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ORIGINAL ARTICLE

Spanish Economic Recovery Supported by the European Green Deal? An Evaluation of Green Jobs and Their Capabilities*

¿Recuperación económica Española vía Pacto Verde Europeo? Evaluación de empleos verdes y sus capacidades

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Abstract
An evaluation of the impact of economic and labor policies on the Spanish economic recovery under the framework of the European Green Deal. This evaluation analyzes the opportunity of green jobs for Europe, comparatively, while later focusing on the case in Spain. The analysis looks to the effects on the design of the new green jobs, and the necessary skills to develop the type of newly generated positions, while maintaining greater personal wellbeing at work. The theoretical and methodological frameworks have been derived from heterodox approaches, notably from the Austrian Economics Policies and Cultural Economics illustrated through secondary sources.

Keywords: Public Economics; Labor Economic policies; European Green Deal; recovery plan; green jobs; skills; Wellbeing Economics.

JEL Clas.: E24, I31, J24, J44, O33

Resumen
Evaluación del impacto en la recuperación económica española de las políticas económicas y laborales en el marco del Pacto Verde Europeo. Se analiza de manera comparada la oportunidad de los empleos verdes para Europa, centrándose luego en el caso español. Se focaliza la atención en los efectos sobre el diseño de nuevos empleos verdes y las habilidades necesarias para desarrollar el tipo de nuevos puestos generados, con mayor bienestar personal laboral. Se han manejado los marcos teóricos y metodológicos de enfoques heterodoxos, especialmente de la Escuela Austriaca y Economía Cultural, ilustrando con fuentes secundarias.

Palabras clave: Economía Pública; Políticas Económicas Laborales; Pacto Verde Europeo; plan de recuperación; empleos verdes; habilidades; economía de bienestar personal.

Códigos JEL: E24, I31, J24, J44, O33

1. Introduction

Analysts might interpret crises and economic cycles in different ways: when financial bubbles burst and crises take place, the Austrian Economic School suggests correcting the economic system of the country. Currently, Spain (and much of Europe) is in a technical recession, camouflaged by inflation—marking the time to develop change. The European Union has been promoting a strategic agenda and multiannual financial plan (2021-27) to implement the European Green Deal, prompting this evaluation with special focus on Spain (Arnedo et al, 2021; García-Vaquero et al, 2021; Sánchez-Bayón, 2022a y 2023).

In recent decades, many international institutions and forums have been committed to making a climate-neutral welfare economy a reality (beyond state-owned economic models). This is a satisfaction model based on a balanced relationship between people, planet, and profits (Sánchez-Bayón, 2020a): the UN's DGS agenda for Horizon 2030 (Organization for the United Nations [OUN], 2015), the personal welfare economy of the OECD (Organization for the Economic Cooperation and Development [OECD], 2021), the WEF Personal Welfare Economy Alliance (2018), and the network of transnational corporations (2004), the EU Green Deal (2019) and others. The EU Green Deal was officially adopted in 2019 for the Multiannual Financial Framework 2021-2027 (2020) to promote clean energy production (Heredia and Sánchez Bayón, 2020), smart cities, and the well-being of businesses and professionals in Europe (Sánchez-Bayón and Trincado, 2020 and 2021). The black swan (Taleb, 2007) of the COVID 19 crisis and its management (Bagus et al., 2021) created an opportunity to implement real recovery plans aligned with the Green Deal. Currently, there has been a shock in employment rates in the EU, which is why the European Commission is strengthening its commitment to the sustainable and green growth with the Recovery Plan for Europe (2020). This plan is worth €1.8 trillion and is designed to steer the recovery for the European Green Deal framework.

A special note should be made for the Regulation (EU) 2021/241 signed by the co-legislators on February 12, 2021, establishing the Recovery and Resilience Fund (RRF).

The RRF aims to provide financial support for these investments and public reforms; it is considered a key program of the EU Recovery Instrument under the revised Multiannual Financial Framework (MFF) for 2021-2027. The MFF includes the provision of "Non-refundable financial support and loans to member states to support investments and public reforms, as set out in their National Policies Recovery and Resilience Plans (NPRRP)". These "loans complement the non-reimbursable support and will be proposed in exchange for additional reforms and investments to those benefiting from the non-reimbursable financial support" (RRF, 2021).

This proposal builds on and replaces an earlier proposal on the establishment of a Program for Reform Support, which has been withdrawn. Consequently, the proposal establishing a governance framework for the Euro Area Convergence and Competitiveness Budgetary Instrument (BICC) has also been withdrawn. Below lays out the timeline of the proposal:

- The European Commission presented the initiative on May 28, 2020.
- The Council of the European Union adopted its general orientation on this proposal on October 9, 2020.
- The relevant committees of the European Parliament adopted a negotiating position on November 9.
- An informal agreement was reached between the co-legislators on this initiative on December 18.
- This was formally endorsed by the plenary of Parliament on February 10, 2021, and the following day, by the Council.
- The Act was signed on February 12, 2021, and published in the Official Gazette on February 18, 2021.

On May 20, 2021, the plenary of the European Parliament adopted a resolution urging the European Commission to send MEPs all relevant information on national recovery efforts, in the interest of democratic control, as provided for in the RRF Regulation.

Additionally, recent months have led progress on the following fronts: the proposal and launch in some countries of the Climate Law (European Commission, 2021); the development of a sustainable blue economy in the EU for industries and sectors related to oceans, seas, and coasts (European Commission, 2021); the strategy toward zero pollution of air, water, and soil, or the Organic Action Plan, to produce high quality food with low environmental impact; and Organic Farming through the Farm to Fork Strategy.

The EU Green Deal and the EU Recovery Instrument (Next Generation EU) are great opportunities for the European Union. However, to be successful, they must be firmly based in the fundamental pillars of the EU system—solidarity, sustainable development and wellbeing, environmental protection, and the generation of labor relations. Therefore, by creating new green jobs, stability, predictable and resilient economic growth, and less pollution with healthier, cleaner air, in the European Union, the Recovery Plan for Europe, and the individual national plans in each country, will enable member states to reap the full benefits of the green transition for the economy and employment. This paper will analyze the generation of green employment in Spain and its National Plan of Recovery and Resilience: "Plan of Recovery, Transformation, and Resilience" (Ministerio de Economía y Gobierno de España, 2021).

