Green economy for sustainable environment: Slovenian perspective

Abstract
Sustainable development of built environment is necessary much more than in the past, but a very stringent monitoring of environmental impacts is needed to get economic balance and social acceptance of the constructions. Green economy generates new jobs and the new culture, but reliable assessment of net green revenues is still lacking. Moreover, construction sector faces with more than 50% of waste generated in total scale, 40% of all consumed energy, and 35% of CO2 released emissions. This study aims to provide more insights in green sectors, and the evaluation of sustainability. Green public procurement along with the circular economy was found as the right measure towards green sustainability where environmental, economic, and social aspects are harmonized.

Keywords: green economy, green jobs, sustainable construction, circular economy

1. Introduction
A "green" economy (smart energy & environment) generates jobs, businesses and investments while expanding clean energy production, increasing energy efficiency, reducing greenhouse gas emissions, waste and pollution, and conserving water and other natural resources. The "green" or "clean" or low-carbon economy – defined as the sector of the economy that produces goods and services with an environmental aspect, with a capacity for aspiration and an enigma. As a matter of aspiration, no swath of the economy has been more widely celebrated as a source of economic renewal and potential job creation. The green economy offers enormous opportunities for job creation, many of which are already underway in the European economy. These opportunities range from sectors traditionally associated with an environmental content – such as renewable energies or recycling – to other activities that represent emerging and leading sectors that (1) directly works with policies, information, materials, and / or technologies that are related to science, technology, engineering and mathematics) are a greater concern than shortages of “new” green skills [4]. To answer the question, where green jobs can really help to reduce unemployment, it is necessary to take into account not only the net rather than gross effects of green jobs employment.

2. Green economy with sustainable environment
The European Union’s new strategy for sustainable growth and jobs, Europe 2020, puts innovation and green growth at the heart of its blueprint for competitiveness. However, there are no explicit overarching national strategies targeting green skills needs [4]. Some Member States are moving faster than others to rectify this, with France launching its recent mobilization plan for green jobs, and the UK government recently launching a consultation exercise, entitled Meeting the Green Skills Challenge. The EU suffers from weak environmental knowledge and skills base which limit its productivity and competitiveness in today’s economy, and reduce its capacity to exploit the opportunities offered by green growth. These deficits in management skills and technical job-specific skills (both of which are related to science, technology, engineering and mathematics) are a greater concern than shortages of “new” green skills [4].

The world’s most competitive economy of USA [5] defines green economy activity as any activity or service that performs at least one of the following: (1) Generating and storing renewable energy; (2) Recycling existing materials; (3) Energy efficient product manufacturing, distribution, construction, installation, and maintenance; (4) Education, compliance and awareness; and (5) Natural resources, such as minerals, conservation, such as solar panels, energy efficient devices, infrastructure and vehicles. It also includes construction companies that install and repair these products in new or existing residential or commercial real estate, as well as real estate planning and land development to generate green jobs. A Green Job is an occupation that (1) directly works with policies, information, materials, and / or technologies that contribute to minimizing impact, and (2) requires specialized knowledge, skills, training, or experience in these areas while a Green Firm is an organization that provides products and / or services that are aimed at utilizing resources more efficiently, providing renewable sources of energy, lowering greenhouse gas emissions, or otherwise minimizing environmental impact [6].

