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Article

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ORIGINAL ARTICLE

Open Access



Going green: estimating the potential of green jobs in Argentina

Pablo de la Vega^{1*} , Natalia Porto¹ and Manuela Cerimelo¹

Abstract

This paper aims to identify and characterize the potential of green jobs in Argentina, i.e., those workers that would benefit from a transition to a green economy, using occupational green potential scores calculated in US O*NET data for the period 2015–2021. We apply the greenness scores to Argentine household survey data and estimate that between 23 and 25 percent of workers are in green jobs, i.e., have a high green potential. However, to promote and ensure an inclusive and effective green transition, we consider the decent work dimension (through legal informality measures), and find that between 11 and 12 percent of wage earners are in green formal jobs. We then analyze the relationship between the green job indicators and various labor and demographic variables at the individual level. We find that the green potential is relatively greater for men, the elderly, those with very high qualifications, and those in specific sectors such as construction, transportation, mining, and industry. These are the groups that are likely to be the most benefited by the greening of the Argentine economy. The green potential score is positively associated with informality, thus the green transition may be incompatible with decent work.

Keywords Labor markets, Green jobs, Argentina

JEL Classification E20, Q50, J80

1 Introduction

Human-induced climate change is probably the most serious problem that humankind is facing (IPCC 2021, 2022). Because of the threat to climate stability, biodiversity, and economic development, there has been a great deal of academic and political interest in designing policies towards green transition and sustainable development. According to Dierdorff et al. (2009), a ‘green economy’ involves those economic activities that focus specifically on reducing pollution. For instance, activities that directly or indirectly use less fossil fuels or reduce greenhouse gas emissions, as well as activities that promote energy efficiency or recycling materials, would be embodied in the green economy. In addition to reducing

environmental risks, the United Nations Environment Programme adds that a ‘green economy’ should also have a positive impact on welfare and social equity.¹ Similarly, the International Labour Organization’s (ILO) Green Jobs initiative highlights that the creation of decent work in the new green activities and the implementation of social protection policies to mitigate the effects on the sectors that need transforming are key to ensuring this inclusiveness of the transition to greener economies.²

There is broad consensus that the “green transition” will generate both environmental benefits and new opportunities for economic development in the long run (Consoli et al. 2016). For instance, Wallach (2022)

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predicts that the transition to greener forms of energy will create more than 10 million new jobs worldwide by 2030, a forecast that exceeds the number of jobs expected to be lost in most polluting sectors, such as fossil fuels. In fact, the shift to hiring more green jobs is already underway worldwide. As noted by Kimbrough (2021), due to the result of governments and companies committing to their climate and sustainability goals, the demand for green skills has been steadily increasing since 2017. For Latin America and the Caribbean, Saget et al. (2020) argue that cleaner forms of production, such as decarbonization, have the potential to generate 15 million net jobs by 2030.

Acknowledging the above, several countries have been developing strategies to foster the implementation of green technologies, the creation of sustainable industries, the reduction in current pollution levels, among other goals.³ In particular, Argentina has been making efforts to implement environmentally friendly policies. The country has launched several programs that seek to promote renewable energy sources (like RenovAr and Probiomasa programs⁴) and has included goals of sustainable transition to greener economies in the productive, industrial and technological development plan for 2030 (in Spanish, Plan Argentina Productiva 2030).⁵ Additionally, since Argentina is part of the United Nations Framework Convention on Climate Change, it has established several National Determined Contributions which intend to contribute to the goals of the Paris Agreement.

Despite the consensus over the expected long-term benefit of the green transition, in many countries it would take time to transform their economies into greener ones because changes in the production methods and in the workforce skills could be necessary. As a result, in the short or medium run, the cost of adopting greener policies or activities could increase considerably for some sectors, and frictions in the labor market may emerge. This results in winners and losers in terms of employment, as this transition would probably change the allocation of workers across occupations and sectors. Like in many other labor market transformations, the burden costs will be higher for those workers who perform tasks and use skills that are less compatible with the new labor market conditions. Moreover, accelerating human capital accumulation is crucial, considering that the transition to

greener activities will be almost straightforward for those workers with higher skills (IMF 2022).

In consequence, it is crucial to identify which jobs are more or less compatible with the conditions imposed by the greening of an economy in order to manage the transition efficiently. When addressing the labor market implications of the green transition, Dierdorff et al. (2009) suggest that it is convenient to adopt an occupational approach and thus define green jobs as those affected by green activities and technologies. In particular, these green economy activities or technologies can increase the demand for existing occupations, shape the work and worker requirements needed for occupational performance, or generate new work and worker requirements. The extent to which the green activities can alter the labor market conditions is what Dierdorff et al. (2009) denote as the 'greening of occupations'. It is worth noting that non-green occupations are not necessarily 'dirty' or 'brown' but they are not affected by the greening of an economy. Dierdorff et al. (2009) review the literature and list 12 major green economy sectors where green occupations can be found (renewable energy generation, agriculture and forestry, recycling and waste management, among others). In that way, green occupations can be found in sectors that may be classified as 'dirty' based on, for example, definitions which use sectoral emissions.

In light of the above, this paper aims to characterize the potential of green jobs in Argentina, defined as the ability of an occupation to be able to perform green tasks (Lobsiger and Rutzer 2021). We identify which type of workers would win or lose as a consequence of the transition to a green economy, using occupational green potential scores calculated with US O*NET data for the period 2015–2021. While most of the previous analyses focused on developed economies, our paper is the first to apply an occupation-based approach with a greenness perspective in a developing country like Argentina. Once we identify green jobs as those individuals in high green potential occupations, following the ILO approach we study the interrelation with the 'decent work' (Jarvis et al. 2011) dimension using legal informality as a proxy. This dimension is crucial in countries like Argentina where informality is a structural feature linked to poverty and low-quality jobs in a context with a high share of informal employment (45% in 2023⁶). We do this in three steps. First, we analyze in a regression framework the relationship between green jobs and informality and other covariates to elucidate how informality affects the effective green transition of occupations. Second, we define green formal jobs as those workers in green but also formal jobs. Then, we also analyze in a regression framework

³ See initiatives from a perspective of the development and diffusion of technologies in advanced economies [here](#) and [here](#), and [here](#).

⁴ See the OIT et al. (2022) and López et al. (2022) report for a more detailed description of the programs and laws that Argentina has been carrying out with the aim of having a just transition.

⁵ This national strategy intends to develop green industries, adapt the existing ones to reduce their environmental impact, and create more than 2 million green jobs outside the metropolitan area of Ciudad de Buenos Aires. For more information see [here](#).

⁶ See [here](#).

the relationship between green formal jobs and several demographic and labor covariates to study who will be likely to benefit from the green and just transition.

Our results show that between 23 and 25 percent of workers are in green jobs, i.e., have a high green potential. However, when considering the informality dimension, we find that between 11 and 12 percent of wage earners are in green formal jobs. We also find that the groups that are likely to benefit most by the greening of the Argentine economy are those characterized by being men, elderly, and those in specific sectors such as construction, transportation, and mining. The most striking result is that informality is positively associated with the probability of being in a green job, which suggests that the green transition may be incompatible with decent work search.

The remainder of the paper is organized as follows. Section 2 reviews the literature. Section 3 presents the sources of information used. Section 4 deals with descriptive analyses. Finally, Sect. 5 presents the results and Sect. 6 concludes.

2 Literature review

This section provides an overview of the relevant literature that seeks to measure the green potential of jobs.⁷ Given the likely heterogeneous effects of the green transition on economies and on their labor markets in the short run, it is highly relevant to learn about which types of jobs and skills may be affected by this transformation.