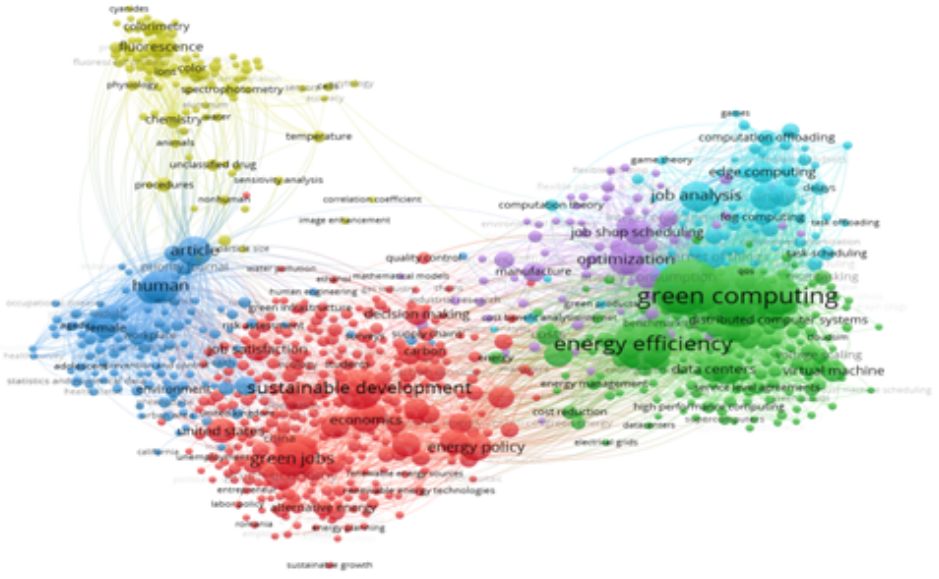
2. Review of the Issue's State

2.1 Green Jobs

This article is an analytical study of Political Economy and Economic Policies that uses a historical and comparative method and accepts changes in reality and its paradigm with globalization (Sánchez-Bayón, 2020a-d and 2021) with international institutions and global and comparative solutions contributing to its reformulation (Sánchez-Bayón, 2014).

The International Labor Organization (ILO), part of the United Nations universal system, has the responsibility of setting general standards in labor relations around the world (Sánchez-Bayón, 2014). The ILO promotes green jobs as part of decent work (an ILO project on the future of work). Therefore, green jobs are connected to sustainable development, the well-being of people, and healthy organizations. The ILO adopted some recommendations on green jobs during the 102nd ICL in 2013, and subsequently adopted the Guidelines for a Just Transition to Environmentally Sustainable Economies and Societies for All in November 2015 by the ILO Governing Body (Sánchez-Bayón, 2014). The ILO defines green jobs as "decent jobs that contribute to preserving or restoring the environment, whether in traditional sectors such as manufacturing and construction, or in new and emerging green sectors such as renewable energy and energy efficiency" (2016). Green jobs "help improve energy and raw material efficiency, limit greenhouse gas emissions, minimize waste and pollution, protect and restore ecosystems, and support adaptation to climate change." Additionally, the ILO goes further and connects green jobs with other fields supporting other scientists' and academics' research (see Figure 1).

Figure 1. Green Jobs, Well-being and Other Connected Fields.



Source: Own Elaboration (with information from articles on Scopus 2017-21 through VOS-Viewer).

The definition of green job is not uniform, therefore, there are dimensions to expand this concept (Browen et al., 2018). Several articles provide different aspects to set the boundaries of green jobs: industry type, production methods, and specific jobs with the associated skills and capabilities. This paper will consult the ideas from Consoli et al. (2016), Lobisger and Rutzer (2021), and Martínez Fernandez et al. (2010). Statistical offices also recognize the challenge of defining green jobs (UK Office of National Statistics, 2021), and therefore align the definition to the Environmental Goods and Services sector describing it as creating new jobs and generating added value (Eurostat, 2020). The US Department of Labor (2021) additionally has their own classification, establishing which occupations have been identified as "green". The green occupational categories assigned to the professions are New and Emerging, Green Enhanced skills, and Green Increased Demand, depending on the level and type of impact of the green economy actions and technologies the job requires and demands. Table 1 shows an example of the most relevant green jobs in the US with their expected evolution.

Table 1. Green Jobs in the US, 2021.

Green Jobs USA as of May 2021	Employment (2019)	Projected Job Openings (2019-2029)	projected Growth (2019-2029)
Sustainability Specialist	1,316,800	128,000	Much faster than average (8% or higher)
Landscaping and Groundskeeping Workers	1,188,000	158,900	Much faster than average (8% or higher)
First-Line Supervisors of Production and Operating Workers	648,900	56,900	Little or no charge
Inspectors, Testers, Sorters, Samplers, and Weighers	590,100	48,300	Decline (-1% or lower)
Plumbers, Pipefitters, and Streamfitters	490,200	49,800	Average (3-4%)
Financial and Development Specialists	487,800	38,600	Faster than average
Training and Development Specialists	327,900	33,700	Much faster than average (8% or higher)
Sales Rep., Wholesale and Manufacturing, Tech and Scientific Products	321,000	30,700	Average (3-4%)
Mechanical Engineers	316,300	19,200	Average (3-4%)
Chief Sustainability Officers	287,900	13,900	Decline (-1% or lower)
Production Workers, All Other	238,600	24,700	Slower than average (1-2%)
Energy Engineers, Except Wind and Solor	170,100	10,300	MSlower than average (1-2%)
Architects, Except Landscape and Naval	129,900	8,700	Slower than average (1-2%)
Mixing and Blending Machine Setters, Operators, and Tenders	128,000	13,300	Slower than average (1-2%)
Career/Technical Education Teachers, and Tenders	124,100	9,400	Slower than average (1-2%)
Industrial Ecologists	90,900	8,900	Much faster than average (8% or higher)
Machine Feeders and Offbearers	62,900	7,000	Little or no change
Separating, Filtering, Clarifying, Precipitating, Operators, and Tenders	53,100	5,400	Average (3-4%)
Materials Engineers	27,500	1,500	Slower than average (1-2%)
Foundry Mold Coremakers	17,600	1,400	Decline (-1% or lower)
Total	**7,017,600**	**668,600**	**New Jobs**
		9,53%	**Increase**

Source: Own Elaboration with information from O*NET (2021).

A simplified and general definition of green jobs is related to the sectors and labor force authorized to produce goods or services that help protect the environment and natural resources and develop new technologies and processes that could stop or reverse the effects of climate change. The skills necessary to perform green work can be seen through some jobs (European Commission, 2021) that highlight the importance of having different skills: "people employed in jobs with high ecological potential are, on average, younger, more often men, have a higher educational level and a higher probability of having immigrated than people employed in other occupations. There is a need for and shortage of skilled labor in the high green potential job group, which is particularly noticeable for management and professional groups" (European Commission, 2021).

