# European Union countries' performance of skills in the context of a green inclusive economy

**Authors:**

**Tudose Gabriela**
**Ghenadie Ciobanu**

**Abstract:**

This paper proposes a cluster analysis, where the clusters are formed using the new indicator European Skills Index (CEDEFOP - ESI), Green Growth Index (GGI), and Gross Domestic Product per Capita (GDP/capita) to show which countries are better equipped to reach what the Sustainability 2030 Agenda aims. The analysis uses data from 25 states members of the EU at NUTS1 in the year 2020 from the CEDEFOP database (for skills index), Global Green Growth Institute database (for GGI) and Eurostat (for GDP per capita). Using the method of hierarchical cluster analysis, the results organized by groups in a hierarchical order will show us which countries have simultaneously enough capabilities in terms of dimensions skills index, like skills development, skills activation and skills matching and in terms of performance in achieving four green growth index dimensions: efficient and sustainable resource use, natural capital protection, green economic opportunities and social inclusion, as well as of a certain level of GDP per capita. Based on this analysis, four distinct clusters are identified showing similarities and differences and reflecting the true patterns in the data. The analysis allows us to, also, observe the relationship between different sub-pillars of the skills index and the green growth index/sub-pillars of the green growth index at the level of the whole EU or by clusters. The paper's conclusions will offer some insights for future green economy growth policies and skills transformation, as well as for the labour market and future orientation of educational policies. The policy needs to focus on extensive accelerating of up- and reskilling and providing guidance and support to workers who will need to change occupation, sector or geographic location (CEDEFOP, 2021).

## Introduction

Our "way of producing and consuming on Planet Earth" has reached a critical point and it's about to break the sustainability threshold. We are consuming 60% more resources than nature can regenerate, we need the resources of 1,6 Earths to provide the current level of production and way of life. If the consumption rate does not change, by 2050, we will need the resources of 3 Earths.

The context became more complex if we add the last two important crises: financial and pandemic crises.

In a world where resources are limited, we are oriented to respond more than ever to sustainability. Associate with sustainability is the green economy, the green organization.

In this context, more than ever education and training are at the core of any effort to increase a country's productivity and to improve people's likelihood not only of accessing employment at all, but of accessing good quality employment. The educational attainment and skills base of the workforce has a clear impact at both the individual and the national level. Accordingly, effective policy-making depends on understanding the ways in which educational trends and labour market trends are related, and how these shape individual and national well-being. Therefore, skills are an important asset in this new age, where globalization, sustainable economies, and the digital transformation of enterprises are often essential challenges. [1]

Based on these reasons, the paper aims to use statistical analysis tools to respond to the research question: Which countries or groups of countries are better equipped in terms of skills to make a just transition and perform in a green inclusive economy. Another part of the article is related to the results of analyses made and offers some recommendations for skills policy in the green economy and clusters trends in the European Union.

Many work papers have been carried out that studied the green economy and the performance of appropriate competencies (" green skills").

Thus, the novelty of this study is related to the choice of an exploratory analysis of the skills development and adjustment policy, green economic growth index, and a proxy for consumption harming the environment.

The hypothesis proposed is that the skills will work within a system related to the labour market and educational system, as a system considering its incomes and outcomes, including a framework of institution structure and regulations. With the aim of increasing the chances of a better transition for the green economy, we must evaluate the performance of a sum of indicators representing skills. What is the purpose of using an index for the performance assessment of the green economy in the last decade?

**Green development policies**

The most important is **New European Green Deal (2020)** and represents the new EU's growth strategy. The European Green Deal is a set of policy initiatives by the European Commission with the overarching aim of making the EU climate neutral in 2050.[2] The European Commission adopted, also, a set of proposals to make the EU's climate, energy, transport and taxation **policies fit for reducing net greenhouse gas emissions by at least 55% by 2030**, compared to 1990 levels and to increase power demand through clean, renewable, and zero-emission energy sources by 2030.

European Commission President Ursula von der Leyen said that "Europe today is too reliant on gas and too dependent on gas imports. The answer has to do with diversifying our suppliers ... and, crucially, with speeding up the transition to clean energy."

The green deal was criticized by different member state governments of Poland, The Czech Republic, and others, like non-profit organizations.

The EU considered the criticisms brought and created a tool called the "Just Transition Mechanism" to distribute the burden of transitioning to a greener economy more fairly.

The Pandemic Sars-cov 19 pushed EC to set new policy orientations in the field. European Union gave a response to the COVID-19 pandemic crisis, including the green deal in

its economic recovery plan.[3] Some opinions talk bout the ecological crisis that could helped create the pandemic, which emphasized the need to advance the European Green Deal.[4,5] This was the reason that the green deal was included in the recovery package called Next Generation EU.[6] One third of the 1.8 trillion euro investments from the Next Generation EU Recovery Plan, and the EU's seven-year budget will finance the European Green Deal.

The pact has goals extending to many different sectors, including construction, biodiversity, energy, transport and food, related to access to nature, clean air and water, healthy food, a sustainable environment, and community resiliency.[7] In fact, The European Green Deal is a landmark change because it is the first EU growth strategy that sets targets for greenhouse gas emissions and offers a framework to approach greening and sustainability comprehensively. [8] These goals are to be accomplished through the following actions on the part of EU:

- More investments will be oriented to communities/regions/sectors/countries more in need, (affected by climate change) even if the changes are systemic and will affect the whole European Economy
- Investing in renewable power sources; securing an affordable EU energy supply and having a "fully integrated, interconnected digitalised EU energy market[9]
- Upgrading all existing buildings and building new ones so that they achieve maximum energy efficiency, water efficiency, safety, affordability, comfort, and durability
- Achieving the goals of the EU Biodiversity Strategy for 2030 through supporting family farming, investing in sustainable farming, and building a more sustainable and equitable food system; protecting sea territory and primary forests and old-growth forests
- Achieving the goals of a comprehensive strategy "Sustainable and Smart mobility" of the green through the adoption of sustainable and alternative fuels in the road, maritime and air transport [10]
- Restoring ecosystems through land preservation, afforestation, and science-based projects
- Cleaning up existing hazardous waste and abandoned sites
- Eliminating the pollution and identifying unknown sources of pollution and emissions

**Skills policies**

In a context where different factors driving global change – digitalisation, automation, global value chains, demographic trends, migration, climate change, we need specific policies for sectors, both within and across countries, looking at their connection with innovation, resilience and inclusion. The skills policies must respond adequately to these challenges.

