

CONCEPT OF CIRCULAR ECONOMY: CRITICAL THINKING

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The paper was presented at 4th International Symposium on Environmental Management - Towards Circular Economy, December 7th - 9th 2016, Zagreb, Croatia

Critical thinking on circular economy in this paper stresses the need for new approach to industrial production, which takes into account consumption avoidance and restrictions of resource usage. Circular economy replaces dig – use - dispose concept still so common in our linear economy. To fully implement circular economy, we need paradigm shift of how we create the process of product design, materials, production, consumption, business models and systems in place and to rethink the saving that implementation of this concept will bring to the producers. Paper analyses public policies that arrange circular economy. It is aiming to point out that we are talking about the concept far more complex than the separate waste collection systems and recycling which are the methods that are most commonly used to describe circular economy. Paper discusses current quality of public policies, whether it is sufficient for circular economy and shortcomings of the current systems.

Key words: circular economy, resource consumption, economy, business.

Koncept kružnog gospodarstva: kritičko razmišljanje. Kritičko razmišljanje o kružnom gospodarstvu predstavljeno u ovom članku naglašava potrebu za novim pristupom industrijskoj proizvodnji koja u obzir uzima izbjegavanje korištenja resursa. Kružno gospodarstvo treba zamijeniti koncept izvadi-koristi-baci kakav se koristi u još uvijek dominantnom linearnom gospodarstvu. Za primjenu kružnog gospodarstva potrebna je promjena paradigme u načinu kako dizajniramo proizvode, koje materijale, proizvodne procese ili poslovne modele koristimo te je potrebno ponovno promisliti kakve koristi ove promjene donose poduzećima. Članak analizira javne politike koje uređuju kružno gospodarstvo i naglašava da se radi o konceptu puno kompleksnijem no što je odvojeno sakupljanje i recikliranje otpada, metode najčešće korištene u opisu kružnog gospodarstva. Članak raspravlja o kvaliteti javnih politika, njihovoj primjerenosti za poticanje kružnog gospodarstva te nedostacima sustava koji je trenutno na snazi.

Ključne riječi: kružno gospodarstvo, potrošnja resursa, gospodarstvo, poslovanje.

INTRODUCTION: THE CONCEPT OF CIRCULAR ECONOMY

Linear model of economy [1], which is currently representing global models of economy, will not be suitable for much longer for it cannot secure satisfaction of all needs of today's human population. The concept in which from one side we extract needed resources, use them in the process of production and consumption, and then dispose of, creating at the same time huge amounts of waste, can simply no longer be sustainable. Additionally, the time of the

consumption period is becoming shorter and shorter because people are being pressured to change products more frequently to satisfied desired social standards. Social progress can no longer be built on the model: *take-make-dispose* because natural resources are in large part definite in quantities so we need to find sustainable and environmentally acceptable way of their harvesting. Rational resource usage represents at the same time the economic interest of business. Better

usage of resources means less material per product or service; lowers cost and increases competitiveness. It also contributes to decoupling of causal relations between economic growth and resource usage what helps divide concept of development from the concept of growth. This represents the basic precondition for sustainable development.

Sustainable development is a 25 years old concept that failed on the level of operationalisation. Started as a proposition of the World's Commission on Environment and Development, the sustainable development was appealing to all governments, those of developed as well as those of developing countries. It offered a solution that would allow everybody to keep on developing and at the same time protect environment. The precondition was that the development was to be smart and environmentally friendly. The ball was in the hands of the business because, the business had the technological power, resources and human capital that can provide such a development that will help us stay within the Earth's capacity.