The advent of Green Recovery Plans has generated an expectation for increased demand of green jobs. Therefore, all countries should implement specific efforts in work skills related to this field (mainly education at all levels and skills enhancement) to meet the demand for qualified specialists. These efforts will help the necessary and rapid adaptation to the new sustainable economy caused by the pandemic and the subsequent labor crisis.

2.2 Green Growth

In the recent years, growth and development concepts and policies have been gaining increasing interest. For instance, international entities such as the Organization for Economic Cooperation and Development (OECD), the World Bank, The European Commission (EC), or the United Nations Environment Program, among others, have taken several initiatives in this regard.

The OECD definition of green growth refers to "fostering economic growth and development while ensuring that natural assets continue to provide the environmental resources and services on which our well-being depends. It is also about encouraging investment and innovation, which underpin sustained growth and create new economic opportunities" (2012).

On the other hand, the EC explicitly says, "the objective is to create more value using less resources and substituting them for more environmentally favorable options whenever possible" (European Commission, 2016). Meanwhile, the World Bank affirms that "green growth is growth, because it is efficient in the use of natural resources, clean, because it minimizes pollution and environmental impacts, and resilient, because it represents natural risks (World Bank, 2012).

The United Nations Environment Program (UNEP) defines the green economy as "the economy that improves human well-being and social equity, while significantly reducing environmental risks and ecological scarcity" (1972).

None of the above definitions establish scientific and measurable criteria for what is considered green growth. Precise and simple indicators are needed to decide whether economic growth is green enough to allow countries to adjust to the parameters set to meet climate change goals. There are criticisms of traditional approaches to the definition that say it is a traditional economic economy growth model with a different label.

Ultimately, based on decoupling theory, Grand (2016) and Tapio (2005) have proposed a definition of green growth, which has been accepted: "Green growth is an increase in economic output that reduces the overall environmental footprint."

An intense debate is taking place about these definitions between green growth advocates and their opponents (Akizu Gardok et al. (2018), Bonauiti (2018), Moreau and Vuille (2018), and O'Neill et al. (2018)) which has drawn attention to reports such as the European Commission. Although in the last decade the dominant thinking has been about green growth in policymaking, whether at the country level, within the UN, the EU, or other global institutions, the underlying argument is the assumption that decoupling environmental pressures from gross domestic product could allow for endless economic growth. Various studies have reviewed the soundness of the scientific foundations that support the decoupling hypothesis and have come to shocking conclusions: there is no empirical evidence to justify the existence of a decoupling between economic growth and environmental pressures to deal with environmental collapse. On the other hand, it seems unlikely that a decoupling could become a reality in the near future. Current policy strategies to increase growth must consider the quest for sufficiency: reducing economic output in many sectors and thus reducing consumption globally. This consideration will make life sustainable within the ecological limits of the planet.

2.3 Green Jobs, Tech-novation, and Well-being

The new economical paradigm is based on the optimization of a "triple P" relationship between Profit, Planet, and People, supported by several international agreements, like the ones mentioned above by the OECD and the World Economic Fund. This relationship is based on technological advances, or tech-novation, to increase global wealth, protect nature, and improve standards of living in the world: the well-being for humanity (Sánchez-Bayón, 2021). The previous paradigm, the Welfare State Economy, was materialistic and focused on measuring GDP; however, the emerging paradigm, the Welfare Economy (which includes several steps of the digital economy, i.e., collaborative and circular economy, orange economy), is more immaterial (i.e., virtual relationships via the internet, psychological and spiritual concerns) and focuses on the pursuit of happiness (since 2012, the UN measures it every year) as reflected in the World Happiness Report. The development of the Welfare

Economy for Horizon 2030 will be shaped by the following three transitions: the end of the fourth industrial and technological revolution and the beginning of the fifth revolution, the fall of industrial capitalism and development, and the rise of talent capitalism as Nordstrom et el. (2000) and Cubieiro (2012), among others, have indicated.

3. Theoretical Framework

The Well-being Economics (Arnedo et al., 2021; Sánchez-Bayón, 2021a; Sánchez-Bayon et al., 2021), supported by the Austrian School, the Neo institutionalists and the Culturalists (Sánchez-Bayón, 2020a and 2022a b; Sánchez-Bayón et al., 2022), and through a development research plan (Sánchez-Bayón, 2020b d and 2021b) provide the theoretical frameworks for this study.

4. Methodology

In addition to the methodological and compositional individualism, the methodology of this study has been illustrated through data resources extracted from secondary sources and processed through documental research and exploration methods, critical and comparative analysis, inductive and deductive reasoning, and mathematical calculations.

The methodology used to obtain information and the final conclusions followed a focus of three stages. Frist, a search for the most recent documentation on Recovery Plans and an in-depth analysis of the Spanish Plan, including renewable and other specific programs (European Commission, 2021). This search used data provided by the International Energy Agency (IEA) and International Monetary Fund in the World Energy Outlook, using "employment multipliers" and "input output model" approaches, which estimates how many jobs are generated for every million euros invested. Second, an identification of the main competences according to the OECD (2018) and the gap between Spain and other European countries. As a result, it has laid the foundation for further analysis to identify the specific green skills needed in the country. Lastly, the conclusions section highlights the most relevant points, limitations of the study, and potential future lines of research (measuring the well-being in new jobs).

5. Results and Discussion

5.1 Macroeconomic View: Green Jobs Management

5.1.1 An Overview

The Spanish Recovery Plan "foresees the mobilization of more than 140 billion euros in public investment until 2026" (Ministerio de Economía, 2021), "with an important concentration of investments and reforms in the first phase of the Plan", covering the 2021-2023 period, "to drive recovery and achieve the greatest possible countercyclical impact". Given the high level of uncertainty about some crucial variables, the plan offers the most essential details for the first phase, including the mobilization of almost "€69.52 billion in transfers from the European Recovery and Resilience Fund" (European Commission, 2021).

The "plan allocates 40.29% of investments to promote the green transition and 29.58% to digital transformation, in precise alignment with the UN SDG 2030 Agenda (2015) and with the specific recommendations of the EU institutions".

5.1.2 Transversal Lines of Action for a Green Spain

Even though the Spanish Recovery Plan has four transversal lines of action that support all drivers and components, this analysis focuses on the green initiatives: the ten-driver policies.