According to the ILO Green Jobs Initiative, 'green jobs' refer to those that take place in economic activities that are more environmentally sustainable than the conventional alternative and which also offer working conditions that meet accepted standards of 'decent work' (Jarvis et al. 2011; van der Ree 2019). The concept of 'decent work' refers to the necessary conditions of an employment relationship to be carried out 'in conditions of freedom, equity, security and human dignity'. For work to be considered decent, workers must have: productive jobs with a fair wage, good working conditions, social protection, labor rights, equal opportunities between genders, and a say in decisions which will affect their lives (ILO 2013).⁸ Green jobs are thus both environmentally sound and 'decent' in social terms.

⁷ Another related strand of the literature has focused on evaluating the effects of environmental policies, which are supposed to ease the transition to greener economies, on various macroeconomic outcomes. See, for example, Hafstead and Williams (2018) for a more comprehensive discussion on the effects of these kinds of policies using computable general equilibrium models.

⁸ Eurofound (2012) develops an alternative approach to decent work that consists in measuring job quality based on extrinsic job features - 'earnings' and 'prospects', alongside a larger set of intrinsic characteristics of the job itself - 'intrinsic job quality' (work and its environment) and 'working time quality'. Contrary to the ILO framework of decent work, Eurofound (2012) made explicit choices regarding to the main aspects to prioritize and the set of indicators (mostly objective) to consider for each dimension, based on their impact on workers' well-being (Cazes et al. 2015).

However, the existing literature has not yet agreed on a widely accepted definition of what a green job is, and most importantly, on how to identify these types of jobs in practice. Indeed, the empirical literature has taken three main approaches to identify green jobs based on: (i) the industry affiliation; (ii) the production methods used; and (iii) the task content of occupation. Below, we briefly describe each approach and discuss the pros and cons. A more comprehensive explanation can be found, for example, in Martinez-Fernandez et al. (2010), Consoli et al. (2016), Bowen et al. (2018), and Vona (2021).

According to the industry affiliation approach, those sectors that produce goods and services that contribute to the protection of the environment or the conservation of natural resources are green sectors, and all employees working in that sector are considered green workers (Eurostat 2009; Yi 2014; Yi and Liu 2015). However, as pointed out by ILO (2018) and Esposito et al. (2017) this definition considers neither the jobs that eventually improve production processes with respect to their environmental impact nor the skills necessary to carry out environmentally friendly activities to achieve a sustainable economy. Besides, this approach is unable to identify green (brown) jobs in brown (green) industries. The second approach (the production method) consists in considering employees that actively participate in green processes, that is, those who are specialized in activities that seek the protection of the environment, such as recycling (of Commerce 2010). Nevertheless, Vona et al. (2019) noted that even though this method provides a precise identification of green jobs, it clearly omits those activities devoted to the whole re-design of products that are often carried out by specialized suppliers of machinery and engineering and architecture solutions.

Contrary to the approaches discussed above, the third method applies the task-based approach (Autor and Dorn 2013; Autor 2013; Acemoglu and Autor 2011) identifying green jobs according to the number of green tasks that a given occupation requires the worker to do. In particular, this strategy addresses the problem discussed when using the industry approach: much of the variation in the share of green employment is observed within rather than between industries (Vona et al. 2019). The key issue with this approach is to find appropriate data for the determination of green jobs and skills.⁹ Most of the studies exploiting this approach use the US Occupational Information Network (O*NET) data. The O*NET database contains not only detailed information on the task and skill content of occupations but also detailed text descriptions for a subset of tasks specific to each

⁹ In fact, for countries like Argentina, it is also difficult to find appropriate/available data for identifying green jobs using either the industry or the production approach.

occupation. Furthermore, the ‘Green Economy Program’ developed by O*NET details the work tasks of green jobs allowing researchers to understand the changes in occupation and skill requirements that may be triggered when a country transitions to a greener economy (Elliott et al. 2021).

Several studies have relied on the O*NET data to measure and characterize green employment in the US. Consoletti et al. (2016) classify occupations as either green or non-green and show that green occupations in the US require higher levels of cognitive and interpersonal skills, higher levels of education, greater work experience, and greater on-the-job training. A novel approach by Vona et al. (2018) computes a continuous greenness measure for each occupation. On this basis, they assess the importance of green skills in the US and find that green occupations have a higher technical skill requirement even though they note that the overall skills gap between green and brown occupations is relatively small. In addition, Vona et al. (2019) study the characteristics of green jobs between 2006 and 2014 and suggest that green occupations yield a wage premium in contrast to non-green jobs. While using O*NET’s broad definition of green jobs, Bowen et al. (2018) find that 19.4 percent of the US workforce is part of the green economy, although most green employment is ‘indirectly’ rather than ‘directly’ green, with only 13 percent of the total workforce using any specifically green tasks in their jobs.

Research on this topic using O*NET to target green jobs has also extended outside the US, where occupational level data availability is a limitation. Rutzer and Niggli (2020) predict the ‘green potential’ of International Standard Classification of Occupations (ISCO) occupations based on their corresponding skills using again O*NET information. They evaluate the distributional consequences of greening the economy in 19 European countries for the period 1992–2010, and find heterogeneous responses between countries and occupations. For instance, occupations with relatively high green potential, such as science or engineering, are expected to benefit from greening, while low green potential occupations, like elementary occupations or clerical support workers, could lose. Similarly, Lobsiger and Rutzer (2021) measure the green potential of occupations in Switzerland and estimate that 16.7 percent of employment is in occupations with high green potential. Moreover, these workers are, on average, younger, more often men, have a higher level of education and a higher probability of having immigrated than employed persons in occupations with low green potential. Valero et al. (2021) use occupational classifications from O*NET applied to individual-level survey data to quantify and describe green jobs in the UK and European Union. Their results reveal that the share

of green jobs ranges from 17 percent (Greece) to 22 percent (Germany), and they suggest that these kinds of jobs tend to be held by older, male workers, with higher educational level, and with permanent contracts. The main criticism that these studies have received is that the task content varies depending on the level of development and, therefore, it would not be advisable to extrapolate estimates based on the United States to other countries, particularly emerging ones (Dicarlo et al. 2016; LoBello et al. 2019).

Although several studies have estimated and described the share of green jobs in the economy, most of them are based solely on developed countries. Green jobs assessments in the developing world are scarce, since these countries do not usually have as much available data as the developed ones. To our knowledge, few studies have focused on Latin America and even fewer on Argentina. For Latin America and the Caribbean, Saget et al. (2020) study the possible impacts of an emissions reduction strategy on labor markets. The authors show that by 2030, structural changes in energy and food production and consumption patterns can eventually result in 15 million more net jobs in the region compared to a business-as-usual scenario. At the same time, they underline that many workers will have to update their skills to meet the demand of emerging sectors, and many firms will have to adopt new technologies and adapt to new ways of doing business. As part of the ILO’s Green Jobs initiative, Ernst et al. (2019) estimate the potential of green jobs in Argentina by sector and company and find that between 4 percent and 7 percent of jobs were green in 2015. In particular, most green jobs were in manufacturing, transport, the agriculture, livestock, forestry and fisheries sector, and water supply and waste management. However, in a recent report ILO estimates that 12 percent of formal salaried employment is green (and decent) in Argentina in 2022.¹⁰

3 Data sources and variable definition

To identify the potential of green jobs in Argentina we exploit various data sources. First, we rely on the Permanent Household Survey (PHS) microdata from the Instituto Nacional de Estadísticas y Censos (INDEC; in English, National Institute of Statistics and Censuses) of Argentina. The PHS consists of piled cross-sections that collect data from households with a continuous frequency and its geographic scope reaches 31 urban agglomerations (cities). In particular, to gain sample size, we use the PHS data from 2015q1 to 2021q3.¹¹ The final sample is restricted to those between 15 and 65 years old

¹⁰ See [here](#).