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To answer the question, where green jobs can really help to reduce unemployment, it is necessary to take into account not only the net rather than gross effects of green jobs employment. Gross effects are a useful indicator of where we want to determine how important each sector of the economy is, but the green economy, such as we want to calculate, that is “greening” economy helps to reduce the number of unemployed. Gross employment effects simply take account of all the jobs created without pay jobs because of these newly created jobs fail, and are therefore always positive. We have to mention that the interpretation of employment is not clear itself, it can make a huge impact on employment may also lead to low productivity. The net effect on employment is calculated by dividing the gross effect added to the substitution effect and the income effect. The substitution effect reflects the fact that this green goods and green substitutes other (conventional) goods and services. The income effect into account the fact that the “green goods” we more expensive than conventional goods and services. If people buy such goods and services, they are left with less money to buy other goods. Of course, the income effect depends on the source of funding and disappears when state-funded the greening economy by increa-
indicates [8] that “Green jobs” does not lend itself to a tight definition but certainly includes the direct employment which reduces environmental impact ultimately to levels that are sustainable. This includes jobs that help to reduce the consumption of fossil fuels and raw materials, decarbonizes the economy, protect and restore ecosystems and biodiversity and minimize the production of waste and pollution. Green jobs are central to sustainable development and respond to the global challenges of environmental protection, economic development and social inclusion. By engaging governments, workers and employers as active agents of change, the ILO promotes the greening of enterprises, workplace practices and the labor market as a whole. These efforts create decent employment opportunities, enhance resource efficiency and build low-carbon sustainable societies [8]. The Eurostat methodology for the “Environmental Goods and Services Sector” (EGSS) does not define “green jobs”, but measures employment in the EGSS. The EGSS is a heterogeneous set of producers of technologies, goods and services that prevent or minimize pollution and minimize the use of natural resources. Thus, environmental activities are divided into two broad segments: environmental protection and resource management [8]. International Trade Union Confederation (ITUC) indicates that “A Green Job should be one which reduces environmental impacts of enterprises and economic sectors, while providing decent working and living conditions to all those involved in production and ensuring workers’ and labor rights are respected” [7].

2.1. Sustainable construction

Modern European society is confronted with new challenges that are conditioned by climate change, rising energy dependence, limited natural resources, efforts for a healthy environment, and as much unspoiled nature as on the other hand, globalization and aging of the population. The latter can support the finding, 50% of the sources of materials and natural deposits are for the needs of the building sector, that over 50% of generated waste is generated in connection with buildings and that buildings consume around 40% of final energy in the EU and are responsible for 35% emission of CO2 into the environment. A large part of the European economy is connected to buildings, around 9% of European GDP and 7-8% of jobs in the EU [10]. European society requires the construction sector to contribute to maximizing the competitiveness of European industry. At the same time, it expects the construction sector to be able to provide better living and working conditions in a built environment. The company also demands that this environment is accessible to all, safe, lasting, pleasant, efficient and adaptable to changing requirements. At the same time, it must also be affordable. In 2005, in the framework of the European Construction Technology Platform (ECTP), the construction sector defined the vision of the development of the industry and developed strategic development Priority for the period up to 2030. The vision of the ECTP 2030 foresees that the field of planning and construction will have to actively deal with the demands of a sustainable and competitive Europe. The vision describes the construction industry as an industry that is intensely oriented towards the customer or user, is a sustainable and on knowledge. It proposes two interlinked strategic goals for achieving the vision: (1) meeting the requirements and needs of the users (meeting client requirements); (2) becoming sustainable [10]. Sustainable cities have existed much longer than the sustainability discourse. Sustainable investment practices much steer urban development. When assessing various possibilities for sustainable investment practices, one vital task we cannot escape is to assess the contribution to energy savings that could be made by cities, their buildings and their citizens. To leave it here would however only serve a narrowly defined sustainability agenda that neglects other dimensions than the “green” ones. In fact, it can be argued that social and economic sustainability issues show more resonance with property investors than that of the older type of environmental-energy sustainability [11]. Sustainability in smart construction comprises three dimensions, e.g. ecological, sociological and economic. Sustainability issues above do not readily fit in to the definitions of the three sustainability dimensions, but are rather combinations of them. Figure 1 synthesis the various facets of the problem area. New business culture makes the profit reinvestment from 3 (economic) into 1 (ecological) and 2 (social) while new other culture keeps the inhabitants happy / satisfied when we maintain 1 (ecological) and 3 (economic). A need for technical solutions, e.g. passive houses, smart houses, remains. The role for the housing market is twofold with focus on buildings and infrastructure. Along with ecology, economics and socio-cultural criteria, there are additional but very important criteria to provide quality: (1) technical characteristics, (2) design and construction of the building, and (3) partly the location characteristics of the building. It seems to be decisive for quality, that sustainability buildings can be described and evaluated using five dimensions of quality: (1) eco quality, (2) economic quality, (3) socio-cultural functional quality, (4) technical quality, (5) process quality, and (6) quality of location. Different aspects of sustainability they are, inter alia, in the direct interaction, so it is indispensable overall assessment [12].