Spanish Recovery Plan, Driver Policy I: "Urban and Rural Agenda, Agricultural Development, and the Fight Against Depopulation"

The first driver is the most important in terms of promotion, and social and rural innovation. The objective is to facilitate the growth and revitalization of territories in decline, implement impactful and attractive projects that increase the population, attract qualified professionals, and promote the

sustainable use of resources. This driver also promotes sustainable and safe mobility in metropolitan and urban areas and rehabilitates buildings that have a negative impact on the environment. Lastly, this plan foresees a plan for the agri-food and fishing industries, with ecological plans, and plans concerning modernization and digitalization.

According to the Spanish Recovery Plan, the plan includes the following components in Driver I:

1. Action plan for sustainable, safe, and connected mobility in urban and metropolitan areas.
2. Housing rehabilitation and urban renewal plan.
3. Green and digital transformation of agri-food and fishing industries.

Spanish Recovery Plan, Driver Policy II: "Resilient Infrastructures and Ecosystems"

This block is related to the protection, conservation, and restoration of ecodiversity: water and the protection of coastal areas are crucial. According to the World Resources Institute, there are 7,268 coastal areas. This field also addresses sustainable, safe, and interconnected mobility, making this block an attractive area for private investment.

According to the Spanish Recovery Plan, the plan includes the following components in Driver II:

4. Ecosystems and biodiversity conservation and restoration.
5. Coastal area and water resources preservation.

With respect to the sixth point, "Sustainable, safe, and connected mobility", the Spanish Recovery Plan uses Driver Policy III: "A Fair and Inclusive Energy Transition". Spain's high potential for both private investment and public private partnerships (PPPs) and for the development of the renewable energy industry, takes full advantage of its potential in terms of geographical and climatic conditions.

Internationally leading companies in the renewable energy field have built international competitiveness through their predictable and stable regulatory framework and green energy sector. These conditions can increase the country's international competitiveness and allow it to be one of the world leaders.

Table 2 shows a summary of the complete Spanish Recovery Plan, with the previous driver policies incorporated with the program's budget allocation and its percentage of the total amount, 69.52 billion euros for 2021-2023.

Table 3 analyzes the components with an effect on green transition (marked in green) and other subchapters that may not be explicitly included.

- Safe, Sustainable and Connected Mobility Strategy (over 10 billion euros): This action plan is positive for its support for zero-emission vehicles; however, part of the funding available will most likely be allocated to "low-emission" vehicles (not to optimal solutions for the green transition) making this component less favorable. Additionally, this plan's funding for the mobility sector is intensively on the automotive industry, with little or no support for other mobility solutions.
- Housing Rehabilitation and Urban Renewal Program (6,800 million euros): Although a presentation of the specific rules and objectives achieved through the renewal measures conditions this plan's final assessment, the action plan is considered positive.
- Other mobility investments (6,700 million euros): Due to the TEN-T (Trans-European Transport Network) rail corridors and sustainable transport, these investments may be considered positive; however, due to ambiguities about what will be supported through some included measures in the component may weaken the original view.
- Investments in Implementation and Integration of Renewable Energies (3,200 million euros): Valued as positive.
- Renewable Hydrogen Roadmap (1,600 million euros): Develops and deploys renewable hydrogen, being valued as positive because of the focus on renewable hydrogen. However, this assessment is conditional on the support of renewable hydrogen, and there are some concerns that non-renewable forms of hydrogen may be supported through this measure, resulting in a less favorable assessment.

Table 2. Sections and Investments of the Recovery Plan.

Driver Policies and Components	€Bn 2021-23	%
I. Urban and Rural Agenda, Agricultural Development and the Fight Against Depopulation	**14.40**	**20.7%**
1. Action Plan for sustainable, safe, and connected mobility in urban and metropolitan areas	6.53	9.4%
2. Housing rehabilitation and urban renewal plan	6.82	9.8%
3. Green and digital transformaation of agri-food and fishing industries	1.05	1.5%
II. Resilient Infrastructures and Ecosystems	**10.40**	**15.0%**
4. Ecosystems and biodiversity conservation and restoration	1.64	2.4%
5. Coastal area and water resources preservation	2.09	3.0%
6. Sustainable, safe, and connected mobility	6.66	9.6%
III. A Fair and Inclusive Energy Transition	**6.38**	**9.2%**
7. Renewable energies implementation and integration	3.16	4.5%
8. Electrical infrastructures, promotion of smart networks, and deployment of flexibility and storage	1.36	2.0%
9. Renewable hydrogen roadmap and sectoral integration	1.55	2.2%
10. Fair transition strategy	0.30	0.4%
IV. A Public Administration for the 21st Century	**4.31**	**6.2%**
11. Modernization of public administration	4.31	6.2%
V. Modernization and Digitalization of Industry and SMEs, Entrepreneurship and Business Environment, Recovery, and Transformation of Tourism and Other Strategic Sectors	**16.07**	**23.1%**
12. Industrial Policy Spain 2030	3.78	5.4%
13. Fostering SME growth	4.89	70.0%
14. Modernization and competiveness of the tourism sector	3.40	4.9%
15. Digital connectivity, cybersecturing, 5G deployment	3.99	5.7%
VI. Promotion of Science and Innovation and Strengthening of the Capabilities of the National Health System	**4.94**	**7.1%**
16. National Strategy for Artificial Intelligence	0.50	0.7%
17. Institutional reform and capacity building in the national science, technology, and innovation system	3.38	49.0%
18. Renewal and expansion of the capabilities of the National Health System	1.06	15.0%
VII. Education and Knowledge, Lifelong Learning, and Capacity Building	**7.31**	**10.5%**
19. National Plan for Digital Skills	3.59	52.0%
20. Strategic plan for Vocational Training	2.07	30.0%
21. Modernization and digitalization of the education system, including eaarly years of education from age 0 to 3	1.64	24.0%
VIII. The New Care Economy and Employment Policies	**4.85**	**7.0%**
22. Emergency plan for the care economy and reinforcement of inclusion policies	2.49	36.0%
23. New public policies for a dynamic, resilient, and inclusive labor market	2.36	34.0%
IX. Promotion of the Culture and Sports Industries	**0.82**	**12.0%**
24. Valorization of the cultural industry	0.32	5.0%
25. Spain and audio-visual hub	0.20	3.0%
26. Sports industry promotion plan	0.30	4.0%
X. Modernization of the tax system for inclusive and sustainable growth	**-**	**0.0%**
27. Measures and actions to prevent and combat tax fraud	-	0.0%
28. Tax reform for the 21st Century	-	0.0%
29. Improving the effectiveness of public speaking	-	0.0%
30. Long-term sustainability of the public pension system within the framework of the Toledo Pact	-	0.0%
Total	69.52	
Total Green Initiatives	36.98	53.0%

Source: Own Elaboration (based on Spain's Recovery Plan, 2021).