Quite wide definition of sustainable development: "Sustainable development represents development that will satisfy the need of present generation without compromising ability of future generations of satisfying their needs" [2] did not give clear agenda of what to do. But, the new concept gave international leaders ease of mind for over a decade. The public sector on international level created a number of international strategies and founded international committees that took over the responsibility of providing guidance of how to achieve necessary changes. National governments mostly did very little or nothing to help the change. It took us almost two decades of failures in finding the development path that would decouple us from resource usage, to finally realize that the solution was not found. We did not

succeed in finding the receipt for actual implementation of programs, rules and standards that would all combined result in satisfaction of everybody's needs while decoupling development from excessive exploitation of resources. From time to time, there were developments of new terms and theories that had purpose of restoring interest for developing new and innovative ways which would find solutions for over excessive resource consumption and improve extremely uneven distribution of wealth and resources. Since Rio Summit in 1992, developed were concepts such as: corporate social responsibility (CSR), corporate sustainability, green economy, circular economy, and many more, all trying to find ways to create incentives to make necessary changes [3]. Now it seems that it is up to business to come up with a solution.

The most recent concept is the one of circular economy. It aims to support economy based on restorative and regenerative design, and aims to keep products, components, and materials at their highest utility and value at all times. The concept distinguishes between technical and biological cycles yet it supports development of technical cycles to mimic as much as possible the biological cycles since they have proved to be so perfect in using resources wisely and as optimal as possible. It represents a continuous positive development cycle that preserves and enhances natural capital, optimises resource yields, and minimises system risks by managing finite stocks and renewable flows [3]. In theory, it works effectively at every scale.

Life's natural systems are circular and cyclical. Our linear patterns of production, consumption, waste disposal and resource usage are not currently synchronised with nature's patterns of production, consumption, waste disposal and resource usage [4]. By mimicking biological cycles in the economic activities, we should be able to

succeed in being green and to achieve growth not making these two binary alternatives.

Are we going to be able to use circular economy to finally start making

necessary changes that will initiate the process of change at the pace that will be sufficient for the situation we are currently in? This is be the subject of this paper.

METHODOLOGY AND THESIS

This paper is of conceptual and theoretical nature. Desk research has been used to analyse available documents, strategies and expert contributions to define what circular economy is and what actions should be taken to achieve results. Based on the analyses and previous experience in business communication, we have presumed that achievement of circular economy depends on realization of changes mainly in business models and in implementation of advanced technologies that will result in resource reduction and longer capture of

resources in the economic cycle. We have also assumed that legislators tend to look at this problem through end results which would be reduction of waste and capture of more materials in the economic cycle. In this paper, we have argued that in order to achieve these results, efforts need to be put to create smart regulation that will reward private-sector leadership and implementation of new business models that will make a shift in a paradigm but this regulation not yet exists.

BUSINESS CASE FOR CIRCULAR ECONOMY

The shift to circular economy requires innovative business models that either replace existing ones or seize new opportunities. Companies with significant market share and capabilities along several vertical steps of the linear value chain could play a major role in circular economy innovation and driving circularity into the mainstream by leveraging their scale and vertical integration. Profitable circular economy business models and initiatives will inspire other players and will be copied and expanded geographically. The question is how to make them profitable to attract other players to join in.

Ken Webster argues that: “our linear 'take-make and dispose' economy is a 19th century heritage adrift in the 21st century reality. In today's global economy, prosperity is faced with rising consumer

demands, environmental challenges, volatile resource prices, and the end of easy credit. The time is right to move towards a circular economy - a regenerative model based around feedback-rich flows allied to new business models. The economic advantage lies in designing out waste, enabling access over ownership, using materials in cascading systems and radical resource productivity with the prospect of rebuilding capital and resilience. A circular economy has profound consequences for employment, education, money and finance but also induces a shift in public policy and taxation” [3].

Wrenching the world away from its dogged dependency on oil, gas and coal is one of circular economy's most attractive propositions. Nearly 90% of the global economy currently relies on fossil fuel consumption. Can circular thinking really

distance us from fossil fuel dependency? Some of technological innovations are quite astonishing. Carbon fibre composites, energy efficiency, lightning, heating and sustainable building are giving us hope that change is possible.

Park et al. in 2010 [5], investigated challenges and opportunities of how firms and organizations can improve balance between economic growth and environmental protection. They managed to demonstrate how business and environmental value can be created from adopting a sustainable supply chain management approach. Based on three case studies in electronic industry and information technology they showed that sustainable development can contribute in creating value through cost reduction, revenue generation, resiliency and through brand and reputation development.

