



ELECTRICITY TRANSMISSION SYSTEM DEVELOPMENT PLAN 2023-2032



CONTENTS

1.	PLAN DEVELOPMENT JUSTIFICATION	3
2.	CHARACTERIZATION OF THE ELECTRICITY TRANSMISSION SYSTEM	4
3.	GENERATING SOURCES DEVELOPMENT FORECAST AND BALANCE FORECAST OF THE ELECTRICITY TRANSMISSION SYSTEMS	6
4.	TRANSMISSION SYSTEM INFRASTRUCTURE, THAT IS NECESSARY FOR THE CAPACITY INCREASE AND SYSTEM SECURITY OF THE INTERNATIONAL CONNECTIONS	7
4.1.	Projects in implementation and planned in the next 3 years	8
4.2.	Other 330/110 kV network development projects in the next 10 years	18
4.3.	Processes that affect or may affect the implementation of projects included in the Development Plan	22
5.	IMPACT ON THE SERVICE TARIFF OF THE TRANSMISSION SYSTEM	27
6.	ANNEXES	29

1.

PLAN DEVELOPMENT JUSTIFICATION

The Ten-Year Development Plan of the Latvian Electricity Transmission System has been developed in accordance with Decision No. 1/28 of the Board of the Public Utilities Commission (hereinafter – PUC) of 23 November 2011 ‘Regulation Regarding the Electricity Transmission System Development Plan’.



2.

CHARACTERIZATION OF THE ELECTRICITY TRANSMISSION SYSTEM



Number of substations, autotransformers and transformers, and installed capacities in 2022:

Table 1

Highest voltage (kV)	Number of substations (pcs)	Number of autotransformers and transformers (pcs)	Installed capacity (MVA)
330 kV	17	26	3800
110 kV	123	245	5231.2
TOTAL	140	271	8956.5

Length of transmission lines (length of line along the circuit) in 2022:

Table 2

Highest voltage (kV)	Overhead cable and cable PTL (km)
330 kV	1,742.13
Of these – cables	22.37
110 kV	3859.70
Of these – cables	82.87
TOTAL	5601.83

3.

GENERATING SOURCES DEVELOPMENT FORECAST AND BALANCE FORECAST OF THE ELECTRICITY TRANSMISSION SYSTEMS

During development of the plan, AS Augstsprieguma tīkls in accordance with paragraph 3 of the 'Regulation Regarding the Electricity Transmission System Development Plan' adopted by the Board of the PUC (23 November 2011) has considered the findings and information, including the development of generating sources and the capacity adequacy forecasts of the electricity transmission system, which are included in the annual assessment report of the transmission system operator for 2022, which is prepared by the transmission system operator in accordance with the Cabinet Regulation (hereinafter – CR) No. 322 'Regulations Regarding the Annual Assessment Report of a Transmission System Operator'.



4.

**TRANSMISSION
SYSTEM
INFRASTRUCTURE,
THAT IS NECESSARY
FOR THE CAPACITY
INCREASE
AND SYSTEM
SECURITY OF THE
INTERNATIONAL
CONNECTIONS**



4.1.

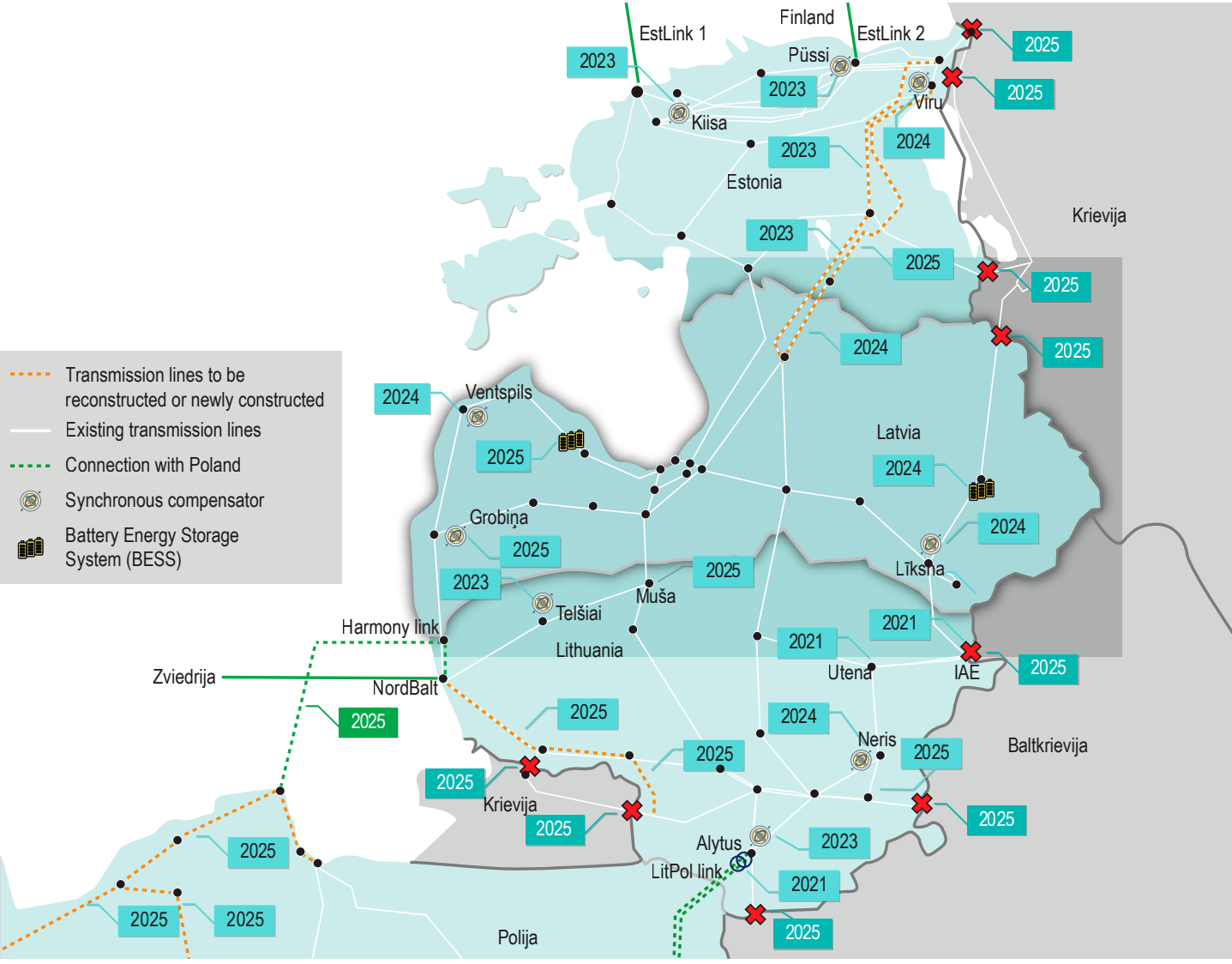
PROJECTS IN IMPLEMENTATION AND PLANNED IN THE NEXT 3 YEARS

4.1.1.

BALTIC SYNCHRONISATION PROJECT

The beginnings of the project of synchronising the electricity systems of the Baltic States with continental Europe can be traced back to 2007,

when the Prime Ministers of the Baltic States signed a memorandum of understanding and instructed the



TSOs of the Baltic States to study the possibilities of joining European networks.

Since then, the Baltic TSOs, in cooperation with energy consultants, have carried out several studies to ascertain the technical and economic feasibility of the project.

The synchronisation project is one of Europe's strategic projects and on 28 June 2018, political support was received, as a political roadmap between the European Commission, the Baltic States and Poland was signed approving a synchronisation scenario between Poland and Lithuania with AC and DC interconnections.

After the studies conducted in 2018 of dynamic stability and frequency stability, the necessary measures the Baltic TSOs should implement by 2025 became clear, when the synchronisation of the Baltic States with continental Europe and desynchronisation with the unified system of Russia is envisaged.

On 27 May 2019, the agreement for the connection of the Baltic states with the Continental Europe synchronous electric power network operation zone and its annex regarding the overall technical measures to be implemented for the beginning of synchronous operation took effect. The list of necessary technical measures, which the Baltic States should implement by 2025, envisages building or rebuilding the necessary infrastructure, as well as providing measures for the necessary amount of inertia and frequency regulation. The Synchronisation Project is divided into 2 phases and the Synchronisation Project is included in all European and national development documents, i.e. the European 10-Year Network Development Plan and the list of projects of common interest.



BALTIC SYNCHRONISATION PROJECT PHASE 1



Phase 1 envisages the strengthening of the electricity transmission network of the Baltic States, the installation of the equipment, which will ensure the necessary amount of inertia and frequency regulation and control.

On 23 January 2019, Phase 1 of the Baltic synchronisation project was awarded 75% co-financing from the funds of the Connecting Europe Facility (CEF), and on 19 March 2019, a Grant Agreement was signed between the TSOs of the Baltic States and European Network Innovations and the executive agency on the conditions for the use of the allocated co-financing within the framework of the implementation of the 1st phase of the synchronisation of the Baltic States.

In Latvia, Phase 1 of the synchronisation project envisages the reconstruction of two existing Estonia – Latvia interconnections Valmiera – Tartu and Valmiera – Tsirgulina, as well as the installation of equipment to ensure the necessary amount of inertia and frequency regulation and control.

4.1.1.1.

RECONSTRUCTION OF THE EXISTING 330 KV INTERCONNECTIONS: VALMIERA (LV) –TARTU (EE) AND VALMIERA (LV) –TSIRGULINA (EE)

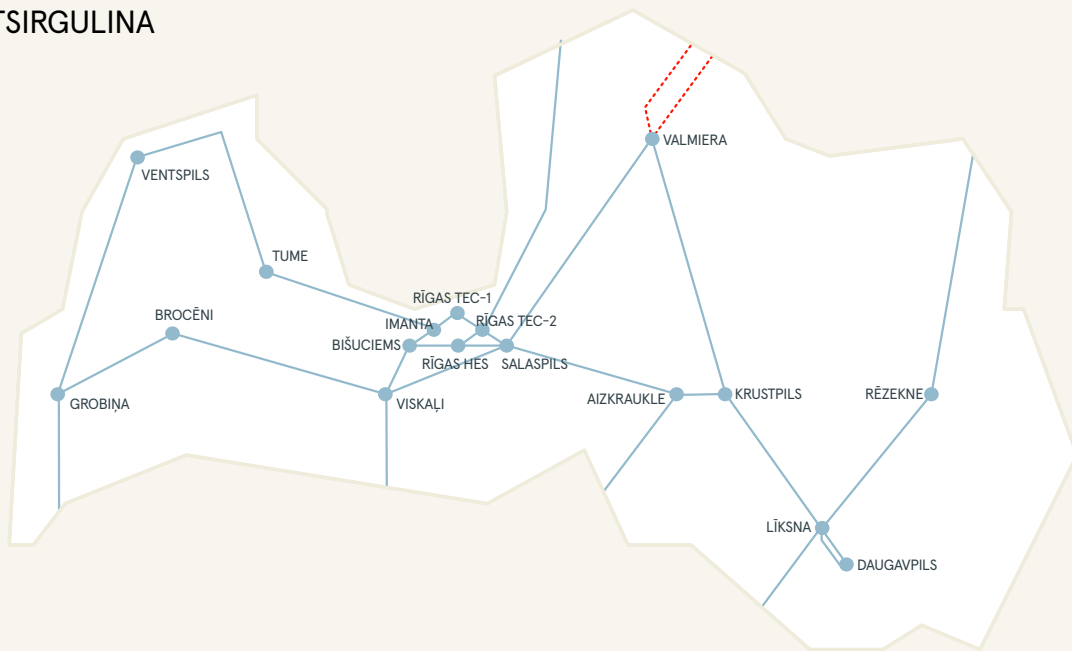
Both 330 kV lines Valmiera (LV) –Tartu (EE) and Valmiera (LV) –Tsirgulina (EE) (Fig. 2) were built in the 1960s and 1970s and no longer meet the requirements of modern operation, e.g., differences in capacity in the winter and summer seasons hinder the optimal and efficient operation of the electricity market. These lines will be replaced by new, increased capacity lines to ensure higher total capacity in the Baltic region in the north-south direction, and to increase the capacity of the Latvian and Baltic electricity transmission network and, consequently, the security of electricity supply

for further synchronisation of the Baltic States with the electricity transmission networks of continental Europe.