- A Fair Transition Strategy (300 million euros): Supports fair transition agreements in energy transition zones and investments in fair transition measures. This measure is positive because it makes an indirect and significant contribution to the green transition.
- New Spain 2030 Industrial Policy and Circular Economy Strategy (3,800 million euros): Likely has a climatic effect that is not measurable: decarbonization of the industrial sector is the next crucial challenge in the green transition. However, this component does not include specific ecological objectives.
- Investments in Science, Technology, and Innovation (3,400 million euros): Includes research projects on environmental issues deeming this component positive.

Below are the 20 main programs in the field of investment mobilization and the 20 main reforms of the Spanish Recovery Plan. The significant reforms – marked in green as very positive – are aligned with green projects and new initiatives (Tables 3 and 4).

Table 3. Investments in the Recovery Plan.

The 20 Main Programs in the Field of Investment Mobilization	€Bn 2021-23
1. Safe, Sustainable, and Connected Mobility Strategy	13.2
2. Housing Rehabilitation and Urban Renewal Program	6.82
3. Modernization of the Public Administration	4.31
4. SMEs Digitalization Plan	4.06
5. 5G Roadmap	3.99
6. New Spain 2030 Industrial Policy and Circular Economy Strategy	3.78
7. National Plan for Digital Skills	3.59
8. Modernization and Competitiveness of the Tourism Industry	3.4
9. Science, Technology, and Innovation	3.38
10. Implementation and Integration of Renewable Energies	3.16
11. New Care Economy	2.49
12. New Public Policies for a Dynamic, Resilient, and Inclusive Labor Market	2.36
13. Preservation of Coastal Areas and Water Resources	2.09
14. Strategic Plan for Vocational Training	2.07
15. Modernization and Digitalization of the Education System	1.64
16. Conservation and Restoration of Ecosystems and Biodiversity	1.64
17. Renewable Hydrogen Roadmap	1.55
18. Electrical Infrastructure, Smart Networks, and Storage	1.36
19. Renovation and Modernization of the Health System	1.06
20. National Straategy for Artificial Intelligence	0.5
Total	69.52
Total Green Initiatives	36.98

Source: Own Elaboration (based on Spain's Recovery Plan, 2021).).

Table 4. Investments in the Recovery Plan.

The 20 Main Reforms of the Spanish Recovery Plan
1. Climate Change and Energy Transition Law
2. Development of a Robust and Flexible Energy System, Implementation, and Integration of Renewable Engergies
3. Renewable Hydrogen Roadmap
4. Resilience and Adaptation of Ecosystems, Development and Connectivity of Green Infrastructures
5. Water Law and National Water Treatment, Sanitation, Efficiency, Saving, and Reuse Plan
6. Modernization of the Agricultural and Fishing Policy - soil protection and efficient use of water
7. Waste Policy and Promotion of the Circular Economy
8. Modernization of the National Science System and Support for Innovation
9. Ssustainable and Connected Mobility Strategy
10. New Housing Policy
11. Modernization of the Justice System
12. Modernization and Digitalization of the Public Administration
13. Better Regulation and Business Environment - insolvency framework reform
14. Modernization and Sstrengthening of the National Health System
15. Modernization and Strengthening of Education, Vocational Training, and University System
16. New Labor Market Public Policies
17. New Care Economy
18. Reinforcement of Inclusion Policies and Social Services
19. Modernization and Progressivity of the Tax System
20. Strengthening of the Pension System
Very Positive

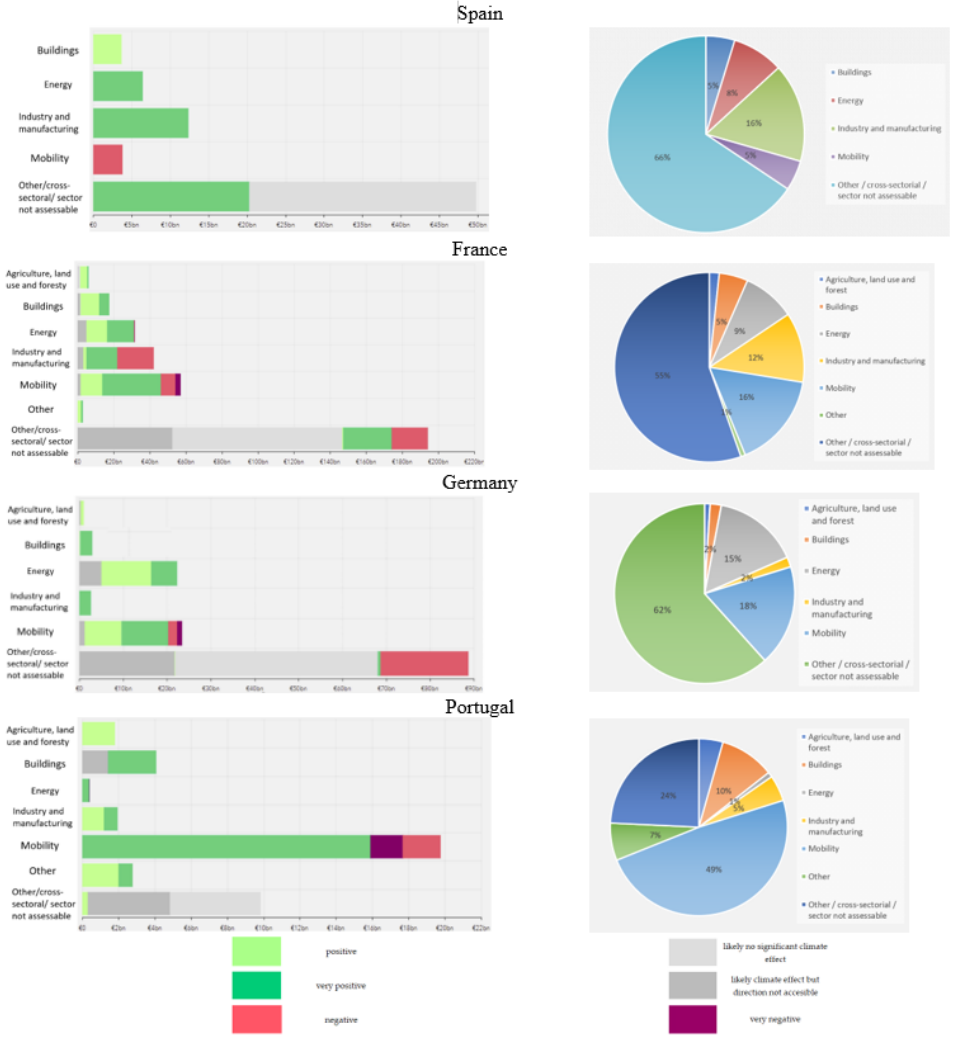
Source: Own Elaboration (based on Spain's Recovery Plan, 2021).

