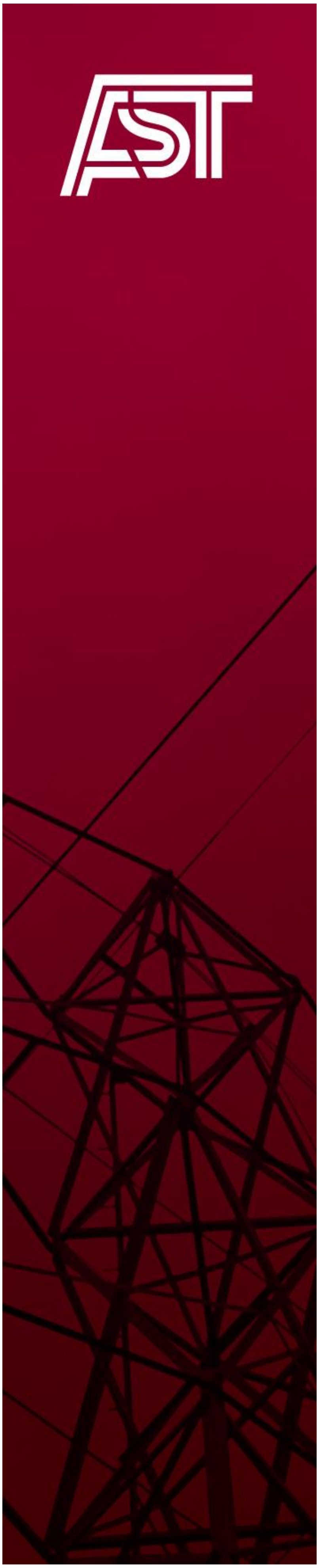

Annual statement of transmission system operator for the year 2013

Riga – 2014

The Report is prepared in accordance with the Regulation No. 322 "Regulations on the TSO's annual statement" by Latvian Cabinet of Ministers from April 25, 2006, taking into account "Energy Development Guidelines for years 2007-2016 in Latvia" approved by the Latvian Cabinet of Ministers.

1. Electricity and power demand in the country last year

1.1. Electricity consumption (including losses) by week for year 2013.

Total annual energy consumption including losses equals 7 602 087 MWh.

Table 1.

Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Consumption, MWh	158364	182117	189174	182172	174589	166412	166054	171091
Week	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Consumption, MWh	161063	165475	171061	167399	151707	155337	152271	145604
Week	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Consumption, MWh	137978	130829	131837	131250	130214	128655	130122	127033
Week	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
Consumption, MWh	128436	125189	128751	128825	123540	124355	129587	131405
Week	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Consumption, MWh	125774	130031	128541	128834	130668	132338	139201	145086
Week	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Consumption, MWh	143861	145150	147081	143093	148268	151576	150251	157033
Week	**49**	**50**	**51**	**52**				
Consumption, MWh	160678	167592	159289	139849				

1.2. Maximum winter peak load and minimum summer load.

Minimum load:	461 MW	22.07.2013.g.	5:00
Maximum load:	1344 MW	14.01.2013.g.	18:00

1.3. System load in control measurement days (24 hours).

Table 2

2013	**June 22nd.**	**January 14th.**
h	**MWh**	**MWh**
01:00	553	855
02:00	508	814
03:00	492	798
04:00	482	790
05:00	461	793
06:00	467	844
07:00	542	968
08:00	653	1155
09:00	768	1261

10:00	834	1312
11:00	857	1286
12:00	857	1275
13:00	833	1216
14:00	856	1227
15:00	849	1265
16:00	835	1274
17:00	823	1324
18:00	802	1344
19:00	799	1326
20:00	786	1291
21:00	776	1256
22:00	759	1192
23:00	725	1072
00:00	656	975
Total	**16 973**	**26 913**

2. Electricity and power demand in the coming years (minimum forecast period - 10 years), including the annual electricity consumption and peak loads by scenarios

Maximum power system load is calculated (normalized) based on the Latvian Ministry of Economics submitted Latvian GDP growth forecast to average regulatory outdoor temperature during winter period (December-February) -3.5°C (Table 3). Changes in outdoor temperature also changes the maximum load. Electricity consumption of the system is forecasted for two scenarios - conservative and optimistic.

Table 3

Year	**Annual consumption for conservative scenario**	**Annual consumption for optimistic scenario**	**Peak load**
	GWh	**GWh**	**MW**
2014	7689	7767	1373
2015	7739	7882	1399
2016	7798	7999	1424
2017	7847	8134	1453
2018	7895	8307	1483
2019	7916	8387	1513
2020	7987	8537	1543
2021	8025	8649	1576
2022	8098	8817	1609
2023	8132	8930	1641
2024	8193	9045	1674

3. Generation and consumption compliance rating during the reporting period and forecast for the future years (minimum forecast period - 10 years)

3.1. Annual power consumption and possible sources of power supplies

Electricity and electrical power balances as well as electricity consumption forecast is developed for two scenarios:

- **Scenario A "Conservative development"**: generating capacity development that takes into account the power plants, which are placed in service or closed in accordance with the information in possession of transmission system operator (hereinafter referred to as – TSO);

- **Scenario B "Optimistic development"**: This forecast takes into account the future development of the base power stations, whose commissioning, according to information available to the TSO, is regarded as possible.

In **Scenario A** second unit of RigaCHP2 is commissioned at September 24, 2013 with an installed capacity of 439 MW (licensed installed capacity). Total installed electric capacity of RigaCHP2 power station is 881 MW.

In **B Scenario** additional to Scenario A until year 2024, due to public support for electricity produced from renewable energy sources a faster wind, biomass and biogas power development is predicted. New high-power base power station development in Latvia for next 10 years is not planned.

Note: *Power plant output is presented in net values and takes into account the power station planned annual maintenance schedules.*

Assumptions and explanations for the tables:

1) Daugava cascade hydropower plants (hereinafter - the Daugava HPP) multi-annual average net output according to the statistical data are 2700 GWh per year.

2) In 2010, a five-party agreement of BRELL ring between the Estonian, Latvian, Lithuanian, Russian and Belarusian TSO provides for the mutual provision of emergency reserves from the beginning of the realization and up to 12 hours. Emergency reserve for Latvia provides BRELL five-party agreement on a common emergency reserve maintenance for each of the parties involved, maintaining 100 MW each, which consists of the sum of 500 MW. Taking into consideration the largest generating unit load in Latvia, Latvian power system needs of the emergency reserve is ensured according to the maximum generating units planned load, i.e. up to 442 MW (RigaCHP2 largest unit), because the missing power amount 3*100MW from neighbouring power systems can be received only 12 hours.

3) On 2011 agreement on emergency replacement reserve provision from “Latvenergo” AS (reserve capacity is 100 MW) has been signed, that was in force in 2013 also.

4) Power system regulation reserve assessed as 6% of the system peak load and 10% of the installed wind power station capacity for winter day peak load.

5) For power balance monthly assessment it is necessary to account water inflow for DaugavaHPPs in Daugava river. For January least average inflow has been 125 m^3/sek, which corresponds to 220 MW of power for covering peak demand.

6) Installed capacities of power stations in the tables are presented, including their own self-consumption (gross), but the rest of the tables are shown excluding self-consumption (net).

Gross output is the total capacity of the power station developed by all main generator units and generators for self-consumption. Net power output is gross output minus the power of the self-consumption equipment required for feeding power and power losses in transformers.

7) Wind power installed capacity and net capacity for conservative scenario assumed on the basis of the information report "Latvian Republic Action for renewable energy in the European Parliament and of the Council of 23 April 2009 Directive 2009/28/EC on the promotion of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC by 2020", in the optimistic scenario – based on technical requirements for producers issued by "Augstsprieguma tikls" AS and "Sadales tikls" AS.

8) In the conservative scenario, biomass and biogas power plant capacity assessed on the basis of the information presented in the report "Latvian Republic Action for renewable energy in the European Parliament and of the Council of 23 April 2009 Directive 2009/28/EC on the promotion of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC by 2020", but in the optimistic scenario – based on technical requirements for producers issued by "Augstsprieguma tikls" AS and "Sadales tikls" AS.