Lovins [6] spoke about circular economy through systems theory. His plastic explanation compares green car which is good, with ride-sharing, congestion-free highways and enhanced public transport which are even better. Combining them, we get the winning combination. The logical conclusion is that the main obstacle is not technology or economics but slow adoption. Lovins believes the answer is not in new subsidies, new taxes or new laws, but education, leadership and rapid learning.

One other problem occupies circular economists and it is the concept of GDP. Stiglitz report in 2010, [7] has spoken about the problematic nature of GDP as a measure of wealth creation. The idea of continual growth within a world of finite resources does not seem to be likely. GDP puts priority on the volume of money exchanged within the economy. The higher the amount, the healthier the economy, neoliberal economists will argue. In circular economy, the central issue is the quality not the quantity of these transactions. Everything, be

it empowering education or clean water, needs to circulate in a way that's unrestricted and fair to all parties.

Preston defines circular economy as a fundamentally new model of industrial organization that is needed to de-link rising prosperity from resource consumption growth. In the resource pressured world, circular economy offers huge business opportunities. Pioneering companies are leading the way but to drive broader change it is critical to collect and share data, spread best practice, invest in innovation and encourage business-to-business collaboration. Policy-makers should focus on accelerating this transition in a timescale consistent with the response to climate change, water scarcity and other global challenges. Smart regulation can reward private-sector leadership and align incentives along the supply because resource consumption targets that reflect environmental constraints should be considered at a global level. Coordination of national policies would help create a level playing field across major markets, easing competitiveness concerns and reducing the costs of implementation [8].

In business leadership, coordinating and empowering are the name of the game, not owning and controlling. Similarly, policy-makers should be looking for ways to nourish human capital and small-scale networks, on the one hand, and curb those "constantly channelling major flows towards selfish, controlling, short-term ends". The circular economy represents an unprecedented opportunity for industry but the challenge we face now is how to integrate its rules into a scalable, value-driven practice of the resource economy. Once leaders start succeeding in it, new companies will develop business strategies that integrate circular economy specifics in their processes [8].

HOW DOES CIRCULAR ECONOMY WORK IN PRACTICE?

Lacy (2015) has suggested five circular economy business models that may transform our current systems into an easy-to-understand system of circular economy. He realizes that when we come to a practical level, making the shift is not that easy. Most companies are simply not built to automatically capitalize on the opportunities the circular economy offers. Their strategies, structures, operations and supply chains are deeply rooted in the linear approach to

growth [9]. To move from traditional to circular model of doing business, the companies need to develop new models that are free of the constraints of linear zero-sum thinking. In his book, Lacy analyses 120 companies that are generating resource productivity improvements in innovative ways. Based on their practice, he suggests five models that can make the necessary shift.

Circular Supply-Chain

When a company needs resources that are scarce or environmentally destructive, it can either pay more or find alternative resources. The Circular Supply-

Chain introduces fully renewable, recyclable or biodegradable materials that can be used in consecutive lifecycles to reduce costs and increase predictability and control.

Recovery & Recycling

The Recovery & Recycling model creates production and consumption systems in which everything that used to be considered waste is revived for other uses. Companies either recover end-of-life

products to recapture and reuse valuable material, energy and components or they reclaim waste and by-products from a production process.

Product Life-Extension

Consumers discard products they no longer value because the products are broken, out of fashion or no longer needed. But many of these products still hold considerable value, and the Product Life-Extension model seeks to recapture it. By maintaining and improving products through repairs, upgrades, remanufacturing or

remarketing, companies can keep them economically useful for as long as possible. This means shifting from merely selling things to actively keeping them alive and relevant. It also means moving customers from transactions to relationships, tailoring upgrades and alterations to specific needs.

Sharing Platform

In developed economies, up to 80 percent of the things stored in a typical home are used only once a month. The Sharing Platform model increasingly assisted by new

forms of digital technology forges new relationships and business opportunities for consumers, companies and micro-entrepreneurs, who rent, share, swap or lend

their idle goods. Fewer resources go into making products that are infrequently used,

and consumers have a new way to both make and save money.

