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CENEF-XXI

Russian LTS – brief overview

1. Structure

The Russian Federation has officially approved and released a document titled *Strategy of socio-economic development of the Russian Federation with low greenhouse gas emissions until 2050* (hereinafter referred to as *the Russian LTS* or *the LTS*). The LTS was brought into force by EXECUTIVE ORDER No. 3052-r dated October 29, 2021. This document (both Russian and English versions)[1] was submitted to the UNFCCC on September 5, 2022. No changes were introduced to the submitted version compared to the 2021-approved document to reflect the most recent developments and Russia's announced carbon neutrality commitment for 2060. The wording of the document is quite general; it does not include clear guidelines, roadmaps, or detailed descriptions of proposed policies and measures.

Russia's LTS includes 6 sections:

I. Analysis of the international context

II. Inertial scenario

III. Target (intensive) scenario

IV. Measures to implement the Strategy

V. Mechanisms for monitoring the implementation of the Strategy

VI. Strategy implementation indicators

2. LTS mitigation goals

In October 2021, Russia formulated its carbon neutrality target for 2060. However, this target is not reflected in the LTS, as its time horizon is limited to 2050. Moreover, the formal targets, as specified in the document, allow for GHG emission growth by 2030 and 2050. So far, no Russian official document reflects the country's carbon neutrality commitment by 2060.

The "Analysis of the international context" section of the LTS erroneously defines GHG emissions balance, or GHG neutrality, as carbon neutrality, whereas carbon neutrality does not mean a balance of sources and stocks across all GHGs, but only for CO_2. However, Russian LTS shows values for all GHGs, but CO_2 emissions are not presented.

The LTS sets three different quantitative goals for GHG emission control:

- to ensure by 2030 the reduction of GHG to below 70% compared to the level of 1990, taking into account the maximum possible sequestration capacity of forests and other ecosystems and subject to sustainable and balanced socio-economic development of the Russian Federation;
- to reduce the accumulated volume of net greenhouse gas emissions in the Russian Federation to lower levels compared to the European Union indicators in the period from 2021 to 2050 (as set in the Message of the President of the Russian Federation to the Federal Assembly of

[1] Quality of translation leaves much to be desired.

the Russian Federation dated April 21, 2021);

- in the Target (intensive) scenario, which is presented as the basis for the LTS implementation, net GHG emissions in 2050 are 60% below the 2019 level and 80% below the 1990 level.

According to the Russian national inventory, its net GHG emissions in 2020 were 52% below the 1990 level. Therefore, the way the first goal is formulated will bring the GHG emission up by 46% in 2030 (70%/48%-1), i.e. by 3,85% per year. When compared with the 2019 level this means 38% growth, or 3.3% per year, which is a faster rate, than the one assumed in LTS for GDP growth. In other words, the LTS sets no real limits to GHG emission growth to 2030. In contrast to many other countries, dramatic GHG emission reductions were achieved in Russia in 1990-1998. In 1998-2020, the country managed to decouple GDP growth and net GHG emissions growth (GDP doubled, while net GHG was only 1% up). This shows how much home work had been done before Paris.

EU's net GHG emission in 2019, as reported to UNFCCC, was 3.832 bln tCO_2eq. If we assume a linear decline in its emission in order to attain EU's net zero GHG target in 2050, then EU's cumulative 2020-2050 GHG emission will reach 57.5 bln tCO_2eq. In 2019, Russian net GHG emissions totaled 1.56 bln tCO_2eq., and if it is to stay below EU's cumulative level with assumed linear growth, it may reach 2.13 bln tCO_2eq. by 2050, which is 36% above the 2019 level. Therefore, the second goal can be attained even with a substantial GHG emission growth by 2050. In 1998-2020, Russia was one of the very few countries who could double its GDP growth while keeping net GHG emissions unchanged. For 2030 and 2050, less ambitious goals are specified: another GDP doubling expected in 2020-2050 (in the Target scenario) will lead to a substantial net GHG growth by 2050.

