AUGSTSPRIEGUMA TĪKLS AS

POWER TRANSMISSION SYSTEM DEVELOPMENT PLAN

CONTENTS

1. SUMMARY

The power transmission system development plan is a planning document prepared by the transmission system operator ('TSO') determining the financial investments that the transmission system operator's facilities need over the next 10 years. The 10-year development plan for the power transmission system was developed in accordance with the 'Regulations on the development plan for the power transmission system' approved by Public Utilities Commission (PUC) Council Decision No. 1/28 of 23 November 2011.

The drafting of the transmission system development plan focused on the achievement of the following strategic goals of Augstsprieguma tīkls AS ('AST') and the government of Latvia, alongside the planned further development of the transmission system infrastructure:

- Desynchronisation of the Baltic power systems from the BRELL circuit and their synchronisation with the continental European systems, including the integration of innovative inertia equipment and energy storage battery systems;
- Maintaining and development of the capacity of the power transmission system, ensuring efficient and high-quality power transmission services at the lowest possible fees;
- Work towards the digitisation and green transformation of the power system, including the integration of new renewable energy producers into the power transmission system;
- Renovation of the existing power system.

	2025–2034 million euros
European co-financing	82.12[1]
Overload fee income	11.93
AST funding	342.65
Connection fee	8.15
TOTAL	444.85

Given the amount of European co-financing raised, the only impact on the transmission fee is expected to come from the implementation of the synchronisation projects (0.69%), while the implementation of the other projects will have no impact on the transmission fee.

[1] Financing via the Connecting Europe Facility (CEF) and Recovery and Resilience Facility (RRF).

2025–2034 POWER TRANSMISSION SYSTEM DEVELOPMENT PLAN INCLUDES

330 kV

- **3** synchronous compensators installed
- **7** 330 kV replacement of automatic transformers
- **3** 330 kV substation expansions
- **575** 330 kV transmission line pylon replacement
- **2** battery energy storage systems installed

110 kV

- **24** 110 kV substations rebuilt
- **2061** 110 kV transmission line pylons replaced
- **49** 110 kV transformers replaced

and connection of renewable plants to the transmission network, as well as other technical measures. So far, 7 connection agreements have been concluded for the connection of 5 solar power plants, 1 hybrid power plant (solar and energy storage), and 1 wind power plant with a total generation capacity of 551 MW.

In addition to the above, AST has outlined the trends for connecting renewables power plants to the power transmission grid and the future prospects for the development of the Baltic Sea region's offshore power transmission infrastructure and AST's potential role in it.

2. POWER TRANSMISSION SYSTEM DESCRIPTION

NUMBER OF SUBSTATIONS, TRANSFORMERS AND AUTOMATIC TRANSFORMERS, AS WELL AS INSTALLED CAPACITY IN 2024:

Table 1

Highest voltage (kV)	Number of substations	Number of transformers and automatic transformers (pcs)	Installed capacity (MVA)
330 kV	17	26	3725
110 kV	124	242	5099.8
TOTAL	**140**	**268**	**8824.8**

LENGTH OF TRANSMISSION LINES (LINE LENGTH IN A CIRCUIT) IN 2024:

Table 2

Highest voltage	Overhead and cable PTL
(kV)	(km)
330 kV	1742.15
of which cable lines	22.37
110 kV	3812.55
of which cable lines	83.75
TOTAL	**5,554.70**

3. FORECAST FOR THE DEVELOPMENT OF GENERATION SOURCES AND POWER TRANSMISSION SYSTEM BALANCE

In preparing the plan, Augstsprieguma tīkls AS took into account the conclusions and information, including the forecasts for the development of generating sources and the sufficiency of the capacity of the power transmission system provided in the transmission system operator's annual assessment report for 2023 prepared by the transmission system operator in accordance with the Public Utilities Commission Council 'Regulations on the power transmission system development plant' of 23 November 2011 and Cabinet Regulation No. 322 'Regulations on the annual assessment report of the transmission system operator'. The electricity production and consumption forecasts of Augstsprieguma tīkls AS are described in the above report.

3.1. MAIN CONCLUSIONS AND RECOMMENDATIONS OF THE TRANSMISSION SYSTEM OPERATOR ASSESSMENT REPORT

- The synchronisation project is the highest-priority project in the Baltics and Latvia and was originally planned to be fully implemented by the end of 2025. In August 2023, in the context of the changing geopolitical situation due to the war in Ukraine initiated by Russia, the prime ministers of the Baltic states signed a political declaration on the accelerated implementation of the synchronisation by 7 February 2025 (‘accelerated synchronisation’). To that end, in August 2023, the Baltic TSOs signed a contract for the implementation of accelerated synchronisation in February 2025. The TSOs must carry out a number of challenging infrastructure, information technology (IT) and system regulation projects to ensure the reliable and stable operation of the system before and after synchronisation (including accelerated synchronisation) with continental Europe.
- A resource sufficiency assessment performed by the European Network of Transmission System Operators for Electricity (ENTSO-E) does not show any significant risks to the sufficiency of power supply resources in Latvia until 2030. However, in order to achieve a higher level of sufficiency for capacity at the regional level, each country needs to pay more attention to the planning of generation by renewable energy producer (‘REP’) and the sufficiency of balancing and regulating capacities to regulate renewables generation.
- The development of REP connections is expected to rise significantly in Latvia and the entire Baltic Sea region, and the amount of energy produced by REP is expected to grow. This will require more balancing capacity to ensure system reliability and stability, which will in turn call for the development of a balancing market across the Baltic region. In order to ensure that the reliability and stability of the Latvian electricity system is not hampered in the next decade, it is important to ensure that Latvia’s current generation capacity does not fall, and that new generation capacity is created that can also participate in the balancing market, providing balancing services.
- Interconnections, strengthening of the transmission network, and the closer and accelerated integration of the Baltic electricity system into the European electricity market will play a critical role in meeting the rising demand for electricity and for REP connections. With the rapid increase in REP capacity expected after 2030, it is essential to develop interconnections with Estonia, Sweden, Germany, and Lithuania, and to strengthen the domestic 330 kV transmission network.
- In order to further promote the development of renewables in Latvia and to connect as many renewables energy producers as possible to the power transmission network, reducing carbon dioxide emissions and moving towards the goal of a climate-neutral energy system, it is necessary to foster the development of electricity consumption technologies in Latvia and the connection of these technologies to the transmission network: namely, the electrification of the economic, transport, and industrial sectors, as well as the creation of new sectors such as those involving the production and consumption of hydrogen and other P2X technologies.
- In order to balance the introduction of new renewables capacities with the need to develop the power transmission system, thus minimising its impact on transmission system fees, the concept of ‘disconnectable’ generation must be introduced in the planning of new connections.

Study on consumption trends in the Baltic states and the Nordics commissioned by AST

The European Union’s green transition is leading towards a modern and competitive economy, so that we can achieve climate neutrality in 2050. With a significant increase in the amounts of renewable energy and the simultaneous development of electrification, Latvia’s power consumption is expected to grow faster after 2030. This consumption growth could reach as high as 100% between 2030 and 2035, according to the results of a KPMG 2024 consumption trends study in the Baltic and Nordic countries commissioned by AST.

The study can be found in more detail on the AST website: https://www.ast.lv/lv/events/petiiums-latvija-sagaidams-straujaks-elektroenergijas-paterina-pieaugums

The results of the AST-commissioned study ‘Use of innovative measures for the integration of renewables in the Latvian power transmission network and methodology for finding optimal solutions’ are expected to be available in 2024. The study is to offer proposals of the innovative measures (dynamic line throughput monitoring, use of energy storage battery systems, introduction of temporary producer restrictions, etc.) whose use would be most effective in an effort to connecting the maximum possible amount of renewable energy generation capacity to the existing 110 kV and 330 kV transmission networks in Latvia.

4. TRANSMISSION SYSTEM INFRASTRUCTURE NEEDED TO INCREASE INTERCONNECTION CAPACITY AND SYSTEM RELIABILITY

4.1. PROJECTS INTENDED FOR IMPLEMENTATION AND PLANNED FOR THE NEXT 3 YEARS

4.1.1. Baltic power system synchronisation project*

Since 2007, when the prime ministers of the Baltic states signed a memorandum of understanding and instructed the Baltic TSOs to explore the possibility of connecting to the European electricity networks, the Baltic TSOs have been pursuing synchronisation (connection) with continental Europe and desynchronisation (disconnection) from the single electricity system of Russia. Several studies have been carried out to ascertain the feasibility of the project since 2011. The synchronisation project is one of Europe's priority projects, receiving political support on 28 June 2018 with the signing of a political roadmap between the European Commission, the Baltic states, and Poland, which confirmed the synchronisation scenario between Poland and Lithuania, with AC and DC interconnections. On 27 May 2019, the agreement for the connection of the Baltic states to the Continental Europe synchronous electric power network operation zone and its annex with a list of technical measures to be implemented for beginning synchronous operation took effect.

The list of technical measures to be implemented by the Baltic states by the beginning of synchronisation in 2025 includes the construction or reconstruction of the necessary infrastructure, as well as measures to provide the necessary inertia and frequency adjustment. In the development documents originally adopted by Europe and Latvia, the Baltic states are to synchronise with continental Europe by the end of 2025 at the latest, while desynchronising from Russia's single electricity system. With the war in Ukraine that Russia began in 2022, the Baltic states have been exploring the possibility of synchronising with continental Europe early. In 2023, the TSOs of the Baltic states and Poland carried out three studies to assess this scenario:

1) dynamic stability study of accelerated synchronisation, commissioned by the Baltic and Polish TSOs and carried out by the energy industry consultant Gdańsk Institute of Energy;
2) market modelling and cost studies conducted by the Baltic TSOs under the leadership of AST;
3) capacity sufficiency study for the Baltic TSOs, led by Elering.

* The planned synchronisation deadline is the end of 2025; the accelerated synchronisation deadline is February 2025. If the text does not refer to accelerated synchronisation, planned synchronisation is meant.

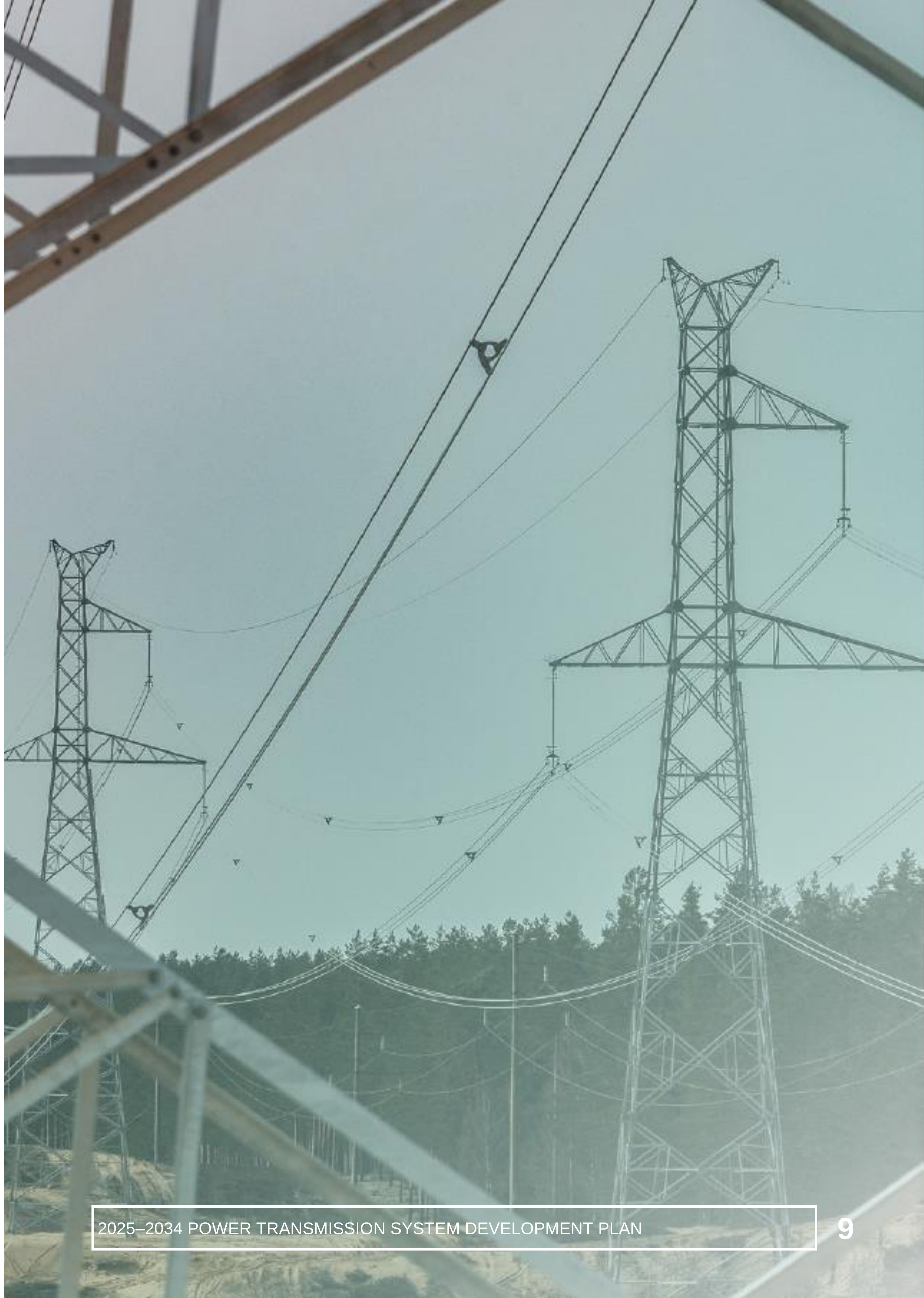
The studies have shown that in technical terms, it is desirable to start the synchronisation no sooner than February 2025, which is when the reconstruction of the Estonia-Latvia interconnections leading from Valmiera to Tsirgulina and then, to the Viru substation in Estonia, is scheduled to be completed.

On 1 August 2023, based on the results of the studies, the Baltic TSOs (AST, Elering, and Litgrid) signed a cooperation agreement to launch the synchronisation in February 2025 and, on 3 August 2023, based on that agreement, the heads of government of the Baltic states decided to begin accelerated synchronisation in February 2025. Following the accelerated synchronisation decision, the Baltic TSOs started activities related to the requirements of the technical catalogue for initiating the synchronisation in February 2025. Most of the projects will be implemented by February 2025, while those that cannot due to challenging deadlines will be implemented by the end of 2025. As part of the implementation of the infrastructure projects, the synchronisation project is divided into two stages and included in all European and national development documents, i.e., the European 10-year development plan and the list of projects of common interest.

4.1.2. Baltic synchronisation project Phase 1

Phase 1 includes the strengthening of the Baltic power grid and the installation of equipment that will handle some of the required inertia and frequency adjustment and control. On 19 March 2019, a grant agreement was signed between the Baltic TSOs and the European Innovation and Networks Executive Agency on the conditions for using 75% of the co-financing for the implementation of Phase 1 of the Baltic synchronisation project provided through the Connecting Europe Facility (CEF).

In Latvia, Phase 1 of the synchronisation project includes the reconstruction of two current Estonian–Latvian interconnections between Valmiera and Tartu and between Valmiera and Tsirgulina, as well as the installation of equipment that will enable inertia and frequency adjustment, as well as control and monitoring within the system.



4.1.2.1. Reconstruction of the existing Valmiera (LV)–Tartu (EE) and Valmiera (LV)–Tsirgulina (EE) 330 kV interconnections

The two Valmiera (LV)–Tartu (EE) and Valmiera (LV)–Tsirgulina (EE) 330 kV lines (Figure 2) were built in the 1960s and 70s and no longer meet modern requirements, such as in terms of differences in their capacity in winter and summer, which obstructs the optimal and efficient operation of the power market. These lines will be replaced by new ones, with increased capacity to provide a higher total north-south throughput capacity in the Baltic region, to increase the capacity of the Latvian and Baltic power transmission systems and thus the reliability of power supply for the future synchronisation of the Baltic states with the power transmission grids of continental Europe and their desynchronising from the single power system of Russia. The Estonian TSO, Elering, will also reconstruct transmission lines connecting the Narva power plants as part of Phase 1 of the synchronisation project. In order to avoid any reduction of transmission capacity for the power market, the Latvian and Estonian TSOs are rebuilding the existing lines following the outage schedule AST and Elering agreed on in 2018.

Figure 2
Valmiera-Tartu and Valmiera-Tsirgulina

Increasing the capacity of the 330 KV Valmiera (LV)–Tartu (EE) transmission line between Latvia and Estonia

The Valmiera (LV)–Tartu (EE) 330 kV power transmission line was built and put into operation in 1971. Its length in Latvia is 48.42 km. The project involves the replacement of the line’s wires, insulation, overhead line accessories, and pylons to accommodate the increased line capacity. The project began in 2020 with the announcement of a procurement, and in July 2021, a contract was signed with Empower and Leonhard Weiss for the implementation of the project. The construction work started in June 2022. As of May 2023, construction work was completed in Latvia and Estonia, and the line is live. The rebuilt line was officially opened on 9 June 2023, and officially commissioned in Latvia in November 2023.

Increasing the capacity of the 330 KV Valmiera (LV)–Tsirgulina (EE) transmission line between Latvia and Estonia

The 330 kV Valmiera (LV)–Tsirgulina (EE) power transmission line was built in 1960. Its length in Latvia is 48.47 km. The project involves the replacement of the line’s wires, insulation, overhead line accessories, and pylons in Latvia to accommodate the increased line capacity. The project began in 2020 with the announcement of a procurement, and in July 2021, a contract was signed with Empower and Leonhard Weiss for the implementation of the project. The development of the design for the line began in June 2023, once the Valmiera (LV)–Tartu (EE) 330 kV transmission line went live. The line rebuild is scheduled to be completed in June 2024 and commissioned at the end of 2024. Both the projects are included on the list of projects of common interest, in the ‘Integration and synchronisation of the Baltic states’ electricity system with the European networks’ cluster, approved by a European Commission and Parliament Regulation. On 5 March 2018, the Valmiera Regional Environmental Administration of the State Environmental Service decided not to impose the environmental impact requirements for the two lines, and issued technical specifications that the project implementers must comply with as part of the project. In 2020, both the projects underwent public consultations in the affected municipalities in Latvia.

4.1.2.2. Equipment needed for the reliable and stable synchronisation of the Baltic states

The key tasks in preparing for the synchronisation include the primary frequency adjustment in the Latvian power system, improvements in the frequency adjustment system and, if necessary, its modernisation in line with the requirements of the continental European power system, as the frequency adjustment has so far been provided through the single power system of Russia. In addition, the supervision, control, and telecontrol systems of the power network need to be developed and upgraded, with the installation of phasor measurement units (PMU) and wide-area monitoring systems (WAMS) at all the important sites. In addition, remote control systems (RCS) and remote terminal units (RTU) must be installed in important power plants and substations in Latvia. These projects must be implemented by no later than the end 2025, when the Baltic states' power systems were originally planned to be synchronised with continental Europe and desynchronised from the single power system of Russia. In addition to the frequency adjustment activities and in order to ensure the stable operation of the power system in synchronisation mode, the TSOs of the Baltic states must provide a total of 17,100 MWs of inertia 24 hours a day, with Latvia providing a proportional share of 5700 MWs of inertia. To enable the provision of these services, Phase 1 of the Baltic synchronisation project includes the installation of one stationary synchronous compensator in Latvia.

Together with the other Baltic TSOs, Augstsprieguma tīkls AS will implement a frequency stability assessment system (FSAS). It is desirable that the project be implemented by the start of the synchronisation; however, this must happen by no later than the end of 2025. Currently, each Baltic TSO pursues its own FSAS concept, with AST planning to launch a tender for the planned FSAS concept in Latvia in Q2 2024.

