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# GO GREEN IN A GREENER WORLD

## State of the Art in EU&LATAM

Ser sostenible en un mundo más verde; Estado del Arte en EU&LATAM

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**KEYWORDS**

*Green Deal*
*Climate Change*
*Digital Economy*
*Digitalization*
*Green Skills*
*Europe*
*Latin America*

**ABSTRACT**

*The global economy is going through a period of drastic changes. One of the main initiatives is the Green Deal, seeking a modern, resource-efficient competitive economy by 2050.*
*However, transformation implies collaboration by all, not just in Europe but globally. Educate future generations from an ecological perspective, re-qualifying employees within sectors prone to change and modifying or eliminating some jobs in "brown" sectors are some of the causes and consequences of change.*
*Higher Education institutions (HEIs) will be required globally, to provide solutions to the market, providing new professionals able to tackle the New Green Challenge.*

**PALABRAS CLAVE**

*Green Deal*
*Cambio Climático*
*Economía Digital*
*Digitalización*
*Competencias Verdes*
*Europa*
*América Latina*

**RESUMEN**

*La economía mundial atraviesa un periodo de cambios drásticos. En este contexto el "Green Deal" busca una economía competitiva y eficiente para 2050.*
*Sin embargo, la transformación implica la colaboración de todos, no sólo en Europa sino a nivel mundial. Educar a las futuras generaciones desde una perspectiva ecológica, recualificar a los empleados de los sectores propensos al cambio y modificar o eliminar algunos puestos de trabajo en sectores "marrones" son algunas de las causas y consecuencias del cambio.*
*Las instituciones de educación superior (IES) debe dar soluciones al mercado, proporcionando nuevos profesionales capaces de afrontar el Nuevo Reto Verde.*

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## 1. Introduction

The global economy is undergoing drastic changes due to the Pandemic (Cárdenas & Guzmán, 2020). Major international initiatives by multilateral organizations, such as the European Green Deal (European Commission, 2019) promote all stakeholders governing today's Society towards a sustainable and green transformation (Netto & Menengola, 2021). The European Green Pact seeks a modern, resource-efficient, and competitive economy with no net greenhouse gas emissions by 2050 and economic growth is decoupled from resource use (Vaquero et al., 2021). However, transformation implies a great deal of collaboration by all. This extraordinary project must be approached as a systematic problem, in which a tremendous global and social awareness is needed where each of the sectors involved (directly or indirectly) must act with the same objective: sustainability (Cecere & Mazzanti, 2017). Educating future generations from an ecological perspective, highlighting the importance of sustainability within the business model, re-qualifying employees within sectors prone to change, modifying or eliminating some jobs in "brown" sectors and consequently generating employment in much greener sectors, adapting large companies to phase out the use of fossil fuels and other non-renewable energies are some of the causes and consequences of change (Heong et al., 2016; Lobsiger & Rutzer, 2021). It is undoubtedly a long-term project, but the green transformation has already begun: The transformation of the economic model to a greener model is increasing the pace of change in the labor market (Kamis et al., 2018). The green industry has created some entirely new green jobs (e.g., energy auditor) and has "greened" existing industries (Sharpe & Martinez-Fernandez, 2021; Song & Xie, 2020).

For example, engineers in the automotive industry need green skills to work with energy-efficient technologies; an architect needs green skills to integrate natural elements into building design. The change in competencies requirements is widespread and requires a significant effort to revise education and training programs (Pavlova, 2018). Consequently, in our opinion, Higher Education institutions (HEIs) will be required to provide solutions to the market, providing new young professionals able to tackle the New Green Challenge. HEIs not just in Europe, in all the Regions should include "green" new elements in their curricula; students should be exposed to green technologies during training (Heong et al., 2016; Song & Xie, 2020; Taverner et al., 2021). Furthermore, adapting to global change and achieving a green economy will require a range of new skills, including new job competencies, learning modes, management approaches, and research efforts (Vaquero et al., 2021). Consequently, HEIs must be upgraded to meet the educational needs for sustainability work better; managers must be trained to better identify and respond to global environmental change; research must be encouraged to address the sustainability challenge (Ramli et al., 2020; Ramsarup & Ward, 2017).