9) Starting from 2015 in electricity balance tables RigaCHP1 and RigaCHP2 power generation is assessed as possible, for both RigaCHPs developing the maximum possible amount of electricity in annual terms. For possibility of co-generation stations to receive compulsory payment for installed capacity according to Cabinet of Ministers Regulations No 221 "Regulations on electricity production and pricing with cogeneration stations" the utilization time of co-generation power stations or a separate equipment installed in them must be at least 1200 hours per year.

Installed capacities (bruto) of power stations, MW

Table 4

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Power stations with installed capacity above 40 MW [6)]	**1**	**2633**	**2638**	**2648**	**2659**	**2660**	**2661**	**2662**	**2663**	**2664**	**2664**	**2664**
Including: Daugava HPPs	*1.1*	*1560*	*1565*	*1575*	*1586*	*1587*	*1588*	*1589*	*1590*	*1591*	*1591*	*1591*
Riga CHP1	*1.2*	*144*	*144*	*144*	*144*	*144*	*144*	*144*	*144*	*144*	*144*	*144*
Riga CHP2	*1.3*	*881*	*881*	*881*	*881*	*881*	*881*	*881*	*881*	*881*	*881*	*881*
Imanta CHP	*1.4*	*48*	*48*	*48*	*48*	*48*	*48*	*48*	*48*	*48*	*48*	*48*
Installed capacity of small power stations (conservative scenario)	**2**	**319**	**355**	**392**	**428**	**464**	**500**	**576**	**636**	**696**	**756**	**817**
Including: Natural gas co-generation stations	*2.1*	*118*	*119*	*120*	*121*	*122*	*123*	*125*	*126*	*127*	*128*	*130*
Hydro power stations	*2.2*	*28*	*28*	*29*	*29*	*29*	*29*	*29*	*29*	*30*	*30*	*30*
Wind power stations [7)]	*2.3*	*75*	*100*	*125*	*150*	*175*	*200*	*264*	*313*	*361*	*410*	*459*
Onshore	*2.3.1.*	*75*	*100*	*125*	*150*	*175*	*200*	*225*	*250*	*275*	*300*	*325*
Offshore	*2.3.2.*	*0*	*0*	*0*	*0*	*0*	*0*	*39*	*63*	*86*	*110*	*134*
Biomass power stations [8)]	*2.4*	*36*	*40*	*44*	*48*	*52*	*56*	*60*	*64*	*68*	*72*	*76*
Biogas power stations [8)]	*2.5*	*61*	*67*	*72*	*78*	*83*	*89*	*94*	*100*	*105*	*111*	*117*
Solar power stations	*2.6*	*0.68*	*1.14*	*1.60*	*2.06*	*2.51*	*2.97*	*3.43*	*3.88*	*4.34*	*4.80*	*5.26*
Installed capacity of small power stations (optimistic scenario)	**3**	**331**	**384**	**437**	**491**	**584**	**665**	**745**	**826**	**907**	**988**	**1069**
Including: Natural gas co-generation stations	*3.1*	*121*	*124*	*127*	*130*	*133*	*135*	*138*	*141*	*144*	*147*	*150*
Hydro power stations	*3.2*	*28*	*28*	*29*	*29*	*29*	*29*	*29*	*29*	*30*	*30*	*30*
Wind power stations [7)]	*3.3*	*75*	*106*	*137*	*168*	*239*	*297*	*356*	*414*	*473*	*531*	*590*
Onshore	*3.3.1.*	*75*	*106*	*137*	*168*	*199*	*229*	*260*	*291*	*322*	*353*	*384*
Offshore	*3.3.2.*	*0*	*0*	*0*	*0*	*40*	*68*	*95*	*123*	*151*	*178*	*206*
Biomass power stations [8)]	*3.4*	*39*	*46*	*53*	*60*	*67*	*74*	*81*	*88*	*95*	*101*	*108*
Biogas power stations [8)]	*3.5*	*67*	*78*	*90*	*101*	*113*	*124*	*136*	*147*	*158*	*170*	*181*
Solar power stations	*3.6*	*1.10*	*1.92*	*2.73*	*3.55*	*4.37*	*5.19*	*6.01*	*6.82*	*7.64*	*8.46*	*9.28*

Latvian power system balance for Scenario A winter peak load hours, MW (neto)

Table 5

Years		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Maximum load	**1**	**1373**	**1399**	**1424**	**1453**	**1483**	**1513**	**1543**	**1576**	**1609**	**1641**	**1674**
Power stations with installed capacity above 40 MW	**2**	**2584**	**2589**	**2599**	**2609**	**2610**	**2611**	**2612**	**2613**	**2614**	**2614**	**2614**
Including: Daugava HPPs	*2.1*	*1552*	*1557*	*1567*	*1578*	*1579*	*1580*	*1581*	*1582*	*1583*	*1583*	*1583*
Riga CHP1	*2.2*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*
Riga CHP2	*2.3*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*
Imanta CHP	*2.4*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*
Small power stations	**3**	**297**	**332**	**367**	**402**	**437**	**472**	**546**	**604**	**663**	**721**	**781**
Including: Natural gas co-generation power stations	*3.1*	*107*	*108*	*109*	*110*	*111*	*112*	*113*	*114*	*115*	*116*	*118*
Hydro power stations	*3.2*	*27*	*27*	*27*	*27*	*28*	*28*	*28*	*28*	*28*	*28*	*29*
Wind power stations	*3.3*	*74*	*99*	*124*	*149*	*173*	*198*	*261*	*310*	*358*	*406*	*454*
Onshore	*3.3.1.*	*74*	*99*	*124*	*149*	*173*	*198*	*223*	*248*	*272*	*297*	*322*
Offshore	*3.3.2.*	*0*	*0*	*0*	*0*	*0*	*0*	*39*	*62*	*86*	*109*	*133*
Biomass power stations	*3.4*	*33*	*36*	*40*	*44*	*47*	*51*	*55*	*58*	*62*	*65*	*69*
Biogas power stations	*3.5*	*55*	*60*	*66*	*71*	*76*	*81*	*86*	*91*	*96*	*101*	*106*
Solar power stations	*3.6*	*0.61*	*1.03*	*1.44*	*1.85*	*2.26*	*2.67*	*3.08*	*3.50*	*3.91*	*4.32*	*4.73*
Available capacities for peak load and reserve guaranteeing	**4**	**1401**	**1411**	**1420**	**1430**	**1439**	**1449**	**1462**	**1474**	**1485**	**1497**	**1510**
Including: Daugava HPPs [5)]	*4.01*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*
Riga CHP1	*4.02*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*
Riga CHP2	*4.03*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*
Imanta CHP	*4.04*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*
Natural gas co-generation power stations	*4.05*	*75*	*76*	*76*	*77*	*78*	*79*	*79*	*80*	*81*	*81*	*83*
Hydro power stations	*4.06*	*5*	*5*	*5*	*5*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
Wind power stations	*4.07*	*7*	*10*	*12*	*15*	*17*	*20*	*26*	*31*	*36*	*41*	*45*
Biomass power stations	*4.08*	*23*	*26*	*28*	*31*	*33*	*36*	*38*	*41*	*43*	*46*	*48*
Biogas power stations	*4.09*	*39*	*42*	*46*	*49*	*53*	*57*	*60*	*64*	*67*	*71*	*74*
Solar power stations	*4.10*	*0.25*	*0.41*	*0.58*	*0.74*	*0.90*	*1.07*	*1.23*	*1.40*	*1.56*	*1.73*	*1.89*
Power system emergency reserve [2)]	**5**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Power system regulating reserve [4)]	**6**	**90**	**94**	**98**	**102**	**106**	**111**	**119**	**126**	**132**	**139**	**146**
Total reserve in Latvia	**7=5+6**	**190**	**194**	**198**	**202**	**206**	**211**	**219**	**226**	**232**	**239**	**246**
Power deficit	**8=4-1-7**	**-162**	**-182**	**-202**	**-225**	**-251**	**-275**	**-300**	**-328**	**-355**	**-383**	**-411**
Power adequacy	**9=(4-7)/1**	**88%**	**87%**	**86%**	**85%**	**83%**	**82%**	**81%**	**79%**	**78%**	**77%**	**75%**

Latvian power system balance for Scenario B winter peak load hours, MW (neto)