As the Estonian TSO Elering in the Phase 1 of the synchronisation project also plans to reconstruct transmission lines to Narva power plants, in order not to reduce transmission capacity for the electricity market, Latvian and Estonian TSOs plan to rebuild existing lines in accordance with the power line disconnection schedule AST and Elering agreed upon in 2018.

Figure 2.

VALMIERA-TARTU AND VALMIERA-TSIRGULINA



THE INCREASE OF CAPACITY OF THE 330 KV POWER TRANSMISSION LINE VALMIERA (LV) – TARTU (EE) BETWEEN LATVIA AND ESTONIA.

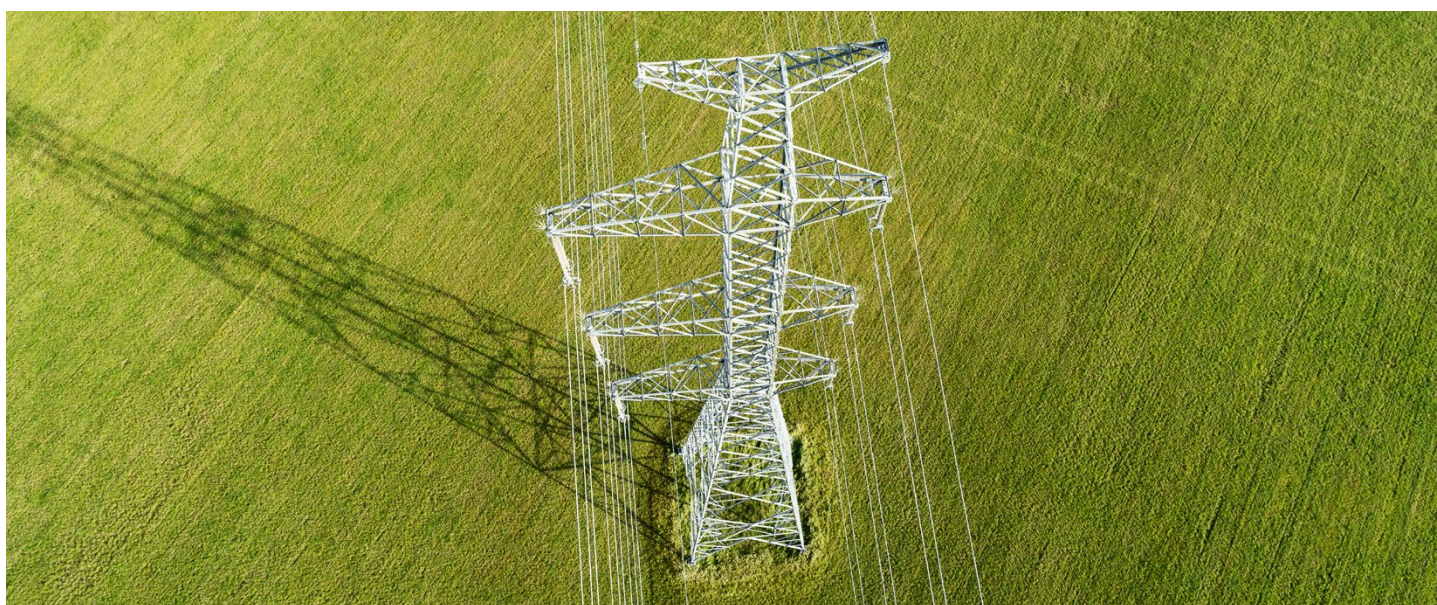
The 330 kV power transmission line Valmiera (LV) – Tartu (EE) was put into operation in 1971. The total length of line in the territory of Latvia is 48.42 km. The project involves the replacement of wiring, insulation, suspension, and poles of the existing line to increase its capacity from 434 MVA to 1200 MVA. The project was launched in 2020 with a procurement announcement, and in July 2021 a contract was signed with the general partnership Empower and Leonhard Weiss for the implementation of the project. Construction is planned to be commenced in June 2022. The commissioning of the transmission line is scheduled for the end of 2023.

THE INCREASE OF CAPACITY OF THE 330 KV POWER TRANSMISSION LINE VALMIERA (LV) – TSIRGULINA (EE) BETWEEN LATVIA AND ESTONIA.

The 330 kV power transmission line Valmiera (LV) – Tsirgulina (EE) was put into operation in 1960. The total length of line in the territory of Latvia is 48.47 km. The project involves the replacement of wiring, insulation, suspension, and poles of the existing line to increase its capacity from 434 MVA to 1200 MVA. The implementation of the project started in 2020 with a procurement announcement, and in July 2021 a contract was signed with the general partnership Empower and Leonhard Weiss. The design of the line has started and the construction works are expected to start immediately after the realization of the project “330 kV power transmission line Valmiera (LV) – Tartu (EE). The commissioning of the project is scheduled for the end of 2024.

Both projects are included in the fifth Union list in the cluster ‘Integration and synchronisation of the Baltic States electricity system with the European networks’ approved by the EC Regulation (2020/89) in November 2021.

On 5 March 2018 the Valmiera Regional Environmental Board of the State Environmental Service (hereinafter – SES) decided not to perform an environmental impact assessment of both lines, as well as issued technical regulations that project implementers shall follow during the project implementation. In 2020, public consultations on both projects were conducted in the affected municipalities in the territory of Latvia.



4.1.1.2.

EQUIPMENT NECESSARY TO ENSURE SAFE AND STABLE SYNCHRONISATION IN THE BALTIC STATES

One of the important tasks in the preparation process of synchronisation is the primary frequency regulation of the Latvian electricity system, organisation of the frequency regulation system and, if necessary, modernisation in accordance with the requirements of the continental European electricity system, as frequency regulation was provided by the Russian combined electricity system until now. In addition, it is necessary to create and modernise the electricity system management and control system and the telecommunication network of the electricity transmission network by installing phasor measurement units (PMU) and wide area monitoring systems (WAMS) in all important objects.

These measures must be implemented by 2025, when synchronisation of the Baltic electricity systems with continental Europe and desynchronisation from the combined Russian energy system is planned.

In addition to the frequency regulation measures, for the stable operation of the electricity system in the synchronisation mode, the TSOs of the Baltic States shall ensure a total inertia of 17,100 MWs 24 hours a day, Latvia correspondingly shall provide 5700 MWs proportionally. Phase 1 of the Baltic Synchronisation Project envisages the installation of one stationary synchronous compensator in Latvia.



Image resource – <https://www.siemens-energy.com/global/en/offerings/power-transmission/portfolio/flexible-ac-transmission-systems/synchronous-condenser.html>

PROJECT BENEFITS

In 2018, a project cost-benefit analysis was prepared for the synchronisation phase 1 projects and submitted to the regulatory authorities of the Baltic States.

FUNDING

In accordance with the Electricity Transmission System Service Tariff Calculation Methodology approved by the Decision No. 1/6 paragraph 17 of 18 February 2020 of the Board of the PUC, the part of the value of fixed assets financed from European Union financial support, as well as the received income from the congestion charges shall not be included in the electricity transmission system service tariff calculation.

Taking into account the above, the indicative percentage distribution of the eligible costs of each

project in May 2022 is as follows: 75% is financed from the structural fund of CEF and 25% is financed from *AS Augstsprieguma tīkls* funds, including the accumulated congestion fee revenues. The percentage of funding may change as the total actual costs of the project may change.

The projects are planned to be implemented by using the European Union co-financing in the amount of 75% of the eligible costs and the income from the accumulated congestion charges.

Considering the previously adopted decisions of the Board of the Public Utilities Commission and subject to the provisions of Article 16 of the 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, it is planned to use the income from the accumulated congestion charges to finance the project.

BALTIC SYNCHRONISATION PROJECT PHASE 2



Phase 2 of the Baltic Synchronisation Project is the continuation of the first phase, which envisages the construction of an additional DC interconnection between Poland and Lithuania (Harmony link), including the necessary reinforcement of the electricity transmission infrastructure in Lithuania and Poland for the safe operation of this interconnection, the installation of equipment designed to provide the remainder of the inertia and the installation of the frequency control infrastructure, including the installation of BESS – Battery Energy Storage System), modernisation of metering and accounting system, anti-emergency automation and system protection and SCADA modernisation projects. The 2nd phase of the Baltic synchronisation project is divided into two rounds, where the projects of the 1st round of the synchronisation phase 2, i.e. Harmony link together with the converter stations, 6 synchronous compensators in the Baltic countries and the modernisation of the Polish internal network in 2020, have been allocated 75% European co-financing (up to 55 million EUR in LV). The grant agreement between the CSOs of the Baltic States and Poland and the European Innovation and Network Executive Agency was signed on 14 December 2020.

On the other hand, European co-financing from the CEF structural fund has been requested for the investments of the 2nd round of phase 2 of the synchronisation project in October 2021, and in

January 2022, 75% of CEF co-financing has been allocated to the projects of the 2nd round of the synchronisation phase 2 (for projects in Latvia – up to 37.1 million. EUR) and the signing of the Grant Agreement with the European Executive Agency for Climate, Infrastructure and Environment is planned for the first half of 2022.

The list of projects of the 2nd round of the synchronisation phase 2 from Latvia includes energy storage batteries (BESS), modernisation of measurement and accounting system, anti-emergency automation and system protection, and SCADA modernisation projects.

On 24 September 2021, the Cabinet adopted order No. 674 “On permission for the joint stock company *Augstsprieguma tīkls* to acquire, develop, manage, and operate electricity storage facilities”. In January 2022, BESS was granted EUR 30 million CEF co-funding from the European Union, however, the provision of the remaining funding could have an impact on the amount of projects planned in the transmission system operator’s development plan 2022-2031 in the coming years.

CEF co-financing has been allocated to 60MW/120MWh BESS, while 20MW/40MWh BESS is expected to be financed from *AS Augstsprieguma tīkls* funds, which, together with the part not covered by CEF funding, amounts to EUR 47.3 million. AST

plans to cover these costs from retained earnings, as well as by raising loans on the financial market.

The implementation of the synchronisation Phase 2 projects is planned until the end of 2025. One of the technical requirements that AST, together with other TSOs of the Baltic States, must implement in accordance with the technical catalogue issued by the TSOs of continental Europe, is the preparation of dynamic stability studies.

Based on these studies, the European TSO consortium will issue recommendations for the establishment or improvement of anti-emergency and system automation, as well as ensuring frequency stability and power frequency control in the Baltic States. Thus, in April 2021, the TSOs of the Baltic States concluded an agreement with the European TSO consortium for the preparation of 5 studies regarding dynamic stability, stability of isolated operation and FSAS (English – Frequency stability assessment system) and LFC (English – Load frequency controller). All research should be completed by the end of 2022.

INSTALLATION OF BESS ON THE TSO NETWORK

These requirements are related to changes in settings in the transmission system, investments in infrastructure development, and the obligations of TSOs to maintain a certain amount of frequency maintenance, frequency renewal reserves, as well as to ensure system inertia.

In order to calculate the necessary amounts of frequency retention and restoration reserves and to identify the sources of their coverage, TSOs of the Baltic States have conducted a market study of balancing capacity reserves, which concluded that the energy systems of Estonia, Latvia and Lithuania individually cannot provide the necessary FCR (Frequency Containment Reserve), aFRR (automatic Frequency Restoration Reserve) and downward mFRR (manual Frequency Restoration Reserve) reserves, but can only provide upward mFRR. Additional operating generators are necessary to maintain FCR, aFRR and mFRR, however none of the individual power systems can maintain all required reserves. Consequently, it is necessary to evaluate the alternatives of purchasing these reserves on the



Image resource - <https://fluenceenergy.com/energy-storage-technology/gridstack-grid-energy-storage/>

electricity market or installing equipment capable of providing frequency stability services.

On 22 May 2019, AS *Augstsprieguma tīkls* signed the Agreement on the conditions of the future interconnection of the power system of Baltic States and power system of continental Europe. The annexes to this agreement set out the technical requirements to be met by the Baltic TSOs before and after the start of the synchronisation process.