¹¹ After the presidential change in 2015, the publication of the PHS surveys from 2015q3 to 2016q1 were put under review and finally not published.

to avoid the influence of educational and retirement decisions on labor market participation.

Second, since there is no information on the task composition of occupations for Argentina, we estimate occupational greenness scores based on US data and then extrapolate it to the Argentine occupational structure. Specifically, we calculate the greenness scores proposed in Vona (2021) in the O*NET dataset at the Standard Occupational Classification (SOC) level, and then extrapolate them to the Argentine occupational classification to impute them to each person employed in the PHS. This procedure has already been applied in several papers (Rutzer and Niggli 2020; Lobsiger and Rutzer 2021; Elliott et al. 2021; Valero et al. 2021) and is common in the automation literature (Gasparini et al. 2020; Brambilla et al. 2021) and more recently in the teleworking literature (Albrieu et al. 2021; Foschiatti and Gasparini 2020; de la Vega 2021; de la Vega and Gasparini 2023). As stated in the previous section, these studies have been criticized because the task content varies depending on the level of development and, therefore, it would not be advisable to extrapolate estimates based on the United States to other countries, particularly emerging ones (Dicarlo et al. 2016; LoBello et al. 2019). However, we lack alternatives based on data availability.¹² The rest of this section explains how the greenness scores are calculated.

As explained in Vona (2021), O*NET identifies three groups of green occupations that will be affected by the greening of an economy: (i) occupations that are expected to experience an increase in demand (Green Increased Demand); (ii) occupations that will see major changes to the tasks content of work (Green Enhanced Skills); and (iii) occupations that did not exist before and that will be created (Green New and Emerging).¹³ For (ii) and (iii), O*NET also identifies green tasks within each occupation, but not for (i) because they may benefit only indirectly from the greening of an economy. In consequence, green jobs can be identified by using O*NET data in two ways: (i) a binary definition where an occupation is considered either green or non-green depending on whether it falls under any of the three categories mentioned above; (ii) a continuous definition of occupational greenness that exploits information on the greenness of the task content of occupations. Following Vona (2021), we calculate the greenness of an occupation j as follows:

$$greenness_j = \frac{\# \text{ green tasks}}{\# \text{ total tasks}} \quad (1)$$

which takes values greater than zero only for Green Enhanced Skills and Green New and Emerging occupations.¹⁴ As stated in Vona (2021), the greenness indicator can be considered as a proxy for the amount of time spent on green activities and technologies in the average job post within a certain occupation.¹⁵

In summary, we have two greenness indicators: (1) a binary definition where an occupation is considered either green or non-green (*green_occ*); and (2) a task-based indicator that considers the proportion of green tasks on total tasks within an occupation (*greenness*).

Once we have the greenness indicators at the 8-digit SOC level, the goal is to transfer them to the 2-digit ISCO classification (International Standard Classification of Occupations; the classification used in the Argentine Household Surveys). A crosswalk between the 6-digit level SOC and 4-digit ISCO classifications is provided by the US Bureau of Labor Statistics. Therefore, the first step consists in calculating the simple average of the greenness indicators at the 6-digit SOC.¹⁶ The most challenging procedure is the mapping of 6-digit SOC codes to 2-digit ISCO codes. Given the many-to-many mapping, taking a weighted average using the SOC's employment as weights would put disproportionate weight on those SOC's that map to a larger number of ISCO's.¹⁷ In consequence, following Dingel and Neiman (2020), when an SOC maps to multiple ISCO's, we allocate the SOC's employment weight across the ISCO's in proportion to the ISCO's employment shares.¹⁸ With the greenness

¹² It is worth mentioning that there are other initiatives - the PIAAC, STEP and CULS surveys- that gather information about the task content of occupations in countries other than the United States but unfortunately Argentina was not included in any of these surveys. Lewandowski et al. (2019, 2020), for example, use the information in those surveys to explore differences in occupations around the world. The authors focus on the automation approach and develop a regression-based methodology to predict the country-specific routine task intensity of occupations. Nevertheless, this type of analysis cannot be applied to study green jobs since ONET is the only initiative on data collected by tasks that considers the green dimension.

¹³ It is worth remembering that non-green occupations are not necessarily 'dirty' or 'brown' but are not affected by the greening of an economy.

¹⁴ Given that O*NET also provides data on the importance of each task within an occupation, a weighted version of this indicator can be calculated. However, according to Vona (2021), the correlation between the unweighted and the weighted version is extremely high, thus the use of such weights is unnecessary. In our calculations such correlation exceed 99%.

¹⁵ Additionally, O*NET identifies core tasks within each occupation, thus we can also calculate a more restrictive score using only the core tasks. However, the results are very similar to the greenness score and are available upon request.

¹⁶ This step is very common in the literature (see, for example, OECD (2017), Goos et al. (2014), Consoli et al. (2016), Vona et al. (2018), Elliott et al. (2021), Rutzer and Niggli (2020)).

¹⁷ Indeed, other papers that extrapolate greenness indicators from O*NET to ISCO apply a simple average at each step. See, for example, Elliott et al. (2021) and Rutzer and Niggli (2020). In addition to this method, Valero et al. (2021) use a different approach for the last step considering a UK occupation as green if at least one of its matched occupations from O*NET is green.

¹⁸ Formally, for each SOC-ISCO combination, the resulting weight is as follows:

$$weight_{SOC,ISCO} = \frac{L_{SOC}^{BLS}}{\sum_{ISCO} L_{SOC,ISCO}^{ILO}} \frac{L_{SOC,ISCO}^{ILO}}{L_{ISCO}^{ILO}}$$

where L_{SOC}^{BLS} is the 6-digit SOC employment from the US Bureau of Labor Statistics, and $L_{SOC,ISCO}^{ILO}$ is the 2-digit ISCO employment from the International Labour Organization (ILO). We also calculated the scores by simple averaging on the ISCO-2d and the correlation with the weighted measurements ranges from 82 to 90 percent.

Table 1 Green jobs (ISCO Classification)

ISCO 1-digit	ISCO 2-digit	greenness	green_occ
Managers	Public administration officials	Green	Green
Managers	Managers: Production	Green	Non-green
Managers	Managers: Services	Green	Green
Professional	Professionals: Science and engineering	Green	Green
Professional	Professionals: Business and administration	Green	Non-green
Technicians and associate professionals	Associate Prof: Science and engineering	Green	Green
Technicians and associate professionals	Associate Prof: Business and administration	Green	Non-green
Craft and related trades workers	Workers: Building and related trades	Green	Green
Craft and related trades workers	Workers: Metal and machinery	Non-green	Green
Plant and machine operators, and assemblers	Assemblers	Non-green	Green
Plant and machine operators, and assemblers	Drivers and mobile plant operators	Non-green	Green
Elementary occupations	Laborers: Mining, construction, manuf., transport	Green	Green
Elementary occupations	Elementary workers	Green	Green

Own elaboration

scores at 2-digit ISCO, we impute them to each person employed in the Argentine PHS.¹⁹

Finally, to identify green jobs we follow previous literature which defines those jobs as high green potential occupations. Elliott et al. (2021) consider an individual to be a green worker if their corresponding occupational greenness score is greater than the average greenness (0.189 in their sample). Similarly, Lobsiger and Rutzer (2021) define high-green-potential occupations as those with green potential larger than or equal to 0.5. This threshold was adopted because they find a significant positive association between an increase in the implicit emission tax and demand only for occupations with a green potential equal to or above 0.5. Moreover, the median green potential is 0.27 in their sample, thus high-green-potential occupations include occupations that have more than one and a half times the median green potential.