**EU skills 'policies**

The **European Skills Agenda** is a five-year plan to help individuals and businesses develop more and better skills and put them to use, by:

- strengthening sustainable competitiveness, as set out in the **European Green Deal,** therefore the skills are directly linked to green development;
- ensuring social fairness, putting into practice the first principle of the **European Pillar of Social Rights**: access to education, training and lifelong learning for everybody, everywhere in the EU;

- building resilience to react to crises, based on the lessons learnt during the COVID-19 pandemic.

## Literature review

Kolesnichenko at all. think that the era of knowledge means a transition towards a more competitive society, based on the institutional structure; an innovative system; education, and training. The transition to a new economy needs differentiation of human capital into three types: “traditional”, “convertible” and “creative.” The latter is characterized by knowledge and skills in the advanced fields; the permanence of continuing education and knowledge updating; the ability to set tasks independently; the ability to switch to various activities; high professional autonomy. It is the creative human capital that plays the role of the accelerator in the process of becoming and spreading Industry 4.0.[11]

The new economy is based on highly qualified human capital. The green economy is a particular sector of the knowledge economy in a larger approach. A green economy means manufacturing, commercial, service, and other economic activities are more environmentally friendly which produce lower carbon emissions and consume lesser unrenewable energy that leads to improved human well-being and social equity [12]. The green industries that underpin the green economy require workers with green skills to perform the tasks for new occupations. Structural changes will realign sectors that are likely to decline as a result of the greening of the economy and workers will need to be retrained accordingly. The successful transition to a low-carbon economy will only be possible if workers can flexibly adapt and transfer from areas of decreasing employment to new industries.[13] It will be changed the structure of demand and supply of workforce and that implies the also, a different approach to the structure of labour market and educational institutions. For these processes, we need appropriate skills. Employees need to be prepared to shift jobs and to be flexible in acquiring skills. Therefore, we are talking about green skills.

Eurostat defines green jobs as part of the objective to better manage resources in environmental protection conditions. Eurostat categorizes an activity as an ecological activity when at least 50% of the time required to complete it involves a good or service that protects the environment.

The International Institute for Labour Studies believes that green jobs are those jobs maintained or created in the transition process towards a green economy [14].

A definition of green skills, accordingly to the United Nations Industrial Development Organization – UNIDO, is the knowledge, abilities, values, and attitudes needed to live in develop and support a sustainable and resource-efficient society.[15]

Policies We have also witnessed the rise of greening to the top of the policy agenda in the EU and internationally. We see – perhaps for the first time – a major global disruption on the horizon that is not driven by the invisible hand of the market, but by deliberate policy decisions.[16] in this context, the economic forum stresses the ability of individuals to work with systems, in order to assess their performance. The green economy will need workers who can design, operate and monitor a wide range of systems. They’ll need to assess systems against

performance indicators and find ways to optimize and improve system operations. They'll need skills in macroeconomics to build sustainability into long-term infrastructure projects.

The net employment growth of moving towards a low-carbon and sustainable economy should not lead us to underestimate the negative consequences on labour markets of this transition. The imposition of stricter climate change regulations will inevitably lead to significant job losses and increasing social fragmentation if appropriate steps are not taken to avoid this. OECD [17] Creating a green growth index, takes into consideration this impact by monitoring the Green growth performance of countries, respectively the result of policies applied in the driven sectors of the economy.

## Methodology

We use cluster analysis as a statistical method for processing data. It works by organizing items into groups, or clusters, based on how closely associated they are.

Cluster analysis, like reduced space analysis (factor analysis), is concerned with data matrices in which the variables have not been partitioned beforehand into criterion versus predictor subsets. The objective of cluster analysis is to find similar groups of subjects, where "similarity" between each pair of subjects means some global measure over the whole set of characteristics.[18]

*Cluster analysis description*

Using the method of hierarchical cluster analysis, the results organized by groups in a hierarchical order will show us which countries have simultaneously enough capabilities in terms of dimensions skills index, like skills development, skills activation, and skills matching, and in terms of performance in achieving the green growth index dimensions, as well as a good level of GDP per capita.

*Methode Agglomerative:* This is a "bottom-up" approach: each observation starts in its cluster, and pairs of clusters are merged as one moves up the hierarchy. Agglomerative methods begin with 'n' clusters and sequentially combine similar clusters until only one cluster is obtained.

Squared Euclidean distance: linkage criteria include the increase in variance for the cluster being merged (Ward's criterion)

In order to decide how many clusters to keep we used the agglomeration graph.