After evaluating various sources of balancing power reserves and their availability, it was concluded that the most effective and cheapest solution for providing balancing power reserves is to install a BESS (battery energy storage system) in the electricity transmission system. In accordance with AS *Augstsprieguma tīkls* calculations, to ensure all balancing power reserves, it is necessary to install energy storage batteries with a total capacity of 80 MW (160 MWh). Such a volume would enable the fulfilment of the European strategic goal of synchronising the Baltic electricity systems with continental Europe and avoiding the risks that the mentioned reserves will not be available on the electricity market, or will be available at an inadequate price, at the beginning of the synchronisation.

PROJECT BENEFITS

All the above-mentioned projects are part of Phase 2 of the synchronisation project, which the CSOs of the Baltic States and Poland have committed to implement by 2025. In 2019, a project cost-benefit analysis was prepared for the synchronisation Phase 2, which was submitted to the regulatory authorities of the Baltic States and Poland.

4.1.3.

RENOVATION WORKS OF 330 KV TRANSMISSION LINES

In addition to the above-mentioned projects, the development plan envisages the inclusion of the necessary renovation works on 330 kV power transmission lines: LNo. 312 "Aizkraukle-Krustpils", LNo. 322 "Viskaļi-Brocēni".

FUNDING

Phase 2 synchronisation projects are planned to be implemented by using the European Union granted CEF co-financing in the amount of 75% of the eligible costs (excluding BESS) and the income from the accumulated congestion charges.

Considering the previously adopted decisions of the Board of the Public Utilities Commission and subject to the provisions of Article 16 of the 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, it is planned to use the income from the accumulated congestion charges to finance the project. In accordance with the Electricity Transmission System Service Tariff Calculation Methodology approved by the Decision No. 1/6 paragraph 17 of 18 February 2020 of the Board of the PUC, the part of the value of fixed assets financed from European Union financial support, as well as the received income from the congestion charges shall not be included in the electricity transmission system service tariff calculation.

Taking into account the above, the indicative percentage distribution of the eligible costs of each project in May 2022 is as follows: 56% is financed from the structural fund of CEF and 44% is financed from AS *Augstsprieguma tīkls* funds, and the accumulated congestion fee revenues. The percentage of funding may change as the total actual costs of the project may change.

4.2.

OTHER 330/110 KV NETWORK DEVELOPMENT PROJECTS IN THE NEXT 10 YEARS

4.2.1.

RENOVATION WORKS OF 330 KV TRANSMISSION LINES

In addition to the above-mentioned projects, the development plan envisages the inclusion of the necessary renovation works on 330 kV power transmission lines: LNo. 311 "Krustpils-Līksna", LNo. 313 "Līksna-Daugavpils", LNo. 323 Brocēni-Grobiņa etc.

- In 10 years, it is planned to replace **642 poles** in 330 kV power transmission lines and to replace **6 autotransformers** in the 330 kV substations.

4.2.2.

RENOVATION WORKS OF 110 KV TRANSMISSION NETWORK AND ITS OBJECTS

In order not to significantly accelerate the aging trends of the transmission network, thus ensuring stable operation of the transmission system and uninterrupted supply for consumers with the amounts of electric power requested, transmission system operator plans to rebuild 110 kV substations and distribution stations and 110 kV transmission lines, as well as to replace 110 kV transformers, and to carry out other projects aimed at maintaining the operability of the electricity transmission system. Financial investments are planned in such a way that, in the long run, transmission equipment does not become obsolete fast, i.e., so that the number of equipment older than the critical age does not increase.



to be able to fulfil the above-mentioned, the electricity transmission system development plan provides for:

- rebuild **27 substations** (thirty-two 110 kV switchboards);
- replace **53 transformers**;
- replace **1316 110 kV line poles**.

Before making the final decision on investments in the infrastructure projects, *AS Augstsprieguma tīkls* will take appropriate actions to verify the topicality of the project on the part of the infrastructure customer with the aim to prevent the construction of such infrastructure, the load of which would not be ensured.

4.2.3.

INVESTMENTS IN INFORMATION TECHNOLOGY

AST continuously takes measures to develop the IT infrastructure, supplementing and introducing new equipment both for increasing computing

capacity and data storage, and for ensuring the data transmission network, providing for the operation of IT services for simultaneous work from two data



centres (primary and secondary), which ensure the safety of the services provided by AST.

The rotation of new equipment is required within 5 to 8 years (depending on the type of equipment and the load), which requires periodic investments to ensure

4.2.4.

CONSTRUCTION OF AS AUGSTSPRIEGUMA TĪKLS DISPATCH CONTROL AND DATA CENTRE, RENOVATION OF PRODUCTION BASE TERRITORY AND BUILDING COMPLEX AT DĀRZCIEMA IELA 86, RIGA

To ensure sustainable development of the transmission system, the Ten-Year Development Plan of the Transmission System includes the construction of *AS Augstsprieguma tīkls* Dispatch Control and Data Centre, renovation of production base territory and building complex at Dārziema iela 86, Riga.

The construction of the Dispatch Control and Data Centre is critical for several reasons:

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- The Dispatch Control and Data Centre is part of the critical infrastructure of category C, the location of which is not allowed in unsuitable premises due to the risks associated with it;
 - in order to ensure synchronous work with continental European power networks in the first years, it is necessary to move the critical infrastructure of category C and equip the Dispatch Control and Data Centre;
 - it is necessary to modernise/replace the equipment of the existing dispatch centre, because it does not provide the dispatcher on duty with the opportunities that modern equipment could provide, which would improve the quality of power system management and market operation support;
 - To ensure the continuity of the critical infrastructure, it is necessary to build a data centre where SCADA and other critical IT system servers, communication and security equipment will be placed.
-

the stable operation of the IT infrastructure in the amount required at that time. Over time, additional requirements appear in the areas of both security and business process improvement or provision of additional functions, which are expected to be realized within the framework of the AST IT infrastructure.

On the other hand, the main reasons for the critical need to rebuild the production base territory and building complex of AS “Augstsprieguma tīkls” at Dārziema iela 86 are as follows:

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- all external engineering networks in the territory of Dārziema iela 86 must be rebuilt due to their complete deterioration, which results in regular accidents of these networks;
 - in order to ensure the safe movement of operational and commercial transport in the territory of critical infrastructure, it is necessary to build an additional entrance to the territory of Dārziema iela 86,
 - the number of production and economic buildings (material warehouses, transport parking spaces, equipment repair rooms, etc.) needs to be optimized by dismantling unnecessary buildings/volumes, as well as by carrying out necessary building reconstructions;
 - it is necessary to improve the energy efficiency of the buildings in the territory.
-

Based on the evaluation of all conditions, *AS Augstsprieguma tīkls* has decided to implement the project in a rational and gradual manner. This means that during the entire reconstruction period (construction works are planned from 2023 to the end of the first quarter of 2026) it is planned to ensure uninterrupted functioning of the facility.

The project is planned to be implemented in two stages. In the first stage, it is planned to develop the construction project in the period from the beginning of 2021 to the end of 2022. It is planned that after the development of the construction project, AS *Augstsprieguma tīkls* will evaluate the scope of construction works and the planned costs of construction works together with the Regulator. In the second stage, from the beginning of 2023 to the end of the first quarter of 2026, construction works are planned to be carried out gradually, dividing them into three stages, this is necessary to ensure the uninterrupted functionality of the facility throughout the reconstruction period.

FUNDING

The financial investments planned for the implementation of the project for the construction of the Dispatch control and data centre, the reconstruction of the production base territory and building complex are 38.04 million EUR, for the infrastructure of information systems and digitization of network management – EUR 15.6 million.

Taking into account that the project is of strategic importance both from the point of view of the safety of electricity supply, since the project will provide the main functions of planning and management of the electricity transmission system even after the synchronisation of the Baltic States with continental Europe in 2025, and from the point of view of the performance of cyber security functions, since dispatch and data centres and new SCADA and IT systems will be built as part of the project, it is planned to attract co-financing from the Recovery and Resilience Fund (RRF) for the project. Proposals for the inclusion of the mentioned project in the recovery and resilience mechanism are included in the list of projects prepared by the Ministry of Economy with a total amount of co-financing of EUR 38.9 million, of which EUR 27 million are intended for the construction of the Dispatch control and data centre, reconstruction of the production base territory and building complex, 11.9 million EUR for the infrastructure of information systems and digitization of network management. The remaining amount is planned to be covered from the funds of AS “Augstsprieguma tīkls”.



4.3.

PROCESSES THAT AFFECT OR MAY AFFECT THE IMPLEMENTATION OF PROJECTS INCLUDED IN THE DEVELOPMENT PLAN

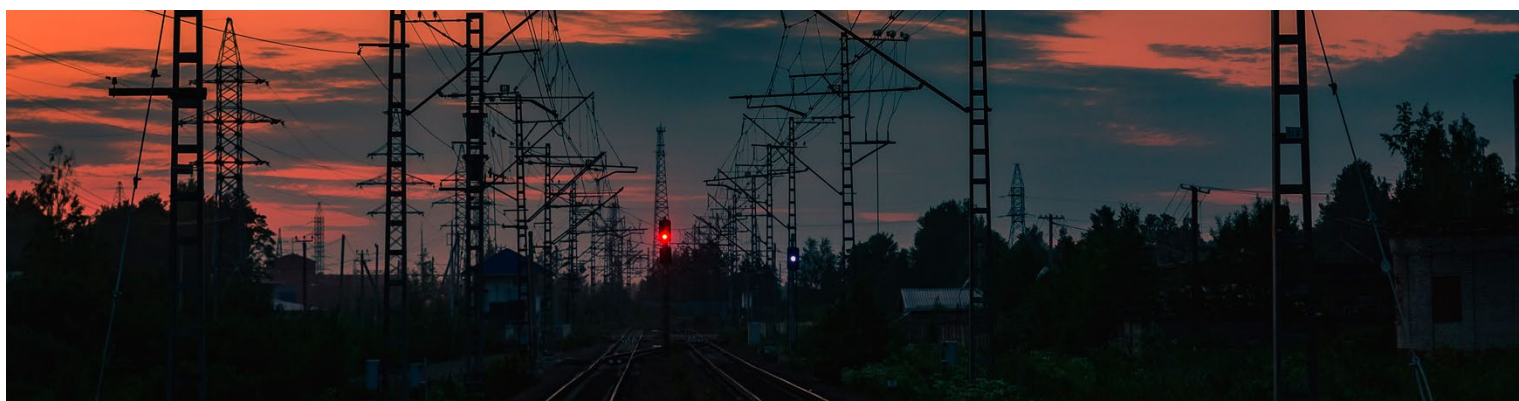
4.3.1.

PROJECT RAIL BALTICA

Rail Baltica is a rail transport project that aims to integrate the Baltic States into the European rail network and covers four European Union countries – Poland, Lithuania, Latvia, and Estonia, and by extending the Tallinn-Helsinki route, indirectly Finland, as well.

The second phase of the project (*Rail Baltica II*) envisages the construction of a new European standard gauge (1435 mm) railway line in the Baltic States to connect Tallinn-Riga-Kaunas-Warsaw metropolises with fast and environmentally friendly rail transport. In May 2016, the Environment State Bureau issued an opinion on the environmental impact assessment report prepared by *SIA Estonian, Latvian & Lithuanian Environment* and the general partnership *RB Latvija* for the construction of the European standard gauge public railway infrastructure line *Rail Baltica*.

The design is planned for 2018/2019, the construction – from 2020 to 2030. It is planned to build three traction power substations in the territory of Latvia, which are connected to the electricity transmission system by creating new connections. It is planned to build a new 110kV power transmission line approximately 47 km long to ensure the connection of the Salacgrīva traction power substation. If a decision is made on the construction of such a power transmission line, then an Environmental Impact Assessment will have to be carried out. Apart from connection activities, the railway will cross transmission power lines in at least 35 places. Mostly in all crossings, power line reconstruction works will have to be carried out (for example, changing the gauge of wires, rebuilding from an overhead line to a cable line, changing the position of the power line, etc.).



Taking into account the importance of the RailBaltica project, AST understands that the successful progress of this project will be one of Latvia's priorities, so its support will require the involvement of significant resources at AST's disposal, which, without additional strengthening of AST's internal resources, may affect

AST's ability to fulfil all planned development projects within the deadlines specified in the plan.

Aware of this risk, AST proactively monitors the situation and decides on the necessary actions in providing resources.

4.3.2.