We follow a similar approach and define high green potential occupations as those with greenness scores greater than the 75th percentile. Thus, the threshold is set within the sample and, in our case, is relatively more conservative. The resulting greenness scores at the 2-digit ISCO level along with the thresholds that separate green and non-green jobs are shown in Fig. 1. The results are very similar to previous literature (Vona et al. 2018; Elliott et al. 2021; Rutzer and Niggli 2020; Lobsiger and Rutzer 2021). The *green_occ* indicator is highest for assemblers, elementary workers and public administration officials, whereas the *greenness* indicator is highest

for public administration officials, science and engineering professionals and elementary workers. Meanwhile, occupations with the lowest scores include legal, social and cultural professionals, cleaners and helpers, clerks and street vendors, among others. Table 1 lists the occupations that are classified as green jobs based on each green measure. It is valid to note that it is possible for an occupation to be classified as a green job when one green score is used, but as a non-green job when the other score is used. A list of the associated O*NET green tasks (based on the correspondence between SOC and ISCO classifications) is provided in the [Online Appendix](#).

In addition, we bear into account the ILO's definition according to which green jobs are those that, by meeting decent work standards, contribute to the preservation and restoration of the environment. Following Ernst et al. (2019), we use labor informality as a proxy for decent work. The usual definition of informality emphasizes the lack of labor protection and social security benefits. In Argentine household surveys, entitlement to a pension after retirement is the social security benefit asked and that question only applies to salaried workers. Therefore, we additionally define green formal jobs as those workers with high green potential who are in formal positions.

4 Descriptive analysis

This section explores how green jobs, i.e., those with high green potential, are distributed across economic sectors and which is the relationship between green jobs and the measure of decent work (legal informality). Figure 2 shows the sectoral distribution of employment across the occupations that were identified as green jobs (the analogous figure for non-green jobs can be found in the [Appendix A](#)). When the *green_occ* measure is considered,

¹⁹ It is worth noting that the greenness scores are fixed within the whole period, thus changes in the green potential of jobs must be understood as triggered by changes in the occupational structures.

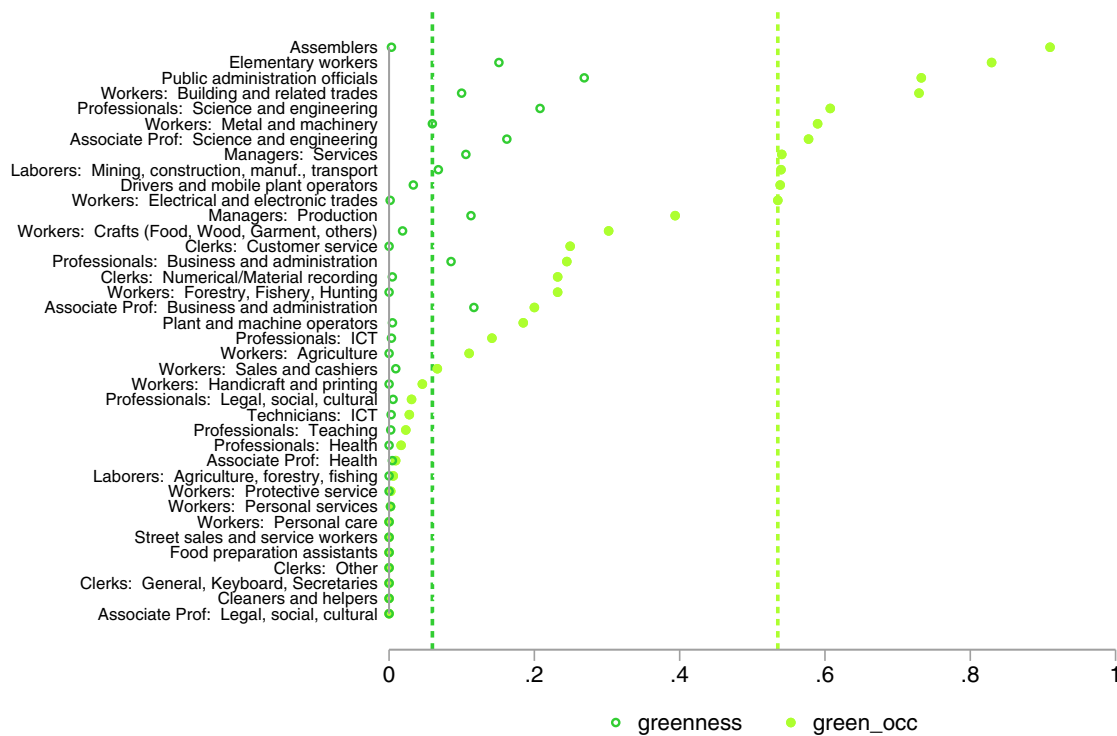


Fig. 1 Greenness over ISCO 2-digit occupations. Own elaboration based on PHS. The figure shows the estimated greenness scores at the 2-digit ISCO level. *green_occ* refers to a binary definition where an occupation is considered either green or non-green; and *greenness* is a task-based indicator that accounts for the proportion of green tasks on total tasks within an occupation. The thresholds for identifying green jobs correspond to the 75th percentile of each score within the survey. For *green_occ* that is 0.535, while for *greenness* it is 0.06. Occupations are listed at the ISCO 2-digit level. Survey weights were used. Calculations for the period 2015q1–2021q3

the green jobs with the highest level of employment are drivers and mobile plant operators, building workers, and workers in mining, construction, and transportation. Similarly, when using the *greenness* score, the green jobs with the highest level of employment are building workers, mining, construction and transportation workers, and business professionals. Figure 3 shows the relationship between employment and informality for green and non-green jobs. For both greenness measures, there is a positive relationship between informality and employment for green jobs, whereas it is somewhat negative for non-green jobs.

Complementary, Fig. 4 shows average informality as a function of the sectoral proportion of green jobs. There is no clear relationship between these two variables. Construction, transportation, and mining, the three sectors with the highest proportion of green jobs, evidence very different levels of labor informality. Something analogous occurs among the sectors with the lowest proportion of green jobs: other services, human health, and teaching. For the rest of the sectors a negative relationship appears to exist, i.e., those with a greater proportion of green jobs have lower levels of informality.

Table 2 shows the sectoral decomposition of green jobs and of green formal jobs (green jobs in formal positions). We find that between 23–25 percent of workers are in green jobs. However, when taking into account the informality dimension, we find that between 11 and 12 percent of wage earners are in green formal jobs.