4.1.2.3. Project benefits

Phase 1 of synchronisation For the Phase 1 synchronisation projects, a cost-benefit analysis of the projects was prepared and submitted to the Baltic states' regulatory authorities in 2018, for which a PUC decision was received in September 2018.

4.1.2.4. Funding

The projects are to be implemented with EU co-financing from CEF structural fund covering 75% and accumulated overload fee income. Taking the previous decisions of the Public Utilities Commission Council into account and in accordance with the provisions of Article 16 of Regulation (EC) No. 714/2009 of the European Parliament and of the Council on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No. 1228/2003, the accumulated overload fee income will be allocated to the project. In accordance with Section 7 of the Capital Cost Accounting and Calculation Methodology approved by Public Utilities Commission Council Decision No. 1/12 of 29 August 2022, the part of the value of fixed assets funded with the financial support of the European Union and through the accrued overload fee income is not to be included in the calculation of power transmission system service fees. In view of the above, the approximate percentage breakdown of the eligible costs for each project in May 2024 is as follows: 75% is financed by the CEF structural fund and 25% by AST, including accumulated overload fee income. The percentage of funding may change with changes in the total actual cost of the project.

4.1.3. Baltic synchronisation project Phase 2

Phase 2 of the Baltic Synchronisation Project is a continuation of the first phase, as part of which it is planned to:

- build an additional interconnection between Poland and Lithuania (Harmony link), including the necessary strengthening of the power transmission infrastructure in Lithuania and Poland, enabling the reliable operation of this interconnection;
- install equipment to cover the residual amount of inertia in the Baltic states, and build and install frequency adjustment infrastructure;
- install battery energy storage systems (BESS);
- modernise the cross-border fiscal metering system;
- implement the emergency automation and system protection and SCADA system upgrade projects, adding the load and frequency controller (LFC) functions to them.

Phase 2 of the Baltic Synchronisation Project is divided into two rounds. Round 1 of the Phase 2 synchronisation projects, i.e., Harmony link, 6 synchronous compensators in the Baltic states and the strengthening of the Polish internal grid, were awarded the allocated 75% European co-financing in 2020 (up to EUR 55 million in Latvia), and on 14 December 2020, a grant agreement was signed by the TSOs of the Baltic states and Poland, and the European Climate, Infrastructure and Environment Executive Agency (CINEA).

Round 2 of Phase 2 of the synchronisation project received European CEF co-financing covering 75% of the planned project costs in January 2022 (up to EUR 37.1 million for projects in Latvia), the grant agreement with CINEA was signed on 3 June 2022. The list of Phase 2 Round 2 projects in Latvia includes the battery energy storage system (BESS), upgrades in the international fiscal metering system, emergency automation and system protection, and SCADA/LFC upgrades.

On 24 September 2021, the Latvian Cabinet of Ministers adopted Order No. 674 ‘To permit Joint-Stock Company “Augstsprieguma tīkls” to buy, develop, manage, and operate electric power storage facilities’.
In January 2022, EU CEF co-funding of 30 million euros was granted to BESS. However, after the war Russia started in Ukraine, the energy crisis and the significant increase in the market price of materials in 2022, the costs of BESS which were planned in 2019, with the preparation of all the necessary documents for European and Latvian institutions, have increased significantly.

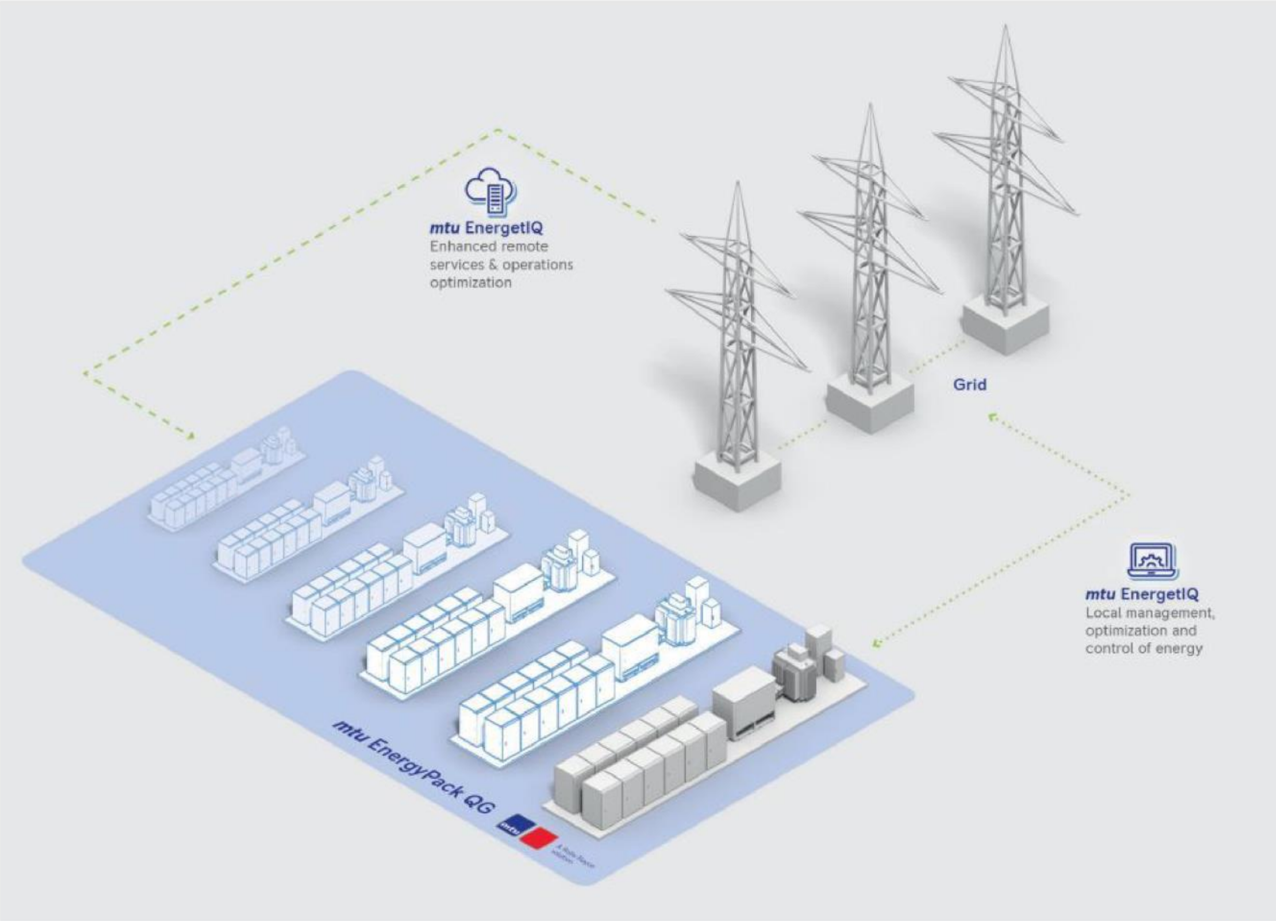
Thus, in order to minimise the impact of cost increases on the electricity fees and to cover the potential increase in BESS costs, as compared to what had been originally planned, AST raised European Union RePowerEU funding to supply and install BESS at the Rēzekne substation. AST plans to install energy storage batteries with a total capacity of 80 MW/160 MWh, split into two 60 MW/120 MWh and a 20 MW/40 MWh BESS for reliability reasons. AST plans to cover the costs not covered by the European Structural Funds from retained profits and by borrowing on the financial market. The implementation of the projects of Phase 2 of the synchronisation is scheduled for 2025, with some of the projects completed by February 2025, and the rest, by the end of 2025.

4.1.3.1. Installation of BESS in the TSO network

In 2019, AST signed an ‘Agreement on the conditions of the future interconnection of power system of Baltic States and power system of Continental Europe’. The annexes to this agreement set the technical requirements to be met by the Baltic TSOs before and after the start of the synchronisation process. These requirements are associated with changes in the settings of the transmission system, investments in infrastructure development and the duty of the TSOs to maintain a certain amount of frequency containment and frequency restoration reserves and system inertia.

In order to calculate the amount of frequency containment and restoration reserves required and to identify the sources of their coverage, the Baltic TSOs carried out a balancing capacity reserve market study, which concluded that the Estonian, Latvian and Lithuanian power systems were unable to provide the required FCR (Frequency Containment Reserve), aFRR (Automatic Frequency Restoration Reserve) and downstream mFRR (Manual Frequency Restoration Reserve) reserves on their own, only being able to provide upstream mFRR. Additional generators are needed to maintain FCR, aFRR, and mFRR, but no single power system can keep all the required reserves.

Consequently, one must consider purchasing alternatives to these reserves on the power market or to install equipment capable of providing frequency stability services. An assessment of different sources of balancing capacity reserves and their availability revealed that the most efficient and cheapest solution for providing balancing capacity reserves is to install energy storage batteries in the power transmission system.



According to the calculations of AST, one must install energy storage batteries with a total capacity of 80 MW (160 MWh) to provide all the balancing capacity reserves necessary. This amount would make it possible to reliably and consistently achieve the European strategic objective of synchronising the Baltic power systems with continental Europe and to prevent the risks of reserves being unavailable on the power market or being available at an excessive price once the synchronisation begins.

On 24 September 2021, the Latvian Cabinet of Ministers adopted Order No. 674 ‘To permit Joint-Stock Company “Augstsprieguma tīkls” to buy, develop, manage, and operate electric power storage facilities’. In order to clearly define the conditions for the use of BESS and to strengthen the AST-received

Amendments to the Electricity Market Law were drafted and submitted to confirm the status of the Cabinet of Ministers’ permit issued to AST for the purchase, installation and operation of BESS; the amendments were announced after their adoption by the Parliament, on 5 July 2023.

In addition, amendments to Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU were also submitted, making it possible for the Baltic states to deviate from Article 54(2) of the Directive, with the goal of making it clear that, during the transitional period, the acquisition, installation and operation of Baltic TSO BESS would not require authorisation by the regulatory authority and that it would be allowed to use the frequency regulation service in synchronisation mode without participating in the energy market. The European Council reached a general agreement on the amendments to the Directive with the European Parliament and the Commission regarding the future implementation of BESS in Latvia.

Based on the results of the procurement, a contract for the construction and installation of BESS at the substations in Tume and Rēzekne was signed with Rolls-Royce Solutions GmbH on 16 February 2024. According to the contract, BESS projects must be implemented by October 2025.

4.1.3.2. Project benefits

All of the above projects are part of Phase 2 of the synchronisation project, which the Baltic and Polish TSOs have committed to implement by the end of 2025. For the Phase 2 synchronisation projects, a cost-benefit analysis was prepared and submitted to the Baltic states’ regulatory authorities in 2019, and a PUC council decision was adopted for this in May 2020.

4.1.3.3. Financing

All the synchronisation Phase 2 projects are to be implemented with EU CEF co-financing covering 75% of eligible costs (not including Rēzekne BESS), EU RePowerEU funding in the amount of EUR 53.7 million, and accumulated overload fee income.

Taking the previous decisions of the Public Utilities Commission Council into account and in accordance with the provisions of Article 16 of Regulation (EC) No. 714/2009 of the European Parliament and of the Council on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No. 1228/2003, the accumulated overload fee income will be allocated to the project.

In accordance with Section 7 of the Capital Cost Accounting and Calculation Methodology approved by Public Utilities Commission Council Decision No. 1/12 of 29 August 2022, the part of the value of fixed assets funded with the financial support of the European Union and through the accrued overload fee income is not to be included in the calculation of power transmission system service fees. In view of the above, the approximate percentage breakdown of the eligible costs for the project in May 2024 is as follows: 80% is financed by the CEF and RePowerEU structural funds and 20%, by AST, including accumulated overload fee income. The percentage of funding may change with changes in the total actual cost of the project.

4.2. OTHER 330/110 KV SYSTEM 10-YEAR DEVELOPMENT PROJECTS

4.2.1. Renovation of the 330 kV transmission system and its facilities

In addition to the above projects, the development plan includes the necessary renovation of the 330 kV transmission lines, specifically lines No. 322 Viskaļi–Brocēni, No. 355 Valmiera–Aizkraukle, No. 311 'Krustpils-Līksna', etc.

- A total of 575 pylons and 7 transformers are to be replaced at 330 kV power transmission lines and substations over these 10 years.

4.2.2. Renovation of the 110 kV transmission system and its facilities

In order to prevent a significant acceleration in the obsolescence of the transmission network, and to thus ensure the stable operation of the transmission system and uninterrupted supply of the required amount of power to the users connected to it, the transmission system operator will plan the reconstruction of 110 kV substations and distribution facilities, 110 kV transmission lines, as well as the replacement of 110 kV transformers and other projects aimed at maintaining the operability of the power transmission system. The financial investments are planned such that, in the long run, the transmission equipment ages less, meaning that the number of items of equipment over the critical age does not increase.
To enable this, the power transmission system development plan foresees:

- the reconstruction of 24 substations (twenty-four 110 kV substations);
- the replacement of 49 transformers;
- the replacement of 2061 110 kV line pylons.

4.2.2.1. Kuldīga digital substation – Recovery and Resilience Facility funding awarded

In line with technological innovations, the Kuldīga substation will be rebuilt as a digital substation. This means that the connections between different devices will mainly be through fibre optic cables instead of copper cables. Furthermore, a number of pieces of equipment in this substation will be equipped with monitoring systems enabling the real-time monitoring of the technical condition of this equipment, thus preventing defects leading to failures.

4.2.2.2. Environmentally-friendly equipment

A rising number of high-voltage equipment manufacturers are offering equipment that is more environmentally friendly. These are devices that do not use SF6 gas for insulation, and instead have eco-friendly insulating gas or biodegradable insulating oil. The Carnikava substation will be the first substation to have such equipment (110 kV circuit breakers and instrument transformers) installed during its reconstruction, with Recovery and Resilience Facility funding.

4.2.2.3. Loss reduction

The plan provides for the installation of new transformers with lower losses, in accordance with COMMISSION REGULATION (EU) No. 548/2014. It is estimated that the replacement of the seven automatic transformers envisaged in the plan could result in average annual savings of around EUR 853,834 through loss reduction, while the replacement of the 49 transformers envisaged in the plan could result in average annual savings of around EUR 691,210, through loss reduction.

4.2.2.4. Purchase of a mobile substation

Emergencies caused by technological failures in the power transmission system can be caused by various external and internal factors: extreme weather conditions, equipment failures, damage to substation structural elements, etc. Similarly, emergencies or crises can be triggered by deliberate targeted attacks on the critical infrastructure of the TSO. In the event of such extensive damage, it can take a very long time to recover and restore the power supply. The mobile substation (a high-voltage switchgear facility, a power transformer, and the auxiliary equipment necessary for the autonomous functioning of the substation, all on a mobile platform) would enable the TSO to restore the power supply to the most important consumers of its clients at existing connection points in key substations more quickly.

The mobile substation could also be used for substation rebuilds, as a back-up power supply connection to the site for the duration of the rebuild, thus preventing significant reductions in the reliability of the supply of electricity to clients, and allowing rebuilds to be done in a shorter time, freeing up more space for the construction area. The approximate purchase cost of the mobile substation is EUR 4 million, Augstsprieguma tīkls AS plans to raise 50% of the project financing via the European Union.

4.2.2.5. Purchase of mobile pylon sets

Given the act that Augstsprieguma tīkls AS currently does not have any pylons in its emergency reserve for rebuilding the lines as per the European standard (Kurzeme circuit, Estonian interconnection lines) where multiple circuit lines are installed, it is necessary to purchase pylon sets for rapid emergency response, thus ensuring the shortest possible post-emergency recovery times. If necessary, the pylon sets can also be used for the temporary lines at the construction sites of new substations. The approximate purchase cost of a mobile pylon set is EUR 3 million, Augstsprieguma tīkls AS plans to raise 50% of the project financing via the European Union.

4.2.3. Investments in information technology

AST continuously develops its IT infrastructure by adding and implementing new equipment and solutions to increase computing capacity and data storage, and to ensure the availability of the data transmission network, enabling IT services to operate simultaneously via two data centres (primary and secondary), guaranteeing the reliability of AST’s services. New equipment needs to be rotated every 5–8 years (depending on the type of equipment and the intensity of its use), which requires periodic investments to keep the IT infrastructure running at the level required at the time. Over time, additional requirements arise in the fields of safety and business process improvements, in the company’s business functions, which are implemented based on AST’s IT infrastructure. The efforts aimed at strengthening AST’s cybersecurity include implementing and improving IT security solutions, providing multiple layers of protection and increasing the competence of the company’s employees in the field of cyber hygiene.

Extensive development and expansion of business information systems is also underway, automating data analysis capabilities, implementing process-orientated solutions for operations and development, balancing and regulation services, and providing essential support to the synchronisation process. These activities take place as part of AST's digital transformation process, simultaneously improving business information systems and the company's internal processes, and building the digital skills of its employees, thus making the company more efficient and open to innovation and new technologies.

4.2.4. Construction of the AST supervisory control and data centre and the rebuilding of the production facility grounds and building compound

In order to enable the sustainable development of the transmission system, the 10-year transmission system development plan includes the construction of a supervisory control and data centre, as well as rebuilding of the production facility grounds and building compound for AST at Dārzciema iela 86 in Riga.

The construction of the supervisory control and data centre is critical for a number of reasons:

- The supervisory control and data centre is part of critical Class C infrastructure, which may not be set up in unsuitable premises due to the risks involved;
- to ensure synchronous operation with the continental European grid in the first few years, it is necessary to relocate critical Category C infrastructure by building and equipping a supervisory control and data centre;
- The existing supervisory control centre equipment needs to be upgraded/replaced as it does not provide the on-duty supervisory control operator with the features that modern equipment could provide for the better power system management and support of market operations;
- The data centre is needed to accommodate servers, communication, storage, and security equipment for SCADA and other critical IT systems to ensure the uninterrupted operation of critical infrastructure.

The main reasons for the critical need to rebuild the AST production facility grounds and building compound at Dārzciema iela 86 are:

- all the outdoor utility lines in the area of Dārzciema iela 86 need to be rebuilt due to their having worn out completely, which results in regular breakdowns;
- to ensure the safe movement of rapid-response and utility vehicles in the critical infrastructure area, it is necessary to construct an additional drive-in on the grounds at Dārzciema iela 86; the number of production and utility buildings (material storage, vehicle parking, equipment repair premises, etc.) needs to be optimised by demolishing unnecessary buildings/building volumes and carrying out the necessary rebuilding;
- the energy performance of the buildings at the facility needs to be increased. The control room, data centre, and office building are designed as a near-zero-energy building. Solar panels are also to be installed to partially cover own power consumption, while the heat generated by the data centre is to be partially used for heating.

Based on an assessment of all the conditions, AST has decided to implement the project in an efficient and gradual manner. This means that the continued functioning of the facility is to be ensured throughout the entire duration of the reconstruction (Phases 1 and 2 of the construction are to take place from 2023 until the end of the first quarter of 2026, and Phase 3 will take place until mid-2027).

The design stage takes place from early 2021 to mid-2023. The developed construction designs were also submitted for review to the Public Utilities Commission, which issued its approval to proceed with the project in January 2023.

Funding

The planned financial investment amount for the construction of the supervisory control and data centre and the rebuilding of the production facility grounds and building compound is EUR 46.0 million, and for the information system infrastructure and the digitisation of grid management, EUR 11.1 million.