ESTONIAN-LATVIAN SEA WIND PARK PROJECT

In the Latvian National Energy and Climate Plan for 2021 - 2030 (NEKP 2030), the task of implementing an international project for the construction of an off-shore wind park in the period up to 2030 has been confirmed. Such a task was included in NEKP 2030, because Latvia has committed to reach 50% of the share of renewable energy in the total final energy consumption by 2030, as well as to ensure a reduction of Latvia's total greenhouse gas emissions (GHG) by 65%, compared to Latvia's GHG emissions in 1990.

In 2020, Latvia approved the marine spatial planning map, which also provides potential construction sites for offshore wind farms, as well as possible connections of the power transmission infrastructure. AST, together with other institutions, participated in

the marine spatial planning process organized by the Ministry of Environmental Protection and Regional Development.

On 2 September 2020, the Cabinet took note of and supported the Informative Report on the implementation of the task on the use of offshore wind energy in energy production included in the Latvian National Energy and Climate Plan for 2021-2030, and on 18 September 2020, the Ministry of Economy of Latvia and the Ministry of Economic Affairs and Communications of Estonia, which are responsible for the energy sector in their respective countries, signed a Memorandum of Understanding (MoU) for the Estonian-Latvian offshore wind park project for the production of energy from renewable energy resources by developing offshore wind parks identified in marine spatial planning. Since the project is planned to be implemented in two countries, the project will apply for the status of regional significance, in the future also applying for European co-financing from CEF RES structural



funds. On the Estonian side, the Estonian Ministry of Economic Affairs and Communications is responsible for the development of the wind park project itself, on the Latvian side, the Ministry of Economy and the Latvian Investment and Development Agency (LIAA) are involved in the project.

Latvian and Estonian transmission system operators AST and Elering, respectively, as well as being responsible for infrastructure development and connections to the electricity transmission network, are also involved in the implementation of this project. In 2021, AST and Elering conducted a route study for possible project infrastructure connection options, as well as a marine technical catalogue study for possible offshore infrastructure options and costs.

On the other hand, the ministries and LIAA carried out a study of the analysis of potential wind park

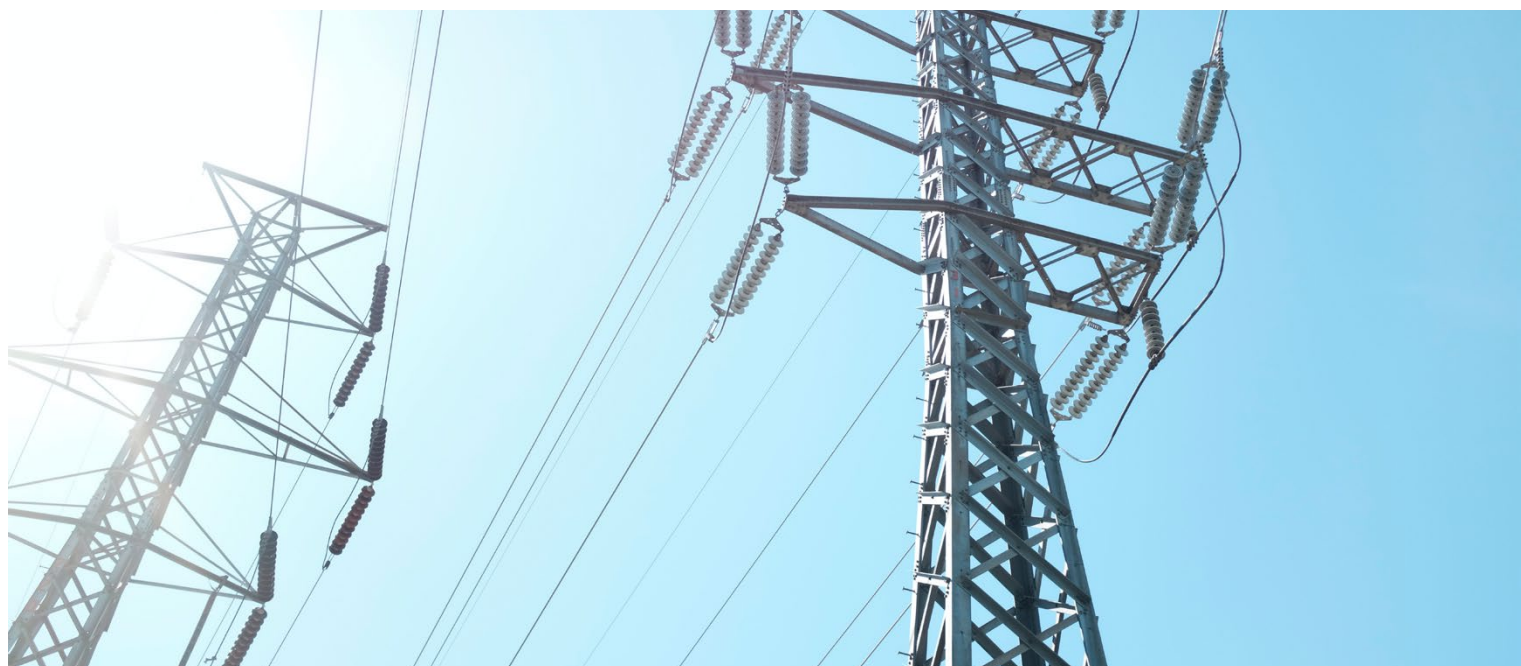
areas in each country. In 2022, decisions of national importance are planned in each country regarding further project development scenarios: it is planned to start environmental impact assessment activities, and in 2022 it is also planned to start CEF RES European co-financing attraction activities. The auction of the wind park project to a potential investor may take place after 2025, and the implementation of the project itself together with the infrastructure is planned until 2030. Considering that the location of the project and its technical solution, as well as the management model of this project, have not been selected at the moment, AST cannot determine the potential impact on the implementation of the 10-year development plan, however, AST is involved in all the development processes of this project in order to be able to assess the potential impacts in time risks and the measures necessary to mitigate them.

4.3.3.

EUROPEAN UNION CO-FINANCING

In accordance with Article 4(3) 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 Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009 “in exercising its



power, the Commission shall ensure that the Union list (of PCIs) is established every two years". On 19 November 2021, EC approved the fifth Union list by delegated Decision No. C (2021) 8409, which includes synchronisation projects to be implemented in Latvia.

On 30 April 2021, the Ministry of Finance submitted the plan of the Latvian Recovery Fund (ANM) to the European Commission (EC) for consideration, and on 22 June 2021, the European Commission approved the plan. After the evaluation of the plan by the Economic and Financial Affairs Council of the European Union (ECOFIN), ANM received approval on 13 July 2021.

On the part of AST, projects for a total amount of 38.9 million were included and approved in the plan. EUR for the development of IT solutions for increasing the security of the transmission system, creating the necessary information system infrastructure and digitalization of advanced network management, as well as projects for the construction of Latvia's main dispatch centre and data centre, including the creation of an IT infrastructure solution.

In the middle of 2022, the Ministry of Economics plans to submit to the Cabinet for approval the regulations on AST implemented projects, and at the end of 2022, it is planned to sign an agreement with the Ministry of Economics on the conditions of project implementation.

4.3.4.

MASS IMPLEMENTATION OF NEW CONNECTIONS

For AS *Augstsprieguma tīkls* to fulfil the provisions determined by the law and the obligations it has undertaken by issuing technical regulations to the electricity producer, it is necessary to reserve the capacity for which the technical regulations were issued from the moment of issuing the technical regulations. Until 30 March 2022, AST has issued technical regulations for the installation of new connections for the connection of wind and solar



power plants with a total capacity of 2168 MW (1386 MW in Kurzeme, 307 MW in Vidzeme, 309 MW in Zemgale and 166 MW in Latgale), respectively, such a capacity is currently reserved.

There is a possibility that electricity producers will show interest in implementing a new connection installation for the connection of wind power plants almost at the same time. If such a situation arises, there is a risk that *AS Augstsprieguma tīkls* will not have sufficient resources to carry out both the implementation of the Development Plan and the installation of a massive new connection. After evaluating the risk, *AS Augstsprieguma tīkls* will plan to attract additional resources for the simultaneous installation of many new connections, if necessary.

4.3.5.

WAR IN UKRAINE

Taking into account the geopolitical situation in the world and the war in Ukraine, *AS Augstsprieguma tīkls* is facing problems related to the supply of various materials and equipment, and this can significantly increase the cost of capital investments. Several contractors have informed *AS Augstsprieguma tīkls* about possible delays in the supply of materials and equipment, as well as possible cost increases. There is a risk that the implementation of several projects will become more expensive, get delayed or postponed for some time.



5.

IMPACT ON THE SERVICE TARIFF OF THE TRANSMISSION SYSTEM



To ensure the sustainable development of the transmission system, the Development Plan includes financial investments in the renewal of the existing transmission system and in the development of the transmission system, creating new transmission system assets. By evaluating the impact of the investments included in the Development Plan on the tariff, it can be concluded that investments in the transmission system necessary to stop the aging trends of the transmission network, ensuring stable operation of the transmission system (renovation of 110 kV substations and distribution points, and 110 kV power transmission lines, as well as replacement of 110 kV transformers, and other projects aimed at maintaining the operational capacity of the transmission system) are financed from the depreciation of the transmission system assets and do not affect the tariffs for electricity transmission system services.

The investments planned in accordance with the European Ten-Year Development Plan are closely related to the strengthening of Latvia's energy security by integrating into the EU electricity market, and are strategically important not only nationally, but also in the Baltic Sea region. To minimise the impact of these projects on transmission system service tariffs, EU co-financing is attracted to the projects, as well as the income from the accumulated congestion charges. For the initiated European co-financed projects included in the Development Plan, PUC has determined the maximum permitted impact on the transmission system service tariff.

AS *Augstsprieguma tīkls* efficiently and rationally using the available financial resources and project financing sources, makes every effort to ensure that

these projects have the least possible impact on transmission system service tariffs.

As a result of AST's activities, 84% of the financing required for the implementation of the development projects included in the European ten-year development plan is covered by EU co-financing and overload charge revenues, thus reducing the impact on the electricity transmission system service tariffs. After the implementation of these projects, AS *Augstsprieguma tīkls* forecasts a smaller impact on the price of the transmitted unit than has been determined by PUC. The comparison between the maximum possible impact on the price of the transmitted unit determined by the PUC and the forecast of AS *Augstsprieguma tīkls* is shown in Table 3.

The other projects mentioned in the Plan are financed from the depreciation fee of the fixed assets and do not affect the transmission system service tariff. The calculation has been performed in accordance with the electricity transmission system service tariff calculation methodology in force at the time of elaboration of the Development Plan and in accordance with Decision No. 90 of the Board of the PUC of 23 August 2021 'On the Rate of Return on Capital for the Calculation of the Draft Tariffs for Electricity Transmission System and Electricity Distribution System Services'.

The priority of AS "Augstsprieguma tīkls" is a high-quality and safe electricity transmission service at the lowest possible tariffs. In addition to the above-mentioned measures, AS *Augstsprieguma tīkls* is continuously working on optimizing operating costs under direct control and improving the efficiency of processes.

Changes in the units transferred (EUR/MWh) compared to the applicable tariff

Table 3

No.	Project name	PUC threshold, %	AST forecast after project completion, %
1.	Phase 1 of the synchronisation project	3.0	0,6
2.	Phase 2 of the synchronisation project	- *	10.4

* For the mentioned project, in accordance with the PUC decision of 7 May 2020 No. 47 "Regarding the distribution of investment costs for the project of common interest "Integration and synchronisation of the electricity transmission system of the Baltic States with European networks, stage 2"" the threshold of the impact on the tariff has not been determined, the decision provides for the part of the costs covered by AST to be included in the electricity transmission system service tariff, without limiting the size of the tariff changes.

6.

ANNEXES

1. Part of the ten-year plan of the transmission system operator on the financial investments included in the Ten-year Community Plan.
2. Part of the ten-year plan of the transmission system operator on the financial investments not included in the Ten-year Community Plan.
3. Financial investments in the transmission system from 2023 to 2032.