With regard to circular economy aspects embedded in green economy, performance across the EU MS is very heterogeneous. Countries differ widely with regard to investments.
Key industrial sectors
Green growth
Priority technology areas
Inclusive growth
Smart growth

To overcome obstacles and to achieve common goals of the EU 2020, Slovenia set the following national targets for 2020, which applies to enter (incorporated and taken into account) in Slovenia’s Development Strategy to 2020 [14], Table 2.

Environmental change itself and policy efforts aimed at more sustainable growth have important feedbacks on the labor markets: they affect how and what is produced and how work is organized. The dynamics of labor market outcomes are complex and difficult to predict [7]. Policies aimed at greening the economy might imply some degree of labor reallocation. In turn, this require appropriate labor market policies that address mismatches between the demand and supply of employment and skills, ensure that the transitions are fair and allow the development of new specializations. Good growth will provide new opportunities for local economic development initiatives. Some green technologies may initially have a higher than average labor intensity, differences in labor intensity are likely to grow in the future. In order to enhance the new green jobs are generated in sectors with high versus low eco-innovation performance. In order to analyze, which countries have high versus low eco-innovation performance, it is important to apply a set of reliable indicators. Data from Eurostat, the Resource Efficiency Scoreboard and the Raw Materials Scoreboard allow us to evaluate this specific performance across EU countries, that include targeted economic, employment and skills development policies along with industrial development, in order to analyze, which countries have high versus low eco-innovation performance. We now turn to the eco-innovation performance across the EU, in order to analyze, which countries have high versus low eco-innovation performance. In order to evaluate this specific performance across EU countries, a composite index has been developed by the Eco-Innovation Observatory [2], ill. 2.

The scoreboard aims at capturing the different aspects of eco-innovation by applying 16 indicators grouped into five thematic areas: (1) Eco-innovation inputs, (2) eco-innovation outputs, (3) eco-innovation efficiency, and (4) socio-economic outcomes. Maximum possible score was 192. In order to assess circular economy performance across the EU, it is important to apply a set of reliable indicators. Data from Eurostat, the Resource Efficiency Scoreboard and the Raw Materials Scoreboard all contain relevant indicators and analysis, which are useful for tracking progress.

3. Green sustainability in Slovenia
Since sustainable development of a country or a region has received more and more attention recently, many countries and regions have implemented policies to ensure or protect sustainable development. An assessment of different initiatives and policies put forward by the European Commission to promote a more sustainable economy shows that environmental policies, in particular those related to renewable energy and climate change, mainly trigger creation of green jobs. The EU also acknowledges that greening the economy is a multidimensional challenge and therefore must be addressed through cross-cutting measures at the sectoral level that include targeted economic, employment and skills development policies along with industrial development, innovation and competitiveness policies. Hence, Slovenia did not make a specific (green) legislation for green sectors. As far as green economy based on net savings (effects) of the natural resources, all industry and other sectors of national economy are engaged here. All needed legislation adopted for these sectors is in force also for green sectors. In Slovenia, there are also two tripartite social dialogue structures that are relevant to green issues: the Council for Sustainable Development and the Interservice Group on Climate Change. Slovenia’s National Policy (SIP) as a backdrop aims to improve the business environment refers to 10 areas of measures, including the integration of the concept of corporate social responsibility [13]. Another important area is strengthening entrepreneurship and innovation, which is the key to expanding productivity, employment and the economy. SIP also defines activities for the long-term development of industry. From our integral perspective, as we have now seen, we would argue that not only is a moral and ecological core underpinned in the above SIP analysis, but nature and community (southern) and culture and spirituality (eastern) should be more strongly emphasized. However, once the SIP moves onto its “priority areas” there is an integral shift in orientation toward a more overt “green” perspective.

The “green” perspective is systematically elaborated through searching new sources of growth that are represented primarily by responses to social challenges with the introduction of a new paradigm of development, resulting from concepts of green growth (OECD), the green economy (UNEP) and a materially-efficient and low carbon society (EC), which are based on improving efficiency (energy, material, environmental and social) instead of relying on increasing consumption of space, raw materials and energy. Definition of priority areas is based on social challenges, Table 1.

