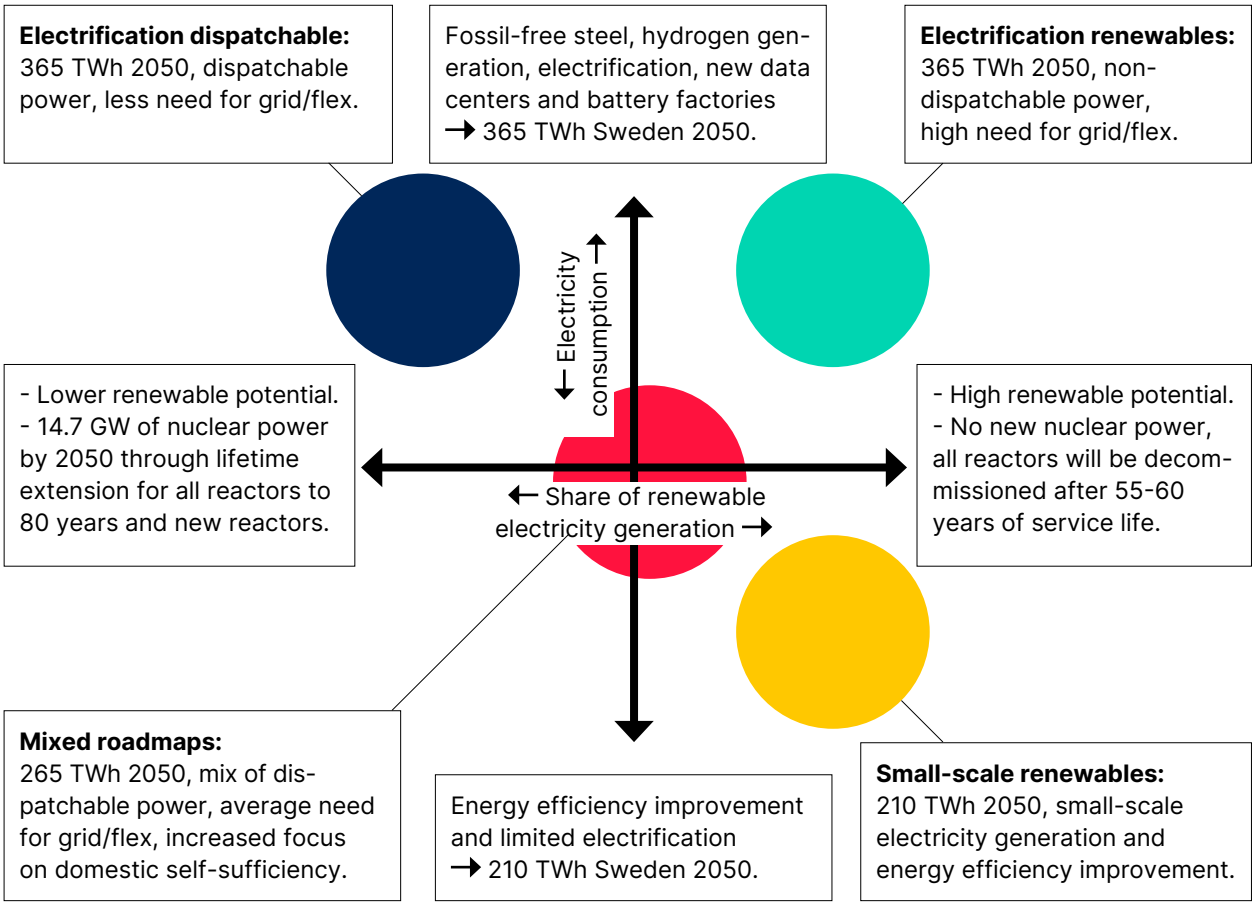


Figure 2: Illustration of scenarios in LMA2024. The main differences between the scenarios are the proportion of nuclear power and renewable weather-dependent generation (x-axis) and electricity consumption (y-axis).

By analysing simulation results such as prices, flows and electricity generation, Svenska kraftnät can create a clearer picture of the future need for transmission capacity and other types of measures, such as ancillary services. The scenarios are important in our analyses, where we compare different alternative measures to identify the most socio-economic cost-beneficial option.

The latest edition, LMA2024[11], was published in January 2024 and analyses four scenarios that show different development paths for the power system and what needs they may entail. The differences between the scenarios are the amount of electricity consumption and the proportion of weather-dependent generation, see Figure 2. In the scenarios, electricity consumption will increase from 135 TWh in 2023 to 200-343 TWh in 2045. On the generation side, there are two scenarios where nuclear power is decommissioned while making the assumption that there is higher potential for expanding weather-dependent generation, while the other two scenarios assume different levels of lifetime extension of existing nuclear power reactors and the construction of new nuclear power.

Since Svenska kraftnät developed LMA2024, several projects that drive the high electricity demand in the scenarios with the highest electricity consumption have been adjusted, which indicates that the high levels of electricity consumption will be postponed. Svenska kraftnät is now working on the upcoming long-term market analysis, which we plan to publish in early 2026.

11. Långsiktig marknadsanalys

3.2.2 Transmission needs

The future scenarios show a significantly changed power system compared to today. In scenarios with a major energy transition in industry in northern Sweden, the trade flow at intersection 1 is estimated to be reversed and go north on an annual net basis.

The transmission capacity will increase in intersection 2 as the investments in the NordSyd initiative are commissioned, see section 4.6.1.2. Despite these measures, and the fact that a larger proportion of generation in SE2 is needed to meet the electricity demand in SE1, the limitations at intersection 2 in the southern direction remain to varying degrees in all scenarios until 2045. In the scenarios where nuclear power remains, the number of hours of limited transfer is less than in scenarios with nuclear power decommissioned. This is a consequence of how nuclear power affects the annual electricity balance in SE3.

For intersection 4, there are limitations to varying degrees in all scenarios for both north and south flows. See section 4.6.1.3 for more information on intersection 4.

The electricity market benefit of interconnectors is high in the future scenarios. In general, the benefit of connections to the continent is greatest at lower electricity consumption, as in these scenarios a Nordic generation surplus remains, which results in significant price differences between Sweden and the continent. In the scenarios with higher electricity consumption, the price difference between Sweden and the continent decreases, which leads to relatively lower societal benefits for new connections to the continent. Instead, the societal benefit will be greater by increasing the capacity between SE1 and adjacent bidding areas, see also section 4.6.1.1 for more information on intersection 1.

3.2.3 Resource adequacy

To analyse resource adequacy, the entire Northern European power system is simulated. The simulation is done for a large number of weather years (with correlating historical temperatures, water inflow, wind and solar irradiation). Outages of generation plants and interconnectors are randomised hourly based on data that reflects real availability. When generation and imports are not sufficient to meet electricity consumption, there is a risk of power shortage, which is expressed in a key figure called loss of load expectation (LOLE).

The model results show that flexibility is necessary for a functioning future power system, where weather-dependent electricity generation will account for a large degree of the generation, even with continued development of dispatchable electricity generation.

The analyses of resource adequacy in Sweden show that increased electricity consumption without significant flexible volumes in the power system will be untenable as early as 2035 and the problem will be amplified by 2045. It is worth noting that since Svenska kraftnät carried out the analysis, several energy transition projects have either been postponed or cancelled, which improves the situation for resource adequacy for both analysis years. However, the fundamental need for flexibility remains even if is postponed.

In the long-term scenarios studied, Sweden is completely dependent on there being a great deal of flexibility in the power system, as well as on imports from our neighbouring countries, during periods of system stress. Flexibility in the electricity system can be achieved through adapted electricity consumption as well as energy storage or flexible electricity generation.

3.3 International cooperation

In recent years, it has become clear that the fastest, most cost-effective way to manage the energy transition and achieve the climate goals is through electrification, and in some industries the use of hydrogen. Increased electricity consumption in a power system with increasingly weather-dependent generation, combined with a reduced proportion of dispatchable production, necessitates a strong and flexible interconnected electricity system, which requires more national and international connections.

Svenska kraftnät is part of the European Network of Transmission System Operators, ENTSO-E - a collaborative body of 40 transmission system operators in Europe. ENTSO-E works to ensure that the operation of the European electricity system is coordinated and safe all hours of the year. It also plays a key role in enabling Europe to become the first climate-neutral continent by 2050.

What is required to succeed in this are common regulations and markets (network codes[12]), analyses of whether resources in the electricity system meet demand (resource adequacy studies, ERAA[13]) and

12. Network Codes Home

13. ERAA – European Resource Adequacy Assessment

network development plans (TYNDP[14]). ENTSO-E develops both a common European network development plan and regional development plans with a more detailed description of challenges and projects in individual regions. The European network development plans are based on future scenarios that describe different development paths to achieve climate neutrality by 2050. ENTSO-E and ENTSOG (the equivalent for gas operators) develop these together.

In addition to collaborating with ENTSO-E, there are a number of other initiatives, for example around the Baltic Sea:

- Baltic Energy Market Integration Plan (BEMIP), led by the European Commission and working to integrate the Baltics with the European electricity markets
- The Baltic Offshore Grid Initiative works on developing offshore wind in the Baltic Sea and the infrastructure this requires.

3.3.1 Projects of common interest

The EU Regulation 2022/869 on trans-European energy infrastructure defines geographical areas, so-called trans-European corridors, and infrastructure areas that are particularly prioritised for development. This is to limit climate change, achieve the Union's energy and climate targets for 2030 and the goal of climate neutrality by 2050.

In accordance with the regulation, ENTSO-E develops future scenarios and socio-economic analyses of the projects included in prioritized corridors that have been approved for inclusion in the common network development plan, TYNDP. These analyses are used as a basis when the European Commission assesses which projects should be given the status of Projects of Common Interest[15] (PCI). PCI projects are on the Union list and are cross-border infrastructure projects that have been assessed to contribute to the EU's energy and climate goals. Having PCI status should facilitate and speed up project planning and permitting processes, allowing new infrastructure to be deployed faster. The projects can also be granted funding from the EU's Connecting Europe Facility (CEF).

Svenska kraftnät actively participates in developing projects and reports projects to TYNDP together with other European system operators.

In addition to the area of "transmission of electricity", where Svenska kraftnät mainly operates, the regulation also covers the area of "storage of electricity". For a project in the latter category to achieve PCI status and ultimately be eligible to apply for CEF funding, it must be included in the national network development plan of the country in question. This is to show at an early stage that the project is supported by the transmission system operator. To enable the projects to obtain PCI status, this network development plan therefore includes projects that Svenska kraftnät supports in the area of electricity storage. For the electricity system, electricity storage is positive as it is a flexibility resource, see also section 3.1.1.

Fortum Sverige AB plans to commission the following storage projects in 2033:

- pumped storage project Lekstjärnen, Dalarna
- pumped storage project Bastsåpen, Värmland
- pumped storage project Höljessjön, Värmland

3.4 Civil preparedness

Svenska kraftnät is currently implementing various initiatives to strengthen civil preparedness within energy supply. We do this partly through our power supply preparedness assignment, and partly within our own operations through our assignment as system operator for the transmission grid and emergency preparedness authority for energy supply. Svenska kraftnät is also an emergency preparedness authority in the field of electronic communications/mail, due to the substantial telecommunications network we operate and manage.

As an example, Svenska kraftnät received an extended assignment in 2024 in terms of the reintroduced civil duty for electricity supply: to train and assign 1,000 civilians to wartime positions by 2028. The first were assigned and trained in 2025.

However, this network development plan focuses on how Svenska kraftnät takes the preparedness perspective into account in the long-term development of the power system. Read more about Svenska kraftnät's work related to total defence on our website[16].

14. ENTSO-E – The reference for the future European electricity system
15. Projects of Common Interest | www.acer.europa.eu
16. Totalförsvar | Svenska kraftnät

Ongoing climate change and the deteriorating geopolitical situation in Sweden's immediate vicinity underline the need to transform society to meet new conditions. As a consequence of the changes, several major decisions have been made in recent years to strengthen the Swedish total defence, which includes both civil and military preparedness, and its ability to handle serious social crises and, in the worst case, war. The Defence Decision 2025-2030[17] is the most vigorous reinforcement of total defence since the Cold War. Sweden is quickly ramping up and making major investments in both civil and military defence.

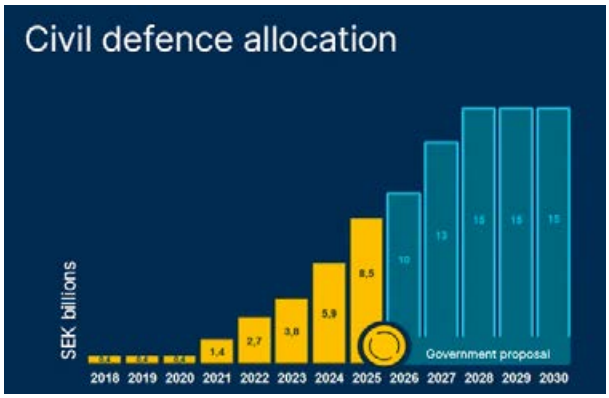


Figure 3. Extension of allocation to civil defence in accordance with the Defence Decision 2025-2030[18].

The decision elucidates that the civil defence shall be based on the requirements imposed by war and that the transition must be characterised by the ability to act and prioritise measures that have the greatest immediate effect and thus enhance capacity within the most important societal functions. A number of Sweden's emergency preparedness sectors are identified as particularly important, and energy supply is one of these.

Svenska kraftnät adopted an enterprise-wide preparedness target in 2024:

Preparedness targets

Svenska kraftnät has the ability, today and tomorrow, to meet society's electricity needs, regardless events or the societal conditions, in cooperation with the actors of the electricity supply system.

The target applies to all operations within Svenska kraftnät. For long-term grid development, the aim is to integrate the perspectives that the changing geopolitical situation entails into regular processes, procedures and criteria for developing the power system.

International experience is important in the work to strengthen Svenska kraftnät's capacity and achieve our goal of providing the electricity society needs. For example, on behalf of Svenska kraftnät, FOI has analysed the ongoing war of invasion in Ukraine and its impact on the energy supply[19].

Since the Defence Decision clearly states that Svenska kraftnät should dimension its operations based on the requirements of war, work is underway to ensure that our principles and criteria for regular long-term grid development support this direction. In the long term, this will result in a power system with increased capacity to provide the electricity society needs. If necessary, we make decisions on direct capacity-enhancing measures where deemed appropriate based on, for example, experiences from Ukraine.

17. Försvarsbeslutet 2025–2030 - Regeringen.se

18. Presentation slides from press conference on 15 October 2024

19. Ukraina står emot angrepp på kraftsystemet – Totalförsvarets forskningsinstitut – FO

4. Transmission capacity

Energy transition increases the demands on the electricity system, which means that its ability to transfer enough electricity is increasingly in focus. Transmission capacity is a measure of how much a system, for example an electricity grid or a road network, can transport within a certain period of time. If the system is not able to move as large quantities as needed, there are limitations in the system's transmission capacity.

4.1 Domestic and cross-border constraints

Bottlenecks arise where there are limitations that prevent the transmission of the amount of electricity the market demands. Bottlenecks could be caused by physical limitations on how much electricity transmission lines can safely transmit. Bottlenecks can also occur when there is a risk of instability in the power system. If the transmission of electricity is high when a fault occurs, the electrical system may become unstable. This can lead to the electrical system not being able to maintain the voltages, causing a voltage collapse.

Since 2011, Sweden has been divided into four bidding areas: SE1, SE2, SE3 and SE4, see Figure 4. The division into bidding areas is based on where there are bottlenecks in the Swedish transmission grid. The two northernmost bidding areas, SE1 and SE2, currently have a generation surplus, primarily from hydropower and wind power. SE3 and SE4 usually have greater electricity consumption than available generation. In order to achieve balance, electricity must be transported from surplus areas to deficit areas, which can take place both within the country and via interconnectors.

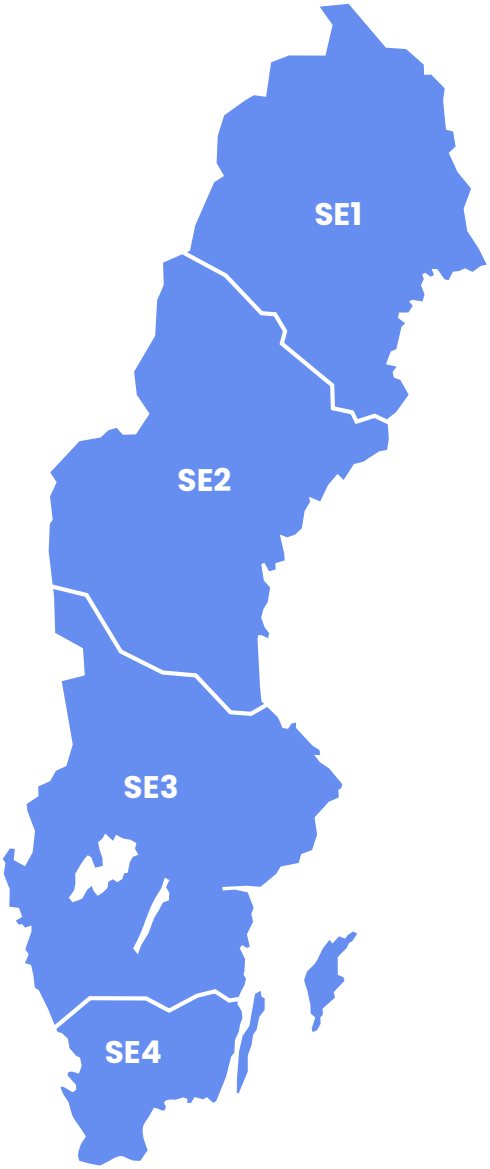


Figure 4. Sweden's division into bidding areas.

The bottlenecks are often referred to as intersections and in the Swedish transmission grid there are mainly three[20]: intersection 1 between SE1 and SE2, intersection 2 between SE2 and SE3 and intersection 4 between SE3 and SE4.

Svenska kraftnät is investing in modifications and extensions as well as other measures to reduce or eliminate bottlenecks. One example is the NordSyd initiative, see section 4.6.1.2, which is updating and reinforcing lines passing through intersection 2. Another example is the introduction of new calculation methods that contribute to more efficient use of the electricity grid.

The Swedish transmission grid is closely interconnected with the transmission grids of surrounding countries, either via AC or DC connections. AC connections are used when both countries' transmission grids are in the same synchronous area[21]. High Voltage Direct Current (HVDC) connections are used to transfer electricity between different synchronous areas. HVDC connections can also be used to transmit electricity over long distances. The Swedish transmission grid currently has HVDC connections to Finland, Denmark, Germany, Poland and Lithuania[22] as well as between SE3 and SE4.

The interconnectors make it possible to use the cheapest available electricity generation in the Northern European electricity system. They can also help to increase operational reliability by offering support in the event of faults in the Swedish electricity system.

4.2 Targets for increased transmission capacity between Sweden's bidding areas

In September 2024, Svenska kraftnät reported on the government assignment "Targets for increasing transmission capacity between Sweden's bidding areas"[23]. The targets indicate the least the transmission capacity in the transmission grid should increase to meet the increased electricity demand resulting from the energy transition, and take into account that the government deems that Sweden needs to plan for an electricity demand of at least 300 TWh by 2045. Svenska kraftnät has developed target levels for maximum reliable transmission per intersection for 2030, 2035, 2040 and 2045, see Table 3. For comparison, the maximum allocated capacity for trading during the period 2021-2023 is also reported.

Maximum allocated capacity for trading 2021-2023 [MW]		Transmission capacity target levels [MW]			
		2030	**2035**	**2040**	**2045**
SE1→SE2	3,300	3,300	3,300	3,700	4,000
SE2→SE1	3,300	3,300	5,500	6,500	7,500
SE2→SE3	7,300	8,100	9,600	10,500	10,500
SE3→SE2	7,300	7,300	7,300	7,300	7,300
SE3→SE4	5,600	6,200	6,200	6,200	6,200
SE4→SE3	2,800	2,800	3,300	3,500	3,600

Table 3. Target levels for maximum transmission capacity between the Swedish bidding areas.

20. Intersection 3 goes through SE3 and is used internally within Svenska kraftnät to monitor the east-west flow.

21. The Nordic synchronous area consists of Norway, Sweden, Finland and Zealand in Denmark.

22. The connection to Germany is not owned by Svenska kraftnät, the other connections are co-owned by the concerned countries' transmission system operators.

23. Mål för ökning av överföringskapaciteten mellan Sveriges elområden

The targets were developed based on an assessment of the market's future capacity needs with the support of market simulations in Svenska kraftnät's planning scenarios, see section 3.2. The target levels were selected by using a threshold for the maximum average price difference between bidding areas. Thus, the target levels have not been based on a socio-economic cost-benefit analysis, but should be seen as reference values to be used as a basis for grid and system planning.

4.3 Flow-based capacity calculation

In October 2024, a new method for calculating and allocating capacity for day-ahead trading, flow-based capacity calculation[24], was introduced in the Nordic region. In addition to affecting all stakeholders on the electricity market - consumers, producers and electricity traders – this also affects how Svenska kraftnät will work with grid development in the future.

The major difference between the previous NTC method and the flow-based method is that the transmission capacity in the transmission grid can be set per line instead of per bidding area boundary. This way, the electricity grid can be used more efficiently, which means that more electricity can be transferred on average.

Since the capacities and contract levels set in the planning stage will be relevant in future operating situations, it is important that the working method for planning is similar to that used for electricity system operation. This is one reason for why grid development processes at Svenska kraftnät are undergoing a change that will result in using more flow-based methods and principles.

The flow-based capacity calculation method involves analysing larger amounts of data. This is a challenge, but above all it offers opportunities to study in more detail, for example, how a grid change will affect the electricity market. Svenska kraftnät expects that electricity grid studies carried out at the planning stage will have a stronger link to electricity market studies. Among other things, they can show how often certain consumption takes place at a transmission grid substation or what impact consumption at one connection point can have at another connection point.

The development of the working methods we use in electricity grid planning is driven by the changes that have taken place in the electricity market and in the operation of the electricity system. The flow-based capacity calculation method leads to more data-driven processes, which gives us better insight into how planned grid measures affect the electricity system.

4.4 Capacity for new connection

The need for grid capacity is high as a result of the energy transition. However, between January and May 2025, the amount of requested capacity has decreased in Svenska kraftnät's connection queue, both for the connection of installations for electricity consumption and for the connection of onshore generation plants.

There are several reasons why the volumes in the connection queue have decreased. One explanation is that Svenska kraftnät has managed queues more actively over the past year through increased dialogue, requirements for and follow-up of maturity levels, and that the same projects are not managed at several places in the grid structure. As a result, applications have been closed. Another explanation is that operators view the market conditions as not being favourable enough, thus withdrawing their applications. Overall, the volumes that have disappeared from the queue have been higher than newly added connection requests.

Despite the connection queue having decreased since the turn of 2024/2025, the demand for connection power is still more than twice as high as the current peak load hour in Sweden. However, Svenska kraftnät sees the reduced queue as a sign of a delay in needs rather than a change in ambition level. The reduced connection rate may enable necessary grid reinforcements to be ready to better meet the needs. However, it will continue to be important to work proactively and develop new ways of working with both grid planning and connection request management in order to meet the needs of the connection queue.

24. Flödesbaserad kapacitetsberäkningsmetod | Svenska kraftnät

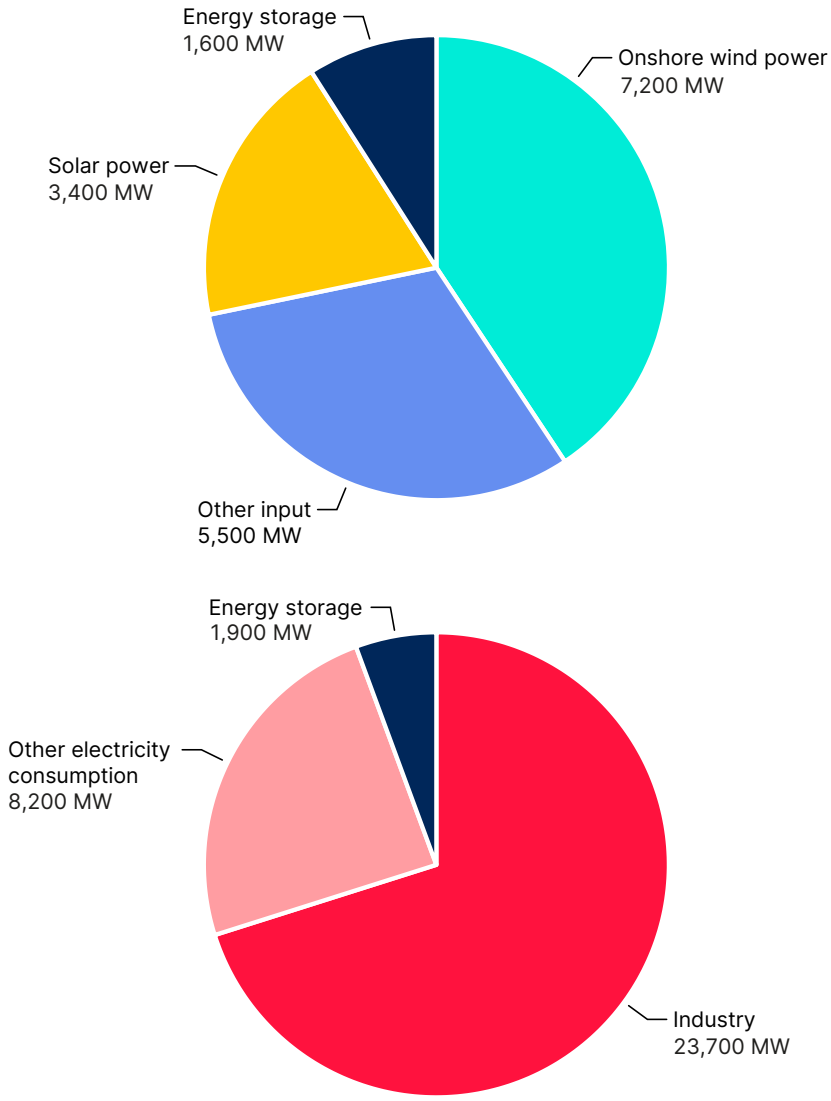


Figure 5. Power applied for per connection type for input (electricity generation) and output (electricity consumption). The pie charts show Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

4.4.1 Planning for increased electricity consumption

In February 2025, Svenska kraftnät reported on the government assignment "Planning for increased electricity consumption"[25]. Our mission was to report on how cooperation with regional grid operators on grid planning is organised and how it has developed, and to make it visible to electricity market actors where connection to the electricity grid should take place for electricity users, electricity generation and flexibility resources in order to contribute to a more efficient expansion of the electricity system.

In the report, Svenska kraftnät describes a well-functioning structural cooperation between the regional grid operators and us in terms of grid planning and that this creates the conditions for efficient grid development.

