Enel

How can we legally operationalize the reuse of recycling materials from companies in favor of a circular economy system

Legal research in the e-Legal project

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0. Executive summary

A circular economy is a systemic approach to economic development designed to benefit businesses, society, and the environment. In a circular economy economic activity builds and rebuilds overall system health. The concept recognizes the importance of the economy needing to work effectively at all scales – for big and small businesses, for organizations and individuals, globally and locally. Transition to circular economy gives an opportunity to gradually decouple economic growth from virgin resource inputs, encourage innovation, increase growth, and create more robust employment.

A transition to a circular economy shifts the focus to reusing, repairing, refurbishing, and recycling existing materials and products. What used to be regarded as 'waste' can be turned into a resource.

The potential benefits of shifting to a circular economy extend beyond the economy and into the natural environment. By designing out waste and pollution, keeping products and materials in use, and regenerating rather than degrading natural systems, the circular economy represents a powerful contribution to achieving global climate targets. Businesses would benefit significantly by shifting their operations in line with the principles of the circular economy. These benefits include the creation of new profit opportunities, reduced costs due to lower virgin-material requirements, and stronger relationships with customers.[1]

It is on the basis of all of the above that international organizations, integration unions, developed and developing countries, as well as individual non-profit and commercial organizations strive to adopt plans for the transition to a circular economy and take the first steps to implement them.

Currently, an increasing number of policies and initiatives support this transition to a circular economy. However, specific political, social, economic, and technological barriers to wider implementation and adoption still remain:

- companies often lack awareness, knowledge or capacity to pursue circular economy solutions;
- current systems, infrastructure, business models and technology can lock the economy in a linear model;
- investment in measures to improve efficiency, or innovative business models, remains insufficient as they are perceived as risky and complex;
- demand for sustainable products and services may remain low, especially if they are associated with behavioral change;
- prices often do not reflect the real cost to society of resource and energy use;
- the political signals for the transition to a circular economy are not strong enough and consistent enough.[2]

This study provides an overview of legal acts adopted at the international, supranational, and national levels with the review of the measures and instruments that the companies have today, as well as various opportunities that each company of the Enel Group can take. Bearing in mind that the circular economy is a complex and systematic approach concerning every sphere of life and business it was decided to have the main focus on

[1] Source: https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview

[2] Source: https://www.acceleratio.eu/circular-economy/

the electricity energy business area in order to overview the possibilities for the energy companies.

Any changes, decisions and actions must be properly regulated by the law. Changing the legislation at various levels will enable each element of the system to take available steps. Also, a legal norm can establish a ban or prescription, which will force the subject to move away from the usual and "easy" path and take a more complex path, but which will later make it possible to establish a circular economy.

The circular economy will not only benefit businesses, the environment, and the economy at large, but also the individual. Ranging from increased disposable income to improved living conditions and associated health impacts, the benefits for individuals of a system based on the principles of circularity are significant.

That is why the introduction of a circular economy should begin with each individual, by educating society in this concept.

1. Definition

In order to develop an approach to the question of how can we legally operationalize the reuse of recycling materials from companies in favor of a circular economy system first of all one should **define** what a “circular economy” actually is. We can define a circular economy by contrasting it with a traditional economy, but it will not give an understanding of the mechanisms, goals, and objectives of the circular economy.

For more systematic approach we propose to define a circular economy as ***a system in which the rational use of resources, materials, components, and goods brings maximum utility at any given time, thus separating the development of the global economy from the consumption of finite resources, leading to sustainable development***.

This definition allows us to consider the circular economy as a complex macroeconomic process, as a result of which there is an emphasis not only on the recycle of goods, but also on the transition to a low-carbon economy.

Since this process is global, it is necessary to review legal tools at all levels of legal regulation.

2. International law context

Since the concept of “circular economy” requires attention of several sectors of economy that are connected to the sustainable development and sustainability science, it triggers the necessity of creating and enforcing a legislation framework among governments and international organizations. At an international level there are three most relevant treaties that are governing the circular economy and that can technically affect national efforts to achieve a circular economy.

International Treaties Relevant to Circular Economy[3]

There are two international treaties that are pertinent to the issues of national legislative regulation of the circular economy: the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the United Nations Framework Convention on Climate Change (UNFCC). In addition, the World Trade Organization has developed an Aid-for-Trade Work Program which is related to the establishment of a sustainable trade relations between the countries.

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (hereinafter referred to as "Basel Convention")

The Basel Convention was adopted March 22, 1989 by the Conference of Plenipotentiaries in Basel, Switzerland, in response to the public outcry caused by the discovery of deposits of toxic waste imported from abroad in Africa and other parts of the developing world in the 1980s[4].

The aim of Basel convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as "hazardous wastes" based on their origin and/or composition and their characteristics, as well as two types of wastes defined as "other wastes" - household waste and incinerator ash.

There are several countries[5] from all over the world that have signed the ratification of the Basel Convection and which determine their national policies based on its principles.
General principles of the Basel Convention for the Party that has ratified it[6]:

1) the obligation to adopt appropriate national legislation to regulate the transboundary movement of hazardous wastes;
2) recognition of illegal trafficking of hazardous or other wastes as a crime;
3) the adoption of appropriate legislation to prevent illegal trafficking and the imposition of penalties for those involved in it.

The United Nations Framework Convention on Climate Change (hereinafter referred to as "the Convention")

The Convention is an international environmental treaty against climate change, negotiated and signed by 154 states at the United Nations Conference on Environment and Development (UNCED)[7].

The Convention applies to three categories of signatory countries: developed countries, developed countries with special financial responsibilities and developing countries, which are all members of the Organization for Economic Cooperation and Development.

The mail goal of the Convention is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human interference in the Earth's climate system. Such a level should be achieved quickly enough to allow ecosystems to

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[3] Source: https://www.reusablepackaging.org/insights/circular-economy-legislation-the-international-experience/
[4] http://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx
[5] List of the countries party to Basel Convention: http://www.basel.int/?tabid=4499
[6] https://www.informea.org/sites/default/files/decisions/basel/UNEP-CHW-OEWG-7-OEWG-VII-1.English.pdf
[7] https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXVII-7&chapter=27&Temp=mtdsg3&clang=_en

adapt naturally to climate change, ensure that there is no threat to food production and to ensure sustainable economic development[8].

World Trade Organization (hereinafter referred to as "WTO")

The WTO Committee on Trade and Development Aid for Trade recently approved the **2020-22 Aid-for-Trade Work Program (WT/COMTD/AFT/W/81.Rev. 1)** for empowering a connected and a sustainable trade among developing countries and, in particular, the least developed countries. Among other relevant topics on the WTO agenda at the cross-border level, the Committee focuses on renewable energy sources. Based on the WT program, the main goal is to find solutions and support countries at the cross-border level for the development of sustainable trade based on responsible production. This program is a response to the results of monitoring and evaluating the most effective forms of aid in support of trade received from partner countries and donors who reported their views on the Sustainable Development Goals, not limited to good health and well - being, innovations in industry and infrastructure, sustainable cities and communities, responsible consumption and production, climate action[9].

As we can see, international acts are essentially declarative and establish general principles and directions. For the development of business and its adaptation to the conditions of the circular economy, more detailed state regulation is necessary. First of all, it is necessary to pay attention to the legal regulation within the framework of integration organization, since it is there that specific ways are provided for the countries of the integration organization to unify and harmonize legislation on the way to building a circular economy throughout the territory of the integration organization.

3. Legislation of European Union

The legislative acts of the European Union are adopted in response to the existing needs of the association of member states. Therefore, it is better to consider the acts of the European Union in the field of circular economy in the order of their adoption.

2015:

The European Commission adopted its first circular economy action plan {COM (2015) 614}[10]

It included measures aimed at stimulating Europe's transition towards a circular economy, increasing global competitiveness, foster sustainable economic growth and creating new workplaces.