Table 1. SIP priority areas [13]

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Priority technology areas</th>
<th>Key industrial sectors</th>
</tr>
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<tbody>
<tr>
<td>Environmental and energy challenges</td>
<td>Environmental technologies (technologies for the efficient use of energy, including the economical use of energy, renewable energy technologies, technologies for increasing material efficiency etc.)</td>
<td>Energetics / &quot;Smart&quot; systems Sustainable construction Manufacturing (especially wood-processing, metal and electrical industry and electronics) Chemical and process industry</td>
</tr>
<tr>
<td>Sustainable mobility</td>
<td>Technologies for sustainable mobility</td>
<td>Automotive industry</td>
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<tr>
<td>Food, health and aging population</td>
<td>Biotechnology and other related technologies</td>
<td>Pharmaceutical industry Food-processing industry and sustainable food production Sustainable tourism</td>
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<tr>
<td>Potential KET – Key Enabling Technologies</td>
<td>Nanotechnology, micro- and nanoelectronics, photonics, biotechnology, advanced materials, advanced manufacturing and process technologies</td>
<td>ICT Electrical industry and electronics New materials Metal-processing industry, engineering and tool-making</td>
</tr>
</tbody>
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Table 2. National development objectives to year 2020 [14]

<table>
<thead>
<tr>
<th>Priority</th>
<th>Smart growth</th>
<th>Inclusive growth</th>
<th>Green growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>National objectives</td>
<td>3% of GDP for R&amp;D</td>
<td>75% of the economically active population</td>
<td>40 000 people out of poverty</td>
</tr>
<tr>
<td>Development policies</td>
<td>01 Promoting Entrepreneurship and Competitiveness</td>
<td>02 Higher Education, Science, Technology and Information Society</td>
<td>03 Labor Market 10 Social security 11 Health care</td>
</tr>
<tr>
<td>06 Transport and Infrastructure</td>
<td>07 Energetic</td>
<td>09 Environmental and Spatial Policy</td>
<td></td>
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duction to sustainable levels, reducing waste and increasing the use of renewable energy sources that do not pollute the environment. In most countries, including Slovenia, regulations are also major factors of the promotion of eco-innovation (35%), followed by awareness from customers (30%) while 10% present fiscal incentives [17].

At national level, the most important green jobs sectors are Renewable energy (RE) and the Energy efficiency and construction. In total, 3,375 green jobs in RE sectors are indicated in Slovenia in 2016 with adding of construction sector a total number of 7,250 green jobs are in total considering a pure definition of a green job. According to wider definition, a total of 15,000 green jobs are generated across the sectors with 50,000 green oriented jobs in sustainable forestry and wood industry, sustainable tourism, eco-agriculture, waste management, building and construction, and social entrepreneurship [16, 18].

There are quite a number of reports available about job creation potential result of a more ambitious transition towards renewable energy production. A good example is the “A 100% Renewable Energy Vision for the European Union” report, the European Renewable Energy Council proposed a pathway to achieve 100% renewable in the energy sector. Considering that a target of 45% renewable energy in final energy consumption in 2030 is met, this would provide an annual average growth rate of about 6% on 2020. If a target of 100% renewable energy was followed, this constitutes an average annual increase of gross employment of 36% and 30% respectively compared to 2009 [19].

In 2016, the sector of Energy Efficiency and Building is indicated as the second most important [1][20]. Energy efficiency strategies and activities used more intensive than manufacturing. The leverage of public and private funding is often between ten and five to one, meaning 1 million € of public money can lead to investments of between 5 and 10 million €. That means the creation of between 85 to 190 jobs for 1 million € of public money spending [21].

The draft National energy program (NEP 2030) is based on a number of operational objectives by 2030, i.e. improvement of energy efficiency by 2020 (27% to 2030), 25% share of RES in final energy consumption by 2020 (30% by 2030), reduction of GHG from fuel burning by 18% to 2030. The above targets assume gradual increase of the share of nearly zero energy buildings (nZEB) among new and renovated buildings by 100% in 2020 and in the public sector until 2018 [19][20].