The outcome expected from the Target (intensive) scenario – GHG emissions in 2050 down by 80% from the 1990 level – is not declared as a LTS quantitative goal and is used for indicative purposes only. No data are shown for net CO_2 emission reduction, however, with GHG emissions at 80% below the 1990 level reductions in net CO_2 emissions should be more substantial.

In October 2021, the carbon neutrality target for 2060 was formulated in Russia for the first time. In his speech at the Russian Energy Week international forum, President Putin said: "Russia will attain carbon neutrality of its economy, and we are setting a specific benchmark here – no later than 2060". However, RF Government Decree of October 29, 2021, No. 3052-r *"Strategies for the socio-economic development of the Russian Federation with low greenhouse gas emissions until 2050"*, adopted later the same month, did not include this goal, for its time horizon was limited to 2050. To date, no official document sets the carbon neutrality target for Russia; and despite this target was announced, it was not reflected in the LTS as an official goal.

3. LTS scenarios

LTS recognizes, that the less carbon intensive scenario – the Target (intensive) scenario – "ensures high indicators of the socio-economic development of the Russian Federation: the growth of gross domestic product at a level above the world average, maintaining a balance between reducing emissions and maintaining macroeconomic stability, expressed in high values of exports, employment, and household incomes".[2]

[2] This is CENEf-XXI's triumph in the long debates with the experts and officials responsible for the LTS development, who initially were insisting on the opposite statement.

Two scenarios are included in the LTS:

- Inertial scenario;
- Target (intensive) scenario.

Inertial scenario

Assumptions:

- After 2030, Russia's physical energy exports can be expected to go down by 2.8% per year as a result of the global energy transition; and no offset can be expected from the non-energy exports;
- Structural shifts are slow, and so is penetration of the emerging low carbon technologies;
- Russia manages to maintain the 2019 level of GHG sinks;
- No new GHG mitigation policies are adopted.

Results:

- 2021-2050 average GDP growth rates will be 2% per year declining to 1,5% in 2031-2050 and further down to 1% in 2040- 2050;
- GDP carbon intensity will be 1.5 times down in 2050 staying above the global average;
- GHG emissions will be growing in 2019-2050 from 2119 to 2521 $MtCO_2eq$ (+19%), sinks will stay unchanged at 535 $MtCO_2eq$, and net emissions will be up from 1,584 to 1,986 $MtCO_2eq$ (+25%).

First, it is assumed that in this scenario Russia's GDP growth can accelerate from 1% in 2008-2021 to more than 2% on average in 2021-2050. However, the drivers for such acceleration in the Inertial scenario are unclear.

Second, while Russian forests are huge, the country does not have reliable data on their qualitative and quantitative characteristics. Therefore, the role of the LULUCF sector in the implementation of the LTS is poorly defined. Recent trends show,[3] that:

- in 2010-2020, net CO_2 emissions from LULUCF were 150 Mt CO_2 down from 754 to 604 Mt CO_2;
- net CO_2 emissions from forest lands alone were 133 Mt CO_2 down from 782 to 649 Mt CO_2;
- carbon sinks in forests have been nearly stable since 2009, and the forest-covered territory has been stable since 2005;
- net sinks in forests are declining driven by CO_2 losses. This decline equals 140 Mt CO_2 in 2010-2020;
- carbon losses have been steadily growing since 2005 resulting from clearcuts and forest fires, for which there is a clear upward trend reaching 4-7 Mha/year in the recent years;
- as a result, net sinks reduction in LULUCF contributed 79% to the total net GHG emission increments in 2010-2020 and exceeded 100% (over-offsetting the reductions in other sectors) for the overall CO_2-only emissions increment.

Extrapolation of these trends to 2050 sets a LULUCF net sink decline baseline, against which the LTS goal for unchanging LULUCF net sinks looks very ambitious.

If GDP growth is limited to only 1% per year, GHG intensity of the GDP will decline 1.3-fold, and in 2050, LULUCF sinks will only be half of the 2019 level, net GHG emissions will equal 1,951 Mt CO_2eq, which is quite close to the LTS result in this scenario (1,986 $MtCO_2eq$). This speculation shows, that emission levels in the Inertial scenario with more realistic assumptions

[3] National Inventory Report of the Russian Federation on anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by Montreal Protocol for 1990 – 2020. Part 1, Moscow, 2022.

on GDP growth correspond to poor penetration of low carbon technologies. The LTS concludes that the economic development pathway in the inertial scenario is associated with significant risks, so this pathway should be avoided.