Product as a Service

What if manufacturers and retailers bore the “total cost of ownership?” Many would immediately adjust their focus to longevity, reliability and reusability. When consumers lease or pay for products by use through the Product as a Service model, the business model fundamentally shifts in a good way. Performance trumps volume, durability tops disposability, and companies have an opportunity to build new relationships with consumers.

Adoption of these five circular business models has grown substantially in the past decade, even if we are still at the

beginning of the coming changes. Initially, circular business model innovation was driven by start-ups. Now, large multinationals are making serious moves as well.

To help necessary changes Lacy also detected technologies that can help the needed change. New business models offer companies powerful options for embracing the circular economy. But it would not be possible to scale many of these business models without the support of innovative technologies.

CIRCULAR ECONOMY IN EU PUBLIC POLICY

On December 2nd 2015, the European Commission (EC) has put forward a package to support the EU's transition to a circular economy. EC explains circular economy being economy where the value of products and materials is maintained for as long as possible [10, 11 12]. Waste and resource consumption are minimised, and when a product reaches the end of its life, it is used again to create further value. This can bring major economic benefits, contributing to innovation, growth and job creation, claims EC.

Circular economy offers an opportunity to boost economy, making it more sustainable and competitive in the long run. Action at EU level can drive investment, create a level playing field, and remove obstacles stemming from European legislation or its inadequate enforcement.

A circular economy could preserve resources, some of which are increasingly scarce, subject to mounting environmental

pressure or volatile prices, and will save costs for European industries. It will unlock new business opportunities and help build a new generation of European businesses which make and export clean products and services around the globe, and create innovative, more resource efficient ways to provide services or products to customers. It can create local low and high-skilled jobs for our citizens and opportunities for social integration and cohesion.

The EU Action Plan for the Circular Economy is composed of a set of both general and material-specific actions [10]. One of these actions includes Product design. It is explained as better design that can provide solutions to facilitating recycling and helping to make products that are easier to repair or more durable, thus saving precious resources. At the same time, current market signals are not always sufficient. EC proposes incentives that will support necessary changes.

The Commission claims that it will: Support reparability, durability, and recyclability of products in product requirements under the Eco-design Directive, taking into account specific requirements of different products to help create framework under which eco-design will contribute to the objectives of the circular economy.

The Plan proposes the differentiation of financial contributions paid by producers under the Extended Producer Responsibility scheme on the basis of the end-of-life management costs of their products. This provision under the revised legislative proposal on waste creates economic incentives for the design of products that can be more easily recycled or reused.

Plan contains also horizontal measures aiming to empower areas like innovation and investment that should support the transition to circular economy. Suggested measures try to support circular economy in value chain, from production to consumption, repair and reuse, waste management and restoration of raw materials and their reintroduction in economic cycles. It examines options and actions for a more coherent policy framework for the different strands of work on EU product policy in their contribution to the circular economy and innovation, investment and other cross-cutting issues. It has also set up some actions specific for some materials and industry sectors such as plastics; food value chain, critical raw materials; construction and

demolition; biomass and bio-based products and review of fertiliser's legislation. Even though quite ambitious in targets, the proposed Plan only sets clear targets in waste management leaving quite undefined what will be the specific measures taken by EC. From the proposition we are seeing, it is clear that: (1) the EC has very limited role in terms of setting the specific regulation, rather, the whole Plan is more of a soft measure, leaving to the national governments to put it to life and (2) it is still not clear how this changes should be introduced so the focus is again on soft measures that will support voluntary changes without any specifically defined processes and consequences. As a result of this lack of clear vision of how to achieve this goal, the only indices to measure positive changes are set in the waste management goals, what can reach only partial success. Ultimately, the implementation of circular economy will lower the production and disposal of waste, but there is a large number of indicators throughout the economic process that precedes the waste production and are much more important and represent more important indicators of the direction of the development. These indicators are located in the changes of the production models and the models of finances and need to be set in order to have positive results in waste production and management. Of course, it is still to be seen will EC propose some actual, specific measures to boost changes it talks about.

