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Virginia Zhelyazkova[1]

THE ROAD TO CIRCULAR ECONOMY: WHAT CAN EUROPE LEARN FROM THE EXPERIENCE OF GERMANY AND JAPAN?

The transition from linear to circular economic model has gradually become an imperative for all countries in the world. Negative phenomena, which are the result of prolonged environmental pollution, affect all economic actors and reveal the defects of the linear economic model. The clarity of the need to abandon it, however, faces the complexity of its replacement. It is becoming increasingly obvious that this will be a long and complicated process in which the state will have to play an active role.
Some countries have moved in this direction relatively earlier than others. Such are Germany and Japan.
The aim of the present study is to present in a general analytical and comparative plan the main policies that these two leading economies in the world have conducted over the years as their experience would be of significant benefit to the successful realization of the actions - part of the transition to a circular economic model, in the countries of Europe and in particular those in the EU.
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1. Introduction

The transition from a linear to a circular economic model has gradually become an imperative for all countries in the world. Negative phenomena, which are the result of prolonged environmental pollution, affect all economic actors and reveal the defects of the linear economic model. Kitanov stressed that "the acute need to solve the environmental problems that are increasingly global in nature is realized today in all countries" (Kitanov, 2015, p. 5). He further argues that these problems "….materialize in domino effects of negative events such as air pollution, spreading of diseases such as allergies and respiratory problems, soil and water pollution and the consequent plant and food contamination with harmful substances." (Kitanov, 2018, p. 154). The clarity of the need to abandon the linear economic model, however, faces the complexity of its replacement. It is becoming increasingly obvious that this will be a long and complicated process in which the state will have to play an active role. Some countries have moved in this direction relatively earlier than others. Such are Germany and Japan. The experience of these two countries would be

[1] *Prof. Virginia Zhelyazkova, PhD, VUZF University – Sofia, mob.: +359 888 789 234, email: vzhelyazkova@vuzf.bg.*

of significant benefit to the successful implementation of the actions – part of the transition to a circular economic model – in the countries of Europe and, in particular, those in the EU.

2. Germany's policy towards circular economy

Germany is among the most active countries in the EU in the efforts to move towards circular economy and a major supporter of this policy at EU level. Since 2000, the effective use of natural resources, the recycling of objects and materials, the closure of the production cycle to minimize waste, are at the heart of Germany's sustainable development policy. The drive of the German governments is to turn the environmental challenges into economic opportunities. In addition, the country has to provide a certain amount of metals for its export-oriented economy and seeks to do so, as far as possible, on the basis of recycling, thereby optimizing the extraction and import of these metals.

In Germany a Law on the Promotion of the Circular Economy and for Environmental and Rational Waste Management was adopted and is in force. Within the framework of this law, the following definition of circular economy is given: "prevention and recycling of waste". The circular economy, as interpreted by this law, covers several important aspects of economic activities. In the first place, there is directly related to strengthening the control over waste management activities. Secondly, the rules for monitoring the fate of waste products that are exported from Germany and which the German economy is actually losing. Next, very important for the functioning of the circular economy is consumer awareness. Last but not least comes the role of municipalities in the proper management of the waste collection process.

The importance of following clear rules is emphasized, paying particular attention to the separate disposal of recyclable materials in specially designated containers.

Another important step in Germany's policy towards the transition to the circular economic model is the declaration in 2002 in the sustainable development strategy of the need to differentiate the efforts to realize economic growth from the increase in the use of resources. The German government has set itself the ambitious goal of doubling the productivity of the raw materials used in the various industries between 1994 and 2020. The goal thus put, forced Germany to initiate detailed work on identifying the specific parameters to help it materialize.

First of all, serious analytical work is underway on identifying the potential of resource efficiency in the various industries. Analyzes are then made on what measures should be taken to actually use this potential. Thirdly, the possible micro- and macroeconomic effects of these measures are explored in detail. To this end, a comprehensive program for the study of these issues was set up in 2007, with 31 organizations under the leadership of the Wuppertal Institute (CGDD, 2014).

Based on the results of three years of research, the German government has created and deployed the so-called the PROGRESS program, which aims to increase resource efficiency (Federal Ministry for the Environment, 2016). This program, in practice,

complements Germany's environmental policy by covering a category of resources that have not been covered by then – raw materials that are not energy-producing and not related to food production. The aim of the program is to make the fight against undesirable environmental consequences a viable option from an economic point of view. Thus, on the one hand, as a result of the government's efforts outlined in the program, it aims to achieve security of supply, increase the competitiveness of enterprises, secure the leading position for German manufacturers in the future. On the other hand, objectives related to the state of the environment are pursued, such as the reduction of the use of raw materials and other materials, which contributes to the preservation of nature.