The action plan established concrete and ambitious actions covering the whole lifecycle: from production and consumption to waste management and the secondary raw materials market, as well as a revised legislative proposal on waste.

2016:

The European Commission adopted its Ecodesign Working Plan 2016-2019 {COM (2016) 773}[11]

The Ecodesign Working Plan contributes to the Commission's new initiative on the Circular Economy through a series of measures covering the whole lifecycle of products and materials. There is a need and a political priority to increase the efficiency of the use

[8] https://en.wikipedia.org/wiki/United_Nations_Framework_Convention_on_Climate_Change#Kyoto_Protocol
[9] https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/COMTD/AFTW81R1.pdf&Open=True
[10] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614
[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016DC0773&qid=1625055480378

of resources in the EU. Product design is a key aspect in this regard, as it can have a significant impact on the whole product lifecycle, e.g. making the product more durable, easier to repair, reuse or recycle.

The Ecodesign directive {DIR 2009/125/EC}[12]
already covered all significant environmental impacts throughout the product life cycle, but so far the focus had been on improving energy efficiency. In the future, ecodesign should make a much more significant contribution to the circular economy, e.g. by more systematically addressing issues of material efficiency, such as durability and recyclability.

2018:

The European Commission adopted a monitoring framework for the circular economy {COM (2018) 29}[13]
Also, in 2018 a major work on revising legislative acts in the field of waste treatment has been done, namely:

- REGULATION (EU) 2018/848 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007;
- DIRECTIVE (EU) 2018/849 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment;
- DIRECTIVE (EU) 2018/850 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste;
- DIRECTIVE (EU) 2018/852 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste.

In addition, Decision (EU) 2018/853 of the European Parliament and of the Council of 30 May 2018 amending Regulation (EU) No 1257/2013 and Directives 94/63/EC and 2009/31/EC of the European Parliament and of the Council and Council Directives 86/278/EEC and 87/217/EEC as regards procedural rules in the field of environmental reporting and repealing Council Directive 91/692/EEC is adopted.

2019:

March 4, 2019, the ***European Commission adopted a comprehensive report on the implementation of the action plan.*** The report presents the main achievements and outlines future tasks for the formation of the EU economy and paving the way to a climate-neutral, circular economy, in which the impact on natural and freshwater resources, as well as ecosystems is minimized.

- REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the implementation of the Circular Economy Action Plan {COM/2019/190 final}
- Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilizing products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003 (Text with EEA relevance)

[12] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0125
[13] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0029&qid=1625055630277

- Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment (Text with EEA relevance)

Regulations establishing requirements for ecodesign on October 1, 2019:

- **C(2019) 2120 – ecodesign for household refrigerators and annexes**
- **C(2019) 2121 – ecodesign for light sources and annexes**
- **C(2019) 2122 – ecodesign for electronic displays and annexes**
- **C(2019) 2123 – ecodesign for dishwashers and annexes**
- **C(2019) 2124 – ecodesign for washing machines and washer-driers and annexes**
- **C(2019) 2125 – ecodesign for motors and annexes**
- **C(2019) 2126 – ecodesign for external power supplies and annexes**
- **C(2019) 2127– ecodesign for refrigerators with a direct sales function and annexes**
- **C(2019) 5380 – ecodesign for power transformers and annexes**
- **C(2019) 6843 – ecodesign for welding equipment and annexes**

2020:

European Green Deal

COMMUNICATION FROM THE COMMISSION - The European Green Deal {COM (2019) 640}[14]
Europe has set goals for a new growth strategy that will transform the EU into a modern, resource-efficient, and competitive economy. Goals are:

- no net emissions of greenhouse gases by 2050;
- non-resource-based economic growth;
- no person and no place left behind.

The European Green Deal is the plan to make the EU's economy sustainable. The EU aims to be climate neutral in 2050.
In 2020, a proposal was put forward for the adoption of a European climate law designed to turn this political commitment into a legal obligation.

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law) {COM(2020) 80 final}
Achieving this goal will require actions from all sectors of the economy, including

- investing in environmentally friendly technologies;
- supporting industry to innovate;
- introducing cleaner, cheaper, and healthier forms of private and public transport;
- decarbonizing the energy sector;
- ensuring greater energy efficiency of buildings;
- working with international partners to improve global environmental standards.

The EU also provides **financial support and technical assistance to those who have been most affected by the transition towards the green economy**. This is called the Just Transition Mechanism (JTM).
JTM will help to mobilize at least 100 billion euros in the period 2021-2027 in the most affected regions. The JTM is a key tool to ensure a fair transition to a climate-neutral economy, leaving no one behind. It provides targeted support to help mobilize at least 65-

[14] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640&qid=1625055795719

75 billion euros in the period 2021-2027 in the most affected regions to mitigate the socio-economic consequences of the transition period. JTM examines the social and economic consequences of the transition period, focusing on the regions, industries and workers who will face the most serious problems, through three main pillars:

- A new Just Transition Fund (in the amount of approximately 20 billion euros) is expected to attract about 30 billion euros of investment);
- InvestEU Just Transition Scheme (will provide a budget guarantee under the InvestEU program within the framework of four policy windows and the InvestEU Advisory Hub, which will act as a central entry point for requests for advisory support. It is expected that it will attract 10-15 billion euros, mainly private sector investments);
- A new Public Sector Loan Facility (will combine 1.5 billion euros of grants financed from the EU budget with 10 billion euros of loans from the European Investment Bank to mobilize 25-30 billion euros of public investment).

The identification of these territories is carried out within the framework of a dialogue with the European Commission. These plans set out the challenges in each territory, as well as the development needs and objectives to be achieved by 2030. They define the types of planned operations and specify the management mechanisms. The approval of the territorial Just Transition Plans opens the door for targeted funding within the other two main pillars of the Just Transition Mechanism.

The ***Just Transition Platform*** helps EU countries and regions in a fair transition. It consists of a single access point and a support service. It provides comprehensive technical and advisory support. Authorities and beneficiaries can access it to find out everything they need to know about the funds, including opportunities, relevant regulatory updates or industry initiatives. The platform also actively promotes the exchange of best practices among all stakeholders, including through regular physical and virtual meetings.

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A new Circular Economy Action Plan, {COM (2020) 98}[15]

The measures to be taken in accordance with the new action plan are aimed at:

- make eco-friendly products the norm in the EU;
- empower consumers and government buyers;
- focus on the sectors that use the most resources and where the circulation potential is high, such as: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients;
- ensure less waste;
- make the circularity work for people, regions and cities;
- lead global efforts to develop a circular economy.

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020 {COM(2020) 798/3}

[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0098

4. Law of the EAEU

As for the Eurasian Economic Union (EEU), where Russia is a member state, at the end of 2020, the ***Decision of the Supreme Eurasian Economic Council No. 12 dated 11.12.2020 "On Strategic directions for the development of the Eurasian Economic Integration until 2025"***[16] was adopted. In accordance with this document, one of the integration priorities is to increase energy conservation and energy efficiency, solve existing environmental problems and ensure sustainable development. In this area, it is planned to combine efforts to create and use new technologies and innovations, including "green" technologies, renewable energy sources, circular economy models, bioengineering and nanotechnology.

Within the framework of the strategic direction on ensuring quality guarantees, safety of the traded goods and proper protection of consumer rights, the EEU intends to take the following measures:

- introduce circular economy models (closed-cycle economy) into technical regulation within the Union in order to increase energy efficiency and resource conservation;
- develop proposals on the expediency of making changes to the technical regulations of the Union in terms of supplementing them with general approaches to the disposal of products, including its recycling, in accordance with the procedure established by the legislation of the member states.