Svenska kraftnät also described two long-term regional network development plans, Norrbotten and Västerbotten Counties and Skåne County, to show how we work to increase transparency towards electricity market stakeholders. Work is ongoing at Svenska kraftnät to highlight the remaining counties, with the aim of presenting a national map with long-term regional network development plans in 2026. The network development plans will be updated every 2-3 years.

25. Planering för ökad elanvändning

4.4.2 Conditional connection agreements

The flexiN[26] potential study and the previous government assignment "Efficiency of the process for connection to the transmission grid"[27] clearly showed that new types of connection agreements are needed to support the energy transition and to contribute to more efficient use of the electricity grid and faster new connections. Conditional connection agreements are one of the proposed measures in the report for the government assignment.

Conditional connection agreements

Conditional connection agreements are a temporary measure to connect actors before the necessary network measures are in place. To ensure operational reliability, conditional connection agreements are required. Conditional connection agreements contain agreed conditions for limiting and controlling inputs to and outputs from the transmission grid. The terms of the agreement mean that Svenska kraftnät can ensure that additional capacity can be reliably connected for a temporary period.

The introduction of conditional connection agreements would contribute to the objective of a transmission grid with high availability and sufficient capacity through more efficient use of available capacity.

In a feasibility study, Svenska kraftnät has analysed whether capacity can be allocated before the necessary grid reinforcements have been implemented, on the condition that the connection is curtailed if there is an overload or if a risk of overload occurs. An important part of the feasibility study was to study how this type of connection agreement can be handled in practice in the operational phase. Managing full-scale implementation proved to be impossible with the systems and tools available today. Therefore, conditional connection agreements should be tested to a limited extent initially. Then, broader implementation can be assessed.

Svenska kraftnät sees that conditional connection agreements at transmission grid level are advantageous because:

1. actors can connect earlier in areas with high connection demands where grid reinforcements are necessary to meet the need for power
2. it reduces the risk of delayed network reinforcements affecting connecting parties and, where applicable, their customers
3. connecting parties and, where applicable, their customers are given better opportunities to make their final investment decisions.

As conditional connection agreements can currently only be introduced to a limited extent, a selection needs to be made. If the grid structure is complicated, it is difficult to attribute overload to a specific connection. In such cases, it is not possible to select an application in that area, as it cannot be ensured that the connection with the conditional connection agreement is the one that needs to be curtailed.

In selecting, the time at which the connecting party needs capacity is important, as the need should be in the near future (2026-2030). Svenska kraftnät also believes that a conditional connection agreement needs to lead to commissioning being brought forward by at least two years in order to be relevant for selection. The connecting party must also be flexible in terms of the conditions that may apply.

Finally, Svenska kraftnät needs to take into account the prevailing first come-first serve principle. If the party that is next in line does not have the opportunity or does not want to be flexible in line with the terms and conditions of the connection agreement, the next party in the queue may be considered for the allocation of conditional capacity.

For the applications that Svenska kraftnät deems relevant for conditional connection, a more in-depth study will be required for each specific connection in order to determine whether the conditions can be met, the scope of conditions, when in time curtailing may be relevant and how curtailing should be implemented.

The conditional connection agreements that Svenska kraftnät can introduce are not permanent, but rather a transitional solution for allocating power in part or in full before the necessary grid reinforcements have been implemented. Subsequently, the conditional connection agreement will transition into a connection agreement in which the allocated power can be used continuously without curtailing.

26. flexiN

27. Effektivisering av processen för anslutning till transmissionsnätet

Curtailing linked to conditional connection agreements applies in the normal state when there is a risk of overload. For other operational statuses, it is already possible for Svenska kraftnät to take action, for example through network protection[28].

As conditional connection agreements are not a market-based method, they will only be used when there are no market-based alternatives, or when they are already in use.

Initially, no priority will be given to connections that have the option of controlling their electricity consumption. Conditional connection agreements will also not result in any reduction in the connection fee, grid tariff or adjustment of costs for imbalance if curtailing becomes relevant.

4.5 Co-planning of electricity and hydrogen networks

Hydrogen could play an important role in Sweden's energy transition and enable the transition in sectors that are struggling to reduce emissions in other ways, such as the iron/steel industry and heavy transport. In Svenska kraftnät's long-term market analysis from 2024, electricity consumption for the generation of fossil-free hydrogen accounts for no less than 87 TWh of the total annual electricity consumption of 350 TWh in 2045. Much of the hydrogen demand is expected to arise in the regions Västernorrland, Västerbotten and Norrbotten.

As it is challenging to expand the electricity grid to the extent required for all hydrogen generation to take place close to the end user, hydrogen grids are an interesting complement or substitute for electricity grids. By building hydrogen pipelines, hydrogen can be sent to end users from places where there is electricity grid capacity for hydrogen generation. Hydrogen pipelines have the potential to transfer larger amounts of energy compared to electricity lines and are normally underground, which means reduced land intrusion. However, they also present a number of other technical challenges compared to electricity transmission.

In 2024, the government commissioned Svenska kraftnät to propose how electricity and hydrogen infrastructure can be co-planned, and to present a plan for the expansion of electricity and hydrogen infrastructure at transmission level for Norrbotten and Västerbotten Counties[29] .In this assignment we deemed that the mutual dependence between electricity and hydrogen networks in an energy system with fossil-free hydrogen means that it is not possible to expand one infrastructure without taking the other into account. Through infrastructure integration, we believe there is potential to develop a more efficient and robust energy system.

In the report to the government, Svenska kraftnät proposes a method that involves fully integrated planning of electricity and hydrogen infrastructure at transmission level. At this time, it is difficult to determine whether the combination of hydrogen pipelines and electrical systems will be socio-economically efficient. This is because there is considerable uncertainty about the final scope and schedule of the industrial initiatives that lie behind the future hydrogen needs.

4.6 Current situation and future per region

The following subsections present overall planning assumptions and ongoing studies and transmission grid projects in Sweden's regions. The introductory subsection, 4.6.1, describes Svenska kraftnät's ongoing work to reinforce transmission capacity in the three internal transmission intersections 1, 2 and 4.

The regional subsections, 4.6.2-4.6.13, have the following headings:

1. **Current situation**
   Describes the existing transmission grid in the region and what characterises the electricity system, e.g. if more electricity is produced than is consumed.
2. **Needs**
   Specifies the needs that drive grid investments in the region, such as reinvestments or electrification of industry.
3. **Target network**
   Presents the measures Svenska kraftnät is planning in the region to meet new capacity needs.
4. **Uncertainties and upcoming work**
   Describes uncertainties in planning and ongoing studies of measures to meet future needs.

28. Functions that automatically intervene in the event of a weakened grid or in the event of operational disruptions.

29. Svenska kraftnät ska samplanera el- och vätgasinfrastruktur i norra Sverige – Regeringen.se

In many of Sweden's regions, a large part of the transmission grid's ongoing development is linked to planned wind farms, industrial projects or other large-scale electricity consumption or generation. For several of these establishments, there is currently great uncertainty regarding both the final scope and schedule, partly due to challenging business conditions.

In order for measures in the transmission grid to be less dependent on individual actors and to reduce investment risk, Svenska kraftnät strives to ensure that the grid measures we take can meet several needs at the same time. When reinvesting our lines, for example, we usually also carry out capacity upgrades to enable new connections.

4.6.1 Development of the Swedish internal intersections

Section 4.2 presents target levels for the development of the transmission capacity for the three intersections. However, after the introduction of flow-based capacity calculation, see section 4.3, it is worth noting that it is normally no longer the capacity at the intersections that controls trade flows and price differences between bidding areas. Instead, it is typically individual objects, such as a line, that affect which trading outcomes can be permitted from an operational reliability point of view.

4.6.1.1 Intersection 1

Intersection 1, i.e. the border between the SE1 and SE2 bidding areas, is located in Region Västerbotten. The transmission intersection currently consists of four 400 kV lines that connect substations along the Skellefte river with substations along the Lule river. There is a high-set objective to gradually increase the transmission capacity at the intersection, especially in the northward direction, see section 4.2.

The western part of intersection 1 was built in the early 1950s and will thus reach the end of its technical service life at some point in the 2030s. Svenska kraftnät is currently working on a long-term action plan to address reinvestment needs and increase capacity at the intersection. An initial decision on the reinvestment in the aging western route was probably made before this report was published.

With regard to new investments, Svenska kraftnät assesses that a reinforcement of the route along the coast is most likely. In addition to contributing to higher transmission capacity at intersection 1, grid expansion close to the coast also increases capacity for connection in coastal municipalities such as Boden, Luleå, Piteå, Skellefteå and Umeå. Decisions on completely new lines in intersection 1 can probably be made during the period 2026-2027.

4.6.1.2 Intersection 2

Intersection 2, i.e. the border between the SE2 and SE3 bidding areas, is Northern Europe's largest transmission intersection. It consists of eight 400 kV lines and three 220 kV lines. Intersection 2 passes through the regions Dalarna and Gävleborg.

The three 220 kV lines and three of the eight 400 kV lines will reach the end of their technical service life in the 2020s and 2030s. In addition, there is a need to increase the transmission capacity in the intersection in order to reduce differences in electricity prices between northern and southern Sweden. Today's 400 kV lines are equipped with so-called series compensation systems. It is an effective way to increase transmission capacity and improve grid stability, but also presents technical challenges for new connections along the lines.

In 2018, Svenska kraftnät launched the NordSyd initiative,[30] which renews and reinforces intersection 2. Within NordSyd, we are reinvesting the six oldest intersection 2 lines, which will be replaced by four double 400 kV lines in the four transmission branches Uppsala, Västerås, Karlstad and Hallsberg. NordSyd is Svenska kraftnät's most extensive grid development initiative ever, affecting a total of nine regions in central Sweden. The new 400 kV lines will not be equipped with series compensation substations, which will facilitate new connections along the lines in the future.

When the entire NordSyd project is completed by the end of the 2030s, the transmission capacity will have increased at intersection 2 from the current 7,300 MW to approximately 10,500 MW. In addition to reinforcing intersection capacity, the construction of the new lines will increase the regional grid capacity, enabling the connection of new electricity consumption and generation.

Uppsala branch

The Uppsala branch is the easternmost of the four transmission routes in NordSyd and consists of double 400 kV lines between Sollefteå in the north and Märsta in the south. New substations with

30. Program NordSyd | Svenska kraftnät

connections to the regional networks are being built in Sollefteå, Sundsvall, Hudiksvall and Uppsala municipalities. The Uppsala branch affects the regions Västernorrland, Gävleborg, Uppsala and Stockholm.

The Uppsala branch can probably be put into operation in stages during 2030-2033.

Västerås branch

The Västerås branch is the second easternmost of the four transmission routes within NordSyd and extends from Sollefteå municipality to just north of Västerås. From Västerås, the Västerås branch divides eastwards towards Enköping municipality and westwards towards Örebro municipality. The Västerås branch affects the regions Västernorrland, Jämtland Härjedalen, Gävleborg, Dalarna and Västmanland.

Svenska kraftnät estimates that the Västerås branch can be put into operation in stages during 2030-2033.

Karlstad branch

The Karlstad branch is the westernmost of the four transmission routes within NordSyd. The new double 400 kV lines will extend from Östersund municipality in the north to Grums municipality in the south. In addition to increasing transmission capacity at intersection 2, this grid expansion is particularly important for increasing regional transmission capacity in the regions Jämtland Härjedalen and Värmland. The investment is also important in order to meet the need for increased grid capacity for the electrification of industries in region Västra Götaland, as well as to handle the east-west flows through the Swedish transmission grid that have arisen after the closure of Ringhals 1 and 2.

The Karlstad branch is expected to be ready for operation in winter 2035.

Hallsberg branch

The measures in the Hallsberg branch will reinvest an old 400 kV line between Sollefteå municipality and Hallsberg and replace it with two 400 kV lines. The exact design of the Hallsberg branch is currently being studied and a decision to start the project is likely to be made in 2026.

4.6.1.3 Intersection 4

Intersection 4 constitutes the border between Sweden's two southernmost bidding areas, SE3 and SE4. It passes through Region Halland on the west coast and further east through regions Jönköping County and Kalmar County. Intersection 4 consists of five 400 kV lines, two HVDC links (South-West Link sub-connections 1 and 2) and eight 130 kV lines that are part of the regional grid operator's electricity network. The latest reinforcement and increase in the transmission capacity of the intersection took place with the commissioning of the South-West Link in 2021.

Currently, two line projects are underway that will increase the transmission capacity at intersection 4:

- Oskarshamn municipality-Nybro, new 400 kV line. The main motive for this investment is to manage an increased electricity transmission in south-eastern Sweden while maintaining operational reliability. The line also reinforces the eastern side of intersection 4, which provides a stronger integration between the SE3 and SE4 bidding areas.
- Varberg municipality-Halmstad municipality, new 400 kV line. The main motive for this investment is to reinvest a line built in the 1950s. In connection with the renewal, a capacity upgrade will also be carried out, which will increase the capacity on the western side of intersection 4.

Apart from the above investment projects, no further measures to reinforce intersection 4 are currently being studied. However, a number of reinvestments of lines are being carried out both north and south of the intersection, especially on the west coast. This is due to the fact that the line network in southwest Sweden has been subjected to severe wear and tear as it is located in a corrosive environment close to the North Sea.

In May 2025, Svenska kraftnät received a government assignment to analyse the conditions for changing the Swedish bidding area division[31]. In this assignment, intersection 4 is not included as a bidding area boundary in any of the alternatives that Svenska kraftnät is to analyse.

31. Beslutsdokument

4.6.2 Region Norrbotten

4.6.2.1 Current situation

Region Norrbotten belongs to bidding area SE1. Construction of the transmission grid in Norrbotten began in the 1930s to collect electricity generation from hydropower along the Lule river for further transfer southwards. In recent years, a large amount of wind power has been connected, primarily in the municipalities of Arvidsjaur and Piteå. Smaller consumers have also been added, especially in the cities along the coast. In general, the area has historically had a generation surplus and electricity consumption has been relatively small.

The region has several interconnectors that enable electricity trading: three lines to Finland and one to Norway.

In Norrbotten, major investments are underway in the energy transition in industry, primarily the development of fossil-free iron and steel production. The current grid capacity is not sufficient to fully meet current plans for large-scale and electricity-intensive industries at sites such as Boden, Luleå and Malmfälten. A number of reinforcement projects are therefore underway. Svenska kraftnät is also carrying out a number of reinvestments in older 400 kV substations.

4.6.2.2 Needs

From 2020 onwards, the number of requests for connection for electricity consumption increased dramatically, see Figure 6. The background is several initiatives around energy transition in new or existing operations with energy-intensive processes such as the mining, steel and fertiliser industries. Svenska kraftnät has ongoing projects and studies to meet the new needs.

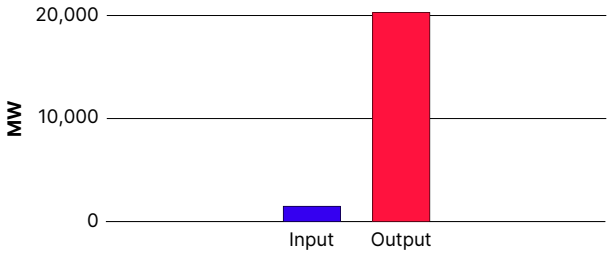


Figure 6. Power applied for in Region Norrbotten for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

A large part of the additional power requirements come from installations that will produce hydrogen. The hydrogen is then used in industrial processes or as input goods. This great need has led to plans for a regional hydrogen infrastructure, see also section 4.5. If there will be no new electricity generation in the area, there will be a deficit, which is why studies are underway to strengthen trade capacity to neighbouring areas. Svenska kraftnät also sees that we need to make grid reinforcements along the Lule river and that reinvestments in the first lines that were put into operation must be made in the near future.

Applications for the connection of onshore wind power have been submitted, and Svenska kraftnät has designated a connection point for offshore wind power in Luleå municipality[32].

4.6.2.3 Target network

The grid measures in Region Norrbotten that have been decided or are being studied are shown in Figure 7. Areas affected by ongoing grid studies are described below the figure.

32. Information om stationsplacering Luleå

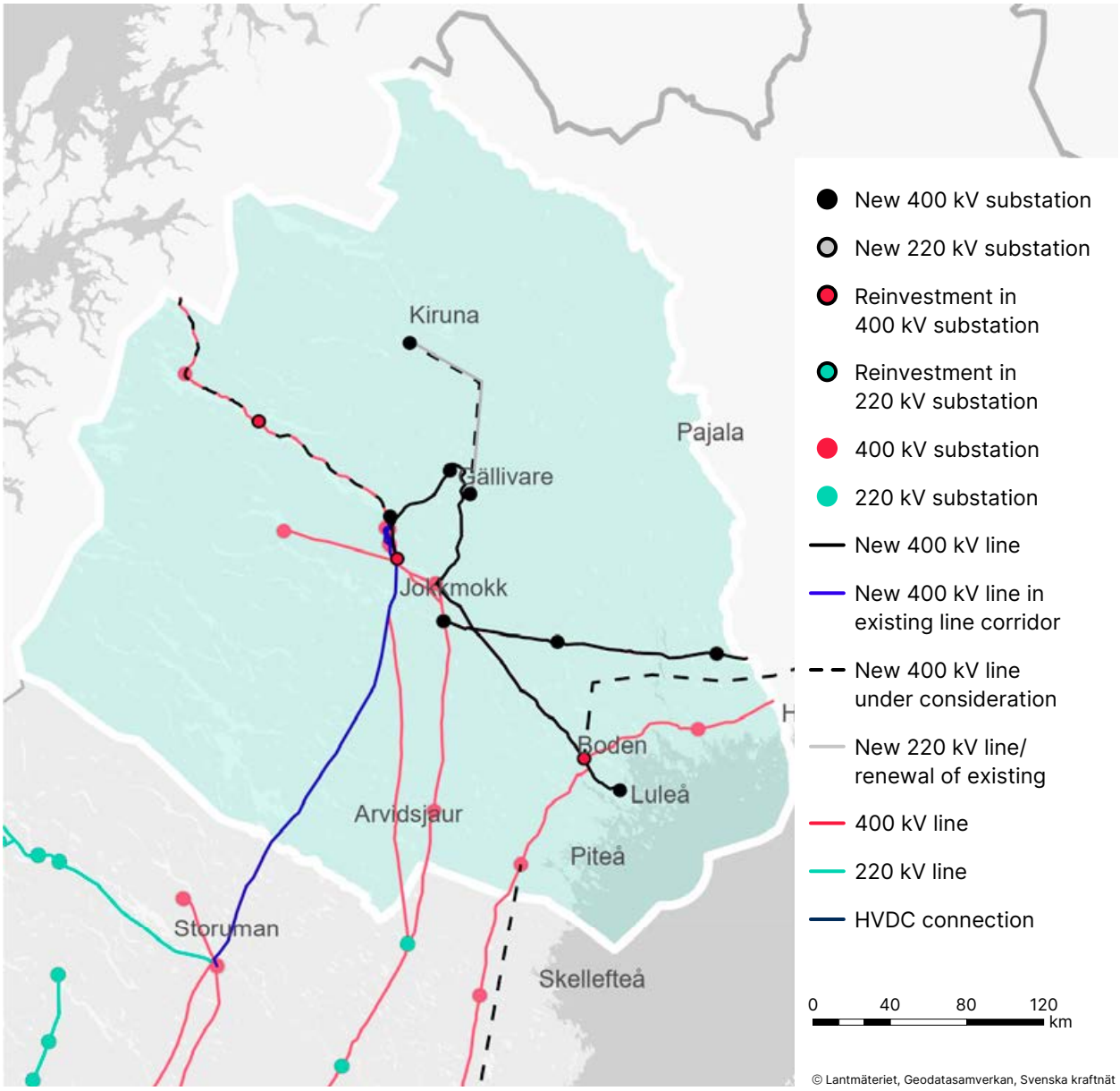


Figure 7. Grid measures in Region Norrbotten during the period 2026-2035, decided or under consideration.

Norrland Coast

The current grid capacity is not sufficient to meet plans for electricity-intensive industries along the northern Norrland coast.

The Norrland Coast investment package makes it possible to increase consumption and includes three new 400 kV lines, three new 400 kV substations and a number of 400 kV connecting lines. However, it does not cover the entire requested consumption requirement, which is why Svenska kraftnät continues to study further measures.

The current capacity for new connection of generation is already reserved, but the possibilities to connect additional generation increase when reinforcements are put into operation and when more electricity consumption is connected.

Malmfälten

Malmfälten is the mining-dense area in the municipalities of Gällivare and Kiruna. New large-scale power consumption is planned for the generation of fossil-free iron and steel.

The transmission grid in SE1 has historically been built to collect electricity generation from the hydropower plants along the rivers for further transfer

southwards. Therefore, there is no transmission grid in the vicinity of these new major electricity-intensive industries. They are so large that only regional grid lines is not the most efficient way to connect them, which is why the transmission grid needs to be expanded.

A grid concession application has been submitted for a 400 kV line from Gällivare to Jokkmokk. In addition to this line, Svenska kraftnät is preparing for another line to increase the capacity for electricity consumption in Gällivare and at the same time achive higher security of supply. We are also planning to build a new substation in Gällivare.

Svenska kraftnät is studying the expansion of the transmission grid from Gällivare to Kiruna. An additional connection substation[33] in Gällivare may also be required for increased redundancy, which increases operational reliability in the event of faults in the electricity grid.

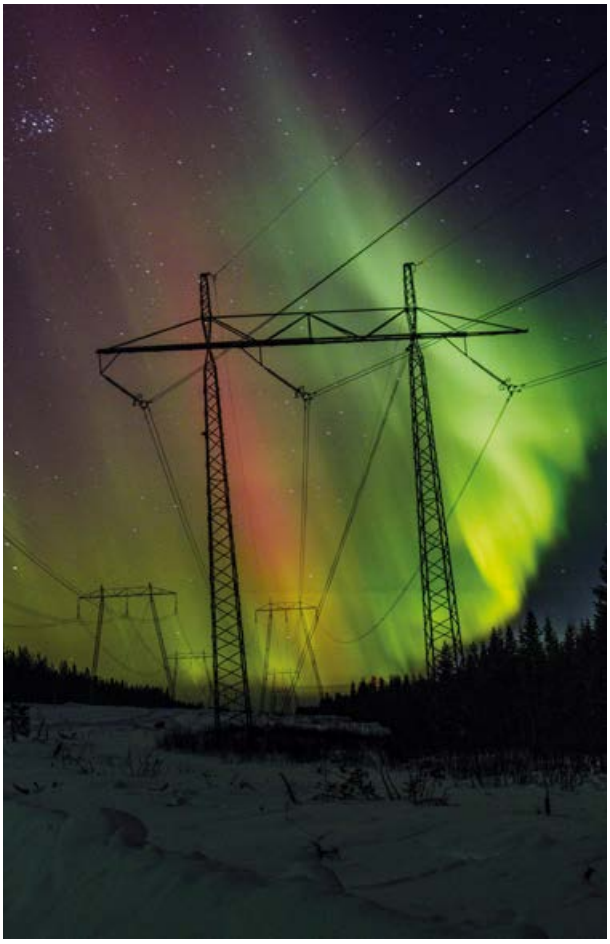
Lule river

The connection of new electricity-intensive industry along the Lule river and around Luleå/Boden, as well as the transfer of electricity northwards to Malmfälten, will increase and change the flows in the transmission grid along the Lule river. These changed flows require reinforcements, and studies are underway to increase capacity in the network. Among other things, Svenska kraftnät plans to reinvest two lines, see Figure 7.

Finland

Norrbotten is connected to Finland via three 400 kV lines, the latest of which was put into operation at the end of 2025. The new connection increases electricity trading capacity, helps balance electricity prices between Finland and the rest of the Nordic region, improves opportunities to exchange balancing resources and increases security of supply.

Svenska kraftnät and its Finnish counterpart are studying another electricity connection between SE1 and Finland. In the study, we are also looking at the connection needs in northern and eastern Norrbotten. This may mean that a possible fourth Finland line may need to branch off north towards Gällivare and south towards Piteå, as well as further reinforcement measures along the Lule river.



Norway

Norrbotten is connected to northern Norway via a 400 kV line. Svenska kraftnät is investigating, in collaboration with its Norwegian counterpart, an increase in capacity of the connections between northern Sweden and northern Norway.

4.6.2.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there is considerable uncertainty regarding the final scope and schedule for several planned initiatives in Norrbotten. This applies, for example, to hydrogen generation and a possible future hydrogen distribution system, see section 4.5.

For more information on the development of intersection 1, see section 4.6.1.1.

33. A substation that connects different lines.

4.6.3 Region Västerbotten

4.6.3.1 Current situation

Region Västerbotten belongs to the SE1 and SE2 bidding areas. The transmission grid in Västerbotten mainly consists of long lines between the Skellefte river in the north, via the Ume river and further down to the Ångerman river. The Ume river and Skellefte river hydro power plants are connected to the underlying regional grid. The largest consumers are located along the coast. There is a connection to Norway that enables cross-border trade.

A large amount of wind power has been connected in recent years, primarily inland, and there are several wind power projects in an early development phase. As a result, the grid capacity for power input in the region has largely been claimed, which makes it challenging to connect new generation in the short term.

4.6.3.2 Needs

The large industrial establishments in Norrbotten mean that transmission capacity north through Västerbotten needs to be increased. In the longer term, several lines will also need to be reinvested.

Skellefteå has expanded significantly in recent years, largely driven by the battery industry. In Umeå, there are far-reaching plans for several industrial establishments in, for example, green electrofuel. The growing electricity demand along the coast has led to bottlenecks, and Svenska kraftnät has taken several measures to cope with increased consumption, including a new east-west 400 kV line between substations in Norsjö and Skellefteå municipalities. However, over the past year, major changes have taken place in the leading companies in the area, which affects capacity allocation and network planning. This may lead to a reallocation of capacity among stakeholders.

In the north-western part of the region, Svenska kraftnät has received a number of wind power applications. However, more wind power can only be connected when new system reinforcements have been implemented, or when older lines have been reinvested and replaced by new ones with higher capacity.

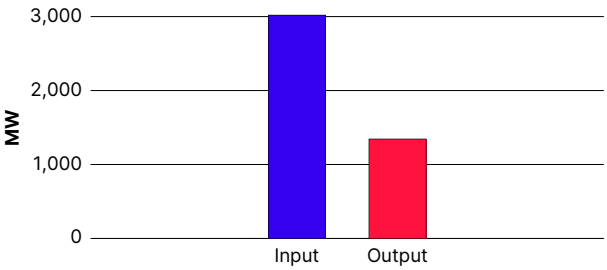


Figure 8. Power applied for in Region Västerbotten for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

4.6.3.3 Target network

In order to meet the future increased capacity and reinvestment needs, several system studies are underway in the region. One of the studies is described above, see section 4.6.1.1. The Fjällgränsen study examines the possibility of strengthening trade capacity between SE2 and northern Norway. We are also reviewing the need for reinvestment of the line to Norway.