Target (intensive) scenario

Assumptions:

- after 2030,[4] global energy transition will lead to 2.1% per year decline in physical energy exports from Russia; yet this drop will be offset with 4.4% per year growth in non-energy exports;
- intensive structural shifts towards low carbon activities, which will become new drivers for economic growth;
- a large set of policy measures will be adopted to promote penetration of low carbon technologies and practices and implementation of "green" projects;
- the scale of LULUCF sinks will rise from 535 $MtCO_2eq$. in 2019 to 1,200 $MtCO_2eq$. in 2050;
- international cooperation: the following issues will be agreed upon by the parties to the Paris Agreement:
  - the ability of each country to independently determine the trajectory of reductions and the national contribution to the collective goal;
  - technological neutrality of measures (non-discrimination of the results of reductions and takeovers, including from nuclear and hydro projects);
  - mutual recognition of the need to improve the assessments of the absorption capacity of managed ecosystems;
  - Russian climate regulation compliance with international standards, including taxonomy, electricity origin certificates, and verification of the results of "green" projects;
  - recognition that the level of ambition of nationally determined contributions to the implementation of the Paris Agreement will increase as the global green finance system will be developing to promote green projects and investment in low greenhouse gas development and climate change adaptation (and sanctions will be lifted from this direction);
  - universal rules of Article 6 mechanisms will ensure compliance with the international standards of issuing carbon credits for voluntary climate projects and of other greenhouse gas emission reduction units. The development of such non-discriminatory conditions will promote the most effective climate projects and ensure stable demand for carbon credits.

The conditions for international cooperation are specified as important factors to support Russia's motivation to launch the policies listed in the Target (intensive) scenario.

Results:

- in 2031-2050, GDP growth rates will increase to 3% per year followed by a slowdown to 2.8% in 2040-2050 yet exceeding those expected by the Russian LTS for the global average;
- GHG emissions will be up from 2,119 to 2,212 $MtCO_2eq$ in 2019-2030 with a subsequent decline to 1,830 $MtCO_2eq$ (-14%) in 2050;
- carbon sinks will be up from 535 to 1200 $MtCO_2eq$ (+124%) in 2019-2050, and so

[4] For some unclear reasons LTS provides no data regarding the economic development assumptions for 2022-2030.

- net emissions will drop from 1,584 to 630 $MtCO_2eq$ (-60%) with the sinks responsible for 70% of net GHG emissions reduction.

The target (intensive) scenario may be named 2F (*Forest First*). It is the pathway to carbon neutrality favoured by the Russian Government. It implies a large additional sequestration in LULUCF (by adding 665 Mt CO_2eq of net sinks in 2019-2050), while emission reductions in other sectors are expected to be moderate (-289 Mt CO_2eq in 2019-2050). Russian mitigation policy is based on a hope that it will be possible to provide science-based evidence that current net sinks in LULUCF are highly underestimated, and that in reality they are much larger and can be substantially and cost-effectively scaled up by the mid-century. At the same time, it is recognized that the scarce data on CO_2 flows in natural systems is a weak ground for the LTS. Looking to lay down a more solid scientific basis for these aspirations, in 2022 it was decided to allocate large resources to support extensive research in this direction. The Russian LTS builds upon a weak assumption that net sinks in LULUCF can reach 1,200 MtCO2eq by 2050.

LTS needs more pillars to form a solid basis for the net zero carbon pledge. GHG emission split by sectors is not presented in the LTS, leaving no room for judgments on how much progress in mitigation is expected from the key sectors. Like stated above, 630 $MtCO_2eq$ net GHG emission in 2050, or -80% from the 1990 level, is indicative and not set to serve a mitigation target in the Russian LTS. To ensure a more robust basis for the LTS, it is important to provide scenarios with deeper GHG cuts in other sectors, so they can serve an airbag for a failure to scale up LULUCF sinks.