5.1.3 Green Recovery Plans: Cross-Country Vision

Figures 2 and 3 briefly analyze the strengths and different plans and levels of investment in France, Germany, Portugal, and Spain. At the time of writing, it was not accessible or possible to make a thorough comparative analysis of these countries; therefore, the analysis and main conclusions were reproduced through the Green Recovery Tracker, E3G, and the Wuppertal Institute (2021).

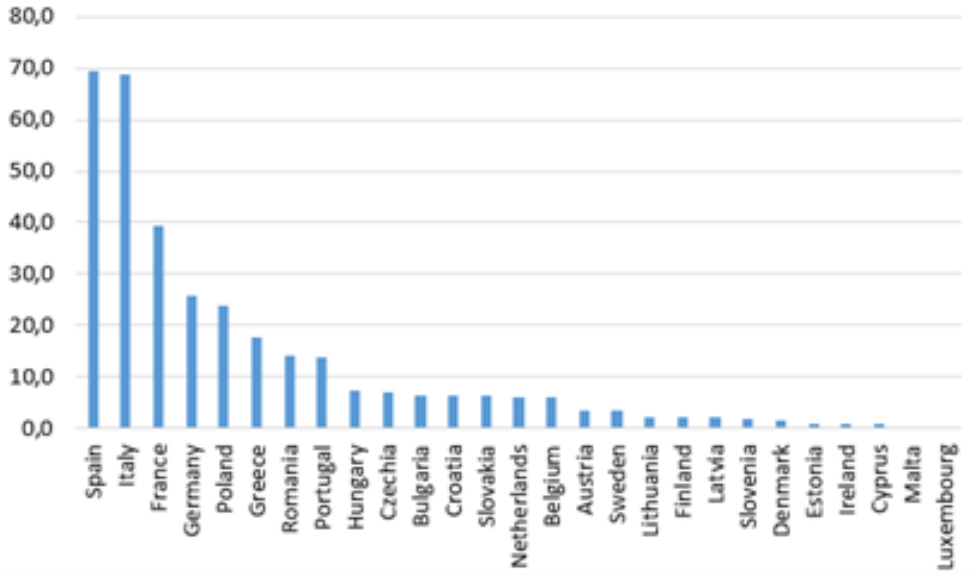
- France: Vocational training to support the ecological transition. France reinforces training for the "strategic professions of tomorrow" in line with strategic sectors (digitalization, environmental change, industrial sectors concerned with economic sovereignty, and relocation of productions) and in line with priorities of the Recovery Plan. The training activities in the sectors considered strategic, are financed with 25 million euros.
- Germany: Recovery Plan does not include measures to support the fossil fuel industry, even though major German manufacturers strongly support the opposite. There are some exceptions for gasoline engines and new aircraft purchases.
- Portugal: Investments in nature-based solutions. Portugal's Resilience and Recovery Plan includes investments of 665 million euros in forest management and cultivation. The Ministry of Environment and Climate will implement this measure, which is presented as an essential resilience measure for rural territories, combining climate change mitigation and long-term resilience. The 2030 Investment Plan contains an additional 300 million euros for the protection of maritime biodiversity.
- Spain: Economic recovery and regional development link. The Spanish government emphasizes the support for less developed regions of the country through recovery measures aligned with territorial policies aimed to create more jobs and develop new economic activities in these regions.

Figure 2. Description.



Spurce: Own Elaboration (based on Green Recovery Tracker, E3G, and Wuppertal Institute, 2021).

Figure 3. Comparative View of Investments in Green Jobs. Recovery and Resilience Plan 2021–2023 Billion Euros, Current Prices

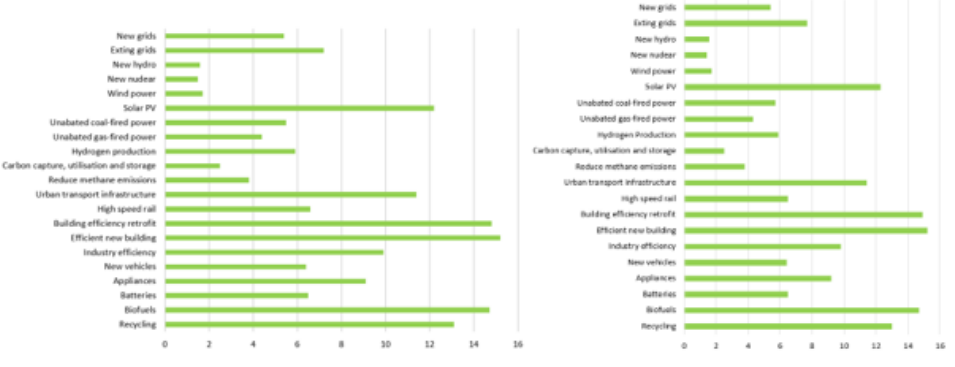


Source: Own Elaboration (based on Spanish Recovery Plan, 2021).

5.1.4 Green Jobs to be Created in Spain

Using the data provided by the International Energy Agency (IEA) and the International Monetary Fund in the World Energy Outlook (2016), this analysis estimates the new green jobs that the Spanish Recovery Plan could create. This analysis is focused on the green initiatives of the below programs (see Figure 4, Table 5).

Figure 4. Green Jobs Generated per Million Euros Invested.



Source: Own Elaboration (based on IEA and World Energy Outlook).

Table 5. Investments in the Recovery Plan.

The 20 Programs Driving Investment	€Bn 2021-23	New Green jobs/ 1M Investment	New Green Jobs Created
1. Safe, Sustainable, and Connected Mobility Strategy	13.2	9	118,800
2. Housing Rehabilitation and Urban Renewal Program	6.82	15.2	103,664
6. New Spain 2030 Industrial Policy and Circular Economy Strategy	3.78	9.9	37,422
9. Science, Technology, and Innovation	3.38	8	27,040
10. Implementation and Integration of Renewable Energies	3.16	6.95	21,962
13. Preservation of Coastal Areas and Water Resources	2.09	8	16,720
16. Conservation and Restoration of Ecosystems and Biodiversity	1.64	8	13,120
17. Renewable Hydrogen Roadmap	1.55	5.9	9,145
18. Electrical Infrastructure, Smart Networks, and Storage	1.36	6.35	8,636
Total Green Initiatives	36.98		356,509

Source: Own Elaboration (based on IEA, 2016; Spain's Recovery Plan, 2021).