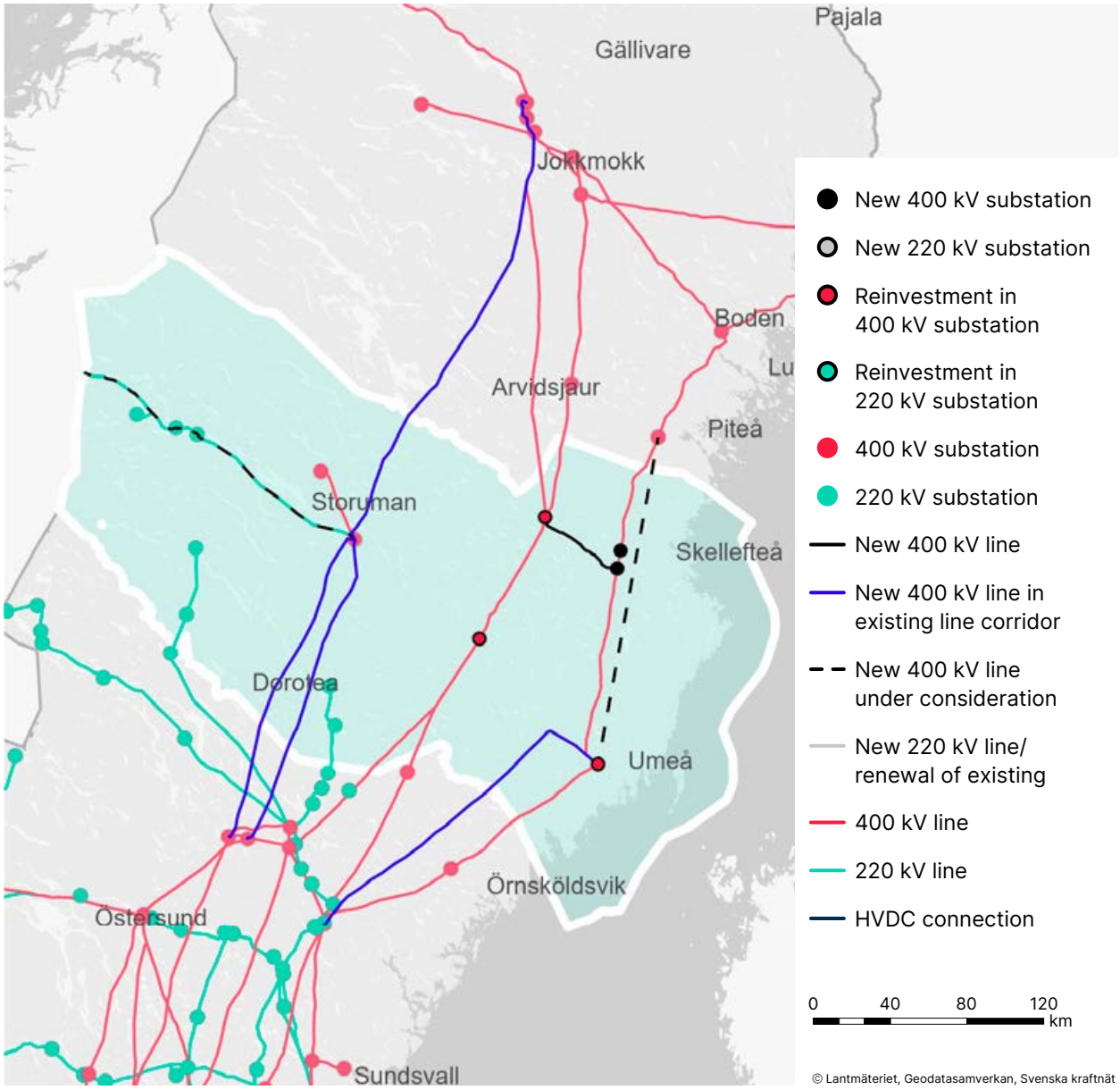


Figure 9. Grid measures in Region Västerbotten during the period 2026-2035, decided or under consideration.

4.6.3.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there is considerable uncertainty regarding the final scope and schedule for several planned initiatives in Västerbotten. This applies, for example, to hydrogen generation and a possible future hydrogen distribution system, see section 4.5.

For more information on the development of intersection 1, see section 4.6.1.1.

4.6.4 Region Västernorrland

4.6.4.1 Current situation

The region is part of the SE2 electricity bidding area and is a distinct surplus area with large generation capacity in hydro and wind power. Wind power stands for the largest increase in generation capacity in recent years. The majority of electricity consumption takes place in the larger urban areas along the coast.

4.6.4.2 Needs

Both Sundsvall and Örnsköldsvik have long-standing plans for the establishment of new electricity-intensive industries. There is also interest in new energy storage and wind and solar power in the region, see also Figure 10. In many areas, it is currently challenging to reserve capacity for additional power input due to local bottlenecks in the transmission grid.

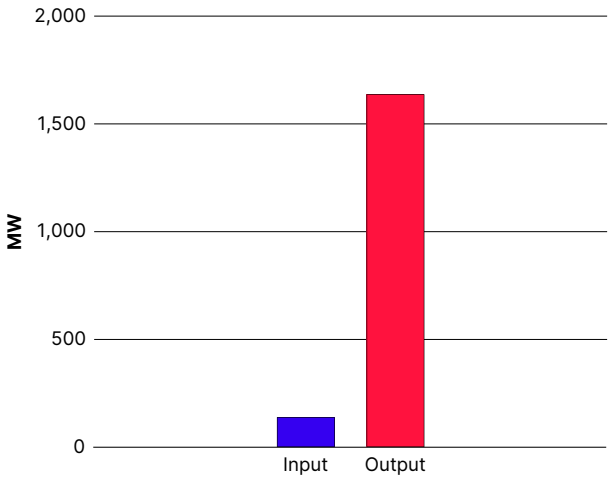


Figure 10. Power applied for in Region Västernorrland for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

4.6.4.3 Target network

Along Ångerman river, parts of the 220 kV lines are starting to reach the end of their technical service life and therefore need to be reinvested.

The 220 kV grid between Jämtland and Sundsvall comprises several substations and lines that will soon reach the end of their estimated technical service life. When Svenska kraftnät reinvests, we also reinforce the electricity grid and, in some cases, we also reconstruct the grid to make it more flexible for connection of more electricity consumption, electricity generation and energy storage.

In the area around Sundsvall and Timrå, a new transformer substation will be built to supply new industries with electricity. The new substation will be connected to one of the new 400 kV lines being built within the Uppsala branch in the NordSyd initiative, see section 4.6.1.2.

Figure 11 shows an overview of ongoing major investment projects in the region.

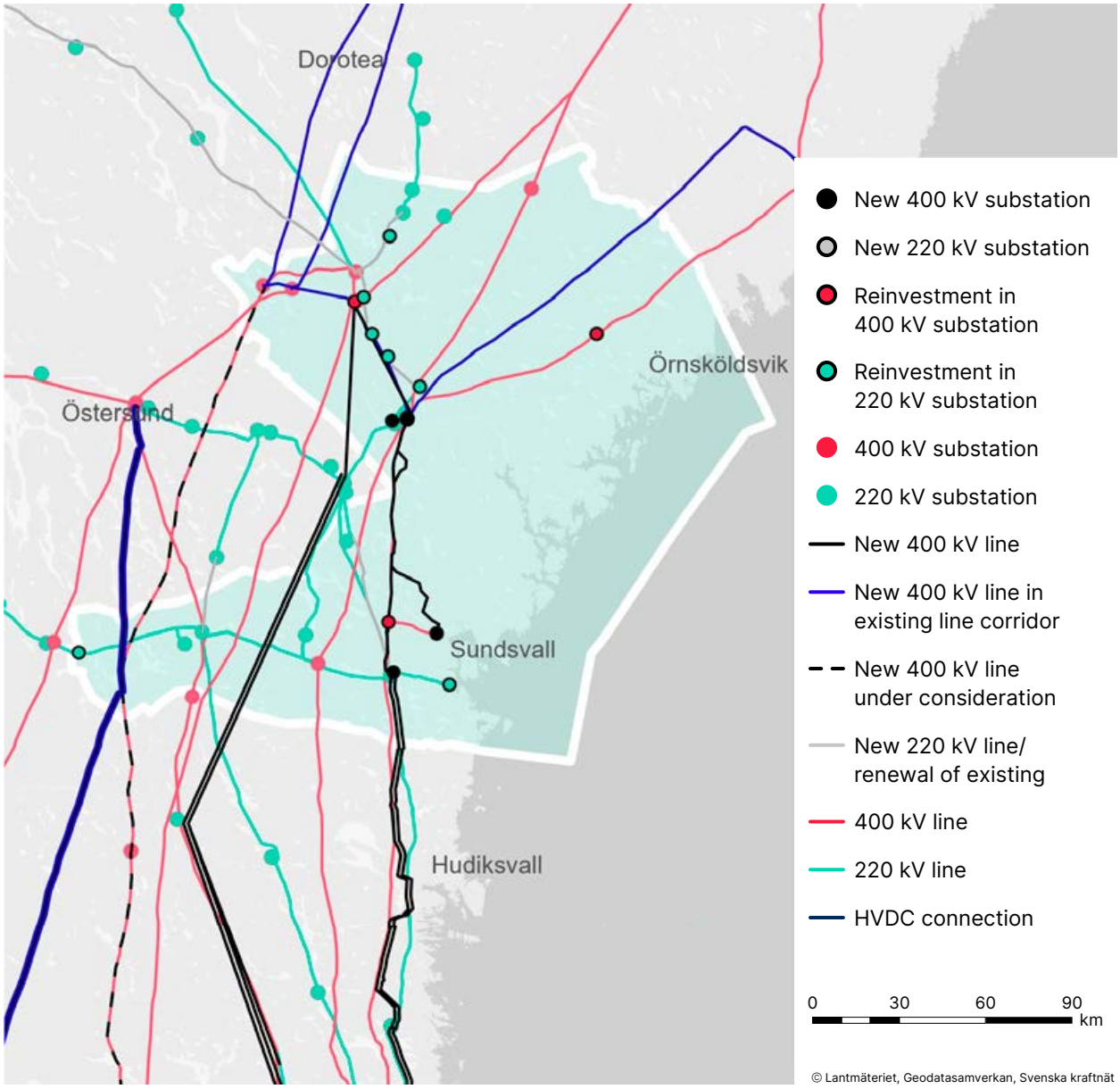


Figure 11. Grid measures in Region Västernorrland during the period 2026-2035, decided or under consideration.

Svenska kraftnät is planning reinvestments of several substations at hydro power plants north of Sollefteå and Sundsvall and in the area around Sundsvall.

The following measures are included in the Uppsala branch, see section 4.6.1.2:

- In Sollefteå municipality, Svenska kraftnät is reinforcing with a new 400 kV line along Ångerman river.
- On the stretch between Sollefteå and west of Sundsvall, Svenska kraftnät is reinvesting an old line that will be replaced with two new 400 kV lines.
- Svenska kraftnät is building two new 400 kV lines on the route from west of Sundsvall to south of Hudiksvall.
- In the northern part of Sollefteå municipality, Svenska kraftnät is reinvesting a 400 kV line.

The following measures are included in the Västerås branch, see section 4.6.1.2:

- Svenska kraftnät is planning two new 400 kV lines from north of Sollefteå to the municipality of Ockelbo (Gävleborg).
- Svenska kraftnät is also planning a new substation in Ragunda municipality (Jämtland) and a number of minor line measures to adapt the transmission grid to the new network structure.

4.6.4.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.

Svenska kraftnät is studying the possibility of staged allocations of capacity, see also section 4.4.2.

4.6.5 Region Jämtland Härjedalen

4.6.5.1 Current situation

Region Jämtland Härjedalen is part of the SE2 bidding area. The transmission grid is mainly adapted for transmission southwards from the hydropower plants in Ljungan, Indal river and Ångerman river. It consists of long north-southern 400 kV lines, supplemented by a 220 kV grid that collects electricity generation from the hydro power plants. The area has an interconnector to Norway that enables electricity trading.

The region is a surplus area in terms of electricity generation, where hydropower and wind power dominate.

4.6.5.2 Needs

There is great interest in the establishment of both industries and new wind power, and several municipalities are actively working to attract investments to the region, see also Figure 12. The largest initiatives in new electricity-intensive operations are located in Östersund municipality. Svenska kraftnät and the regional grid operator are collaborating on the reinforcement measures required to free up sufficient capacity for the new operations. Until all reinforcement measures are in place in the transmission grid and regional grids, there are local restrictions to reserve more capacity for both power consumption and input.

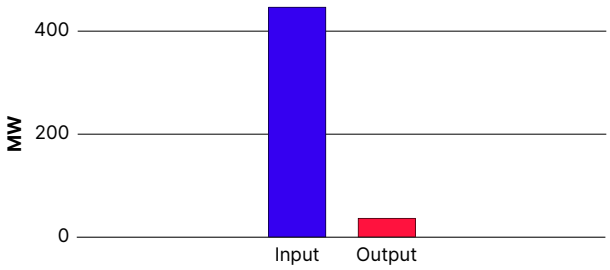


Figure 12. Power applied for in Region Jämtland Härjedalen for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

The 220 kV grid running north of Östersund and from eastern Jämtland to Sundsvall is approaching the end of its technical service life and needs to be reinvested.

4.6.5.3 Target network

To meet the region's capacity and reinvestment needs, a number of network measures are planned within the so-called Östersund package. The most central measure to increase the regional capacity of the transmission grid is the voltage increase of a line north of Östersund from 220 kV to 400 kV, which boosts the line capacity by more than five times. The line runs along Indal river from Åre to Ragunda municipality, where it connects in a new 400 kV substation.

Closer to Östersund, Svenska kraftnät is working together with the regional grid operator to reinforce the connections between the transmission grid and the regional grid. We are doing this, for example, by building a new 400 kV substation.

The measures in the Hallsberg and Karlstad branches, see section 4.6.1.2, create opportunities for connection of increased electricity consumption and electricity generation in the southeastern parts of the region.

Figure 13 shows an overview of decided line and substation measures in Region Jämtland Härjedalen.

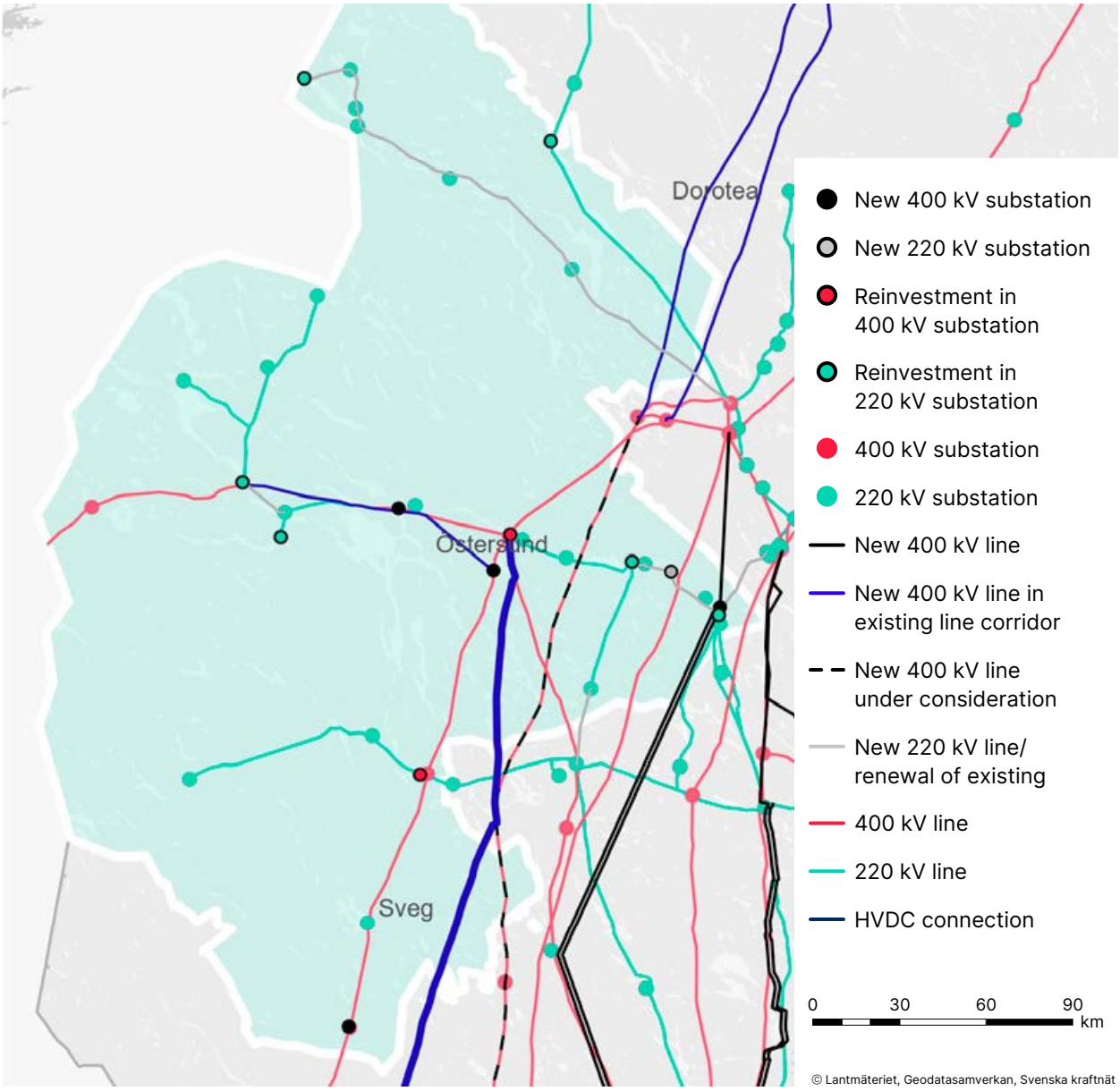


Figure 13. Decided grid measures in Region Jämtland Härjedalen during the period 2026-2035.

4.6.5.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.

4.6.6 Region Gävleborg

4.6.6.1 Current situation

Region Gävleborg is part of the SE2 and SE3 bidding areas. The transmission grid consists essentially of long north-south lines in the form of seven series-compensated 400 kV lines and three 220 kV lines without series compensation. These lines are mainly used to transfer power in the north-south direction, both between SE2 and SE3, but also within the region. The majority of electricity consumption takes place in the southern part of the region.

In the north-western part of the region, there is a large surplus of electricity generation, on the one hand at the upper part of Ljusnan (hydropower and wind power) and on the other hand in the region's most north-western corner (wind power). Other parts of the region are typically net consumers of electricity, although the generation of hydropower, wind power and combined heat and power contribute to keeping power and energy demand down.

4.6.6.2 Needs

There is a strong interest in the establishment of onshore wind power throughout the region, along the coast also in the form of offshore wind power. Electricity consumption is expected to increase throughout the region with large individual electricity consumers such as hydrogen industries and data centres, but also general societal growth.

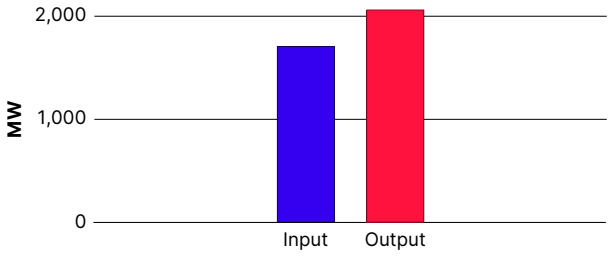


Figure 14. Power applied for in Region Gävleborg for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

The most important motive for projects in the area is the need for increased transmission capacity, both between the bidding areas and within the region. In addition, there is a major need for reinvestment as several of the lines will be reaching the end of their technical service life. New 400 kV lines are a prerequisite for increased transmission capacity between SE2 and SE3, both in terms of current needs and in order to be able to gradually increase capacity in the future. The reinforcements allow Svenska kraftnät to accommodate applications received for extended consumption and input contracts.

4.6.6.3 Target network

Within the NordSyd initiative, see section 4.6.1.2, all three 220 kV lines and the two oldest series-compensated 400 kV lines will be reinvested and replaced with three double 400 kV lines. New connection points are being built in the municipalities of Hudiksvall, Ljusdal and Ockelbo. The new transmission grid structure allows old substations to be decommissioned, more capacity to be allocated and new connection points to be built in addition to those mentioned above.

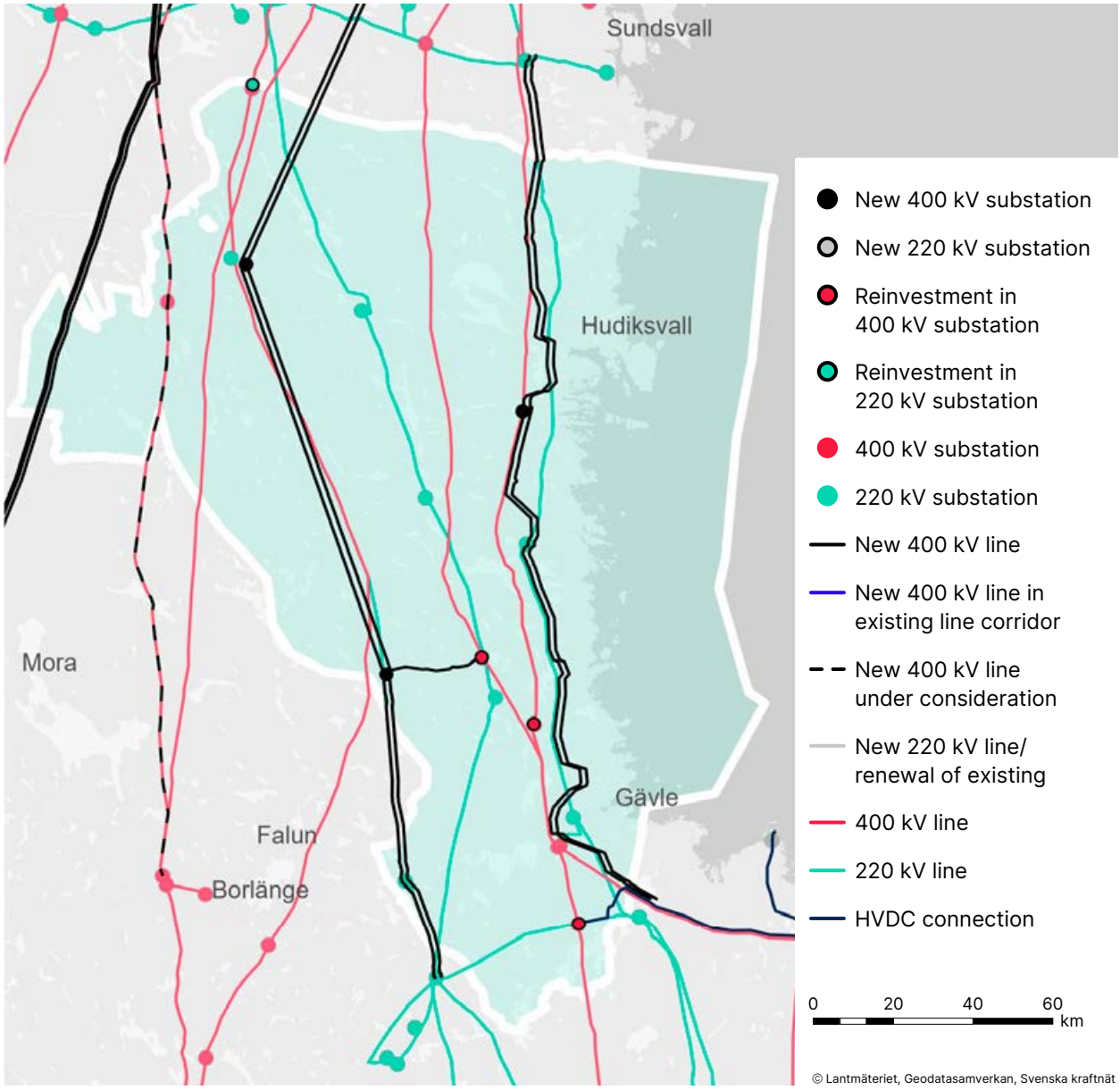


Figure 15. Grid measures in Region Gävleborg during the period 2026-2035, decided or under consideration.

4.6.6.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.

4.6.7 Regions Örebro County, Dalarna and Värmland

4.6.7.1 Current situation

Örebro County

Region Örebro County is part of the SE3 bidding area. The flows mainly consist of southbound flows at intersection 2, which are distributed further south, southwest and southeast from the substations at Hallsberg.

Dalarna

Region Dalarna is part of the SE2 and SE3 bidding areas. The transmission grid essentially consists of series-compensated lines that transfer power in the north-south direction between SE2 and SE3.

The northern parts of the region in particular have hydro and wind power generation. The southern parts mainly have net consumption.

Värmland

Region Värmland is part of the SE3 bidding area. The transmission grid essentially consists of two lines from SE2 further down towards SE3 and Västra Götaland. There is a connection to Norway to the west of Grums. These are mainly north-south flows, but the area is also affected by east-west flows towards Norway.

The region is a net consumer of power.

4.6.7.2 Needs

In all three regions, the need for capacity reinforcements is driven by connection requests, see also Figure 16. In addition, there is a need for increased transmission capacity at intersection 2 in order to reduce bottlenecks and thus increase the electricity market benefit.

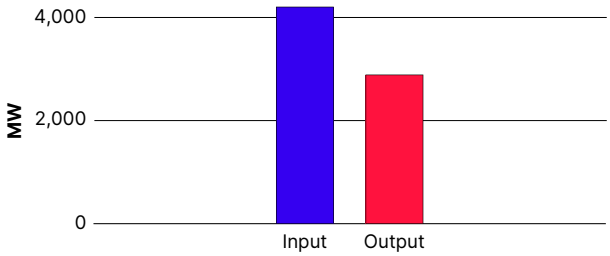


Figure 16. Power applied for in Regions Örebro County, Dalarna and Värmland for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

Örebro County

There is a need to increase the capacity for east-west flows and for additional consumption. The existing line from Västernorrland to Hallsberg is approaching the end of its technical service life.

Dalarna

Forecasts show that Borlänge will have new large consumers.

The existing line from Region Västernorrland to Hallsberg is approaching the end of its technical service life.

Värmland

There are forecasts for additional electricity generation from onshore wind and solar power, as well as increased electricity consumption for new industrial establishments. Large parts of Värmland have been identified as areas with increased variable electricity generation and are therefore suitable for connecting flexibility resources.

4.6.7.3 Target network

Örebro County

Svenska kraftnät plans to reinvest parts of a substation in Örebro. We will also increase the voltage on the Örebro-Köping line from 220 kV to 400 kV, which will increase the capacity for the east-west flow.

The line between Hallsberg and Västernorrland is approaching the end of its technical service life, which is why Svenska kraftnät will replace it. This means increased capacity, and new or expanded connections can thus be received in the region.

Dalarna

Svenska kraftnät plans to build a new grid substation just north of Malung. Among other things, it will serve as redundancy for the regional grid and make it more reliable in the event of a fault in the electricity grid.

Svenska kraftnät is reinvesting the substation in Gagnef and then supplementing the existing 400 kV line to Borlänge with another line.