4. LTS set of low carbon technologies

LTS sets no ban for any carbon intensive technologies or products use before 2050, nor does it provide any indicators for low carbon technologies penetration. A long duty list – a wide set of low carbon technologies to be promoted – is provided in the LTS by sectors and includes:

- innovative resource- and energy efficiency technologies for the extraction, enrichment, processing, and transport of solid fossil fuels;
- innovative and climate-efficient coal combustion technologies;
- technologies to reduce fugitive emissions;
- low (or no) carbon power and heat generation – nuclear, hydro and renewables;
- CCS and CCU;
- production of hydrogen, "green" ammonia, biodiesel from wood;
- energy efficiency, material efficiency, circularity, hydrogen and CCUS technologies uptake in industry;
- comprehensive electrification and gasification of transport, developing gas and electric charging infrastructure;
- technologies to meet stringent requirements for energy efficiency and renewables penetration in new and retrofitted residential, public, and industrial buildings;
- waste management and secondary resource utilization technologies;
- innovative agricultural and breeding technologies;
- re-watering of previously drained swamps;
- forest preservation and fire protection technologies; etc.

The LTS does not specify the penetration scale or the expected effects for these technologies. On average, cumulative investments in reducing net GHG emissions are expected to reach 1% of GDP in 2022-2030 and 1.5-2% in 2031-2050. Multiplier effects from such investments are expected to ensure more than 25% additional GDP growth by 2050.

5. LTS mitigation policies portfolio

The Target (intensive) scenario assumes the following policy measures:

- Setting sectoral targets for GHG mitigation;
- Adoption of sectoral and regional plans for adaptation to climate change and energy transition;
- Mandatory reporting, validation and verification; promotion of public non-financial reporting;
- Setting standards and technical regulations, including mandatory, to promote the use of low carbon and high energy- and resource efficiency technologies;
- Strengthening the requirements set in technical BAT guides with a focus on energy- and resource efficiency indicators and GHG intensities;
- Improving energy efficiency policies;
- Amending tax, customs, and budgetary policies to meet the challenges of low greenhouse gas emission developments, including adjustment of budgetary expenses and investment policies to support mitigation projects;
- Launching carbon pricing and quota systems based on the outcomes of regional "pilots";
- Promotion of "green" projects for Article 6 cooperation;
- Introducing energy origin certificates to promote carbon-free generation;
- Development of taxonomies and "green" financial instruments.

6. LTS implementation framework

The RF Government has developed a Passport of the Federal Project *"Low Carbon Development Policy"* (Politika nizkouglerodnogo rasvitia),[5] which is a "road map" for the LTS implementation to 2030. It includes general economic, cross-sectoral, sectoral and other activities for the LTS implementation. This Federal Project is to be included in the state program *"Economic Development and Innovative Economy"*, which specifies quantitative indicators for the LTS to be controlled. Publicly available monitoring results are to be reported by the RF Ministry of Economic Development to the RF Government in a State report, which will be quoted in the UNFCCC reporting. In order to promote regional mitigation, it is important to sign agreements between the RF Ministry of Economic Development and regional authorities and adopt regional implementation plans. The LTS will be updated, and so will the Nationally Determined Contributions.

The Passport of the Federal Project "Low Carbon Development Policy" includes multiple activities with a total budget of 11 billion rubles, including:

- development of the infrastructure for the national climate regulation system (1.65 billion rubles);
- national network to monitor GHG sinks (4.1 billion rubles);

[5] A detailed 145-page document. See FP_Politika_nizkouglerodnogo_razvitiya (profiz.ru)

- priority scientific research (5.2 billion rubles).

This Plan includes the development of the infrastructure and institutions for regulation purposes; development of a national GHG register; setting up the project office to mobilize scientific, methodological, informational, and analytical support for climate and energy efficiency policies implementation and to launch and support investment activities. This Plan includes support for the development of new methods to estimate carbon sinks, which will be later recognized by the international community. First Deputy Prime Minister of the Russian Federation is nominated as a curator for this Federal Project.