Given the fact that:

- the project is of strategic importance for the reliability of power supply because it will also provide the main planning and control functions of the power transmission system after the Baltic states synchronise with continental Europe in 2025
- it will include the implementation of new information systems (important from the viewpoint of the continuity and reliability of IT functions) because there will be the construction of new supervisory control and data centres, as well the renovation and expansion of the ICT infrastructure, with improvements in the overall level of cybersecurity at the company.

Thus, co-financing from the Recovery and Resilience Fund (RRF) with a total amount of EUR 38.1 million will be provided, EUR 27 million of which is intended for the construction of the supervisory control and data centre and the rebuilding of the production facility grounds and building compound, while EUR 11.1 million is for information system infrastructure and the digitisation of network management. The remaining amount is to be covered by AST.

4.3. PROCESSES AFFECTING OR LIKELY TO AFFECT THE IMPLEMENTATION OF THE PROJECTS INCLUDED IN THE DEVELOPMENT PLAN

4.3.1. Rail Baltica project

Rail Baltica is a railway project aimed at integrating the Baltic states into the European rail network, covering four EU countries (Poland, Lithuania, Latvia, and Estonia) and indirectly, Finland, extending the route with the Tallinn-Helsinki connection.

The second stage of the project (Rail Baltica II) involves the construction of a new European standard gauge (1435 mm) railway line in the Baltic states, connecting the cities of Tallinn, Riga, Kaunas, and Warsaw with fast and environmentally-friendly rail transport.

- In May 2016, the State Environmental Monitoring Bureau issued a statement on the environmental impact assessment report prepared by SIA ‘Estonian, Latvian & Lithuanian Environment’ and RB Latvija partnership for the construction of the Rail Baltica European standard gauge public railway infrastructure line.
- By 2028, three traction power substations are planned to be built in Latvia and connected to the power transmission system with the construction of new connections.
  - A new 110 kV power transmission line of about 47 kilometres is to connect the Salacgrīva traction substation.
  - In addition to the connection activities, the railway will intersect transmission lines in at least 35 locations. Most of the intersection will require rebuilding of the power lines (e.g., changing the dimensions of the lines, converting from overhead line to cable, relocating the power line, etc.).

Given the importance of the Rail Baltica project, AST understands that its successful progress will be one of Latvia’s priorities, and significant resources available to AST will have to be assigned to supporting it, which without additional improvements in AST’s internal resources, may affect AST’s ability to carry out all the planned development projects within the time specified in the plan. Aware of this risk, AST actively monitors the situation and makes decisions on the actions necessary in the provisioning of resources.

4.3.2. European Union funding

As part of its 10-year development plan, AST has raised European funding via a number of structural funds: Connecting Europe Facility (CEF), Recovery and Resilience Facility (RRF), and RePowerEU.

With 75% co-financing provided by CEF, AST implements the synchronisation Phase 1 and Phase 2 projects, as per the list of projects of common interest approved every two years, according to Article 3(4) of Regulation (EU) No. 347/2013 of the European Parliament and of the Council on guidelines for trans-European energy infrastructure and repealing Decision No. 1364/2006/EC and amending Commission Regulations (EC) No. 713/2009, (EC) No. 714/2009 and (EC) No. 715/2009.

On 22 June 2021, the European Commission approved Latvia's RRF plan, in which AST included and approved projects totalling EUR 38.1 million for the construction of Latvia's main supervisory control centre and data centre, including the development of an IT infrastructure solution, the implementation of a network management model, a balance management system, and IT cybersecurity solution projects. On 11 March 2023, an agreement was signed with the Ministry of Economics and AST covering the conditions for implementing projects with RRF funding.

In September 2023, the European Commission approved the continuation of the RRF plan with RePowerEU funding, with Latvian AST projects also being on the list for EUR 72.6 million, associated with synchronisation, transmission network modernisation and development, as well as IT project solutions related to cybersecurity and the development of digital solutions for RES.

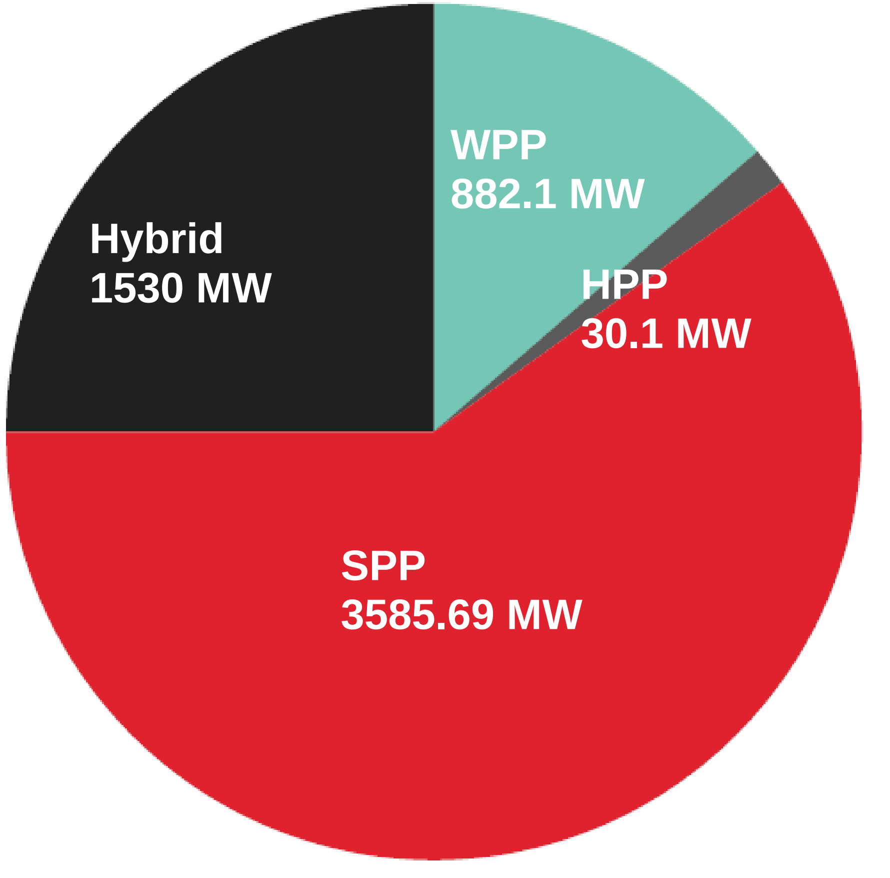
On 26 September 2023, the Latvian Cabinet of Ministers Order No. 635 'On expanding the Recovery and Resilience Facility plan for Latvia', based on the European Commission decision. On the basis of that Order, it is planned to approve Cabinet Regulations for the implementation of the RePowerEU Fund in spring 2024, on the basis of which AST will conclude a contract with the Ministry of Climate and Energy for the completion of the AST projects.

4.3.3. Large-scale implementation of new connections

The development of renewable energy power plants is an important contribution to achieving Latvia's energy and climate goals. AST contributes to this by ensuring that such power plants are connected to the power transmission system.

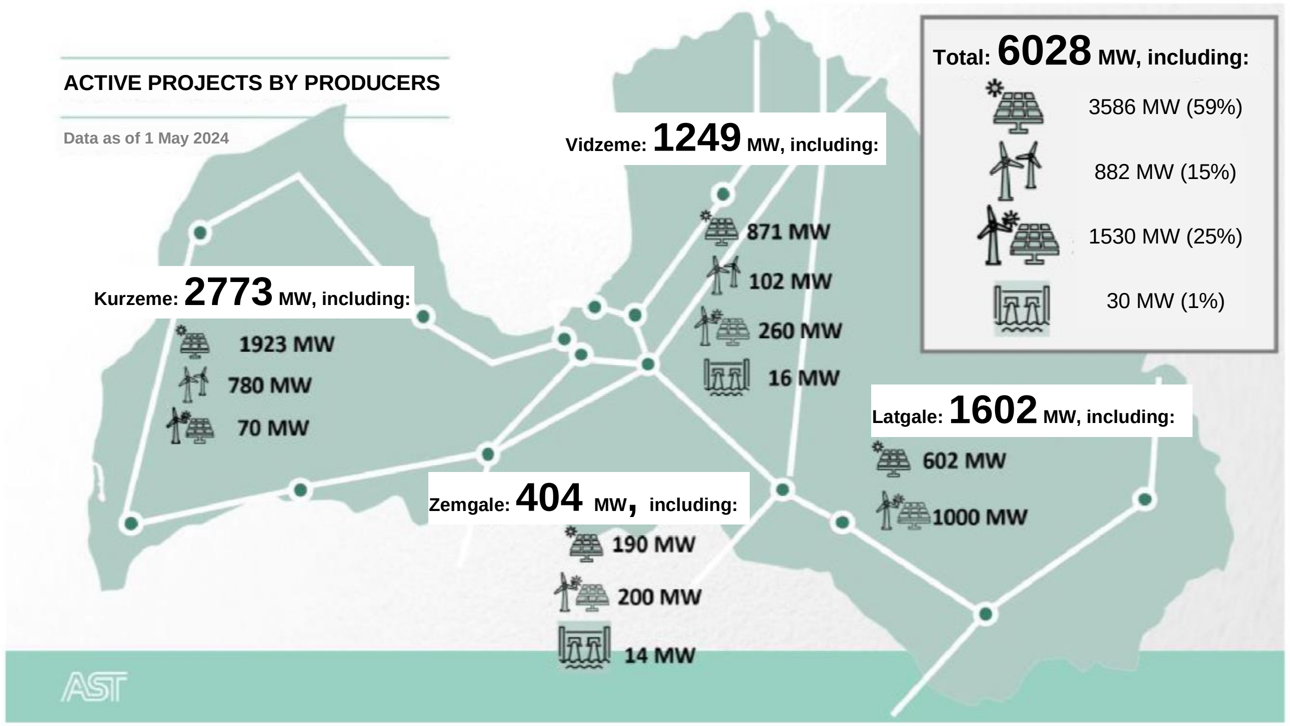
In order for AST to comply with the legal requirements and the obligations it undertook when issuing technical specifications to the power producer, it is necessary to reserve the capacity for which the technical specifications were issued from the moment the technical specifications were issued. AST issued technical specifications for new connections with wind and solar power plants with a total capacity of 6028 MW before 1 June 2024, and this is the amount of capacity currently reserved.

Total reserved capacity, broken down by energy type, MW



At the time of preparation of the plan (1 May 2024), there were 7 connection contracts for a total capacity of 551 MW, comprising 431 MW in solar power plants, 60 MW in wind power plants, and 60 MW in hybrid projects (solar power plant and energy storage), with the total number of connection contracts reaching 44.

To connect this capacity, one must carry out 35 new substation construction projects, involving the construction of 16 new 330 kV substations, 19 new 110 kV substations, and the rebuilding of 11 existing 110 kV substations or construction of new connections in existing substations over 3 years. Construction has started on 5 new connection projects, and for many other projects, the construction design work is taking place.



AST sees two risks in the current situation:

1) **Negative impact on the implementation of the Augstsprieguma tīkls AS Development Plan:** the large number of connection projects to be implemented at the same time runs the risk that the companies may not have sufficient resources to implement both the Development Plan and the large-scale installation of the new connections. This in turn can make the implementation of the Development Plan projects more costly and time-consuming. AST will also face the challenge of implementing these projects with the resources it has, and will plan to raise additional resources if necessary.
2) **Too high a share of solar power plants (59 to 84% of the total renewables connections requested) is not optimal from the point of view of system balancing and optimum grid use.**

At the time of the preparation of this plan, new regulations are being drafted to mitigate the second risk, expected to involve the following key changes:

1. Setting up a new transmission system connection service (flexible transmission system service), whereby the transmission system service can be limited to 876 hours per calendar year;
2. Producer applications will be assessed using criteria based at least on the following principles:
   a. mutual compatibility between the generation profiles of different power generation facilities;
   b. compatibility of power generation and consumption within a single connection;
   c. technical capability of power generation equipment to provide auxiliary services;
   d. degree of readiness for the implementation of power generating facilities.

At the time of the preparation of the plan, the new regulations are expected to take place in mid-2025.

EFFECTIVE TECHNICAL REQUIREMENTS FOR PRODUCERS SETTING UP NEW CONNECTIONS OR CHANGING THE TECHNICAL PARAMETERS OF AN EXISTING CONNECTION (situation as of 1 May 2024)

#	Producer	Connection point	Approximate connection costs*, million EUR (new)	Reserved capacity, MW	Region	Type of power plant
1	Laflora Energy, SIA	110 kV grid connection (Phase 1)	5.29	90	Zemgale	Hybrid power plant (wind and solar)
2	Rapsoil, SIA	Connection to the 110 kV system	4.07**	60	Kurzeme	Wind power plant
3	AB Wind, SIA	Connection to the 110 kV system	3.56	58.8	Kurzeme	Wind power plant
4	ENERGO WIND, SIA	Connection to the 330 kV system	7.8	93.5	Kurzeme	Wind power plant
5	WPR2, SIA	Connection to the 110 kV system	3.56	102	Vidzeme	Wind power plant
6	BRVE, SIA	Connection to the 110 kV system	3.56	70	Kurzeme	Hybrid power plant (wind and solar)
7	Envirsus, SIA	Connection to the 110 kV system	3.56	290	Kurzeme	Wind power plant
8	Birznieki Industrial Solutions, SIA	Connection to the 110 kV system	2.48**	60	Vidzeme	Hybrid – solar power plant with energy storage battery system
9	Ventspils Wind, SIA	Connection to the 110 kV system	3.56	66	Kurzeme	Wind power plant
10	SP Venta, SIA	Connection to the 110 kV system	3.824”	70	Zemgale	Solar power plant
11	SP Venta, SIA	Connection to the 110 kV system	3.702**	70	Zemgale	Solar power plant
12	DSE Aizpute Solar, SIA	Connection to the 330 kV system	7.8	199.8	Kurzeme	Solar power plant
13	Rēzekne PV, SIA	Connection to the 110 kV system	3.54”	50	Latgale	Solar power plant
14	SP Venta, SIA	Connection to the 110 kV system	3.95**	81.2	Kurzeme	Solar power plant
15	Baltic Biorefinery Group, SIA	Connection to the 110 kV system	0.79”	100	Latgale	Solar power plant
16	DSE Lazas Solar, SIA	Connection to the 330 kV system	7.8	274.95	Kurzeme	Solar power plant
17	Alsun Energy, SIA	Connection to the 110 kV system	1.2	6	Kurzeme	Solar power plant
18	4 WIND, SIA	Connection to the 110 kV system	3.56	23.2	Kurzeme	Wind power plant
19	STELO ORIENTA, SIA	Connection to the 110 kV system	1.04	110	Kurzeme	Solar power plant
20	Sunly Land Solar 1, SIA	Connection to the 110 kV system	3.56	40	Vidzeme	Solar power plant
21	Sunly Land Solar 3, SIA	Connection to the 330 kV system	7.8	280	Vidzeme	Solar power plant
22	SPVKurzeme, SIA	Connection to the 110 kV system	4.11”	110	Latgale	Solar power plant
23	Sunly Land, SIA	Connection to the 110 kV system	3.56	60	Vidzeme	Solar power plant
24	Baltazar, SIA	Connection to the 110 kV system	1.04	46	Kurzeme	Solar power plant
25	Vestman Zemes Fonds, SIA	Connection to the 330 kV system	7.8	200	Kurzeme	Solar power plant
26	Sunly Land Solar 2, SIA	Connection to the 330 kV system	7.8	200	Kurzeme	Solar power plant
27	Jaukta jauda, SIA	Connection to the 110 kV system	3.56	59.99	Vidzeme	Solar power plant
28	Pienava Wind, SIA	Connection to the 330 kV system	7.8	158.4	Kurzeme	Wind power plant
29	CVE, SIA	Connection to the 330 kV system	7.8	200	Vidzeme	Hybrid power plant (wind and solar)
30	SCHWENK Latvija, SIA	Connection to the 110 kV system	0.25	5	Kurzeme	Solar power plant
31	Laflora Energy, SIA	110 kV grid connection (Phase 2)	20	110	Zemgale	Hybrid power plant (wind and solar)
32	PurpleGreen Energy B, SIA	Connection to the 330 kV system	7.8	400	Latgale	Hybrid – solar power plant with energy storage battery system
33	Sunly Land Solar 4, SIA	Connection to the 110 kV system	3.56	30	Vidzeme	Solar power plant
34	SIA IGN RES DEV2, SIA	Connection to the 330 kV system	7.8	222	Kurzeme	Solar power plant
35	Purplegreen SolWin, SIA	Connection to the 330 kV system	7.8	400	Latgale	Hybrid – solar power plant with energy storage battery system
36	Purplegreen SolWin 1, SIA	Connection to the 110 kV system	3.56	200	Latgale	Hybrid – solar power plant with energy storage battery system
37	ib vogt Latvia alfa, SIA	Connection to the 110 kV system	1.04	91.75	Latgale	Solar power plant
38	Virga Tero, SIA	Connection to the 330 kV system	7.8	250	Latgale	Solar power plant
39	Latvenergo, AS	Connection to the 110 kV system	0	16	Vidzeme	Hydroelectric power plant
40	Latvenergo, AS	Connection to the 110 kV system	0	14.1	Zemgale	Hydroelectric power plant
41	Utilitas Wind, SIA	Connection to the 330 kV system	7.8	259	Kurzeme	Solar power plant
42	Utilitas Wind, SIA	Connection to the 330 kV system	7.8	249	Kurzeme	Solar power plant
43	Utilitas Wind, SIA	Connection to the 330 kV system	7.8	180	Vidzeme	Solar power plant
44	Utilitas Wind, SIA	Connection to the 330 kV system	7.8	221	Vidzeme	Solar power plant
45	ib vogt Dobele, SIA	Connection to the 110 kV system	3.56	50	Zemgale	Solar power plant
46	ib vogt Brocēni, SIA	Connection to the 110 kV system	1.04	70	Kurzeme	Solar power plant
47	TCK, SIA	Connection to the 110 kV system	0	0	Kurzeme	Hybrid – wind power plant with energy storage battery system
48	Winergy, SIA	Connection to the 110 kV system	0	30.2	Kurzeme	Wind power plant
49	Latvenergo, AS	Connection to the 110 kV system	0	0	Vidzeme	Hybrid power plant (CHPP and solar)
				6027.89		

EFFECTIVE TECHNICAL REQUIREMENTS FOR USERS SETTING UP NEW CONNECTIONS OR CHANGING THE TECHNICAL PARAMETERS OF AN EXISTING CONNECTION (situation as of 1 May 2024)

#	User	Connection point	Approximate connection costs*, million EUR (new)	Reserved capacity, MW	Region	Note
1	Sadales tīkls, AS	Connection to the 110 kV system	0.06	6.3	Kurzeme	User
2	Sadales tīkls, AS	Connection to the 110 kV system	0.887	6.3	Kurzeme	User
3	'Gaujas koks', SIA	Connection to the 110 kV system	1.52**	10	Zemgale	User
4	'Gaujas koks', SIA	Connection to the 110 kV system	2.618**	10	Vidzeme	User
5	RB Rail, AS	Connection to the 110 kV system	22.2	30	Vidzeme	User
6	RB Rail, AS	Connection to the 110 kV system	3.56	30	Vidzeme	User
7	RB Rail, AS	Connection to the 110 kV system	3.56	40	Zemgale	User
8	Sadales tīkls, AS	Connection to the 110 kV system	0	32	Vidzeme	User
9	Sadales tīkls, AS	Connection to the 110 kV system	2.3	50	Vidzeme	User
10	Sadales tīkls, AS	Connection to the 110 kV system	3.56	16	Vidzeme	User
11	Sadales tīkls, AS	Connection to the 110 kV system	3.56	16	Vidzeme	User
12	Sadales tīkls, AS	Connection to the 110 kV system	3.56	16	Kurzeme	User
13	Sadales tīkls, AS	Connection to the 110 kV system	3.56	16	Vidzeme	User
14	Sadales tīkls, AS	Connection to the 110 kV system	0.45	32	Zemgale	User
15	Sadales tīkls, AS	Connection to the 110 kV system	0.45	25	Vidzeme	User
16	Sadales tīkls, AS	Connection to the 110 kV system	0.45	40	Vidzeme	User
17	Sadales tīkls, AS	Connection to the 110 kV system	0.45	32	Zemgale	User
18	Birznieki Industrial Solutions, SIA	Connection to the 110 kV system	2.48**	60	Vidzeme	User
19	VK Terminal Services, SIA	Connection to the 110 kV system	3.56	65	Kurzeme	User
20	Sadales tīkls, AS	Connection to the 110 kV system	0.175	25	Zemgale	User
21	Sadales tīkls, AS	Connection to the 110 kV system	0.25	16	Vidzeme	User
22	RĪGAS SILTUMS, AS	Connection to the 110 kV system	0	52.5	Vidzeme	User
23	Sadales tīkls, AS	Connection to the 110 kV system	3.56	63	Vidzeme	User
24	PATA ENERGY, SIA	Connection to the 110 kV system	2.72	10	Zemgale	User
25	PATA ENERGY, SIA	Connection to the 110 kV system	2.72	10	Kurzeme	User
26	PurpleGreen Energy A, SIA	Connection to the 330 kV system	9.3	400	Kurzeme	User
27	PurpleGreen Energy C, SIA	Connection to the 330 kV system	9.3	550	Kurzeme	User
				1659.10		

Notes for the table of producers and consumers:

* Approximate average cost of a connection (building a substation or connection), not including the construction or rebuilding of the power line to the substation

** The costs specified in the connection contract

*** More details on the status and location of these projects can be found on the capacity map and in the status section of the Augstsprieguma tīkls AS website:

https://www.ast.lv/lv/content/pieslegumi-parvades-sistemai

https://www.ast.lv/lv/content/pieslegumu-ierikosanas-un-atlautas-slodzes-izmainu-statuss

4.3.4. Geopolitical situation

The current geopolitical situation caused by the war in Ukraine and international sanctions against Russia and Belarus led to significant changes in the construction market in 2022, with changes in suppliers and supply chains for materials leading to higher costs and delays in the delivery of materials and equipment, as well as changes in the conditions for deliveries and construction work (e.g., advance payments required for equipment and materials). This situation still has not normalised, and there is a risk that a number of projects could become more expensive, completed late, or postponed. To reduce the likelihood of this risk, contracts for the completion of work and the delivery of equipment must follow the rules of indexing the contract price or its constituent components, and include other mechanisms to stabilise the contract price.