Furthermore, we will reinvest one of the series-compensated lines through Dalarna and replace it with new double 400 kV lines without series compensation, see the Karlstad branch in section 4.6.1.2. We are also studying upgrading another series-compensated line through Dalarna to new double 400 kV lines without series compensation, see the Hallsberg branch in section 4.6.1.2. By eliminating series compensation, it is possible to connect new transmission grid substations along the lines, which is limited by the series-compensated lines.

The line between the regions Örebro County and Västernorrland runs through Dalarna. It is approaching the end of its technical service life, which is why Svenska kraftnät will replace it. This results in increased capacity, and new or expanded connections can thus be received.

Värmland

Svenska kraftnät will reinvest one of the series-compensated lines through Värmland and replace it with new double 400 kV lines without series compensation, see the Karlstad branch in section 4.6.1.2. A new 400 kV substation will be built near the existing 400 kV substation at Karlstad. The two substations will be connected with a new 400 kV line. The new substation connects the Karlstad branch and the regional networks in Värmland.

Svenska kraftnät is also studying the possibility of upgrading another series-compensated line through Värmland to new double 400 kV lines without series compensation, see the Hallsberg branch in section 4.6.1.2. By switching to lines without compensation, it is possible to connect new transmission grid substations along the lines, which is limited by the series-compensated lines.

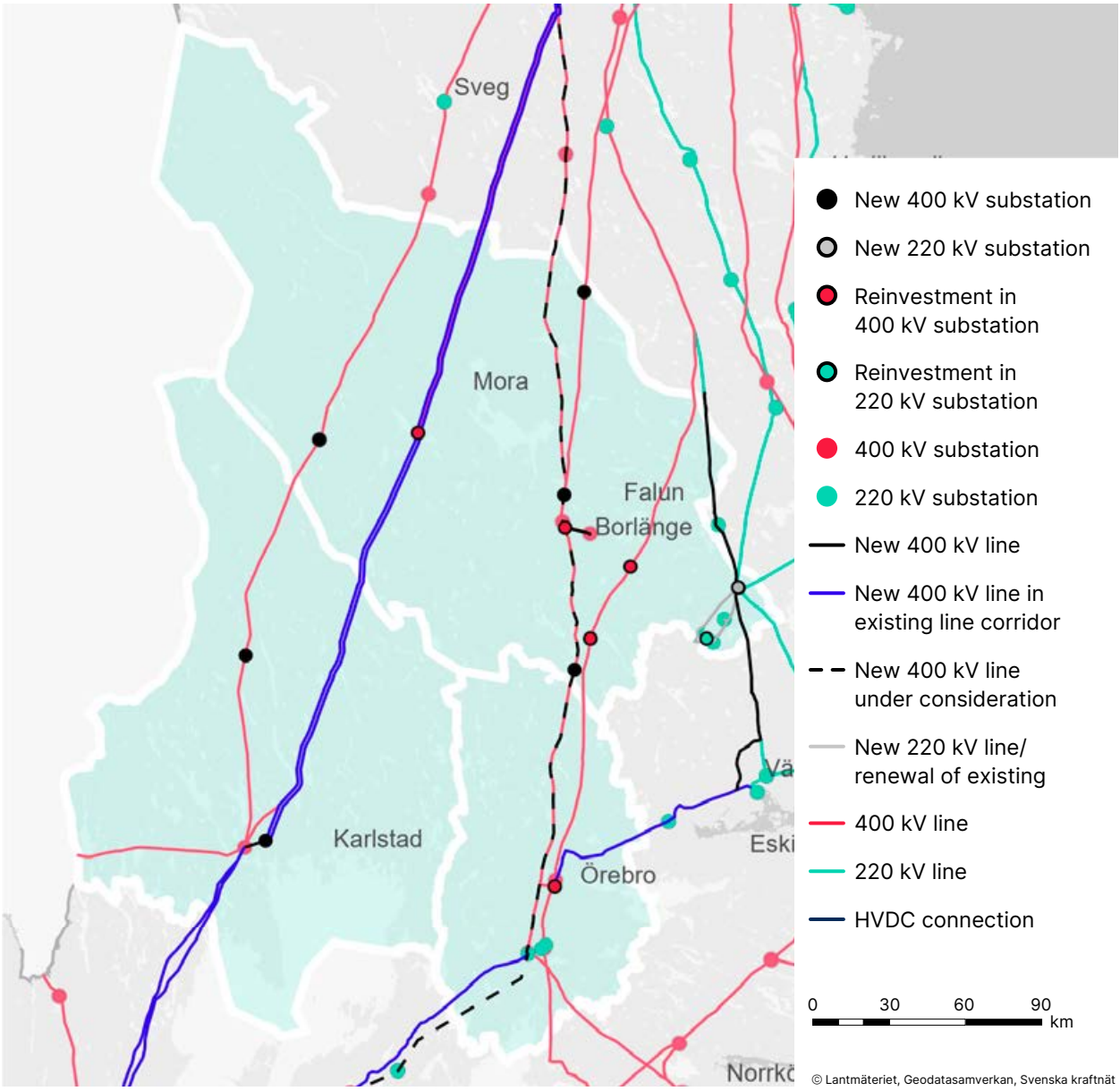


Figure 17. Grid measures in Regions of Örebro County, Dalarna and Värmland during the period 2026-2035, decided or under consideration.

4.6.7.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.

Värmland

Svenska kraftnät is investigating the possibility of rescheduling the reinvestment in the easternmost of the southern lines from Karlstad to an earlier date. This is to meet the Karlstad branch capacity increase from the north and to enable additional connections in the area. At the same time, a move of the current lines from the existing substation at Karlstad to the new substation to be built is being analysed.

4.6.8 Region Stockholm

4.6.8.1 Current situation

Region Stockholm is part of the SE3 bidding area. Electricity demand in the Stockholm region is increasing rapidly. The main reasons are a growing population, overall reduced local electricity generation, new electricity-dependent infrastructure (e.g. charging of electric vehicles) and new data centers. Already now, electricity consumption is so high that further increases cannot be granted with the current transmission grid.

4.6.8.2 Needs

More than fifteen years ago, Svenska kraftnät and the regional grid operators concerned developed a new grid structure for the Stockholm region, which resulted in the Stockholms Ström package of measures.

However, forecasts for electricity demand have increased faster than expected. Svenska kraftnät has therefore developed another package of measures with reinforcements, Storstockholm Väst, to meet the sharply increased demand for electricity and ensure long-term operational reliability.

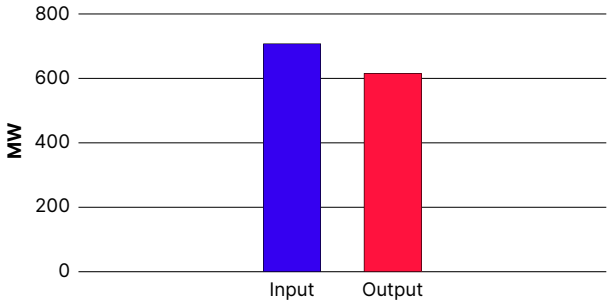


Figure 18. Power applied for in Region Stockholm for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

4.6.8.3 Target network

The measures are divided into two main projects: Stockholms Ström and Storstockholm Väst. For both, there are many dependencies on other projects conducted by regional grid operators and to municipalities that have plans for land that is freed up. The stakeholders involved must coordinate the construction of new substations and the reconstruction or demolition of existing substations and lines. At the same time, the system requirements for each sub-stage must be met. This places great demands on collaboration between the various stakeholders when planning commissioning and outages.

When both of these packages of measures have been implemented, the capacity of the transmission grid will be sufficient according to current forecasts. However, it is important that the regional grid in the area is also adapted and reinforced in order to ultimately be able to meet customers' electricity needs.

Stockholms Ström

Stockholms Ström comprises around fifty subprojects. In addition to Svenska kraftnät, it also involves regional grid operators and affects 21 municipalities in Stockholm County.

The new network structure means that parts of today's relatively fine-meshed 220 kV network will be decommissioned. In other parts of the grid, the voltage is increased from 220 kV to 400 kV. A new 400 kV line called City Link is being built between Upplands Väsby in the north and Haninge in the south. The sections from Upplands Väsby to Danderyd and from Skanstull to Haninge are ready and have been put into operation. Work is underway on the Danderyd-Skanstull section. It runs under the city centre and is installed in a drilled tunnel.

When Stockholms Ström is completed, approximately 150 km of overhead lines will be demolished. Municipalities and other landowners co-finance Stockholms Ström in proportion to the value of the land thereby freed up for other use.

Storstockholm Väst

Storstockholm Väst includes several reinforcements:

- a new north-south 400 kV link through the western part of the region. It replaces the current 220 kV connections along the route from northeast of Enköping, via a corridor west of Sollentuna, Sundbyberg and Stockholm, to east of Södertälje
- a new 400 kV line from north of Märsta to north-west of Sollentuna
- a number of new 400 kV substations.

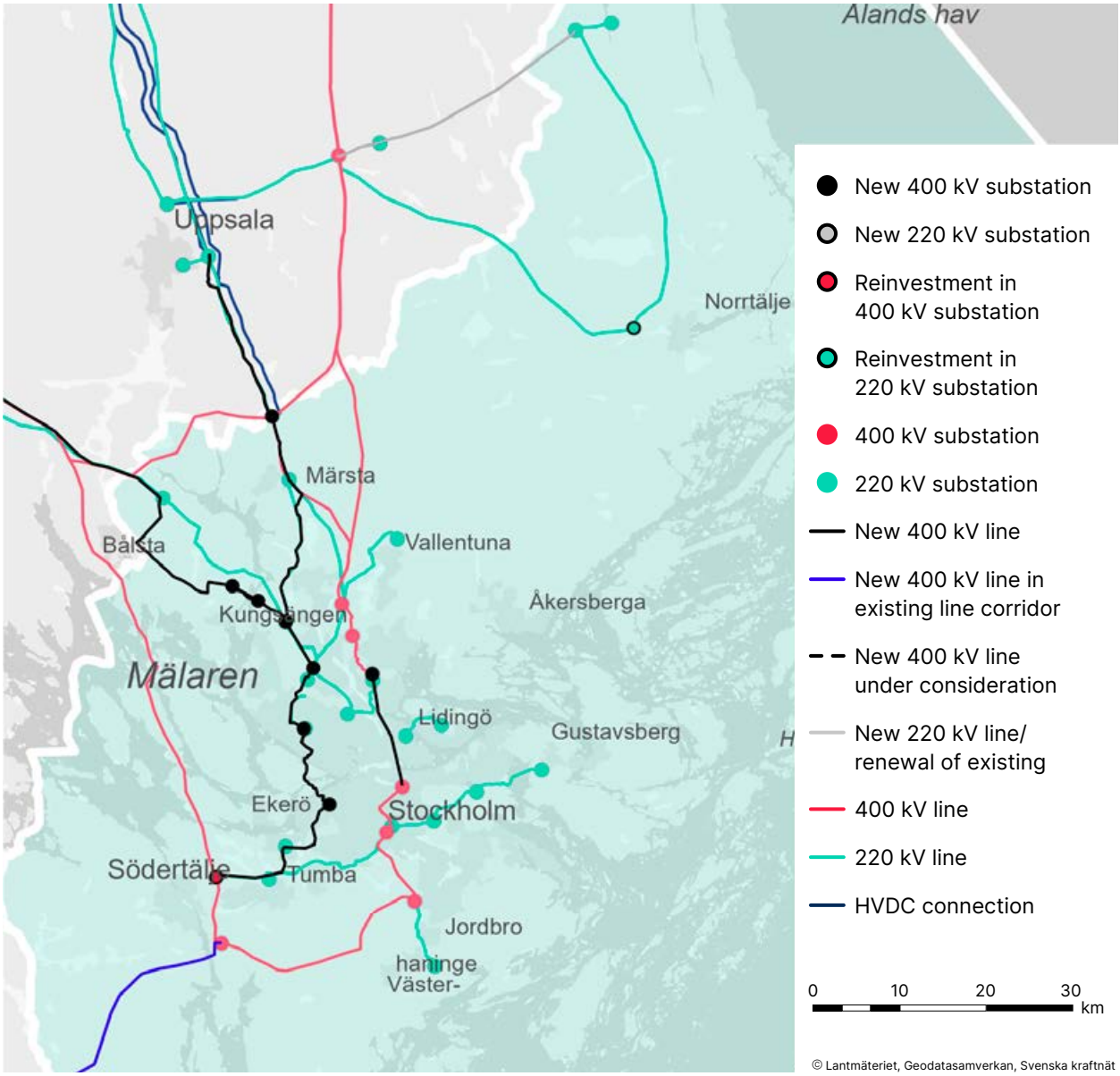


Figure 19. Grid measures in Region Stockholm during the period 2026-2035, decided or under consideration.

4.6.8.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

The measures in Stockholm mean that a large proportion of underground cables will be added as it is very difficult to build overhead lines in densely built-up areas. Large-scale use of cables in the transmission grid presents many technical challenges, especially in terms of operation, power quality and voltage control. This, combined with the complexity of building electricity grids in a large city, may affect project schedules.

4.6.9 Regions Västmanland and Uppsala

4.6.9.1 Current situation

Regions Västmanland and Uppsala are part of the SE3 bidding area. The regions' generation comes largely from Forsmark's nuclear power plant (Region Uppsala). In Västerås (Västmanland), the CHP plant contributes to the electricity supply in Mälardalen. There is also some wind power in the regions, and there is great interest in connecting solar power and batteries in many areas. Apart from Forsmark and the CHP plant in Västerås, the remaining transmission grid connections have net consumption.

Västmanland

There are 220 kV lines from Enköping in a south-western direction through Västmanland. They are important in case of east-west flows. These flows have become more common in recent years, partly due to increased nuclear power generation in Finland and expanded exports from Norway to the UK. This has increased the load on, and the importance of, these lines. To the north of Västerås, the south-western lines are connected to a 220 kV line that feeds power in the north-south direction.

Region Uppsala

In Region Uppsala, power is distributed from several of the transmission grid's north-south 400 kV lines towards Uppsala and Stockholm and further south. There are two direct current connections to Finland north of Uppsala. Historically, it has mainly been about exports on the connections, but imports have increased in recent years.

4.6.9.2 Needs

The transmission capacity needs to be increased at intersection 2 and within SE3, both for current needs and for future needs as the lines over intersection 2 are upgraded, see section 4.6.1.2. The measures also reinforce the transmission grid in the area, which means that Svenska kraftnät can accommodate applications for extended consumption and input contracts, see Figure 20.

Both Region Uppsala and Västmanland have been identified as areas suitable for connection of new power generation, with the area near Forsmark identified as suitable for new dispatchable production, see Figure 21.

There is also a certain need for reinvestment, as several lines are soon reaching the end of their technical service life.

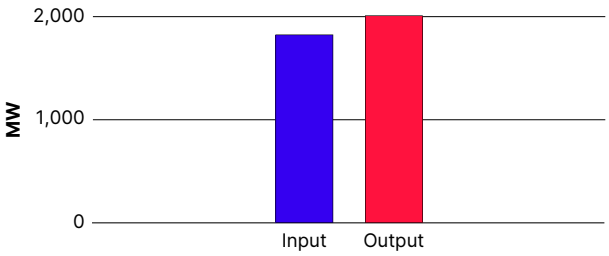


Figure 20. Power applied for in Regions Västmanland and Uppsala for input (electricity generation) and output (electricity consumption) respectively. The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

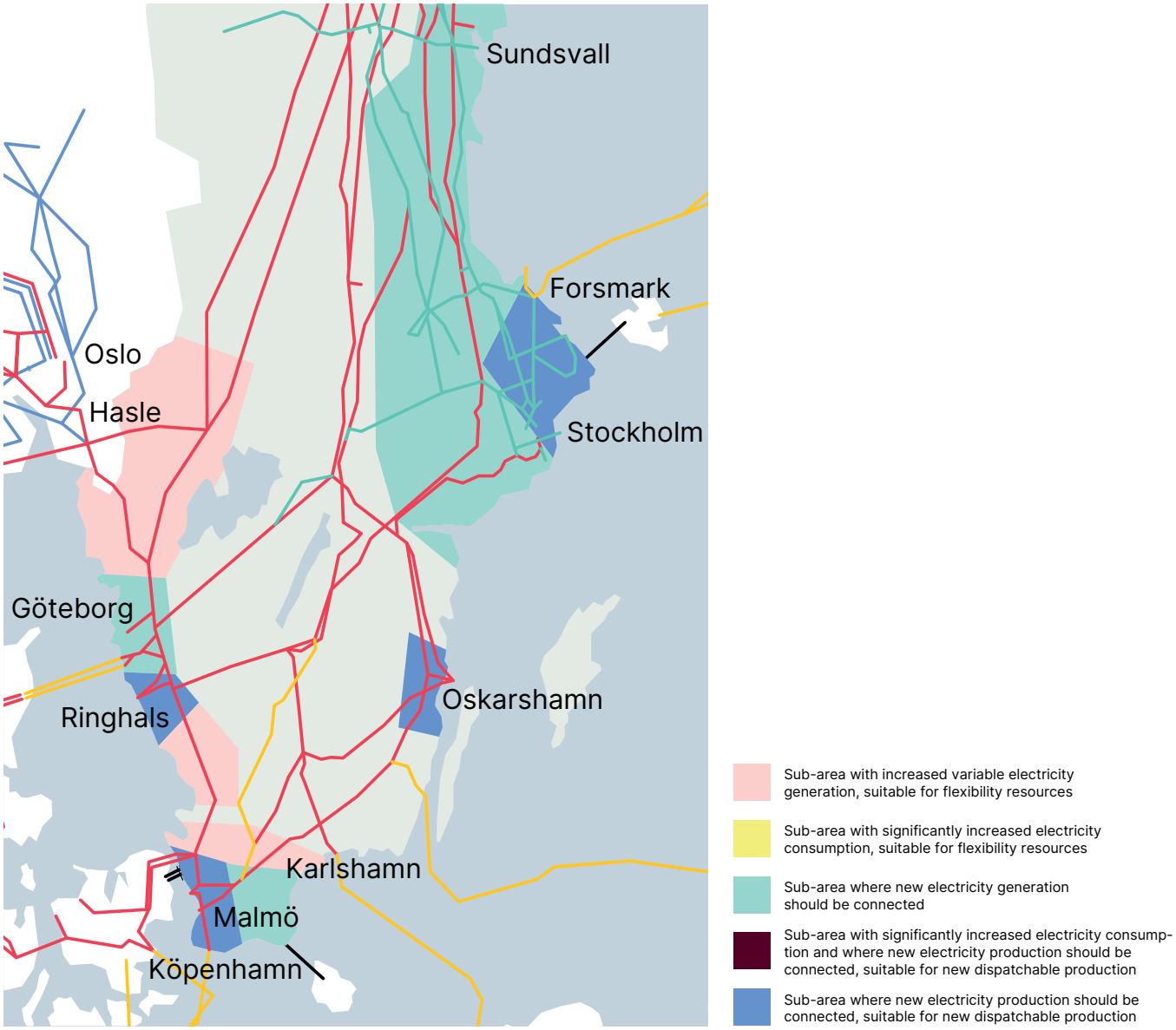


Figure 21. Sub-areas suitable for electricity generation and/or flexibility resources, see also section 4.4.1.

4.6.9.3 Target network

The grid around Uppsala needs to be reinvested as it begins to reach the end of its technical service life. At the same time, capacity from the north needs to be increased. Therefore, Svenska kraftnät is building new double 400 kV lines from north of Stockholm and further north. We are also reinforcing and reinvesting connections to the regional grid. These projects are part of the Uppsala branch, see section 4.6.1.2.

In Västmanland, too, many lines are approaching the end of their technical service life. Svenska kraftnät is decommissioning or increasing the voltage of most 220 kV lines and replacing them with 400 kV lines. This is to remove bottlenecks within SE3 and increase capacity in both southern and western direction. Svenska kraftnät is also decommissioning north-south 220 kV lines and replacing them with double 400 kV lines. To make this possible, we are putting a new 400 kV substation north of Västerås into operation. These measures are included in the Västerås branch, see section 4.6.1.2.

In substations outside Enköping, Södertälje and Hallsberg, respectively, Svenska kraftnät is installing STATCOM systems for dynamic voltage regulation.

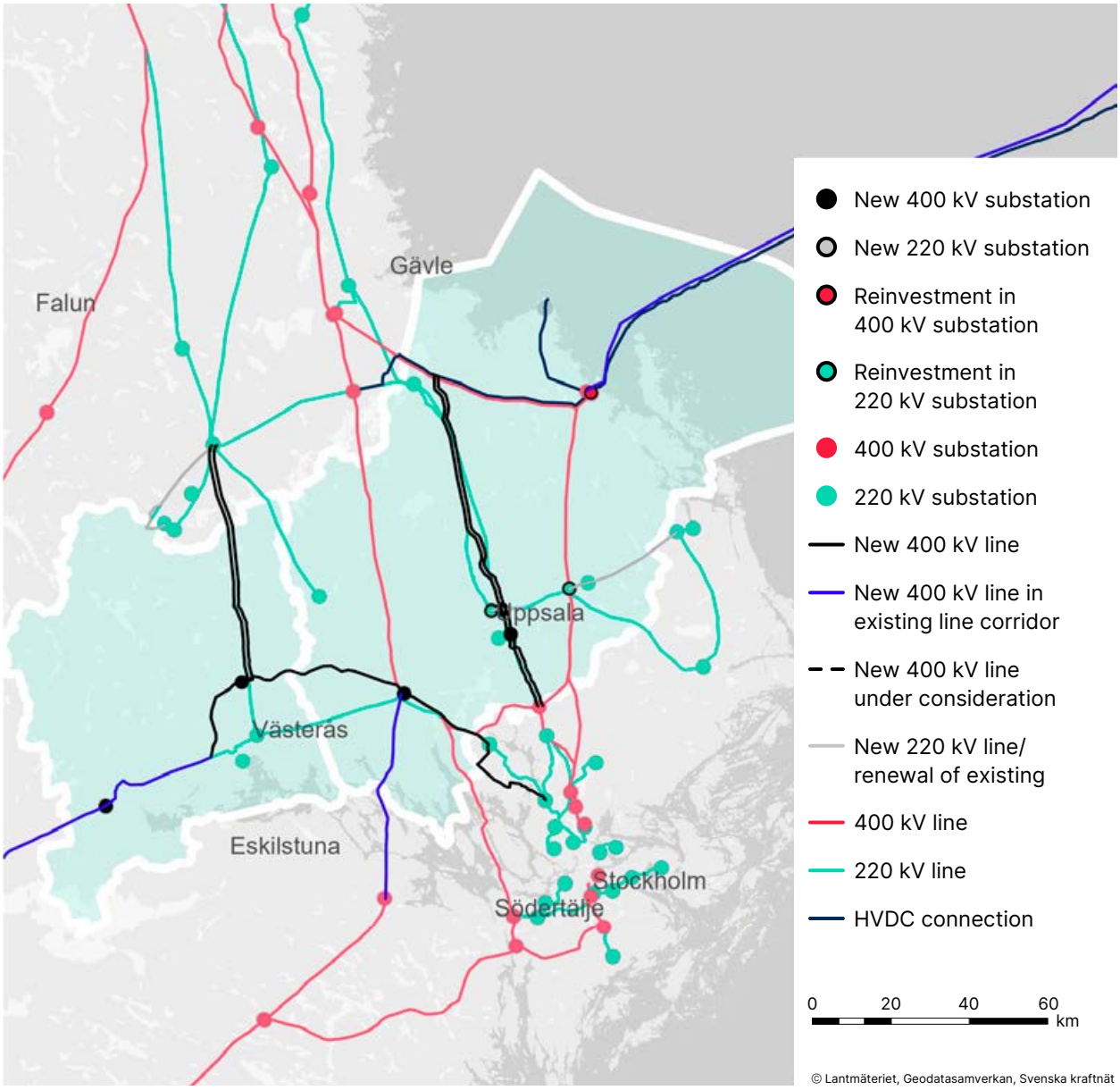


Figure 22. Grid measures in Regions Västmanland and Uppsala County during the period 2026-2035, decided or under consideration.

4.6.9.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.

In the eastern part of Region Uppsala, a loop of 220 kV lines runs from Uppsala to Hallstavik, on to Norrtälje and then back to Uppsala. Parts of the loop need to be reinvested as they are approaching the end of their technical service life. At the same time, there is a need for increased capacity and potentially also stronger interconnectors and connection of offshore wind power. Svenska kraftnät is studying different solutions. Among other things, it may be necessary to build new substations and lines and change the voltage level.

One of the connections to Finland is approaching the end of its service life. Svenska kraftnät is therefore investigating, together with our Finnish counterpart, how a possible reinvestment should be designed.

4.6.10 Regions Sörmland and Östergötland

4.6.10.1 Current situation

Regions Sörmland and Östergötland are part of the SE3 bidding area. The largest electricity users in the regions are the larger cities and industries. Generation consists mainly of combined heat and power, followed by onshore wind and solar power. Both Östergötland and Sörmland are deficit areas where electricity consumption exceeds generation.

Through Sörmland, 400 kV lines run in the south-west direction, that are important for east-west flows. These flows have become more common in recent years, partly due to increased nuclear power generation in Finland and expanded exports from Norway to the UK. This has increased the load on, and the importance of, these lines. It is important to have sufficient capacity on the lines to be able to allocate maximum reliable transmission capacity between Swedish bidding areas, which contributes to increased benefits for the electricity market.

4.6.10.2 Needs

Several of the transmission lines need to be reinvested the future when they reach the end of their technical service life. Svenska kraftnät sees a need to advance reinvestments in certain 400 kV lines to meet the increase in capacity north of the lines in the Uppsala branch project, see section 4.6.1.2. The line reinforcements are also important for connecting more local electricity consumption.

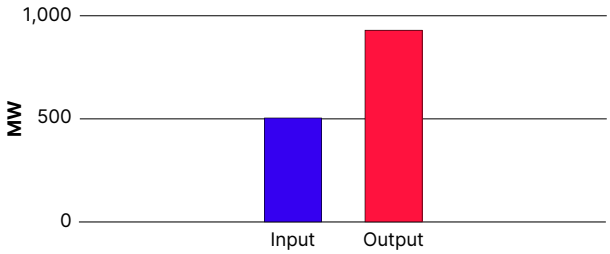


Figure 23. Power applied for in Regions Sörmland and Östergötland for input (electricity generation) and output (electricity consumption) respectively. The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

4.6.10.3 Target network

In connection with Svenska kraftnät's reinvestments, we are also increasing capacity. This provides electricity market benefits through better use of intersection capacities, both internally and for export.

Brought-forward reinvestments in 400 kV lines are planned between substations close to:

- Enköping-Mariefred (Uppsala-Sörmland)
- Södertälje-Flen (Stockholm-Sörmland)
- Mariefred-Flen-Finspång (Sörmland-Östergötland)
- Finspång-west of Norrköping (Östergötland)
- Finspång-Oskarshamn (Östergötland-Kalmar County)

Svenska kraftnät strives to use existing utility corridors as far as possible.