A first approximation with the aforementioned methodology, and assuming the level of investment per program together with the corresponding multiplier, the final estimate is about 356,000 new green jobs for the period of 2021-2023. This first approach should be put in context as the next step approves the green projects, giving them an opportunity to be implemented and achieve the intended outcome.

5.2 Microeconomic View

5.2.1 Green Jobs and Skills

The main sources of data and analysis as the following tables indicate. After the individual classification of the most relevant competencies by country, this study has developed a simple comparative analysis to detect which competencies Spain is ranked poorer than average (Table 6).

Table 6. Comparative View of Green Jobs.

	Basic Skills (Content)	Basic Skills (Content)					
		Reading Comprehension	Active Listening	Writing	Speaking	Mathematics Skills	Science
Country							
France	0,167	0,173	0,167	0,182	0,22	0,109	0,153
Germany	0,259	0,32	0,279	0,3	0,263	0,235	0,156
Italy	0,375	0,487	0,377	0,452	0,37	0,29	0,274
Spain	0,342	0,475	0,335	0,433	0,364	0,269	0,175

	Basic Skills (Process)	Basic Skills (Process)			
		Critical Thinking	Active Learning	Learning Strategies	Monitoring
Country					
France	0,211	0,166	0,189	0,308	0,181
Germany	0,228	0,255	0,268	0,223	0,165
Italy	0,311	0,373	0,349	0,275	0,248
Spain	0,307	0,332	0,328	0,335	0,234

	Complex Problem Solving Skills	Complex Problem Solving Skills	Social Skills	Social Skills					
		Complex Problem Solving		Social Perceptiveness	Coordination	Persuasion	Negotiation	Instructing	Service Orientation
Country									
France	0,094	0,094	0,158	0,152	0,19	0,1	0,129	0,259	0,116
Germany	0,244	0,244	0,228	0,225	0,117	0,341	0,293	0,219	0,175
Italy	0,341	0,341	0,19	0,209	0,138	0,222	0,208	0,28	0,082
Spain	0,256	0,256	0,187	0,197	0,166	0,177	0,169	0,28	0,133

	Technical Skills	Technical Skills									
		Operations Analysis	Technology Design	Equipment Selection	Installation	Programming	Operation Monitoring	Operation and Control	Equipment Maintenance	Troubleshooting	Repairing	Quality Control Analysis
Country												
France	-0,016	0,058	0,014	-0,027	-0,007	-0,049	0,006	-0,052	-0,062	-0,01	-0,042	-0,003
Germany	-0,034	0,242	0,103	-0,052	0,024	0,095	-0,167	-0,236	-0,123	-0,101	-0,079	-0,077
Italy	0,094	0,295	0,122	0,045	0,018	0,155	0,089	-0,001	0,046	0,067	0,069	0,125
Spain	0,027	0,169	0,074	0,007	0,07	0,1	-0,034	-0,081	-0,018	-0,006	0,014	0,002

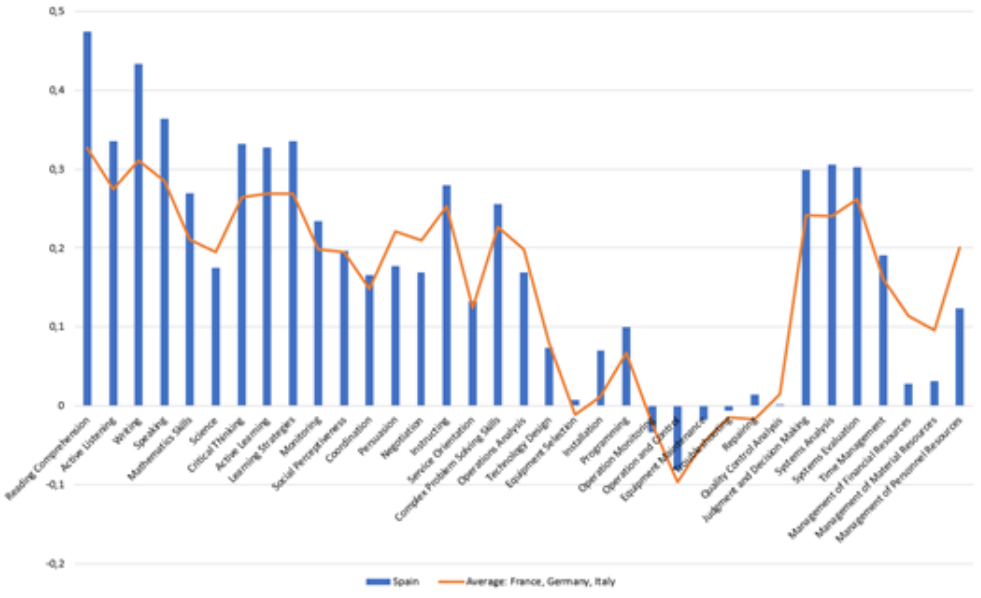
	Systems Skills	Systems Skills			Resource Management Skills	Resource Management Skills			
		Judgment and Decision Making	Systems Analysis	Systems Evaluation		Time Management	Management of Financial Resources	Management of Material Resources	Management of Personnel Resources
Country									
France	0,133	0,143	0,118	0,139	0,169	0,17	0,124	0,144	0,238
Germany	0,263	0,247	0,25	0,291	0,1	0,089	0,104	0,062	0,145
Italy	0,348	0,335	0,353	0,355	0,159	0,222	0,113	0,082	0,219
Spain	0,302	0,299	0,306	0,302	0,093	0,191	0,028	0,031	0,124

Source: Own Elaboration (based on OECD, 2018).

5.2.2 Harmonization and Unit of Measurement Used

According to the methodology used by the OECD (2011) to classify the different skills by country, the results compared between Spain and the average scores of Germany, France, and Italy are shown on a scale ranging from -1 to 1. According to the OECD, "Positive values indicate skill shortages, while negative values suggest skill surpluses. The higher the absolute value, the more significant the imbalance. The maximum value reflects the greatest shortages observed in all OECD countries (2011) and in skills dimensions" (see Figure 5).

Figure 5. Description.