4.4. PROJECTS FOR THE FUTURE DEVELOPMENT OF THE POWER TRANSMISSION SYSTEM

4.4.1. Offshore wind farms

In addition to the large number of renewables requests for onshore grid connections, a large-scale near-future expansion of renewables capacity is also expected in the Baltic Sea: both out in the sea, which has the biggest offshore wind potential, and in the Gulf of Riga.

In 2019, the Latvian Ministry of Environmental Protection and Regional Development of Latvia ('MEPRD') approved the Marine Spatial Planning 2030 ('MSP') development document (https://likumi.lv/ta/id/306969-par-juras-planojumu-latvijasrepublikas-ieksejiem-juras-udeniem-teritorialajai-jurai-un-ekskluzivas-ekonomiskas-zonas) that defines the areas in the sea intended for the construction of offshore wind farms.

The development of the second version of the Latvian Marine Spatial Planning began in 2023. AST participates in the MSP work groups, contributing in what pertains to the development of the power transmission network for connecting the offshore wind farms. MSP clearly shows that the offshore wind potential in Latvia and the whole Baltic Sea region is very large (up to 15 GW of installed capacity in Latvia), and in order to feed the power generated by the offshore wind farms into the power grid, it is critical that the Latvian power transmission infrastructure, both onshore and offshore, is developed as well, by building new or upgrading existing interconnections with neighbouring countries and by implementing ambitious offshore wind infrastructure projects throughout the Baltic Sea region. As offshore wind farms expand, TSOs will also have to develop their onshore power transmission networks in order to connect the offshore wind turbines.

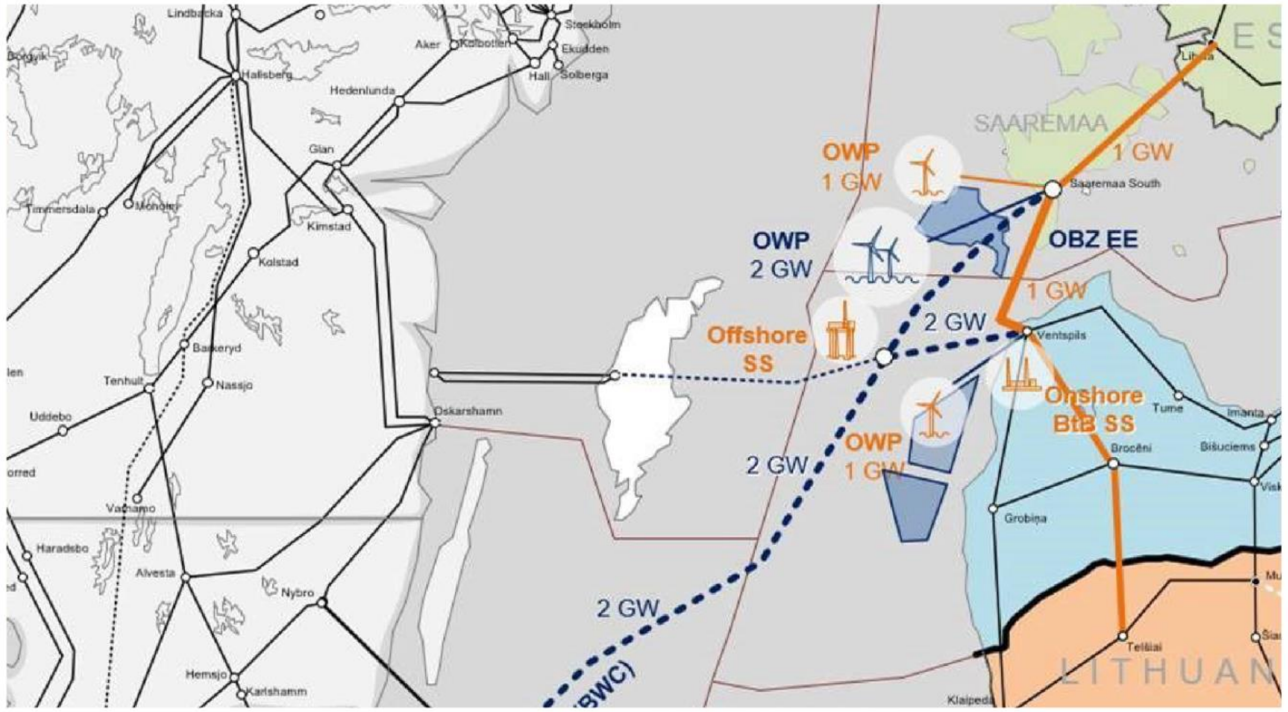
4.4.2. Development of the power transmission infrastructure in the Baltic Sea region

Due to the rapid development of offshore wind farms in Europe, including in the Baltic Sea region, it is necessary to develop long-term transmission infrastructure development plans, promoting the development of offshore wind farms, CO2 reduction, and the development of an environmentally-friendly energy system.

European development documents note that the Baltic Sea region has significant potential for achieving green energy policy objectives. According to a Baltic Energy Market and Infrastructure Plan (BEMIP) study, the Baltic Sea wind potential exceeds 90 GW of installed capacity (including 15 GW in Latvia's territorial waters), and the total annual power production could be as high as 325 TWh.

The European Union has set high and ambitious targets for the development of a decarbonised energy system, and offshore renewables are the main element on the path to carbon neutrality, meaning that a strong transmission system is needed to use the potential of Europe's offshore renewables. The ENTSO-E offshore network development plan ('ONDP'), which is a part of the 10-year European network development plan, describes the financial and technical aspects of developing networks to enable the construction of more new renewables generation capacity in European offshore areas, for the 2030, 2040 and 2050 scenarios. ENTSO-E underlines that with the increasing rate of installation of generation and transmission capacity, offshore wind farms can become one of the most important sources of energy in the European energy system. The development of the offshore infrastructure must be in synergy with environmental protection, in order to create a sustainable energy system by preserving natural biodiversity.

The figure is for information purposes only,
showing project ideas to be updated in the future.



As a member of ENTSO-E, AST work with the other Baltic Sea TSOs to develop a number of offshore connections that could potentially link up offshore wind farms, such as interconnections with Sweden, Germany, and Estonia, which are also mentioned in the ONDP plan (https://www.entsoe.eu/outlooks/offshore-hub/tyndp-ondp/).

4.4.3. Fourth interconnection between Estonia and Latvia

One of the potential offshore wind park development projects in Latvia is ELWIND, a joint Latvian-Estonian transnational offshore wind farm project implemented by the Investment and Development Agency of Latvian (IDAL) and the Latvian Ministry of Economics and the Estonian Environmental Investment Centre (EIC) and the Estonian Ministry of Climate and Energy, based on a memorandum of understanding signed on 18 September 2020 by the Latvian Ministry of Economics and the Estonian Ministry of Economic Affairs and Communications. The Estonian and Latvian power transmission system operators, AST and AS Elering, participate in the project as they will be in charge of the development of the power transmission infrastructure. From a transmission infrastructure planning and modelling point of view, connecting such a large offshore wind farm (up to 1 GW) to the grid requires a new interconnection between Estonia and Latvia. AST is currently involved in the ELWIND project insofar as it pertains to planning the development of the transmission network and to identifying matters related to the development of the offshore power transmission network that should be addressed in national legislation. In 2022, offshore wind farm sites in each country were selected for the ELWIND project, and the corresponding technical and legal issues will have to be sorted out in the near future.

In 2021, AST in conjunction with Elering, investigated the potential project locations for building connections to the onshore grid. In August 2022, the Latvian Cabinet of Ministers approved a report setting the conditions for the implementation of the project in Latvia, including that the project is to be implemented as a hybrid project, i.e., building an offshore wind farm, an offshore interconnection linking Latvian and Estonian wind farms, and connections to the onshore grid. The wind farm is expected to be auctioned to a potential investor in 2026, and the ELWIND project is expected to be completed by 2030.

In October 2023, AST and Elering concluded a memorandum of understanding on the principles and future steps for the development of the 4th Estonia-Latvia interconnection. The project will be implemented using HVAC (high-voltage alternating current) with an implementation period of up to 2035. The planned connection point for the 4th interconnection in Latvia is the power transmission network in the area of Ventspils.

In order to connect the planned offshore wind farm capacities and another interconnection to the 330 kV transmission grid in Kurzeme, the following improvements in the Latvian power transmission grid will be made:

- Strengthening of the Latvia–Lithuania Grobiņa–Darbenai 330 kV interconnection, increasing the throughput capacity of the existing interconnection.
- Strengthening of the Latvia–Lithuania interconnection with the construction of a new 330 kV Ventspils–Brocēni line and a new 330 kV Brocēni–Varduva Latvia–Lithuania interconnection.

These improvements in the grid will provide the grid capacity needed for the ELWIND project as well as, possibly, for other offshore and onshore wind farm projects.

In order for the 4th Estonia-Latvia interconnection project to be eligible for future co-financing through European CEF structural funds, the project has been included in the European Commission list of projects of common interest, approved in 2023. The 4th interconnection project is included in the ENTSO-E ten-year network development plan 2022 (ENTSO-E TYNDP-2022) and is a candidate for inclusion in TYNDP-2024, which will make it eligible for future European co-financing via CEF structural funds.

The network infrastructure needed for the ELWIND project fits into the vision of a single Baltic Sea power grid, with the possibility of extending this infrastructure further to Sweden and Germany.

Estimated costs:
1. Grobina (LV)–Derbenai (LT) – 30 million euros;
2. Brocēni–Ventspils – 70 million euros;
3. Brocēni–Varduva – 25 million euros;
4. Latvia–Estonia interconnection – 600 million euros

4.4.4. Latvia–Sweden interconnection

The Latvia–Sweden high-voltage power interconnection is an important power transmission infrastructure project not only for Latvia and Sweden but also for the entire Baltic Sea region, especially within the context of the synchronous operation of the Baltic states with the power system of continental Europe and increasing the share of renewables, especially offshore wind farms. Given the expected rise in power consumption, the development of the power market and the achievement of the n-1 safety criteria, it will be necessary in the long run to strengthen the transmission network and build new interconnections between the countries of the Baltic Sea region. Currently, Latvia's development documents include the Latvia–Sweden interconnection and refer to the project as the LaSGo (Latvia–Sweden–Gotland) link in line with its geographical location.

AST is working with the Ministry of Climate and Energy on the development of a vision for the project and is engaged in talks with Sweden at the government and TSO level. In discussions on the future of the project between the Latvian and Swedish TSOs so far, the Swedish TSO, Svenska Kraftnat (SvK) has pointed out that it sees the benefits of such a project, provided that it is of a hybrid design, enabling the connection of the offshore wind farms being built off Gotland Island. At this point, SvK plans to include' a radial connection between the offshore wind farm near Gotland and the onshore grid in Sweden in its development plans, with the note that this connection could be expanded with a hybrid offshore transmission interconnection between Latvia and Sweden. The Latvia–Sweden interconnection is mentioned in ENTSO-E ONDP as one of the potential offshore infrastructure projects.

In 2023, recognising the importance of the project and the need to start the first steps in time, Augstsprieguma tīkls AS signed a contract with CESI, an energy sector consultant, to initiate a study of the LaSGo Link project, conducting a dynamic stability calculation, assessing the possible technical implementation of the project and performing a cost-benefit analysis. The study will examine a number of interconnection scenarios and estimate the preliminary costs of the interconnection.

Through an intergovernmental agreement on the project with Sweden, it will be possible to raise European co-financing for further surveys and construction as part of the further development of the project, and, in order to become eligible for CEF co-financing in the future, the project needs to be included in the European development documents, i.e., the Ten-Year Network Development Plan (TYNDP) and then the list of projects of common interest (PCI).

Preliminary costs of LaSGo: 900 million euros

4.4.5. Baltics–Germany interconnection

In May 2023, given the rapid growth of renewables in the Baltic states and the need to export this energy to European countries with power shortages, the Baltic TSOs (Elering from Estonia, AST from Latvia, and Litgrid from Lithuania) signed a multilateral letter of intent with the German TSO 50 Hertz, with the goal of establishing a power transmission interconnection between the Baltic states and Germany through the Baltic Sea, in order to strengthen cooperation and take common steps towards energy independence. The project is called the Baltic WindConnector. The Baltic WindConnector will consist of an 800 km power transmission cable in the Baltic Sea running from Germany to the Baltic states, enabling the future connection of high-capacity offshore wind farms, with the Baltic states becoming exporters of green power to Europe's power market.

At the moment, the development of the project is at its beginning, and the letter of intent is the first step towards building this interconnection: it is initially planned to carry out a feasibility analysis of the possible development of this project.

If the Baltic WindConnector line is built, connecting the Baltics to Germany, it could become an important piece of transmission infrastructure for the whole Baltic Sea region in the context of the already mentioned Baltic Sea Region Offshore Infrastructure Initiative and the operation of the networks of the Baltic States synchronised with the power system of continental Europe, where the synchronous link for the Baltic states will be created through the Poland-Lithuania high-voltage alternating-current (HVAC) interconnection, with additional trading capacities possibly being provided through high-voltage direct-current (HVDC) interconnections with continental Europe, i.e., including Poland and Germany.

The BWC project is included on the ENTSO-E TYNDP-2024 candidate list as a trilateral TSO project (Germany, Estonia, and Latvia), in which AST is one of the promoters. As the project is at an initial survey stage, the further possible technical solution for the project in Latvia will be decided at a later time, once additional technical studies are carried out.

The development of the Baltic-German interconnection could be important in the context of the rising share of renewables in the entire Baltic Sea region, taking into account electrification, the expansion of the power market, as well as the achievement of n-1 reliability criteria in all the operating modes of the system. In the long run, it will be necessary to strengthen the transmission network and develop new interconnections between the countries of the Baltic Sea region to contribute to accomplishing the EU's common goals for a single and integrated electric power system.

4.4.6. Development of Latvia-Lithuania interconnection and power transmission network projects

In 2023, AST and Lithuania's Litgrid carried out a feasibility analysis of the need to upgrade the existing Latvia-Lithuania interconnections and to build new interconnections. Increasing the Latvia-Lithuania throughput is linked to the significantly higher interest in transmission grid connections among RES developers. AST and Litgrid conducted a survey, which involved network and market modelling for the 2030 and 2040 scenarios, taking into account the possible development of renewables in each country as well as the possible development of consumption technologies. The analysis concluded that the existing Grobiņa-Darbenai interconnection needs to be rebuilt and a new Brocēni-Varduva interconnection needs to be constructed. A detailed cost-benefit analysis of the projects is needed for further assessment and decision-making. The projects are included on the ENTSO-E TYNDP-2024 candidate list for future project of common interest status and eligibility for European co-funding.

4.5. NATIONAL AND REGIONAL ELECTRICITY MARKET DEVELOPMENT TRENDS

Average annual exchange electricity prices in the Baltic states

Year	EE (EUR/MWh)	LT (EUR/MWh)	LV (EUR/MWh)
2013	43.14	48.93	52.40
2014	37.61	50.13	50.12
2015	31.08	41.92	41.85
2016	33.06	36.54	36.09
2017	33.20	35.13	34.68
2018	47.07	50.00	49.90
2019	45.86	46.12	46.28
2020	33.69	34.04	34.05
2021	86.73	90.45	88.78
2022	192.82	230.23	226.91
2023	90.79	94.44	93.89

Source: NordPool

Baltic states’ electricity generation, consumption, balance

Year	Consumption, MWh	Generation, MWh	Balance, MWh
2013	24,992	21,804	-3188
2014	24,669	18,640	-6029
2015	24,550	19,992	-4558
2016	25,500	20,730	-4770
2017	27,511	22,448	-5063
2018	28,230	20,132	-8098
2019	27,631	15,941	-11,691
2020	26,856	15,162	-11,694
2021	27,935	15,701	-12,234
2022	27,165	15,680	-11,485
2023	26,225	15,557	-10,668

Source: Transparency platform

Average annual cross-border capacity available for electricity trading at the internal borders of the Baltic states

Year	EE-LV Capacity (MW)	LT-LV Capacity (MW)	LV-EE Capacity (MW)	LV-LT Capacity (MW)
2013	676	591	675	1077
2014	762	527	657	1000
2015	729	536	620	978
2016	779	554	670	1021
2017	795	587	649	1043
2018	764	589	711	1025
2019	800	584	734	1077
2020	848	693	778	1096
2021	1132	1194	1089	1132
2022	936	878	915	961
2023	972	1062	838	1028

Source: NordPool

Average annual cross-border capacity available for electricity trading at the external borders of the Baltic states with third countries

Year	LBI-LT Capacity (MW)	LKAL-LT Capacity (MW)	LRI-LV Capacity (MW)	LT-LBE Capacity (MW)	LT-LKAL Capacity (MW)	LV-LRE Capacity (MW)
2013	576	240	0	1042	602	0
2014	636	266	0	1054	578	0
2015	549	242	0	991	591	0
2016	500	281	0	886	566	0
2017	633	341	0	850	603	0
2018	485	341	0	1136	518	0
2019	749	302	0	1161	571	0
2020	792	227	96	791	535	84
2021	0	211	408	0	450	365
2022	0	76	89	0	76	510
2023	0	0	0	0	0	0

Average annual cross-border capacity available for electricity trading at the external borders of the Baltic states with European Union countries

Year	EE-FI Capacity (MW)	FI-EE Capacity (MW)	LT-PL Capacity (MW)	LT-SE4 Capacity (MW)	EN-LT Capacity (MW)	SE4-LT Capacity (MW)
2013	352	374	0	0	0	0
2014	838	795	0	0	0	0
2015	892	934	16	0	11	0
2016	965	975	311	414	149	426
2017	1006	1008	377	450	268	579
2018	977	981	477	441	295	562
2019	998	998	474	502	394	652
2020	961	983	448	647	436	653
2021	988	1006	422	677	423	643
2022	942	988	453	596	480	650
2023	975	977	343	638	474	647

Next-day electricity trading amounts in the Baltic states

Year	Baltic imports from third countries (MWH)	Baltic imports from EU countries (MWH)	Baltic exports to third countries (MWH)	Baltic exports to EU countries (MWH)	Baltic trade with third countries (MWH)	Baltic trade with EU countries (MWH)
2013	3,648,392	1,511,311	115,230	510,488	3,763,622	2,021,799
2014	3,713,994	3,490,904	0	39,290	3,713,994	3,530,193
2015	3,242,246	5,159,875	0	27,583	3,242,246	5,187,457
2016	3,180,514	6,118,902	0	1,793,259	3,180,514	7,912,161
2017	3,292,126	5,235,794	0	2,452,397	3,292,126	7,688,191
2018	5,500,969	6,018,102	0	2,675,208	5,500,969	8,693,310
2019	7,822,237	7,913,522	0	2,787,569	7,822,237	10,701,091
2020	3,948,685	11,453,503	3098	1,993,997	3,951,783	13,447,500
2021	4,670,974	10,693,266	0	1,709,819	4,670,974	12,403,085
2022	1,095,320	12,714,353	0	1,765,408	1,095,320	14,479,761
2023	0	13,052,617	0	1,566,544	0	14,619,161

4.5.1. Transition from 60-minute to 15-minute imbalance settlement period

Since production for most renewable energy sources is variable and weather-dependent, they cannot be controlled by network operators or the market. These fluctuations in renewables generation can create a discrepancy in electricity supply and demand: additional flexibility is needed to balance the electric system[1]. As the number of wind and solar plants connected to the grid grows, a need arises to control the balance more accurately. This can be facilitated by shortening both the balance control period and the imbalance settlement period.