Table 6

Years		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Maximum load	**1**	**1373**	**1399**	**1424**	**1453**	**1483**	**1513**	**1543**	**1576**	**1609**	**1641**	**1674**
Power stations with installed capacity above 40 MW	**2**	**2584**	**2589**	**2599**	**2609**	**2610**	**2611**	**2612**	**2613**	**2614**	**2614**	**2614**
Including: Daugava HPPs	*2.1*	*1552*	*1557*	*1567*	*1578*	*1579*	*1580*	*1581*	*1582*	*1583*	*1583*	*1583*
Riga CHP1	*2.2*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*
Riga CHP2	*2.3*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*
Imanta CHP	*2.4*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*
Small power stations	**3**	**306**	**355**	**404**	**453**	**542**	**619**	**695**	**772**	**848**	**925**	**1003**
Including: Natural gas co-generation power stations	*3.1*	*107*	*108*	*109*	*110*	*111*	*112*	*113*	*114*	*115*	*116*	*118*
Hydro power stations	*3.2*	*27*	*27*	*27*	*27*	*28*	*28*	*28*	*28*	*28*	*28*	*29*
Wind power stations	*3.3*	*74*	*105*	*135*	*166*	*236*	*294*	*352*	*410*	*468*	*526*	*584*
Onshore	*3.3.1.*	*74*	*105*	*135*	*166*	*197*	*227*	*258*	*288*	*319*	*349*	*380*
Offshore	*3.3.2.*	*0*	*0*	*0*	*0*	*40*	*67*	*94*	*122*	*149*	*177*	*204*
Biomass power stations	*3.4*	*35*	*42*	*48*	*54*	*61*	*67*	*73*	*80*	*86*	*92*	*99*
Biogas power stations	*3.5*	*61*	*71*	*82*	*92*	*102*	*113*	*123*	*134*	*144*	*154*	*165*
Solar power stations	*3.6*	*0.99*	*1.72*	*2.46*	*3.20*	*3.93*	*4.67*	*5.40*	*6.14*	*6.88*	*7.61*	*8.35*
Available capacities for peak load and reserve guaranteeing	**4**	**1407**	**1423**	**1439**	**1454**	**1474**	**1493**	**1511**	**1530**	**1548**	**1567**	**1586**
Including: Daugava HPPs [5)]	*4.01*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*	*220*
Riga CHP1	*4.02*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*
Riga CHP2	*4.03*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*	*850*
Imanta CHP	*4.04*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*	*42*
Natural gas co-generation power stations	*4.05*	*75*	*76*	*76*	*77*	*78*	*79*	*79*	*80*	*81*	*81*	*83*
Hydro power stations	*4.06*	*5*	*5*	*5*	*5*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
Wind power stations	*4.07*	*7*	*10*	*14*	*17*	*24*	*29*	*35*	*41*	*47*	*53*	*58*
Biomass power stations	*4.08*	*25*	*29*	*34*	*38*	*42*	*47*	*51*	*56*	*60*	*65*	*69*
Biogas power stations	*4.09*	*43*	*50*	*57*	*64*	*72*	*79*	*86*	*94*	*101*	*108*	*115*
Solar power stations	*4.10*	*0.40*	*0.69*	*0.98*	*1.28*	*1.57*	*1.87*	*2.16*	*2.46*	*2.75*	*3.04*	*3.34*
Power system emergency reserve [2)]	**5**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Power system regulating reserve [4)]	**6**	**90**	**94**	**99**	**104**	**113**	**120**	**128**	**136**	**143**	**151**	**159**
Total reserve in Latvia	**7=5+6**	**190**	**194**	**199**	**204**	**213**	**220**	**228**	**236**	**243**	**251**	**259**
Power deficit	**8=4-1-7**	**-156**	**-171**	**-185**	**-202**	**-222**	**-241**	**-260**	**-282**	**-304**	**-326**	**-347**
Power adequacy	**9=(4-7)/1**	**89%**	**88%**	**87%**	**86%**	**85%**	**84%**	**83%**	**82%**	**81%**	**80%**	**79%**

Possible power balance for Scenario A (annual values), GWh

Table 7

Scenario A

Years		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Energy demand	**1**	**7689**	**7739**	**7798**	**7847**	**7895**	**7916**	**7987**	**8025**	**8098**	**8132**	**8193**
Output in power stations with installed capacity above 40 MW	**2**	**5457**	**9510**	**9531**	**9552**	**9558**	**9563**	**9568**	**9574**	**9579**	**9579**	**9579**
Including: Daugava HPPs [1]	*2.1*	*2767*	*2763*	*2784*	*2805*	*2811*	*2816*	*2821*	*2827*	*2832*	*2832*	*2832*
Riga CHP1 [9]	*2.2*	*400*	*894*	*894*	*894*	*894*	*894*	*894*	*894*	*894*	*894*	*894*
Riga CHP2 [9]	*2.3*	*2000*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*
Imanta CHP	*2.4*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*
Small power stations	**3**	**1426**	**1514**	**1602**	**1691**	**1779**	**1867**	**1994**	**2106**	**2218**	**2330**	**2448**
Including: Natural gas co-generation power stations	*3.1*	*697*	*704*	*710*	*717*	*723*	*730*	*736*	*742*	*749*	*755*	*768*
Hydro power stations	*3.2*	*81*	*81*	*82*	*82*	*83*	*83*	*84*	*84*	*85*	*85*	*86*
Wind power stations	*3.3*	*74*	*99*	*124*	*149*	*173*	*198*	*261*	*310*	*358*	*406*	*454*
Onshore	*3.3.1.*	*74*	*99*	*124*	*149*	*173*	*198*	*223*	*248*	*272*	*297*	*322*
Offshore	*3.3.2.*	*0*	*0*	*0*	*0*	*0*	*0*	*39*	*62*	*86*	*109*	*133*
Biomass power stations	*3.4*	*213*	*237*	*260*	*284*	*308*	*331*	*355*	*378*	*402*	*426*	*449*
Biogas power stations	*3.5*	*360*	*393*	*426*	*459*	*492*	*525*	*558*	*590*	*623*	*656*	*689*
Solar power stations	*3.6*	*0.18*	*0.31*	*0.43*	*0.55*	*0.68*	*0.80*	*0.93*	*1.05*	*1.17*	*1.30*	*1.4*
Possible annual export/import	**4=(2+3)-1**	**-807**	**3285**	**3336**	**3396**	**3442**	**3514**	**3575**	**3655**	**3699**	**3777**	**3835**
Spring flood period export	**5**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**
Annual adequacy	**6=(2+3-5)/1**	**83%**	**136%**	**136%**	**137%**	**137%**	**138%**	**139%**	**139%**	**140%**	**140%**	**141%**

Possible power balance for Scenario B (annual values), GWh

Scenario B

Table 8

Years		**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Energy demand	**1**	**7767**	**7882**	**7999**	**8134**	**8307**	**8387**	**8537**	**8649**	**8817**	**8930**	**9045**
Output in power stations with installed capacity above 40 MW	**2**	**5457**	**9510**	**9531**	**9552**	**9558**	**9563**	**9568**	**9574**	**9579**	**9579**	**9579**
Including: Daugava HPPs [1)]	*2.1*	*2767*	*2763*	*2784*	*2805*	*2811*	*2816*	*2821*	*2827*	*2832*	*2832*	*2832*
Riga CHP1 [9)]	*2.2*	*400*	*894*	*894*	*894*	*894*	*894*	*894*	*894*	*894*	*894*	*894*
Riga CHP2 [9)]	*2.3*	*2000*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*	*5563*
Imanta CHP	*2.4*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*	*290*
Small power stations	**3**	**1500**	**1662**	**1824**	**1986**	**2207**	**2411**	**2614**	**2817**	**3020**	**3224**	**3433**
Including: Natural gas co-generation power stations	*3.1*	*697*	*704*	*710*	*717*	*723*	*730*	*736*	*742*	*749*	*755*	*768*
Hydro power stations	*3.2*	*64*	*65*	*65*	*66*	*66*	*66*	*67*	*67*	*68*	*68*	*69*
Wind power stations	*3.3*	*111*	*157*	*203*	*249*	*354*	*441*	*528*	*615*	*702*	*789*	*876*
Onshore	*3.3.1.*	*111*	*157*	*203*	*249*	*295*	*341*	*387*	*432*	*478*	*524*	*570*
Offshore	*3.3.2.*	*0*	*0*	*0*	*0*	*59*	*101*	*142*	*183*	*224*	*265*	*306*
Biomass power stations	*3.4*	*231*	*272*	*313*	*354*	*395*	*436*	*477*	*518*	*559*	*599*	*640*
Biogas power stations	*3.5*	*395*	*463*	*530*	*598*	*666*	*733*	*801*	*868*	*936*	*1004*	*1071*
Solar power stations	*3.6*	*1.0*	*1.7*	*2.5*	*3.2*	*3.9*	*4.7*	*5.4*	*6.1*	*6.9*	*7.6*	*8.3*
Possible annual export/import	**4=(2+3)-1**	**-810**	**3290**	**3356**	**3404**	**3459**	**3587**	**3645**	**3742**	**3783**	**3872**	**3967**
Spring flood period export	**5**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**
Annual adequacy	**6=(2+3-5)/1**	**83%**	**135%**	**136%**	**136%**	**136%**	**137%**	**137%**	**137%**	**137%**	**138%**	**138%**