## 2. Green Economy, Industries, and Jobs

However, what exactly do we mean by the green economy, green industries, or green jobs? A green economy model can be considered an economic model for sustainable development, promoting advancement and sustainability in social, economic, and environmental terms (Del Vecchio et al., 2021; Heong et al., 2016). The United Nations Environment Programme (UNEP) defines the Green Economy as a socially inclusive, low-carbon, and energy-efficient economic model that significantly reduces environmental risks and improves social welfare (Savchenko & Borodina, 2020). In addition, the green economy, supported by public and private investment, will bring about employment and income growth while reducing pollution, improving energy and resource efficiency, and promoting biodiversity and ecosystem conservation(Netto & Menengola, 2021; Sharpe & Martinez-Fernandez, 2021).

Finally, the United Nations Conference on Trade and Development (UNCTAD) defines the green economy as improving human wellbeing and reducing inequalities while not exposing future generations to significant environmental risks and ecological scarcity. It seeks to bring long-term social benefits to short-term activities to mitigate environmental risks. A green economy is an enabling component of the overall goal of sustainable development (Took Gee et al., 2017). The green economy has been defined differently by different bodies. However, two elements are mentioned in all these definitions: "nature conservation and environmental protection" and "improvement of human wellbeing and social development." The green economy can be conceptualized as an economic model that emphasizes nature conservation and environmental protection and improves human welfare and sustainable social development (Del Vecchio et al., 2021; Pavlović, 2016; Vaquero et al., 2021). On the other hand, green jobs can be defined as those sectors and skilled labor that produce goods or services that help protect the environment and natural resources and develop new technologies and processes that could halt or reverse the effects of climate change. (Vaquero et al., M. G., 2021). The International Labour Organization (ILO) complements this definition, considering them as: "decent jobs that contribute to preserving or restoring the environment, whether in traditional sectors such as manufacturing and construction or new emerging green sectors such as renewable energy and energy efficiency" (Cecere & Mazzanti, 2017; Vaquero et al., 2021). However, the European Green Deal and other significant initiatives focus not only on Europe. The transition is an opportunity to expand sustainable and employment-intensive economic activity. As a mother of fact, Global markets have significant potential for low-emission technologies and sustainable products and services (Cedefop, 2021a). Moreover,

countries and regions like China, Thailand, and Latin America are major players in this large project. Specifically, Latin America, where young people from Latin America will play an essential role in contributing to the country's transition towards sustainable societies and economies (UNIDO, OECD, CAF, 2012).

Moreover, Latin America has been particularly affected by the Pandemic:

1. Regarding the ten countries with the highest number of Covid-19 cases to date, five are in Latin America ((OIT) & (BID), 2020; Technical & America, 2021).
2. In the case of deaths per million inhabitants, four countries in the global top 10 are from the region (Bogliaccini & Madariaga, 2020).
3. More surprisingly, the region accounts for only 8.4% of the world's population, but 30% of all Covid-19 deaths to date (half of those deaths in Brazil alone) (Cárdenas & Guzmán, 2020).

Under those circumstances, Latin América, in addition to having a precarious economy, has been the geographical area hardest hit by the Pandemic, highlighting the need for an immediate action plan. With the implementation of these international initiatives, economies with more difficulties in prospering will reshape their economies towards a fairer and more sustainable path.

## 2.1. Europe and the European Green Deal

Understanding what the European Green Deal (EGD) is all about must be put into historical context. The Green New Deal movement emerged in 2007 in the United States, although the term has appeared in political and economic debates since the 1970s. It was propelled into the US debate in 2007 when New York Times columnist Thomas Friedman claimed that the candidate capable of presenting ambitious energy and the environmental program would have a clear advantage in the 2008 US presidential race. The writer called the Green New Deal (GND), referencing the US New Deal, featured many industrial programs and projects to revitalize America between 1933 and 1937 under President Franklin Delano Roosevelt (Netto & Menengola, 2021).