The European regulation* prescribes a reduction of the imbalance settlement period from 60 minutes (current) to 15 minutes. According to the deviation from the requirements of the regulation granted by the Baltic states' regulatory bodies, the transition to a 15-minute imbalance settlement period in the Baltics is planned for 1 January 2025, when balancing providers will be required to start submitting balance plans to the transmission system operator for 15-minute periods and the imbalance settlement will be for 15-minute periods.

4.5.2. Transition to 15-minute periods in electricity trading

The TSOs of the Baltic states are also planning to change the electricity market model in order to enable market participants to arrange the provision of balance more accurately after the introduction of the 15-minute imbalance settlement period. In conjunction with the electricity market operator (the exchange), the Baltic TSOs plan to introduce 15-minute trading in the next-day and same-day electricity markets.

The switch to trading in 15-minute periods on the next-day market is planned to take place in the first quarter of 2025, simultaneously across Europe. The time of the transition to 15-minute trading periods on the same-day market will vary from one European region to the other. The TSOs of the Baltic states plan to switch to trading in 15-minute periods on the same-day market in the fourth quarter of 2024.

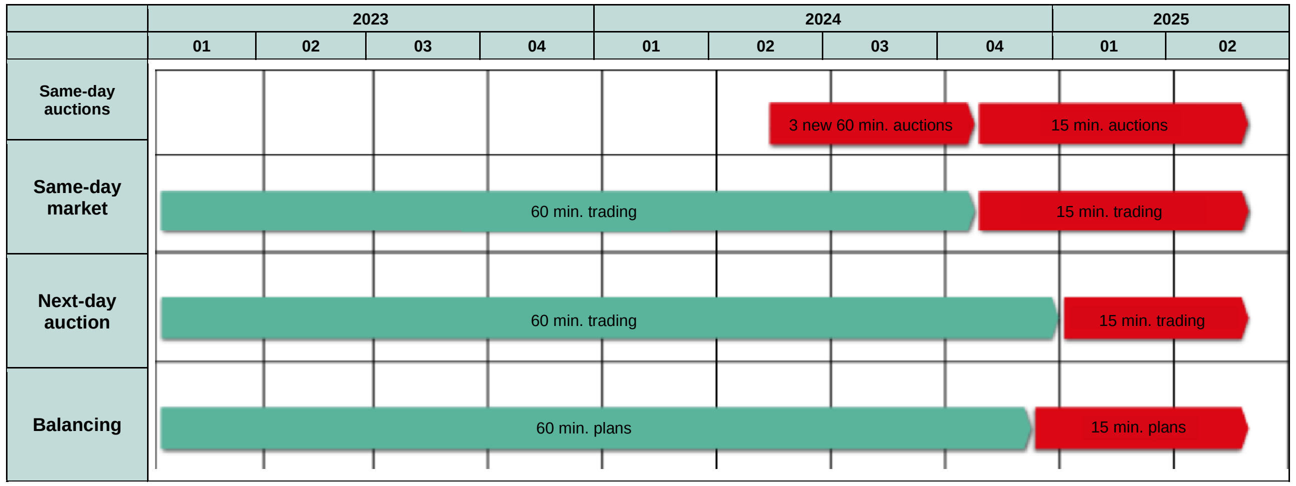
[1] Michelle Antretter et al. Digitalisation of Energy Flexibility. Fraunhofer Institute for Systems and Innovation Research ISI. EU Publications, 2022. doi.org/doi/10.2833/113770.
* Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

4.5.3. Additional same-day market auctions

An auction takes place on the next-day electricity market that determines the price of electricity and the cross-border commercial flows in every trading zone. The next-day market algorithm ensures that the electricity purchase and sale transactions are concluded in a way that maximises social benefit while taking into account the network operation constraints imposed by the transmission system operators. It is also important that the algorithm for electricity flows and setting the prices ensures the optimal utilisation of cross-border trading capacity.

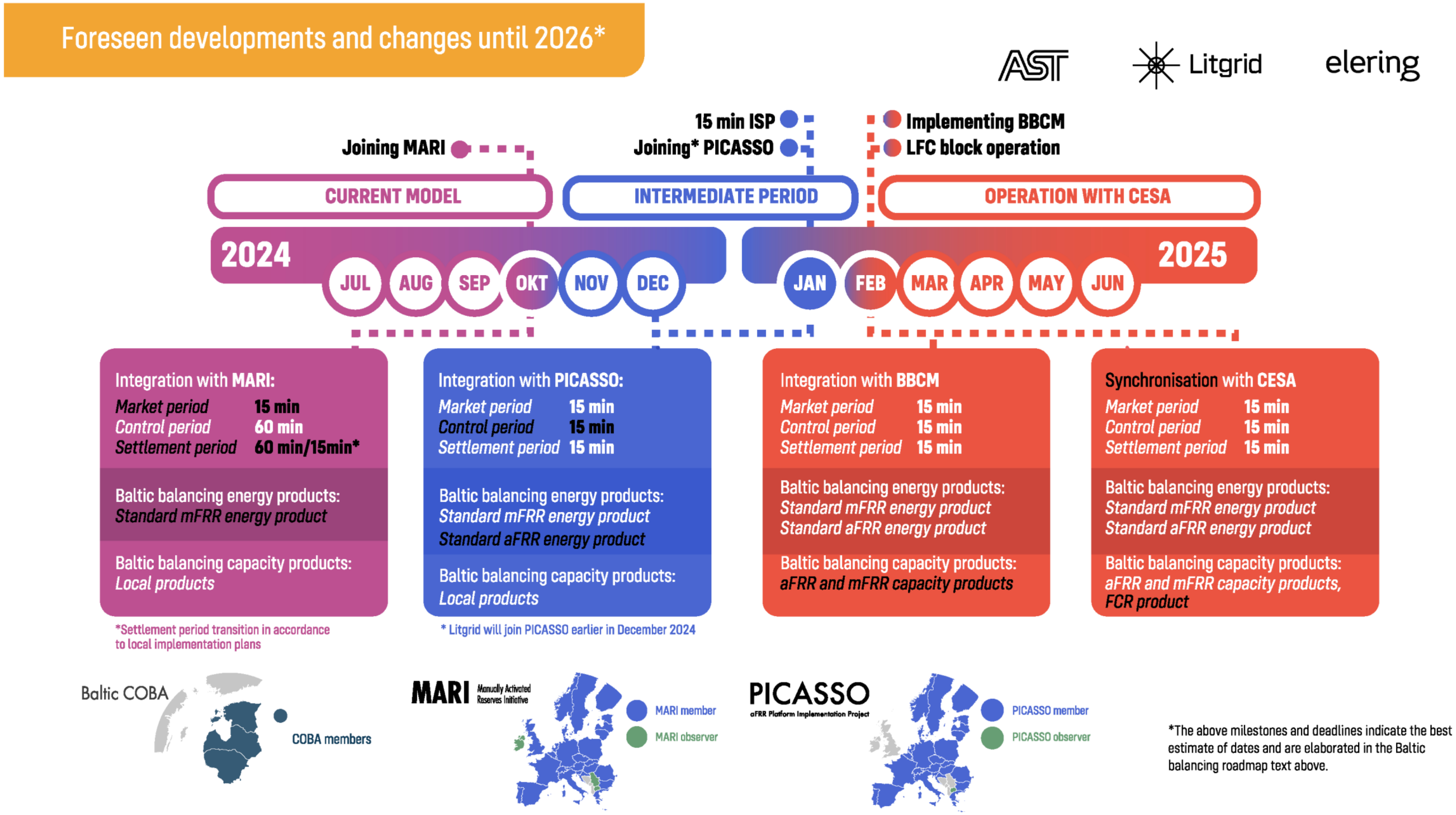
In the current same-day market model, the continuous trading mechanism does not enable the optimal utilisation of and pricing for cross-border capacity, as access is granted to traders on a first-come first-served basis. In 2019, in order to rectify this deficiency, the EU Agency for the Cooperation of Energy Regulators (ACER) decided to hold auctions in addition to the next-day auction (held every day at 13:00): at 16:00 the previous day, 23:00 the previous day, and 11:00 the current day. The Baltic TSOs plan to introduce additional same-day auctions in June 2024.

Key changes in the electricity market model



4.5.4. Balancing market development

Since 1 January 2018, the Baltic states' TSOs have used a single model for balancing the Estonian, Latvian and Lithuanian energy systems. For this purpose, a single Baltic coordinated balancing area was created and a single Baltic balancing market for energy from manually activated frequency restoration reserves (mFRR) was introduced. In order to meet the requirements of Commission Regulation (EU) 2017/2195 establishing a guideline on electricity balancing ('EBGL'), the requirements of the Central European Synchronous Area (CESA) after the Baltic states synchronise with the Central European energy system, and the requirements of Commission Regulation (EU) 2017/1485 establishing a guideline on electricity transmission system operation ('SOGL'), there are significant changes planned in the Baltic states, as shown in the balancing roadmap jointly drafted by the Baltic TSOs.



4.5.4.1. Joining the MARI platform

According to Articles 19(2), 20(2), 21(2), and 22(2) of the EBGL, European TSOs must establish single European platforms for the exchange of balancing energy. For the development and management of these platforms, the TSOs must follow uniform platform management processes, and these platforms must consist of at least an activation optimisation function/imbalance netting process function and a TSO-to-TSO settlement function.

Joining the MARI platform not only makes it possible for the TSOs to comply with the EBGL requirements but also contributes to the creation of integrated European balancing markets in general, improving competition and ensuring equal opportunities for market participants at the regional level. A more liquid and larger market will improve balancing efficiency and ensure greater availability of balancing energy, thus contributing to the reliability of energy systems.

In accordance with Article 62 of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing ('EBGL'), the TSOs of the Baltic states (AST, Litgrid AB and AS Elering) ('Baltic TSOs') jointly submitted a request for a deviation from the deadline for joining the European platform for balancing energy exchange via manually-activated frequency restoration reserves ('MARI'). This request was submitted to the regulatory bodies of the Baltic states ('Baltic RB') on 1 June 2021.

The Baltic RB approved the deviation request (last RB approval date: 19 November 2021), extending the deadline for the Baltic TSOs joining MARI to 24 July 2024. The main prerequisites for joining the MARI platform specified in the deviation request are:

- At least one cross-border interconnection (LT-SE, LT-PL, or EE-FI) must be operational within the MARI platform so that the Baltic states' balancing energy market is not isolated from other neighbouring balancing energy markets;
- The technical and legal preparation of the Baltic states' balancing market development plan must be completed.

In the plan for joining MARI[2] published on 1 October 2023, the Nordic TSOs and the Polish TSO specified a later deadline for joining the platform than what had been envisaged in the approved Baltic TSOs' request for a deadline deviation. As a result, the Baltic TSOs reassessed the Baltic balancing energy market plan for integration with the MARI platform and identified the risks associated with it.

In order to prevent the balancing market from operating with very low liquidity for a long time and to reduce the risk of balancing resource depletion, and to avoid limited cooperation with the Polish, Swedish, and Finnish TSOs, which together would increase uncertainty for balancing market participants and lead to high price volatility and challenges in system operation, the Baltic TSOs intend to delay joining the MARI platform until October 2024. This information, together with the risks identified, was communicated to the Baltic RB on 29 January 2024.

[2] https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-docum ents/Network%20codes%20docum ents/NC%20 EB/2024/MARI_Accession_roadmap_Feb_2024.pdf

4.5.4.2. Joining the PICASSO platform

PICASSO ('Platform for the International Coordination of Automated Frequency Restoration and Stable System Operation') and IGCC ('International Grid Control Cooperation') are projects that set up a specialised coordinated European IT platform for the efficient exchange of balancing energy from aFRR and provide a coordinated imbalance netting process ('INP'), which reduces the amount of aFRR activations required.

Similarly to the MARI platform, the PICASSO platform fosters the creation of an integrated European balancing market, which will improve competition and create equal opportunities for market participants at the regional level, with a wider availability of resources, in this case in the form of aFRR energy. The imbalance settlement and activation optimisation functions integrated into PICASSO also make it possible to minimise the amount of reverse automatic activations in Europe, enabling high efficiency of the aFRR energy market and the frequency recovery process, while still complying with high reliability standards.

According to Article 2(4) of SOGL, the Baltic TSOs are exempt from Article 145 (1, 2, 3, 4, and 6) of SOGL as long as and to the extent that they operate in synchronous mode in a synchronous area in which not all countries are bound by European Union law. Article 145 of the SOGL requires that every TSO in each LFC (load frequency control) zone implements aFRP (automatic frequency recovery process) and that the TSOs use one frequency recovery controller for the calculation of aFRR activation settings in their LFC zone. As per EBGL, all TSOs pursuing aFRP and all TSOs in the Continental Europe Synchronous Area must use the platform developed for European TSOs (PICASSO) for these processes.
With the planned synchronisation of the Baltic states with CESA in 2025, the above exemptions will no longer apply, and it will, therefore, be necessary to provide aFRP as well as an imbalance settlement process via the PICASSO platform in the Baltic states as well.

[3] https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-documents/Network%20codes%20documents/Implementation/picasso/PICASSO_9th_Accession_roadmap_ext.pdf

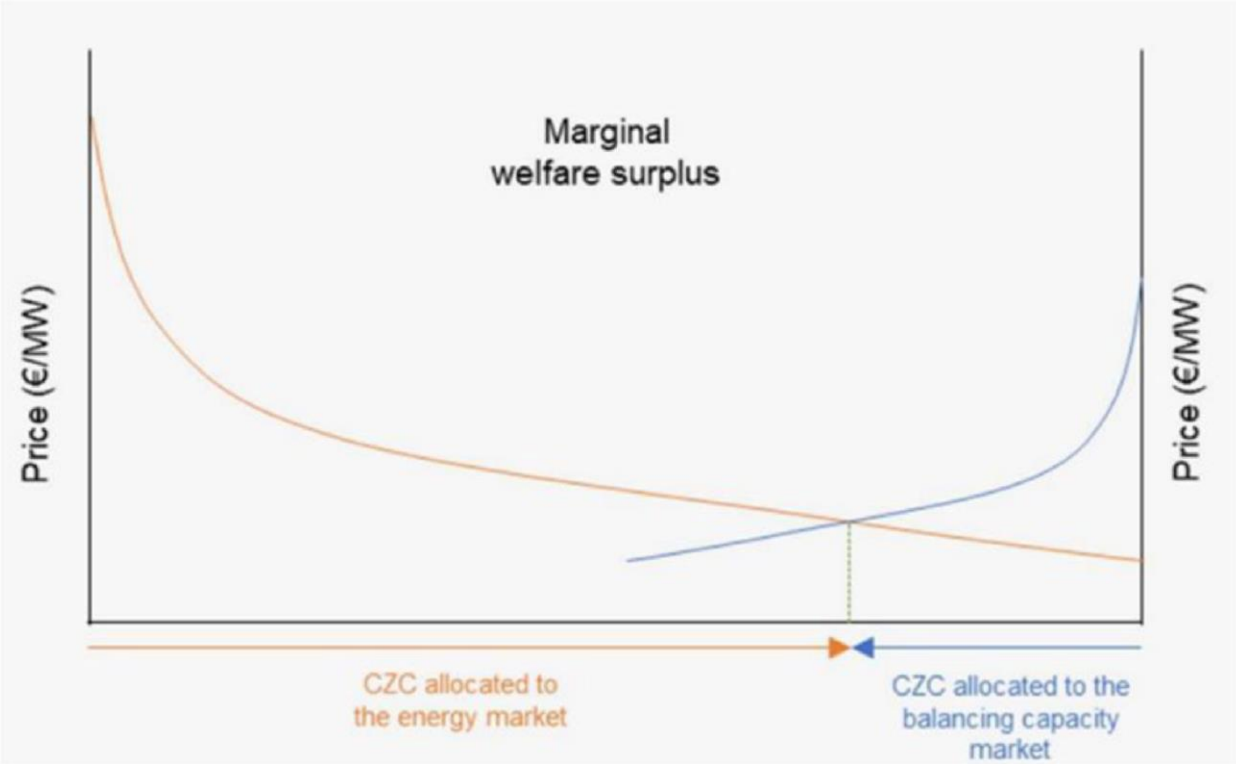
AST is expected to join the PICASSO platform in early 2025. This marks the point at which the transition to the 15-minute balance control period will take place, and the use of the new aFRR product will begin. As is the case with the MARI platform, the other TSOs are expected to join the platform in the future (see the plan for joining PICASSO[3]), creating an increasingly broad and unified European market for aFRR balancing energy.

4.5.4.3. Baltic balancing capacity market

On 21 January 2021, AST, together with the other Baltic TSOs, published a Baltic Load and frequency control (LFC) block concept, envisaging a Baltic LFC block with three LFC zones representing each of the three TSOs and enabling cooperation in the Baltic LFC balancing capacity market. The Baltic TSOs are committed to implementing a single Baltic balancing capacity market at the beginning of 2025, as part of creating a single Baltic LFC block. In order to ensure the availability of the reserves required for the operation of the Baltic LFC block, the Baltic TSOs intend to purchase frequency control reserves (FCR), aFRR, and mFRR as capacity products in the amount dimensioned for the Baltic LFC block.