Person entitled to represent the system operator:



Board Member
Arnis Daugulis

Edgars Lazda
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Date: 25.05.2022

Part of the transmission system operator's plan included in the Community plan for 2023 to 2032 (excluding VAT)

No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Total financial investments (million EUR)	Total project implementation time (from_ to_)	Distribution of financial investments during each of the next 10 years (million EUR)																		
								2023	2024	2025	2026	2027	2028	2029	2030	2031	2032									
1. Phase 1 of the synchronisation project																										
1.1	Increase of the capacity of the Tartu (EE) –Valmiera (LV) 330 kV interconnection Increase of the capacity of the Tsirgulina (EE) –Valmiera (LV) 330 kV interconnection Purchase and installation of system synchronisation and inertia equipment	Increase of the transmission network capacity, strengthening of the security of the electricity supply in the Baltic region.	none	In the project, the reconstruction of approximately 48 km long existing 330 kV power transmission lines is envisaged to ensure the increase of the capacity of the Baltic Corridor. The Baltic Corridor is a project that increases capacity through the Baltic States by 600 MW. The project envisages the purchase and installation of equipment necessary for the maintenance of frequency and inertia, including the construction of new connections for the connection of this equipment.	2025	59.27	2020-2025	24.42	22.09	0.13																
2. Phase 2 of the synchronisation project																										
2.1	Purchase and installation of system synchronisation and inertia equipment Modernisation of electricity commercial accounting, dispatch control systems and emergency automatics.	Stability and reliability of the transmission network in synchronous network operation with Continental Europe	none	The project envisages the purchase and installation of equipment necessary for the maintenance of frequency and inertia, including the purchase and installation of electric energy storage battery systems, the construction of new connections for the connection of this equipment. Modernisation of electricity commercial accounting, modernisation of dispatch control systems and emergency automatics is also planned.	2025	164.97	2021-2025	41.37	87.76	33.13																
						208.91	Kopā	65.80	109.85	33.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							

Notes:

1. For the interconnections, the plan indicates characteristics and financial investments of the project for the implementation of the project only in the territory of Latvia.

Person entitled to represent the transmission system operator:

E. Lazda

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Board member Arnis Daugulis _____

Part of the transmission system operator's plan not included in the Community plan for 2023 to 2032 (excluding VAT)												
No.	Name	Total financial investments (million EUR)	Distribution of financial investments during each of the next 10 years (million EUR)									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	Substations	76.67	11.19	8.19	7.06	7.54	7.75	7.65	6.67	6.78	6.69	7.16
2	Replacements of autotransformers and transformers	32.82	2.87	0.58	3.35	6.27	2.45	1.59	2.41	3.93	3.68	5.70
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	95.23	12.56	8.57	7.37	8.22	9.24	9.29	9.45	9.42	10.50	10.61
5	Other measures	48.52	3.38	11.04	3.86	2.38	4.53	4.50	5.16	4.99	5.09	3.59
6	Total	253.23	29.99	28.38	21.63	24.40	23.97	23.03	23.68	25.11	25.97	27.06

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Board member Arnis Daugulis _____

Financial investments in the transmission infrastructure from 2023 to 2032 (excluding VAT)																			
No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Location of project sites	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Financial contribution	Total financial investments (million EUR)	Total project implementation time (from... to...)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	Phase 1 of the synchronisation project Tartu(EE)-Valmiera(LV), Tsigulina(EE)-Valmiera(LV) interconnection passes capacity building System synchronisation and inertia Purchase and installation of equipment.	Increase of the transmission network capacity, strengthening of the security of the electricity supply in the Baltic region. Stability and reliability of the transmission network in synchronous network operations with Continental Europe	none	Latvia	In the project, the reconstruction of approximately 48 km long existing 330 kV power transmission lines is envisaged to ensure the increase of the capacity of the Baltic Corridor. The Baltic Corridor is a project that increases the transmission capacity through the Baltic States by 600 MW. The project envisages the purchase and installation of equipment necessary for the maintenance of frequency and inertia, including the construction of new connections for the connection of this equipment.	1971, 1960	AST funding 25% / EU funding 75%	59.27	2020-2025	24.42	22.09	0.13							
2	Phase 2 of the synchronisation project. Purchase and installation of system synchronisation and inertia equipment. Modernisation of electricity commercial accounting, dispatch control systems and anti-emergency automatics.	Stability and reliability of the transmission network in synchronous network operation with Continental Europe	none	Latvia	The project envisages the purchase and installation of equipment necessary for the maintenance of frequency and inertia, including the purchase and installation of electric energy storage battery systems, the construction of new connections for the connection of this equipment. Modernisation of electricity commercial accounting, modernisation of dispatch control systems and emergency automatics is also planned..		AST funding 44% / EU funding 56%	164.97	2021-2025	41.37	87.76	33.13							
Total European TYNDP2020 projects:										65.80	109.85	33.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Installation of the connection of SIA Gaujas koks by building a new connection at the "Vangaži" substation	New connection construction	none	Latvia, Vangaži	Creation of double-busbar scheme in the 110kV substation at the "Vangaži" substation by constructing a new connection	1968	SIA Gaujas koks funding	0.58	2021-2023	0.01									
4	Installation of the connection of SIA Gaujas koks by building a new substation "Gaujas koks"	New connection construction	none	Latvia, Zilāni	Construction of a new 110kV substation with an incomplete H-shaped circuit by building 3 110kV connections		SIA Gaujas koks funding	1.6	2022-2023	0.50									
5	Reconstruction of 110 kV switchboard of 110/20/6kV substation "Vangaži" and replacement of transformer	Improving the reliability of the transmission system	none	Latvia, Vangaži	Creation of double-busbar scheme in the 110kV substation at the "Vangaži" substation by constructing a new connection	1968	AST funding	1.98	2020-2023	0.02									
6	Reconstruction of the 110 kV switchboard of the 110/20/10kV "Ogre" substation	Improving the reliability of the transmission system	none	Latvia, Ogre	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1968	AST funding	1.75	2020-2023	0.91	0.30								
7	Partial reconstruction of the 110kV switchboard of the 110/20kV substation "Tēraudlietuve"	Improving the reliability of the transmission system	none	Latvia, Zilāni	Partial reconstruction of the substation "Tēraudlietuve" and 110kV lines, so that the new substation "Gaujas koks" can be connected to the system	1986	AST funding	0.42	2022-2023	0.12									
8	Reconstruction of 110 kV switchboard of 110/20kV substation "Ugāle"	Improving the reliability of the transmission system	none	Latvia, Ugāle	Development of half 'H-shaped' scheme in 110 kV switchboard, by building 2 110kV sockets and installing a power switch for each connection.	1982	AST funding	0.76	2021-2023	0.35									
9	Replacement of 330 kV RAA and DVS for the 330/110kV substation "Salaspils"	Improving the reliability of the transmission system	none	Latvia, Salaspils	Replacement of relay protection and automation equipment, and dispatch control system (7 pcs.) For 330kV connections	1997	AST funding	0.32	2021-2023	0.05									

Financial investments in the transmission infrastructure from 2023 to 2032 (excluding VAT)																				
No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Location of project sites	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Financial contribution	Total financial investments (million EUR)	Total project implementation time (from_ to_)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
10	Reconstruction of 110 kV switchboard of 110/10/6kV substation "Vairogs"	Improving the reliability of the transmission system	none	Latvia, Riga	Development of double-busbar scheme in 110 kV switchboard (in GIS version), building 6 110kV sockets.	1963	AST funding	4.29	2021-2024	3.77	0.13									
										Works to be performed during the implementation of the project:			6 pcs. Reconstruction of 110kV connections in GIS version	Landscaping, completion of works, inspections, and commissioning						
11	Reconstruction of 110 kV switchboard of 110/20kV substation "Lode" and replacement of transformers	Improving the reliability of the transmission system	none	Latvia, Liepa	Development of "H-shaped" scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1962	AST funding	2.75	2022-2024	1.85	0.79									
										Works to be performed during the implementation of the project:			4 pcs. Reconstruction of 110kV connections in ASI design and installation of transformers	Landscaping, completion of works, inspections, and commissioning						
12	Reconstruction of 110 kV switchboard of 110/20/6kV substation "Dzūkste"	Improving the reliability of the transmission system	none	Latvia, Dzūkste	Development of "H-shaped" scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1976	AST funding	1.90	2022-2024	1.07	0.74									
										Works to be performed during the implementation of the project:			2 items Reconstruction of 110 kV connections by ASI	2 items Reconstruction of 110 kV connections by ASI. Landscaping, completion of works, inspections, and commissioning						
13	Replacement of 110 kV RAA and DVS for the 110/20kV substation "Ropaži"	Improving the reliability of the transmission system	none	Latvia, Garkalne	Replacement of relay protection and automation equipment, and control system for 7 110kV connections	1997	AST funding	0.39	2022-2024	0.16	0.22									
										Works to be performed during the implementation of the project:			Replacement of RAA and DVS equipment	Replacement of RAA and DVS equipment						
14	Replacement of 110 kV RAA and DVS for the 110/20/6kV substation "Sloka"	Improving the reliability of the transmission system	none	Latvia, Sloka	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	1997	AST funding	0.36	2022-2024	0.08	0.09									
										Works to be performed during the implementation of the project:			Replacement of RAA and DVS equipment	Replacement of RAA and DVS equipment						
15	Replacement of 110 kV RAA and DVS for the 110/20kV substation "Ieriķi"	Improving the reliability of the transmission system	none	Latvia, Ieriķi	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	year 1998	AST funding	0.22	2022-2024	0.11	0.11									
										Works to be performed during the implementation of the project:			Replacement of RAA and DVS equipment	Replacement of RAA and DVS equipment						
16	Reconstruction 110 kV switchboard of the 330/110/20kV "Krustpils" substation and replacement of transformers	Improving the reliability of the transmission system	none	Latvia, Krustpils	Development of double-busbar scheme in 110 kV switchboard, by building 12 110kV sockets and replacing transformers	1959 (separate 110 kV equipment replacement - 1985)	AST funding	5.00	2021-2025	2.30	1.30	0.10								
										Works to be performed during the implementation of the project:			5 pcs. Reconstruction of 110kV connections in ASI design and replacement of transformers	3 pcs. Reconstruction of 110 kV connections by ASI	Landscaping, completion of works, inspections, and commissioning					
17	Reconstruction of 110 kV switchboard of 110/20kV substation "Carnikava"	Improving the reliability of the transmission system	none	Latvia, Carnikava	Development of "H-shaped" scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1981	AST funding	2.60	2022-2025	0.12	1.31	1.14								
										Works to be performed during the implementation of the project:			Development of the technical design.	2 items Reconstruction of 110 kV connections by ASI	2 items Reconstruction of 110 kV connections. Landscaping, completion of works, inspections, and commissioning					
18	Reconstruction of 110 kV switchboard of 110/20kV substation "Kuldīga" and replacement of transformers	Improving the reliability of the transmission system	none	Latvia, Kuldīga	Development of "H-shaped" scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1959	AST funding	4.01	2022-2025	0.19	2.03	1.77								
										Works to be performed during the implementation of the project:			Development of the technical design.	2 items Reconstruction of 110kV connections in ASI design and installation of a transformer	2 items Reconstruction of 110kV connections in ASI design and installation of a transformer. Landscaping, completion of works, inspections, and commissioning					
19	Replacement of 110 kV RAA and DVS for the 110/20kV substation "Bauska"	Improving the reliability of the transmission system	none	Latvia, Bauska	Replacement of relay protection and automation equipment, and control system (4 pcs.) For 110kV connections	1999	AST funding	0.22	2023-2024	0.02	0.20									
										Works to be performed during the implementation of the project:			Development of the technical design.	Replacement of RAA and DVS equipment						
20	Replacement of 110 kV RAA and DVS for the 110/10kV substation "Grīzīkalns"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	1999	AST funding	0.33	2023-2025	0.02	0.15	0.15								
										Works to be performed during the implementation of the project:			Development of the technical design.	Replacement of RAA and DVS equipment	Replacement of RAA and DVS equipment					
21	Replacement of 110 kV RAA and DVS for the 110/20/10kV substation "Dzintari"	Improving the reliability of the transmission system	none	Latvia, Jūrmala	Replacement of relay protection and automation equipment, and dispatch control system (3 pcs.) For 110kV connections	1999	AST funding	0.17	2023-2024	0.02	0.15									
										Works to be performed during the implementation of the project:			Development of the technical design.	Replacement of RAA and DVS equipment						