Source: Own Elaboration (based on OECD, 2018).

According to the analysis and that provided by the OECD Skills Stats, Table 7 shows those skills to be improved in Spain for general adaptation and for green jobs.

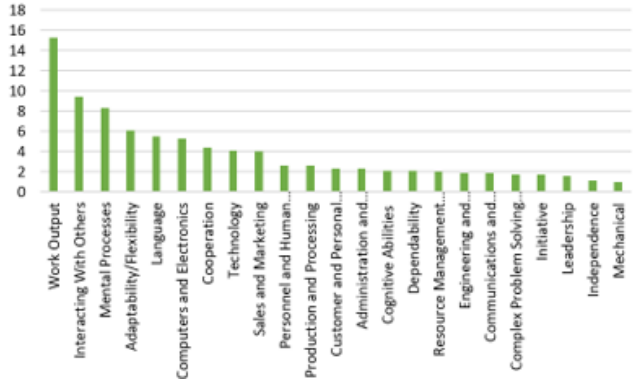
Table 7. Soft Skills to Improve in Spain.

Soft Skills to improve to Spain	Improve
Reading Comprehension	-
Active Listening	-
Writing	-
Speaking	-
Mathematics Skills	-
Science	+
Critical Thinking	-
Active Learning	-
Learning Strategies	-
Monitoring	-
Social Perceptiveness	-
Coordination	-
Persuasion	+
Negotiation	+
Instructing	-
Service Orientation	-
Complex Problem-Solving	-
Operations Analysis	+
Technology Design	-
Equipment Selection	-
Installation	-
Programming	-
Operation and Control	-
Equipment Maintenance	+
Troubleshooting	+
Repairing	+
Judgment and Decision Making	-
Systems Analysis	-
Systems Evaluation	-
Time Management	-
Management of financial resources	+
Management of material resources	+
Management of personnel resources	+

Source: Own Elaboration (based on OECD data [55]).

Cedefop Europa (2018) offers another view of the necessary capabilities, which classified them in a more detailed and visual way. Both approaches provide an outline of the most required competencies, first in Spain, and secondly throughout Europe.

Figure 6. Percentage Share of the Most Important Number of Mentioned Skills; (a) xxx; (b) xxx.



% share on total number of skill mention	
Work Output	15,3
Interacting With Others	9,4
Mental Processes	8,3
Adaptability/Flexibility	6,1
Language	5,5
Computers and Electronics	5,3
Cooperation	4,4
Technology	4,1
Sales and Marketing	4,0
Personnel and Human Resources	2,6
Production and Processing	2,6
Customer and Personal Service	2,3
Administration and Management	2,3
Cognitive Abilities	2,1
Dependability	2,1
Resource Management Skills	2,0
Engineering and Technology	1,9
Communications and Media	1,9
Complex Problem Solving Skills	1,7
Initiative	1,7
Leadership	1,6
Independence	1,1
Mechanical	1,0

Source: Own Elaboration (based on data from Cedefop. Europe, 2018).

6. Conclusions

This article contributes to the understanding and impact of the European Recovery and Resilience Funds on the green industry and, in particular, on green jobs created (direct and indirect) due to the implementation of said program. Additionally, this study highlights the need to update workers' skills to execute these new green jobs that require a more qualified workforce.

The first research question asked—how many estimated new green jobs would be created as a result of the implementation of the Spanish Recovery Plan—obtained an estimated number of 350,000 green jobs, exceeding the initial expectations planned by policy makers. This figure will be achieved in a relatively short period (2021-2023) and only includes the Transformation and Resilience Plan presented by Spain and approved by the EU in June 2021. Therefore, only the plan's lines of action with sustainability projects will be included and the creation of green jobs has been considered.

Following the launch of the European Green Deal (EGD) and the temporary halt/slowdown of economic activity due to the pandemic, and therefore the EGD, the launch of the Recovery and Resilience Fund led to an injection of special funds that will further relaunch the initial EGD in all EU member countries.

This study made a brief comparison of several countries and their green policies, highlighting the differences in investments and green and non-green projects at the country level. A future line of research is to compare all EU member countries in terms of their recovery plans' evolutions, their green policies, and their effects on creating new green jobs. This research project would add value with a comprehensive and country-specific vision, providing interested economies with an understanding of improved practices and success stories from other countries.

As an area of improvement for this study, being conducted using a diverse range of secondary sources and other means of research (critical and comparative analysis, inductive and deductive reasoning, and mathematical calculations) although based on Leontief's input output model, it has been applied indirectly through surveys and disaggregated data, albeit from other countries, a subsequent study will use primary sources for more satisfactory adjustment at national and sectoral levels within the green sector. Additionally, the novelty of the Recovery Plan means that empirical data on the performance of different projects is not yet available. This novelty is noted especially in the lack of literature on the subject. Once countries begin to implement their respective recovery plans, more information will be published for deeper and more accurate research.

The second research question—what new interpersonal skills or retraining would be necessary to develop new green jobs under the Spanish Plan—discovered interesting points. This question found the great diversity of different general work skills, as noted by international organizations. However, after a general comparison between Spain and other countries, the competency profile of Spanish workers is below the OECD average in basic cognitive skills, complex problem solving, critical thinking, or innovative capacity. While this study identifies the lack of general interpersonal skills, policymakers, businesses, and workers should have a clear profile of the green skills needed for the thousands of expected new jobs to be created.oki

Finally, this study considers the challenges of making a plan that contains multiple lines of implementation, a reality. The risks associated with the rapid and constant change that occur in respective green projects of the Recovery Plan that significantly affect the impact on green jobs and compel the need to incorporate alternative contingency and management plans also contribute to the challenge. Additionally, these predictions were made at the European Union level, where neo-Keynesian approaches to sustainable green growth prevailed; however, the dominant thinking currently is post-Keynesian, regarding decrease (reduction of the standard of living, to move to a reproductive level—not developmental—prioritizing the environment and the public sector).

Future research lines will address the implementation of the recovery funds and the execution of green jobs, as a green financial bubble, larger than that of the Great Recession of 2008, appears to be forming.

Author Contributions

Antonio Sánchez Bayón: Conceptualization, Investigation, Formal analysis, Methodology, Supervision, Validation. Martín García Vaquero: Conceptualization, Investigation, Formal analysis, Methodology, Supervision, Validation. Francisco J. Sastre Segovia: Conceptualization, Investigation, Formal analysis, Methodology, Supervision, Validation, Writing – review of the English version. Anika Mazier: Writing – review of the English version, Editing and processing tables, Supervision, Validation.

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