Therefore, Friedman's idea was to link industrial and economic development with clean energy, thus stimulating sustainable growth. Ricardo Mastini calls the projects GND 1.0 (2009) and GND 2.0 (2019), pointing out that their differences are evident (Mastini et al., 2021). The 2009 project set out top-down proposals to restore the economy after the 2008 financial crisis, while the more recent one is seen as part of popular movement-building in the context of struggles for environmental justice (Netto & Menengola, 2021). The European Green Deal (EGD), presented by the European Commission on December 11th, 2019, is an ambitious agreement that aims to make Europe carbon-free by 2050 while maintaining its economic competitiveness. The aim is to reduce greenhouse gas emissions by at least 55% by 2030, considering 1990 emissions, and make the continent carbon neutral by 2050 (European Commission, 2019).

To implement a sustainable economic model, the digitalization of the economy is one of the pillars of the EGD. European institutions have been looking for technological alternatives that can be used to make the digital economy more energy-efficient, meeting carbon emission reduction targets (Mastini et al., 2021; Vaquero et al., 2021). The digital and ecological transitions reshaping European economies and labor markets and the transformative and uncertain impact of the Covid-19 Pandemic are the starting points for building future scenarios by CEDEFOP (European Centre for the Development of Vocational Education and Training), considering that this transformation implies the modification or elimination of millions of jobs and the implementation and necessity of many others. The existence of "winners" and "losers" sectors is evident, with sectors directly linked to sustainability and climate change being the most affected (Cedefop, 2021b):

1. Public services (health and social care, education), business services, transport, communications and distribution and retailing, and a general increase in technology and R&D intensive activities will be the main drivers of the shift towards a sustainable economy.
2. At the same time, it was expected that high-skill occupations would be the most difficult to recruit in 2030, as automation contributes to rendering the skills of today's high-skilled workers obsolete (Cedefop, 2021).
3. The decline in employment in manufacturing is expected to accelerate. The same is true for agriculture, forestry, and fishing. Lower job creation in wholesale and retail and in transport and warehousing drives the projected employment decline in distribution and transport, which also reflects the effect of the Pandemic on the acceleration of work automation (Cedefop, 2021).
4. On the other hand, clean steel technologies will alleviate the baseline employment decline and require specific training to cope with technological changes. This creates additional employment growth by 2030 compared to the baseline scenario in the electronics sector.
5. In many other manufacturing sectors, employment changes are expected to be minor, and dynamics are more likely to reflect inter-sectoral job-to-job mobility and upgrading or reskilling needs rather than employment flow between sectors (Sharpe & Martinez-Fernandez, 2021).

6. Employment in low-skilled occupations is expected to decline, demonstrating that the Pandemic is likely to disproportionately affect the labor force's least skilled and most disadvantaged sectors (Cedefop, 2021).
7. With the increased use of recycled materials, reduced use of virgin materials, increased repair activities, a collaborative economy, and investment in recycling facilities, employment is expected to increase by 52% by 2030. (Cedefop, 2021)
8. The continued shift from combustion engine cars to electric vehicles in the automotive sector will mostly reorient workers rather than reduce employment (Cedefop, 2021).
9. Small positive employment effects are expected in sectors with mainly indirect EGD implications, such as legal, accounting, and consultancy activities. However, they can point to important priorities for reskilling and upskilling (Cabral & Dhar, 2021).

In short, the more polluting activities will be negatively affected, while the more sustainable ones are likely to increase. Some sectors cannot be considered "winners or "losers." They will have to adapt to new market trends and needs. Achieving the GFD targets will change the levels and structure of sectoral employment. As the new green paradigm demands new approaches to production, design, development, and use of materials, products, and services, intra- and inter-sectoral changes in labor demand will be accompanied by changes in occupational and skills demand. The occupational changes implied by the green transition create a significant demand for training and apprenticeships.

HEIs and other advanced training methods hold the key to successful future development, in which the need for specific skills and competencies indispensable for any future business is instilled and taught (Kamis et al., 2018).

Universities will be able to solve real environmental/green problems experienced by industries, while companies can adequately and accurately solve environmental/green issues/problems (Del Vecchio et al., 2021).