CROATIAN CIRCULAR ECONOMY POLICY

Thinking about this advanced technologies and smart business models that Lacy suggests as ways toward circular economy, the question that evolves is how are we going to support their implementation in Croatia? They would help our target

which is the introduction of circular economy, but evenly important, it would help our business regain competitiveness it is constantly losing, and remain current jobs in Croatia with possible creation of new ones.

When it comes to Croatia, no policy on circular economy exist. The only strategic document that would be in line with new models of production and consumption is Sustainable Development Strategy adopted by Croatian Parliament in 2009 as a standalone document, which was never used to correct other sectoral strategies to meet the goals of sustainable development [13]. The only action plan that was developed as a result of this Strategy was the Action Plan on Education on Sustainable Development. Seven years later the implementation of the Strategy was not evaluated or goals adjusted according to the evaluation.

As a result of the publication of Circular Economy Package, Working Group on Circular Economy was formed within the Ministry of environmental protection and energy. Its activity is currently concentrated on follow-up on the development process of the Package on circular economy, developed by European Commission and no national documents has yet been introduced.

Regarding other strategic documents passed by the Parliament or in the process of the development, the most important is the Waste Management Plan, recently adopted [14]. From the content of this document and the discussion and messages coming out of the Ministry, the impression is being made that when it comes to circular economy strategy, the Ministry is considering activities in the area of waste management mostly. For example, in the part of the Waste Management Plan called Plan for Reduction of Waste Production [9], document suggests closing the loop and introduction of circular economy. When it comes to the measures suggested they include: (1) waste collection; (2) separate collection of bio-waste; (3) avoiding food waste and (4) education of citizens on the proposed measures. All this activities are useful but at the same time, they show that there is no intention to support advance technologies or business models being introduced in Croatian

business as a way to achieve circular economy. News posted on the web portal of the Ministry show that priorities in environmental protection in Croatia are circular economy and waste management but for implementation of these targets, waste management scheme and importance of education of citizens and other stakeholders to become responsible parts of the waste management scheme are only measures listed (Source: www.mzojp.hr).

“Transition towards circular economy represents huge opportunity for sustainable development and economic growth. One of key areas for Croatia is waste management. Aiming at more efficient resource consumption and creation of green jobs, we attend to redefined waste management system,” said the Minister of environment at the Conference of the Council of Europe on Environment in Brussels. The Ministry further states that “the Package on circular economy, which was introduced by EC at the end of 2015 sets new targets in the area of waste management, sets clear and ambitious vision of increase in recycling and decrease in waste disposal. At the same time, it sets clear measures to remove obstacles on the fields in terms of better waste management. Action Plan for Circular Economy further strengthens this proposal with specific measures for loop closure in all phases of life cycle, from production and consumption to the waste management and market of secondary resources” (Source: www.mzojp.hr).

Minister also said that he finds very important to support eco-design and to secure necessary financing for initiatives such as the centres for reuse of products. He also believes that implementation of Green Public Procurement and strengthening of instruments that support sustainable and responsible consumption in term of less resource consumption are important. Nevertheless, no evidence is available that

specific measures in that direction are planned.

Additional challenge comes from the fact that only the Ministry of environmental protection and energy is in charge for circular economy. The Ministry of economy

and entrepreneurship, Ministry of finance or other stakeholders are not involved. Therefore, it is very unlikely that measures in terms of technology upgrades and implementation of new business models will be considered and supported.

DISCUSSION

Why there is no progress made so far? It seems that EU policy is oriented towards circular economy, but even EC Circular Economy Package sets few clear measures that would set the clear path. The key problem lies within the lack of understanding of the thinking patterns of the sectors that need to coordinate in order to make things work. The international agenda has set a framework within which we need to innovate in order to fit. The responsibility lies within national governments and business. European Union has the role similar to the one of the UN. It can set up the framework and it does it in a fairly clear manner. The problem arises somewhere in the step two. The next step consists of the changes that business can do in order to improve, and the framework set by national governments that will provide that this changes happen. To make business embrace the proposed changes and implement them using its specific business agenda to innovate and create new solutions, these changes need to be good for profit. And here is where the mistake is repeating. The governments do not think the way business does and do not understand that in order to make changes significant, in more than just few extra responsible companies, business needs to benefit from the changes it invests in. To create framework that will support

positive changes within business, governments usually don't have capacities, experience and understanding. So in order to make things work, these two sectors need to work together to make national legislative frameworks suitable to support and initiate positive changes. The goal needs to be: (1) to create positive changes and achieve policy goals and (2) to make the changes good for companies, if possible through higher profits or some other value added.