7. Recent developments and CENEf-XXI's assessment of Russia's potential to achieve carbon neutrality by 2060[6]

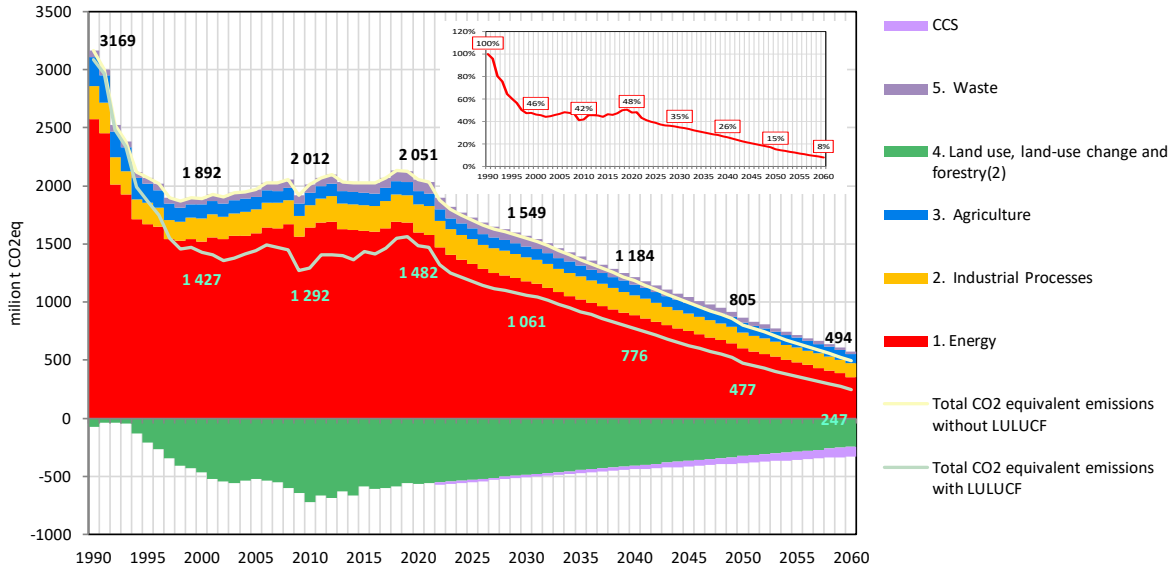
One lesson from the future is: there is no business-as-usual for the years to come; instead, business-as-unusual needs to be in the focus. For Russia, there will be no business-as-usual even in the short- and medium-term. Even some of the previous pessimistic expectations for the economic growth in Russia became quite optimistic overnight on February 24, 2022, as a result of the "military operation" and the sanctions that followed. The angle of incidence is not equal to the angle of reflection. As a result of new developments, Russia is expected to lose 10-11 years of economic growth, the 2021 GDP level is expected back only in 2031-2032, and by 2050 Russia will have lost nearly half of the previously expected potential GDP level.

In order to judge on a possibility to attain the 2060 carbon neutrality target, CENEf-XXI used its models to make long-term projections that reflect the recent economic and technological evolution of the country and the effects of a variety of GHG control policies in the key sectors. Three sets of scenario storylines were developed to cover the abruptly widening uncertainty zone to draw the pathways which may get Russia to carbon neutrality by 2060: 4S – Stagnation, Sanctions, Self-Sufficiency, which may be alternatively titled Forward-to-the-Past (as the opposite to Back-to-the-Future); 4D – Development Driven by Decarbonization and Democratization, which opens the door for Russia to return to the global economy; 4F – Fossil Fuels for Feedstock, which builds upon 4D and allows Russia to use more of its fossil fuel resources as feedstocks.