## 2.2. Latin America and the Caribbean

Latin America has been possibly the geographical area most affected by the Pandemic. As mentioned above, four of the ten countries with the highest number of deaths per million inhabitants due to COVID-19 are from the region. IMF estimations suggest that Latin America and the Caribbean will be the hardest hit region globally, with a GDP contraction of 9.4% in 2020. On average, advanced economies will contract by 8.0 percent in 2020, while emerging economies are expected to fall by only 3 percent (Cárdenas & Guzmán, 2020). Moreover, the situation is particularly serious in this area, where before the current recession, it was already suffering the lowest economic growth in the world. The World Bank (2020) forecasts a ten percentage point increase in poverty rates in the region due to the Pandemic ((OIT) & (BID), 2020). More than ever, there is an urgent need for a recovery plan that considers the Pandemic's consequences and transforms a weak and unsustainable economy into a much greener economic model. Currently, hundreds of data reflect the vulnerability of Latin America and the Caribbean (Cárdenas & Guzmán, 2020). Recovery packages have already been implemented in areas where the Pandemic has weakened, such as the European Union, which focuses not only on rebuilding but on building back better, in the sense of seizing the opportunity to improve conditions relative to pre-pandemic levels (Vaquero et al., 2021). However, the relevant question is whether this type of green recovery is feasible in Latin America once the Pandemic recedes due to their characteristics and factors (Morea, 2021).

The lack of skilled labor in Latin America is one of the most critical impediments to achieving higher economic and social development levels, which is in stark contrast to the common European situation ((OIT) & (BID), 2020; Kamis et al., 2018). In Latin America, there is a significant gap in the understanding of the policies underlying successful skills formation policies (Bogliaccini & Madariaga, 2020; Cárdenas & Guzmán, 2020), and this translates into a lack of skilled labor, the low quality of skills, and the mismatch between the supply of skills and the demand of the labor market.

These skills are acquired in standardized educational and training contexts and comprise specific and broad knowledge (Cabral & Dhar, 2021). Skills are valued in different ways in the labor market concerning their ability to be used in specific jobs and increase worker production ((OIT) & (BID), 2020). All this reflects a lack of quality mainly in the stock of skills of the labor force, which points directly to the government and its education policies, where private providers such as HEIs are the key to more (and better) training of competitive skills ((OIT) & (BID), 2020; Cárdenas et al., 2022).

Another unsolved question about the potential effectiveness of these recovery packages in Latin America is individual countries' capacity (social, political, and economic) to adapt to what a green economy needs and suggests (Technical & America, 2021). One of the three priority areas of the UNESCO Strategy for TVET (Technical and Vocational Education and Training) (2016-2021) is "facilitating the transition to green economies and sustainable societies."

To this end, UNESCO aims to promote the development of green skills and cross-sectoral approaches to facilitate the development of such skills. A key role must be played by young people, who number around 163

million people, about 25% of the total population (BID & DDPLAC, 2020). One-fifth of these 163 million young people work in informal jobs, and another almost 30 million young people are not in employment, education, or training (OECD, 2016). Part of the problem is weak TVET and school-to-work transition systems; around 50% of formal enterprises in Latin America cannot find the labor force with the skills they need, compared to 36% of firms in OECD countries (OECD, 2016).

Owing to that, Green jobs and green skills development are essential for the transition toward sustainable societies and economies and offer HEIs stakeholders in Latin America the possibility to develop relevant skills for the future labor market (Pavlova, 2018).

On the other hand, businesses also need to acquire new skills to cope with the impacts of climate change. Training can strengthen business management capacities to encourage the adoption of innovative and environmentally friendly technologies, human resource development, and productivity improvement (Adarina et al., 2020; Savchenko & Borodina, 2020; Taverner et al., 2021)

As a result, many Latin American member states have already begun to take steps to promote green growth: Costa Rica introduced a low-carbon agenda in 2009, intending to become carbon neutral by 2021, while the Mexican government has also taken steps to reform the energy sector to make the transition to clean energy. Chile is taking steps to implement its Green Growth Strategy, while Colombia implements a Low Carbon Development Strategy to promote growth in sectors that generate fewer GHG emissions (Cárdenas & Guzmán, 2020; Cárdenas et al., 2022).

However, which sectors are set to change the most, and which are set to grow the most? Undoubtedly, agriculture and forestry have enormous potential to create new jobs. Latin America and the Caribbean have 40% of the world's biodiversity, almost 50% of the world's tropical forests, and are one of the world's leading food exporters. Advances in this area would allow for ecosystem restoration, sustainable agriculture, and, in the long term, ecotourism, which could create millions of jobs (about 15 million) (BID & DDPLAC, 2020).