From the documents coming out as a result of the transposition of EU directives and other regulatory documents, it is quite obvious that national governments, Croatian but not just Croatian, doesn't understand its role in the hierarchy in which its position stands. So usually it only translates the European regulation and gives it a national official registration instead of transposing the goals of the regulation with introduction of its own measures, developed considering its specifics in full. These measures should be developed jointly with those to which the measures will be applied to better understand the possibilities, limitations and specifics of the sector and to offer regulatory framework which will support realistic positive changes and discourage lagers. For this type of national legislation, the public policy creators have to: (1) Understand the attentions of the international strategies; (2)

To understand the possible sets of measures that could be applied to reach the proposed goals; (3) To understand the local business or other sectors whose changes tends to provokes, and finally (4) To start discussions with the sector in question and be ready to listen and apply suggestions coming from the sector.

Obviously, the proposed process has quite high requirements in terms of expertise of the policy writers. It also presumes that the policy will be written by the experts, using procedures which take up a certain amount of time, and doesn't allow cutting through procedure that can sometime be required by the daily politics. And of course it should not be influenced or shaped by the interest of the daily politics, but it should have very clear long term goal proposed by international legislation in mind. And public interest.

CONCLUSION

This paper has tried to show how European Commission, which is serving as a referent point to Croatian business and legislators, defines circular economy. It has also tried to show how Croatian Government understands and transposes this policy. And it also tried to show the necessary approach the policy would have to have in order to provoke the changes inside business at whom the greatest responsibility lies upon, Further it has tried to operationalize this term to help understand what are actual activities and programs that need to be implemented to achieve this goal. Circular economy is crucial at this point as a tool which will give us a chance to achieve sustainable development as our ultimate

Does Croatian public sector have these preconditions satisfied in order to secure high quality procedures in development of the new legislation as a transposition process from the EU?

Looking back to the Circular Economy Package, it is easy to understand why the policy that would allow changes towards circular economy is not sufficiently developed. Instead of creating a set of positive measures that would provoke desired changes and make a step forward in implementation of not just Circular Economy Package but also Croatian National Sustainable Development Strategy [15] and also a Low-carbon Strategy (which has never been adopted so only various drafts were ever available) [16] the proposed measures only propose education and measurements of targets without understanding what is the process that should lead us to the implementation of these targets.

goal. In the process of understanding what circular economy means, we have tried to argue our thesis that achievement of circular economy depends on realization of changes mainly in business models and in implementation of advanced technologies that will result in resource reduction and longer capture of resources in the economic cycle. It is the concept far more complex than the separate waste collection systems and recycling which are the methods that are most commonly used to describe circular economy. In comparison to our understanding of circular economy, documents and statements produced by the legislator (i.e. Ministry of environment and energy) concentrate on waste reduction and

management activities. It is of utmost importance to start considering, discussing and upon these conclusions acting in the direction of innovation, rethinking of production processes and business entrepreneurship to start changes necessary for this transformation. To fully implement circular economy, we need the shift of the paradigm of how we create the products, how we think in the product design, materials, production, consumption, business models and systems we use and we need to rethink the saving that implementation of this concept should bring to the producers. There are no specific

directions, but this is exactly reason to start forming think tanks consisting of experts from all sectors that will try to find answers how to proceed. It needs to be clear that resource efficiency is better implemented at the point of resource usage, not at the point of separate collection and recycling. Being without question necessary, waste management serves as end-of-pipe solution. Smart and successful economy can only be based on innovative processes which need to be implemented. Legislative framework needs to be set to reward business leadership towards circular economy.

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