

## Building a responsible Europe - the value of circular economy

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**Abstract:** The following paper focuses on the philosophical idea of circular economy, a model of industrial ecology that suggests concrete solutions to achieve a sustainable way of living and an environmentally-friendly economy. Different to the linear model, the innovative circular economy approach comprises life-cycle thinking and considers both stocks and flows.

In chapter 1 the work outlines the fact of pushing for economic growth for the last centuries. Chapter 2 then continues in highlighting the major characteristics of the next industrial era – the 4th industrial revolution. Successively chapter 3 introduces the concept of circular economy and briefly sketches its importance for global industrialisation. Chapter 4 focuses on the concepts of stocks and flows in circular economy and its importance in terms of production and waste. In chapter 5 and in the conclusions this paper outlines the concrete solutions and the additional value of circular economy that is to be brought for the current industrial system. The title of this paper alludes to the fact that concrete action is required in all sectors in order to make this revolution happen and to which extent Europe might be able to assume its responsibilities and lead such a shift to a more sustainable future

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### INTRODUCTION

Currently, our planet is striving to provide enough natural resources for 7.3 billion people, and important ecosystems are already on the verge of collapse. Worldwide, the need for land, food and other natural resources in 2030 will be twice that of 2010 (United Nations Department of Economic and Social Affairs, 2015). Considering above, the way we have been living and consuming to date compromises the "ability of future generations to meet their own needs" (United Nations World Commission on Environment and Development, 1987).

Although wealth is not uniform in Europe between the different countries, the poorest are still well above the standards of the states of other continents in terms of gross domestic product (GDP). Therefore, Europe is not only responsible for its own growth but also for the direction that it is setting for the global sustainable development. In this context, the European Union (EU) is aware that it has a pivotal role to play. In fact, the question is not whether the EU should lead the transition to a more sustainable economy but how this can be achieved in the most efficient way, i.e. at the highest level, in the shortest period of time and at the lowest possible costs. The concept of *circular economy* can be a part of the solution. In contrast to the linear model adopting the *production-consumption-waste* approach, circular economy pursues the aim to stay within the limits of our planet, by managing all natural

resources efficiently and sustainably. Circular economy entails life-cycle thinking and it aims at preserving materials/substances/products in the value chain for as long as possible. Ideally, also at a product's end-of-life stage, materials should serve as a resource, in order to be led back into the cycle. In a nutshell, the circular economy proposes concrete solutions – but it requires structured policy-making – to deal with major concerns on the European environmental and economic agenda: resource and energy efficiency, supply security, waste treatment, the reduction of greenhouse gas emissions, the creation of innovative business models and the increase of job opportunities. In this paper it is argued that pressure for economic growth led to disastrous consequences that we, and the future generations, will have to face. Circular economy requires not only a change of the economic models or on the production side but also system thinking needs to be applied. In order to achieve that, it might be useful to refer to the *living system* concept adopting a life-cycle approach

### 1. PUSHING FOR GROWTH

Today's world is facing massive production growth due to increasing urbanisation, demography changes and technology development (McKinsey, 2012). After the Industrial Revolution in the 18th and 19th century, production manufacturing accelerated rapidly, significantly improving the standard of life all over the world. Two

important shifts were introduced in the production systems in the 20th century: first of all, after the First World War when Ford Motor Company and General Motors steered global manufacturing away from production to the new era of mass production; secondly, after the Second World War when Toyota led the way towards *lean manufacturing* systems and the just-in-time (flexible) production that was adopted by many companies from all over the world in different industries (Womack, Jones and Roos, 1990). Thanks to those systematic improvements, changes in the production and consequently in the economy happened much faster. As a consequence, those developments have influenced and initiated technology progress, resource exploitation and regulatory frameworks that are regulating different markets. Those years of booming production were dominated by linear consumption (World Economic Forum Report, 2014). Linear model of production means producing goods from raw materials, and selling and consuming them until they reach the last stadium. It is also described as a take-make-dispose model (Esposito, Tse and Soufani, 2015).

Economic growth was the main direction for global development in the second half of the 20th century. All companies were blinded with a need of maximising their benefits. The basic notion of microeconomics is that producing more increases benefits, more precisely marginal benefits increase faster than marginal costs. Thus, companies were encouraged to produce more and more outputs. Outputs increase would boost the profits. Only when the marginal benefits equalise with marginal costs, the growth is exhausted and producing more is "uneconomic" (Lawn, 2007). This optimal paradigm in microeconomics is applied in many other areas such as consumption, labour market or supply optimization. For decades the economists neglected the fact that producing more does not mean producing better quality goods, and having more efficient production systems or optimization of resources (unless it meant costs optimization). If assumed that the global economy is a part of our ecosphere, which is Earth and is finite, it has to be concluded that the economic growth also has its limits. Limitation of growth has been questioned already since the Industrial Revolution. Meadows, Meadows, Randers and Behrens (1972) named the five most powerful trends in terms of growth: accelerating industrialization, rapid population growth, malnutrition, depletion of resources, deteriorating environments. According to Meadows et al. these mentioned variables "grow exponentially, while the ability of technology to increase resources availability is only linear". Since the limits of the economic growth have been addressed, it became clearer that uncontrollable economic growth can harm society and environment. This requires individual nations (or a group of nations like the European Union) to regulate and operate a steady economy and finding an optimal equilibrium between pushing for

production and mitigating negative outcomes of output production. Nations should strive for sustainable scale production or changes in the production that could realize it in a more sustainable way. However, according to the Global Footprint Network (2008), more than half of the world is not thinking about the global economy as a whole.

Facing reduction of natural resources and volatility raise a concern across the global economies that linear consumption is reaching its limits. In order to plan a sustainable future for Europe holistically – taking into account the economic, social and environmental dimension – the analysis needs to proceed from reality considering what creates the world and how daily life and consumption project our thinking. It was already mentioned that production models were dominated by linear consumption before. In this article it is stipulated that linear consumption creates a destructive way of thinking about future generations i.e. *linear thinking*. Although Europe was created on Christian values and can be considered an anthropocentric system, current pressure for continuous growth pushes people to compromise their values if they do not bring satisfactory business results, i.e. economic growth. Costs are cut wherever they can in order to improve production capacities and maximize income. On microeconomic level, the companies focus on their performance and revenue, neglecting the macroeconomic impact of their activities. Moreover, it is assumed that there is a strong relation between the values and actual behaviour and functioning of the society (de Jong, 2008). Researchers who focus on industrial societies indicate that historical processes that shaped our values can explain differences in attitude towards economic growth and especially in institutional structures around industry regulations (de Jong, 2008). Thus, the link between values of society and economic performance is assumed in this paper. Those values influence also institutions and governance that create rules which economic agents need to obey. Looking at economic progress in Europe, a question that arises is: what are the values that drive economic development of the continent? Are they enough to direct it towards sustainable growth?

## 2. PRODUCTION AND THE 4<sup>TH</sup> INDUSTRIAL REVOLUTION

As mentioned before, violent development has stretched global economy for years pushing it to maximize growth which brought some negative consequences at the same time: environmental crisis and natural resource shortage. The consequences of extended production have been disastrous for the ecosystems all over the world (especially current Asian markets). This situation is a result of continuous growth that was driven by linear production starting from the 18th century. Changes in manufacturing production have triggered economic, social and global

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