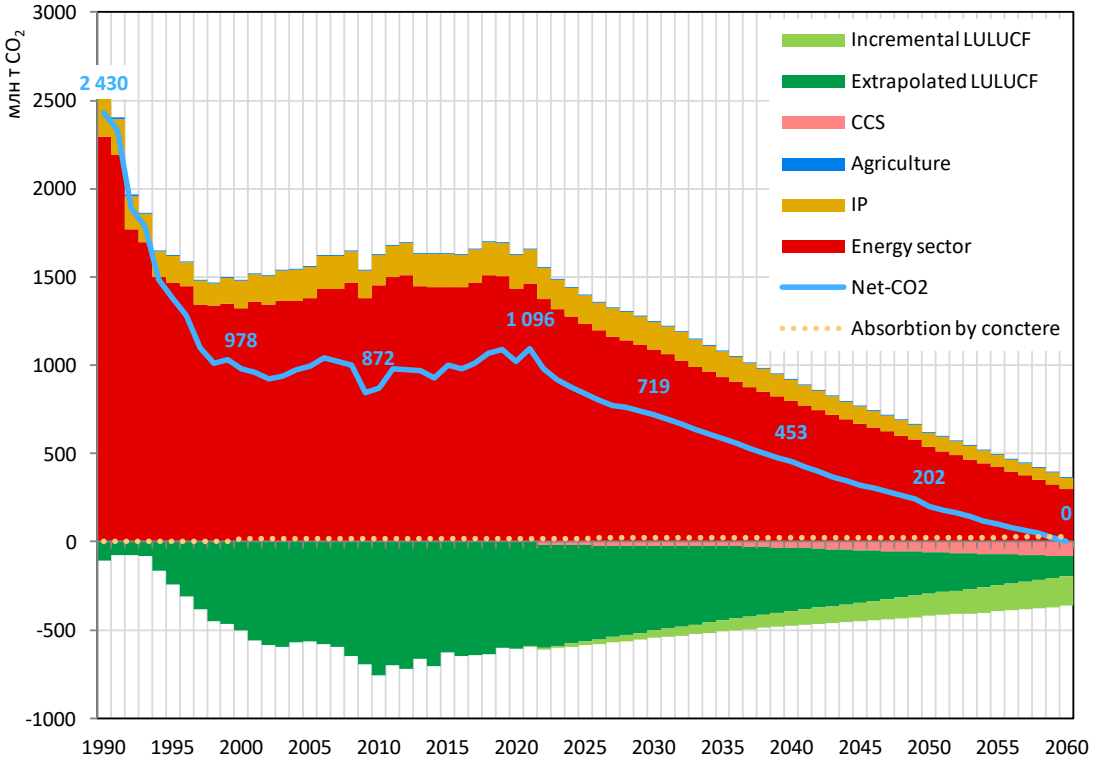
Two decades – the 2020s and 2030s – which have the crucial role in accumulating the know-how and developing skills related to the uptake of technologies with high GHG mitigation potential, may be wasted. In the early 2020s, Russia is about to repeat the negative experience of the 1990s by reducing its GHG emissions through a deep cut in activities, which is the most expensive "mitigation" option costing 1,137 US/tCO_2$eq. It means, that Russian CO_2 and GHG emissions peaked in 2021, and expected by 2030 GHG emissions reduction is 63% (comparing with 1990) and that for CO_2 is 67% (Figure 1). Therefore, Russia can now be expected to outpace the EU in cutting its GHG emission by 2030. It was also shown that Russia can attain carbon neutrality in 2060 without expanding its LULUCF net sink. Moreover, for CO_2 alone, the sinks can drop even from 605 MtCO_2 in 2020 to 291 MtCO_2 in 2060.

[6] See policy paper https://cenef-xxi.ru/articles/russia's-carbon-neutrality:-pathways-to-2060

Figure 1. GHG and CO_2 emissions pathways in 4D scenario



GHG emissions



CO_2 emissions

Source: CENEf-XXI

The Russian LTS needs more pillars to support its net zero carbon pledge. Even in 4S scenario, emissions reduction in all sectors (excl. LULUCF) amounts to 870 Mt CO_2 in 2021-2060. It is three times the reduction in non-LULUCF sectors specified in the LTS for 2050. In 4D and 4F scenarios, emissions reduction in all sectors (excl. LULUCF) is 1,250-1,300 Mt CO_2 in 2021-2060. This twice overweighs what the LTS hopes to obtain as additional net sequestration in LULUCF. If only 2F (Forest First) option is in the focus, and mitigation opportunities in other sectors are largely ignored, no compensation will be available, should the hopes for LULUCF sequestration bring no fruit.