*Definition of the concepts:*

*1) Skills performance - ESI*

CEDEFOP's European Skills Index (ESI) measures the performance of national skills systems using a composite indicator approach. ESI monitors countries' performance over time and provides insights into possible improvement areas. ESI delivers evidence that supports the EU policy framework for VET and skills, in particular the European Pillar of Social Rights and the European Skills Agenda. The ESI measures countries' "distance to the ideal" performance. This ideal performance is chosen as the highest achieved by any country over a period of 7 years. The ideal performance is scaled to be 100 and the scores of all countries are then computed and compared to that. The basis of the ESI is 15 individual indicators from various

international datasets. The scores are calculated across countries at the indicators' level. The scores are then averaged at the various layers and finally, the Index score is formed. To illustrate, an Index (or pillar, sub-pillar etc.) score of 65 suggests that the country has reached 65% of the ideal performance. Thus, there is still 35% (100-65) room for improvement. A score of 100 corresponds to achieving the 'frontier', which is an aspirational target performance for that indicator. A score of 0 corresponds to a lowest-case performance [19].

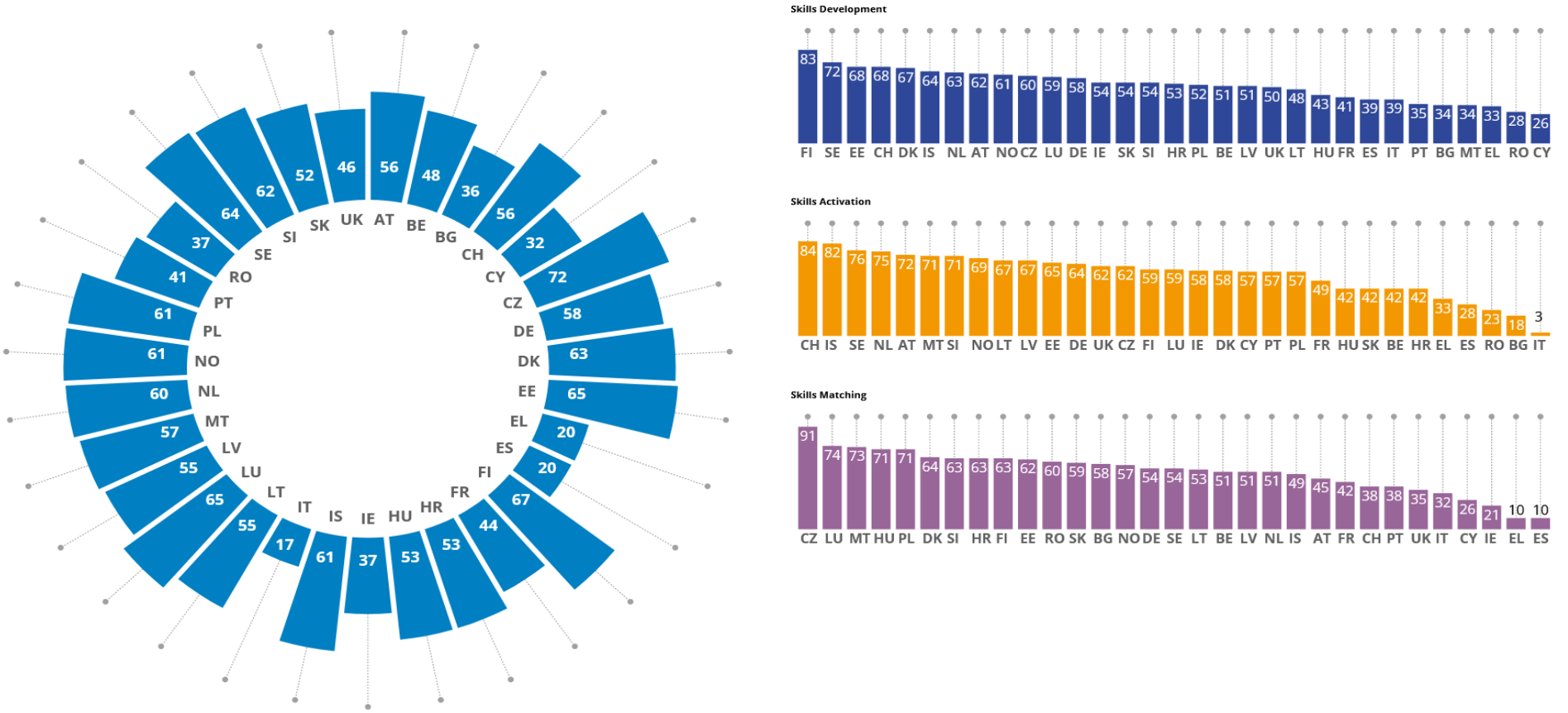
*Composition of ESI*

ESI is formed by three pillars of the index:

- **Skills development** represents the education and training activities of the country and the immediate outputs of that system in terms of the skills developed. Sub-pillars are included to distinguish compulsory education and other education and training (lifelong learning) activities. The skills development pillar contains the following indicators: The basic education sub-pillar comprises 3 indicators to measure quality, participation and achievement in compulsory education: pre-primary pupil-to-teacher ratio; share of population aged 15-64 with at least upper secondary education; and reading, maths & science scores (aged 15). The training and other education sub-pillar comprises 3 indicators to measure participation and achievement in lifelong learning activities: participation in recent training; participation in VET; and achievement of high digital skills.
- **Skills activation** includes indicators of the transition from education to work, together with labour market activity rates for different groups of the population. The transition to work sub-pillar comprises indicators to measure **the transition from education to employment:** early leavers from training; and recent graduates in employment. **The labour market participation** sub-pillar comprises indicators to measure the activity rates of different groups of the population: the activity rate of the 'core' working population and the youth activity rate. **The skills activation pillar** contains the following indicators: Activity rate (aged 25-54), Activity rate (aged 20-24).
- **Skills matching** represents the degree of successful utilization of skills and the extent to which skills are effectively matched in the labour market. This can be observed in the form of jobs and mismatches which include unemployment, shortages, surpluses or under-utilization of skills in the labour market. Sub-pillars are included to distinguish skills under-utilization and skills mismatch. The skills utilization sub-pillar includes indicators to measure different aspects of skills under-utilization, such as, long-term unemployment; and the underemployment of part-time workers (those who declare that they work part-time because they are unable to find full-time work). The skills mismatch sub-pillar comprises 3 indicators to measure different aspects of surpluses or underutilisation of skills in the labour market: overqualification rate (those with higher education that have a job that does not require it); low-waged workers (tertiary graduates that are low-waged earners); and qualification mismatch (the extent to which each employee's education attainment level matches the modal education attainment level for each occupation in each industry).