Power demand and possible sources of guaranteeing, hourly balance for Scenario A (peak load), MW

Scenario A

Year 2015. January, Wednesday of the third week. Working day peak load

Table 9

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
01:00	139	550	42	26	42	76	5	10	0.00	0	0	890
02:00	139	507	42	26	42	76	5	10	0.00	0	0	847
03:00	139	491	42	26	42	76	5	10	0.00	0	0	831
04:00	139	482	42	26	42	76	5	10	0.00	0	0	822
05:00	139	486	42	26	42	76	5	10	0.00	0	0	825
06:00	139	539	42	26	42	76	5	10	0.00	0	0	879
07:00	139	668	42	26	42	76	5	10	0.00	0	0	1008
08:00	139	832	42	26	42	76	5	10	0.00	30	0	1202
09:00	139	767	42	26	42	76	5	10	0.25	206	0	1313
10:00	139	796	42	26	42	76	5	10	0.25	230	0	1366
11:00	139	850	42	26	42	76	5	10	0.25	104	44	1339
12:00	139	850	42	26	42	76	5	10	0.25	0	137	1327
13:00	139	850	42	26	42	76	5	10	0.25	0	76	1266
14:00	139	850	42	26	42	76	5	10	0.25	0	87	1277
15:00	139	850	42	26	42	76	5	10	0.25	66	60	1317
16:00	139	850	42	26	42	76	5	10	0.25	73	63	1326
17:00	139	850	42	26	42	76	5	10	0.00	140	49	1378
18:00	139	850	42	26	42	76	5	10	0.00	205	5	1399
19:00	139	834	42	26	42	76	5	10	0.00	206	0	1380
20:00	139	850	42	26	42	76	5	10	0.00	80	74	1344
21:00	139	850	42	26	42	76	5	10	0.00	0	117	1307
22:00	139	850	42	26	42	76	5	10	0.00	0	51	1241
23:00	139	776	42	26	42	76	5	10	0.00	0	0	1116
00:00	139	675	42	26	42	76	5	10	0.00	0	0	1015

Scenario A

Year 2019. January, Wednesday of the third week. Working day peak load

Table 10

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
01:00	139	585	42	36	57	79	6	20	0.00	0	0	963
02:00	139	539	42	36	57	79	6	20	0.00	0	0	916
03:00	139	521	42	36	57	79	6	20	0.00	0	0	898
04:00	139	512	42	36	57	79	6	20	0.00	0	0	889
05:00	139	516	42	36	57	79	6	20	0.00	0	0	893
06:00	139	573	42	36	57	79	6	20	0.00	0	0	950
07:00	139	713	42	36	57	79	6	20	0.00	0	0	1090
08:00	139	850	42	36	57	79	6	20	0.00	30	43	1300
09:00	139	836	42	36	57	79	6	20	1.07	206	0	1420
10:00	139	850	42	36	57	79	6	20	1.07	230	19	1477
11:00	139	850	42	36	57	79	6	20	1.07	104	115	1448
12:00	139	850	42	36	57	79	6	20	1.07	0	207	1435
13:00	139	850	42	36	57	79	6	20	1.07	0	141	1369
14:00	139	850	42	36	57	79	6	20	1.07	0	153	1381
15:00	139	850	42	36	57	79	6	20	1.07	66	130	1424
16:00	139	850	42	36	57	79	6	20	1.07	73	133	1434
17:00	139	850	42	36	57	79	6	20	0.00	140	124	1491
18:00	139	850	42	36	57	79	6	20	0.00	205	81	1513
19:00	139	850	42	36	57	79	6	20	0.00	206	59	1493
20:00	139	850	42	36	57	79	6	20	0.00	80	146	1453
21:00	139	850	42	36	57	79	6	20	0.00	0	187	1414
22:00	139	850	42	36	57	79	6	20	0.00	0	115	1342
23:00	139	830	42	36	57	79	6	20	0.00	0	0	1207
00:00	139	721	42	36	57	79	6	20	0.00	0	0	1098

Scenario A

Year 2024. January, Wednesday of the third week. Working day peak load *Table 11*

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
01:00	139	628	42	48	74	83	6	45	0.00	0	0	1065
02:00	139	577	42	48	74	83	6	45	0.00	0	0	1014
03:00	139	557	42	48	74	83	6	45	0.00	0	0	994
04:00	139	547	42	48	74	83	6	45	0.00	0	0	984
05:00	139	551	42	48	74	83	6	45	0.00	0	0	988
06:00	139	614	42	48	74	83	6	45	0.00	0	0	1052
07:00	139	769	42	48	74	83	6	45	0.00	0	0	1206
08:00	139	850	42	48	74	83	6	45	0.00	30	121	1439
09:00	139	850	42	48	74	83	6	45	1.89	206	76	1571
10:00	139	850	42	48	74	83	6	45	1.89	230	115	1635
11:00	139	850	42	48	74	83	6	45	1.89	104	209	1602
12:00	139	850	42	48	74	83	6	45	1.89	0	299	1588
13:00	139	850	42	48	74	83	6	45	1.89	0	226	1515
14:00	139	850	42	48	74	83	6	45	1.89	0	239	1529
15:00	139	850	42	48	74	83	6	45	1.89	66	220	1576
16:00	139	850	42	48	74	83	6	45	1.89	73	225	1587
17:00	139	850	42	48	74	83	6	45	0.00	140	223	1650
18:00	139	850	42	48	74	83	6	45	0.00	205	182	1674
19:00	139	850	42	48	74	83	6	45	0.00	206	158	1652
20:00	139	850	42	48	74	83	6	45	0.00	80	241	1608
21:00	139	850	42	48	74	83	6	45	0.00	0	277	1565
22:00	139	850	42	48	74	83	6	45	0.00	0	198	1485
23:00	139	850	42	48	74	83	6	45	0.00	0	48	1336
00:00	139	777	42	48	74	83	6	45	0.00	0	0	1215

Power demand and possible sources of guaranteeing, hourly balance for Scenario B (peak load), MW

Scenario B

Year 2015. January, Wednesday of the third week. Working day peak load

Table 12

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
01:00	139	538	42	29	50	76	5	10	0.00	0	0	890
02:00	139	496	42	29	50	76	5	10	0.00	0	0	847
03:00	139	479	42	29	50	76	5	10	0.00	0	0	831
04:00	139	471	42	29	50	76	5	10	0.00	0	0	822
05:00	139	474	42	29	50	76	5	10	0.00	0	0	825
06:00	139	527	42	29	50	76	5	10	0.00	0	0	879
07:00	139	656	42	29	50	76	5	10	0.00	0	0	1008
08:00	139	820	42	29	50	76	5	10	0.00	30	0	1202
09:00	139	755	42	29	50	76	5	10	0.69	206	0	1313
10:00	139	784	42	29	50	76	5	10	0.69	230	0	1366
11:00	139	850	42	29	50	76	5	10	0.69	104	32	1339
12:00	139	850	42	29	50	76	5	10	0.69	0	125	1327
13:00	139	850	42	29	50	76	5	10	0.69	0	63	1266
14:00	139	850	42	29	50	76	5	10	0.69	0	75	1277
15:00	139	850	42	29	50	76	5	10	0.69	66	48	1317
16:00	139	850	42	29	50	76	5	10	0.69	73	51	1326
17:00	139	850	42	29	50	76	5	10	0.00	140	37	1378
18:00	139	843	42	29	50	76	5	10	0.00	205	0	1399
19:00	139	822	42	29	50	76	5	10	0.00	206	0	1380
20:00	139	850	42	29	50	76	5	10	0.00	80	62	1344
21:00	139	850	42	29	50	76	5	10	0.00	0	106	1307
22:00	139	850	42	29	50	76	5	10	0.00	0	39	1241
23:00	139	764	42	29	50	76	5	10	0.00	0	0	1116
00:00	139	663	42	29	50	76	5	10	0.00	0	0	1015