5 Empirical strategy and results

To explore how green jobs are distributed, we estimate the relationship between the green job indicators and various labor and demographic variables at the individual level by estimating the following equation:

$$green_job_i = b_0 + b_1X_i + reg + quarter + e_i \quad (2)$$

where *green_job_i* is an indicator variable of green jobs/green formal jobs based on the individual's *i* occupation; *X_i* is a set of demographic and employment characteristics. The vector *X_i* includes gender, age, educational level, the activity sector, the type and size of the company, the income decile of the main occupation. When the dependent variable is a green job dummy, *X_i* also includes a dummy variable indicating whether the position is informal. Finally, we include time fixed effects by quarter and regional fixed effects by urban area, *reg*; and

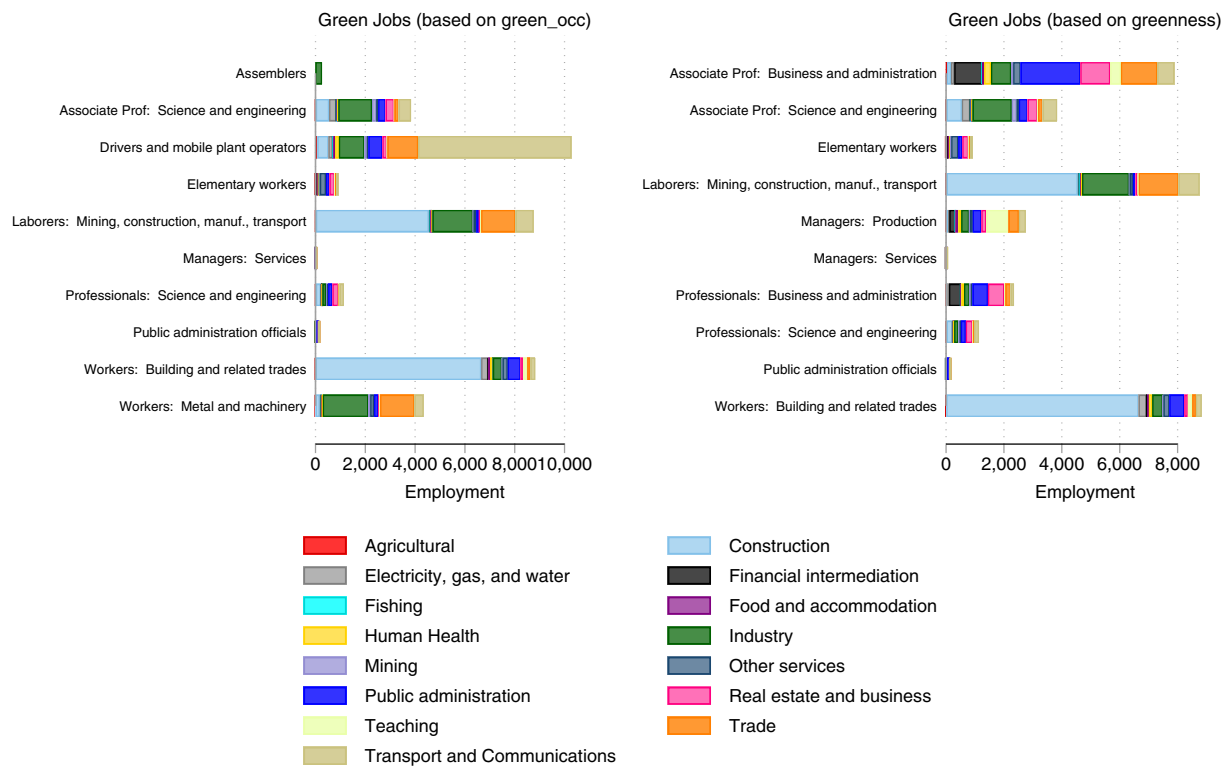


Fig. 2 Sectoral distribution of green jobs. Own elaboration based on PHS. The figure shows the sectoral distribution of employment for green jobs according to *green_occ* (left) and *greenness* (right). *green_occ* refers to a binary definition where an occupation is considered either green or non-green; and *greenness* is a task-based indicator that accounts for the proportion of green tasks on total tasks within an occupation. Occupations are listed at the ISCO 2-digit level. Survey weights were used. Calculations for the period 2015q1–2021q3

e_i is the unobservable error term. The period under analysis is from 2015q1 to 2021q3. Descriptive statistics of both the dependent variables and the independent variables are reported in Table 4, and 5, respectively (in the Appendix A).

We cluster the standard errors at the ISCO-08 2-digit occupation level, that is, at the same level as the green scores, to consider the possible correlation between unobservable characteristics of individuals employed in the same occupation. Alternatively, the estimates were repeated using robust standard errors and the significance levels are practically identical (available upon request). Table 3 presents the results.

First, we find that men are more likely to be in green jobs than women, but this gap narrows when using green formal jobs as the dependent variable (see columns 2–4). In relation to age, we find a clear increasing relationship but solely for the green formal jobs regressions. Taking agricultural activities as the base category, the sectors with more green and green formal jobs are construction, transportation, and mining. Firm size is positively related to the probability of having green formal jobs. There is no statistically significant relationship between the green

job dummies and the income decile of the main occupation. However, there is a U-shaped relationship between income and the probability of being in a green formal job. Finally, we find that being in informal jobs is positively associated with the probability of being in a green job.

In summary, the groups that are likely to benefit most by the greening of the Argentine economy are those characterized by being men, elderly, and those in specific sectors such as construction, transportation, and mining. These results are aligned with previous findings for Argentina Ernst et al. (2019) and for other countries including the US and several European economies (Consoli et al. 2016; Vona et al. 2019; Lobsiger and Rutzer 2021; Valero et al. 2021). At the same time, the specific sectors identified as benefited are in line with some of the major green economy sectors reviewed by Dierdorff et al. (2009). The most striking result is that informality is positively associated with the probability of being in a green job, which suggests that the green transition may be incompatible with decent work search. The finding about the positive relationship between green jobs and informality could be explained by the particular labor market characteristics of Argentina. Labor informality is

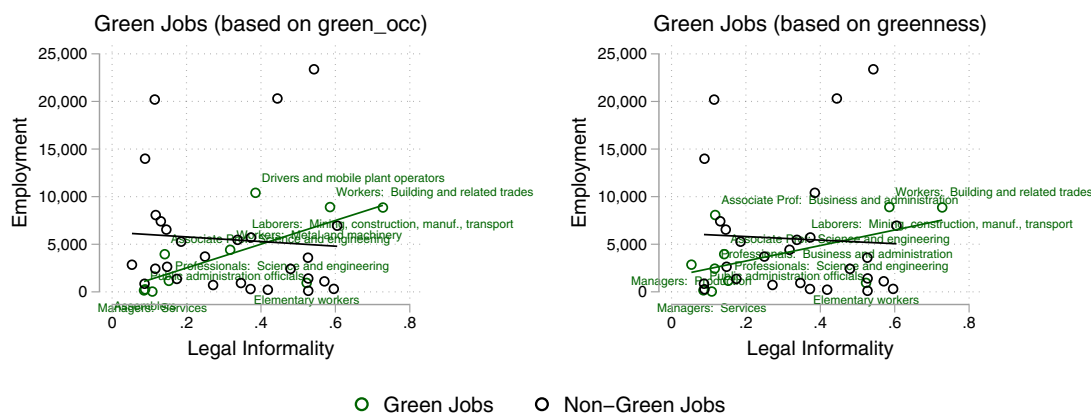


Fig. 3 Employment and informality (Green and Non-Green Jobs) own elaboration based on PHS. The figure shows employment level as a function of informality rate. Legal informality refers to lacking social security rights, and can only be estimated for salaried workers. *green_occ* refers to a binary definition where an occupation is considered either green or non-green; and *greenness* is a task-based indicator that accounts for the proportion of green tasks on total tasks within an occupation. Occupations are listed at the ISCO 2-digit level. Survey weights were used. Calculations for the period 2015q1–2021q3