Fig.1

## 2020 European Skills Index




*Source: CEDEFOP, 2020*

*2) Green inclusive economy*

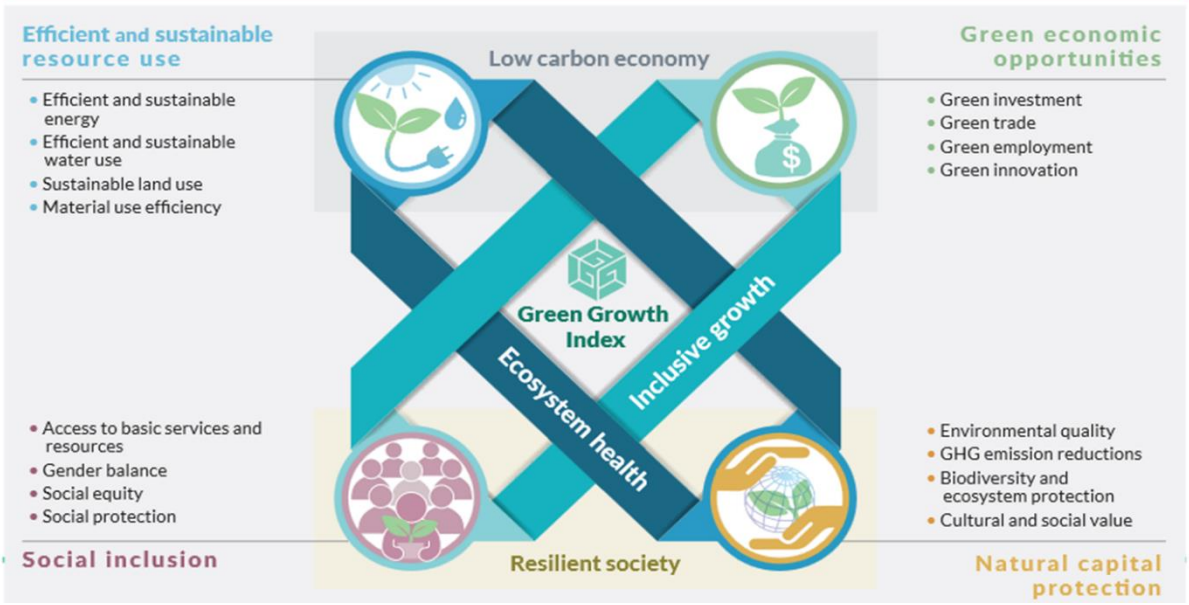
We expect the green economy to become more inclusive and the global partnership of the 2030 Agenda to implement the passage from a global perspective to a planetary one regarding future socio-economic development. Under an Inclusive Green Economy approach, planetary boundaries should not only be adhered to reactively but should also be seized as opportunities for the introduction of innovative measures that contribute to "sustained, inclusive and sustainable growth, full and productive employment and decent work for all" (SDG 8).

*Green Growth Index – an important indicator of a green inclusive economy*

The Green Growth Index measures the performance in achieving sustainability targets including Sustainable Development Goals, Paris Climate Agreement, and Aichi Biodiversity Targets for four green growth dimensions: efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion.

Fig. 2

Figure 1. Conceptual framework of the Green Growth Index




*Source: Conceptual framework for the Green Growth Index Source: Green Growth Index Concepts, Methods and Applications (Acosta, Maharjan, et al., 2019), TR10_Assessment-of-Complementarities_Final.pdf (gggi.org)*

In 2020, in the following graph the GGI for EU member states took that shape:

Fig.3


*Source: https://greengrowthindex.gggi.org/; https://gggi-simtool-demo.herokuapp.com/*

*3) GDP/capita - the regional income*

GDP/capita in European Countries – NUTS 1 Argument for choosing the indicator *GDP & Environment*

A major limitation is that it ignores the impact on the environment. If consumers spend more on gas-guzzling vehicles and fast fashion, this could increase GDP per capita meanwhile harming the environment and future prosperity. We should also, therefore, keep a pulse on factors like air quality and CO2 emissions to better understand long-term costs and what is at risk.

Shared prosperity is simply too complex, multifaceted, and comprehensive for any single indicator. This means we can only fully understand prosperity if we look at GDP per capita along with a broad range of other indicators specific to the green and digital economy that can assure healthy communities and, ultimately, all the things that enable us to live our best possible life.[20]

**Results:**

There are two kinds of results:

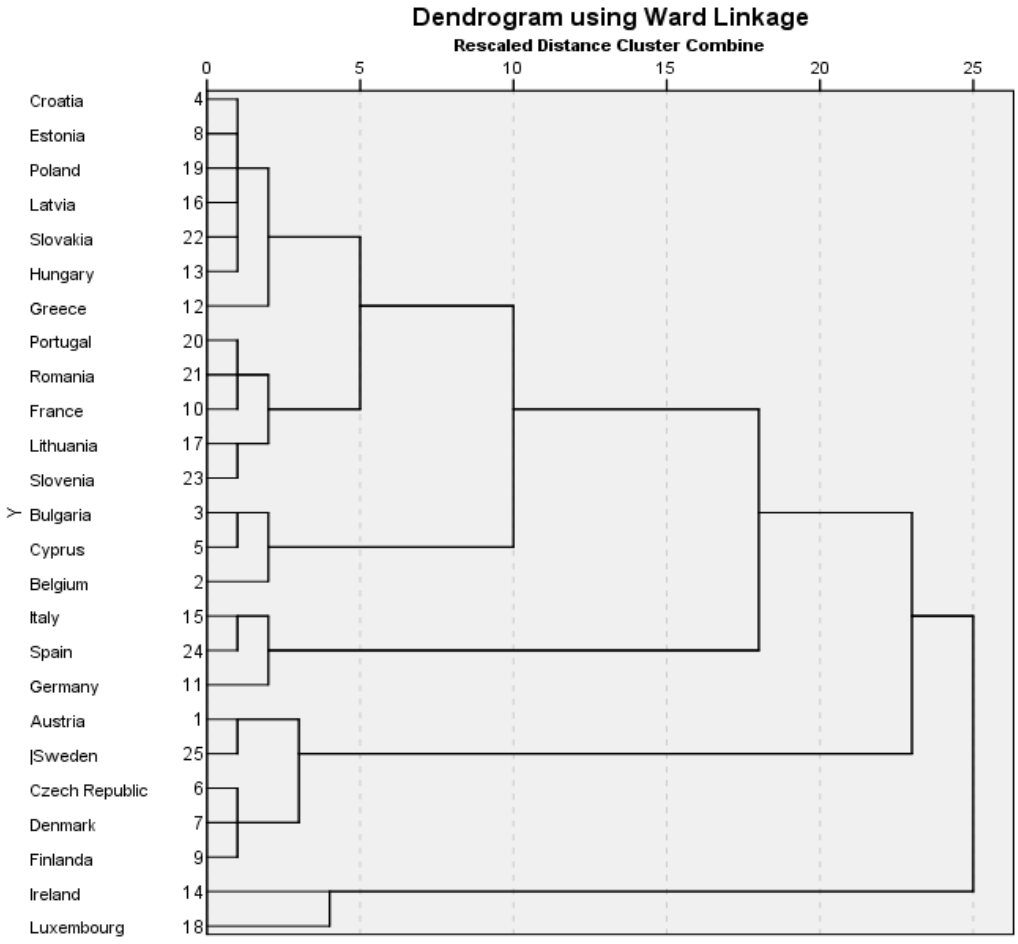
- The First one is the one in which we obtain 4 clusters
- The second one is the one in which we obtain 5 clusters

The dendrograms shown represent the results of a cluster analysis of four countries groups.[1]

[1] We intended to not cover the paper with too much dendrogram, and we preferred to show only the 5 groups of European Union countries, as a result of the second cluster analysis.

Fig.4

Clusters formed by European Skills Index, Green Growth Index and GDP/capita at PPS (Purchasing Power Standard)- EU-27 =100




*Source: author's cluster analysis using SPSS*

Four clusters:

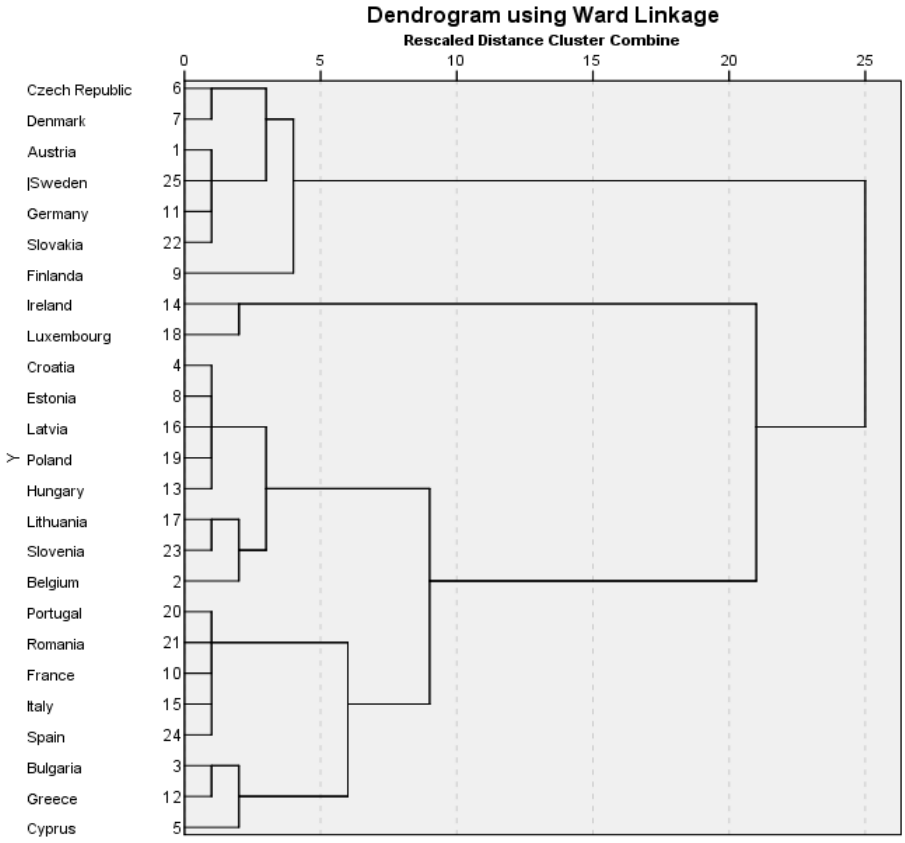
**Cluster1**: Austria, Czech Republic, Denmark, Finland, Sweden;
**Cluster 2**: Belgium, Bulgaria, Croatia, Cyprus, Estonia, France, Greece, Hungary, Latvia, Lithunia, Poland, Portugal, Romania, Slovakia and Slovenia;
**Cluster 3**: Spain, Italy and Germany;
**Cluster 4**: Ireland and Luxembourg.