As part of the strategic direction of combining efforts to stimulate joint research, the EEU intends to take the following measures:

- develop economic cooperation in the field of "green" technologies and environmental protection;
- use the tools of the Eurasian Development Bank and the Eurasian Fund for Stabilization and Development to stimulate the use of energy-and resource-saving technologies;
- distribute "smart" energy-efficient technologies;
- study the issue of introducing a phased ban on the import and production of single-use plastic, including plastic bags;
- exchange best practices and information on practical methods of work to ensure sustainable development and the development of "green" economy programs;
- study and work out the issue of holding an annual event on the topic provided for by the Sustainable Development Goals, with the participation of representatives of state authorities, business communities of the member states, international organizations (primarily the UN) and foundations, summing up the results of the "green" technologies competition;
- ensure the interaction of the Member States in the field of energy conservation, energy efficiency, the use of renewable energy sources and environmental protection;
- develop concepts for the implementation of the principles of the "green" economy in the Union.

[16] https://docs.eaeunion.org/docs/ru-ru/01228321/err_12012021_12

5. Public law of the EU countries, Romania and Greece as the example

Greece – regulatory framework

The Constitution of Greece[17]

Article 24 states that the protection of the natural and cultural environment **constitutes a duty of the State and a right of every person**. The State is bound to adopt special preventive or repressive measures for the preservation of the environment **in the context of the principle of sustainable development**. Matters pertaining to the protection of forests and forest expanses in general shall be regulated by law. The compilation of a forest registry constitutes an obligation of the State. Alteration of the use of forests and forest expanses is prohibited, except where agricultural development or other uses imposed for the public interest prevail for the benefit of the national economy[18].
Law 4736/2020 for harmonization of Directive 904/2019 for the reduction of single use plastics was implemented.

Implementation of measures for a circular economy

National Strategy for Circular Economy – Action Plan 2018[19]

In early 2018 the Governmental Economic Policy Council of Greece approved the National Action Plan for the Circular Economy to set the path towards the long-term adoption of the circular economy principles.

The Action Plan supports the country's strategy to create a "green" economy with creation of workplaces, support for long-term equitable and inclusive growth based on resource efficiency, promotion of small and medium-sized enterprises, innovation and investment in new technologies, as well as strengthening of the “social economy" potential.

Long-term (2030) goals of the National Action Plan on Circular Economy:

- moving up the waste hierarchy by focusing on waste prevention and improving recycling;
- supporting circular entrepreneurship by encouraging "industrial symbiosis" and business clusters
- supporting circular consumption patterns of reuse, restoration and repair, rather than buying new products, especially for electrical and electronic devices
- enhancing multi-stakeholder partnerships in industry, academia and civil society.
- monitoring progress towards a cyclical economic model using SMART (specific, measurable, achievable, relevant and time-limited) indicators.

Priority actions:

- removing barriers to the circular economy through more than 10 **regulatory and legislative interventions**, e.g. integrating circular economy considerations and criteria in the Environmental Impact Assessment and Strategic Impact Assessment requirements for facilities and projects, as well as in the process of issuing environmental permits or the development of new legal definitions of waste, by-products and materials after first use intended for re-use, declassification of waste and quality standards for secondary raw materials;

[17] Source: http://harmonywithnatureun.org/provision/Q5XkmOdTpGeqvXjdh8AoQwlbLplkQNXBQ37kB2h35ciKcAx8rOR!z8sH501vs+oj!0f071INOMtIBv8YGqjzaA
[18] https://www.hellenicparliament.gr/UserFiles/f3c70a23-7696-49db-9148-f24dce6a27c8/001-156%20aggliko.pdf
[19] https://ypen.gov.gr/wp-content/uploads/2021/03/NEO_SXEDIO_DRASIS_KUKLIKH_OIKONOMIA.pdf

- **marking available funds** for the implementation of the above-mentioned activities and demonstration projects;
- **enhancing knowledge**, understanding, education, awareness and communication;
- **improving management structures** by creating an interdepartmental Executive Secretariat for Circular Economy to oversee the implementation and an appropriate Observatory to monitor progress.

Prior to this, in November 2017 Greece had adopted **a new Law on Recycling** to align waste legislation with the circular economy principles, and had taken effective measures to reduce the consumption of single-use plastic bags in accordance with the decision of the Ministry in August 2017, which introduced the responsibility of merchants and set fees for consumers. Greece aims to achieve the following by 2020:

- achieve a radical reduction of waste produced per capita;
- increase reuse and recycling, separate collection of recyclables and of bio-waste to reach 50% of the total municipal solid waste produced from 25%, where it stands today;
- reach a 74% recovery and less than 30% of total municipal solid waste produced from the current 82% disposal;
- create around 15,900 new workplaces and increase annual turnover of waste-related businesses.

Already the Ministry is aimed at developing the following actions:

- sustainable production and industrial policy (e.g. environmental design, environmental certification, industry, tax exemption);
- sustainable consumption, promotion of green public contracts, repair services, reuse;
- actions for less waste with higher value, e.g., financing of prevention programs, regulatory framework for prevention;
- horizontal actions, e.g., the national observatory, voluntary contracts, coordination;
- expert groups working on "sustainable financing";
- use of biomass.

Interesting Greek Initiatives implementing principles of Circular Economy[20].

Reducing Waste Electrical and Electronic Equipment

The ReWeee Project entitled **Development and Demonstration of Waste Electrical and Electronic Equipment (WEEE) Prevention and Re-use Paradigms** aims to reduce WEEE in Greece by preventing the production of WEEE itself, and also by demonstrating, via appropriate paradigms, that WEEE can be efficiently sorted and prepared for re-use. The goal is also to make re-used electrical and electronic equipment (REEE) acceptable to consumers.

For this purpose, two WEEE sorting centers (SC) will be opened for the first time in the country, in the Attika and the Central Macedonia regions. Their main activity is to collect, store and sort WEEE according to their condition, and then prepare them for reuse or processing. Moreover, a measurement tool is being developed to facilitate the assessment of WEEE reuse in Greece.

[20] https://circulareconomy.europa.eu/platform/en/main-language/greek

In addition, a web platform[21] was created to facilitate the donation and exchange of EEE. It main targets are households, companies and public services.

Among the project partners are RReuse, the Hellenic Recycling Agency, the Ecological Recycling Society, the Green Fund and the Harokopio University of Athens.

The project is managed by Appliances Recycling SA, the official take-back system for WEEE management in Greece which operates on a non-profit basis.

Central Macedonian and Attica SCs are operational. Public awareness actions are implemented to promote EEE repair and repair cafes have been organized to give the public the opportunity to repair their equipment with the help of technical specialists.

Olive pits as a circular fuel[22]

KLIMIS Company (founded in 1968) uses the wood part of Greek olive seeds as fuel for its kiln for firing lime stones and producing lime mass (putty lime) for use in the construction of buildings and lime powder (quicklime) for use in agriculture.
The woody part of olive seeds (a by-product of pomace production plants) is a solid and sustainable biomass fuel and, therefore, a renewable energy source obtained during the olive oil harvesting process.

The company compresses olive pits either in an oval shape to create briquettes, or in a polygon shape to create logs (with a hole along their axes), suitable for stoves, wood-burning boilers, pyrolysis boilers and fireplaces. They are 100% natural products, free from chemicals and have a high calorific value of 5153 kcal/kg.

The company also collects black powder obtained as a result of incomplete combustion of the wood part of olive seeds in the oven to create (already patented by the EU) barbecue briquettes that do not emit odors, do not produce smoke or sparks. They light up easily, do not contain chemicals, have a high thermal capacity of 6366 kcal/kg and emit 30% less carbon monoxide than charcoal.

Through this practice, the company applies the best practices on the way to a circular economy, contributes to the achievement of national goals and has received EU awards (including the EU EMAS Awards 2009+ 2014).

Staramaki – a straw made naturally from wheat[23]

The European Commission's announcement in 2020 of the future ban on several single-use plastic products highlighted the need for more sustainable alternatives.

Staramaki is straw made of wheat. The products are made from the stem left after harvesting wheat grain.

It is produced by a social cooperative in Kilkis, Northern Greece.