The Baltic balancing capacity market proposal envisages a single balancing capacity procurement and transmission capacity allocation process to enable regulated service providers in the Baltic states to compete in the single Baltic balancing capacity market, ensuring the most efficient procurement of balancing capacity in the Baltic states.

The market time unit for all Baltic balancing capacity market auctions is equal to the next-day electricity market time unit. According to the methodologies prepared, a significant part of the transmission capacity between the Baltic states can be allocated to exchanging and sharing balancing capacity. However, the allocation of transmission capacity between the Baltic states must follow the principle of economic benefit.



The allocation of transmission capacity will be carried out before the next-day electricity market is triggered in accordance with the methodology of Article 41(1) of EBGL, which provides for a ‘market-based capacity allocation process, whereby the economic benefits of the allocation of transmission capacity for free cross-border trade and the allocation of capacity for reserve exchange and sharing will be simultaneously assessed as part of the procurement’. Up to 50% of the tradable transmission capacity at the border can be allocated in this way, but this value can be increased to 70% of the transmission capacity if the constraint prevents the necessary amount of reserve capacity from being provided.

Starting with the introduction of the single Baltic balancing capacity market, transmission capacity will be allocated according to the regional market methodology prepared by the TSOs of the Baltic capacity calculation region. Later, possibly starting in the second half of 2026, a single European methodology for the allocation of transmission capacity for balancing capacity exchange or sharing will be introduced, integrating the Baltic states into the balancing capacity market of the entire Europe. Accordingly, a European balancing capacity market is expected to emerge, similar to the mFRR and aFRR European balancing energy markets, providing an increasing range of options for balancing market participants.

Based on the CESA FCR amount dimensioning principles, the estimated FCR amount for the Baltic LFC block is 36 MW. The specific FCR amounts are reassessed by the CESA expert group at least once a year, with the possibility of recalculation during that year.

The expected upstream FRR necessary for the Baltic LFC block is in the range of 720 to 860 MW, with downstream FRR in the range of 490 to 700 MW. The FRR ranges depend on the system capacity flow scenarios and on what elements are at work in the Baltic energy systems.

The necessary aFRR capacity amounts are symmetrically variable for upstream and downstream reserves, ranging from 90 MW to 120 MW depending on the time of day. aFRR demand is higher during periods of higher consumption and generation within the energy system, and is lower during periods of more stable consumption and generation. mFRR capacity covers the remaining part of FRR, in the range 600 MW to 770 MW for upstream mFRR, and 370 MW to 610 MW for downstream mFRR.

The data provided on the required capacity reserve amounts are preliminary. Following the introduction of the balancing capacity market, the FRR capacity reserve amounts will be set dynamically, two days before the day of delivery, taking the operation of the system into account. The reserve dimensioning process takes into account the most likely major incidents in the system and historical imbalance data, which leads to the conclusion that the amount of reserves necessary can increase significantly with more variable and unstable energy sources.

5. IMPACT ON THE TRANSMISSION SYSTEM SERVICE FEE

5.1. IMPACT OF INFRASTRUCTURE PROJECTS ON TRANSMISSION SYSTEM SERVICE FEES

To ensure the sustainable development of the transmission system, the development plan includes financial investments in the renovation of the existing transmission system, in maintaining its operating capacity, and in the implementation of synchronisation with continental Europe. The investments intended for upgrading the existing transmission system are planned to the extent necessary to ensure the continuity of power transmission services.

In accordance with Section 7 and 8 of the Capital Cost Accounting and Calculation Methodology approved by Public Utilities Commission Council Decision No. 1/12 of 29 August 2022, the part of the value of the assets funded with the co-financing of the European Union and through overload fee income (OFI) is not to be included in the calculation of power transmission system service fees.

Within the current regulatory framework, capital investments in infrastructure projects are included in the calculation of fees once they are commissioned.

The capital expenditures of infrastructure projects as part of the fee consist of:

- the return on capital from the AST-financed share of the assets created, according to the rate of return on capital set by PUC;
- depreciation of the AST-financed share of the assets.

For information about the impact of infrastructure projects on the transmission fee in the next regulatory period, see section ‘Forecast of changes in the average value of tariffs for transmission system services for the next regulatory period.’

Using the available financial resources and sources of project financing in an efficient way, AST makes every effort to ensure that the infrastructure investments have the least possible impact on its transmission system service fees.

As a result of AST’s activities, 96% of the funding needed to implement the projects of Phase 1 and Phase 2 of synchronisation is covered by EU co-financing and overload fee income, thus reducing the projects’ impact on power transmission system service fees. AST expects that the impact on the unit price of transmission after the implementation of these projects will be lower than that set by PUC. A comparison between the maximum possible impact on the unit price of transmission determined by PUC and the prediction of AST is shown in Table 3.

Change in units transmitted (EUR/MWh) compared to the current fee

Table 3

No.	Project name	PUC threshold, %	AST forecast after project completion,** %
1.	Phase 1 of the synchronisation project	3.0	0.04%
2.	Phase 2 of the synchronisation project	*	0.65%

* PUC Decision No. 47 ‘On the allocation of investment costs for the common interest project “Phase 2 of the Integration and synchronisation of the Baltic power transmission system with European systems”’ of 7 May 2020 sets no fee impact threshold for this project and provides for the inclusion of the share of costs borne by AST in the power transmission system service fee, without limiting the amount of fee changes.

** The calculation of the effect on the fee includes the influence of infrastructure projects on capital expenditures, including the current rate of return on capital of 2.72%.

5.2. FORECAST OF CHANGES IN THE AVERAGE VALUE OF TARIFFS FOR TRANSMISSION SYSTEM SERVICES FOR THE NEXT REGULATORY PERIOD

PUC Council Decision No. 64 of 22 May 2023 approved power transmission service fees for the 1 July 2023 to 31 December 2025 regulatory period ('current transmission fees'). The next regulatory period, thus, starts on 1 January 2026. According to Section 60 of the 'Methodology for the calculation of fees for electricity transmission system services' ('Methodology'), the next draft fees of AST must be submitted for review to PUC by no later than 1 August 2025. According to Section 3 of the Methodology, the regulatory period is between two and five years.

AST has taken a number of measures to reduce the costs associated with synchronisation, including:

- Channelling EU co-financing and overload fee income into capital investment projects, with more than EUR 300 million in EU co-financing, and more than EUR 90 million in PMI. The impact on the fee already in effect is a cost reduction of EUR 9.8 million. Long-term positive effect on the fee.
- Purchase and installation of BESS: the installation of the equipment is expected to result in significant cost savings of around EUR 20 million a year.
- Installation of synchronisation equipment: three synchronous compensators will be used to provide system inertia, voltage adjustment and reactive power support. The operation of the equipment will result in significant cost savings, estimated at EUR 3.8 million a year.

Assessing the impact of the infrastructure projects included in the development plan on the average fee for transmission system services reveals that at the cost base of EUR 94.5 million included in the fee currently charged, and the current rate of return on capital at 2.72%, the impact of investments in infrastructure projects on the average transmission fee is estimated to be 0.6%. This estimate does not include other uncontrollable costs and does not represent the total possible changes in transmission fees in the next regulatory period.

Table 4

	Current fee	Next regulatory period	Next regulatory period/current fee
Regulated asset base	432,691.0	442,118.4	2%
Rate of return on capital	2.72%	2.72%	-
Return on capital	11,769.2	12,025.6	2%
Wear	22,497.1	22,811.3	1%
Total capital expenditures	**34,266.3**	**34,837.0**	**2%**
Total cost in the current fee	94,516.4		
Impact of investments in infrastructure projects on the average fee in the next regulatory period, EUR/MWh		**0.6%**	

In assessing the changes in transmission fees in the next regulatory period, it should be taken into account that in addition to the above, the transmission fee changes are significantly influenced by factors beyond AST’s control, such as the electricity prices at the exchange, electricity consumption, inflation, rate of return on capital set by PUC, etc.

According to the ‘Methodology for recording and calculating capital costs’ approved by PUC, starting from 2025 the rate of return on power transmission capital is determined in nominal terms (currently done in real terms). The effect of a 1 percentage point increase in the rate of return on capital on the average transmission fee in the next regulatory period is estimated at 4.7%, so at a rate of return on capital of 3.72%, the effect on the average transmission fee in the next regulatory period increases from 0.6% to 5.3%. According to Section 14 of the ‘Methodology for recording and calculating capital costs’, PUC will decide on the rate of return on capital to be used in the calculation of transmission fees in the next regulatory period by 1 September 2025.

In accordance with current regulations, changes in uncontrollable costs within a regulatory period are included in the fee calculation for the following regulatory period. Given the high uncertainty of the above factors, their impact on the price per unit transmitted in the next regulatory period is currently difficult to predict.

The priority of Augstsprieguma tīkls AS is to provide high-quality and reliable power transmission services at the lowest possible fees. In addition to the above measures, Augstsprieguma tīkls AS is continuously working on optimising the operating costs it has direct control over and on improving the efficiency of its processes.

6. ANNEXES

6. ANNEXES

1. **Transmission system operator's part of the plan included in the Community Plan for 2025–2034 (without VAT)**
2. **Transmission system operator's part of the plan not included in the Community Plan for 2025–2034 (without VAT)**
3. **Financial investment in transmission infrastructure in 2025–2034 (without VAT)**

Person authorised to represent the system operator:

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Arnis Daugulis

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TRANSMISSION SYSTEM OPERATOR'S PART OF THE PLAN INCLUDED IN THE COMMUNITY PLAN FOR 2025–2034 (WITHOUT VAT)

No k.	Project and facilities within its scope	Project implementation benefits	For joint projects, specify the other legal entities involved in the financing of the project and the percentage share of their financial contribution	Technical description of the project facilities (substation voltages, line lengths, technology used (AC, DC), etc.)	Commissioning date (for reconstructions)	Total financial investments (million EUR)	Total project duration (from_ to_)	Breakdown of financial contributions in each of the next 10 years (million EUR)									
								2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1. Phase 1 of the synchronisation project																	
1.1	Tartu (EE)–Valmiera (LV) 330 kV interconnection capacity increase Tsirgulina (EE)–Valmiera (LV) 330 kV interconnection capacity increase Procurement and installation of system synchronisation and inertia equipment.	Increasing of transmission network capacity, improving the security of power supply in the Baltic region.	none	The project involves the rebuilding of some 48 km of existing 330 kV transmission lines to increase the capacity of the Baltic corridor. The Baltic corridor is a project that increases throughput capacity within the Baltic states. The project involves the procurement and installation of equipment necessary to maintain frequency and inertia, including the construction of new connections for this equipment.	2025	73.79	2020–2025	6.44									
2. Phase 2 of the synchronisation project																	
2.1.	Procurement and installation of system synchronisation and inertia equipment. Upgrading of fiscal metering devices, supervisory control systems and emergency automation.	Transmission grid stability and reliability in synchronous grid operation with continental Europe.	none	The project involves the procurement and installation of equipment necessary to maintain frequency and inertia, including that of power batteries and the construction of new connections for this equipment. There are also plans to upgrade fiscal metering devices, supervisory control systems and emergency automation.	2025	164.13	2021–2025	68.21									
						74.65	**Total**	**74.65**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Notes:

1. For interconnections, the plan only indicates the project parameters and the financial investments necessary for the implementation of the project within the territory of Latvia.

Person authorised to represent the transmission system operator:

Board member Arnis Daugulis

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TRANSMISSION SYSTEM OPERATOR’S PART OF THE PLAN NOT INCLUDED IN THE COMMUNITY PLAN FOR 2025–2034 (WITHOUT VAT)

No.	Name	Total financial investments (million EUR)	Breakdown of financial contributions in each of the next 10 years									
			2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1	**Substations**	**126.94**	11.02	9.96	9.40	12.95	16.61	14.21	14.04	12.21	13.60	12.93
2	**Replacement of transformers and automatic transformers**	**56.95**	3.74	6.16	4.96	5.91	3.95	7.06	5.82	7.43	7.08	4.85
3	**Cable lines**	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	**Overhead lines**	**100.54**	9.12	8.67	8.79	7.57	7.55	9.40	10.06	12.64	12.99	13.77
5	**Other activities**	**77.63**	26.04	12.51	9.65	3.79	4.65	3.42	4.35	4.65	4.12	4.46
6	**Total**	**362.06**	**49.92**	**37.29**	**32.79**	**30.22**	**32.75**	**34.08**	**34.27**	**36.93**	**37.79**	**36.01**

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FINANCIAL INVESTMENT IN TRANSMISSION INFRASTRUCTURE IN 2025–2034 (WITHOUT VAT)

No.	Project and facilities within its scope	Project implementation benefits	For joint projects, specify the other legal entities involved in the financing of the project and the percentage share of their financial contribution	Project facility location	voltages, line lengths, indicating technology descriptions)	Commissioning date (for reconstructions)	Source of financial investments	Total financial investments (million EUR)	Total project duration (from_ to_)	Breakdown of financial contributions and work schedule in each of the next 10 years (million EUR)									
										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1	Phase 1 of the synchronisation project Tartu(EE)–Valmiera(LV), Tsirgulina (EE)–Valmiera (LV) interconnection capacity increase Procurement and installation of system synchronisation and inertia equipment	increasing of transmission network capacity, improving the security of power supply in the Baltic region. Transmission grid stability and reliability in synchronous grid operation with continental Europe	none	Latvia	The project involves the rebuilding of some 48 km of existing 330 kV transmission lines to increase the capacity of the Baltic corridor. The Baltic corridor is a project that increases throughput capacity within the Baltic states. The project involves the procurement and installation of equipment necessary to maintain frequency and inertia, including the construction of new connections for this equipment.	1971* 1960*	AST funding 25% / EU funding 75%	73.79	2020–2025	6.44									
									Work as part of the project:	Delivery and installation of inertia and frequency adjustment equipment. Set-up of equipment, inspections, commissioning. Modernisation of control systems.									
2	Phase 2 of the synchronisation project Procurement and installation of system synchronisation and inertia equipment. Upgrading of fiscal metering devices, supervisory control systems and emergency automation.	Transmission grid stability and reliability in synchronous grid operation with continental Europe	none	Latvia	The project involves the procurement and installation of equipment necessary to maintain frequency and inertia, including that of power batteries and the construction of new connections for this equipment. There are also plans to upgrade fiscal metering devices, supervisory control systems and emergency automation		AST funding 20%/EU funding 80%	164.13	2021–2025	68.21									
									Work as part of the project:	Construction. Delivery and installation of inertia and frequency adjustment equipment. Set-up of equipment, inspections, commissioning. Upgrading of supervisory control systems and emergency automation.									
									European TYNDP 2020 projects total:	74.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Transmission line rebuild at Andrejsala Substation 1	Construction of the substation at a new site, at the request of the owner of the land. Infrastructure improvements in accordance with the approved detailed planning	none	Riga, Latvia		1970*	Funding by SIA 'Jaunrīgas attīstības uzņēmums'	1.09	2025–2026	0.54	0.54								
									Work as part of the project:	Transmission network cable reconstruction	Transmission network cable reconstruction								
4	Construction of a new 'Ziemeļu forti' substation for the connection of the SIA Rapsoil wind power plant	Installation of new connection	none	Latvia, Liepāja	Construction of a new 110 kV substation with an H-shaped circuit.		Funding by SIA Rapsoil	4.01	2023–2025	2.20									
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using OSG designs Grounds improvements, finalisation of work, inspections, commissioning									
5	Construction of a new 110 kV connection at Krustpils substation for the connection of the SIA Baltic Biorefinery Group solar power plant	Installation of new connection	none	Latvia, Krustpils	Construction of a new 110 kV connection at the Krustpils substation.		SIA Baltic Biorefinery Group	0.79	2023–2025	0.01									
									Work as part of the project:	Grounds improvements, finalisation of work, inspections, commissioning									
6	Construction of a new 'Rūtiņi' substation for connecting SIA SP Venta SPP	Installation of new connection	none	Kuldīga Municipality, Vārme Rural Territory	Construction of a new 110 kV substation with an H-shaped circuit.		SIA 'SP Venta'	3.86	2024–2025	0.94									
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using OSG designs Grounds improvements, finalisation of work, inspections, commissioning									

No.	Project and facilities within its scope	Project implementation benefits	For joint projects, specify the other legal entities involved in the financing of the project and the percentage share of their financial contribution	Project facility location	Technical description of the project facilities (substation voltages, line lengths, technology used (AC, DC), etc.)	Commissioning date (for reconstruction)	Source of financial investments	Total financial investments (million EUR)	Total project duration (from_ to_)	Breakdown of financial contributions and work schedule in each of the next 10 years (million EUR)									
										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
7	Construction of a new 'Nīzere' substation for connecting SIA SP Venta SPP	Installation of new connection	none	Bauska Municipality, Stelpe Rural Territory	Construction of a new 110 kV substation with an H-shaped circuit.		SIA SP Venta	3.73	2024–2025	0.91									
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using OSG designs. Grounds improvements, finalisation of work, inspections, commissioning									
8	Construction of a new 'Mariantāle' substation for the connection of the SIA Rēzekne PV SPP	Installation of new connection	-	Rēzekne Municipality, Bērzgale Rural Territory	Construction of a new 110 kV substation with an H-shaped circuit.		SIA Rēzekne PV	3.77	2024–2025	0.95									
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using OSG designs Grounds improvements, finalisation of work, inspections, commissioning									
	Construction of a new 'Biliņi' substation for the connection of the SIA SPV Kurzeme SPP	Installation of new connection	none	Kraslava Municipality. Svariņi Rural Territory	Construction of a new 110 kV substation with an H-shaped circuit.		SIA SPV Kurzeme	4.14	2024–2025	2.00									
9									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using OSG designs. Grounds improvements, finalisation of work, inspections, commissioning									
10	Construction of a new 'Vārme' substation for the connection of the producer SIA SP Venta	Installation of new connection	none	Kuldīga Municipality, Vārme Rural Territory	Construction of a new 110 kV substation with an H-shaped circuit.		SIA SP Venta	3.99	2024–2025	1.13									
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using OSG designs. Grounds improvements, finalisation of work, inspections, commissioning									
11	110/20 kV 'Tēraudlietuve substation 110 kV switchgear partial rebuild	Improvements in transmission system reliability	none	Latvia, Zīlāni	Partial reconstruction of the Tēraudlietuve substation and 110 kV lines to connect the new 'Gaujas koks' substation to the system	1986*	AST funding	0.76	2022–2025	0X>1									
									Work as part of the project:	Grounds improvements, finalisation of work, inspections, commissioning									
12	110/20 kV Zaļā birze substation 110 kV switchgear partial rebuild	Improvements in transmission system reliability	-	Latvia, Zilāni	Partial reconstruction of the 'Zaļā birze' substation and 110 kV lines to connect the new 'Ziemeļu forti' substation to the system	1983*	AST funding	1.29	2023–2025	0.52									
									Work as part of the project:	Rebuilding of substation and 110 kV transmission line Grounds improvements, finalisation of work, inspections, commissioning									
13	Replacement of 330/110/20 kV Krustpils substation	Improvements in transmission system reliability	none	Latvia, Krustpils	Construction of a two-bar circuit in the 110 kV switchgear, installing 12 110 kV sockets and replacing the transformers	1959 (with replacement of some 110 kV equipment in 1985)	AST funding	3.82	2021–2025	0.28									
									Work as part of the project:	Grounds improvements, finalisation of work, inspections, commissioning									
14	110/10/6 kV switchgear rebuild in the 110 kV Vairogs substation	Improvements in transmission system reliability	none	Riga, Latvia	Construction of a two-bar circuit in the 110 kV switchgear (GIS design), installing 6 110 kV sockets.	1963*	AST funding	3.71	2021–2025	0.11									
									Work as part of the project:	Grounds improvements, finalisation of work, inspections, commissioning									
15	110/20 kV Lode substation 110 kV	Improvements in transmission system reliability	none	Latvia, Liepa	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1962*	AST funding	2.97	2022–2025	0.22									
									Work as part of the project:	Grounds improvements, finalisation of work, inspections, commissioning									
16	110/20/6 kV Džūkste substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Džūkste	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1976*	AST funding	2.10	2022–2025	0.20									
									Work as part of the project:	Grounds improvements, finalisation of work, inspections, commissioning									