It should be emphasized here that again, as in Japan, the state plays a key role in the implementation of the planned activities within the policy line. In practice, a variety of levers are being mobilized to promote activities aimed at the circular economy. At federal as well as at local level, agencies, offices and other bodies are set up at different ministries to build the necessary competencies for managing resource-efficient processes (CGDD, 2014).

There are four guiding principles in the program:[2]

- Reconciliation of environmental imperatives with economic opportunities, support for innovation and social responsibility;
- Integrating the global dimension into resource-efficient policy, taking into account the influence that this policy of Germany will have on the rest of the world (a feature that is also observed in Dutch policies);
- Accelerating efforts in Germany to increasingly less raw material dependence at the expense of developing closed-loop management in different production areas;
- Ensuring the sustainable use of natural resources in the long run and the orientation of the whole society towards the quality of growth.

In addition to these four guiding principles, five strategic objectives are also outlined in the plan:[3]

- provision of so-called sustainable raw materials. This should be done by implementing a strategy on raw materials by the German Government as well as by increasing the share of renewable raw materials in production;
- increasing efficiency in the use of resources in production. This could be done by enhancing the role of innovation and enterprise competitiveness though the development and the dissemination of a variety of highly efficient resource production methods (different raw materials for production as well as energy raw materials). Other

[2] For further information, please see Overview of the German Resource Efficiency Programme (ProgRess). Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, n.d., available at: http://www.bmub.bund.de/en/topics/economy-products-resources/resource-efficiency/deutsches-ressourceneffizienzprogramm/german-resource-efficiency-programme-progress/, retrieved 21 August 2016.

[3] Ibidem.

important levers in this direction are such as informing and encouraging the use of environmental management systems, any innovative activities aimed at integrating the resource efficiency criteria into product concepts, integrating resource conservation into standardization processes;

- sharpening public awareness on the issue of the types of products consumed. Gradually, awareness should be raised that resource-efficient products should be preferred; by introducing new certification systems to strengthen the existing ones, and by using the so-called "green government purchases" as an instrument to strengthen the implementation of the principles of resource efficiency;
- strengthening the management of the closed-end resource use cycle;
- the use of different working tools to support of the chosen policy line. These instruments include, for example, various measures to increase the market penetration of such resource-efficient products and services; eliminating subsidies to encourage the use of different types of conventional resources; supporting research and knowledge in this area; extension and upgrading of the legislative framework in this field both in the country and in the EU and internationally, etc. (CGDD, 2014).

The government is actively helping individual companies in their efforts to implement resource-efficient methods. This is being done mainly through the provision of political and institutional support in addition to government guarantees for foreign investment. These are particularly needed, since, as Kitanov notes, "each investor is interested in the future income and therefore in the evaluation of the risks related to particular investment decisions" (KItanov, 2016, p. 332), and resource-efficient methods are often associated with relatively high risks and therefore high rate of returns.

In addition, it is important to note that there are four basic principles in the PROGRESS program:

- increasing producers' responsibility for the ways in which they produce and market their products;
- studying the possibility of setting targets for the collection of raw materials from specific products rich in minerals critically important to the economy of the country;
- setting targets for municipal waste as well as for building and demolition activities;
- combating illegal export-related activities and supporting the recovery of resources in developing countries.

These four principles can also be found in the Law on Promoting the Circular Economy and on Environmental and Rational Waste Management.

Germany is among the EU countries that have begun systematic efforts to impose the circular model at the earliest. What is special is that this country is highly export-oriented, its industry consumes huge quantities of raw materials and produces output for markets around the world. In order for German goods to compete on the world market, they must be produced with the most efficient use of resources. This, to a certain extent, naturally

requires the need to work hard to study resource efficiency, search for funds to be continually upgraded, to stimulate various innovations to support this process, and last but not least – the cultivation of the corresponding awareness in society that supports these efforts.

3. The experience of Japan in the transition from linear to circular economy

Historically, Japan is the first country in the world to systematically apply the principles of the circular economy in its development. The basis of the policy pursued in Japan is the so-called 3 R (Reduce, Reutilize, Recycle) – reduction, re-use and recycling. The roots of this policy should be sought in the geographic, geological and historical realities of this country. Territorial constraints, coupled with a scarcity of natural resources, have forced over time the governments of Japan to seek ways to organize the economy and society so as to consume a minimal amount of resources.