[21] https://reweee.hua.gr/en/

[22] https://circulareconomy.europa.eu/platform/en/good-practices/production-agricultural-lime-summer-barbecues-olive-pits-make-perfect-circular-fuel

[23] **http://www.staramaki.gr**

A widely produced local product, wheat, is being used to create a viable, environmentally friendly alternative to disposable plastic straws. At the same time, the cooperative creates employment opportunities and promotes local and regional development.

Rural depopulation is a serious problem throughout Europe and especially in Greece. This is mainly a question of economic opportunities. In Greece, the population has been moving from rural areas to cities for many years. The problem of population aging is particularly acute in rural Greece.

The recent economic depression has put even more pressure on the desire for innovation and a different approach to achieving well-being. This initiative demonstrates a step towards a circular economy as a fertile field for such innovative actions.

Romania - regulatory framework

Like Greece, Romania has also elevated the right to a clean environment to the status of a fundamental right. As stated in article 35 of the Romanian Constitution[24]:
(1) The state recognizes the right of every person to a healthy and ecologically balanced environment.
(2) The state provides the legislative framework for the exercise of this right.
(3) Natural and legal persons have a duty to protect and improve the environment.

The implementation of the right of every person to a healthy and ecologically balanced environment is guaranteed at the national level by specific provisions regulating the so-called "right to action". It is a legal mechanism that allows “any natural or legal person who has affected or likely to be affected by environmental damage or who considers himself injured in the right or in the legitimate interest” to report the authorities about any case of environmental damage, to be informed about the results of the investigation and about the measures taken to eliminate the damage. Furthermore, the right to action includes the right to appeal any decision taken by the authorities in connection with any claim for environmental damage, since any decision on this issue should be communicated in writing and should include all factual and legal arguments supporting its conclusion[25].

Moreover, this fundamental right has been further developed in the national legislative framework, taking into account the need to fulfill the commitments assumed by Romania in the process of European integration, which necessitated the adoption of appropriate legislation in the field of environmental protection, which also serves the purpose of creating a unified structure that establishes the principles governing all environmental protection activities. As a result, the following laws were adopted:

- Emergency Ordinance no. 195/2005 on environment protection;
- Emergency Ordinance no. 68/2007 on environmental liability regarding the prevention and remedying of environmental damage.

On the same token, in 2005, the National Environmental Protection Agency ("ANPM") was established, a central body responsible, inter alia, for coordinating regulatory activities at the national level and for ensuring compliance with issued regulations and for taking the necessary legal measures in case of non-compliance.

[24] Romanian Constitution, english version, http://www.cdep.ro/pls/dic/site.page?id=371, (accessed 10.06.2021)
[25] Emergency Ordinance no. 68/2007 on environmental liability with regard to the prevention and remedying of environmental damage, Article 20-25.

Considering the legislative framework, it can be concluded that in Romania, most of the legislative documents in the field of environmental protection were adopted under the pressure of the European integration process or to fulfill the obligations arising from membership in the European Union. Moreover, this is a fair statement when considering the relations between Romania and the actions taken at the European level to stimulate Europe's transition to a circular economy.

In a 2019 Country Report on Environmental Implementation Review ('EIR')[26], which analyzes the measures taken by Romania to create a circular economy, the European Commission concluded:

- The circular (secondary) use of material in Romania was 1.5 % in 2015, significantly below the EU-28 average of 11.7 % and down on previous years.
- Resource efficiency remains at the same low level as presented in the first EIR report. The circular economy remains underdeveloped, although there is potential in this area.
- In 2017, Romania's 'resource productivity' ratio (i.e. how efficiently the economy uses material resources to produce wealth) was the lowest in the EU, alongside Bulgaria and Estonia, at 0.33 EUR/kg (EU average: EUR 2.04 EUR/kg).
- In December 2017, following a significant delay, Romania adopted its long-awaited national waste management plan and waste prevention programme, both of which are valid until 2025. However, the adoption of these strategic documents is not accompanied by relevant investment efforts.
- Romania ranked 28th on the 2018 European Innovation Scoreboard, with its score falling 14 percentage points since 2010.
- In its 'Early Warning Report'[27], the Commission listed Romania among the Member States at risk of not meeting the target for municipal waste recycling for 2020. Country-specific recommendations were proposed for Romania to help fill the implementation gap. They are also consistent with the roadmap developed in 2013 in the context of the Commission's compliance promotion exercise. The roadmap has largely not been implemented.

Based on the above and for the purposes of this paper, it should be noted that on the issue of measures taken by member States towards a circular economy, while Greece and Romania have an overall low score for each item considered by the EU in its review, unlike Greece, Romania falls below in rank because it has not implemented the Single-Use Plastics EU Directive at the national level and has not submitted a National Plan for a Circular Economy in connection with the new Circular Economy Action Plan.

From this perspective, it is not surprising that in a study entitled *'Circular Europe. How to successfully manage the transition from a linear to a circular world'*, developed by the European House - Ambrosetti it becomes evident that Romania is among the group of countries with the worst indicators in all four main areas, including a cyclical economy, namely:

- Sustainable inputs[28]. Romania has a good share of renewables; however, it does not cope well with the circular material consumption rate and with the share of total organic area in total utilized agricultural area, ranking last in decile.

[26] https://ec.europa.eu/environment/eir/pdf/report_ro_en.pdf (accessed 11.06.2021)
[27] European Commission, Report on the implementation of waste legislation, including the early warning report for Member States at risk of missing the 2020 preparation for re-use/recycling target on municipal waste, SWD(2018)423 accompanying COM(2018) 656.
[28] Sustainable inputs captures the use of renewable energy and of recyclable, recycled and biodegradable materials to manufacture goods and provide value in consecutive life cycles.

- End-of-life[29]. Romania performs poorly with all the Key Performance Indicators considered in this pillar, in particular, with very high waste generation with limited recycling. Its highest rating is ranked 21st in the KPI for packaging waste recycling.
- Extension of useful life[30]. Romania is characterized by efficient transport logistics, but it lags behind in the number of vehicles salvaged and reused among end-of-life vehicles and has a limited number of employees in the repair and reuse sector.
- Increase of the intensity of use[31].Romania is characterized by good development of collective transport in total passenger transport, but with a limited usage of the internet by individuals and a limited use of sharing economy services compared to other European countries.

To end on a positive note, despite there not being a suitable regulatory, policy and financial framework available for companies to rely on, "there are signs that companies are increasingly auditing their waste management practices internally, trying to find ways to improve waste management[32]. Such examples include:

- Companies such as coffee shops or food delivery companies that resort to biodegradable or compostable packaging.
- Supermarket replacing the single use packaging bags with biodegradable or compostable packaging.
- Private programs and strategies aimed at reducing the use of packaging when buying fresh food or recycling second-hand clothing[33].
- NGOs in partnership with local authorities, seek to raise public awareness of the need for selective collection of waste electrical and electronic equipment and used batteries and the establishment of mobile collection points, thus contributing to an increase in selectively collected and recycled WEEE[34].

6. Public law of Russia

For Russia, in practical terms, the transition to a circular economy model is acutely relevant, primarily due to the high volumes of waste generated, which often significantly exceed the parameters characteristic of developed foreign countries. Thus, in 2015, a total of 5,060.2 million tons of waste were generated in the country, about 60 million tons of which were solid municipal waste (MSW). For comparison, in the same year in Germany, the total volume of waste amounted to 373 million tons, including MSW-50 thousand tons. In addition, the level of waste processing in the Russian Federation is unacceptably low, which in the case of MSW, according to the Minister of Natural Resources and Ecology is less than 10%, while in Germany about 99% of all MSW is processed.

To characterize the level of development of the circular economy in Russia and the 28 EU countries, let's compare some indicators (see the table below).

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[29] End-of-life describes ways of recovering end-of-life value of assets, products and materials through reuse, remanufacturing and recycling.