Five clusters:

**Cluster 1**: Austria, Czech Republic, Denmark, Finland, Sweden;
**Cluster 2**: Belgium, Bulgaria, Cyprus;
**Cluster 3**: Croatia, Estonia, France, Greece, Hungary, Latvia, Lithuania, Poland, Portugal, Romania, Slovenia, Slovakia;
**Cluster 4**: Germany, Italy, Spain;
**Cluster 5**: Ireland and Luxembourg.

Results clusters countries formed by the European Skills Development sub-Index, Green Growth Index and GDP/capita at PPS, EU-27=100

Fig.4




*Source: Authors 'cluster analysis, SPSS*

Four clusters:

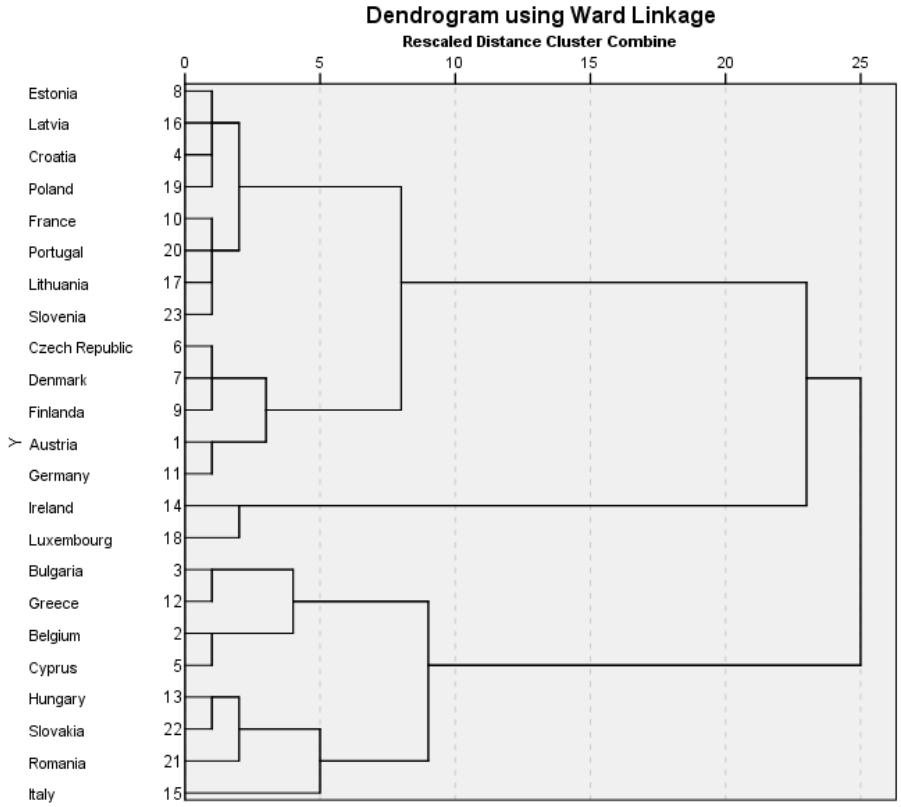
**Cluster 1**: Austria, Czech Republic, Denmark, Finland, Germany, Slovakia, Sweden;
**Cluster 2**: Belgium, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia;
**Cluster 3**: Bulgaria, Cyprus, France, Greece, Italy, Portugal, Romania, Spain;
**Cluster 4**: Ireland and Luxembourg.

Five clusters:

**Cluster 1**: Austria, Czech Republic, Denmark, Finland, Germany, Slovakia Sweden;
**Cluster 2**: Belgium, Croatia, Estonia, Hungry, Latvia, Lithuania, Poland, Slovenia;
**Cluster 3**: Bulgaria, Cyprus, Greece;
**Cluster 4**: France, Italy, Portugal, Romania, Spain;
**Cluster 5**: Ireland and Luxembourg.

Results clusters countries formed by the European Skills Activation sub-Index, Green Growth Index, and GDP/capita at PPS, EU-27=100

Fig.5




*Source: Authors 'cluster analysis, SPSS*

Four clusters:

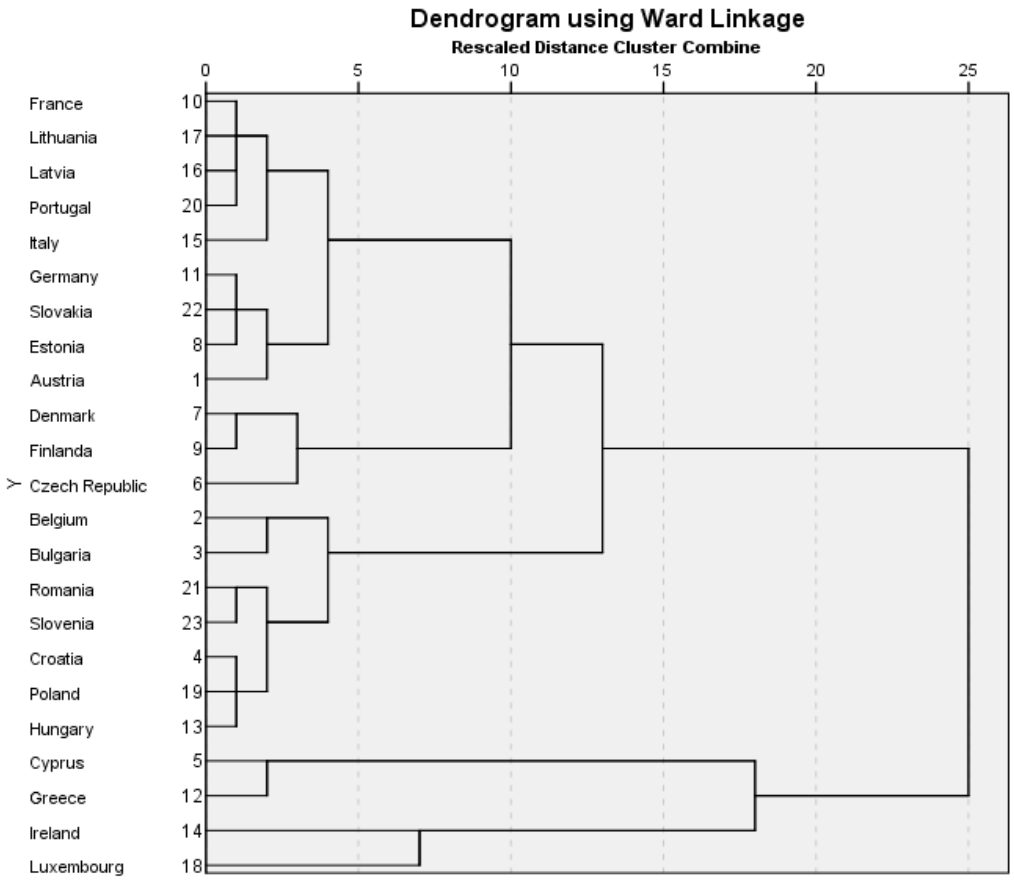
**Cluster 1**:Austria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Latvia, Lithuania, Poland, Portugal, Slovenia;
**Cluster 2**: Belgium, Bulgaria, Cyprus, Greece;
**Cluster 3**: Hungary, Romania, Slovakia and Italy;
**Cluster 4**: Ireland and Luxembourg.

Five clusters:

**Cluster 1**:Austria, Czech Republic, Denmark, Finland, Germany;
**Cluster 2**: Croatia, Estonia, France, Latvia, Lithuania, Poland, Portugal, Slovenia;
**Cluster 3**: Belgium, Bulgaria, Cyprus, Greece;
**Cluster 4**: Hungary, Romania, Slovakia and Italy;
**Cluster 5**: Ireland and Luxembourg.

Results clusters countries formed by the European Skills Matching sub-Index, Green Growth Index, and GDP/capita at PPS, EU-27=100

Fig.6




*Source: Authors 'cluster analysis, SPSS*

Four clusters:

**Cluster 1**: Austria, The Czech Republic, Denmark, Estonia, Finland, France, Germany, Italy, Latvia, Lithuania, Portugal, Slovakia,
**Cluster 2**: Belgium, Bulgaria, Croatia, Hungary, Poland, Romania, Slovenia;
**Cluster 3**: Cyprus and Greece;
**Cluster 4**: Ireland and Luxembourg.

Five clusters:

**Cluster 1**: Austria, Estonia, France, Germany, Italy, Latvia, Lithuania, Portugal, Slovakia;
**Cluster 2**: Belgium, Bulgaria, Croatia, Hungary,
Poland, Romania, Slovenia;
**Cluster 3**: The Czech Republic, Denmark and Finland;
**Cluster 4**: Cyprus and Greece;
**Cluster 5**: Ireland and Luxembourg.

**Debates and conclusions**

In the first case of grouping the skills index, the green growth index and GDP/capita we identify four clusters. Austria, Denmark, Sweden and Finland are found in the first cluster. In this group, we find also the Czech Republic with similar results regarding the overall index. These countries reported very good results in comparison to the rest of the member states. There in the top of the competition for acquiring the appropriate skills in a labour market and educational efficient systems, in the process of developing the green economy, and a better pattern of consuming/investing than other EU countries.

The second group is formed by: Belgium, France, Portugal, Bulgaria, Croatia, Cyprus, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. We identify countries from different European territories like the Western, Mediterranean, Nordic, Central and Southern zones. There are countries with a developed economy, with advanced innovation and green economic progress, but, also, with some traditional activities that are not enough linked to the green economy. Also, these countries' skills are not enough adequate for the green labour market requirements. In the group you can also find emerging countries also, in full transition activities facing a lot of challenges, experiencing different speeds and magnitude of skills adjustment and development, green economic dynamics and a spectrum of patterns of consumption and production.

The third cluster comprises Spain, Italy and Germany, countries reporting some modest results in the case of the overall skills index with high values for GPD/capita and values of GGI varying between very modest and medium score for all European countries. These developed countries still have some traditional economic activities requiring the appropriate skills.

The fourth cluster is formed by two countries, Ireland and Luxembourg and they appear in all four analyses. In 2020, Luxembourg reported modest results for GGI, very good Skills index results and a higher GDP/capita in the EU. Ireland reported good values for skills index, modest GGI results (Ireland is in the last position) and very high values for GDP/capita. This cluster highlights more than others the discrepancies in development showing good skills performance in a context of an expansive pattern of consumption and poor green economy progress.

In the cluster analysis, combining the sub-pillars skills index, GGI and GDP/capita, the results are nuanced:

- between the Skills Development index, GGI and GDP/capita: in the first cluster enters more countries than in the case of the overall index: adding, Germany and Slovakia (relatively good skills developments index, GDP/capita near the EU-average but bottom of it and relatively good GGI. In the second cluster, the remaining countries are Belgium, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland and Slovenia. In the third cluster appears more countries than in the first analysis: Western, Mediterranean and South – Eastern countries. Some of these countries faced difficulties regarding their educational system and others show a low level of digital skills. In the last cluster appears Ireland and Luxembourg.