Today, decent work deficits, inequalities, and dependence on fossil fuel exports make Latin America and the Caribbean particularly susceptible to the social and economic impacts of the Pandemic. These same problems will make the region vulnerable to the impacts of climate change tomorrow (CEPAL & Adenauer, 2021). Thus, there is an urgent need to achieve minimal carbon emissions or decarbonize their economies (Cárdenas & Guzmán, 2020).

So, considering the above-explained framework, the critical question is how Latin American countries can transform themselves into a sustainable, fossil fuel-free economy?. Latin America and the Caribbean can achieve carbon-free prosperity through immediate and parallel actions around five pillars (BID & DDPLAC, 2020):

1. Phase-out fossil fuel-based electricity generation and replace it with carbon-free sources, such as wind and solar power;
2. Use electricity instead of fossil fuels for transport, cooking, and heating;
3. Increasing public and non-motorized transport;
4. Halting deforestation and planting trees, which will require shifting diets from animal to plant-based foods, and;
5. Reducing waste in all sectors, recycling materials, and switching to sustainable building materials like wood or bamboo.

With its rich resources and relatively low population pressure, the region is well placed to transition to net-zero energy. The cost of key technologies, such as renewable energy or electric vehicles, has fallen dramatically, to the extent that zero-carbon solutions are often cheaper than fossil fuel-based technologies. Measures are critical today due to the urgent need to recover the whole region from the pandemic consequences (Cepal & Adenauer, 2021; Lancet, 2021; Morea, 2021).

## 3. Green Skills

Developing a quality green skills stack will be fundamental to the growth of any economy (Pavlova, 2018). An informed and prepared society about the planet's priorities will build a sustainable and productive labor ecosystem. The transition to a much greener global economy requires the implementation and improvement of two fundamental aspects: the education of future generations about the importance of these competencies and skills and the education of the current workforce about the need to acquire these competencies.

Governments, employers, regional and local authorities, HEIs, VET providers, research institutions, and other actors jointly manage skills ecosystems. They must share in the design and implementation of policies to make the green transition smooth and inclusive and stay on track (Cabral & Dhar, 2021; Del Vecchio et al., 2021; Sharpe & Martinez-Fernandez, 2021).

It must be required that each country's government should incorporate green/environmental policies into the national education policy and the country's long-term strategic plan (Del Vecchio et al., 2021).

In addition to that, the governments should continuously implement the national policy and strategic plan by encouraging government agencies, vocational schools, universities, businesses, and NGOs to develop and deliver green/environmental management education/curriculum programs to produce graduates with appropriate qualifications for such businesses (Lobsiger & Rutzer, 2021).

Besides that, the government should encourage vocational schools and universities to equip their students with green skills to prepare for the industry in a real work context (Cecere & Mazzanti, 2017). And finally, to alleviate the problem of skills shortages in the labor market, the government should encourage companies, especially those in the private sector, to focus on upgrading and retraining their employees (Napathorn, 2021)

The importance of green skills is that several sources have referred to it as the Industrial 5.0 revolution (Taverner et al., 2021), where green skills are the foundation of a low-carbon, low-emission economy. Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all, the fourth sustainable development goal on the UN agenda is crucial for development. Achieving this goal involves a variety of practical projects and approaches in various educational areas. Therefore, green skills are critical to the new Industrial Revolution toward a low-carbon economy and innovation (Took Gee et al., 2017).

We have discussed green skills in the work and educational environment, but why are green skills so essential? Green competencies can control resource efficiency through smart grids to improve the quality of life and protect the economy (Cabral & Dhar, 2021). This is because green competencies can control resource efficiency through smart grids that will improve the quality of life and protect the economy resource efficiency through smart grids that will improve the quality of life and protect the economy of a country (Ramli et al., 2020).

Moreover, with the latest digital technology, the gap between rural and urban can be reduced and avoid improving the quality of life and protecting a country's economy (Heong et al., 2016). With the help of IoT, blockchain and VR can detect the quality of the living environment, especially in the areas, and the quality of water and types of solid waste for recycling processes (Ramli et al., 2020).