The oil shocks in the 1970s played a particularly strong influence on the formation of such a policy by Japanese governments. These episodes clearly showed the country that, in order to be a leading economic power, it must find a way to reduce its dependence on imported fuels as far as possible. However, this could only be done by redefining the economic model and directing it to the optimal use of different types of resources. Of course, such a quest would not have been feasible unless there was the necessary knowledge and level of consciousness in the society of Japan. Governments systematically strive to build a comprehensive culture in the country aimed at optimizing the use of resources at all levels. This is not very difficult, as such a way of thinking has been embedded in the Japanese culture for centuries.

Ji, Zhang and Hao highlight three phases in the development of Japan's circular economy (Xiujun Ji et al., 2012).

The first phase covers the 1970s and 1980s and represents a transformation of the state's policy on conventional energy sources. After the oil shocks, the Japanese governments began to pursue a two-dimensional policy. On the one hand, they are focusing on diversifying the use of conventional energy sources, with the participation of an increasing share of coal and gas in the country's energy mix at the expense of oil. On the other hand, active energy efficiency actions are initiated at all levels of production. This is possible both because of energy saving measures, and as a result of directing the industry from energy-intensive sectors such as the production of metals, for example, to the high technology sectors. In this way, the country has progressively made significant progress not only in terms of energy consumption but also in the area of development and use of its relative advantages.

The second phase is characterized by the development of a strategy for the use of renewable energy sources. In 1994, Japan prepared a plan for the exploitation of energy from alternative sources. For the purposes of the plan, these sources are divided into categories depending on the time needed for their recovery. For example, solar, wind and hydropower recover in a very short time, while biomass sources (forests, animal species, etc.) require a

longer recovery period. The use of renewable sources has become national priority and contributes to building a circular economy in the country.

The third phase is related to the formation of such public awareness in Japan that supports governments' efforts to achieve the goals set. In this direction, the Japanese state has been working hard over the years, so that through the educational system and the upbringing of individuals as part of the optional institutional measures, the need for the most efficient use of natural resources is achieved.[4] It can be said that there is practically no need for public debate in Japan at the moment (end of 2018) as to whether the circular economy is an appropriate model of economic development.

As Ji, Zhang and Hao point out, Japan's legislative system is designed to support the functioning of the circular economy. Over the past 25 years, since 1993, a number of laws have been adopted that stimulate the various aspects of the circular economy. The first category is fundamental, the second – the all-embracing and the third – the specific ones.

Generally speaking, Japan's legislative framework is built on three levels: the 2000 Framework Framework for the Establishment of a Circular Society, the Resource Efficiency Promotion Act, and the Waste Management Act of the same year, as well as on some sectoral laws dealing with specific aspects of the circular economy (CGDD, 2014).

It is an idiosyncrasy of Japanese legislation, that it has been developed in detail according to the specifics of the individual economic sectors. This is because of the need to take into account the specificities of the individual products in terms of the materials they are made of and the length of their lives. Since waste processing is organized by sector, regular monitoring of the activities related to it is of great importance.

Another feature of the Japanese model is the continuous tracking of the extent to which waste recycling targets are feasible for individual sectors and product types. This tracking is done with the assistance of independent experts.

During the first stage of the creation of the legislative framework for the transition to a circular economy in Japan, the Law on the Promotion of the Use of Recyclable Resources was adopted in 1991. This law acts in parallel with the Waste Management Act adopted in 1970 and has since undergone numerous amendments and additions. The Waste Management Act mainly addresses the life of the product when it is out of use and has to be discarded. In 2000, the Recycling Act was renamed the Resource Efficiency Act and underwent an amendment, adding to it the subject of waste reduction and re-use.

In fact, it is these two laws that are the basis for Japan's Fundamental Law for the Establishment of a Circular Society. This law defines the principles of the circular economy. These principles include the so-called hierarchy of waste, its cascade use and the specific responsibilities of the different parties in the process.

In order to meet the requirements described in the legislative framework, the Japanese governments initiated the preparation of plans that are complemented by specific action

[4] More on the need to build awareness can be found in Rangelova, 2014.

programs in the different areas. Interestingly, the progress made by the Japanese governments on their own initiative was discussed and evaluated at the G-8 meetings in 2004 and 2008.