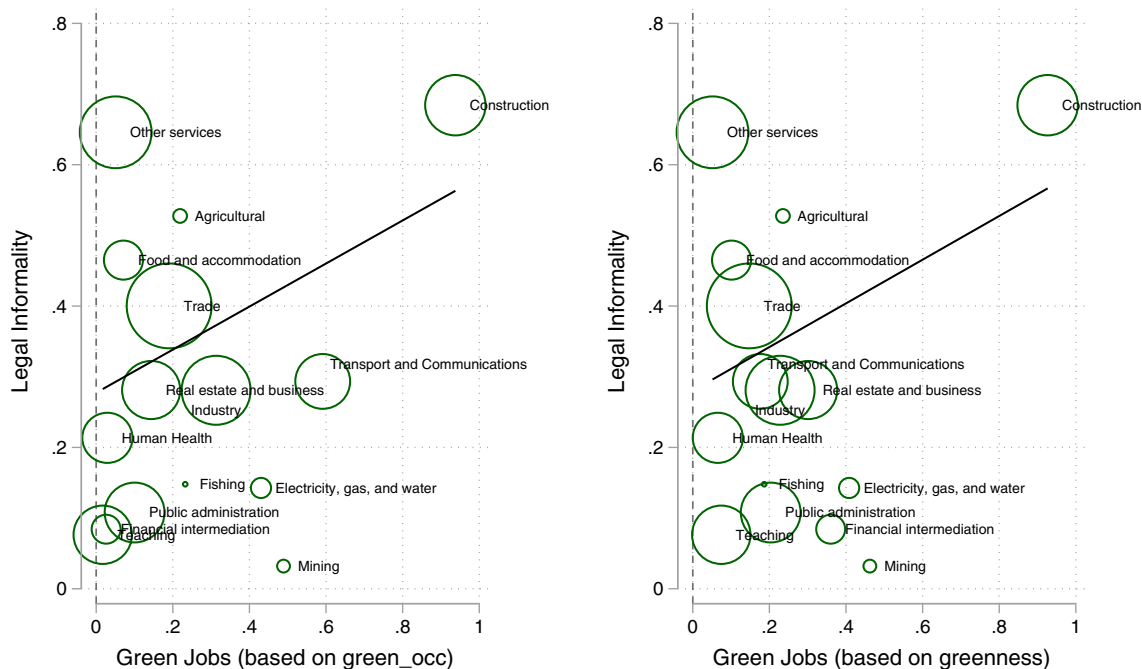


Fig. 4 Green jobs and informality own elaboration based on PHS. The figure shows average informality as a function of the sectoral proportion of green jobs. Circle size refers to sectoral employment. Legal informality refers to lacking social security rights, and can only be estimated for salaried workers. *green_occ* refers to a binary definition where an occupation is considered either green or non-green; and *greenness* is a task-based indicator that accounts for the proportion of green tasks on total tasks within an occupation. Survey weights were used. Calculations for the period 2015q1–2021q3

a structural feature in almost all Latin American countries, and Argentina is not the exception (see Tornarolli et al. (2014) for an analysis of trends in labor informality). In 2023, for example, 45 percent of workers were in

informal jobs in Argentina²⁰. Moreover, it is a pervasive feature in most economic sectors, some of them with high greening scores. At the same time, there are other

²⁰ See [here](#).

Table 2 Green jobs in Argentina, 2015q1–2021q3

Panel A: High green potential									
Sector	Employment		High greenness		High green_occ				
	Thousands	% Of total	Thousands	% Of sector	Thousands	% Of sector			
Agricultural	48	0.47	11	23.56	11	21.74	0.42		
Construction	988	9.69	915	92.63	927	93.80	36.64		
Electricity, gas, and water	98	0.97	40	41.50	42	43.54	1.69		
Financial inter-mediation	209	2.05	75	35.89	5	2.62	0.22		
Fishing	5	0.05	1	18.38	1	22.85	0.05		
Food and accommodation	390	3.82	39	10.27	28	7.18	1.10		
Human Health	679	6.68	44	6.56	20	2.95	0.79		
Industry	1160	11.41	265	22.85	363	31.34	14.40		
Mining	41	0.40	19	45.85	20	49.63	0.79		
Other services	1383	13.56	72	5.17	71	5.10	2.79		
Public administration	869	8.55	177	20.34	87	10.02	3.47		
Real estate and business	760	7.47	229	30.08	109	14.36	4.33		
Teaching	871	8.56	65	7.45	15	1.71	0.59		
Trade	1889	18.55	279	14.71	360	19.06	14.26		
Transport and communications	789	7.75	139	17.63	466	59.18	18.47		
Total	10180	100.00	2371	23.27	2525	24.79	100.00		
Panel B: High green potential + legal formality									
Sector	Employment		Formal employment		High green_occ + Formal		High greenness + Formal		
	Thousands	% Of total	Thousands	% Of sector	Thousands	% Of sector	thousands	% Of sector	
Agricultural	33	0.43	22	72.28	4	0.43	4	13.06	0.47
Construction	566	7.32	238	46.63	140	4.68	128	22.75	13.73
Electricity, gas, and water	90	1.17	79	94.40	35	1.55	34	37.73	3.63
Financial inter-mediation	200	2.60	175	93.71	4	3.45	67	33.47	7.15
Fishing	4	0.06	3	90.60	1	0.07	1	16.19	0.08

Table 2 (continued)

Panel B: High green potential + legal formality										
Sector	Employment		Formal employment		High green, occ + Formal		High greenness + Formal		% Of total	
	Thousands	% Of total	Thousands	% Of sector	Thousands	% Of sector	thousands	% Of sector	% Of total	% Of total
Food and accommodation	303	3.91	198	70.80	6	2.03	11	3.67	0.71	1.14
Human health	583	7.59	513	92.70	13	2.29	23	4.03	1.57	2.50
Industry	852	11.03	613	79.70	204	24.08	146	17.19	24.06	15.56
Mining	40	0.53	36	98.17	19	48.03	18	44.37	2.25	1.92
Other services	1,107	14.31	193	17.97	19	1.67	27	2.48	2.18	2.93
Public administration	869	11.28	867	99.97	74	8.54	159	18.29	8.79	16.94
Real estate and business	551	7.15	357	74.10	29	5.19	75	13.56	3.37	7.96
Teaching	820	10.65	785	98.63	11	1.31	57	7.01	1.29	6.12
Trade	1,077	13.95	556	56.22	87	8.11	97	9.03	10.30	10.34
Transport and communications	619	8.02	455	82.58	203	32.86	90	14.55	23.93	9.54
Total	7,716	100.00	5,093	70.60	847	10.99	937	12.17	100.00	100.00

Own elaboration based on PHS. Panel A shows the share of workers with high green potential in the PHS. Panel B shows the share of workers with high green potential who are in formal positions in the PHS, *green_occ* refers to a binary definition where an occupation is considered either green or non-green; and *greenness* is a task-based indicator that accounts for the proportion of green tasks on total tasks within an occupation. Survey weights were used