Three 400 kV substations will be reinvested:

- When Svenska kraftnät reinvests substations near Finspång and west of Norrköping, we also implement system reinforcement measures to increase system stability and electricity transmission capacity in the area.
- The substation outside Mariefred is part of the "Digital station" pilot project to increase availability, efficiency and security.

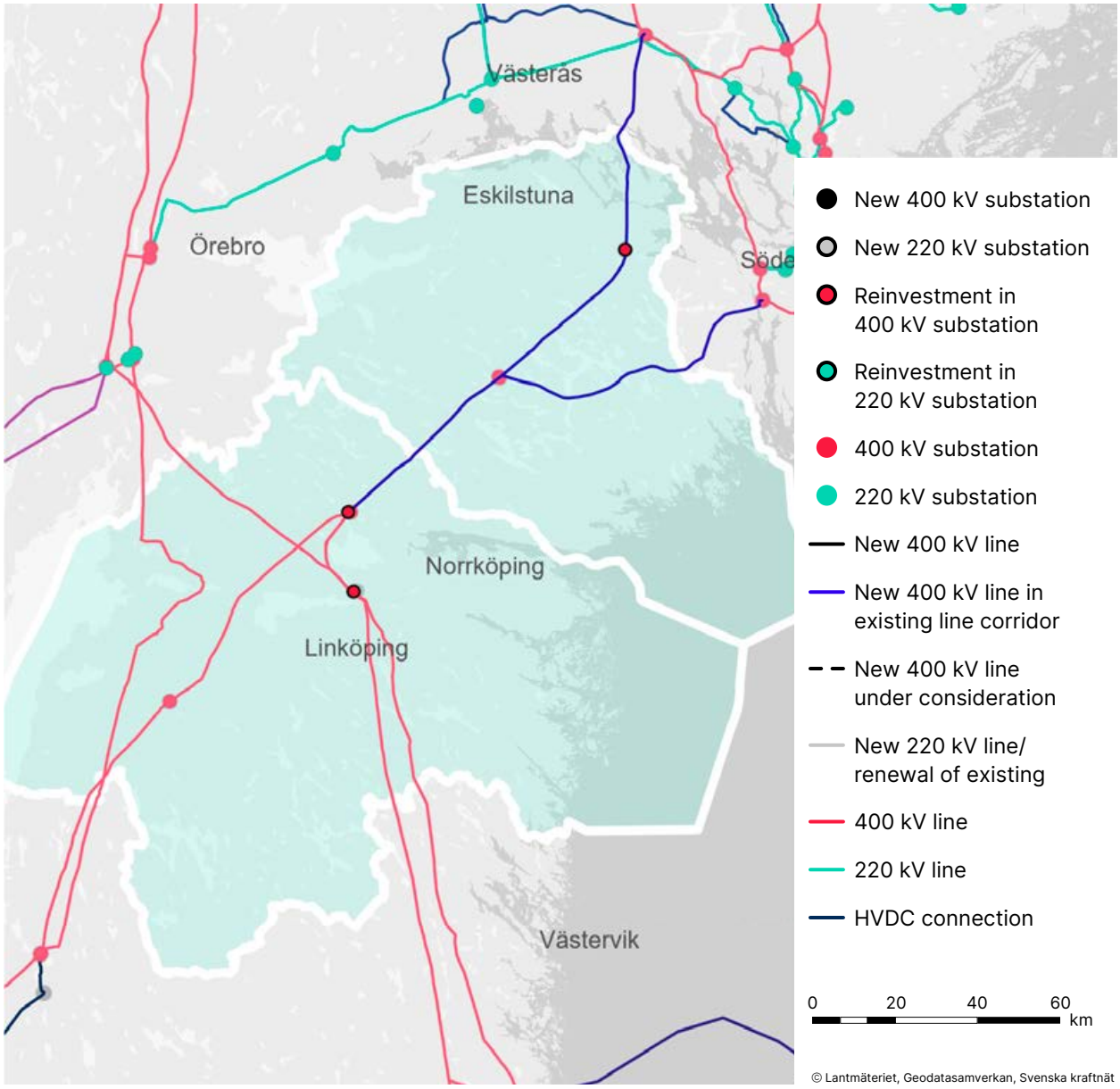


Figure 24. Grid measures in Regions Sörmland and Östergötland during the period 2026-2035, decided or under consideration.

4.6.10.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.

4.6.11 Regions Halland and Västra Götaland

4.6.11.1 Current situation

Västra Götaland

Region Västra Götaland is part of the SE3 bidding area, but a very small part is part of SE4. The region has a strong tradition in the automotive, manufacturing, energy, textiles, chemicals and shipping industries. Barely a third of the electricity consumed is produced in the region. The generation mix mainly consists of wind and hydro power, as well as a smaller proportion of combined heat and power and solar power.

There are interconnectors from Dalsland to Norway and from just south of Gothenburg to Jutland in Denmark. The power flows in the area are mainly north-south, but in some locations they are east-west or south-north.

Halland

Region Halland is part of the SE3 and SE4 bidding areas. The region has historically been characterised by the food industry, wood processing and manufacturing industry, but has in recent years seen an expansion and modernisation of the industry.

Electricity generation is dominated by the nuclear power plant at Ringhals. In addition, there is hydropower, combined heat and power, as well as onshore wind power and solar power. The region is a surplus area where local generation exceeds electricity consumption.

4.6.11.2 Needs

Ongoing analysis work shows that today's network cannot meet all consumption and input needs without system reinforcements.

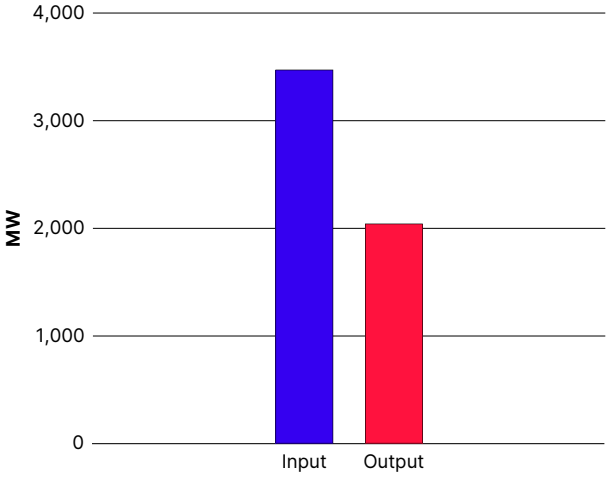


Figure 25. Power applied for in Regions Halland and Västra Götaland for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

Västra Götaland

The region's electricity consumption could double by 2045 due to the energy transition in transport and industry.

To meet growing electricity demand, various actors plan to increase local electricity generation by 15-20 TWh, which would increase the self-sufficiency rate to almost two thirds.

Svenska kraftnät has enquiries about consumption and input increases from both directly connected customers and regional grid operators. The increases in consumption are driven by industrial establishments and energy transition within existing industry in Gothenburg and Skaraborg. New generation refers to offshore wind power and onshore wind and solar power.

Halland

Electricity consumption is expected to increase by up to 70% by 2040. The increased demand for electricity is primarily driven by increased energy transition in industry, the expansion of electrically powered transport and new residential and business areas.

Svenska kraftnät has enquiries about input increases from both directly connected customers and regional grid operators. New generation refers to offshore wind, solar and nuclear power.

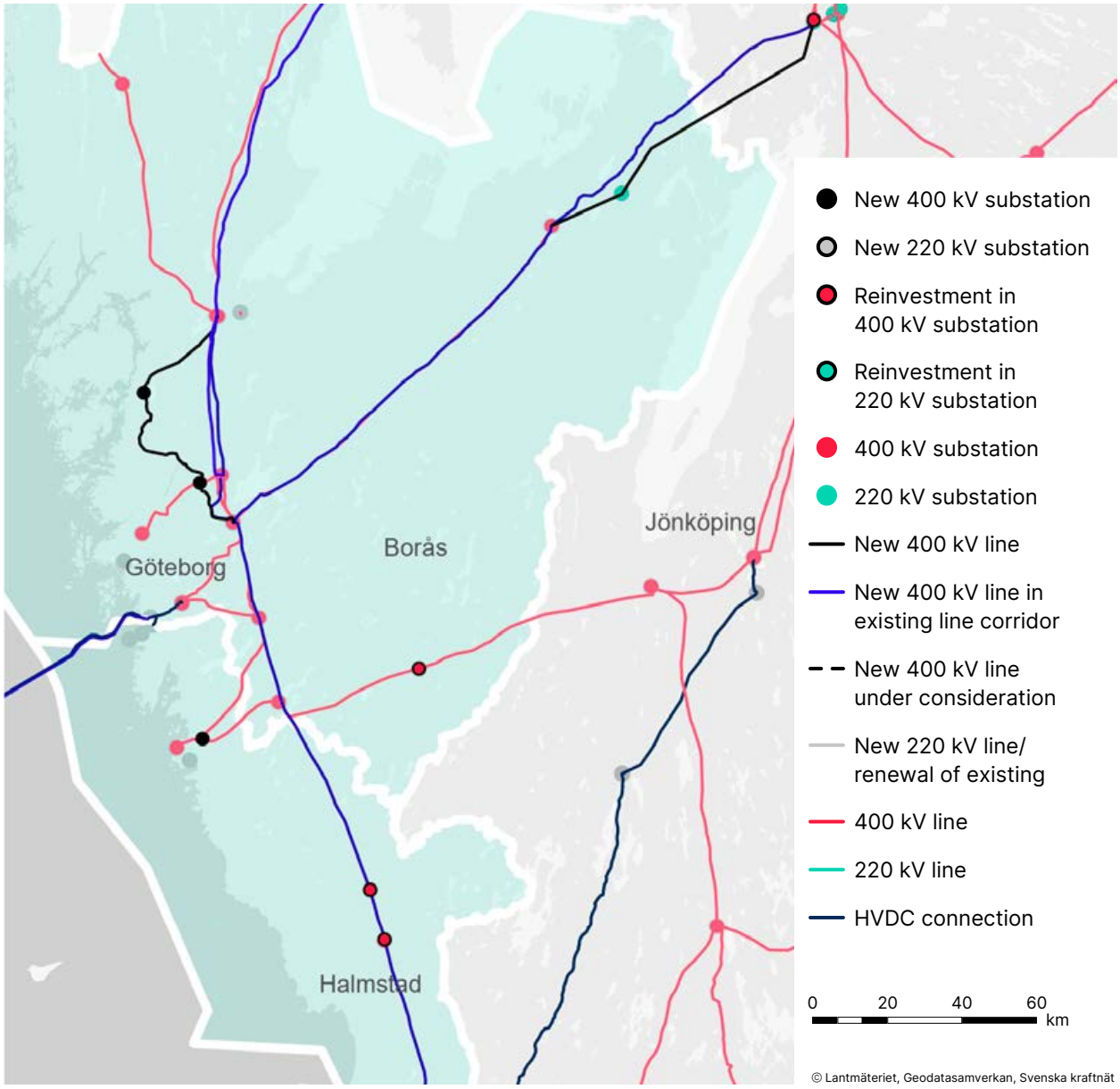


Figure 26. Grid measures in Regions Västra Götaland and Halland during the period 2026-2035, decided or under consideration.

4.6.11.3 Target network

Västra Götaland

The planned measures meet most of the known capacity needs in the area and contribute to system reinforcement, see Figure 26. Read more about how Svenska kraftnät works to manage the entire capacity requirement in section 4.6.11.4.

The purpose of the new lines and substations along the Trollhättan-Stenungsund-Göteborg-Lerum route is primarily to enable larger withdrawals from the transmission grid in the area. The reinvestment of an existing substation in Gothenburg and the reinvestment in the Trollhättan-Kilanda route (north of Lerum) will also contribute to this.

The purpose of a new 400 kV line between Töreboda and Skövde municipalities (Moholm and Timmersdala respectively) and a voltage increase to 400 kV for the existing 220 kV line between Hallsberg and Moholm is to enable increased withdrawals in Skaraborg and Gothenburg by 2035. The substation in Moholm is a 220 kV substation that Svenska kraftnät plans to upgrade to 400 kV. The new line and the higher voltage of the line also contribute to reducing bottlenecks for the east-west flow through SE3.

The lines on the section between Kilanda (north of Lerum) and Lerum will be reinvested as they reach the end of their technical service life and will then have increased transmission capacity. The same applies to the route between Lerum and east of Ringhals.

Svenska kraftnät plans to reinvest and expand the substation outside Svenljunga to enable increased consumption and increased security of supply during outage planning.

Svenska kraftnät also plans to reinvest the connection to Denmark together with our Danish counterpart. Analyses have shown that increased capacity for this connection provides electricity market benefits.

Halland

The easternmost 400 kV lines on the route from east of Ringhals down to Bjuv will be reinvested as they reach the end of their technical service life. The renewal will also increase transmission capacity.

A replacement is underway at a substation north-east of Halmstad. In connection with the reinvestment, new shunt capacitors will be installed in two substations north-east of Halmstad, which will enable increased electricity transfer southwards and provide support for the voltage in the area.

4.6.11.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.

A study of additional needs in Western Sweden up to 2045 is underway and is expected to be completed in December 2025. In order to enable increased consumption in Skaraborg and Gothenburg after 2031, a new 400 kV line is being analysed on the route north of Gothenburg between the municipalities of Grums and Trollhättan. The new line also contributes to reducing bottlenecks for the east-west flow through SE3.

4.6.12 Regions Kronoberg, Kalmar County, Jönköping County and Gotland

4.6.12.1 Current situation

Region Gotland is part of the SE3 bidding area. Regions Kalmar County and Jönköping County are part of the SE3 and SE4 bidding areas. Region Kronoberg is part of the SE4 bidding area. The transmission grid in the regions Kronoberg, Kalmar County and Jönköping County is important for electricity transmission between SE3 and SE4 and between eastern and western Sweden.

The area's electricity is mainly consumed in the larger cities. Generation is dominated by the Oskarshamn nuclear power plant. Wind power is the second largest source of generation, but there is also combined heat and power and solar power.

Nybro has an interconnector to Lithuania. Gotland is connected via the regional grid.

The power flows in the area vary, but are usually north-south. It is a surplus area where local generation exceeds the load for most of a normal year.

4.6.12.2 Needs

The need for transmission capacity in the area is primarily driven by requests for increased electricity generation from solar and wind power (both onshore and offshore) and the establishment of energy storage systems, see Figure 27. There are also minor requests for increased power for industrial establishments. Much of the need arises from the use of interconnectors.

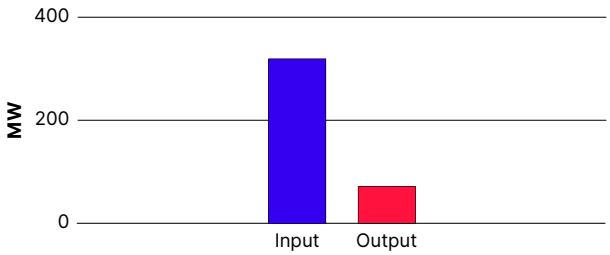


Figure 27. Power applied for in Regions Kronoberg, Kalmar County, Jönköping County and Gotland for input (electricity generation) and output (electricity consumption). The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

The existing connection between Gotland and the mainland is owned by a regional grid company and needs to be reinvested in the near future. At the same time, forecasts show that Gotland will have a power balance deficit within a few years. This requires increased transmission capacity between Gotland and the mainland, and Svenska kraftnät has therefore been commissioned to expand the transmission grid to include Gotland. We expect to be able to put a new AC connection into operation in the early 2030s. However, the purpose is not to replace existing regional grid lines.

4.6.12.3 Target network

Svenska kraftnät will build a new transmission grid connection to Gotland. The connection consists of two 220 kV submarine AC cables with a transmission capacity of 220 MW each. The cables are connected between Västervik and Oskarshamn on the mainland and south of Visby on Gotland.

As there is a need for increased electricity transmission southwards, Svenska kraftnät plans to put new 400 kV lines along the routes Oskarshamn-Nybro and Nybro-east of Olofström into operation. In order to be able to connect the lines, the substations at Oskarshamn, Nybro and east of Olofström will also be expanded with new switchgear bays.

The substation in Alvesta is reaching the end of its technical service life and will therefore be reinvested, which will also increase capacity in the transmission grid.

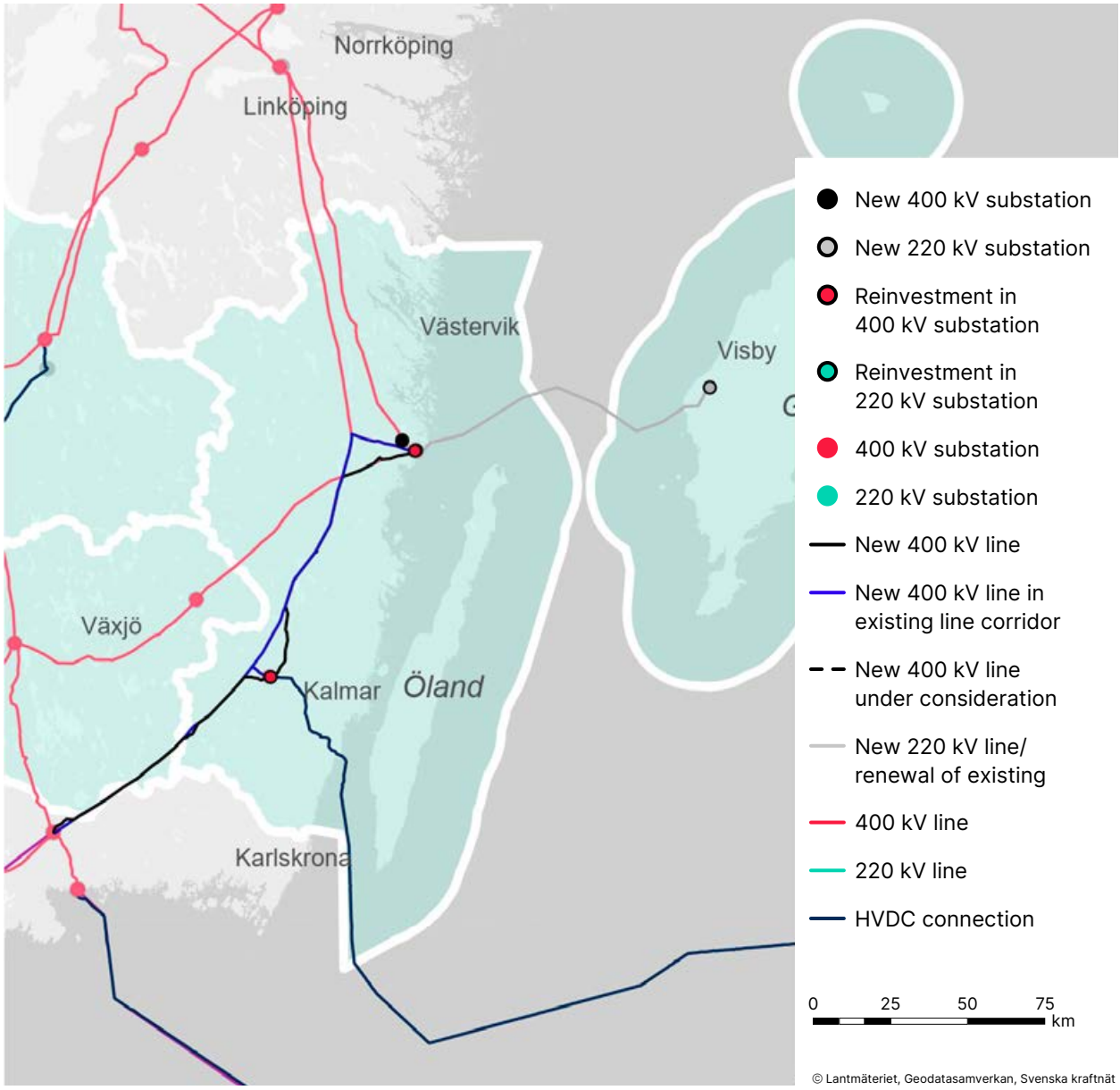


Figure 28. Grid measures in Regions Kronoberg, Kalmar County, Jönköping County and Gotland during the period 2026-2035, decided or under consideration.

4.6.12.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

4.6.13 Regions Skåne and Blekinge

4.6.13.1 Current situation

Regions Skåne and Blekinge are part of the SE4 bidding area. The transmission grid is located at the southern end of the Swedish transmission system and links the western and eastern branches of intersection 4. The area is linked to the European continent and is of strategic importance for the Nordic electricity system as a whole.

Skåne is a deficit area that needs to import from other areas to meet its electricity supply. The energy transition means that the grid capacity in Skåne must be increased and, in the longer term, the supply capacity to Malmö needs to be future-proofed.

Blekinge has a major transmission grid point east of Olofström and one in Karlshamn. In Karlshamn, the Swedish transmission grid is interconnected with Poland and the substation east of Olofström is the hub for two connections north, one south and one towards Karlshamn.

Skåne has interconnectors to Denmark and Germany.

4.6.13.2 Needs

Svenska kraftnät needs to implement system-reinforcing measures to remedy capacity constraints, partly for northbound flows at intersection 4, and partly for east-west transfer through the southern parts of the transmission grid.

Reinvestments in the area are largely driven by the need to replace lines that are beginning to reach the end of their technical service life. In connection with this, capacity will be increased as Svenska kraftnät builds new lines with three parallel lines per phase compared to the previous two.

System reinforcements are driven by Malmö's electricity demand, forecasts for increased electricity generation in SE4 and to meet the NordSyd initiative, see section 4.6.1.2, and thereby counteract the emergence of new bottlenecks.

The plans for market integration have changed since the last network development plan, that included a new connection to Germany. This project was rejected by the government in 2024, whereupon it was terminated. Southeast of Skåne, Denmark and Germany plan to build connections to the island of Bornholm. Svenska kraftnät is studying the socio-economic outcome if Sweden also connects to Bornholm.

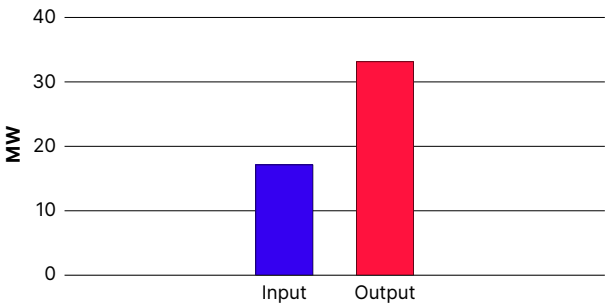


Figure 29. Power applied for in Regions Skåne and Blekinge for input (electricity generation) and output (electricity consumption) respectively. The graph shows Svenska kraftnät's application queue, i.e. until capacity has been reserved, in September 2025.

4.6.13.3 Target network

In Blekinge and Skåne, there are both ongoing and planned system reinforcements to increase capacity in the entire area and to maintain and increase security of supply. The reinforcements have been developed together with the regional network operator in the area.

Along the east coast, Svenska kraftnät is building a new 400 kV line on the route from Oskarshamn, via Nybro and down to the east of Olofström. The existing 400 kV line from Nybro, via Olofström and down to the east of Eslöv is being reinvested. Svenska kraftnät meets the line reinforcements in the NordSyd initiative, see section 4.6.1.2, with a double 400 kV line, which means that no new bottlenecks arise. In addition to increasing capacity at intersection 4, the system can also receive large amounts of electricity generation and allocate more power for new electricity consumption.

A new 400 kV line along the Olofström-Hörby-Tomelilla-Svedala route reinforces the capacity in eastern Skåne and Blekinge. Reinforcement is also planned in western Skåne with a new line from northeast of Helsingborg to Hörby, which will allow Svenska kraftnät to connect more consumption and generation in the area.

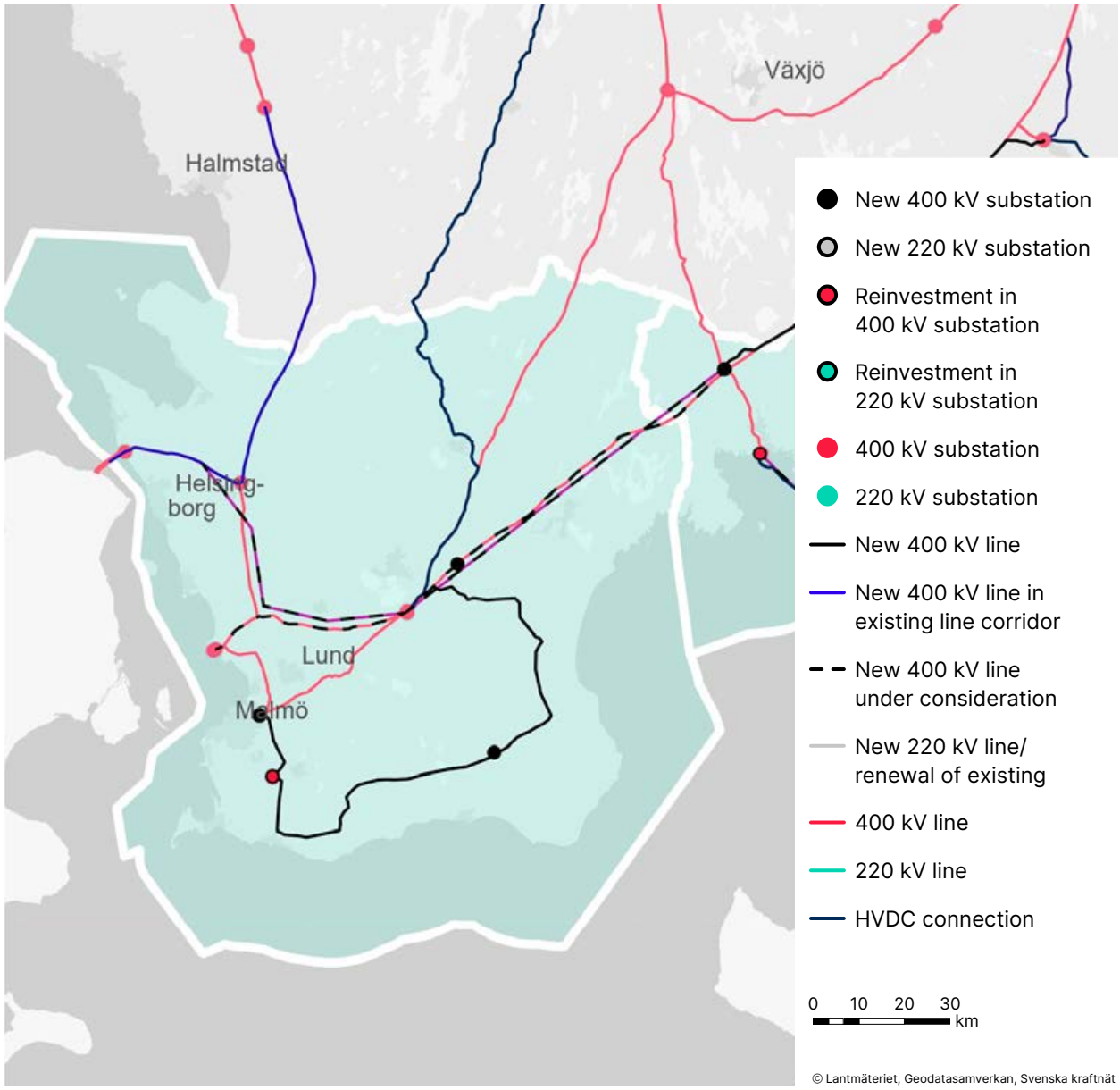


Figure 30. Target network 2045 for regions Skåne and Blekinge.