It is important to note that, in order to support the success of the policy towards establishing a circular economy, the Government of Japan uses a number of measures to act as a kind of incentive for individual groups of economic actors. Various types of competitions have been set up for representatives of the different economic sectors, as well as awards for organizations that achieve the best results. In this way, through the transparency of the efforts of all, public awareness is stimulated and the activities in the field of the circular economy are gaining momentum. Examples of such initiatives are the "top runner" programs, the eco-label "e-Mark", programme "Eco Town", which are discussed below.

The "top runner" program aims at increasing energy efficiency. It covers 21 categories of products such as cars, various items for everyday use, and more.

Once the minimum energy consumption for each of the product groups covered by the program is established, it becomes the target standard for all other products in the same group. They must reach this goal within a certain period of time. These standards are set by a special Committee on Standards for Energy Consumption of the Ministry of Economy, Trade and Industry.

Labeling initiative, the so-called eco-labels, on products showing how close to the energy standard for their class the particular products are, even though the placement of e-Mark is voluntary for companies, appears to be widely applied. Putting eco-labels contributes significantly to meeting Japan's energy efficiency targets, because it promotes the competition element amongst individual companies. Interestingly, labels and the achievement of energy-saving targets per unit of product are closely monitored by the Committee. In cases where objectives are not achieved, it has the power to impose sanctions. At the same time, information on the products for which the highest energy efficiency is achieved is published twice a year in a special catalog.

The next effective initiative aimed at achieving circular economy is known as "Eco Town". It was carried out between 1997 and 2007 under the supervision and support of the two key ministries – the one for economy, trade and industry, on the one hand, and for the environment, on the other. This initiative has two main objectives. The first is to create eco-industrial parks, i.e. places where it is possible to close the production cycle so that the waste products of a given production becomes raw material for another, while minimizing waste. The second is, within these parks, to create the necessary conditions for the revival of certain economic sectors such as the heavy industry, which will already function under the new conditions for the treatment of waste products. At present, there are over 60 such projects in Japan.[5]

[5] For further information, see Overview of the German Resource Efficiency Programme (ProgRess). Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, n.d., available at: http://www.bmub.bund.de/en/topics/economy-products-resources/resource-efficiency/deutsches-ressourceneffizienzprogramm/german-resource-efficiency-programme-progress/, retrieved 21 August 2016.

There are three types of ecosystems in the country. The first category is located in large urban agglomerations and in large cities. The second is positioned on the islands. The third one – in areas that cover many secondary cities for whose waste solution is sought towards the centralization of the recycling activities at the regional level.

The order of approval of a project for the eco-designation is as follows: the municipality, within which the eco-construction is planned, together with the companies that wish to participate (the consortium), draw up a plan in which they outline their project. The consortium defends the necessity of its realization, its economic sustainability, its profitability, what innovations are expected to be introduced and whether the best existing technologies will be used. In addition, the project must demonstrate having a very important quality for the Japanese government – to be able to serve as an example to other similar initiatives, and this must be reflected in the plan for its implementation. The plan is submitted for approval to the two Ministries - the one for economy, trade and industry, and the one for the environment. If it is received, the state grants funding and, in some cases, local authorities support the project by providing loans for the purpose.[6]

The main source of funding for projects aimed at the realization of a circular economy is the Development Bank of Japan. This particular activity is part of the Japanese state policy of promoting sustainable governance as a whole. The concrete financing of individual projects is done through private banks. Three interest rate levels for borrowers are defined. The particular level of interest at which funding will be received depends on the answers provided by the applicants to 120 questions pertaining to different aspects of their activity that are relevant to the environment. It could be rightly said, therefore, that the Development Bank of Japan in this respect acts as a "green bank" in terms that "green banking in its essence is actually the provision of loans, deposits and other banking products (mutual funds and other investment products, custodian services etc.) that would have positive impact on the environment." (Zhelyazkova, Kitanov, 2015, p. 309).

Essential to achieving the goals set out by the government of expanding the scope of the circular economy is the existence of an active governmental policy which, as has become clear, is manifested in a number of activities and, most importantly, in the overall governance of the process. Under the Ministry of the Environment and the Ministry of Economy, Trade and Industry, the state monitors compliance with the energy efficiency norms defined for individual product groups and products, imposes sanctions for non-compliance and rewards in different ways, distinguishing top runners and thus setting examples for the rest. Furthermore, as already mentioned, these two ministries are reviewing and approving the ecotourism plans provided to them by the municipalities jointly with the interested companies and subsequently, upon approval, the Development Bank of Japan provides funding.