Scenario B

Year 2019. January, Wednesday of the third week. Working day peak load

Table 13

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
01:00	139	542	42	47	79	79	6	29	0.00	0	0	963
02:00	139	496	42	47	79	79	6	29	0.00	0	0	916
03:00	139	478	42	47	79	79	6	29	0.00	0	0	898
04:00	139	469	42	47	79	79	6	29	0.00	0	0	889
05:00	139	472	42	47	79	79	6	29	0.00	0	0	893
06:00	139	530	42	47	79	79	6	29	0.00	0	0	950
07:00	139	669	42	47	79	79	6	29	0.00	0	0	1090
08:00	139	850	42	47	79	79	6	29	0.00	30	0	1300
09:00	139	792	42	47	79	79	6	29	1.87	206	0	1420
10:00	139	825	42	47	79	79	6	29	1.87	230	0	1477
11:00	139	850	42	47	79	79	6	29	1.87	104	71	1448
12:00	139	850	42	47	79	79	6	29	1.87	0	163	1435
13:00	139	850	42	47	79	79	6	29	1.87	0	97	1369
14:00	139	850	42	47	79	79	6	29	1.87	0	109	1381
15:00	139	850	42	47	79	79	6	29	1.87	66	86	1424
16:00	139	850	42	47	79	79	6	29	1.87	73	89	1434
17:00	139	850	42	47	79	79	6	29	0.00	140	81	1491
18:00	139	850	42	47	79	79	6	29	0.00	205	38	1513
19:00	139	850	42	47	79	79	6	29	0.00	206	16	1493
20:00	139	850	42	47	79	79	6	29	0.00	80	103	1453
21:00	139	850	42	47	79	79	6	29	0.00	0	144	1414
22:00	139	850	42	47	79	79	6	29	0.00	0	72	1342
23:00	139	786	42	47	79	79	6	29	0.00	0	0	1207
00:00	139	677	42	47	79	79	6	29	0.00	0	0	1098

Scenario B

Year 2024. January, Wednesday of the third week. Working day peak load *Table 14*

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
01:00	139	553	42	69	115	83	6	58	0.00	0	0	1065
02:00	139	502	42	69	115	83	6	58	0.00	0	0	1014
03:00	139	482	42	69	115	83	6	58	0.00	0	0	994
04:00	139	472	42	69	115	83	6	58	0.00	0	0	984
05:00	139	476	42	69	115	83	6	58	0.00	0	0	988
06:00	139	539	42	69	115	83	6	58	0.00	0	0	1052
07:00	139	694	42	69	115	83	6	58	0.00	0	0	1206
08:00	139	850	42	69	115	83	6	58	0.00	30	47	1439
09:00	139	850	42	69	115	83	6	58	3.34	206	0	1571
10:00	139	850	42	69	115	83	6	58	3.34	230	39	1635
11:00	139	850	42	69	115	83	6	58	3.34	104	132	1602
12:00	139	850	42	69	115	83	6	58	3.34	0	223	1588
13:00	139	850	42	69	115	83	6	58	3.34	0	149	1515
14:00	139	850	42	69	115	83	6	58	3.34	0	163	1529
15:00	139	850	42	69	115	83	6	58	3.34	66	144	1576
16:00	139	850	42	69	115	83	6	58	3.34	73	149	1587
17:00	139	850	42	69	115	83	6	58	0.00	140	148	1650
18:00	139	850	42	69	115	83	6	58	0.00	205	108	1674
19:00	139	850	42	69	115	83	6	58	0.00	206	84	1652
20:00	139	850	42	69	115	83	6	58	0.00	80	166	1608
21:00	139	850	42	69	115	83	6	58	0.00	0	203	1565
22:00	139	850	42	69	115	83	6	58	0.00	0	123	1485
23:00	139	823	42	69	115	83	6	58	0.00	0	0	1336
00:00	139	703	42	69	115	83	6	58	0.00	0	0	1215

Power demand and possible sources of guaranteeing, hourly balance for Scenario A (minimum load), MW

Scenario A
June 2019 – minimum load

Table 15

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
00:00	139	312	0	36	57	79	6	20	0.00	0	0	623
01:00	139	262	0	36	57	79	6	20	0.00	0	0	572
02:00	139	244	0	36	57	79	6	20	0.00	0	0	554
03:00	139	232	0	36	57	79	6	20	0.00	0	0	543
04:00	139	209	0	36	57	79	6	20	0.00	0	0	519
05:00	139	216	0	36	57	79	6	20	0.00	0	0	526
06:00	139	300	0	36	57	79	6	20	0.00	0	0	610
07:00	139	425	0	36	57	79	6	20	0.00	0	0	735
08:00	139	516	0	36	57	79	6	20	1.07	38	0	865
09:00	139	516	0	36	57	79	6	20	1.07	112	0	939
10:00	139	506	0	36	57	79	6	20	1.07	148	0	965
11:00	139	495	0	36	57	79	6	20	1.07	159	0	965
12:00	139	536	0	36	57	79	6	20	1.07	91	0	938
13:00	139	563	0	36	57	79	6	20	1.07	90	0	964
14:00	139	543	0	36	57	79	6	20	1.07	102	0	956
15:00	139	541	0	36	57	79	6	20	1.07	88	0	940
16:00	139	559	0	36	57	79	6	20	1.07	57	0	927
17:00	139	572	0	36	57	79	6	20	1.07	20	0	903
18:00	139	588	0	36	57	79	6	20	1.07	0	0	899
19:00	139	575	0	36	57	79	6	20	0.00	0	0	885
20:00	139	563	0	36	57	79	6	20	0.00	0	0	874
21:00	139	544	0	36	57	79	6	20	0.00	0	0	854
22:00	139	506	0	36	57	79	6	20	0.00	0	0	816
23:00	139	428	0	36	57	79	6	20	0.00	0	0	739

Scenario A

June 2024 – minimum load *Table 16*

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
00:00	139	293	0	48	74	83	6	45	0.00	0	0	689
01:00	139	237	0	48	74	83	6	45	0.00	0	0	633
02:00	139	217	0	48	74	83	6	45	0.00	0	0	613
03:00	139	205	0	48	74	83	6	45	0.00	0	0	601
04:00	139	179	0	48	74	83	6	45	0.00	0	0	574
05:00	139	186	0	48	74	83	6	45	0.00	0	0	582
06:00	139	280	0	48	74	83	6	45	0.00	0	0	675
07:00	139	418	0	48	74	83	6	45	0.00	0	0	814
08:00	139	559	0	48	74	83	6	45	1.89	0	0	957
09:00	139	642	0	48	74	83	6	45	1.89	0	0	1039
10:00	139	633	0	48	74	83	6	45	1.89	38	0	1068
11:00	139	558	0	48	74	83	6	45	1.89	112	0	1068
12:00	139	512	0	48	74	83	6	45	1.89	128	0	1038
13:00	139	530	0	48	74	83	6	45	1.89	139	0	1066
14:00	139	570	0	48	74	83	6	45	1.89	91	0	1058
15:00	139	553	0	48	74	83	6	45	1.89	90	0	1040
16:00	139	526	0	48	74	83	6	45	1.89	102	0	1025
17:00	139	514	0	48	74	83	6	45	1.89	88	0	999
18:00	139	541	0	48	74	83	6	45	1.89	57	0	995
19:00	139	564	0	48	74	83	6	45	0.00	20	0	979
20:00	139	551	0	48	74	83	6	45	0.00	20	0	967
21:00	139	530	0	48	74	83	6	45	0.00	20	0	946
22:00	139	508	0	48	74	83	6	45	0.00	0	0	903
23:00	139	422	0	48	74	83	6	45	0.00	0	0	817

Power demand and possible sources of guaranteeing, hourly balance for Scenario B (minimum load), MW