Table 3 Estimation results

VARIABLES	(1)	(2)	(3)	(4)
	<i>Green_occ</i>		<i>Greenness</i>	
	Green job	Green formal job	Green job	Green formal job
Male	0.156*** (0.052)	0.085** (0.032)	0.069* (0.034)	0.033 (0.022)
Age groups (base = [15, 24])				
[25, 34]	0.005 (0.022)	0.032** (0.014)	− 0.023 (0.023)	0.015 (0.010)
[35, 44]	0.013 (0.030)	0.047** (0.019)	− 0.020 (0.031)	0.033* (0.017)
[45, 54]	0.014 (0.035)	0.051** (0.020)	− 0.012 (0.037)	0.047** (0.023)
[55, 64]	0.005 (0.033)	0.044** (0.020)	0.005 (0.040)	0.069** (0.030)
[65+]	− 0.005 (0.039)	0.032* (0.018)	0.005 (0.048)	0.062** (0.028)
Regions (base = Gran Buenos Aires)				
Noroeste	0.004 (0.006)	0.004 (0.007)	− 0.005 (0.005)	− 0.006 (0.005)
Noreste	− 0.005 (0.007)	0.011 (0.012)	− 0.015 (0.010)	− 0.008 (0.010)
Cuyo	0.007 (0.008)	0.013 (0.010)	0.004 (0.005)	− 0.001 (0.005)
Pampeana	0.017** (0.007)	0.019** (0.008)	− 0.006 (0.005)	− 0.004 (0.005)
Patagonia	0.025* (0.014)	0.041** (0.017)	− 0.035** (0.015)	− 0.013 (0.015)
Educational level (base = never attended)				
Primary incomplete	− 0.027 (0.027)	− 0.043 (0.031)	− 0.045** (0.020)	− 0.050* (0.029)
Primary complete	− 0.013 (0.035)	− 0.019 (0.026)	− 0.062** (0.030)	− 0.044* (0.022)
Secondary incomplete	− 0.019 (0.043)	− 0.020 (0.029)	− 0.063* (0.035)	− 0.041 (0.026)
Secondary complete	− 0.068 (0.054)	− 0.038 (0.037)	− 0.061 (0.050)	− 0.024 (0.035)
Superior incomplete	− 0.123* (0.070)	− 0.077 (0.053)	− 0.023 (0.082)	0.014 (0.060)
Superior complete	− 0.119 (0.072)	− 0.094 (0.063)	0.046 (0.086)	0.065 (0.071)
Economic sectors (base = Agricultural)				
Construction	0.702*** (0.123)	0.130* (0.066)	0.749*** (0.084)	0.132** (0.060)
Electricity, gas, and water	0.271* (0.151)	0.197* (0.112)	0.205 (0.130)	0.150 (0.108)
Financial intermediation	− 0.037 (0.107)	− 0.107 (0.069)	0.130 (0.112)	0.086 (0.099)
Fishing	0.125 (0.168)	0.105 (0.129)	0.069 (0.120)	0.042 (0.096)

Table 3 (continued)

VARIABLES	(1)	(2)	(3)	(4)
	<i>Green_occ</i>		<i>Greenness</i>	
	Green job	Green formal job	Green job	Green formal job
Food and accommodation	– 0.093 (0.108)	– 0.059 (0.055)	– 0.084 (0.076)	– 0.068 (0.051)
Human health	– 0.009 (0.105)	– 0.082 (0.066)	– 0.134 (0.101)	– 0.179** (0.085)
Industry	0.170 (0.157)	0.096 (0.093)	0.073 (0.109)	0.014 (0.065)
Mining	0.326** (0.140)	0.250** (0.105)	0.225* (0.114)	0.173* (0.096)
Other services	– 0.057 (0.105)	0.006 (0.056)	– 0.064 (0.072)	– 0.028 (0.051)
Public administration	0.020 (0.102)	– 0.061 (0.061)	0.037 (0.088)	– 0.025 (0.068)
Real estate and business	– 0.016 (0.107)	– 0.057 (0.060)	0.055 (0.078)	– 0.020 (0.047)
Teaching	0.007 (0.110)	– 0.083 (0.071)	– 0.129 (0.122)	– 0.178* (0.103)
Trade	0.040 (0.141)	– 0.005 (0.061)	– 0.005 (0.099)	– 0.024 (0.053)
Transport and communications	0.390** (0.148)	0.172** (0.068)	– 0.010 (0.086)	– 0.045 (0.053)
Firm type (base = Public)				
Private	0.011 (0.013)	0.011 (0.009)	0.012 (0.012)	0.017 (0.011)
Other	0.015 (0.017)	– 0.031* (0.017)	0.027 (0.029)	– 0.029 (0.019)
Firm size (base = 5 or less employees)				
Between 6 and 40 employees	– 0.003 (0.022)	0.094** (0.041)	0.001 (0.016)	0.083** (0.040)
More than 40 employees	0.007 (0.025)	0.149** (0.062)	0.010 (0.019)	0.120** (0.053)
Hourly labor income decile (base = 1st decile)				
2nd decile	– 0.008 (0.012)	0.010 (0.007)	– 0.027** (0.012)	0.003 (0.006)
3rd decile	– 0.010 (0.012)	0.035* (0.018)	– 0.026* (0.013)	0.018 (0.013)
4th decile	– 0.005 (0.017)	0.059** (0.028)	– 0.027 (0.018)	0.030 (0.018)
5th decile	– 0.008 (0.017)	0.077** (0.037)	– 0.021 (0.019)	0.042* (0.023)
6th decile	– 0.016 (0.018)	0.080* (0.041)	– 0.025 (0.020)	0.044* (0.025)
7th decile	– 0.015 (0.020)	0.090* (0.044)	– 0.003 (0.026)	0.066** (0.032)
8th decile	– 0.017 (0.024)	0.087* (0.045)	0.019 (0.034)	0.084** (0.039)
9th decile	– 0.019 (0.027)	0.083* (0.042)	0.052 (0.042)	0.110** (0.046)

Table 3 (continued)

VARIABLES	(1)	(2)	(3)	(4)
	<i>Green_occ</i>		<i>Greenness</i>	
	Green job	Green formal job	Green job	Green formal job
10th decile	– 0.029 (0.029)	0.067* (0.034)	0.114* (0.060)	0.169** (0.062)
Informal	0.040** (0.018)		0.014 (0.019)	
Observations	289,424	289,424	289,424	289,424
R-squared	0.447	0.192	0.331	0.140

Estimates obtained by OLS. Sample weights are used. Cluster-corrected standard errors at the 2-digit level of ISCO-08 in parentheses. Quarter fixed effects included. In columns 1–2 the dependent variable is an indicator of whether a worker is in a high green potential occupation using the *green_occ* definition [i.e if its greenness scores is above 0.535 (column 1) and is in a formal job (column 2)]. In columns 3–4 the dependent variable is an indicator of whether a worker is in a high green potential occupation using the *greenness* definition [i.e if its greenness scores is above 0.06 (column 3) and is in a formal job (column 4)]

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$

dimensions of decent work related to job quality and the precariousness of jobs (ILO 2013). In that complex context, ensuring a green transition reveals the need to boost and reinforce capabilities of our country to, as a first step, revert or mitigate slowly and carefully the deep roots of informality and low quality jobs to lead and enable the country to engage, in a second step, in the green and decent transition.

6 Conclusion

Several countries, including Argentina, recognize the importance of greening the economy and have been developing strategies to foster the implementation of green technologies, the creation of sustainable industries, the reduction in current pollution, among other goals. Despite a broad consensus over the expected long-term benefits of such transition, in the short or medium run some frictions may arise, especially in the labor markets of developing countries. Those workers who perform tasks and use skills that are incompatible with the new labor market conditions will be the most affected. Furthermore, the ILO's Green Jobs initiative emphasizes the importance of both the creation of decent work in the new green activities and the implementation of social protection policies to mitigate the effects on the sectors that need transforming to ensure a more inclusive green transition. As a result, the transition to greener forms of production must also take into consideration work standards that meet those of the decent work. In light of the above, our paper explores the new conditions imposed

by the greening of the economy (such as those relating to changes in labor markets conditions) in a context that meets the decent work standards.

Specifically, in order to understand the current situation of the transition to greener forms of production we characterize the potential of green jobs in Argentina for the period 2015–2021. We take an occupation-based approach and identify the green potential of jobs as the ability of an occupation to perform green tasks. The ILO's concern about decent work is addressed by considering informality as a proxy of (lacking) decent work standards. Our paper is the first to apply an occupation-based approach with a greenness perspective in a developing country like Argentina, which faces not only difficulties related to the changes in labor skills and production methods that a green transition would require, but also to the fact that it has a considerable proportion of informal employment. In this regard, this work serves to understand what type of workers will transition more easily towards greener forms of production, and who will be more affected.