In addition to these very important activities for the success of the policy carried out, in 1994 the state prepared and introduced a specific plan according to which all deliveries to parliament, the government, the various agencies to it and, in general, all governmental institutions, need to meet certain environmental criteria. This is a very powerful tool which

[6] Ibidem

encourages all suppliers for the huge government administration to move on to new production standards. And not only this. With the introduction of such a plan, the state gives an unequivocal signal to the other economic actors in which direction their production and consumption patterns should be targeted, that the current (until the introduction of the plan) mode of work is clearly unacceptable to the government, and that it will use all measures to achieve change at both macro and micro-level.

In addition to this plan in 2000, the Law on the Promotion of Green Purchases entered in force.[7] As a result, from its active policies towards the transition to circular economy, Japan stands out as a country ahead of the most active countries in Europe – Germany and Sweden.[8]

Another important policy direction characteristic for Japan is the introduction of standards for the quality of recycled products, as their lack is a serious obstacle to selling them on the market. Local authorities in Japan play a key role in implementing this important step as they actively inform central authorities about this problem and require their decision in order to make purchases of recycled products.

Progress in establishing a circular society is being followed closely and continuously. According to a 2010 report, when looking at the results of the measures taken under the first plan, Japan has achieved very high results. For example, in the packaging sector almost 100% recycling of materials has been achieved, with the exception of cardboard and glass packaging. In the household appliances sector, 85% is recycled, and in the construction waste segment for some materials such as concrete and wood 95% recycling is achieved, with batteries between 50% and 80% by category. As Stoichkova rightly notes, "environmental standards and their norms are established by governments and by local administrations in view of local specificity" (Stoichkova, 2008).

Table 1

Standards for harmful elements in water (mg/l)9

№	Components	National Standards	Standards of Kanagawa prefecture
1.	Biological oxygen demand	160	20.000
2.	Chemical oxygen demand	160	20.000
3.	Solid fragments	200	50.000
4.	Phenols	5	0.005
5.	Phosphorus	15	0.500

Source: Stoichkova, O. (2008)

The table shows environmental standards established by the Japanese government and a separate prefecture.

[7] See further: http://www.env.go.jp/en/laws/policy/green/1.pdf.
[8] For further information see: Comparaison internationale des politiques publiques en matière d'économie circulaire, Études & documents, Commissariat général au développement durable n° 101, Janvier 2014, p. 22.
[9] Ibidem.

It can be summed up that Japan is a pioneer in the efforts to establish a circular economic model. Long before the idea of a circular economy acquiring public significance globally, it has been embedded in the very foundation of the Japanese state philosophy. Of course, the roots of this philosophy should be sought in the historical past of the country as well as in its geographical peculiarities. Consciousness of the need to ensure optimal efficiency of all economic processes is part of the Japanese culture. It is precisely this culture and public awareness that is in the core of the success of the state policy in the realization of circular economy.

4. Conclusion

The leading developed countries in the world have already recognized the need for an active governmental policy to shift the economic model from linear to circular. Japan and Germany are among the leaders in this respect. These countries create and implement state policies and good practices to set an example for the rest of the world. In the end, as Dobreva points out, "institutions are part of the social order of society and they govern the expectations of individuals while regulating business operations and ethics" (Dobreva, 2018, p. 119), it is therefore impossible to make a transition from one to another economic model without their active participation. In addition, as she stressed out in another publication, "internal transformation must be done in close cooperation with the external environment" (Dobreva, 2016, p. 339), i.e. it is necessary for the management of the institutions themselves and the individual business organizations to realize the need to make the change and to strive to implement it, taking into account the context of the external paradigms.

Despite the stated desire to change the economic model, the efforts of individual countries, even within the EU, remain fragmented. In Japan, it can be said that the circular economy is at the center of economic life. Comprehensive legislative frameworks have been developed defining the rights and obligations of individual economic actors. There are a number of specific incentives and sanctions for the individual actions they take. Such detailed legislation is not yet a fact in the EU as a whole, which can draw a lot from the good practice in Germany. Individual countries within their borders conduct their own national policies, have their own priorities and principles.

In order for change to take place, all countries around the world need to follow a common management philosophy. This is due to the fact that the modern globalized world is open and the countries consume many goods that are not produced on their territory, so it is very difficult to independently conduct an effective policy aimed at circular economy. The policies of Japan and Germany are indicative in this respect - they seek to take into account the influence of imports and exports when they form their decisions to act in different aspects of the circular economy. However, this practice must be transferred to all countries in order to ensure the effectiveness of the efforts.

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