All the aforementioned targets and goals represent a significant challenge to the construction sector, particularly to the buildings field. These new boundary conditions imply new managerial and swift transformation of the sector to be able to respond to strengthened demands. One of the most important tasks is to raise the level of skills and competences of the workforce for state-of-the-art implementation of nZEB (roadmap of the definition of the requirements, content, objectives and time frame that correspond to the national state).

The Chamber of Commerce for Construction has reported about 2,500 employees in green jobs related to nZEB in 2015 and a need for additional training and education for cumulative nearly 85% trained employees in 2020 [15]. Green Building Council of Slovenia (GBC) reported that sustainable construction in the first place means the proper choice of materials and implementation. The two most important aspects are: (1) The lifetime of the building, which is most influenced by the choice of materials, construction and maintenance. The Sustainable aspect introduces in the construction materials the most suitable criteria for the above; (2) Flexibility; This is reflected in the ability to satisfy different user needs [20].

GBC selects perspective of sustainable construction which focuses on the following aspects: (1) Control of direct cost of living; (2) Controlling the indirect cost of living; (3) Accessibility of housing to risk groups (elderly, socially deprived, etc.); (4) Psychological and social function of housing; (5) Criteria for expanding areas suitable for staying. Sustainable construction and energy and ecological efficiency improves the quality of life and the efficient use of natural resources, we also need to: (1) Energy rehabilitation of existing buildings; (2) Sustainability criteria for new buildings; (3) Rational use of natural, non-renewable resources; (4) Introduction and use of renewable energy sources; (5) Effective land use; (6) Efficient use of energy; (7) Selection of building materials according to the criteria of “built-in energy” (energy used for their creation and use), reproducibility and destruction or recycling costs; (8) Limit levels of water consumption as well as control over its quality; (9) Achieving more comfortable living with less investment, especially through the path of technological innovation and innovation in service activities. Figure 3 shows a plan how to make synthesis on aforementioned criteria of degraded the abandoned quarry area and asphalt base [10].

Waste management is considered a “green” sector given its goals focused on the reduction of environmental impact associated with waste treatment which presents a heavy burden for sustainable construction. Recycling ensures that resources remain in the economy via a closed-loop process. It leads to a substantial recovery in the economy and away from a linear economy model characterized by resource depletion and waste. It also reduces virgin non-renewable resource use, directly helping decouple material use from economic growth and production environmental impacts. Recycling could help ensure that the EU has secure supplies of critical resources, especially rare metals, by covering a reasonably large part of EU consumption of certain materials. The employment opportunities in the recycling sector include low-skilled work in particular, but also include medium- and high-skilled jobs, ranging from collection, materials handling and processing to manufacturing products. An annual growth of recycling of 6% is predicted for Slovenia, because of closing a numbers of small landfills and construction of full engineered waste treatment regional centers. Recycling 10,000 tons of waste needs up to 250 jobs compared with 20 to 40 jobs needed if the waste is incinerated and about 10 for a landfill [23]. If a target of 50% for recycling of key materials in 2020 was met on a European level, conservative estimates suggest that the total potential in Slovenia is more than 2,500 net new jobs. In the sector of waste management employed around 6,600 people. That same year, the Slovenian companies in the waste management employed more than 175 million € and the waste to spend 280 million of current expenditure [16].

The net effects of waste collection and waste water management on employment costs from the first stage to the end of processing to manufacturing products. An annual growth of recycling of 6% is predicted for Slovenia, because of closing a numbers of small landfills and construction of full engineered waste treatment regional centers. Recycling 10,000 tons of waste needs up to 250 jobs compared with 20 to 40 jobs needed if the waste is incinerated and about 10 for a landfill [23]. If a target of 50% for recycling of key materials in 2020 was met on a European level, conservative estimates suggest that the total potential in Slovenia is more than 2,500 net new jobs. In the sector of waste management employed around 6,600 people. That same year, the Slovenian companies in the waste management employed more than 175 million € and the waste to spend 280 million of current expenditure [16].
essential elements of a circular economy have been brought onto the agenda. These include: refurbish, sharing / leasing, re-manufacture, recovery, and repair while reduce (in the sense of waste prevention and minimization of hazardous substances) plays also a prominent role [2].