Scenario B
June 2019 – minimum load

Table 17

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
00:00	100	223	0	47	79	79	6	29	0.00	60	0	623
01:00	100	233	0	47	79	79	6	29	0.00	0	0	572
02:00	100	214	0	47	79	79	6	29	0.00	0	0	554
03:00	100	203	0	47	79	79	6	29	0.00	0	0	543
04:00	100	180	0	47	79	79	6	29	0.00	0	0	519
05:00	100	186	0	47	79	79	6	29	0.00	0	0	526
06:00	100	271	0	47	79	79	6	29	0.00	0	0	610
07:00	100	396	0	47	79	79	6	29	0.00	0	0	735
08:00	100	486	0	47	79	79	6	29	1.87	38	0	865
09:00	100	520	0	47	79	79	6	29	1.87	78	0	939
10:00	100	503	0	47	79	79	6	29	1.87	121	0	965
11:00	100	470	0	47	79	79	6	29	1.87	154	0	965
12:00	100	444	0	47	79	79	6	29	1.87	153	0	938
13:00	100	479	0	47	79	79	6	29	1.87	143	0	964
14:00	100	474	0	47	79	79	6	29	1.87	141	0	956
15:00	100	468	0	47	79	79	6	29	1.87	131	0	940
16:00	100	463	0	47	79	79	6	29	1.87	122	0	927
17:00	100	451	0	47	79	79	6	29	1.87	111	0	903
18:00	100	458	0	47	79	79	6	29	1.87	100	0	899
19:00	100	447	0	47	79	79	6	29	0.00	98	0	885
20:00	100	435	0	47	79	79	6	29	0.00	99	0	874
21:00	100	408	0	47	79	79	6	29	0.00	107	0	854
22:00	100	388	0	47	79	79	6	29	0.00	89	0	816
23:00	100	326	0	47	79	79	6	29	0.00	73	0	739

Scenario B

June 2024 – minimum load

Table 18

h	Riga CHP1	Riga CHP2	Imanta CHP	Biomass	Biogas	Gas fuelled co-generation	Small HPP	Wind power	Solar power	Daugava HPPs	Import	Load
00:00	139	194	0	171		79	6	53	0.00	48	0	689
01:00	139	186	0	171		79	6	53	0.00	0	0	633
02:00	135	170	0	171		79	6	53	0.00	0	0	613
03:00	123	170	0	171		79	6	53	0.00	0	0	601
04:00	116	170	0	171		59	6	53	0.00	0	0	574
05:00	130	170	0	171		53	6	53	0.00	0	0	582
06:00	139	209	0	171		50	6	53	0.00	48	0	675
07:00	139	349	0	171		79	6	53	0.00	18	0	814
08:00	139	470	0	171		79	6	53	3.04	38	0	957
09:00	139	512	0	171		79	6	53	3.04	78	0	1039
10:00	139	497	0	171		79	6	53	3.04	121	0	1068
11:00	139	464	0	171		79	6	53	3.04	154	0	1068
12:00	139	435	0	171		79	6	53	3.04	153	0	1038
13:00	139	474	0	171		79	6	53	3.04	143	0	1066
14:00	139	467	0	171		79	6	53	3.04	141	0	1058
15:00	139	460	0	171		79	6	53	3.04	131	0	1040
16:00	139	454	0	171		79	6	53	3.04	122	0	1025
17:00	139	439	0	171		79	6	53	3.04	111	0	999
18:00	139	446	0	171		79	6	53	3.04	100	0	995
19:00	139	435	0	171		79	6	53	0.00	98	0	979
20:00	139	421	0	171		79	6	53	0.00	99	0	967
21:00	139	394	0	171		79	6	53	0.00	105	0	946
22:00	139	396	0	171		79	6	53	0.00	61	0	903
23:00	139	371	0	171		79	6	53	0.00	0	0	817

3.2. Information on energy cross-border trade amounts for 2013.

Table 19

	Amounts of energy trade (MWh)
Import	5 004 531
Eksport	3 650 477

3.3. TSO evaluation for the time periods of insufficient power adequacy and suggestions for power supply guarantee in forcoming years (i.e. generation development on certain locations, demand side management, new infrastructure creation).

Since 3 June 2013 Latvia is operating according to "Nord Pool Spot" AS electricity market principles and electricity trading takes place jointly and consistent throughout the Baltic Sea region. Power supply and demand in Latvia is regulated by electricity market conditions and Latvian TSO provides market transactions in Latvian bidding area, as well as the balance of power in the region and the generation and interconnections capacity available with neighbouring countries. Since the European Union's Energy Action Plan 2050 was adopted, which states that the generation and development of national capacity adequacy should be focused on areas with the potential for renewable energy to stimulate the reduction of CO2 emissions and greenhouse gas reduction, and promote a more efficient and competitive development of the power plants, the power base of the adequacy of one within a country is not necessarily an indication of the adequacy of generating capacity, but it must take into account the complex with the available throughput capacity to/from the State or region. Working in the above circumstances, in recent years there has not been a situation where Latvia would need to disable any consumer or regions due to insufficient generating capacity or insufficient capacity on interconnectors with Lithuania, Estonia and Russia. Working synchronously with Russia, Latvian TSO in all modes has been able to ensure the adequacy of the Latvian power system, regardless of the existing generating units in the Latvian territory. At the same time, looking at the adequacy of the state and a regional level, the generating capacity of the Latvian electricity system is insufficient to cover the peak load and cover self-consumption.

Analysing the capacity adequacy for the coming years, the conservative scenario (A) of power (MW) ensuring analysis tables (Table 5) shows that the generating capacity is insufficient to cover the Latvian electricity peak load in winter period months, not only in this year, when second unit has already been implemented in Riga CHP2 (439 MW) but also till 2024 when the planned construction of wind power installed capacity could reach 454 MW. It is planned that 133 MW of total wind power installed capacity could be on offshore wind parks, which timeline of development at the moment is difficult to predict. For conservative scenario, electricity demand can be covered at 100% from 2015, because all power plants in Latvia are able to cover the national electricity consumption (Table 7). Looking at the Latvian TSO forecast, the market studies of European transmission system operators association (ENTSO-E) and "Nord Pool Spot" AS market operation principles, meaning power generation for RigaCHP1 and RigaCHP2 is practically impossible due to economic reasons. Working under market principles, RigaCHP1 and RigaCHP2 could produce approx. 30% of maximally possible year producing, but, in the isolated operation mode from the neighbouring power systems and ensuring power balance in Latvia, RigaCHP1 and RigacHP2 from 2015 are able to produce maximally possible (specified in tables) amount of electricity.

The optimistic scenario (B) of power (MW) ensuring analysis tables (Table 6) shows that Latvian power system will not be able to cover the peak load in whole analysed period, but will be able to cover the forecasted electricity consumption (in 2019 winter months 84%

self-sufficiency capacity and 137% sufficiency of annual electricity consumption). In the optimistic scenario (B), increasing the share of wind power in Latvian power system, the need for regulating reserve will be increased, for the achievement of which Latvian TSO will be actively integrated to the Scandinavian/Baltic TSOs reserve regulated market and possible to implement own power station projects for power reserve maintenance.

3.4. Information on required and available emergency reserve capacities, replacement reserves (MW) and amount of reserve utilisation in year 2013.

Table 20

Month	Max required	Available		Replacement reserve (replace BRELL emergency reserve after 12h)	Utilised emergency reserve in 2013
		In Latvia	BRELL agreement, till 12h		
	MW	MW	MW	MW	MWh
January	400	100	400	100	68,333
February	400	100	400	100	0
March	400	100	400	100	625,666
April	400	100	400	100	141,667
May	400	100	400	100	927
June	400	100	400	100	6726,033
July	400	100	400	100	10755,833
August	400	100	400	100	2149,833
September	400	100	400	100	2581,834
October	400	100	400	100	442
November	400	100	400	100	1142
December	400	100	400	100	340

3.5. TSO conclusions on generation capacity and power availability for the needs of power supply providing for Latvian consumers

Energy Development Guidelines states that in 2016 the Latvian power system has to achieve 100% self-sufficiency level. Table 5 shows that in 2014 in the conservative development Scenario (A) Latvian power system capacity to self-sufficiency has reached approx. the 88% level, but the provision of electricity (Table 7) is 83%. The same figures are planned as in optimistic scenario (B).