Achieving the Green Deal's expected outcomes will require a new kind of skills or also a new type of Green Talent. In China, for example, they already talk about "green talent", which refers to "the combination of manpower development and environmentally sustainable development" (Song & Xie, 2020), considering green skills indispensable as a large increase in the green workforce supports economic growth (Cabral & Dhar, 2021)

Considering all the arguments, perspectives, and facts detailed in our analysis, it is clear that Green skills and talent are likely essential for economic development. Therefore, we need to find out which green skills are essential.

Today, the most sought-after green skills for different industries are not strictly focused on environmental preservation: design, communication, waste management, energy, urban planning, management, leadership, administration, finance, or procurement are critical skills today and tomorrow.

Therefore, higher education institutions should play a more significant role in training graduates with green skills to meet the needs of the green industry and industry in general.



## 4. Conclusions

Therefore, what we propose in our analysis is how Latin America can join the European effort to develop a change in the production model. Moreover, for this change to have the most favorable effect, it must be accompanied by a retraining strategy for those workers who belong to the more traditional sectors of the economy, which could be left aside if they are not retrained to adapt to the new models of a sustainable economy.

Throughout this analysis, we have been able to witness how the Latin American economy has been seriously affected by the Pandemic and how its productive sectors remain, in many cases, far removed from the parameters of sustainability and the improvement and efficiency of natural resources.

Furthermore, we have shown the importance for both regions of the role of education as a facilitator of change and how Higher Education Institutions are called upon to play a leading role in the process of change. Universities must take a proactive role in this process of redefining the production model in order to include in all their training programs the necessary competencies so that the future professionals that emerge from their respective institutions have acquired a set of green competencies that will enable them to successfully face the new professional models that will be generated as a result of the change in the production model.

However, in addition to this upskilling strategy, it is equally, if not more, important that the training strategies allow for the reskilling of those professionals coming from highly polluting industrial sectors who may be left out of the labor market if their professional skills are not adapted in order to join forces in the shared challenge not only for Latin America and Europe but for the world's population as a whole.

We therefore wish to emphasise that the change of model must involve prioritising and empowering Higher Education Institutions in both Regions. And that they have the potential to enact institutional and organisational change and thus drive a regional transition to sustainability through the channels of teaching, research and outreach.

But these institutions alone could not do so without a confluence of interests with their most important stakeholder: the faculty. Universities do their work thanks to their teaching staff, who define their programmes, manage them and are primarily responsible for the quality of the education they provide.

Therefore, the changes proposed by the Green Revolution, in this area, depend to a large extent on the upward motivation of each of the members of the teaching staff and the downward consolidation of the university management as priority agents of this change.

And all of this, in our opinion, because universities are vital actors in achieving the challenge of sustainability in all countries, and even more so in the case of Latin America, where Society is increasingly expected to play an active leadership role in all aspects of the transition towards sustainability.

Universities are also key actors in implementing innovation systems where knowledge gaps can be relevant and are addressed through teaching, research and dissemination.

It is fully supported that they are relevant for any regional development, and they will play a crucial role in implementing the reform of the production model brought about by the Green Deal at a global level.

They will do so by providing knowledge to companies that intend to transition their production models towards progressively more sustainable models, involving communities and different grassroots organisations in a transition path, defining an appropriate framework for each country or region by linking directly with international networks for improving sustainability, and providing expert advice to governments when considering the necessary regulatory changes.

They are therefore uniquely positioned to identify and build on identified best practices and promote an inclusive CE agenda. They will therefore be able to integrate the different worldviews of local informal knowledge with global practices of improving the state-of-the-art production model to provide an adequate framework for sustainability in their respective environments of action and influence.

This green skills agenda must be defined in coordination with the private sector, whose representatives must integrate their proposals on the profiles that their companies need to tackle this change in the production model and, together with the universities and the VETs, determine and identify in detail the set of skills required to design these new profiles.

Because the Green Deal, not only at European or Latin American level, does not imply the generation of a certain number of new professional profiles, but rather that each and every university and vocational training programme should incorporate the acquisition of a series of these sustainable skills, so that all types of profiles, regardless of their speciality, assume, as has been done in the case of digital skills, the need and importance of assuming as their own the basic principles of a new model of economic and social, inclusive and sustainable development.

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