[30] Extension of useful life reflects the capability of increasing the duration of the useful life, with respect to usual end-of-life of a product or its components.

[31] Increase of the intensity of use rates the increase of the load factor of a single item (for example with product as a service or sharing services models). It measures the increase of the bene- t obtainable with each unit of input (material and energy) used.

[32] European Commission, Report on the implementation of waste legislation, including the early warning report for Member States at risk of missing the 2020 preparation for re-use/recycling target on municipal waste, SWD(2018)423 accompanying COM(2018) 656, P. 5.

[33] URL: https://www.zf.ro/supliment-zf-green-economy/este-economia-circulara-solutia-pentru-criza-de-mediu-care-este-la-20042604, accessed 12.06.2021.

[34] URL: https://reciclamimpreuna.ro/romania-recicleaza/, accessed 12.06.2021.

Some indicators of the spread of circular business models in Russia[35]

Business model	Indicator	Year	EU-28	Russia
Joint consumption	Airbnb market share in hotel revenue	2016	5%	<1%
Waste recycling	Share of recycled MSW	2018	46%	7%
Waste recycling	Share of products made from waste paper	2017	72%	32%
Optimizing the use of resources	Energy intensity of GDP	2017	20 kg of conventional fuel per 10 thousand rubles	100 kg of conventional fuel for 10 thousand rubles

These and many other pressing problems originate in the legislative framework of the country: in the Russian Federation there is no system of normative legal acts regulating the transition to a circular economy. The most noticeable is the reform of the waste management system. The legislation in the field of waste processing has undergone significant changes: an expanded responsibility of the manufacturer, the institute of a regional operator for waste management has been introduced. A Russian environmental operator has been created – a public law company that co-finances investment infrastructure projects in the field of waste and is responsible for auditing territorial schemes for municipal waste management in the regions, as well as standardizing the calculation of tariffs and creating a federal scheme for waste management. Reference books of the best available technologies (BAT) in the field of waste management have been formed: heat treatment, waste disposal. The listed changes in Russia have been implemented considering the experience of European countries, but the priority areas for the development of the waste disposal industry differ significantly.

Thus, separate waste collection in accordance with the regulations is not mandatory, and, which is especially critical in the light of the concept of a circular economy, food waste is not separated from other potentially recyclable waste. Meanwhile, the efficiency of sorting and processing of waste, including food waste, is significantly reduced. Currently, there is no BAT in terms of methods for processing organic waste, and there are practically no capacities for processing such waste.

Despite active steps to transform the waste management system and positive changes (recultivation of landfills and elimination of unauthorized landfills), Russia remains within the framework of the linear economy model. The main attention, as well as capital investments, are aimed at creating additional waste processing capacities, mainly incinerators and landfills for waste disposal. Moreover, the current tariff system does not motivate the use of preferred methods of waste management from an environmental point of view: it is more profitable for companies to pay an environmental fee, which is 3-4 times cheaper than organizing the collection and delivery of PET to the processor.

A positive aspect is the development of a **draft law on secondary material resources**. The draft law introduces a new concept -secondary material resources, according to which waste and secondary raw materials are products. The proposed changes are

[35] Source: https://cyberleninka.ru/article/n/tsirkulyarnaya-ekonomika-kak-instrument-ustoychivogo-razvitiya-rossii/viewer

aimed at eliminating disputes between businesses and supervisory authorities that cannot agree and create a basis for dealing with secondary resources.

These and many other indices of the development of the circular economy show the need to improve the waste management system in Russia.

The main purpose of the Draft Law is to include the issues of resource conservation and resource efficiency of industry in the sphere of formation and implementation of industrial policy in the Russian Federation with the allocation of two main directions:

- modernization of industry on the principles of the best available technologies;
- involvement of secondary resources in economic activity.

The draft law provides for the addition of general and the inclusion of special provisions on the procedure for developing and implementing state industrial policy in the field of resource conservation and resource efficiency of industry, taking into account the peculiarities of the current state of this area of regulation.

January 15,2020 the President of Russia[36] declared that at least 80 of the 300 largest enterprises must switch to the so-called best available technologies, obtain comprehensive environmental permits, which means a consistent reduction of harmful emissions. It is necessary to radically reduce the volume of waste entering landfills, introduce separate waste collection, generally switch to a closed-cycle economy and start using the so-called extended producer responsibility mechanism from 2021.

April 21, 2021 the President in his massage to the Federal Assembly[37] said that the principle of ***"the polluter pays" should fully work in the field of waste management*** in order to ensure the transition to the so-called closed-cycle economy. To do this, it is necessary to launch a mechanism of expanded responsibility of manufacturers and importers for the disposal of goods and packaging. He also proposed to ***"color" the environmental payments*** received by the federal budget and this money should be directed in a targeted way to eliminate the accumulated harm and improve the environment. Moreover, he proposed to ***extend the system of quotas*** of harmful emissions to all cities of Russia where the problem of air quality is acute, and to provide for strict responsibility for compliance with such environmental standards. This should be done with the full support of business projects on environmental modernization of enterprises.

It is also impossible to ignore the topic of the **Arctic region**, in which the issue of ecology is the most sensitive. ***Decree of the President of the Russian Federation No. 645 of 26.10.2020 "On the Strategy for the Development of the Arctic Zone of the Russian Federation and ensuring national Security for the period up to 2035"[38]*** prescribes the fulfillment of the main tasks in the field of economic development of the Arctic zone is to be ensured by implementing the following measures:

- introduction of a special economic regime in the Arctic zone that promotes the transition to a circular economy,
- implementation of private investments in geological exploration,
- creation of new and modernization of existing industrial facilities,
- development of high-tech industries,

[36] http://www.kremlin.ru/acts/bank/45148
[37] http://www.kremlin.ru/acts/bank/46794
[38] http://www.kremlin.ru/acts/bank/45972

- development of new oil and gas provinces, deposits of solid minerals and hard-to-recover hydrocarbon reserves,
- increasing the volume of deep oil refining, production of liquefied natural gas and gas chemical products.

7. What needs to be developed in the company to be ready to work in a circular economy?

Bearing in mind all the above, it is clearly seen that now there is no single approach to understanding and implementing the principles of the circular economy in different countries. What is indisputable is that the transition to the concept of a circular economy is reasonable and inevitable. Considering that Enel uses only innovative and advanced approaches in its activities, calculates trends in the development of society and the world and takes the first steps towards a full transition to a circular economy.

In view of this, we propose to review an approach to the circular economy within the Enel Group - what needs to be developed in Enel to work in a circular economy right now.

Private law mechanisms implemented at the company level

Due to the fact that one of the indicators of the circular economy is following the principles of sustainable development, it is necessary to take into account all the company's documents adopted in this area. At the global level, a policy has been adopted to create a common CSV value, which is localized at the level of each country in the format of a regulation. There is also a global operating instruction for a sustainable construction site, which is also localized in each specific country of Enel presence.
Circular Economy Enel Position paper[39] was issued December 2020.This document states that Enel's circular economy strategy is characterized by the reappraisal of the business along the entire value chain, starting from the design and procurement phases. Enel's circular economy vision is based on the following pillars, which define the areas and methods of application:

- Circular inputs;
- Product as a service;
- Sharing platforms;
- Extension of useful life;
- New life cycles.

In addition, Enel is already implementing its procurement procedures in accordance with the requirements of sustainable development. Since 2020, in the framework of the procurement procedures of the ENEL Group of companies, an additional criterion for choosing a supplier is in compliance with the requirements in the field of sustainable development. Full or partial compliance with these requirements is recommended but is not mandatory for participation in the procurement procedure. Compliance with these requirements is an additional advantage for the participant of the tender procedure.