Financial investments in the transmission infrastructure from 2023 to 2032 (excluding VAT)																				
No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Location of project sites	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Financial contribution	Total financial investments (million EUR)	Total project implementation time (from... to...)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
22	Replacement of 110 kV RAA and DVS for the 110/10kV substation "Venta"	Improving the reliability of the transmission system	none	Latvia, Ventspils	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	1999	AST funding	0.33	2023-2025	0.02	0.15	0.15								
										Works to be performed during the implementation of the project:									Development of the technical design.	Replacement of RAA and DVS equipment
23	Reconstruction of 110 kV switchboard of 110/20kV substation "Livāni"	Improving the reliability of the transmission system	none	Latvia, Livāni	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1982	AST funding	2.00	2024-2026		0.12	1.08	0.80							
										Works to be performed during the implementation of the project:									Development of the technical design.	2 gab. 110kV pievienojumu pārbūve ĀSI izpildījumā
24	Reconstruction of 110 kV switchboard of 110/10kV substation "Andrejsala"	Improving the reliability of the transmission system	none	Latvia, Rīga	Development of double-busbar scheme in 110 kV switchboard (in GIS version), building five (5) 110kV sockets.	1970	AST funding	4.70	2024-2026		0.30	1.90	2.50							
										Works to be performed during the implementation of the project:									Development of the technical design.	Construction of GIS building and other infrastructure
25	Replacement of 110 kV RAA and DVS for the 110/20kV substation "Tukums"	Improving the reliability of the transmission system	none	Latvia, Tukums	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	year 1998	AST funding	0.33	2024-2026		0.02	0.15	0.15							
										Works to be performed during the implementation of the project:									Development of the technical design.	Replacement of RAA and DVS equipment
26	Replacement of 110 kV RAA and DVS for the 110/10kV substation "Hanza"	Improving the reliability of the transmission system	none	Latvia, Rīga	Replacement of relay protection and automation equipment, and dispatch control system (9 pcs.) For 110kV connections	2000	AST funding	0.53	2024-2026		0.07	0.20	0.26							
										Works to be performed during the implementation of the project:									Development of the technical design.	Replacement of RAA and DVS equipment
27	Reconstruction of 110/20kV substation "Špoģi" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Špoģi	Development of an incomplete 'H-shaped' scheme in 110 kV switchboard, by building 3 110kV sockets and installing a power switch for each connection.	1988	AST funding	1.53	2025-2027			0.12	0.80	0.61						
										Works to be performed during the implementation of the project:										Development of the technical design.
28	Reconstruction of 110 kV switchboard of 110/10kV substation "Torņakalns"	Improving the reliability of the transmission system	none	Latvia, Rīga	Creation of double-busbar scheme in 110 kV switchboard, building 6 pcs. 110 kV sockets and installing a power switch for each connection.	1980	AST funding	3.17	2025-2028			0.16	1.43	1.43	0.15					
										Works to be performed during the implementation of the project:										Development of the technical design.
29	Replacement of 110 kV RAA and DVS for the 110/20/6kV substation "Jēkabpils"	Improving the reliability of the transmission system	none	Latvia, Jēkabpils	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	2000	AST funding	0.45	2025-2027			0.02	0.21	0.21						
										Works to be performed during the implementation of the project:										Development of the technical design.
30	Replacement of 110 kV RAA and DVS for the 110/10kV substation "Ventamonjaks"	Improving the reliability of the transmission system	none	Latvia, Ventspils	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	2000	AST funding	0.45	2025-2027			0.02	0.21	0.21						
										Works to be performed during the implementation of the project:										Development of the technical design.
31	Replacement of 110 kV RAA and DVS for the 110/10kV substation "Purviems"	Improving the reliability of the transmission system	none	Latvia, Rīga	Replacement of relay protection and automation equipment, and dispatch control system 5 pcs. For 110kV connections	2000	AST funding	0.38	2025-2027			0.02	0.14	0.21						
										Works to be performed during the implementation of the project:										Development of the technical design.
32	Replacement of RAA and DVS for the 330/110/10kV substation "TEC-1"	Improving the reliability of the transmission system	none	Latvia, Rīga	Replacement of relay protection and automation equipment, and dispatch control system 13 pcs. For 110kV connections	2000	AST funding	1.00	2025-2028			0.07	0.28	0.28	0.36					
										Works to be performed during the implementation of the project:										Development of the technical design.
33	Reconstruction of 110 kV switchboard of the 110/10kV substation "Latgale"	Improving the reliability of the transmission system	none	Latvia, Latgale	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1973	AST funding	2.45	2026-2028				0.12	1.35	0.98					
										Works to be performed during the implementation of the project:										
34	Reconstruction of 110/20kV substation "Priekule" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Priekule	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1975	AST funding	2.95	2026-2029				0.13	1.26	1.26	0.30				
										Works to be performed during the implementation of the project:										

Financial investments in the transmission infrastructure from 2023 to 2032 (excluding VAT)																					
No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Location of project sites	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Financial contribution	Total financial investments (million EUR)	Total project implementation time (from_ to_)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		
35	Reconstruction of 110 kV switchboard of 110/20kV substation "Sigulda"	Pārvades sistēmas drošuma paaugstināšana	none	Latvia, Sigulda	"H-veida" shēmas izveidošana 110kV sadalnē, izbūvējot 4 gab. 110kV līgždas un uzstādot jaudas slēdži katram pievienojumam.	1974	AST funding	2.00	2026-2028				0.12	1.08	0.80						
																				Works to be performed during the implementation of the project:	
36	Replacement of 330 kV RAA and DVS for the 330/110kV substation "Brocēni"	Improving the reliability of the transmission system	none	Latvia, Brocēni	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 330kV connections	2002	AST funding	0.64	2026-2028				0.14	0.20	0.30						
																					Works to be performed during the implementation of the project:
37	Replacement of RAA and DVS for the 110 kV substation "Limbaži"	Improving the reliability of the transmission system	none	Latvia, Limbaži	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 110kV connections	2002	AST funding	0.28	2026-2028				0.02	0.10	0.15						
																					Works to be performed during the implementation of the project:
38	Replacement of 330 kV RAA and DVS for the 330/110/20/10kV substation "Bišuciemis"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 330kV connections	2002	AST funding	0.64	2026-2028				0.14	0.20	0.30						
																					Works to be performed during the implementation of the project:
39	Replacement of 110 kV RAA and DVS for the 110kV substation "Liepāja"	Improving the reliability of the transmission system	none	Latvia, Liepāja	Replacement of relay protection and automation equipment, and dispatch control system (8 pcs.) For 110kV connections	2001	AST funding	0.48	2026-2028				0.07	0.20	0.20						
																					Works to be performed during the implementation of the project:
40	Reconstruction of 110 kV switchboard of 110/20/6kV substation "Iecava"	Improving the reliability of the transmission system	none	Latvia, Iecava	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1969	AST funding	2.00	2027-2029					0.12	1.08	0.80					2 items Reconstruction of 110 kV connections. Landscaping, completion of works, inspections, and commissioning
41	Reconstruction of 110/20kV substation "Lauma" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Liepāja	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1971	AST funding	2.00	2027-2029					0.12	1.08	0.80					2 items Reconstruction of 110 kV connections. Landscaping, completion of works, inspections, and commissioning
42	Replacement of 110 kV RAA and DVS for the 330/110/20/10kV substation "Bišuciemis"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of relay protection and automation equipment, and dispatch control system 11 pcs. For 110kV connections	2003	AST funding	0.48	2027-2030					0.07	0.10	0.15	0.15				
43	Replacement of 110 kV RAA and DVS for the 330/110kV substation "Brocēni"	Improving the reliability of the transmission system	none	Latvia, Brocēni	Replacement of relay protection and automation equipment, and dispatch control system (9 pcs.) For 110kV connections	2003	AST funding	0.53	2027-2030					0.07	0.15	0.15	0.15				
44	Reconstruction of 110 kV switchboard of 110/20kV substation "Eleja"	Improving the reliability of the transmission system	none	Latvia, Eleja	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1980	AST funding	2.00	2028-2030					0.12	1.08	0.80					2 items Reconstruction of 110 kV connections. Landscaping, completion of works, inspections, and commissioning
45	Reconstruction of 110 kV switchboard of 110/20kV substation "Ludza"	Improving the reliability of the transmission system	none	Latvia, Ludza	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1963	AST funding	2.00	2028-2030					0.12	1.08	0.80					2 items Reconstruction of 110 kV connections. Landscaping, completion of works, inspections, and commissioning
46	Reconstruction of 110/20kV substation "Rūjiena" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Rūjiena	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1978	AST funding	2.00	2028-2030					0.12	1.08	0.80					2 items Reconstruction of 110 kV connections. Landscaping, completion of works, inspections, and commissioning

Financial investments in the transmission infrastructure from 2023 to 2032 (excluding VAT)																			
No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Location of project sites	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Financial contribution	Total financial investments (million EUR)	Total project implementation time (from... to...)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
47	Replacement of 330 kV RAA and DVS for the 330/110kV substation "Likсна"	Improving the reliability of the transmission system	none	Latvia, Likсна	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 330kV connections	2004	AST funding	0.74	2028-2030						0.14	0.30	0.30		
															Works to be performed during the implementation of the project:				
48	Replacement of 330 kV RAA and DVS for the 330/110kV substation "Grobīņa"	Improving the reliability of the transmission system	none	Latvia, Grobiņa	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 330kV connections	2004	AST funding	0.64	2028-2030						0.14	0.20	0.30		
															Works to be performed during the implementation of the project:				
49	Replacement of 110 kV RAA and DVS for the 110 kV substation "Vecmilgrāvis"	Improving the reliability of the transmission system	none	Latvia, Rīga	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 110kV connections	2004	AST funding	0.28	2028-2030						0.02	0.10	0.15		
															Works to be performed during the implementation of the project:				
50	Replacement of 110 kV RAA and DVS for the 110 kV substation "Mārupe"	Improving the reliability of the transmission system	none	Latvia, Mārupe	Replacement of relay protection and automation equipment, and dispatch control system (9 pcs.) For 110kV connections	2004	AST funding	0.53	2028-2031						0.07	0.15	0.15	0.15	
															Works to be performed during the implementation of the project:				
51	Reconstruction of 110 kV switchboard of 110/20kV substation "Krāslava"	Improving the reliability of the transmission system	none	Latvia, Krāslava	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1977	AST funding	2.00	2029-2031							0.12	1.08	0.80	
															Works to be performed during the implementation of the project:				
52	Reconstruction of 110 kV switchboard of 110/20kV substation "Salaspils"	Improving the reliability of the transmission system	none	Latvia, Salaspils	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1979	AST funding	2.00	2029-2031							0.12	1.08	0.80	
															Works to be performed during the implementation of the project:				
53	Replacement of 110 kV RAA and DVS for the 110kV substation "Daugava"	Improving the reliability of the transmission system	none	Latvia, Aizkraukle	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 110kV connections	2005	AST funding	0.64	2029-2031							0.02	0.10	0.15	
															Works to be performed during the implementation of the project:				
54	Replacement of 330 kV RAA and DVS for the 330/110kV substation "Rēzekne"	Improving the reliability of the transmission system	none	Latvia, Rēzekne	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 330kV connections	2005	AST funding	0.64	2029-2031							0.14	0.20	0.30	
															Works to be performed during the implementation of the project:				
55	Replacement of 110 kV RAA and DVS for the 110 kV substation "Rēzekne"	Improving the reliability of the transmission system	none	Latvia, Rēzekne	Replacement of relay protection and automation equipment, and dispatch control system (7 pcs.) For 110kV connections	2005	AST funding	0.57	2029-2031							0.07	0.15	0.20	
															Works to be performed during the implementation of the project:				
56	Reconstruction of 110/20kV substation "Preiļi" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Preiļi	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1978	AST funding	2.00	2030-2032							0.12	1.08	0.80	
															Works to be performed during the implementation of the project:				
57	Reconstruction of 110 kV switchboard of 110/20kV substation "Stelpe"	Improving the reliability of the transmission system	none	Latvia, Stelpe	Creation of double-busbar scheme in 110 kV switchboard, building 5 110 kV sockets and installing a power switch for each connection.	1982	AST funding	2.23	2030-2033							0.13	1.05	1.05	
															Works to be performed during the implementation of the project:				
58	Reconstruction of 110 kV switchboard of 110/20kV substation "Dobele"	Improving the reliability of the transmission system	none	Latvia, Dobele	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1974	AST funding	2.00	2029-2031							0.12	1.08	0.80	
															Works to be performed during the implementation of the project:				
59	Replacement of 110 kV RAA and DVS for the 110 kV substation "Grobīņa"	Improving the reliability of the transmission system	none	Latvia, Grobiņa	Replacement of relay protection and automation equipment, and dispatch control system (15 pcs.) For 110kV connections	2006	AST funding	0.84	2030-2033							0.07	0.15	0.20	
															Works to be performed during the implementation of the project:				
60	Replacement of 110 kV RAA and DVS for the 110 kV substation "Ķegums-1"	Improving the reliability of the transmission system	none	Latvia, Ķegums	Replacement of relay protection and automation equipment, and dispatch control system (10 pcs.) For 110kV connections	2006	AST funding	0.58	2030-2033							0.07	0.15	0.20	
															Works to be performed during the implementation of the project:				