The goal of a sustainable resource and waste management must be to ultimately achieve a transition to a fully fledged circular economy within this century [2], i.e. to preserve the value of the resources and materials as long as possible, to reuse them as often as possible, and, ideally, to recover or as little as possible waste. The concept includes all sectors of the economy; especial the construction sector must adopt this concept as far as majority of waste is generated in this sector; from re-using materials over production, storage and consumption, as well as the disposal or recycling. Through the closing of loops waste shall become a resource again (so-called "second-sourcing") [20].

One important measure was found in 16% of EU GDP several institution proposed green-based public procurement [1, 19, 20, 24] where a complex system and data base of building cost classification was done. In the following years, a design of LCC data base for construction sector is urgent, to make new changes towards green sustainability in construction sector [20].

Looking beyond the employment effects of greening the economy, it is also necessary to take into account the consequences on productivity and incomes: results differ in the short and long term: while in the short term they could be negative, they could be less negative or even positive in the longer term. Even if the effects on employment were neutral or positive (in the longer term), the effects on real income could be negative; and significant emission reduction targets are likely to result in higher energy prices, increasing production costs and resulting in negative indirect effects.

In order to ensure skills of green professionals who work in energy-efficient buildings and installing technology to improve energy efficiency, and to facilitate as much as possible the use of renewable energy sources, and that newly acquired skills as much as possible respond to the needs of the green industry, it is necessary to establish a monitoring the process of training the workforce and compare progress in the sector of vocational education with the needs and deficits in the green sector. In case of any discrepancy between deficits and ensuring better skills workers need to take corrective measures. Monitoring can be carried out by government institutions, professional organizations, professional chambers or associations, depending on the program of vocational education and target groups.

Projected growth of the green sector in Slovenia for year 2020 was moderate: Based on data in the NEP 2030 (draft National Energy Program 2030) growth of renewables in the period 2012–2020 to 35% in 2020, while the growth of the construction sector (due to the aging of the population) in the period 2010–2020 is 12%. For the period 2010–2030 is therefore expected total net demand for additional manpower for training in the strongest green sectors 12% [23]. In respect to Green Industry Activities in Slovenia, from the data for the green jobs from 2010 to 2015 [1, 16], a growth rate of green jobs is indicated, ill. 4.

A trend of positive growth of green jobs is detected. Especially in the sector of transportation and transport infrastructure, renewables and sustainable construction green growth rate is positive. Only conserve of natural resources still suffers in growth, where a mutual effect of green economy is detected.

4. Conclusions

Green economy as new paradigm significantly affects and national economy, but efficacy of the green sectors is ambiguous. To find more support for green jobs, solid strategies must be done along with a precise definition of green job notations. Firstly, how to measure net effects of green jobs. A huge potential for green jobs is reported in several EU member states, but if the net effects or savings are not known, it is difficult to argue how effective the mutual influences of green economy are.

Green sustainability in construction sector is much more than only a need, because a large majority of waste is generated in this sector along with high consumption of energy and releasing emissions of CO2. Three aspects of sustainable green constructions should be considered, namely economic, ecological, and social. To reduce waste, energy consumed and emissions of CO2 in construction sector a concept of circular economy is proposed. Moreover, green public procurement should significantly contribute to net savings in construction sector, where a measure of LCC must be adopted on regular basis.

In the case of green public procurement, it could be prescribed: (1) Requirements for meeting the criteria required for passive house, Minergie house, low energy house or any other very low energy house (the criteria are summarized, the calculation method is given, and the sign itself should not be prescribed), and (2) requirements for meeting more complex criteria for sustainable construction, given in the context of signs such as LEED (Leadership in Energy and Environmental Design), BRBREAM (Building Research Establishment Environmental Assessment Method), GBtool, SPEAR (Sustainable Project Appraisal Routine), DNGN (German certificate for sustainable buildings).

However, the question to what extent do the green jobs really help to reduce unemployment remains unanswered. The need to calculate the net impact of green jobs on employment is essential. It is essential that the assessment of green jobs has to combine also the social and ecological criteria.

BIBLIOGRAPHY