Such requirements in the field of sustainable development include:

- availability of certifications in the field of labor protection, industrial safety and ecology;
- existing environmental, social and economic impact factors and relevant management practices;

[39] https://www.enel.com/content/dam/enel-com/documenti/azienda/circular-economy-enel-position-paper-en.pdf

- reducing the negative impact on the environment, the availability of practices for responsible waste management (recycling, reuse)
- labor protection and industrial safety
- presence of social initiatives (favorable working conditions, practices for training and advanced training of employees, the guarantee of freedom of association and collective bargaining, involvement and development of local communities, respect for human rights, presence of a code of ethics, availability of remote work, presence of a corporate kindergarten).

Formation and implementation of an integrated approach for advanced additional professional training of personnel for the circular economy in the conditions of digital transformation of industry

The introduction of a circular economy is impossible without a systematic, comprehensive restructuring of many aspects, starting with legislative regulation in the country of the company's presence, the introduction of advanced technologies and stable financing, but it is worth focusing separately on the individual and the willingness of society as a whole to change their habits. Therefore, we propose to consider the tools of the circular economy for implementation in the company's business processes and for the formation of a society of conscious consumption.

Tools of the circular economy in the company's business processes for the implementation of an integrated approach to the introduction of the circular economy:

1. Product design.

When developing and creating a new product, we should initially include the principle of the circular economy 4R in the product design: Reuse, Remanufacture, Recycle and Reduce.

EXAMPLE of BMW Group. Integrating these concepts into product design and initial manufacturing is critical to reducing remanufacturing costs later on in the product cycle.)

2. Internal quality control and standardization

We should optimize business processes and find rational methods of using resources; ensure a stable production cycle in order to effectively use the available capacities.

EXAMPLE of Enel Russia - a waste list and what to do with it. List of events and checklist that can be used to decide the fate of the produced waste - resale, use in economic activities, sale for processing, disposal.

3. Product life extension-

This model allows companies to extend the life cycle of using their products through repair, modernization, reconstruction or restoration.

EXAMPLE of ENEL Russia is the modernization of the workshop at the station.

4. Responsible waste management

The Company must recognize its responsibility for the management of waste arising because of its activities, be guided by the following:

- adhere to the following priorities in waste management: prevention of their formation - ensuring use – taking measures for disposal-placement is allowed in the absence of acceptable methods of use and disposal of waste, taking into account the peculiarities in the region of the Company's presence;
- reduce the production of all types of waste through responsible consumption of resources and maximum involvement of waste in secondary economic turnover;
- maximize the use of substances or objects that are formed in the process of production, performance of works, provision of services or in the process

of consumption, introducing an approach to the management of by-products of electricity generation that takes into account the principle of a circular economy;

- make a decision on the disposal of substances or objects that are formed in the process of production, performance of works, provision of services or in the process of consumption as waste only in the absence of environmentally sound ways of their secondary use;
- keep reliable records of the generated waste, organize their accumulation in accordance with the established requirements, ensuring their separate accumulation as much as possible;
- search for and implement the most environmentally sound methods of waste management, giving priority to their disposal, neutralization;
- strive to reduce the amount of waste sent to the disposal, when placing waste, use

EXAMPLE OF ENEL Russia - the concrete slabs formed as a waste from the economic activity, instead of sending them to a landfill, due to the lack of the possibility of their recycle, are used to repair internal household roads at the station.

5. The circular economy is at the heart of the company's strategic goals and strategic direction of development.

The main tool for building a circular economy in a company is the designation of a development strategy.

For the purposes of the sustainable development policy, the company:

- strives to provide open access to information on environmental impact and annually publish an annual report prepared in accordance with international standards in the field of sustainable development;
- strives to involve stakeholders and be ready for an open dialogue on the environmental sustainability of the Company

6. Promoting environmental practices and environmental responsibility in the supply chain

The Company recognizes the need to develop not only its environmental practices, but also to convey the importance of environmental responsibility to its suppliers and contractors. In this regard, the company can:

- inform and educate suppliers about the Company's expectations regarding environmental impact management;
- evaluate suppliers taking into account qualification criteria based on environmental performance;
- evaluate suppliers based on the environmental performance of their activities.

Formation and development of functional literacy and digital competencies of employees.

Enel employees = Society of Conscious Consumption

1. Continuous training and development of employees at work and beyond.

For its employees and other interested parties, the company undertakes to ensure maximum transparency in matters related to the environmental aspects of its activities, as well as to maintain a constant dialogue on this topic with interested parties.

In this connection, it is proposed to:

- conduct continuous training and awareness-raising of employees on the issues of circular economy and environmental protection;
- demonstrate by the personal example of managers a commitment to constantly improving the level of environmental safety;

- to carry out initiatives on environmental education of the population, to form and promote the spread of a culture of respect for the environment and natural resources;
- conduct initiatives on environmental education of employees' family members in an interactive form;
- exchange best practices with the business community in order to improve management approaches in the field of the environment and develop joint initiatives.

Enel has many examples of training (the Week of Sustainable Development, training on the principles of circular economy), there are materials for employees on the eDucation platform dedicated to the circular economy.

2. Involvement of personnel in the process of introducing the circular economy into the company's business processes.

To attract employees to participate in environmental protection campaigns, it is proposed to create a "Circular economy community". This is a community that will include representatives of various functions that can take part in the identification of processes, projects, and initiatives with a circular component: environmentalists, procurement, production efficiency, financiers, lawyers. United and guided by a common goal, the community will be able to offer new interesting ideas to solve the company's problems.

3. Creating a platform for the exchange/sale of goods and sharing within the company.

As one of the tools of the circular economy, "Sharing platforms" is based on the exchange or sharing of goods or assets. Provides the promotion of platforms for interaction between users of the product (individuals or organizations), thereby increasing the level of its use. For example, Enel Russia has a corporate platform https://ecircular.enel.com//. It is an intra-corporate mix of "Sell/give away used personal goods" and a social network dedicated to the issues of the circular economy.

An advanced example of a developed society of conscious consumption is the rejection of single-use plastic. This initiative was unanimously supported by Enel employees, which indicates a high level of understanding and increasing conscious and responsible consumption.

PJSC Enel Russia adopts a **Policy on the rejection of single-use plastic** and undertakes to abandon all types of single-use plastic throughout the value chain, at all its branches and in all subsidiaries as soon as possible, taking into account the available opportunities and practices.

The policy of abandoning single-use plastic is based on the understanding that the purchase and disposal of single-use plastic creates external negative effects for the environment and society. The policy is based on the belief that the purchase of disposable plastic can be completely avoided.

The policy of abandoning single-use plastic is important for preventing the formation of plastic waste and is of strategic importance for ensuring the transition from a traditional economy to a circular economy, from a single-use society to a zero-waste society, aimed at reducing the sources of waste generation, as well as their sorting and reuse.

The policy on the rejection of single-use plastic applies to single-use plastics used by the Company for the technological needs of its generating assets. It is equally applied when ensuring the functioning of its office buildings, holding corporate events, and should be

considered by all employees of the Company, including when holding private events at the Company's premises.

PJSC Enel Russia counts on the commitment and responsible attitude of all the Company's personnel to ensure that the Policy of Abandoning single-use Plastic becomes an integral part of our corporate culture.

To ensure continuous improvement of the environment, PJSC Enel Russia invites partners, suppliers and contractors to join the Policy on the Rejection of Single-use Plastic and follow its main provisions within the framework of its production activities.

8. Transition to renewable energy and hydrogen energy

An important contour within the circular economy is the concept of a low-carbon economy, which involves the rational use of resources; reduction of greenhouse gas emissions; social responsibility of business and its focus on greening production; improving energy efficiency, as well as reducing the consumption of traditional fossil energy sources and the transition to a wider use of renewable energy sources (RES).

In the current conditions of the international economic crisis, it is the green economy that is associated with the sustainable development of industry and energy in general. Renewable energy also includes hydrogen, the global use of which is becoming a reality[40].