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										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
17	110/20/10 kV Ogre substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Ogre	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1968*	AST funding	2.39	2020–2026	0.76	030								
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections in ASI version and the installation of one transformer Grounds improvements, finalisation of work, inspections, commissioning	Grounds improvements, finalisation of work, inspections, commissioning								
18	110/20 kV Carnikava substation 110 kV switchgear rebuild	Improvements in transmission system reliability	-	Latvia, Carnikava	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1981*	AST funding (Recovery Fund)	2.71	2022–2026	1.11	0.10								
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using OSG designs	Grounds improvements, finalisation of work, inspections, commissioning								
19	110/20 kV Kuldīga substation 110 kV switchgear rebuild and replacement of transformers	Improvements in transmission system reliability	none	Latvia, Kuldīga	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1959*	AST funding (Recovery Fund)	5.74	2022–2026	1.92	034								
									Work as part of the project:	2 pcs Rebuilding of 110 kV connections using outdoor switchgear designs; installation of one transformer.	Grounds improvements, finalisation of work, inspections, commissioning								
20	110 kV RPA and SCS replacement in the 110/10 kV Grīziņkalns substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 6 110 kV connections.	1999*	AST funding	0.53	2023–2025	033									
									Work as part of the project:	Replacement of RPA and SCS equipment									
21	110 kV RPA and SCS replacement in the 110/20/10 kV Dzintari substation	Improvements in transmission system reliability	none	Latvia, Jūrmala	Replacement of the relay protection and automation system and the supervisory control system, 3 110 kV connections.	1999*	AST funding	0.40	2023–2025	0.10									
									Work as part of the project:	Replacement of RPA and SCS equipment									
22	110 kV RPA and SCS replacement in the 110/10 kV Venta substation	Improvements in transmission system reliability	none	Latvia, Ventspils	Replacement of the relay protection and automation system and the supervisory control system, 6 110 kV connections.	1999*	AST funding	0.53	2023–2025	0.12									
									Work as part of the project:	Replacement of RPA and SCS equipment									
23	110/20 kV Līvāni substation 110 kV switchgear rebuild and replacement of both transformers	Improvements in transmission system reliability	none	Latvia, Līvāni	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection, as well as the replacement of both transformers.	1982*	AST funding	4.78	2024–2027	0.17	2.31	237							
									Work as part of the project:	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning							
24	110/10 kV substation Andrejsala, 110 kV	Improvements in transmission system reliability	none	Latvia, Riga	Construction of a two-bar circuit in the 110 kV switchgear (GIS design), installing 5 pcs of 110 kV sockets and both transformers.	1970*	AST funding	1039	2024–2026	435	5.94								
									Work as part of the project:	Construction of a GIS building and other infrastructure	Grounds improvements, finalisation of work, installation of equipment inspections, commissioning								
25	110 kV RPA and SCS replacement in the 110/20 kV Tukums substation	Improvements in transmission system reliability	none	Latvia, Tukums	Replacement of the relay protection and automation system and the supervisory control system, 6 110 kV connections	1998	AST funding	0.84	2024–2026	039	039								
									Work as part of the project:	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment								
26	110/10 kV Latgale substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Latgale	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1973*	AST funding	4.01	2026–2029		033	0.17	231	130					
									Work as part of the project:		Preliminary project development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning					
27	110/20 kV Špoģi substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Špoģi	Construction of an incomplete H-shaped circuit in the 110 kV substation, building 3 110 kV sockets, installing a power switch for each connection.	1988	AST funding	2.72	2026–2029		033	0.17	1.43	139					
									Work as part of the project:		Preliminary project development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	1 pc. Rebuilding of 110 kV connections using OSG designs					
28	110 kV RPA and SCS replacement in the 110/10 kV Hanza substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 9 110 kV connections.	2000*	AST funding	135	2026–2028		038	0.52	035						
									Work as part of the project:		Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment						

No.	Project and facilities within its scope	Project implementation benefits	For joint projects, specify the other legal entities involved in the financing of the project and the percentage share of their financial contribution	Project facility location	Technical description of the project facilities (substation voltages, line lengths, technology used (AC, DC), etc.)	Commissioning date (for reconstructions)	Source of financial investments	Total financial investments (million EUR)	Total project duration (from_ to_)	Breakdown of financial contributions and work schedule in each of the next 10 years (million EUR)									
										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
29	110 kV RPA and SCS replacement in the 110/20/6 kV Jēkabpils substation	Improvements in transmission system reliability	none	Latvia, Jēkabpils	Replacement of the relay protection and automation system and the supervisory control system, 6 110 kV connections.	2000*	AST funding	0.84	2026–2028		0*6	0.39	0*9						
									Work as part of the project:		Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment						
30	110 kV RPA and SCS replacement in the 110/10 kV Ventamonjaks substation	Improvements in transmission system reliability	none	Latvia, Ventspils	Replacement of the relay protection and automation system and the supervisory control system, 6 110 kV connections	2000*	AST funding	0*4	2026–2028		0*6	0.39	0*9						
					Work as part of the project:						Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment						
31	110/10 kV Purvciems substation 110 kV RPA and SCS replacement	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2000*	AST funding	0.70	2026–2029		0.05	0*6	0*9						
					Work as part of the project:						Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment						
32	330/110/10 kV TEC-1 substation RPA and SCS replacement	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 13 110 kV connections.	2000*	AST funding	1.78	2026–2029		0*9	0.52	0*2	0*5					
									Work as part of the project:		Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment					
33	Purchase of mobile substations	Improvements in transmission system reliability	none	Latvia	For faster emergency response and the quicker restoration of electricity supply in the event of technical failures, and for rebuilding substations, the TSO will purchase a mobile substation. It is a high-voltage switchgear facility with a power transformer and auxiliary equipment necessary to enable the autonomous functioning of the substation, installed on a mobile platform.		AST funding	4.00	2027			4							
									Work as part of the project:			Purchase of a mobile substation							
34	110/10 kV Torņakalns substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Riga, Latvia	Construction of a two-bar circuit in the 110 kV switchgear, installing 6 110 kV sockets, installing a power switch for each connection.	1980*	AST funding	4.67	2027–2030			0*0	2*6	1*0	0.42				
									Work as part of the project:			Engineering design development	3 pcs Rebuilding of 110 kV connections using OSG design	3 pcs Rebuilding of 110 kV connections using OSG design	Grounds improvements, finalisation of work, inspections, commissioning				
35	110 kV switchgear rebuild in the 110/20 kV Priekule substation	Improvements in transmission system reliability	none	Latvia, Priekule	Construction of a two-bar circuit in the 110 kV switchgear, installing 6 new 110 kV sockets.	1975*	AST funding	5*9	2026–2030		0.05	0*0	2*6	2*6	0.53				
									Work as part of the project:		Preliminary project development	Engineering design development	3 pcs Rebuilding of 110 kV connections using OSG designs	3 pcs Rebuilding of 110 kV connections using OSG designs	Grounds improvements, finalisation of work, inspections, commissioning				
35	110/20/6 kV Iecava substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Iecava	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1969*	AST funding	3*6	2027–2030			0.03	0.17	1.94	1.42				
									Work as part of the project:			Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning				
37	Replacement of the 330 kV RPA and SCS at the 330/110 kV Brocēni substation	Improvements in transmission system reliability	none	Latvia, Brocēni	Replacement of the relay protection and automation system and the supervisory control system, 5 330 kV connections.	2002*	AST funding	1.05	2027–2029			0*5	0.40	0*0					
									Work as part of the project:			Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment					
38	RPA and SCS replacement in the 110 kV Limbaži substation	Improvements in transmission system reliability	none	Latvia, Limbaži	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2002*.	AST funding	0.70	2027–2029			0*5	0*6	0*9					
									Work as part of the project:			Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment					
39	Replacement of 330 kV RPA and SCS at the 330/110/20/10 kV Bišuciems substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 6 330 kV connections.	2002*.	AST funding	1*6	2027–2029			0.06	0*0	0*0					
									Work as part of the project:			Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment					
40	110 kV RPA and SCS replacement in the 110 kV Limbaži substation	Improvements in transmission system reliability	none	Latvia, Liepāja	Replacement of the relay protection and automation system and the supervisory control system, 8 110 kV connections.	2001	AST funding	1.11	2027–2029			0.07	0*2	0*2					
									Work as part of the project:			Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment					
41	110/20 kV Sigulda substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Sigulda	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1974*	AST funding	3.56	2027–2030			0.03	0.17	1.94	1.42				
									Work as part of the project:			Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning				

No.	Project and facilities within its scope	Project implementation benefits	For joint projects, specify the other legal entities involved in the financing of the project and the percentage share of their financial contribution	Project facility location	Technical description of the project facilities (substation voltages, line lengths, technology used (AC, DC), etc.)	Commissioning date (for reconstruction)	Source of financial investments	Total financial investments (million EUR)	Total project duration (from_ to_)	Breakdown of financial contributions and work schedule in each of the next 10 years (million EUR)									
										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
42	110 kV switchgear rebuild in the 110/20 kV Lauma substation	Improvements in transmission system reliability	-	Latvia, Liepāja	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1971*	AST funding	3.56	2027–2030			0.03	0.17	1.94	1.42				
									Work as part of the project:			Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning				
43	Replacement of 110 kV RPA and SCS at the 330/110/20/10 kV Bišuciems substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 11 110 kV connections.	2003*	AST funding	1.51	2028–2031				0.08	039	0.52	032			
					Work as part of the project:								Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment			
44	Replacement of the 110 kV RPA and SCS at the 330/110 kV Brocēni substation	Improvements in transmission system reliability	none	Latvia, Brocēni	Replacement of the relay protection and automation system and the supervisory control system, 9 110 kV connections.	2003*	AST funding	1.24	2029–2032					0.07	0.39	0.39	039		
					Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment		
45	110/20 kV Ludza substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Ludza	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1963*	AST funding	3.56	2028–2031				0.03	0.17	1.94	1.42			
									Work as part of the project:				Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning			
46	110/20 kV Elaja substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Eleja	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1950	AST funding	3.56	2028–2031				0.03	0.17	1.94	1.42			
									Work as part of the project:				Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning			
47	110 kV switchgear rebuild in the 110/20 kV Rūjiena substation	Improvements in transmission system reliability	none	Latvia, Rūjiena	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1978*	AST funding	3.56	2028–2031				0.03	0.17	1.94	1.42			
									Work as part of the project:				Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning			
48	Replacement of the 330 kV RPA and SCS at the 330/110 kV Līksna substation	Improvements in transmission system reliability	-	Latvia, Līksna	Replacement of the relay protection and automation system and the supervisory control system, 6 330 kV connections.	2004*	AST funding	1.26	2029–2031					0.06	0.60	030			
					Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment			
49	Replacement of 330 kV RPA and SCS at the 330/110 kV Grobiņa substation	Improvements in transmission system reliability	none	Latvia, Grobiņa	Replacement of the relay protection and automation system and the supervisory control system, 5 330 kV connections.	2004*	AST funding	1.05	2029–2031					0.05	0.40	0.60			
					Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment			
50	110 kV RPA and SCS replacement in the 110 kV Vecmīlgrāvis substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2004*	AST funding	0.70	2029–2031					0.05	0.26	0.39			
					Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment			
51	110 kV RPA and SCS replacement in the 110 kV Mārupe substation	Improvements in transmission system reliability	none	Latvia, Mārupe	Replacement of the relay protection and automation system and the supervisory control system, 9 110 kV connections.	2004*	AST funding	1.24	2029–2032					*Offl*	0.39	039	039		
					Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment		
52	110/20 kV Krāslava substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Krāslava	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1977*	AST funding	3.56	2029–2032					0.03	0.17	1.94	132		
									Work as part of the project:					Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning		
53	110/20 kV switchgear rebuild in the 110 kV Salaspils substation	Improvements in transmission system reliability	none	Latvia, Salaspils	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1979*	AST funding	3.56	2029–2032					0.03	0.17	1.94	1.42		
									Work as part of the project:					Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Site improvements, work acceptance, inspections, commissioning		

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										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
54	110/20 kV Preiļi substation 110 kV section equipment rebuild	Improvements in transmission system reliability	-	Latvia, Preiļi	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1978*	AST funding	3.56	2029–2032					0.03	0.17	1.94	142		
									Work as part of the project:					Preliminary project development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning		
55	110 kV RPA and SCS replacement in the 110 kV Daugava substation	Improvements in transmission system reliability	none	Latvia, Aizkraukle	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2005*	AST funding	0.70	2030–2032						0.05	026	049		
									Work as part of the project:						Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment		
56	Replacement of 330 kV RPA and SCS at the 330/110 kV Rēzekne substation	Improvements in transmission system reliability	none	Latvia, Rēzekne	Replacement of the relay protection and automation system and the supervisory control system, 5 330 kV connections.	2005*	AST funding	1.05	2031–2033							0.05	0.40	0.60	
									Work as part of the project:							Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	
57	Replacement of 110 kV RPA and SCS at the 110 kV Rēzekne substation	Improvements in transmission system reliability	none	Latvia, Rēzekne	Replacement of the relay protection and automation system and the supervisory control system, 7 110 kV connections.	2005*	AST funding	0.97	2031–2033							0.06	049	0.52	
									Work as part of the project:							Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	
58	110/20 kV Stelpe substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Stelpe	Construction of a two-bar circuit in the 110 kV switchgear, installing 5 110 kV sockets, installing a power switch for each connection.	1982*	AST funding	3.96	2030–2033						0.03	0.17	148	1.88	
									Work as part of the project:						Development of preliminary design	Engineering design development	3 pcs Rebuilding of 110 kV connections using OSG designs	3 pcs Rebuilding of 110 kV connections using OSG designs	
59	110/20 kV Dobele substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Dobele	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1974*	AST funding	3.56	2030–2033						0.03	0.17	1.94	1.42	
									Work as part of the project:						Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning	
60	110/20 kV Barkava substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Barkava	Construction of a semi-H-shaped circuit in the 110 kV substation, building 2 110 kV sockets, installing a power switch for each connection.	1978*	AST funding	1.60	2031–2033							0.03	0.08	1.49	
									Work as part of the project:							Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning	
61	110 kV RPA and SCS replacement in the 110 kV Grobiņa substation	Improvements in transmission system reliability	none	Latvia, Grobiņa	Replacement of the relay protection and automation system and the supervisory control system, 15 pcs 110 kV connections.	2006*	AST funding	1.66	2031–2034							0.10	042	0.52	042
					Work as part of the project:											Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment
62	110 kV RPA and SCS replacement in the 110 kV Ķegums-1 substation	Improvements in transmission system reliability	none	Latvia, Ķegums	Replacement of the relay protection and automation system and the supervisory control system, 10 pcs 110 kV connections.	2006*	AST funding	1.38	2031–2034							0.08	049	0.39	0.52
									Work as part of the project:							Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment
63	Replacement of 110 kV RPA and SCS at the 110 kV Madona substation	Improvements in transmission system reliability	none	Latvia, Madona	Replacement of the relay protection and automation system and the supervisory control system, 5 pcs 110 kV connections.	2006*	AST funding	0.70	2031–2033							0.05	026	0.39	
									Work as part of the project:							Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	
64	110 kV RPA and SCS replacement in the 110 kV Sarkandaugava substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 4 110 kV connections.	2006*	AST funding	0.57	2031–2033							0.05	026	026	
									Work as part of the project:							Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment	
65	110/10 kV Iļģuciems substation 110 kV switchgear rebuild	Improvements in transmission system reliability	-	Riga, Latvia	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1961*	AST funding	3.56	2031–2034							0.03	0.17	1.94	1.424
									Work as part of the project:							Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning
66	110/20 kV Kārsava substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Kārsava	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1977*	AST funding	3.66	2031–2034							0.03	0.17	1.94	1.424
									Work as part of the project:							ne p oje aizstrāc	Engineering design development	2 pcs 110 kV connection rebuild OSG design	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning

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										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
67	110/20 kV Ērgļi substation 110 kV switchgear rebuild	Improvements in transmission system reliability	-	Latvia, Ērgļi	Construction of a semi-H-shaped circuit in the 110 kV substation, building 2 110 kV sockets, installing a power switch for each connection.	1967*	AST funding	1.60	2032–2034								0.03	0.08	1.492
									Work as part of the project:								Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections. Grounds improvements, finalisation of work, inspections, commissioning
68	110 kV RPA and SCS replacement in the 110 kV Zunda substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2007*	AST funding	0.70	2032–2034								0.05	0.26	039
					Work as part of the project:												Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment
69	Replacement of 110 kV RPA and SCS at the 330/110 kV TEC-2 substation	Improvements in transmission system reliability	none	Latvia, Acone	Replacement of the relay protection and automation system and the supervisory control system, 14 110 kV connections.	2008*	AST funding	1.92	2032–2035								0.10	0.52	032
									Work as part of the project:								Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment
70	Replacement of the 330 kV RPA and SCS at the 330/110 kV Aizkraukle substation	Improvements in transmission system reliability	-	Latvia, Aizkraukle	Replacement of the relay protection and automation system and the supervisory control system, 11 330 kV connections.	2008*	AST funding	2.28	2032–2035								0.08	0.80	0.80
									Work as part of the project:								Engineering design development	Replacement of RPA and SCS equipment	Replacement of RPA and SCS equipment
71	110 kV switchgear rebuild in the 110/20 kV Ķekava substation	Improvements in transmission system reliability	none	Latvia, Ķekava	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1967*	AST funding	3.56	2032–2035								0.03	0.17	1.94
									Work as part of the project:								Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs
72	110/20 kV switchgear rebuild in the 110 kV Ezerkrasts substation	Improvements in transmission system reliability	none	Latvia, Liepāja	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1979*	AST funding	3.56	2032–2035								0j03	0.17	1.94
									Work as part of the project:								Preliminary design development	Engineering design development	2 pcs Rebuilding of 110 kV connections using OSG designs
73	Replacement of RPA and SCS at the TEC-2 Substation 8	Improvements in transmission system reliability	-	Latvia, Acone	Replacement of the relay protection and automation system and the supervisory control system, 7 330 kV connections.	2008*	AST funding	1.46	2033–2035									0.06	0.6
									Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment
74	Replacement of RPA and SCS at the Brocēni 110 Substation 53	Improvements in transmission system reliability	none	Latvia, Brocēni	Replacement of the relay protection and automation system and the supervisory control system, 6 110 kV connections.	2002*	AST funding	0.84	2033–2035									0.06	039
									Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment
75	Replacement of RPA and SCS at Cēsis Substation No. 76	Improvements in transmission system reliability	none	Latvia, Cēsis	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2008*	AST funding	0.70	2033–2035									0.05	036
									Work as part of the project:									Engineering design development	Replacement of RPA and SCS equipment
76	110/20 kV Grīva substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Daugavpils	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1973*	AST funding	3.56	2032–2035									0.03	0.17
									Work as part of the project:									Preliminary design development	Engineering design development
77	110/20 kV Malta substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Malta	Construction of an H-shaped circuit in the 110 kV substation, building 3 110 kV sockets, installing a power switch for each connection.	1987*	AST funding	2.64	2032–2035									0.03	0.17
									Work as part of the project:									Preliminary design development	Engineering design development
78	110/20 kV Alūksne substation 110 kV switchgear rebuild	Improvements in transmission system reliability	none	Latvia, Alūksne	Construction of an H-shaped circuit in the 110 kV substation, building 4 110 kV sockets, installing a power switch for each connection.	1975*	AST funding	3.56	2032–2035									0.03	0.17
									Work as part of the project:									Preliminary design development	Engineering design development
79	Replacement of RPA and SCS at Valmiera Substation No. 70	Improvements in transmission system reliability	none	Latvia, Valmiera	Replacement of the relay protection and automation system and the supervisory control system, 7 330 kV connections.	2010*	AST funding	0.70	2033–2035										0.06
									Work as part of the project:										Engineering design development
80	RPA and SCS replacement at Substation No. 119 'Bastejkalns'	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 2 110 kV connections.	2001*	AST funding	0.70	2033–2035										0.05
									Work as part of the project:										Engineering design development
81	RPA and SCS replacement at Substation No. 106 'Matīss'	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2009*	AST funding	0.70	2033–2035										0.05
									Work as part of the project:										Engineering design development
82	RPA and SCS replacement at Substation No. 139 'Zolitūde'	Improvements in transmission system reliability	-	Riga, Latvia	Replacement of the relay protection and automation system and the supervisory control system, 5 110 kV connections.	2008*	AST funding	0.70	2033–2035										0.05
									Work as part of the project:										Engineering design development
									Total substation rebuilds	19.17	9.96	9/40	12.95	16.61	1431	14.04	12^1	13.60	12.93
83	at the substation 'TEC-1'	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of 125 MVA automatic transformer AT No. 2 with an automatic transformer of the same capacity.	1964*	AST funding	3.26	2024–2026	0.18	3.08								
									Work as part of the project:	Engineering design development	Replacement of AT No. 2								