4.6.13.4 Uncertainties and upcoming work

As described in the introduction to section 4.6, there may be uncertainty about the final scope and timing of planned initiatives.

For more information about the NordSyd initiative, see section 4.6.1.2.


410

10 year grid investment plan

This chapter describes major investments in the transmission grid over the next ten years. The projects reported represent the best assessment in September 2025. New projects will gradually be added whilst others will be removed or amended time- and scope-wise. This is an inevitable consequence of the many parameters that impact the conditions and motives for investment activities. There is also ongoing development work on fundamental assumptions for the investment plan such as opportunities to schedule outages, resource requirements, legal requirements regarding connection obligations and priorities.

The probable outcome of Svenska kraftnät's grid investments over the next ten years is shown in Figure 31 between the dashed and solid lines. The figure also shows the outcome from the last ten years. Grid investments have started to increase from a relatively steady level and are expected to increase sharply in the future.

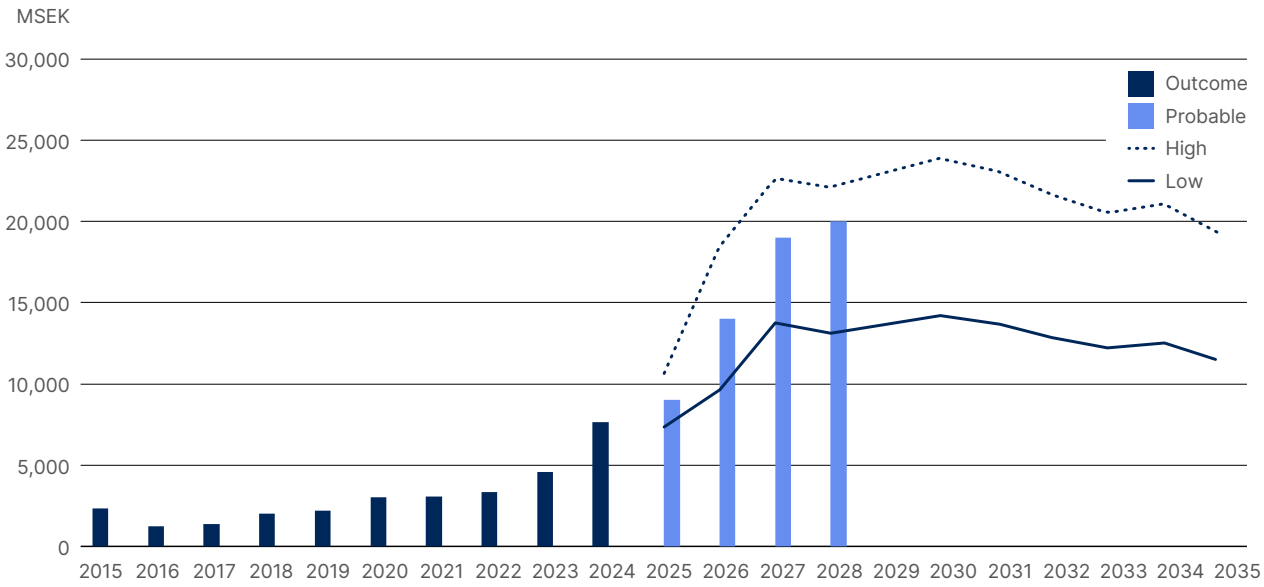


Figure 31. Outcome of grid investments during the period 2015-2024, and probable development of grid investments during the period 2025-2035. The area between the dashed and solid lines provides an estimate of future grid investments based on the projects that were included in the basis for the business plan in January 2025. Note that the graph does not include future projects that have not yet been defined.

An overview of the different investments is shown in Figure 32. The following sections present the investments in more detail in separate maps per region based on the situation in September 2025. Note that an investment can appear in several maps, for example the construction of a line that extends through several regions.

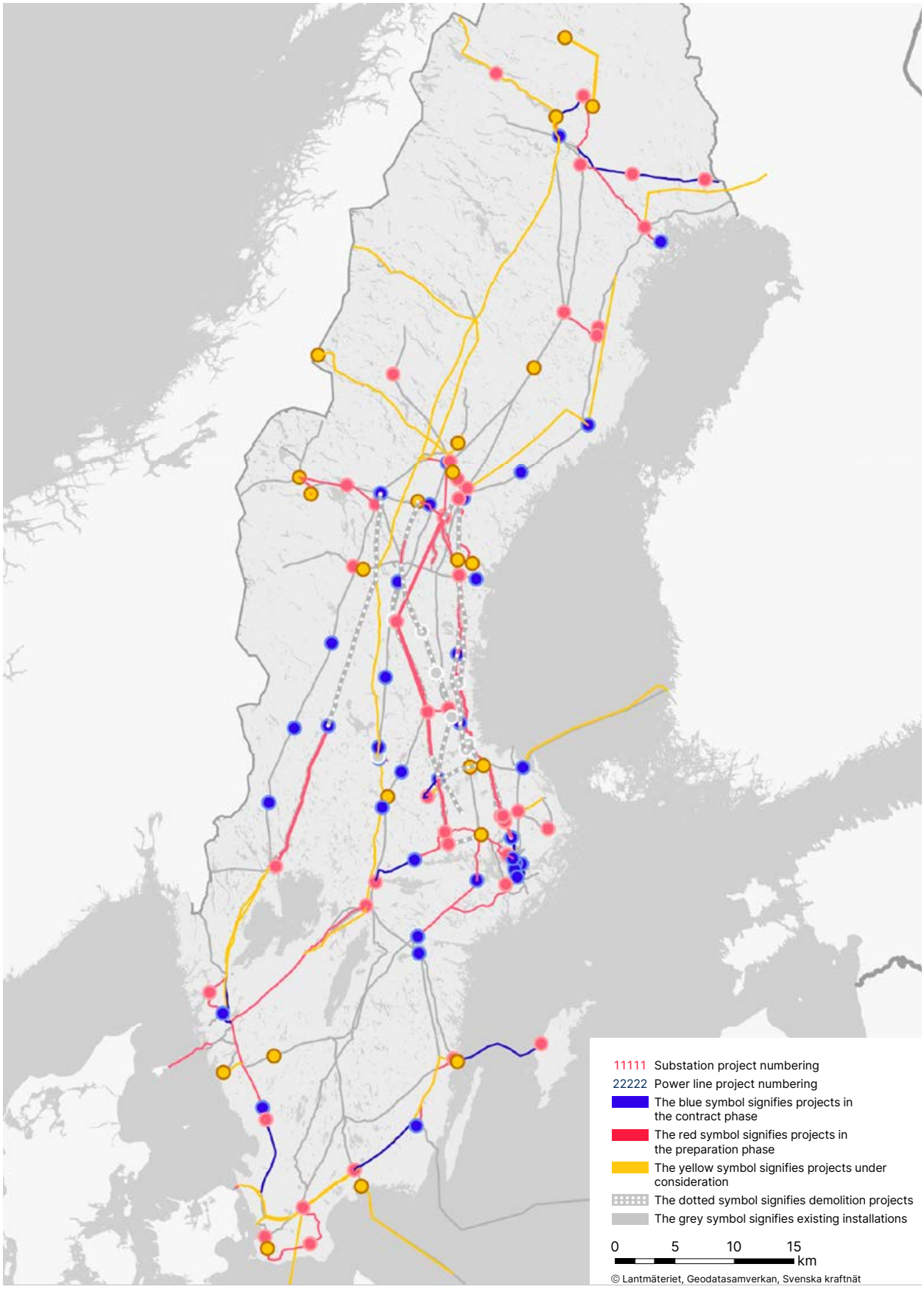


Figure 32. Major construction projects starting before 2036.

The projects in each area are divided into the phases under consideration, preparation and contracting.

Project under consideration

A project is classified as under consideration when there is an ongoing study to assess the conditions required for carrying out an investment. The category also includes projects that have not yet been started but for which a clear need has been identified for starting measures within the next ten years. The majority of the latter type concerns reinvestments where the installations are approaching the end of their technical lifespan. Projects to connect external parties have not been included if the conditions have not yet been investigated.

Project in preparation phase

A project is in the preparation phase from the time a policy decision is drawn up until a final decision on implementation is made. The phase includes in-depth technical design and procurement of the construction contract. Line projects also include consultation and permitting work.

Some projects in preparation phase are not realised. This may be because the need is no longer considered sufficient, for example because the conditions have changed. To be able to sign a connection agreement with Svenska kraftnät, a connecting party may be dependent on a wind power developer obtaining financing for a project.

Project in contracting phase

A project is classified as being in the contracting phase when Svenska kraftnät has made the decision to proceed and sign the contract for the main contract works. This corresponds to an investment decision having been made according to Svenska kraftnät's decision-making process. Only in exceptional cases will ongoing projects be cancelled, but changes to the time plan or cost estimates may occur.

Decision phase	BSEK
Under consideration	160
Preparation phase	125
Contracting phase	80
Total	**365**

Table 3. Projects with planned start 2025-2035, distribution per decision phase.

Key to the tables

The tables for each region and phase contain the following information:

Phase: Indicates which of the three phases, under consideration, preparation phase or contracting phase, the project is in.

- Map no.: Serial number shown on the map.
- Project description: Short description of the measures included in the project.
- Planned to be put into/taken out of operation: The year in which the installation is planned to be put into operation (for new construction and reconstruction) or out of operation (for demolition).
- Motive: The project motives are categorised as connection, market integration, system reinforcement and reinvestment. The motives are described in section 2. The tables indicate each project's main motive. See also Figure 33 for the distribution between the different motives.

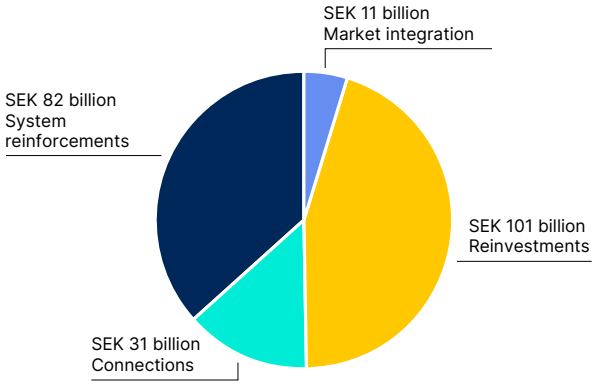


Figure 33. Investments over the 10-year period distributed between different motives. Total SEK 225 billion

Project	BSEK
Stockholm	30
Kustpaketet (Coast package)	17
Midskog-Malsjö, new double 400 kV lines	14
Inlandspaketet (Inland package)	13
Konti-Skan Connect	10
Gotlandsförbindelsen (Gotland connection)	10
Ockelbopaketet (Ockelbo package)	6
Uppsalapaketet (Uppsala package)	6
Malmfälten	6
Norrland Coast	5
Skåne Syd (Southern Skåne)	5
Ekhyddan-Nybro-Hemsjö	3
Total	**125**

Table 4. Projects with the largest investments during the period 2025-2035.

During 2025-2035, Svenska kraftnät plans to put approximately 2,900 km of new lines and approximately 40 new substations into operation. In addition, we will reinvest over 1,100 km of lines and about half of our nearly 200 substations.

Grid investments in Region Norrbotten

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
31075	Porjus' new 400 kV substation	2034	Connection
31083	Gällivare new 400 kV substation	2034	Connection
31089	Porjusberget-Porjus reinforcement measure	2034	System reinforcements
31679	Kiruna new 400 kV substation	2034	Connection
31683	Kiruna-Gällivare new 400 kV line	2034	Connection
31635	Aurora Line 2 new connection SE1-Finland	2036	Market integration
31079	Ligga-Porjus new 400 kV line	2037	Connection
30901	Ligga-Vargfors (Malånäset) line renewal	2037	Reinvestment
31095	Ligga-Grundfors line renewal	2038	System reinforcements
10089	Råbäcken-Stornorrfors new 400 kV line	2039	System reinforcements
31087	Norwegian border-Porjusberget temperature upgrade	2043	System reinforcements

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
31190	Letsi substation renewal	2026	Reinvestment
10894	Letsi-Svartbyn new 400 kV line	2028	System reinforcements
31541	Naalojärvi new 400 kV substation	2029	Connection
31761	Vietas substation renewal	2029	Reinvestment
31826	Isovaara SC substation renewal	2029	System reinforcements
31989	Pålkem new 400 kV substation	2029	Connection
31687	Naalojärvi-Messaure new 400 kV line	2031	Connection
31093	Porjusberget-Ligga reinforcement measure	2032	System reinforcements
31894	Harsprånget-Porjusberget line renewal	2033	System reinforcements

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
31302	Ligga substation renewal	2026	Reinvestment
31106	Hällmyran new 400 kV substation	2029	Connection
31134	Porjusberget-Naalojärvi new 400 kV line	2029	Connection
31315	Svartbyn-Hällmyran two new 400 kV lines	2029	Connection
31754	Svartbyn substation renewal	2029	Reinvestment

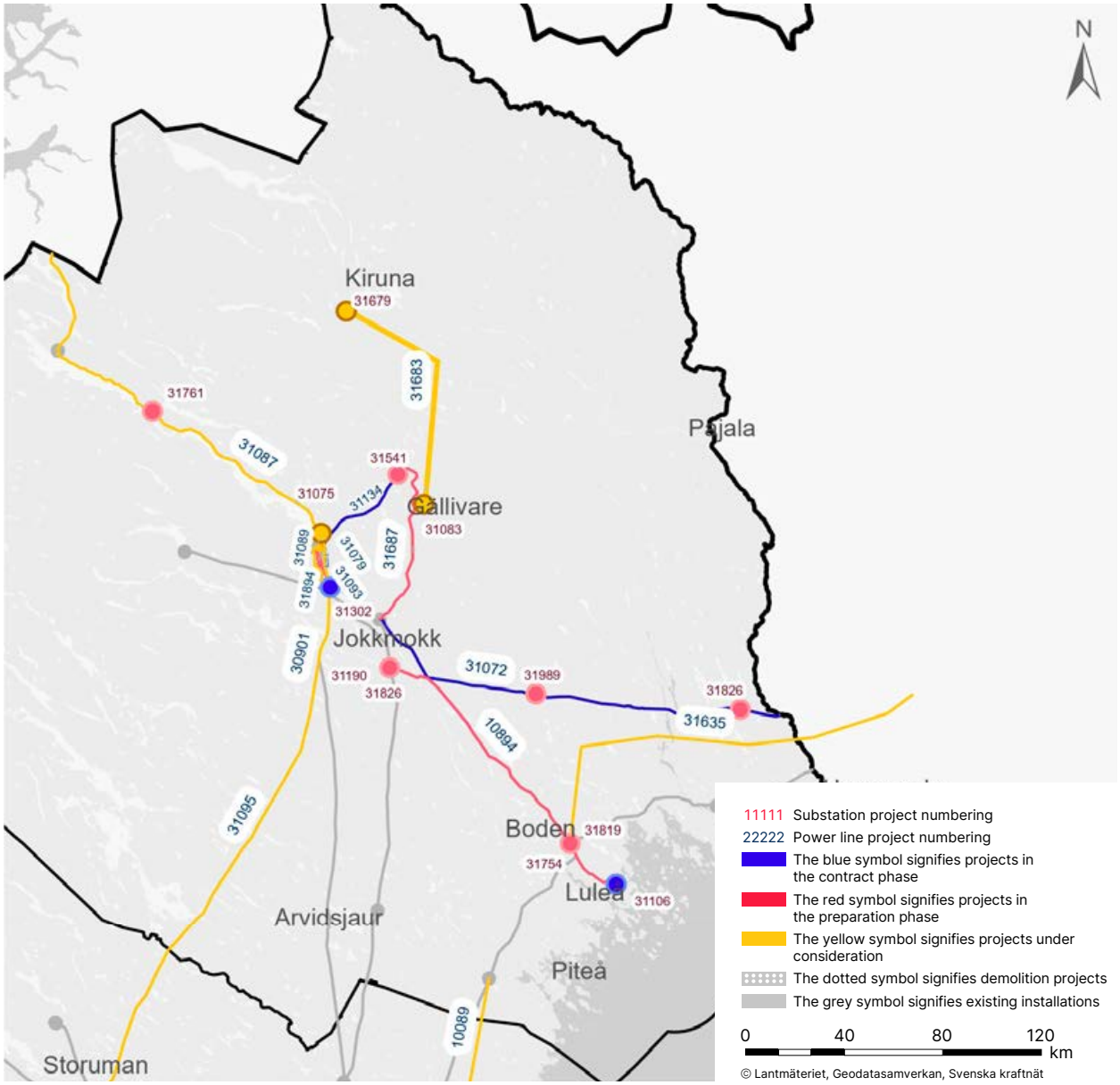


Figure 34. Major construction projects in Region Norrbotten starting before 2036.

Grid investments in Region Västerbotten

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
30973	Tuggen substation renewal	2031	Reinvestment
30897	Grundfors-Storfinnforsen line renewal	2037	Reinvestment
30904	Grundfors-Ramsele line renewal	2039	Reinvestment
10089	Råbäcken-Stornorrfors new 400 kV line	2039	System reinforcements
29900	Stornorrfors-Hjälta line renewal	2043	Reinvestment
31467	Voltage uprating of 220 kV line SE2-NO4	2045	Market integration

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
30248	Vargfors (Malånäset) substation renewal	2029	Reinvestment
30817	Malånäset-Högnäs new 400 kV line	2029	System reinforcements
30830	Högnäs substation expansion	2029	System reinforcements
30311	Lidmyran new 400 kV substation	2031	Connection

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
30753	Stornorrfors substation renewal	2027	Reinvestment

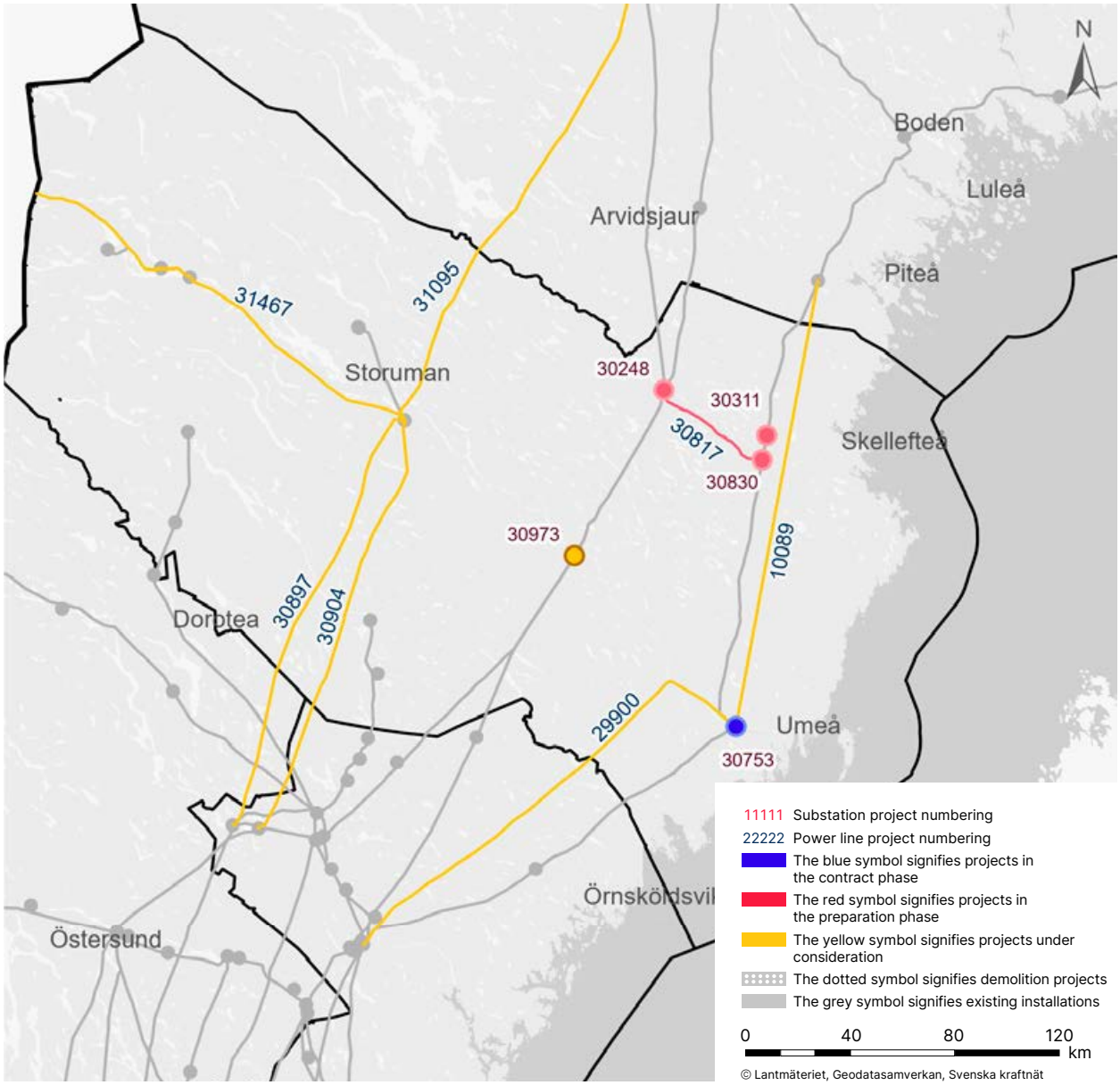


Figure 35. Major construction projects in Region Västerbotten starting before 2036.

Grid investments in Region Västernorrland

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
29725	Degerforsen substation renewal	2031	Reinvestment
29750	Nysäter substation renewal	2033	Reinvestment
29176	Hjälta partial renewal	2034	Reinvestment
29880	Långbjörn branch to Degerforsen line renewal	2036	Reinvestment
30897	Grundfors-Storfinnforsen line renewal	2037	Reinvestment
29921	Kilforsen-Hjälta line renewal	2038	Reinvestment
29925	Ramsele-Storfinnforsen line renewal	2038	Reinvestment
29233	Nämforsen substation renewal	2039	Reinvestment
29758	Turinge substation renewal	2039	Reinvestment
30904	Grundfors-Ramsele line renewal	2039	Reinvestment
29748	Moliden substation renewal	2040	Reinvestment
29978	Storfinnforsen-Bäsna-Hallsberg new double 400 kV lines	2041	Reinvestment
29443	Helgum-Hjälta line renewal	2042	Reinvestment
29868	Långbjörn-Linnvasselv including branch to Junsterforsen line renewal	2042	Reinvestment
29900	Stornorrfors-Hjälta line renewal	2043	Reinvestment

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
29904	Forsse-Stadsforsen line demolition	2027	Reinvestment
29582	Helgum substation measures	2028	Connection
29729	Forsmo substation renewal	2028	Reinvestment
29747	Moforsen substation renewal	2028	Reinvestment
29901	Hjälta-Nysäter line demolition	2028	Reinvestment
29907	Hällsjö-Söderala line demolition	2028	Reinvestment
29909	Betåsen-Nässe new 400 kV line	2028	Reinvestment
29744	Lasele substation renewal	2030	Reinvestment
27902	Nysäter-Njutånger line demolition	2031	Reinvestment

Map no.	Project description:	Planned to put into/ take out of operation	Motive
29018	Bandsjö new 400 kV substation	2031	Connection
29690	Hjälta/Nässe expansion of 400 kV substation and connection to Odensala 400 kV substation	2031	System reinforcements
29910	Ramsele-Kilforsen capacity upgrade 400 kV	2031	System reinforcements
28900	Stadsforsen-Torpshammar line demolition	2032	Reinvestment
28905	Stadsforsen-Hällsjö line demolition	2032	Reinvestment
29903	Nässe-Vattjom new double 400 kV lines	2032	Reinvestment
29917	Vattjom new 400 kV substation	2032	System reinforcements
29923	Nässe connection to Jälla	2032	System reinforcements
28937	Kilforsen-Utanede new double 400 kV lines	2033	Reinvestment
29028	Hällsjö and Vattjom connection of 220 kV line	2033	System reinforcements
29848	Stadsforsen-Hölleforsen-Järkvissle line renewal	2033	Reinvestment
29920	Vattjom-Njutånger two new 400 kV lines	2033	Reinvestment
29495	Bräcke–Ånge new 220 kV line	2034	Reinvestment
29951	Utanede-Fallviken new double 400 kV lines	2034	Reinvestment
28969	Midskog-Malsjö new double 400 kV lines	2035	Reinvestment
29027	Järkvissle-Hällsjö line demolition	2035	Reinvestment
29854	Forsmo-Lasele-Långbjörn line renewal	2036	Reinvestment

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
29603	Moliden partial renewal	2026	Reinvestment
29760	Vaple substation renewal	2026	Reinvestment
29071	Kilforsen substation renewal	2028	Reinvestment
29911	Nässe new 400 kV substation	2028	Connection

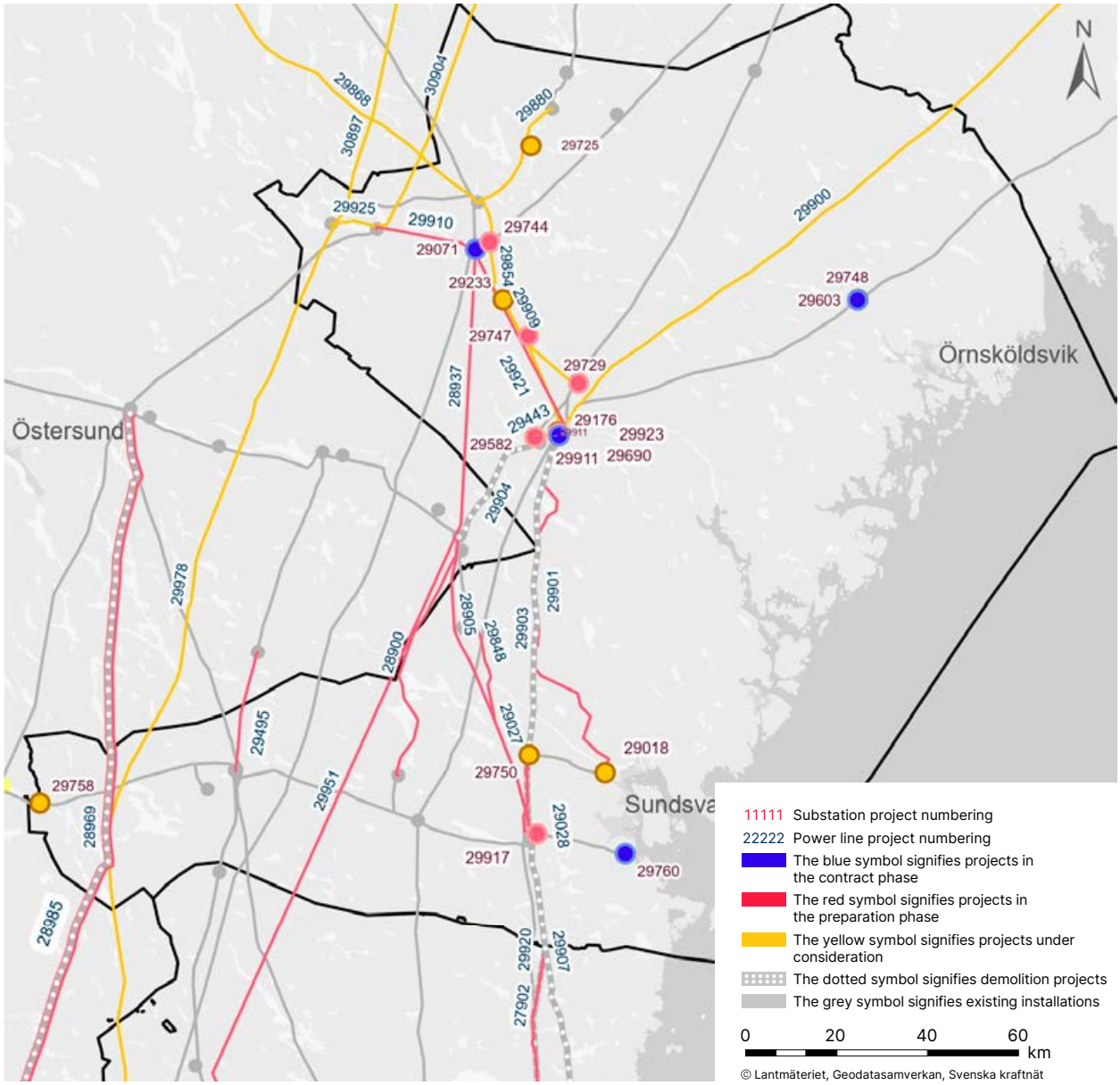


Figure 36. Major construction projects in Region Västernorrland starting before 2036.