New base power plant commissioning in Latvia and Baltic till 2024 is not expected and Ministry of Economics of Latvia provided information for long-term development shows that base power station implementation in Latvia is not expected. Energy Strategy 2030 provides the preconditions for the development of only economically viable regional low-carbon emission base power station projects and is steering away from direct public support for base power stations projects.

Now transmission and distribution system operators in Latvia received big amount of application from local producers for technical requirement to grid connection. Theoretically 330kV transmission line Grobina-Ventspils (2^{nd} stage of Kurzeme Ring) commissioning to make possible of potential producers interest (especially wind energy producers) for new power plants construction and connection to the transmission network. Taking into account past experience, TSO and DSOs have no reason to consider that the technical requirements submitted to the system operators for the construction of small power plants will be realized in full. In this context, TSO believe that actually built station number and power will be considerably less than the specified in technical requirement issued, but there are not available any criteria by which to objectively assess and monitor the planned power plant construction process.

Received information of development plans from energy consumers in Latvia (both big – connected to the transmission network, and small – connected to distribution network) shows quite conservative development for 10 years.

4. Transmission system adequacy for demand and maintenance quality

4.1. TSO conclusions on the power transmission system adequacy for the tasks of energy transmission and the ability to provide noninterrupted functioning of the power system in outage of one of the systems units and activities (individually and jointly with other transmission system operators) for the reliable operation of the transmission system for the coming years (minimum forecast period - 10 years)

By the end of 2009 the transmission capacity of the network provided for the Latvian electricity consumers of electricity demand with an adequate sufficient reserve during normal modes of operation. From 2010, the situation significantly changed because was significantly reduced capacity in cross-border Estonia-Latvia and Russia-Latvia, due to the reason that Estonian TSO “Elering” AS established increased or critical conductor slack for number of interconnections and internal 330 kV transmission lines. The second reason or problems in Estonian-Latvian cross-border was closure of Ignalina NPP in the end of 2009, than transmission power system lost significant voltage regulation source and big generation unit. After closure of INPP the electricity import to Baltic (especially to Lithuania) has been increased and transmission network cross-sections (external and internal) has been significantly loaded. Due to network topologies historically cross-borders Estonia – Latvia and Russia – Latvia are calculated as one. Taking into account mentioned above the EE-LV cross-border technical transmission capacity of 1150 MW to Latvian direction is reduced to 900 MW and towards the Estonian direction to 850 MW at an outdoor temperature of 0°C or lower, and down to 700 MW in Latvian direction and down to 750 MW in Estonia direction at an outdoor temperature of 25°C, taking into account existing capacity, as well as during the summer conductor thermal limits. Estonian TSO carried out lengthy investigations and line survey at different outdoor temperatures and line loads, receiving help from professionals from Scandinavian companies. On this basis "Elering" AS made conclusions of the examination and now "Elering" AS has prepared a timetable for internal and external 330 kV transmission line reinforcement to prevent critical slacks. Starting from 2018 "Elering" AS plans to start a transmission lines reconstruction for slack prevention and plans to invest additional money for the cause. All necessary lines planned to be reconstructed by the 2030. This mentioned cross-border capacity constraint significantly complicates the possibility for Latvian and Lithuanian consumers, as well as in some cases the Kaliningrad region consumers to import electricity from cheaper electricity prices areas of Estonian and Scandinavian countries, as a result, Lithuanian and Latvian average electricity price is higher than in Estonia and in the Nordic countries. After Ignalina NPP closure loads increased on the cross-section between Russia and Belarus, where during repair and emergency modes, cross-border transmission capacity has to be limited, leading to problems with power supplies from Russia as well.

4.2. Information about the planned system interconnections (minimum forecast period - 10 years)

On September 22, 2011, the three Baltic TSOs "Augstsprieguma tīkls" AS, "Elering" AS and "Litgrid" AB signed a cooperation agreement on research work carried out in regard of the Baltic States energy integration in the EU internal electricity market and with financial support from the European Union Trans-European energy networks funds (hereinafter - TEN-E) in April 2012 an agreement between Baltic TSOs and Swedish consulting company "Gothia Power" for synchronisation study preparing was signed. The study was finalised on October 2013. The study results are published on Baltic TSOs webpages (in Latvia – http://www.ast.lv/eng/par_ast/transmission_network/synchronous_operation_study/) and study is a prerequisite for the elaboration of technical requirements of possible Baltic States power system synchronization with the continental European synchronous zones. The main conclusions of the study are following: the Baltic power systems synchronisation with Continental Europe transmission network is practically possible, but in addition to the technical and economic arguments is necessary to find also strategic and/or politic aspects. The possible Baltic states synchronous interconnection with continental Europe is included into the list of Project of Common Interest (PCI) under EC Regulation No 1391/2013 from October 14 2013 and if the positive political decision will be done in each Baltic State, the Project could be co-financed from European Commission under European Parliament and Council Regulation No 1316/2013.

With European Union co-financing in September 2013 the 330kV cable line Project between RigaCHP1 and Imanta substations has been realised under 330kV “Kurzeme Ring” Project. The cable line has been commissioned together with construction of new 330kV substation RigaCHP1 (gas insulated substation) and reconstruction of existing 330kV substation Imanta. The mentioned transmission line will increase the security of supply of the city of Riga, including the network maintenance modes. Without the implementation of the project, some of Riga transmission network repair and emergency modes will be more difficult for the reliability requirements to meet. The provision of the Project due to the need for strengthening the Riga node to the next step to ensure a close connection to the Western part of Latvia (Kurzeme) 330 kV transmission development. In addition, the increase in power transit reliability in the western region of Lithuania direction, which means reduced transmission network limitations at this area.

The 2nd stage of Kurzeme Ring Project – 330kV transmission line Grobina–Ventspils has been commissioned on 2014 August 26. The 330kV transmission line implementation has been started on 2010 with European Union co-financing. The 330kV transmission line Grobina-Ventspils will increase security of supply in Latvia and in Western part of Latvia and will provide possibility to connection to transmission network for potential electricity producers, especially for off-shore or on-shore wind producers in Latvia.

The 3rd stage of Kurzeme Ring Project – 330kV line Ventspils-Tume-Imanta implementation is expected before the end of 2019. In 2013 the Environmental Impact Assessment and Right-of-Way studies have been finalised with EU co-financing. 330kV Ventspils-Tume-Imanta transmission project is included into the PCI list under EC Regulation No 1391/2013 from October 14 2013 and will candidate for co-financing from European Commission under European Parliament and Council Regulation No 1316/2013. In October 2013 Latvian TSO “Augstsprieguma tikls” AS together with transmission system owner in Latvia “Latvijas elektriskie tikli” AS submitted to the Public Utilities Commission in Latvia the investment request according to ACER guidelines for cross-border cost allocation (CBCA) decision for project of common interest “Ventspis-Tume-Imanta”. In April 2014 Latvian NRA has issued CBCA decision for the mentioned Project and based on the CBCA decision PCI could candidate to the EC co-financing under European Commission under European Parliament and Council Regulation No 1316/2013. In 2014 July 28 “Augstsprieguma tikls” together with “Latvijas elektriskie tikli” prepared and submitted to European Commission common application for co-financing request. The future 330kV line “Ventspils-Tume-Imanta” development depends on the EU co-financing amount under EC Regulation No 1316/2013.

The whole Kurzeme Ring project will provide the necessary infrastructure for the planned wind farms and the possible growing demand load in the Western region in Latvia, connecting two larger (Western and Central) Latvian production and consumption regions, as well as providing a possible increase in transfer capacity, for 700 MW DC interconnection between Sweden and Lithuania.

Together with the Estonian transmission system operator and Latvian transmission system owner the third Estonian-Latvian electricity interconnection between 330kV substations Killingi-Nomme(Estonia) and RigaCHP2(Latvia) is developing. This interconnection will increase the available interconnection capacity between the Latvian and Estonian power systems. Estonian-Latvian third interconnection is part of the Pan-European transmission network 10-year development plan for 2014 and part of the Latvian and Estonian electricity transmission system 10-year development plan. Interconnection is included in the PCI list under EC Regulation No 1391/2013 from October 14 2013 and will candidate for co-financing from European Commission under European Parliament and Council Regulation No 1316/2013, as one of the most important projects for the whole Baltic Sea region. The project will increase Estonian-Latvian cross-border transmission capacity in both the normal scheme of 500-600MW and in isolated scheme of 300-500 MW.