Financial investments in the transmission infrastructure from 2023 to 2032 (excluding VAT)																			
No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Location of project sites	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Financial contribution	Total financial investments (million EUR)	Total project implementation time (from_ to_)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
61	Replacement of 110 kV RAA and DVS for the 110 kV substation "Madona"	Improving the reliability of the transmission system	none	Latvia, Madona	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 110kV connections	2006	AST funding	0.43	2030-2032								0.02	0.10	0.15
Works to be performed during the implementation of the project:																	Development of the technical design.	Replacement of RAA and DVS equipment	Replacement of RAA and DVS equipment
62	Replacement of 110 kV RAA and DVS for the 110 kV substation "Sarkandaugava"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of relay protection and automation equipment, and dispatch control system (4 pcs.) For 110kV connections	2006	AST funding	0.36	2030-2032								0.02	0.10	0.10
Works to be performed during the implementation of the project:																	Development of the technical design.	Replacement of RAA and DVS equipment	Replacement of RAA and DVS equipment
63	Reconstruction of 110 kV switchboard of 110/20kV substation "Karsava"	Improving the reliability of the transmission system	none	Latvia, Karsava	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1977	AST funding	2.00	2031-2033									0.12	1.08
Works to be performed during the implementation of the project:																		Development of the technical design.	2 items Reconstruction of 110 kV connections by ASI
64	Reconstruction of 110/20kV substation "Barkava" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Barkava	Development of half 'H-shaped' scheme in 110 kV switchboard, by building 2 110kV sockets and installing a power switch for each connection.	1978	AST funding	1.04	2031-2033									0.10	0.84
Works to be performed during the implementation of the project:																		Development of the technical design.	2 items Reconstruction of 110 kV connections by ASI
65	Reconstruction of 110/20kV substation "Ergli" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Ergli	Development of half 'H-shaped' scheme in 110 kV switchboard, by building 2 110kV sockets and installing a power switch for each connection.	1967	AST funding	1.04	2031-2033									0.11	0.84
Works to be performed during the implementation of the project:																		Development of the technical design.	2 items Reconstruction of 110 kV connections by ASI
66	Replacement of 110 kV RAA and DVS for the 110 kV substation "Zunda"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 110kV connections	2007	AST funding	0.28	2031-2033									0.02	0.10
Works to be performed during the implementation of the project:																		Development of the technical design.	Replacement of RAA and DVS equipment
67	Replacement of 110 kV RAA and DVS for the 330/110kV substation "TEC-2"	Improving the reliability of the transmission system	none	Latvia, Acone	Replacement of relay protection and automation equipment, and dispatch control system (14 pcs.) For 110kV connections	2008	AST funding	0.79	2031-2035									0.07	0.15
Works to be performed during the implementation of the project:																		Development of the technical design.	Replacement of RAA and DVS equipment
68	Replacement of 330 kV RAA and DVS for the 330/110kV substation "Aizkraukle"	Improving the reliability of the transmission system	none	Latvia, Aizkraukle	Replacement of relay protection and automation equipment, and dispatch control system 11 pcs. For 330kV connections	2008	AST funding	1.24	2031-2034									0.14	0.30
Works to be performed during the implementation of the project:																		Development of the technical design.	Replacement of RAA and DVS equipment
69	Reconstruction of 110 kV switchboard of 110/10kV substation "Ilguciems"	Improving the reliability of the transmission system	none	Latvia, Riga	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1961	AST funding	2.00	2032-2034										0.12
Works to be performed during the implementation of the project:																			Development of the technical design.
70	Reconstruction of 110/20kV substation "Kekava" 110 kV distribution facility	Improving the reliability of the transmission system	none	Latvia, Kekava	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1967	AST funding	2.00	2032-2034										0.12
Works to be performed during the implementation of the project:																			Development of the technical design.
71	Reconstruction of 110 kV switchboard of 110/20kV substation "Ezerkrasts"	Improving the reliability of the transmission system	none	Latvia, Liepāja	Development of 'H-shaped' scheme in 110 kV switchboard, by building 4 110kV sockets and installing a power switch for each connection.	1979	AST funding	2.00	2032-2034										0.12
Works to be performed during the implementation of the project:																			Development of the technical design.
72	Replacement of RAA and DVS for the substation No. 8 "TEC-2"	Improving the reliability of the transmission system	none	Latvia, Acone	Replacement of relay protection and automation equipment, and dispatch control system (7 pcs.) For 330kV connections	2008	AST funding	0.84	2032-2034										0.14
Works to be performed during the implementation of the project:																			Development of the technical design.
73	Replacement of RAA and DVS for the substation No. 53 "Brocēni 110"	Improving the reliability of the transmission system	none	Latvia, Brocēni	Replacement of relay protection and automation equipment, and dispatch control system (6 pcs.) For 110kV connections	2002	AST funding	0.33	2032-2034										0.02
Works to be performed during the implementation of the project:																			Development of the technical design.
74	Replacement of RAA and DVS for the substation No. 76 "Cēsis"	Improving the reliability of the transmission system	none	Latvia, Cēsis	Replacement of relay protection and automation equipment, and dispatch control system (5 pcs.) For 110kV connections	2008	AST funding	0.28	2032-2034										0.02
Works to be performed during the implementation of the project:																			Development of the technical design.
Total substation conversions										11.70	8.19	7.06	7.54	7.75	7.65	6.67	6.78	6.69	7.16
75	Replacement of a autotransformer ATNo.2 in the substation "TEC-1"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of 125 MVA autotransformer ATNo.2 with an autotransformer of the same capacity.	1964	AST funding	2.03	2023										
Works to be performed during the implementation of the project:										Development of technical design and replacement of ATNo.2									

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76	Replacement of ATNo.2 autotransformer in the "Imanta" substation	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of 125 MVA autotransformer ATNo.2 with an autotransformer of the same capacity.	1971	AST funding	2.00	2025			2.00								
Works to be performed during the implementation of the project:													Development of technical design and replacement of ATNo.2							
77	Replacement of autotransformer ATNo.1 in the substation "Valmiera"	Improving the reliability of the transmission system	none	Latvia, Valmiera	Replacement of 125 MVA autotransformer ATNo.1 with a 200 MVA autotransformer.	1968	AST funding	2.50	2026				2.50							
Works to be performed during the implementation of the project:														Development of technical design and replacement of ATNo.1						
78	Replacement of ATNo.2 autotransformer in the "Brocēni" substation	Improving the reliability of the transmission system	none	Latvia, Brocēni	Replacement of 125 MVA autotransformer ATNo.2 with an autotransformer of the same capacity.	1970	AST funding	2.00	2026				2.00							
Works to be performed during the implementation of the project:														Development of technical design and replacement of ATNo.2						
79	Replacement of ATNo.1 autotransformer in the "Grobīņa" substation	Improving the reliability of the transmission system	none	Latvia, Grobiņa	Replacement of 125 MVA autotransformer ATNo.1 with an autotransformer of the same capacity.	1971	AST funding	2.00	2027					2.00						
Works to be performed during the implementation of the project:														Development of technical design and replacement of ATNo.1						
80	Replacement of autotransformer ATNo.1 in the substation "Viskaji"	Improving the reliability of the transmission system	none	Latvia, Viskaji	Replacement of 200 MVA autotransformer ATNo.1 with an autotransformer of the same capacity.	1984	AST funding	2.50	2032										2.50	
Works to be performed during the implementation of the project:																			Development of technical design and replacement of ATNo.1	
Total autotransformer replacement:										2.03	0.00	2.00	4.50	2.00	0.00	0.00	0.00	0.00	0.00	2.50
81	Replacement of 110 kV transformer ATNo.2 in the substation "Alūksne"	Improving the reliability of the transmission system	none	Latvia, Alūksne	Replacement of 10 MVA transformer with a transformer of the same power	1978	AST funding	0.35	2023	0.35										
Works to be performed during the implementation of the project:										Transformer replacement										
82	Replacement of 110 kV transformer TNo.2 in the substation "Bauska"	Improving the reliability of the transmission system	none	Latvia, Bauska	Replacement of 16 MVA transformer with a transformer of the same capacity	1975	AST funding	0.49	2023	0.49										
Works to be performed during the implementation of the project:										Transformer replacement										
83	Replacement of 110kV transformer TNo.2 in the substation "RAF" and arrangement of the commercial records	Improving the reliability of the transmission system	none	Latvia, Jelgava	Replacement of 25 MVA transformer with a transformer of the same capacity and arrangement of commercial records for both transformers	1978	AST funding	0.58	2024		0.58									
Works to be performed during the implementation of the project:											Transformer replacement and arrangement of commercial records									
84	Replacement of 110 kV transformer TNo.1 in the substation "Līvāni"	Improving the reliability of the transmission system	none	Latvia, Līvāni	Replacement of 16 MVA transformer with a transformer of the same capacity	1976	AST funding	0.39	2025			0.39								
Works to be performed during the implementation of the project:											Transformer replacement									
85	Replacement of 110 kV transformer TNo.3 in the substation "Valmiera"	Improving the reliability of the transmission system	none	Latvia, Valmiera	Replacement of 25 MVA transformer with a transformer of the same capacity	1978	AST funding	0.48	2025			0.48								
Works to be performed during the implementation of the project:											Transformer replacement									
86	Replacement of 110 kV transformer TNo.2 in the substation "Gajoks"	Improving the reliability of the transmission system	none	Daugavpils, Latvia	Replacement of 25 MVA transformer with a transformer of the same capacity	1979	AST funding	0.48	2025			0.48								
Works to be performed during the implementation of the project:											Transformer replacement									
87	Replacement of 110 kV transformer TNo.1 in the substation "Aizkraukle"	Improving the reliability of the transmission system	none	Latvia, Rīga	Replacement of 40 MVA transformer with a transformer of the same power	1977	AST funding	0.48	2026				0.48							
Works to be performed during the implementation of the project:													Transformer replacement and arrangement of commercial records							
88	Replacement of 110 kV transformer TNo.2 in the substation "Andrejsala"	Improving the reliability of the transmission system	none	Latvia, Rīga	Replacement of 40 MVA transformer with a transformer of the same power	1975	AST funding	0.48	2026				0.48							
Works to be performed during the implementation of the project:													Transformer replacement							
89	Replacement of 110 kV transformer TNo.2 in the substation "Līvāni"	Improving the reliability of the transmission system	none	Latvia, Līvāni	Replacement of 16 MVA transformer with a transformer of the same capacity	1976	AST funding	0.39	2026				0.39							
Works to be performed during the implementation of the project:													Transformer replacement							
90	Replacement of 110 kV transformer TNo.1 in the substation "Bolderāja I"	Improving the reliability of the transmission system	none	Latvia, Rīga	Replacement of 16 MVA transformer with a transformer of the same capacity	1981	AST funding	0.42	2026				0.42							
Works to be performed during the implementation of the project:													Transformer replacement							
91	Replacement of 110kV transformer TNo.1 in the substation "Birži" and arrangement of the commercial records	Improving the reliability of the transmission system	none	Latvia, Birži	Replacement of 10 MVA transformer with a transformer of the same power	1980	AST funding	0.45	2027					0.45						
Works to be performed during the implementation of the project:														Transformer replacement and arrangement of commercial records						
92	Replacement of 110 kV transformer TNo.1 in the substation "Gulbene"	Improving the reliability of the transmission system	none	Latvia, Gulbene	Replacement of 16 MVA transformer with a transformer of the same capacity	1982	AST funding	0.46	2028						0.46					
Works to be performed during the implementation of the project:														Transformer replacement						