Grid investments in Region Jämtland Härjedalen

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
10967	Linnvasselv substation renewal	2030	Reinvestment
28845	Krångede substation renewal	2033	Reinvestment
28847	Sällsjö substation renewal	2033	Reinvestment
28352	Järpströmmen substation renewal	2035	Reinvestment
30897	Grundfors-Storfinnforsen line renewal	2037	Reinvestment
30904	Grundfors-Ramsele line renewal	2039	Reinvestment
29978	Storfinnforsen-Bäsna-Hallsberg new double 400 kV lines	2041	Reinvestment
29868	Långbjörn-Linnvasselv including branch to Junsterforsen line renewal	2042	Reinvestment

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
29904	Forsse-Stadsforsen line demolition	2027	Reinvestment
28521	Korsselbränna substation renewal and expansion	2028	Reinvestment
28816	Åsbacken new 400 kV substation	2029	Connection
28980	Rätan power station substation renewal	2029	Reinvestment
28827	Krångede-Gammelänge line renewal	2030	Reinvestment
28830	Stadsforsen-Hammarstrand-Krångede line renewal	2030	Reinvestment
28913	Stadsforsen substation renewal	2031	Reinvestment
27960	Ånge-Ljusdal line demolition	2032	Reinvestment
28900	Stadsforsen-Torpshammar line demolition	2032	Reinvestment
28905	Stadsforsen-Hällsjö line demolition	2032	Reinvestment
28918	Utanede new 400 kV substation	2032	System reinforcements
29903	Nässe-Vattjom new double 400 kV lines	2032	Reinvestment
28937	Kilforsen-Utanede new double 400 kV lines	2033	Reinvestment
28938	Krångede-Bräcke line demolition	2034	Reinvestment
29495	Bräcke–Ånge new 220 kV line	2034	Reinvestment
28777	Ismunden-Järpströmmen new 400 kV line	2035	System reinforcements
28969	Midskog-Malsjö new double 400 kV lines	2035	Reinvestment
28982	Ismunden new 400 kV substation	2035	System reinforcements
28985	Midskog-Kättbo line demolition	2038	Reinvestment

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
24714	Olingan and Gräsmark SC substations	2026	System reinforcements
28939	Hammarstrand new 220 kV substation	2027	Connection
28965	Midskog substation expansion	2028	Connection

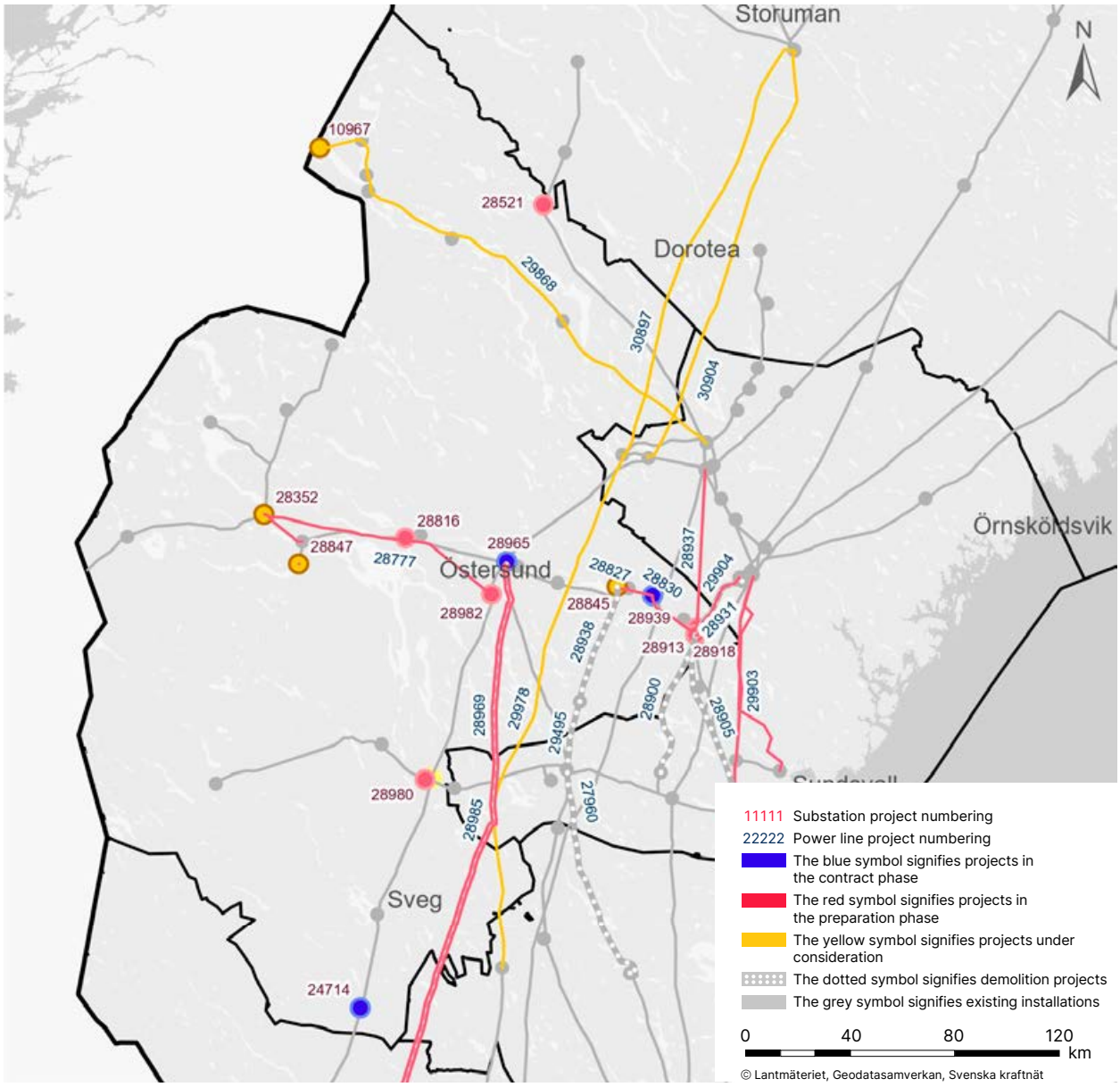


Figure 37. Major construction projects in Region Jämtland Härjedalen starting before 2036.

Grid investments in Region Gävleborg

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
27290	Finnböle (Fenno-Skan 2) partial renewal	2033	Reinvestment
27930	Vittersjö EK3 demolition series compensation substation	2034	Reinvestment
29978	Storfinnforsen-Bäsna-Hallsberg new double 400 kV lines	2041	Reinvestment

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
27857	Enån new 400 kV substation	2028	System reinforcements
27863	Ånge-Laforsen line demolition	2028	Reinvestment
27959	Laforsen-Horndal line demolition	2028	Reinvestment
29907	Hällsjö-Söderala line demolition	2028	Reinvestment
27873	Grönviken-Fallviken new 400 kV line	2029	System reinforcements
24858	Fallviken-Horndal new double 400 kV lines	2030	System reinforcements
27925	Söderala-Valbo line demolition	2030	Reinvestment
27874	Fallviken new 400 kV substation	2031	System reinforcements
27902	Nysäter-Njutånger line demolition	2031	Reinvestment
27966	Grönviken substation expansion (external project)	2031	System reinforcements
27861	Ockelbo substation demolition	2032	Reinvestment
27869	Dönje substation demolition	2032	Reinvestment
27939	Ljusdal-Dönje line demolition	2032	Reinvestment
27948	Laforsen substation demolition	2032	Reinvestment
27960	Ånge-Ljusdal line demolition	2032	Reinvestment
27962	Ljusdal substation demolition	2032	Reinvestment
27903	Njutånger-Ängsberg line demolition	2033	Reinvestment
27957	Ockelbo-Horndal line demolition	2033	Reinvestment
29920	Vattjom-Njutånger two new 400 kV lines	2033	Reinvestment
27927	Valbo-Untra line demolition	2033–2034	Reinvestment
27882	Stackbo and Valbo substation demolition	2034	Reinvestment
29951	Utanede-Fallviken new double 400 kV lines	2034	Reinvestment

Map no.	Project description:	Planned to put into/ take out of operation	Motive
27924	Njutånger-Mehedeby new double 400 kV lines	2035	Reinvestment
27929	Söderala substation demolition	2035	Reinvestment
28969	Midskog-Malsjö new double 400 kV lines	2035	Reinvestment

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
24767	Tovåsen and Gustafs series compensation	2027	System reinforcements
27914	Njutånger new 400 kV substation	2027	System reinforcements
27526	Vittersjö EK5 series compensation	2029	System reinforcements

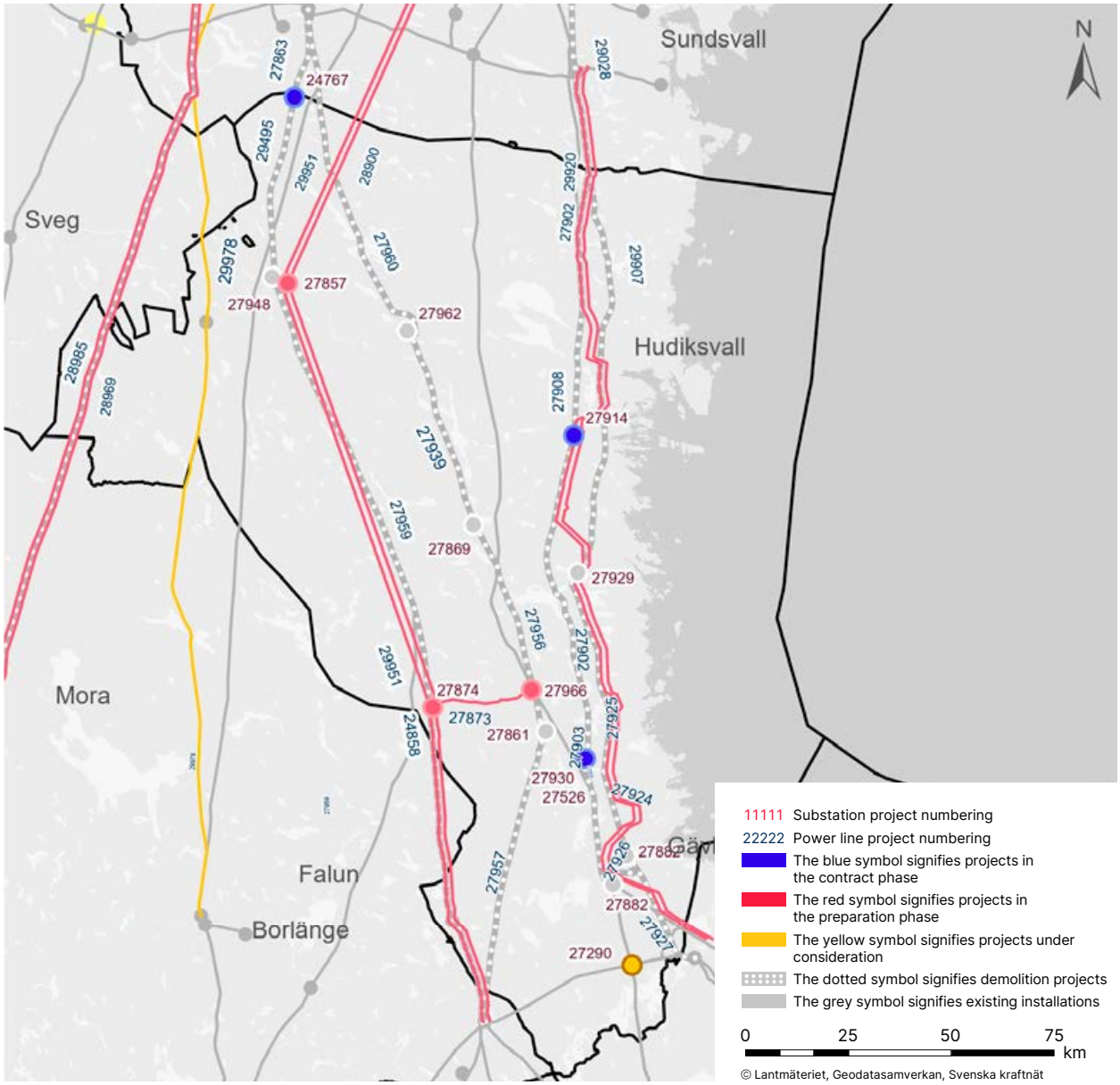


Figure 38. Major construction projects in Region Gävleborg starting before 2036.

Grid investments in Regions Örebro County, Dalarna and Värmland

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
21855	Substation measures for voltage uprating of Himmeta-Karlslund line	2027	System reinforcements
24719	Djurmo EK2 and EK4 demolition series compensation substation	2028	Reinvestment
27167	Horndal substation measures	2030	Connection
24674	Horndal-Starfors line demolition	2030–2031	Reinvestment
24971	Morgårdshammar substation renewal	2033	Reinvestment
25628	Borgvik-Skogssäter line renewal	2035	Reinvestment
24983	Kättbo demolition series compensation substation	2036	Reinvestment
24980	Helgbo and Snösjön EK1 demolition series compensation substation	2037	System reinforcements
24690	Forssjön-Krylbo line renewal	2038	Reinvestment
29978	Storfinnforsen-Bäsna-Hallsberg new double 400 kV lines	2041	Reinvestment

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
24850	Avesta substation renewal	2030	Reinvestment
24856	Horndal new 400 kV substation	2030	System reinforcements
24858	Fallviken-Horndal new double 400 kV lines	2030	System reinforcements
26404	Hallsberg new STATCOM	2030	System reinforcements
24876	Horndal-Munga new double 400 kV lines	2031	Reinvestment
17645	Hallsberg-Timmersdala line renewal	2032	Reinvestment
24578	Bäsna-Repbäcken new 400 kV line	2032	Connection
26145	Lindbacka substation renewal	2032	Reinvestment
27886	Untra substation demolition	2033	Reinvestment
20928	Untra-Horndal line demolition	2033–2034	Reinvestment
25782	Borgvik-Malsjö new 400 kV line	2035	Reinvestment
17633	Hallsberg-Moholm-Timmersdala new 400 kV line	2035	System reinforcements
25970	Malsjö new 400 kV substation	2035	System reinforcements

Map no.	Project description:	Planned to put into/ take out of operation	Motive
28969	Midskog-Malsjö new double 400 kV lines	2035	Reinvestment
24986	Kättbo-Borgvik line demolition	2038	Reinvestment
28985	Midskog-Kättbo line demolition	2038	Reinvestment

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
24714	Olingan and Gräsmark SC substations	2026	System reinforcements
24982	Tandö new 400 kV substation	2026	Connection
24522	Kättbo SC substation renewal	2027	System reinforcements
24676	Horndal-Avesta line renewal	2027	Reinvestment
24735	Horndal substation renewal	2027	Reinvestment
24767	Tovåsen and Gustafs series compensation	2027	System reinforcements
24003	Horndal-Finnslätten east line demolition	2028	Reinvestment
24301	Bäsna substation renewal	2028	Reinvestment
24516	Helgbo and Snösjön EK1 series compensation	2028	System reinforcements
24662	Loberget and Snösjön EK2 series compensation	2028	System reinforcements

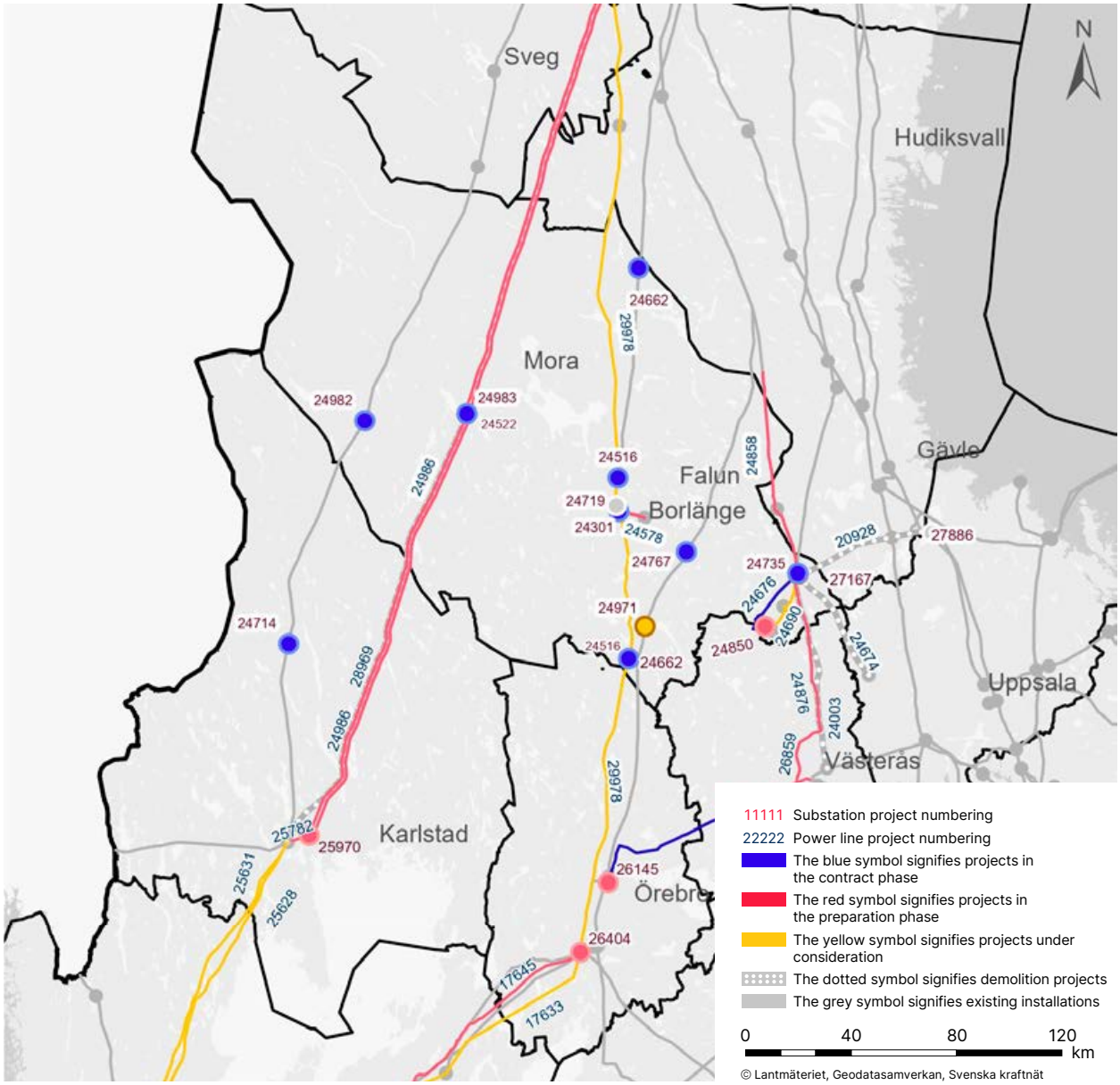


Figure 39. Major construction projects in Regions Örebro County, Dalarna and Värmland starting before 2036.

Grid investments in Region Stockholm

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
23383	Hagby-Järva line demolition	2031	Reinvestment
20704	Tuna-Edinge-Gråska line renewal	2035	System reinforcements

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
20889	Plenninge-Odensala, new double 400 kV lines	2029	Reinvestment
23746	Malsta substation renewal	2029	Reinvestment
23017	Kolbotten substation renewal	2030	Reinvestment
23807	Kappetorp-Kronåsen new 400 kV line	2030	System reinforcements
23808	Beckomberga-Bredäng new 400 kV line (Ellevio)	2030	System reinforcements
23809	Björksätra-Kolbotten new 400 kV line	2030	System reinforcements
23476	Hall-Hedenlunda line renewal	2042	System reinforcements
23632	Granhammar-Runby new 400 kV underground and submarine cable	*	System reinforcements
23634	Granhammar and Runby new 400 kV terminal substations	*	System reinforcements
23805	Hamra-Kappetorp new 400 kV line	*	System reinforcements

*study in progress

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
23385	Lindhov-Högdalen line demolition	2026	Reinvestment
23880	Odensala substation reconstruction and expansion	2027	System reinforcements
23100	Anneberg substation measures	2030	System reinforcements
23162	Kronåsen-Råcksta new 400 kV underground cable	2030	System reinforcements
23194	Kronåsen new 400 kV substation	2030	System reinforcements
23421	Anneberg-Skanstull 400 kV underground cable	2030	System reinforcements
23802	Kappetorp new 400 kV substation	2030	System reinforcements
23803	Råcksta new 400 kV substation	2030	System reinforcements
23804	Björksätra new 400 kV substation	2030	System reinforcements
23806	Odensala-Kappetorp new 400 kV line	2030	System reinforcements

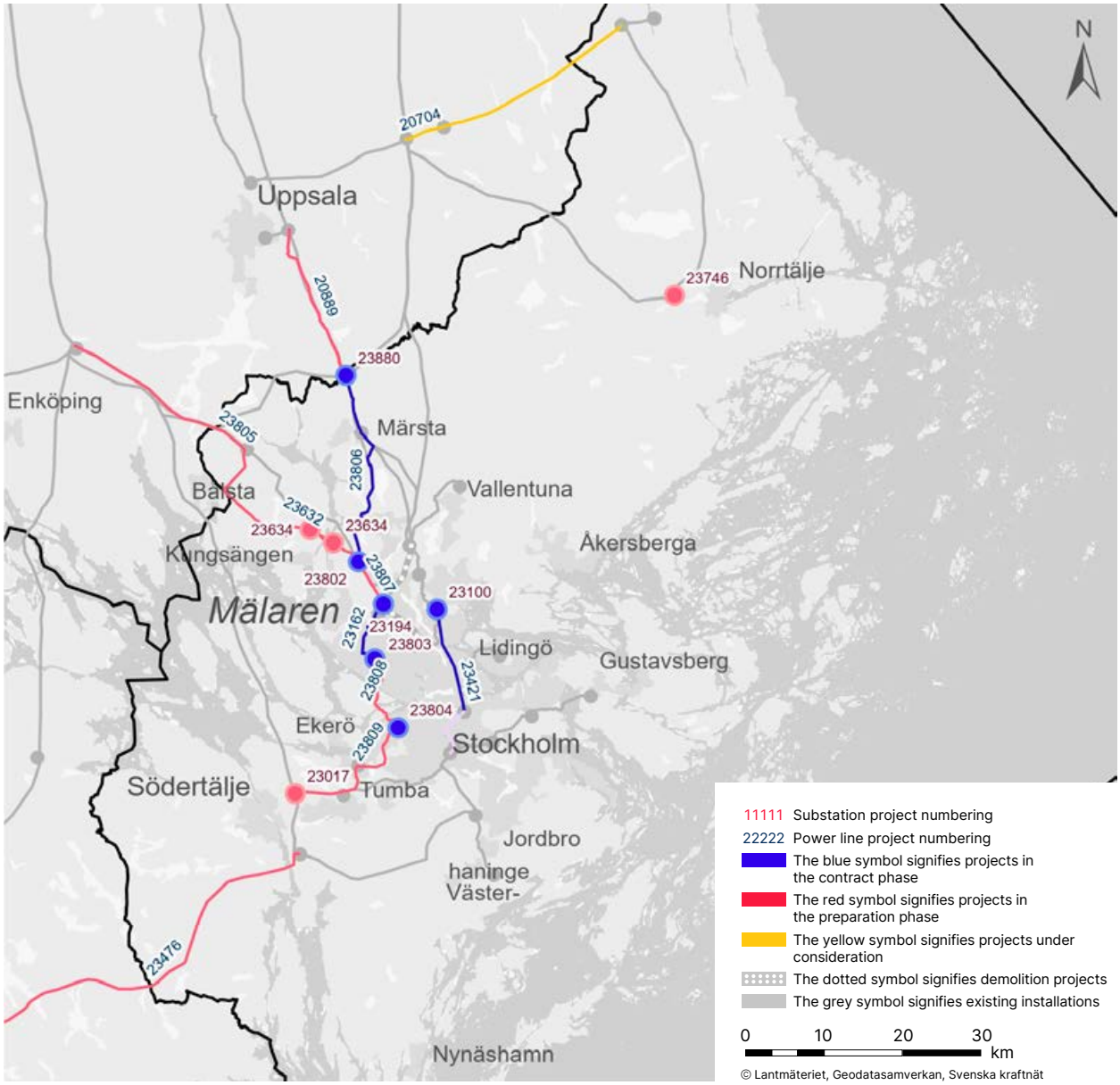


Figure 40. Major construction projects in Region Stockholm starting before 2036.