- Between the Skills Activation index, GGI and GDP/capita: the first cluster comprises countries from different European areas, Nordic, Central and Western zones, with good similar results; the second group includes countries from South and North of EU. The third group is

formed by Hungary, Romania, Slovakia and Italy with difficulties in the transition from education to employment. The last group is formed by Ireland and Luxembourg.

- Between Skills Matching Sub-Index, Green Growth Index, and GDP/capita: the first cluster is formed by countries that appear in all other cases but are others who are included for the first time like France, Italy, Latvia and Lithuania. The second cluster is dominated by countries from Central-Southern territory. The third cluster is formed by Cyprus and Greece, reporting a similar loss of human capital by underutilization of the workforce and skills mismatching.

Romania appears in all cases in the second and third clusters with very modest skills index results, even reporting a relatively good GGI index and under the values of EU GDP/capita average. The GGI is not the result of a high green development is the result of a lack of specialization, in secondary and tertiary economic activities.

The limitation of the paper is referring to the method used. Cluster analysis is an exploratory analysis that tries to identify structures within the data. Cluster analysis is also called segmentation analysis or taxonomy analysis. More specifically, it tries to identify homogenous groups of cases if the grouping is not previously known. Because it is exploratory, it does not make any distinction between dependent and independent variables.[21]

In conclusion to this paper, in a green economy, the real challenge is to acquire skills in a well-regulated framework and activate all the resources of the society to reduce or eliminate the malfunctioning of the labour market and educational systems. That means to:

- reduce their losses through the process of mismatching between the skills obtained in school and those required in the labour market;
- limit the skills lost by underutilization;
- increase the efficiency of the TVET system; TVET system can contribute to improving the green economy competitiveness;
- reduce the school abandonment of teens;
- increase the chances of a rapid and efficient transition from school to the labour market;
- top-up training for mid-career workers who need to adapt to greener ways of working, and ensuring that both men and women are equally well-prepared for the shift to a greener economy;
- support eco-innovation and the diffusion of green technologies, especially at the local and regional level by strengthening initial education and vocational training and ensuring that overly-strict product market regulations are not blunting the incentive to innovate.

In the context of the three index analysis, important policies to be implemented will follow:

- an integrated policy approach to environmental and skills issues, also, the pattern of consumption vectors – this pattern is different depending on the country and the region. The performance must be convergent of the three vectors;
- increase the performance of the comprehensive skills system in the EU countries, including the green skills;

- identification of factors that determine the new model consumer/investor for the development of the green economy;
- smart multi-level governance in order to enhance the sustainability of educational system and labour market.

Companies should fight for a lower profit, but secure in the long run, using green technology and, also, using sustainable skills (sustainably using them).

The TVET system and higher education must be more flexible and able to sustain the twin transformation of EU economies, green and digital. This paper shows us that some countries have better results than others and a sharing of practices and procedures between them will be a must.

The process of reducing excessive economic growth is difficult but necessary, regarding the fact that this kind of economic growth and irrational, unhealthy consumption would destroy the planet.

## References


[1]https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_424077.pdf

[2] Tamma, Paola; Schaart, Eline; Gurzu, Anca (2019-12-11). "Europe's Green Deal plan unveiled". POLITICO. Retrieved 2019-12-29.

[3] "COVID-19: MEPs call for massive recovery package and Coronavirus Solidarity Fund". European Parliament. 17 April 2020. Retrieved 22 April 2020.

[4] "From Farm to Fork". European Commission website. European Union. Text was copied from this source, which is available under a Creative Commons Attribution 4.0 International License.

[5] "EU Biodiversity Strategy for 2030". European Commission website. European Union.. Text was copied from this source, which is available under a Creative Commons Attribution 4.0 International License.

[6] "EU recovery fund's debt-pooling is massive shift for bloc". Euronews. May 28, 2020.

[7] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_17

[8] https://www.cedefop.europa.eu/en/themes/skills-changing-societies

[9] https://ec.europa.eu/commission/presscorner/detail/en/fs_19_6723

[10] https://www.europarl.europa.eu/legislative-train

[11] Kolesnichenko, E.A., Radyukova, Y.Y., Pakhomov, N.N. (2019). The Role and Importance of Knowledge Economy as a Platform for Formation of Industry 4.0. In: Popkova, E., Ragulina, Y., Bogoviz, A. (eds) Industry 4.0: Industrial Revolution of the 21st Century. Studies in Systems, Decision and Control, vol 169. Springer, Cham. https://doi.org/10.1007/978-3-319-94310-7_7

[12] United Nations Environment Program, UNEP. (2011). UNEP Yearbook: Emerging Issues in Our Global Environment. Retrieved from www.unep.org/yearbook/2011

[13] ***, OECD, 2014, Greener Skills and Jobs

[14] International Labour Organization; European Union & International Institute for Labour Studies. Defining "Green": Issues and Considerations. Available online: http://www.ilo.org/inst/research/addressing-crisis-challenges/discussion-paper-series/WCMS_194180/lang--en/index.htm (accessed on 17 January 2015).

[15] https://www.unido.org/stories/what-are-green-skills

[16] https://www.etf.europa.eu/en/news-and-events/news/end-vet-we-know-it

[17] OECD/Martinez-Fernandez. C, Hinojosa C,Miranda G., "Green jobs and skills: the local labour market implications of addressing climate change", 8 February 2010, working document, CFE/LEED, OECD

[18] https://www.qualtrics.com/uk/experience-management/research/cluster-analysis/?rid=ip&prevsite=en&newsite=uk&geo=RO&geomatch=uk

[19] https://www.cedefop.europa.eu/en/tools/european-skills-index

[20] https://www.businesscouncilab.com/work/how-well-does-gdp-per-capita-really-measure-our-well-being/

[21] https://www.statisticssolutions.com/free-resources/directory-of-statistical-analyses/cluster-analysis/