Our results show that between 23 and 25 percent of workers are in green jobs, i.e., have a high green potential. However, when considering the informality dimension, we find that between 11 and 12 percent of wage earners are in green formal jobs. We also find that the groups that are likely to benefit most by the greening of the Argentine economy are those characterized by being men, elderly, and those in specific sectors such as construction, transportation, and mining. The most striking result is that

informality is positively associated with the probability of being in a green job, which suggests that the green transition may be incompatible with decent work search.

Based on these results, some implications can be drawn. The definition and conceptualization of green jobs goes hand in hand with the need for a just transition as we consider the dimension of decent work. A fair transition implies sustainable economies, climatic neutrality and social justice (López et al. 2022). In this context, the strategies for promoting green jobs have the potential to boost the well-functioning of labor markets. Argentina may need to develop more flexible arrangements in its labor markets as a way to develop decent work in a sustainable scenario, that is, one that considers both the current context of the region and the changing scenarios and future implications. In spite of this, the current conceptualization of green jobs can serve as a guide to develop a country-specific plan (López et al. 2022).

From a policy implication point of view, as López et al. (2022) suggest, Argentina needs to review its legal and regulatory framework in relation to environmental issues so that all regulations point towards the same objective in this fairer transition. At the same time, efforts must be made to transition towards greener forms of production in all sectors of the economy, articulating the role of the State, employers, employees and unions. In the OIT et al. (2022) report for Argentina, the authors study the role of each of the actors mentioned above, what initiatives they have implemented so far, how they could be improved, and what inconsistencies may arise in the analysis of a just transition from the perspective of the different actors involved. Finally, as López et al. (2022) highlight, Argentina should look at the experiences of other Latin American countries (Colombia, Chile or Uruguay) in terms of the design and implementation of green policies that help to achieve a more just and inclusive transition.

The above results highlight the importance of considering the effects of the green transition on all groups of workers when designing and implementing public policies that promote greener forms of production. For

instance, the IMF (2022) proposes some policies such as job training, tax credits for lower-income workers, promotion of investment in R & D and green infrastructure, and a carbon tax. Similarly, the ILO (2015) calls for government action in reviewing current skills development policies or technical and vocational education to ensure that those policies meet the greening of the economy conditions. Particularly, the ILO asks for allocating resources to both the identification and anticipation of emerging skills needs or occupations requirements and training programmes. Many countries, especially emerging and developing countries such as Argentina, could take advantage of this likely change in their economic structure and seek to implement some of the recommended labor policies in the hope that it will also help boost informal workers out of this condition.

The limitations of our study are crystal clear since our measurements of occupational greenness are calculated with data from the United States, given that Argentina does not have descriptions of work content and skills at the occupational level. Further investigation will be necessary when data availability ceases to be a constraint. In addition, future research could be focused on studying the effects of several environmental policies that Argentina is currently undertaking. It would be somehow useful to address the consequences of such policies on several variables, such as the effect on the labor market or on the economy as a whole, and investigate whether they are effective in achieving the established goals. One line of research could be to examine if these policies are associated with a heterogeneous change in the demand for workers with higher green potential relative to those with lower green potential.

Appendix

See Fig. 5 and Tables 4, 5.



Fig. 5 Sectoral distribution of Non-Green Jobs. Own elaboration based on PHS. The figure shows the sectoral distribution of employment for non-green jobs according to *green_occ* (left) and *greenness* (right). Survey weights were used. Calculations for the period 2015q1–2021q3. *green_occ* refers to a binary definition where an occupation is considered either green or non-green; and *greenness* is a task-based indicator that accounts for the proportion of green tasks on total tasks within an occupation

Table 4 Summary statistics

	N	Mean	sd	Min	p25	p50	p75	Max
high_green_occ_global	289,424	0.21	0.41	0.00	0.00	0.00	1.00	1.00
high_green_occ_formal	289,424	0.11	0.31	0.00	0.00	0.00	0.00	1.00
high_greenness_global	289,424	0.19	0.40	0.00	0.00	0.00	0.00	1.00
high_greenness_formal	289,424	0.11	0.31	0.00	0.00	0.00	0.00	1.00

Greenness indicators. Own elaboration. Survey weights were used. *high_green_occ_global* and *high_greenness_global* are dummies variables that equal 1 for those occupations with a green potential above 0.535 (for *green_occ* indicator) or 0.06 (for *greenness* indicator), and 0 otherwise; *high_green_occ_formal* and *high_greenness_formal* are the same as before but also equals 0 for those in informal position (legal definition)

Table 5 Summary statistics

	N	Mean	sd
Men	289,424	0.54	0.50
Age groups			
[15, 24]	289,424	0.13	0.33
[25, 34]	289,424	0.28	0.45
[35, 44]	289,424	0.27	0.44
[45, 54]	289,424	0.20	0.40
[55, 64]	289,424	0.11	0.32
[65+]	289,424	0.01	0.07
Region			
Gran Buenos Aires	289,424	0.14	0.35
Noroeste	289,424	0.24	0.43
Noreste	289,424	0.10	0.29
Cuyo	289,424	0.11	0.31
Pampeana	289,424	0.27	0.45
Patagonia	289,424	0.14	0.34
Educational level			
Never attended	289,424	0.00	0.05
Primary incomplete	289,424	0.03	0.17
Primary complete	289,424	0.13	0.34
Secondary incomplete	289,424	0.17	0.38
Secondary complete	289,424	0.30	0.46
Superior incomplete	289,424	0.14	0.35
Superior complete	289,424	0.22	0.41
Sector			
Agricultural	289,424	0.01	0.09
Construction	289,424	0.09	0.28
Electricity, gas, and water	289,424	0.01	0.11
Financial intermediation	289,424	0.02	0.14
Fishing	289,424	0.00	0.02
Food and accommodation	289,424	0.04	0.19
Human health	289,424	0.07	0.26
Industry	289,424	0.09	0.28
Mining	289,424	0.01	0.09
Other services	289,424	0.15	0.36
Public administration	289,424	0.16	0.36
Real estate and business	289,424	0.05	0.22
Teaching	289,424	0.11	0.31
Trade	289,424	0.14	0.35
Transport and communications	289,424	0.06	0.24
Firm type			
Public	289,424	0.30	0.46
Private	289,424	0.69	0.46
Other	289,424	0.01	0.12
Informal (productive definition)	289,424	0.31	0.46
Informal (legal definition)	289,424	0.36	0.48
Firm size			
5 or less employees	289,424	0.32	0.47
Between 6 and 40 employees	289,424	0.33	0.47
More than 40	289,424	0.35	0.48

Table 5 (continued)

	N	Mean	sd
Hourly labor income decile			
1st decile	289,424	0.07	0.25
2nd decile	289,424	0.10	0.30
3rd decile	289,424	0.11	0.31
4th decile	289,424	0.11	0.31
5th decile	289,424	0.11	0.31
6th decile	289,424	0.11	0.31
7th decile	289,424	0.11	0.31
8th decile	289,424	0.11	0.31
9th decile	289,424	0.10	0.31
10th decile	289,424	0.09	0.29

Independent variables. Own elaboration. Survey weights were used

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Author contributions

de la PV: conceptualization, methodology, software, formal analysis, investigation, writing—original draft, writing—review and editing; NP: conceptualization, writing—original draft, writing—review and editing, supervision, project administration; MC: methodology, software, formal analysis, investigation, writing—original draft, writing—review and editing.

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All authors agreed with the content and gave consent to submit the manuscript to the journal publishing house for publication.

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We have no conflicts of interest to disclose.

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