Grid investments in Regions Sörmland and Östergötland

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
22458	Hamra-Åker line renewal	2032	System reinforcements
19669	Hedenlunda-Glan line renewal	2033	System reinforcements
22668	Åker-Hedenlunda line renewal	2040	System reinforcements
23476	Hall-Hedenlunda line renewal	2042	System reinforcements

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
22762	Åker substation renewal	2026	Reinvestment
19065	Kimstad substation renewal	2027	Reinvestment
19730	Glan substation renewal	2027	Reinvestment

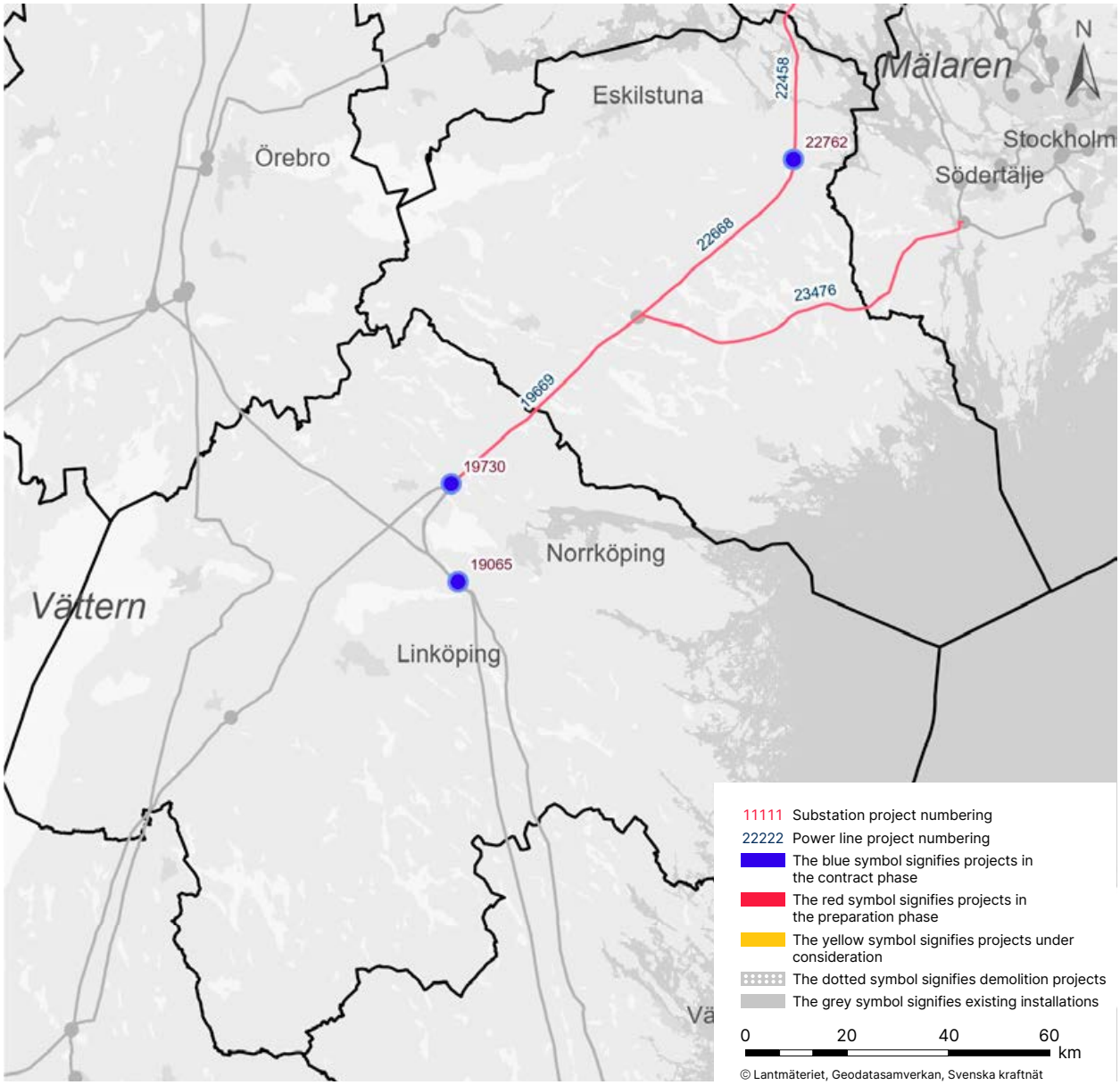


Figure 41. Major construction projects in Regions Sörmland and Östergötland starting before 2036.

Grid investments in Regions Västmanland and Uppsala

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
21855	Substation measures for voltage uprating of Himmeta-Karlslund line	2027	System reinforcements
24674	Horndal-Starfors line demolition	2030–2031	Reinvestment
20704	Tuna-Edinge-Gråska line renewal	2035	System reinforcements
20946	Fenno-Skan replacement	2038	Market integration

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
20895	Plenninge-Odensala line demolition	2028	Reinvestment
21852	Munga new 400 kV substation	2028	System reinforcements
21860	Munga-Hamra new 400 kV line	2028	Reinvestment
21862	Finnslätten-Arosverket-Bysingsberg line demolition	2028	Reinvestment
26859	Munga-Bysingsberg new 400 kV line	2028	Reinvestment
20881	Plenninge new 400 kV substation	2029	System reinforcements
20889	Plenninge-Odensala new double 400 kV lines	2029	Reinvestment
20892	Bredåker-Plenninge line demolition	2029	Reinvestment
20021	Tuna substation renewal	2030	Reinvestment
20879	Jälla new 400 kV substation	2030	System reinforcements
20884	Bredåker-Jälla line renewal	2030	Reinvestment
20890	Bredåker-Jälla new 220 kV line	2030	Reinvestment
20894	Untra-Bredåker west line demolition	2030	Reinvestment
20897	Jälla-Plenninge new double 400 kV lines	2030	System reinforcements
20505	Bredåker substation renewal	2031	Reinvestment
20883	Mehedeby-Jälla new double 400 kV lines	2031	Reinvestment
20893	Untra-Bredåker east line demolition	2031	Reinvestment
23805	Hamra-Kappetorp new 400 kV line	2031	System reinforcements
24876	Horndal-Munga new double 400 kV lines	2031	Reinvestment
21004	Finnslätten-Hamra line demolition	2032	Reinvestment
21005	Finnslätten substation demolition	2032	Reinvestment

Map no.	Project description:	Planned to put into/ take out of operation	Motive
21868	Horndal-Finnslätten west line demolition	2032	Reinvestment
22458	Hamra-Åker line renewal	2032	System reinforcements
20867	Hamra 220 kV substation demolition	2033	Reinvestment
27886	Untra substation demolition	2033	Reinvestment
29920	Vattjom-Njutånger two new 400 kV lines	2033	Reinvestment
20928	Untra-Horndal line demolition	2033–2034	Reinvestment
27927	Valbo-Untra line demolition	2033–2034	Reinvestment

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
20442	Hamra renewal of SVS installation	2026	Reinvestment
21855	Himmeta substation renewal	2026	System reinforcements
20440	Forsmark substation renewal	2026–2027	Reinvestment
24676	Horndal-Avesta line renewal	2027	Reinvestment
24003	Horndal-Finnslätten east line demolition	2028	Reinvestment
20811	Hamra reconstruction and expansion	2030	System reinforcements

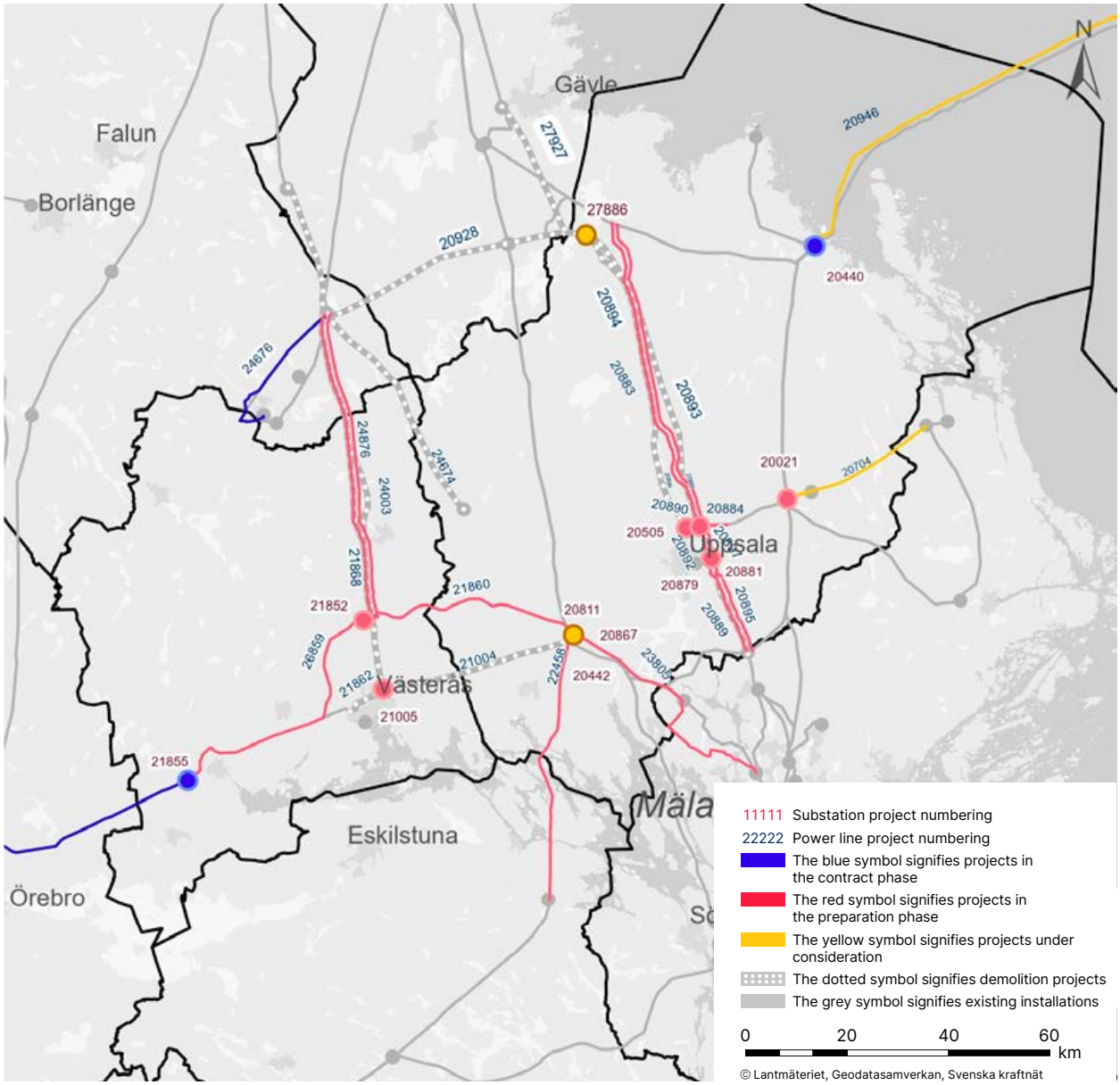


Figure 42. Major construction projects in Regions Västmanland and Uppsala starting before 2036.

Grid investments in Regions Halland and Västra Götaland

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
18429	Nordvära new 400 kV substation	2030	Connection
17853	Uddebo new 400 kV substation	2031	Connection
25628	Borgvik-Skogssäter line renewal	2035	Reinvestment
25631	Skogssäter-Kilanda west line renewal	2038	Reinvestment
18463	Horred-Ringhals line renewal	2043	Reinvestment

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
18640	Horred-Breared line renewal	2028	Reinvestment
17634	Stenkullen-Horred line renewal	2029	Reinvestment
18722	Breared substation renewal	2029	Reinvestment
17631	Lunna new 400 kV substation	2030	System reinforcements
17514	Skogssäter-Ingelkärr new 400 kV line	2031	System reinforcements
17647	Kilanda-Stenkullen line renewal	2031	Reinvestment
17645	Hallsberg-Timmersdala line renewal	2032	Reinvestment
17646	Timmersdala-Stenkullen line renewal	2033	Reinvestment
17633	Hallsberg-Moholm-Timmersdala new 400 kV line	2035	System reinforcements
17407	Konti-Skan Connect	2036	Reinvestment

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
11652	Breared-Söderåsen line renewal	2026	Reinvestment
17266	Ingelkärr-Stenkullen new 400 kV line	2026	System reinforcements
17482	Ingelkärr new 400 kV substation	2026	System reinforcements
17619	Skogssäter-Kilanda east line renewal	2026	Reinvestment
18897	Häradsbo new shunt capacitor	2026	System reinforcements

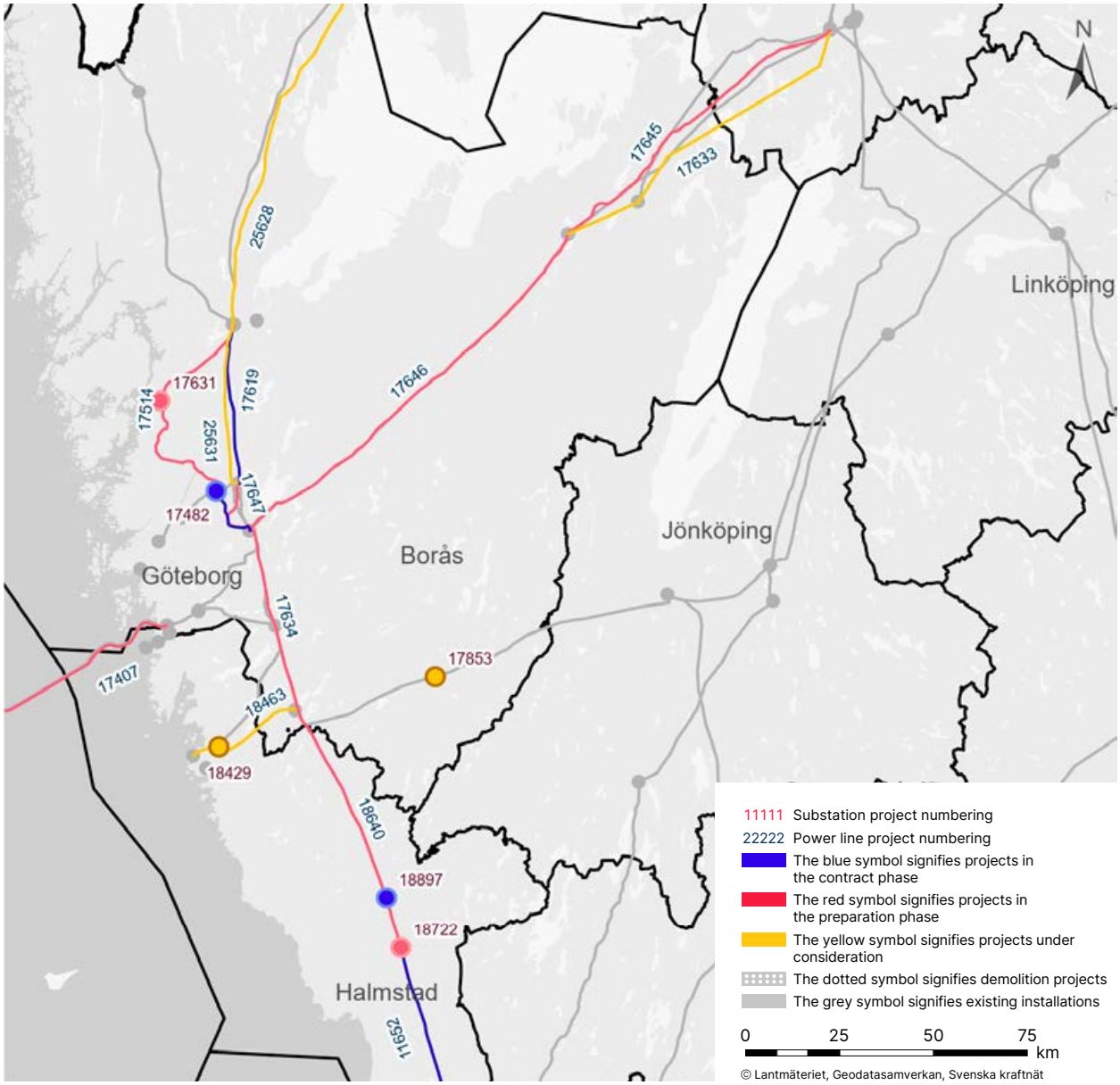


Figure 43. Major construction projects in Regions Halland and Västra Götaland, starting before 2036.

Grid investments in Regions Kronoberg, Kalmar County, Jönköping County and Gotland

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
12434	Ekhyddan and Hemsjö reactor package	2028	System reinforcements
14812	Nordbalt partial renewal	2037	Reinvestment
14469	Nybro-Hemsjö line renewal	2040	System reinforcements
14650	Ekhyddan-Nybro line renewal	2042	System reinforcements

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
14792	Ekhyddan-Nybro new 400 kV line	2029	Market integration
14073	Misterhult new 400 kV substation	2030	System reinforcements
15071	Stenkumla new 220 kV substation	2030	System reinforcements

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
14793	Nybro-Hemsjö new 400 kV line	2027	Market integration
14794	Ekhyddan-Nybro-Hemsjö substation measures	2027–2028	Market integration
15069	Connection to Gotland	2030	System reinforcements

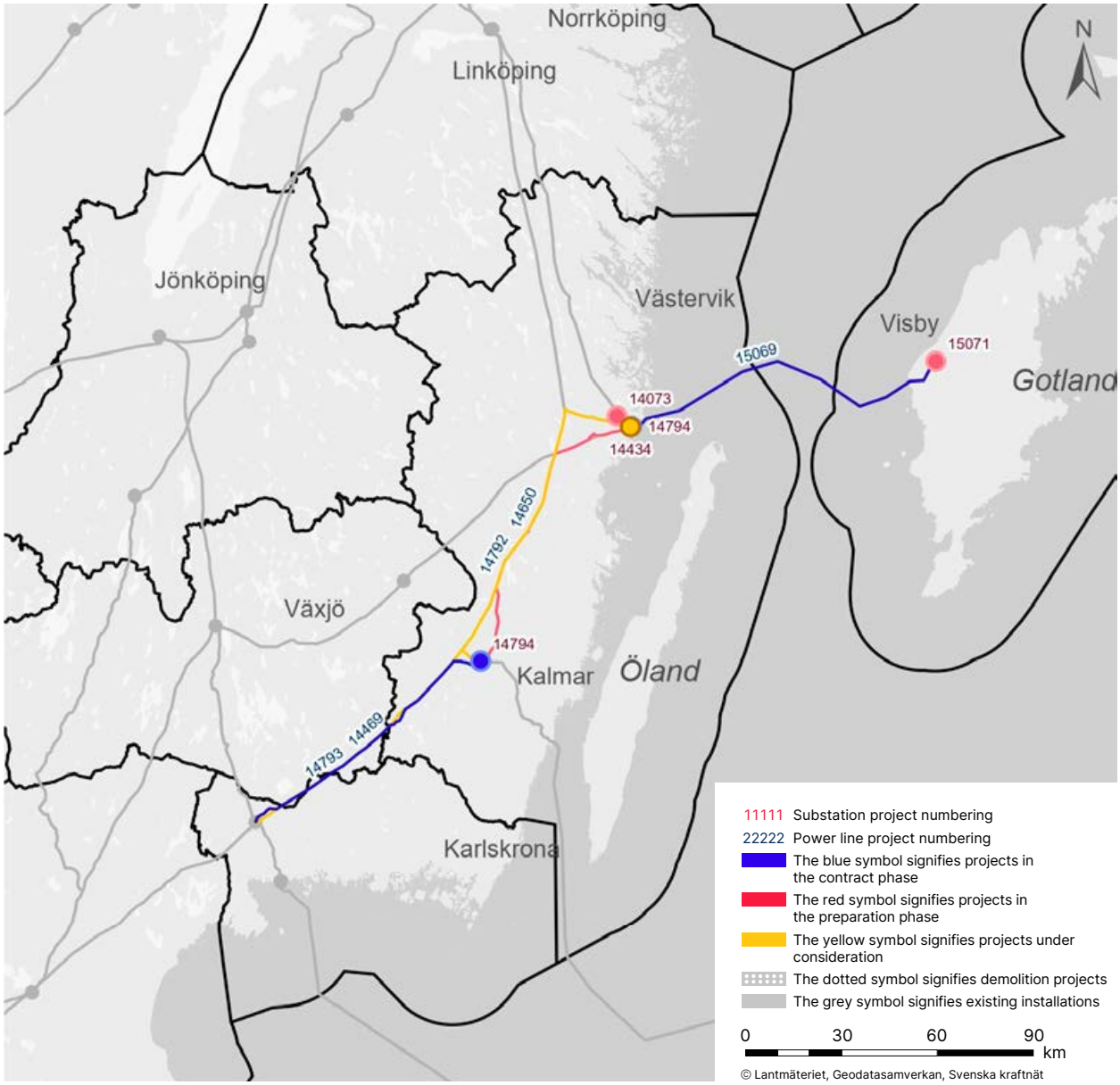


Figure 44. Major construction projects in Regions Kronoberg, Kalmar County, Jönköping County and Gotland starting before 2036.

Grid investments in Regions Skåne and Blekinge

Under consideration

Map no.	Project description:	Planned to put into/ take out of operation	Motive
12434	Ekhyddan and Hemsjö reactor package	2028	System reinforcements
11720	Arrie substation renewal and expansion	2034	Reinvestment
12820	SwePol Link SCM upgrade	2034	Reinvestment
11173	Hyllinge new 400 kV substation	2035–2040	System reinforcements
11173	Hyllinge-Tarstad new 400 kV line	2035–2040	System reinforcements
11173	Tarstad-Harrie new 400 kV line	2035–2040	System reinforcements
11173	Barsebäck-Harrie new 400 kV line	2035–2040	System reinforcements
11173	Hurva-Harrie new 400 kV line	2035–2040	System reinforcements
11173	Hurva substation expansion	2035–2040	System reinforcements
12470	Hemsjö-Hurva line renewal	2037	Reinvestment
10101	Interconnector DE-SWE	2037–2045	Market integration
11636	Hemsjö-Hurva new line	2038–2040	System reinforcements
12586	SwePol Link replacement	2040	Reinvestment
11461	Söderåsen-Kristinelund line renewal	2043	Reinvestment
11462	Hurva-Barsebäck line renewal	2043	Reinvestment

Preparation phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
11598	Öresund cable renewal	2026	Reinvestment
11389	Sege connection of new transformer	2027	Connection
11638	Skåne Southeast new 400 kV substation	2036	System reinforcements
11640	Arrie-Skåne Southeast new 400 kV line	2036	System reinforcements
11642	Skåne Northeast new 400 kV substation	2037	System reinforcements
11644	Skåne Northeast–Skåne Southeast new 400 kV line	2037	System reinforcements
11646	Sege substation expansion	2038	System reinforcements
11648	Sege-Arrie new 400 kV line	2038	System reinforcements

Contracting phase

Map no.	Project description:	Planned to put into/ take out of operation	Motive
11652	Breared-Söderåsen line renewal	2026	Reinvestment
14793	Nybro-Hemsjö new 400 kV line	2027	Market integration
14794	Ekhyddan-Nybro-Hemsjö substation measures	2027–2028	Market integration

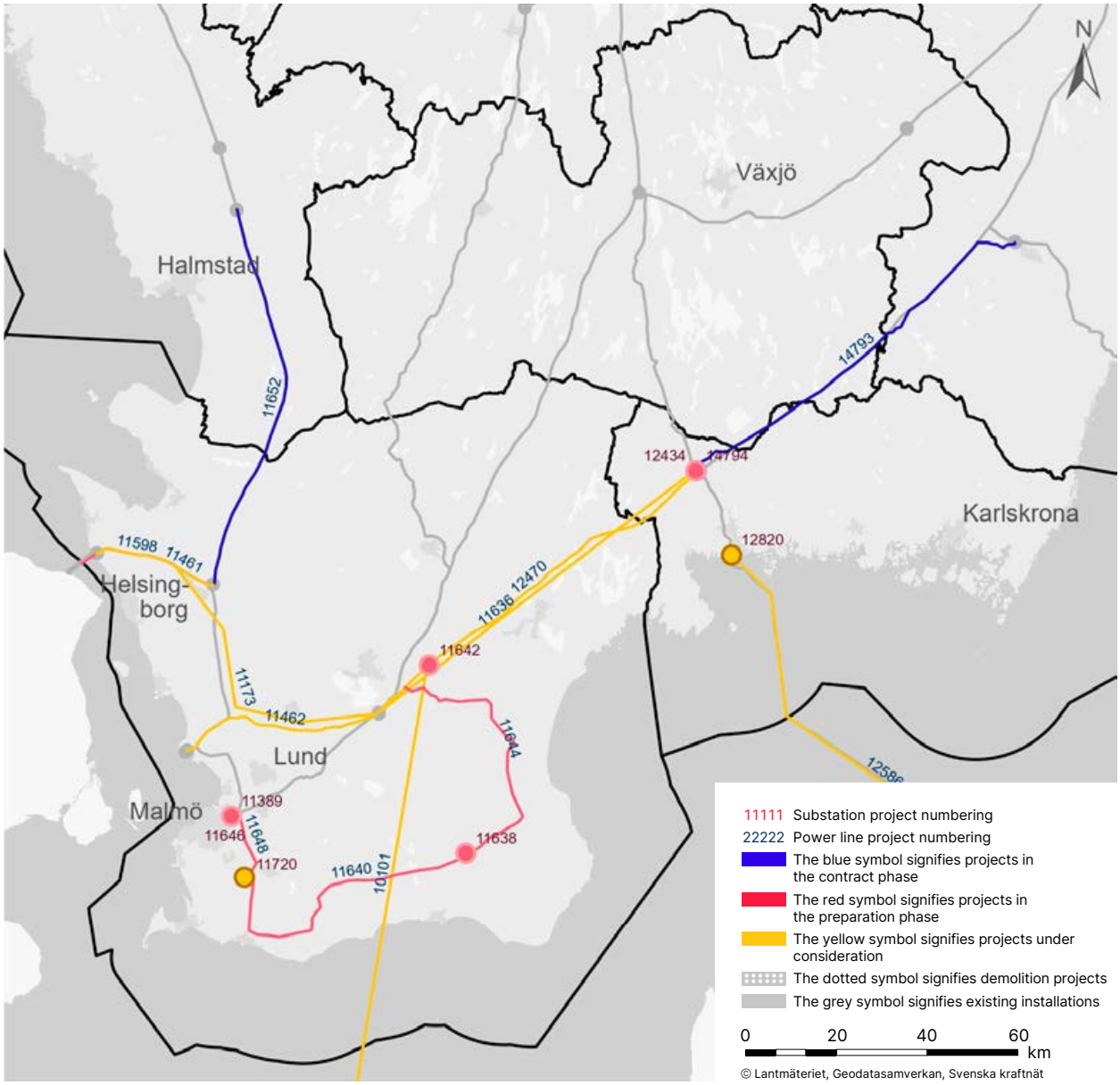


Figure 45. Major construction projects in Region Skåne and Blekinge starting before 2036.

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