In August 2013 the EIA and RoW studies for Estonian-Latvian interconnection have been started with EC TEN-E co-financing support, and in parallel launched the public discussions process with local municipalities of research and consultation for the possible routes in the Latvian territory.

On 2014 August 1 "Augstsprieguma tīkls" AS (AST), "Elering" AS and "Latvijas elektriskie tīkli" AS (LET) signed a Memorandum of Understanding where agreed about 3rd Estonian-Latvian interconnection development steps and each party responsibilities in the implementation process. In October 2013 AST together with Elering and LET received to Latvian and Estonian National Regulators investment request according to EU Regulation No 347/2013 and ACER guidelines for CBCA decision of PCIs “Interconnection between Killingi-Nomme (EE) un RigaCHP2 (LV)” and „Internal line between Harku un Sindi (EE)”. In April 2014 Latvian NRA has issued CBCA decision for the mentioned Projects and based on the CBCA decision PCIs could candidate to the EC co-financing under European Commission under European Parliament and Council Regulation No 1316/2013. In 2014 August 14 AST together with Elering and LET prepared and submitted to European Commission common application for co-financing request. The future 3rd Estonian-Latvian interconnection development depends on the EU co-financing amount under EC Regulation No 1316/2013. The Project implementation is expected by the end of 2020.

In October 2013 a second DC interconnection Estlink2, realised by Estonian and Finnish TSOs with EC co-financing, with 650 MW capacity has been. By the end of 2015 it is also planned to implement the Lithuanian-Swedish (NordBalt) DC interconnection with a 700 MW transmission capacity, thereby providing further Baltic transmission network integration with Scandinavian transmission networks and electricity market integration in the Scandinavian market. Lithuanian TSO and Polish TSO are planning to implement DC interconnection LitPol Link 1 with 500 MW of transmission capacity (Phase 1) by the end of 2015 and with a total 1,000 MW of transmission capacity (Phase 2) by 2020. After mentioned Projects implementation together with electricity market opening in Baltic States, the Baltic electricity market functioning could be mostly effective with purchasing/selling possibilities from/to neighbouring countries.

4.3. PSO conclusions on the electricity transmission system reliability and adequacy of all consumers to provide secure power supply in the previous year and the following years (minimum forecast period - 10 years)

Annual statement paragraph 4.2. contains descriptions of the projects providing for the reliable operation of transmission networks in the face of increasing electricity consumption, secure and stable operation of power plants and power transit through Latvian and Baltic transmission networks. At present significant challenges for operation of power transmission system are created by capacity reduction in cross-border Estonia-Latvia, where one of the possible solutions is of interest to all Latvian and Lithuanian power plants to participate in the electricity market "Nord Pool Spot" and to promote the electricity market liquidity. The increasing competition between market participants will provide lower electricity prices in each Baltic bidding area and reduce influence to electricity import from Russia.

330kV and 110kV transmission network is planned to be reconstructed, modernized and developed according to "Augstsprieguma tikls" AS (AST) developed and the Public Utilities Commission (PUC) approved electricity transmission system development plan, which is published in the AST and PUC websites. Parallel to the development of 330 kV transmission network it is planned to developed 110 kV transmission network, especially in places that cannot provide N-1 criterion to be fulfilled. In 110 kV transmission network there are planned 110 kV substations reconstruction, which does not meet the technical criteria set out in development policy, as well as the planned replacement of aged transformers. In addition to the completed 330 kV cable line around Riga city, in Riga region it is necessary to develop the 110 kV network in order to increase security and reliability of power supply.

4.4. Existing generation capacities, greater than 1 MW.

Latvian power system power stations with installed capacity above 1 MW:

Table 21

No	Station name	Installed capacity (MW)
	Natural gas co-generation stations	
1	BK ENERĢIJA, SIA	3.9
2	Daugavpils siltumtīkli, PAS, SC1	3.9
3	Dobeles enerģija, SIA	1.5
4	Elektro bizness, SIA	3.6
5	Energy & Communication, AS	3.9
6	JUGLAS JAUDA, SIA	14.9
7	LIEPĀJAS ENERĢIJA, SIA	4
8	Līvbērzes enerģija, SIA	1.644
9	Mārupes siltumnīcas	1.999
10	Fortum Jelgava, SIA	3.996
11	Olenergo, SIA	3.12
12	SABIEDRĪBA MĀRUPE, SIA	2
13	Sal-Energo, SIA	3.99
14	SALDUS SILTUMS, SIA	1.3
15	Uni-enerkom, SIA	1.998
16	VANGAŽU SILDSPĒKS, SIA	2.746
17	VALMIERAS ENERĢIJA, AS	1.99
18	VALMIERAS ENERĢIJA, AS	1.99
19	Betula Premium, SIA	1.9
20	Enefit power un Heat Valka, SIA	2.4
21	RTU enerģija, SIA	1.56
22	Olainfarm enerģija, AS	2
23	RĪGAS SILTUMS, AS	50.53
24	WINDAU, SIA	3.86
25	DLRR Enerģija SIA	1.698
26	International Investments SIA	1
27	Preiļu Enerģētika SIA	1.15
28	Rēzeknes siltumtīkli SIA	3.9
29	Zaļā dārzniecība SIA	1.99
30	Biznesa centrs Tomo SIA	1
	Biomass and biogas power stations	
1	AD Biogāzes stacija, SIA	1.96
2	Agro Iecava, SIA	1.95
3	Conatus BIOenergy, SIA	1.96
4	Bioenerģija-08, SIA	1.98
5	Biodegviela, SIA	2
6	BIO ZIEDI, SIA	1.998
7	DAILE AGRO, SIA	1
8	Getliņi EKO, BO SIA	5.24
9	Grow Energy, SIA	1.995
10	KŅAVAS GRANULAS, SIA	1
11	LIEPĀJAS RAS, SIA	1
12	RIGENS, SIA	2.096

13	Zaļā Mārupe, SIA	1
14	GRAANUL INVEST, SIA	6.492
15	Krāslavas nami, SIA	1
16	Liepājas Enerģija, SIA	2.5
17	GAS STREAM	1
18	BIO FUTURE, SIA	1
19	Pampāļi, SIA	1
20	EcoZeta, SIA	1.4
21	Saldus enerģija,SIA	1.862
22	BIOEninvest, SIA	1
23	Priekules Bioenerģija, SIA	2
24	Piejūras energy, SIA	1.6
25	Agro Lestene, SIA	1.5
26	OŠUKALNS, SIA	1.4
27	LATNEFTEGAZ SIA	3.986
28	Fortum Jelgava SIA	23,82
29	RĪGAS SILTUMS AS	4.6
30	Zaļās zemes enerģija SIA	1
Wind power stations		
1	Baltnorvent, SIA, Alsungas VES	2
2	BK Enerģija, SIA	1.95
3	Enercom Plus, SIA	2.75
4	Impakt, SIA Užavas VES	1
5	Lenkas energo, SIA Lenkas VES- 1	2
6	VĒJA PARKS 10, SIA	1.8
7	VĒJA PARKS 11, SIA	1.8
8	VĒJA PARKS 12, SIA	1.8
9	VĒJA PARKS 13, SIA	1.8
10	VĒJA PARKS 14, SIA	1.8
11	VĒJA PARKS 15, SIA	1.8
12	VĒJA PARKS 16, SIA	1.8
13	VĒJA PARKS 17, SIA	1.8
14	VĒJA PARKS 18, SIA	1.8
15	VĒJA PARKS 19, SIA	1.8
16	VĒJA PARKS 20, SIA	1.8
17	WINERGY, SIA	20.7
18	Silfs V SIA	1
Hydro power stations		
1	Spridzēnu HES, SIA	1.2
Latvenergo power stations		
1	Kegums HPP	264
2	Riga HPP	402
3	Plavinas HPP	894
4	RigaCHP1	144
5	RigaCHP2	881

4.5. Actions during maximum demand or supply deficit periods

In the event of the deficit of power and energy in Latvian territory and in the neighbouring countries to cover the consumption of the Latvian power system, the TSO will be forced to limited or disable from the network a certain number of consumers in order to balance the power consumption and the generation in Latvian power system. In this case, the TSO will act according to Latvian legislation and will inform the Ministry of Economy of the problem of ensuring the balance of power.

On behalf of „Augstsprieguma tīkls" AS

Chairman of the Board V. Boks