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										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
64	Replacement of automatic transformer AT No. 2 at the Imanta substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of 125 MVA automatic transformer AT No. 2 with an automatic transformer of the same capacity.	1971*	AST funding	3.26	2024–2026	0.18	3.08								
									Work as part of the project:	Engineering design development	Replacement of AT No. 2								
85	Replacement of automatic transformer AT No. 1 at Valmiera substation	Improvements in transmission system reliability	none	Latvia, Valmiera	Replacement of 125 MVA automatic transformer AT No. 1 with a 200 MVA automatic transformer.	1968*	AST funding	3.50	2024–2026			330							
									Work as part of the project:			Engineering design development and AT No. 1 equipment							
86	Replacement of automatic transformer AT No. 2 at the Brocēni substation	Improvements in transmission system reliability	none	Latvia, Brocēni	Replacement of 125 MVA automatic transformer AT No. 2 with an automatic transformer of the same capacity.	1970*	AST funding	3.00	2024–2026				3.00						
									Work as part of the project:				Engineering design development and replacement of AT No. 2						
87	Replacement of the automatic transformer AT No. 1 at the Grobiņa substation	Improvements in transmission system reliability		Latvia, Grobiņa	Replacement of 125 MVA automatic transformer AT No 1 with an automatic transformer of the same capacity.	1971*	AST funding	3.00	2029					330					
									Work as part of the project:					Engineering design development and replacement of AT No. 1					
88	at the Viskaļi substation	Improvements in transmission system reliability	none	Latvia, Viskaļi	Replacement of 200 MVA automatic transformer AT No. 1 with an automatic transformer of the same capacity.	1984*	AST funding	330	2032								330		
									Work as part of the project:								Engineering design development and replacement of AT No. 1		
89	at the Grobiņa substation	Improvements in transmission system reliability	none	Latvia, Grobiņa	Replacement of 125 MVA automatic transformer AT No 1 with an automatic transformer of the same capacity.	1971*	AST funding	3.00	2033									3.00	
									Work as part of the project:									Engineering design development and replacement of AT No. 1	
									Total transformer replacements:	0.36	6.16	330	3.00	3.00	0.00	0.00	3.50	3.00	0.00
90	Replacement of 110 kV transformer T No. 2 at the Alūksne substation	Improvements in transmission system reliability		Latvia, Alūksne	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.61	2025	031									
									Work as part of the project:	Transformer replacement									
91	Replacement of 110 kV transformer T No. 2 at the Bauska substation	Improvements in transmission system reliability	-	Latvia, Bauska	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1975*	AST funding	0.75	2025	0.75									
									Work as part of the project:	Transformer replacement									
92	Replacement of 110 kV transformer T No. 2 at the RAF substation, with improvements in fiscal metering	Improvements in transmission system reliability	none	Latvia, Jelgava	Replacement of a 25 MVA transformer with a transformer of the same capacity and fiscal metering for both transformers.	1978*	AST funding	1.21	2024–2025	U1									
									Work as part of the project:	Transformer replacement and improvements in fiscal metering									
93	Replacement of 110 kV transformer T No. 2 at the Gajoks substation	Improvements in transmission system reliability	none	Latvia, Daugavpils	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1979*	AST funding	0.80	2025	0.80									
									Work as part of the project:	Transformer replacement									
94	Replacement of 110 kV transformer T No. 1 at the Birži substation with improvements in fiscal metering	Improvements in transmission system reliability	-	Latvia, Birži	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1980*	AST funding	0.71	2027			0.71							
									Work as part of the project:			Transformer replacement and improvements in fiscal metering							
95	Replacement of 110 kV transformer T No. 1 at the Bolderāja 1 substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1981*	AST funding	0.75	2027			0.75							
									Work as part of the project:			Transformer replacement							
96	Replacement of 110 kV transformer T No. 1 at the Gulbene substation	Improvements in transmission system reliability	none	Latvia, Gulbene	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1982*	AST funding	0.84	2028				034						
									Work as part of the project:				Transformer replacement						
97	Replacement of 110 kV transformer T No. 2 at the Rēzekne substation with improvements in fiscal metering	Improvements in transmission system reliability	none	Latvia, Rēzekne	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1976*	AST funding	1.05	2028				1.05						
									Work as part of the project:				Transformer replacement and improvements in fiscal metering						
98	Replacement of 110 kV transformer T No. 1 at the Iļģuciems substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of a 40 MVA transformer with a transformer of the same capacity.	1976*	AST funding	1.02	2028				1.02						
									Work as part of the project:				Transformer replacement						
99	Replacement of 110 kV transformer T No. 3 at the Valmiera substation	Improvements in transmission system reliability		Latvia, Valmiera	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.95	2029					0.95					
									Work as part of the project:					Transformer replacement					
100	Replacement of 110 kV transformer T No. 1 at the TEC-2 substation	Improvements in transmission system reliability	-	Latvia, Acone	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1970*	AST funding	0.95	2030						0.95				
									Work as part of the project:						Transformer replacement				
101	Replacement of 110 kV transformer T No. 1 at the Zaļā birze substation	Improvements in transmission system reliability	none	Latvia, Liepāja	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1983*	AST funding	0.84	2030						0.84				
									Work as part of the project:						Transformer replacement				
102	Replacement of 110 kV transformer T No. 2 at the Miezīte substation	Improvements in transmission system reliability	none	Latvia, Miezīte	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1983*	AST funding	0.84	2026						0.84				
									Work as part of the project:						Transformer replacement				
103	Replacement of 110 kV transformer T No. 1 at the Aizkraukle substation	Improvements in transmission system reliability	none	Latvia, Aizkraukle	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1983*	AST funding	0.84	2030						0.84				
									Work as part of the project:						Transformer replacement				
104	Replacement of 110 kV transformer T No. 2 at the Ludza substation	Improvements in transmission system reliability	-	Latvia, Ludza	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1977*	AST funding	034	2030						034				
									Work as part of the project:						Transformer replacement				
106	Replacement of 110 kV transformer T No. 2 at the Ventspils substation	Improvements in transmission system reliability	none	Latvia, Ventspils	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.95	2030						0.95				
									Work as part of the project:						Transformer replacement				
106	Replacement of 110 kV transformer T No. 1 at the RAF substation	Improvements in transmission system reliability	none	Latvia, Jelgava	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.95	2030						0.95				
									Work as part of the project:						Transformer replacement				
107	Replacement of 110 kV transformer T No. 2 at the Rūjiena substation	Improvements in transmission system reliability	none	Latvia, Rūjiena	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.54	2030						0.54				
									Work as part of the project:						Transformer replacement				
108	Replacement of 110 kV transformer T No. 1 at the Eleja substation	Improvements in transmission system reliability	none	Latvia, Eleja	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1980*	AST funding	0.61	2030						0.61				
									Work as part of the project:						Transformer replacement				

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										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
109	Replacement of 110 kV transformer T No. 1 at the Ludza substation	Improvements in transmission system reliability	none	Latvia, Ludza	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1977*	AST funding	0.54	2031							0.54			
									Work as part of the project:							Transformer replacement			
110	Replacement of 110 kV transformer T No. 1 at the Rēzekne substation	Improvements in transmission system reliability	none	Latvia, Rēzekne	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.95	2031							0.95			
									Work as part of the project:							Transformer replacement			
111	Replacement of 110 kV transformer T No. 1 at the Jaunpiebalga substation	Improvements in transmission system reliability	none	Latvia, Jaunpiebalga	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1979*	AST funding	0.61	2031							0.61			
									Work as part of the project:							Transformer replacement			
112	Replacement of 110 kV transformer T No. 1 at the Salaspils substation	Improvements in transmission system reliability	none	Latvia, Salaspils	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1991*	AST funding	0.80	2031							040			
									Work as part of the project:							Transformer replacement			
113	Replacement of 110 kV transformer T No. 1 at the Rūjiena substation	Improvements in transmission system reliability	none	Latvia, Rūjiena	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.54	2031							044			
									Work as part of the project:							Transformer replacement			
114	Replacement of 110 kV transformer T No. 1 at the Grīziņkalns substation	Improvements in transmission system reliability	none	Latvia, Riga	Replacement of a 40 MVA transformer with a transformer of the same capacity.	1985*	AST funding	*102*	2031							1.02			
									Work as part of the project:							Transformer replacement			
115	Replacement of 110 kV transformer T No. 1 at the Skulte substation	Improvements in transmission system reliability	none	Latvia, Skulte	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.61	2031							0.61			
									Work as part of the project:							Transformer replacement			
116	Replacement of 110 kV transformer T No. 1	Improvements in transmission system reliability	none	Latvia, Garkalne	Replacement of 16 MVA transformer with a transformer of the same capacity.	1979*	AST funding	0.75	2031							0.75			
									Work as part of the project:							Transformer replacement			
117	Replacement of 110 kV transformer T No. 1 at the Stelpe substation	Improvements in transmission system reliability	none	Latvia, Stelpe	Replacement of a 10 MVA transformer with a transformer of the same capacity and improvements in fiscal metering.	1982*	AST funding	0.71	2032								0.71		
									Work as part of the project:								Transformer replacement and improvements in fiscal metering		
118	Replacement of 110 kV transformer T No. 2 at the Dobele substation	Improvements in transmission system reliability	none	Latvia, Dobele	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1977*	AST funding	0.77	2032								0.77		
									Work as part of the project:								Transformer replacement		
119	Replacement of 110 kV transformer T No. 2 at the Ropaži substation	Improvements in transmission system reliability	none	Latvia, Garkalne	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1979*	AST funding	0.75	2032								0.75		
									Work as part of the project:								Transformer replacement		
120	Replacement of 110 kV transformer T No. 1	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of 25 MVA transformer with a transformer of the same capacity.	1979*	AST funding	0.95	2032								0.95		
									Work as part of the project:								Transformer replacement		
121	Replacement of 110 kV transformer T No. 2 at the Grobiņa substation	Improvements in transmission system reliability	none	Latvia, Grobiņa	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1973*	AST funding	0.75	2032								0.75		
									Work as part of the project:								Transformer replacement		
122	Replacement of 110 kV transformer T No. 2 at the Grīziņkalns substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of a 40 MVA transformer with a transformer of the same capacity.	1986*	AST funding	142	2033									142	
									Work as part of the project:									Transformer replacement	
123	Replacement of 110 kV transformer T No. 1 at the Smiltene substation	Improvements in transmission system reliability	none	Latvia, Smiltene	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1980*	AST funding	0.89	2033									049	
									Work as part of the project:									Transformer replacement	
124	Replacement of 110 kV transformer T No. 1 at the Ventspils substation	Improvements in transmission system reliability	none	Latvia, Ventspils	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1980*	AST funding	0.95	2033									0.95	
									Work as part of the project:									Transformer replacement	
125	Replacement of 110 kV transformer T No. 1 at the Pļaviņas substation	Improvements in transmission system reliability	none	Latvia, Pļaviņas	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1979*	AST funding	0.61	2033									041	
									Work as part of the project:									Transformer replacement	
126	Replacement of 110 kV transformer T No. 1 at the Limbaži substation	Improvements in transmission system reliability	none	Latvia, Limbaži	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.61	2033									041	
									Work as part of the project:									Transformer replacement	
127	Replacement of 110 kV transformer T No. 1 at the Barkava substation	Improvements in transmission system reliability	none	Latvia, Barkava	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.54	2034										0.54
									Work as part of the project:										Transformer replacement
128	Replacement of 110 kV transformer T No. 2 at the Inčukalns substation	Improvements in transmission system reliability	none	Latvia, Inčukalns	Replacement of a 16 MVA transformer with a transformer of the same capacity.	1987*	AST funding	0.75	2034										0.75
									Work as part of the project:										Transformer replacement
129	Replacement of 110 kV transformer T No. 2 at the Limbaži substation	Improvements in transmission system reliability	none	Latvia, Limbaži	Replacement of 16 MVA transformer with a transformer of the same capacity.	1987*	AST funding	0.75	2034										0.75
									Work as part of the project:										Transformer replacement
130	Replacement of 110 kV transformer T No. 1 at the Tīraine substation	Improvements in transmission system reliability	none	Riga, Latvia	Replacement of a 25 MVA transformer with a transformer of the same capacity.	1980*	AST funding	0.95	2034										0.95
									Work as part of the project:										Transformer replacement
131	Replacement of 110 kV transformer T No. 1 at the Salacgrīva substation	Improvements in transmission system reliability	none	Latvia, Salacgrīva	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1981*	AST funding	0.61	2034										0.61
									Work as part of the project:										Transformer replacement
132	Replacement of 110 kV transformer T No. 1 at the Viesīte substation	Improvements in transmission system reliability	none	Latvia, Viesīte	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1980*	AST funding	0.71	2034										0.71
									Work as part of the project:										Transformer replacement
133	Replacement of 110 kV transformer T No. 1 at the Ērgļi substation	Improvements in transmission system reliability	none	Latvia, Ērgļi	Replacement of a 10 MVA transformer with a transformer of the same capacity.	1978*	AST funding	0.54	2034										0.54
									Work as part of the project:										Transformer replacement
									Total transformers	3.38	040	1.46	2.91	0.95	7.06	542	3.93	448	445
134	110 kV substation partial rebuilds, with the rebuilding of medium-voltage switchgear	Improvements in transmission system reliability	none	Latvia	rebuilding of transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	-	AST funding	3.72	2025–2034	046	040	0.28	0.15	035	0.45	044	033	046	031
									Work as part of the project:	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.	Rebuilding of RPA devices at transformer connections, transformer busbar jumpers, fiscal metering devices, supervisory control systems, etc.

No.	Project and facilities within its scope	Project implementation benefits	For joint projects, specify the other legal entities involved in the financing of the project and the percentage share of their financial contribution	Project facility location	Technical description of the project facilities (substation voltages, line lengths, technology used etc.)	Commissioning date (for reconstruction)	Source of financial investments	Total financial investments (million EUR)	Total project duration (from_ to_)	Breakdown of financial contributions and work schedule in each of the next 10 years (million EUR)									
										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
135	330 kV transmission line rebuild	Maintaining of transmission system capacity	none	Latvia	Replacement of pylons, wires, reinforcement, screen wire, etc.	-	AST funding	3933	2025–2034	3.99	3.99	3.71	339	339	3.50	4.06	334	3.99	637
									Work as part of the project:	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.
136	110 kV transmission line rebuild	Maintaining of transmission system capacity	none	Latvia	Replacement of pylons, wires, reinforcement, screen wire, etc.	-	AST funding	57.71	2025–2034	333	3.18	5.08	438	436	5.90	6.00	930	9.00	7.40
									Work as part of the project:	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.	Replacement of pylons, wires, reinforcement, screen wire, etc.
137	Purchase of mobile pylon sets	Maintaining of transmission system capacity	none	Latvia	The TSO will buy pylon sets for emergency response and the setting up of temporary lines for the construction of new substations, thus enabling the shortest possible emergency recovery times.	-	AST funding	3.00	2025–2026	130	130								
									Work as part of the project:	Replacement of pylons, wires, reinforcement, screen wire	Replacement of pylons, wires, reinforcement, screen wire, etc.								
138	Replacement of electrical equipment, installation of individual items of equipment in substations	Maintaining of transmission system capacity	none	Latvia	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	-	AST funding	430	2025–2034	0.48	0.72	038	034	034	0.34	0.48	034	0.34	034
									Work as part of the project:	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.	Repairs to and the replacement of obsolete electrical equipment, upgrades in the security and fire safety systems, etc.
139	Production buildings and structures	Maintaining of transmission system capacity	none	Latvia	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	-	AST funding	2.18	2025–2034	034	034	034	034	034	034	034	034	034	034
									Work as part of the project:	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.
	Construction of the AS 'Augstsprieguma tīkls' supervisory control and data centre, rebuilding of the production facility grounds and building compound at Dārzciema iela 86, Riga.	Maintaining of transmission system capacity	none	Latvia	Renovation of roofing in industrial buildings and structures, replacement of windows and doors, thermal insulating of buildings to improve energy performance, replacement of substation fences.	-	AST funding	2038	2020–2027	937	135	5.10							
							Recovery Fund (RRF) financing	27.00	2022–2026	10.91	7.75								
									Work as part of the project:	Construction of a supervisory control and data centre, rebuilding of the production facility grounds and building compound at Dārzciema iela 86, Riga.	Construction of a supervisory control and data centre, rebuilding of the production facility grounds and building compound at Dārzciema iela 86, Riga.	Rebuilding of the production facility grounds and building compound, grounds improvements, finalisation of the work at Dārzciema iela 86, Riga. Commissioning.							
140	Investments in information technology	Maintaining of transmission system capacity	none	Latvia	Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.	-	AST funding	27.60	2025–2034	330	2.10	335	3.06	332	2.39	2.79	334	2.976	337
							Recovery Fund (RRF) financing	10.98	2022–2026	038	035								

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										2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
									Work as part of the project:	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**	**Purchase and installation of new IT equipment. Updating and purchase of software for IT equipment. Expansion of data centre and server infrastructure.**
							Total in 10 years pos. 1–2.	*74.65*	**Total, pos. 1–2.**	74.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Total in 10 years, items 3–140 (without PM, with RRF)	*36206*	**Total, pos. 3–140. (without connection fee)**	49.92	37.29	32.79	30.22	32.75	34.08	34.27	36.93	37.79	36.01
							Total connection fee, over 10 years	*8.15*	**Total connection fee, pos.**	8.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							10 year total:	*444.85*	**Grand total:**	132.71	37.29	32.79	30.22	32.75	34.08	34.27	36.93	37.79	36.01

Notes:
1. Only the connection fee sites (i.e., the sites whose installation is financed by the party requesting the connection, in accordance with the regulations of the Public Utilities Commission), for which a connection contract has been concluded between the system operator and the system user/producer, are included in the plan. The total cost of these facilities is not shown in the total cost, except where the project also involves investments by the system operator (positions 4, 5, 6, 7, and 8).

Person authorised to represent the transmission system operator:

Board member Arnis Daugulis 

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