In 2020, the transition to hydrogen energy has become a key issue on the agenda of the international energy strategy. The main impetus for the idea of replacing organic fuel with ecological hydrogen was the concept of energy security of the European Union, which makes maximum efforts to reduce carbon dependence[41]. As noted, the global transition to pure hydrogen is a challenge for the development of the Russian economy, which, first of all, is associated with an increase in the level of scientific research and the establishment of the most promising conditions for the use of hydrogen energy for the country from a political and economic point of view.

At this stage, the ***decree of the Government of the Russian Federation No. 2634-r October 12, 2020 approved an action plan ("roadmap") on the development of hydrogen energy in the Russian Federation until 2024***, aimed at increasing the production and expanding the scope of use of hydrogen as an environmentally friendly energy carrier, as well as the country's entry into the world leaders in its production and export. According to some estimates, by 2025, production growth will be more or less constant at the current rate and will amount to 3.5%[42]. This is due to the developing trend

[40] Filimonova A. A., Chichirov A. A., Chichirova N. D., etc. Modern trends in the development of hydrogen energy technologies // Reliability and safety of energy. 2019. Vol. 12. No. 2. pp. 89-96; Information and analytical publication of the EnergyNet Infrastructure Center / EnergyTransition (hydrogen) No. 39 December 2020; Information and analytical publication of the EnergyNet Infrastructure Center / EnergyTransition (hydrogen) No 40 December 2020.

[41] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank Energy Union Package. A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM(2015) 80 final of 25.02.2015, URL: http://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF; Communication from the Commission to the European Parliament and the Council Energy Efficiency and its contribution to energy security and the 2030 Framework for climate and energy policy, COM(2014) 520 final of 23.07.2014, URL: http://eur- lex.europa.eu/resource.html?uri=cellar:f0db7509-13e5-11e4-933d- 01aa75ed71a1.0003.03/DOC_1&format=PDF.

[42] FraileD., Lanoix J.C., Maio P., et al. Overview of the Market Segmentation for Hydrogen Across Potential Customer Groups, Based on Key Application Areas. European Commission, 2015. Available online: URL: http://www.certifhy.eu/images/D1_2_Overview_of_the_market_segmentation_Final_22_June_low- res.pdf.

towards decarbonizing the economy and reducing the anthropogenic impact on the environment, where ***hydrogen energy is considered as a key direction for achieving carbon neutrality***.

In the Russian Federation, the task of developing hydrogen energy is fixed in the sectoral strategic planning document – the updated ***Energy Strategy of the Russian Federation for the period up to 2035.***[43] Now, the country has a certain basis for the development of a new direction, in particular: the presence of a significant energy potential and resource base, the presence of underutilized generating capacities, geographical proximity to potential hydrogen consumers, scientific groundwork in the field of production, transportation and storage of hydrogen, as well as the presence of an existing transport infrastructure. These potential opportunities of the Russian Federation can provide a leading position in the production and supply of hydrogen to the global market.

In this regard, certain areas of work were provided for the implementation of the existing potential in the country:

- development of domestic low-carbon technologies for the production of hydrogen with the possibility of localization of foreign technologies;
- increasing the scale of hydrogen production from natural gas, as well as using renewable energy sources (RES), nuclear energy;
- providing legislative support for hydrogen production;
- development and implementation of measures of state support for the creation of infrastructure for the transportation and consumption of hydrogen and energy mixtures based on it;
- stimulating demand on the domestic market for hydrogen fuel cells in Russian transport, as well as for the use of hydrogen and energy mixtures based on it as energy storage devices and converters to improve the efficiency of centralized energy supply systems;
- creation of a regulatory framework in the field of hydrogen energy safety; intensification of international cooperation in the field of hydrogen energy development and access to foreign markets.

Today, the priority task for 2021 as part of the implementation of the action plan is to develop a Concept for the development of hydrogen energy in the Russian Federation. This act will reflect the indicators for assessing the current state of hydrogen production and consumption, as well as assess the resource and technological potential of Russia in the promising market of hydrogen energy carriers. In addition, an interdepartmental working group on the development of hydrogen energy under the chairmanship of the Minister of Energy of the Russian Federation and a project office based on the Federal State Budgetary Institution "Russian Energy Agency" of the Ministry of Energy of the Russian Federation will be created to monitor the implementation of strategic tasks, providing information and analytical support for the implementation of the "roadmap".

The idea of developing a hydrogen economy is also in demand among energy companies. The Russian Federation recently hosted SPIEF-2021, the main idea of which was the topics of renewable energy and the green economy. During the discussion of the climate agenda (in particular, the reduction of CO2 emissions from the extraction and production of fuel and energy complex products, the introduction of "green certificates", the introduction of ESG principles), the development of new energy sources (hydrogen and its production technologies), the introduction of digital products in the fuel and energy

[43] Source: https://minenergo.gov.ru/node/1026

complex, it was noted that environmental safety issues in our country began to be solved systematically. Within the framework of the national project "Ecology", an ambitious task has been set – to send 100% of waste for sorting by 2030, and to halve the volume of solid waste disposal[44].

So, as it was emphasized by Andrey Chibis[45], a document was signed at the St. Petersburg Economic Forum, according to which the project of producing hydrogen using electricity from the largest wind farm in the world in the North is already being structured. Now it is being built by Enel, the launch is planned in a year and a half. Work is also underway to prepare a joint hydrogen energy project with Rosatom using the energy of the Kola NPP. Negotiations are underway with colleagues from Australia on the possibility of using our existing hydroelectric power plants to produce hydrogen. Speaking about international experience, key oil and gas companies, such as Shell, Chevron, BP, Eni, ExxonMobil, also invest in the development of renewable energy sources.

However, unfortunately, the use of hydrogen to produce clean energy is currently hampered by a number of problems, including the high cost of hydrogen production due to the use of non-renewable energy sources, poor development of refueling and generating infrastructure, insufficient regulatory regulation, low level of state incentives and support for the development of renewable energy projects.

9. Regulation of “green certificates”[46]

One of the tools for supporting renewable energy is "green" certificates, the main objectives of which are legislative quotas for the volume of renewable energy consumption, based on the development priorities established by the state; providing subsidies to renewable energy producers, depending on the volume of energy produced, documented, i.e. "green" certificates.

Currently, there are markets for voluntary "green" certificates in the world, including the purchase of certificates by companies for the corporate purpose of achieving a certain share of RES in energy production (consumption) to form a positive climate image, as well as markets with obligations to produce or consume energy based on RES to confirm the achievement of certain goals. Such goals may include quotas or Renewable Portfolio Standards, RPS. It should be noted that the price of "green" certificates on voluntary markets is the result of the balance of supply and demand. In other markets, the price is set under the influence of opportunity costs, including the amount of penalties and fines. In practice, the market for voluntary certificates and the market for mandatory certificates can work simultaneously.

In the member states of the European Union, "green "certificates have been used since 2001 as "Guarantees of Origin". "Green" certificates are used to account for "green" electricity by end-users of electricity. Even though the accounting of renewable energy is mandatory, the order of its organization is determined by the EU member States themselves.

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[44] URL: https://www.vedomosti.ru/press_releases/2021/06/09/itogi-raboti-pmef-2021.

[45] URL: https://fedpress.ru/news/51/ecology/2768524

[46] The Constitution. Right. The fourth energy transition. Collection of articles. Responsible editors: Sedova Zh.I., Spiridonov A.A., Kravchenko D.V.-Moscow, LUM, 2021. Article by A. I. Mursalova " Green certificates: world experience and plans in Russia (p. 163-176).

To harmonize the "guarantees of origin" in the EU, the European Energy Certificate System (EECS) has been established, which allows for the organization and implementation of cross-border trade in the single wholesale market.

The European market for "guarantees of origin" is a voluntary market. However, for the period up to 2030 the EU has approved a pan-European target for the share of renewable energy in the energy balance of the EU member states at 32%.