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93	Replacement of 110 kV transformer TNo.2 in the substation "Rēzekne" and arrangement of the commercial records	Improving the reliability of the transmission system	none	Latvia, Rēzekne	Replacement of 25 MVA transformer with a transformer of the same capacity	1976	AST funding	0.58	2028						0.58				
94	Replacement of 110 kV transformer TNo.1 in the substation "Ilūciems"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of 40 MVA transformer with a transformer of the same power	1976	AST funding	0.55	2028						0.55				
95	Replacement of 110 kV transformer TNo.2 in the substation "Ludza"	Improving the reliability of the transmission system	none	Latvia, Ludza	Replacement of 10 MVA transformer with a transformer of the same power	1977	AST funding	0.28	2029							0.28			
96	Replacement of 110kV transformer TNo.1 in substation "TEC-2"	Improving the reliability of the transmission system	none	Latvia, Acone	Replacement of 25 MVA transformer with a transformer of the same capacity	1970	AST funding	0.48	2029										
97	Replacement of 110 kV transformer TNo.1 in the substation "Zajā birze"	Improving the reliability of the transmission system	none	Latvia, Liepāja	Replacement of 16 MVA transformer with a transformer of the same capacity	1983	AST funding	0.46	2029							0.46			
98	Replacement of 110 kV transformer ATNo.1 in the substation "Aizkraukle"	Improving the reliability of the transmission system	none	Latvia, Aizkraukle	Replacement of 16 MVA transformer with a transformer of the same capacity	1983	AST funding	0.46	2029										
99	Replacement of 110 kV transformer TNo.2 in the substation "Rūjiena"	Improving the reliability of the transmission system	none	Latvia, Rūjiena	Replacement of 10 MVA transformer with a transformer of the same power	1978	AST funding	0.28	2029							0.28			
100	Replacement of 110 kV transformer TNo.1 in the substation "Eleja"	Improving the reliability of the transmission system	none	Latvia, Eleja	Replacement of 10 MVA transformer with a transformer of the same power	1980	AST funding	0.45	2029							0.45			
101	Replacement of 110 kV transformer ATNo.1 in the substation "Stelpe"	Improving the reliability of the transmission system	none	Latvia, Stelpe	Replacement of 10 MVA transformer with a transformer of the same capacity and arrangement of commercial records	1982	AST funding	0.45	2030								0.45		
102	Replacement of 110 kV transformer TNo.2 in the substation "Miezīte"	Improving the reliability of the transmission system	none	Latvia, Miezīte	Replacement of 16 MVA transformer with a transformer of the same capacity	1983	AST funding	0.46	2030										
103	Replacement of 110 kV transformer TNo.1 in the substation "Krāslava"	Improving the reliability of the transmission system	none	Latvia, Krāslava	Replacement of 10 MVA transformer with a transformer of the same power	1977	AST funding	0.28	2030										
104	Replacement of 110 kV transformer TNo.2 in the substation "Dobele"	Improving the reliability of the transmission system	none	Latvia, Dobele	Replacement of 16 MVA transformer with a transformer of the same capacity	1977	AST funding	0.39	2030										
105	Replacement of 110 kV transformer TNo.1 in the substation "Jaunpiebalga"	Improving the reliability of the transmission system	none	Latvia, Jaunpiebalga	Replacement of 10 MVA transformer with a transformer of the same power	1979	AST funding	0.35	2030										
106	Replacement of 110 kV transformer TNo.1 in the substation "Ludza"	Improving the reliability of the transmission system	none	Latvia, Ludza	Replacement of 10 MVA transformer with a transformer of the same power	1977	AST funding	0.28	2030										
107	Replacement of 110 kV transformer TNo.1 in the substation "Rūjiena"	Improving the reliability of the transmission system	none	Latvia, Rūjiena	Replacement of 10 MVA transformer with a transformer of the same power	1978	AST funding	0.28	2030										
108	Replacement of 110 kV transformer TNo.2 in the substation "Ventspils"	Improving the reliability of the transmission system	none	Latvia, Ventspils	Replacement of 25 MVA transformer with a transformer of the same capacity	1978	AST funding	0.48	2030										
109	Replacement of a 110 kV transformer TNo.1 in the substation "RAF"	Improving the reliability of the transmission system	none	Latvia, Jelgava	Replacement of 25 MVA transformer with a transformer of the same capacity	1978	AST funding	0.48	2030										
110	Replacement of 110 kV transformer TNo.1 in the substation "Rēzekne"	Improving the reliability of the transmission system	none	Latvia, Rēzekne	Replacement of 25 MVA transformer with a transformer of the same capacity	1978	AST funding	0.48	2030										
111	Replacement of 110 kV transformer TNo.1 in the substation "Skulte"	Improving the reliability of the transmission system	none	Latvia, Skulte	Replacement of 10 MVA transformer with a transformer of the same power	1978	AST funding	0.35	2031										0.35
112	Replacement of 110 kV transformer TNo.1 in the substation "Salaspils"	Improving the reliability of the transmission system	none	Latvia, Salaspils	Replacement of 25 MVA transformer with a transformer of the same capacity	1991	AST funding	0.50	2031										0.50
113	Replacement of 110 kV transformer TNo.1 in the substation "Grīzkalns"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of 40 MVA transformer with a transformer of the same power	1985	AST funding	0.55	2031										0.55

Financial investments in the transmission infrastructure from 2023 to 2032 (excluding VAT)																				
No.	The project and the sites included	Benefits from the project implementation	For joint projects, indicate the other legal entities involved in the financing of the project and their percentage participation in the financial contribution	Location of project sites	Technical characteristics of the project objects (substation voltages, line lengths, indicating the technology (alternating current, direct current) and other necessary characteristics)	Date of commissioning (of the reconstruction)	Financial contribution	Total financial investments (million EUR)	Total project implementation time (from_ to_)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
114	Replacement of 110 kV transformer TNo.1 in the substation "Ropaži"	Improving the reliability of the transmission system	none	Latvia, Garkalne	Replacement of 16 MVA transformer with a transformer of the same capacity	1979	AST funding	0.42	2031									0.42		
Works to be performed during the implementation of the project:																			Transformer replacement	
115	Replacement of 110 kV transformer TNo.2 in the substation "Ropaži"	Improving the reliability of the transmission system	none	Latvia, Garkalne	Replacement of 16 MVA transformer with a transformer of the same capacity	1979	AST funding	0.42	2031									0.42		
Works to be performed during the implementation of the project:																			Transformer replacement	
116	Replacement of 110 kV transformer TNo.1 in the substation "Salamandra"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of 25 MVA transformer with a transformer of the same capacity	1979	AST funding	0.48	2031									0.48		
Works to be performed during the implementation of the project:																			Transformer replacement	
117	Replacement of 110 kV transformer TNo.2 in the substation "Grobīņa"	Improving the reliability of the transmission system	none	Latvia, Grobiņa	Replacement of 16 MVA transformer with a transformer of the same capacity	1973	AST funding	0.42	2031									0.42		
Works to be performed during the implementation of the project:																			Transformer replacement	
118	Replacement of 110 kV transformer TNo.2 in the substation "Grīziņkalns"	Improving the reliability of the transmission system	none	Latvia, Riga	Replacement of 40 MVA transformer with a transformer of the same power	1986	AST funding	0.48	2031									0.48		
Works to be performed during the implementation of the project:																			Transformer replacement	
119	Replacement of 110 kV transformer TNo.2 in the substation "Krāslava"	Improving the reliability of the transmission system	none	Latvia, Krāslava	Replacement of 10 MVA transformer with a transformer of the same power	1977	AST funding	0.28	2031									0.28		
Works to be performed during the implementation of the project:																			Transformer replacement	
120	Replacement of 110 kV transformer TNo.1 in the substation "Barkava"	Improving the reliability of the transmission system	none	Latvia, Barkava	Replacement of 10 MVA transformer with a transformer of the same power	1978	AST funding	0.28	2032										0.28	
Works to be performed during the implementation of the project:																			Transformer replacement	
121	Replacement of 110 kV transformer TNo.1 in the substation "Smiltene"	Improving the reliability of the transmission system	none	Latvia, Smiltene	Replacement of 16 MVA transformer with a transformer of the same capacity	1980	AST funding	0.56	2032										0.56	
Works to be performed during the implementation of the project:																			Transformer replacement	
122	Replacement of 110 kV transformer TNo.1 in the substation "Ventspils"	Improving the reliability of the transmission system	none	Latvia, Ventspils	Replacement of 25 MVA transformer with a transformer of the same capacity	1980	AST funding	0.48	2032										0.48	
Works to be performed during the implementation of the project:																			Transformer replacement	
123	Replacement of 110 kV transformer TNo.1 in the substation "Pļaviņas"	Improving the reliability of the transmission system	none	Latvia, Pļaviņas	Replacement of 10 MVA transformer with a transformer of the same power	1979	AST funding	0.35	2032										0.35	
Works to be performed during the implementation of the project:																			Transformer replacement	
124	Replacement of 110 kV transformer TNo.2 in the substation "Inčukalns"	Improving the reliability of the transmission system	none	Latvia, Krustpīņi	Replacement of 16 MVA transformer with a transformer of the same capacity	1979	AST funding	0.42	2032										0.42	
Works to be performed during the implementation of the project:																			Transformer replacement	
125	Replacement of 110 kV transformer TNo.1 in the substation "Tiraine"	Improving the reliability of the transmission system	none	Latvia, Mārupe	Replacement of 25 MVA transformer with a transformer of the same capacity	1980	AST funding	0.48	2032										0.48	
Works to be performed during the implementation of the project:																			Transformer replacement	
126	Replacement of 110 kV transformer TNo.1 in the substation "Limbaži"	Improving the reliability of the transmission system	none	Latvia, Limbaži	Replacement of 10 MVA transformer with a transformer of the same power	1983	AST funding	0.35	2032										0.35	
Works to be performed during the implementation of the project:																			Transformer replacement	
127	Replacement of 110 kV transformer TNo.1 in the substation "Ērgļi"	Improving the reliability of the transmission system	none	Latvia, Ērgļi	Replacement of 10 MVA transformer with a transformer of the same power	1978	AST funding	0.28	2032										0.28	
Works to be performed during the implementation of the project:																			Transformer replacement	
Transformers in total										0.84	0.58	1.35	1.77	0.45	1.59	2.41	3.93	3.90	3.20	
128	Partial reconstruction of 110 kV substations related to the reconstruction of medium voltage distribution facilities	Improving the reliability of the transmission system	none	Latvia	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	-	AST funding	1.90	2023-2032	0.27	0.38	0.15	0.15	0.15	0.12	0.35	0.35	0.36	0.36	
Works to be performed during the implementation of the project:										Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.	Reconstruction of transformer connection RAA equipment, reconstruction of transformer bus bars, reconstruction of commercial accounting, reconstruction of dispatch control systems, etc.
129	Increasing the user's permissible load	Increasing the user's permissible load	In proportion to the permissible load	Latvia	Replacement of transformers installed in the substations and conversions, reconstruction of substations or increase of capacity of transmission lines related to such activities	-	AST funding	0.00	2023-2032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Works to be performed during the implementation of the project:										0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
130	Reconstruction of 330 kV power transmission lines	Maintenance of transmission system operation	none	Latvia	Replacement of poles, wires, fittings, etc., replacement of screen cable, etc.	-	Network owner financing	40.27	2023-2032	3.96	4.36	4.57	3.97	3.89	3.55	3.91	3.92	4.26	3.89	
Works to be performed during the implementation of the project:										Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.
131	Reconstruction of 110 kV power transmission lines	Maintenance of transmission system operation	none	Latvia	Replacement of poles, wires, fittings, etc., replacement of screen cable, etc.	-	AST funding	54.96	2023-2032	8.60	4.21	2.80	4.25	5.35	5.74	5.54	5.50	6.24	6.73	
Works to be performed during the implementation of the project:										Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	Replacement of poles, wires, fittings, replacement of screen cable, etc.	