In addition to voluntary markets, there are also markets for “green certificates” with obligations in European countries. Norway and Sweden use the joint system of "green" RES certificates, which quotas RES for manufacturing companies, as well as a number of consumers.
The market for "green" certificates with obligations is typical for the UK, where a quota system called Renewables Obligation Certificates (ROCs) is applied. The system under consideration regulates the mandatory volumes of electricity supply from renewable energy sources for all licensed supplier companies.

If it is impossible to fulfill its obligations on the volume of energy production based on renewable energy, manufacturing companies can purchase "green" certificates that provide compensation for the missing amount of electric energy.

In accordance with the specifics of the current US legislation, the Renewable Energy Certificate (REC) system currently operates on the territory of the country: on a voluntary basis, if there are no targets for renewable energy generation; on a mandatory basis, if there are goals or standards for the use of renewable energy (Renewable Portfolio Standards, RPS). Currently, renewable energy targets are set in 8 states and one territory, while renewable energy standards are set in 29 states, three territories, and the Federal District of Columbia.

The rest of the world, developing markets for "green" certificates, mostly apply International Renewable Energy Standards the International Renewable Energy Certificate (I-REC). According to RECS International, this certification system has been adapted in more than 25 countries around the world, including Latin America, Africa, the Middle East and Asia.

Some countries, such as Japan, still use national certification systems: New Energy Certificates (NEC). The introduction and use of "green" certificates in Japan is aimed at developing the latest technologies in the production of renewable energy.
The creation of a unified certification system and the development of a global market for "green" certificates requires significant work on the harmonization of national systems and the development of common international rules and standards for the creation of a global "green" economy.

The path taken by the Government of the Russian Federation to develop and establish a "green" economy inevitably led to the need to develop a national market for "green" certificates. Currently, the issue of the development of the institute of "green" certificates is only at the stage of its formation. The main achievement to date is two draft laws concerning "green" certificates.

The Ministry of Economic Development and the Ministry of Energy have published their versions of the draft amendments to the Federal Law" On Electric Power Industry "of 26.03.2003 No. 35-FZ, introducing the concepts of "green" certificates (the Ministry of

Economic Development of Russia) and "low-carbon" certificates (the Ministry of Energy of Russia).

According to the draft law prepared by the Ministry of Economic Development of the Russian Federation, the "green" certificate is "an electronic document issued upon the fact of electricity production using exclusively renewable energy sources at a qualified generating facility in the amount and for the period of time specified therein".

According to the draft law, the owners of "green" certificates shall become wind, solar and hydro power station with a capacity up to 25 MW, was commissioned in 2025 and later, in accordance with the so-called program "Agreement for the supply of power RES 2.0". In this issue/redemption/transfer of "green" certificates will be carried out on a voluntary basis by the Association "Market Council" by maintaining the register.

The draft law proposed by the Ministry of Energy of the Russian Federation and submitted to the Government of the Russian Federation on December 1, 2020, provides for the introduction of a system of "low-carbon" certificates starting in January 2021. The key difference between the draft law of the Ministry of Energy and the draft law of the Ministry of Economic Development is that the certificates will apply not only to standard RES (regardless of the year of commissioning), but also to powerful hydroelectric power plants (from 25 MW) and nuclear power plants.

The option of the Ministry of Energy is considered more "export", since it retains the possibility of international recognition of "green" more than a third of Russian generating capacities. According to the definition given in the draft law, a "low-carbon" certificate is understood as "an electronic document issued upon the production of electric energy using nuclear energy and (or) using renewable energy sources at a qualified generating facility (hydroelectric power stations, wind farms, solar energy station)".

Thus, the issue of the development of the market of "green" certificates is extremely relevant for Russia, at least in the context of the development of the "green" economy in the country. However, the high dependence of various sectors of the economy on traditional energy sources makes this process somewhat difficult.

10. Biomass power plants – a new goal for the development of the electric power industry in energy companies

Circular suppliers is a model in which limited resources are replaced by fully renewable sources. In the energy sector, a technology for the production of cellulosic bioethanol has been developed, in which agricultural residues (corn cobs, husks, leaves and stems) are converted into renewable fuel. The implementation of such projects allows the companies North European Bio Tech Oy (Finland) and POET-DSM Advanced Biofuels (Iowa, USA) to receive a new source of income, contributing to reducing emissions, creating workplaces and strengthening national energy security.

The use of biomass, meanwhile, is a rather promising process. It is believed that biomass is able to provide as much energy as is produced by all nuclear power plants. Currently, biomass power plants use wood, plant waste, peat briquettes as fuel, and have an efficiency of about 25%. Low-power biomass-powered power plants are usually equipped with biomass gasification plants, as well as gas-generating plants. In this case, biomass significantly exceeds coal in its ability to gasify, which makes such power plants more economical than coal-fired ones.

In the case of higher-capacity power plants, special energy plantations are used, designed for more large-scale production of fuel for such power plants. Plantations, as a rule, are specially planted fast-growing varieties of trees, such as poplar or willow. One hectare of such a plantation, when using a gas turbine power plant on biomass, can produce up to 25 MWH of electricity. Biomass power plants have a number of pronounced advantages. A simpler process of biomass gasification, compared with coal, as already mentioned above, allows you to get cheaper electricity. In addition, it is a more environmentally friendly type of fuel, since the biomass contains much less sulfur. And modern technologies for processing biomass allow us to achieve a significant reduction in harmful emissions into the environment. Biomass power plants work with renewable energy sources, which is currently becoming increasingly relevant. In addition, the increase in biomass production, including the spread of energy plantations, contributes to improving the environment, and, at the same time, reducing soil erosion. The production of compost from biomass improves the main soil indicators, allows for more efficient wastewater treatment. The spread of biomass power plants will significantly reduce the consumption of non-renewable energy sources, such as petroleum products, natural gas or coal, which has a positive impact on ensuring the energy security of the country as a whole.

Of course, there are preconditions and methods for creating a closed-cycle economy in the world. However, it would be effective to support initiatives to isolate individual regions and transfer them to a circular economy. To do this, the first aspect will be the creation of a biomass power plant. This power plant will serve an isolated region and meet the needs of households, local businesses and farmlands. At the same time, the waste products of this region will be used by the power plant. Thus, we will get a region with a minimum amount of waste generated, as well as a large layer of information on the problems that have arisen from the progress of the transition to a closed-cycle economy. Products produced in this region will be able to be sold on the market with the indication of the place of origin of the goods – the "green" region, or the "circular" region. And this will allow manufacturers, along with products and electricity, to put into civil circulation "biosertificates", the annotation to which will be the phrase that “no animal was injured during the issuance of this certificate, but on the contrary will receive additional feed”.

11. Conclusion

Each country has not only national characteristics of the transition to the concept of a circular economy, but also various priority areas of its implementation, primarily due to the level of economic development. Developed countries, changing the current structure of production and consumption, take a leading role in the introduction of circular systems and in the future will support the transition to a circular economy in developing countries through financing and technology transfer. The latter, in turn, should take into account the principles of a circular economy when solving development problems.

However, since the transition to a circular economy at the global level, as we can conclude from the above, is a long process, first of all it is necessary to ensure that each of us is prepared for this event.

The main means is to invest in a person, in the future generation, to teach everyone the principles of sustainable development, to indicate the importance and necessity of a circular economy for each individual person. Further, all measures at the company level should be strengthened and additional steps should be taken. For example, because of

economic activity, as a waste, a container from under the liquid is formed at the enterprise. The number of containers formed during the year is extremely small, which does not allow us to give these containers for processing, and the factory for processing this container is located on the territory of another region, which makes it economically unprofitable to sell for processing. However, there are a dozen more enterprises in the region, as a result of their economic activities, a small number of containers is also formed. By combining efforts and working out logistics, the collection and transfer of the containers for processing will reduce the amount of waste generated. Thus, the demand for container processing will increase, which will allow building a factory in the region of presence.

This example shows that first of all, the initiative should come from a person and an understanding of the importance of the issue, then business is looking for a solution within the framework of an active dialogue, which in turn gives rise to ideas and demand for a circular economy.