PUBLIC OPINION ON RENEWABLE ENERGY AROUND ENVIRONMENTAL, ECONOMIC, SOCIAL AND LOCAL IMPACTS:

ITALY AS A CASE STUDY.

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ABSTRACT

Renewable energy is an essential component of the development of Mediterranean countries in the near future. At the same time, the role of public opinion in fostering or hindering a transition towards a new energy system is unquestionable. This study puts a spotlight on Italy and employs a survey in order to grasp the public attitude towards renewable energy and its implications. The fundamental drivers of public opinion, focus of the analysis, are found to be: not-in-my-backyard-ism; perception of economic impacts; perception of social impacts; perception of environmental impacts; employment effects; perception of renewable energy jobs; level of awareness and knowledge concerning renewable energy. Surprisingly, issues related to "not-in-my-province-ism" or the so-called "job-killing argument" do not emerge. On the contrary, a general lack of interest and information comes along with the common idea that "renewables are expensive". Interestingly, no regional differences in public opinion arise. Concerning the different renewable energy technologies, solar energy and bioenergy register respectively the most and least favourable public perception. Overall, the Italian population seems to hold a positive attitude towards renewable energy. There is however room for improvement, with opportunities to be exploited such as: the diffusion of "agrivoltaic" systems and community renewable energy; the requalification of degraded areas; the transformation of small islands' energy systems; the de-stigmatisation of bioenergy.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

As highlighted by the prominent economic historian Carlo Cipolla, energy is at the core of every human activity. Our economy, society, productive systems and well-being are grounded on the use, availability and quality of energy. From a historical point of view, every revolution has started with the discovery and employment of new energy sources. (Cipolla, 2013). Our hope is that a new clean energy revolution is around the corner.

Indeed, renewable energy represents one of the most powerful tools at our disposal, as well as a perfect example of human genius. We have brilliantly learnt – and still learning – how to harvest clean power from solar radiation, air currents, ocean waves, water flow and geothermal heat. We indeed have understood that we can create energy without – or at least limiting – environmental harm. We have also realised that this amount of power at our disposal is immense, all around us and in many ways unlimited.

At the same time, we seem to be somehow reluctant to decisively dive into a clean energy future, leaving the dirty past behind. The reasons for this are multiple and can be found in the structure of our society and economy, in the lack of financial capabilities, or in the interests, needs, fears and attitudes of the population. As long as we remain stuck in this limbo, we will never fully exploit the enormous potential of renewable energy. At the same time, we will further exacerbate the negative effects that our fossil-fuels-based energy system already has on climate and environment.

This is particularly true for Southern-Europe (i.e. Italy, Spain, Greece and Portugal), where those adverse effects will be even more impactful. Indeed, the Mediterranean area has been labelled as a hotspot (de Sherbinin, 2013), meaning that it is expected to be one of the most vulnerable and responsive regions to climate change at the global level (UN Environment & Mediterranean Action Plan, 2017).

In this sense, dire evidence emerges from authoritative studies underlying the strong changing patterns of the Southern-European and Mediterranean weather, including increased aridity of the land and ongoing desertification process, warmer temperature, lower level of precipitation and increased water stress, worst air quality in urban areas, higher likelihood of heatwaves and prolonged droughts. (de Sherbinin, 2013; Gao & Giorgi, 2008; Gibelin & Déqué, 2003; Giorgi & Lionello, 2008; Lelieveld et al., 2012).

Such patterns would imply higher energy needs for heating (Dowling, 2013), decreased land and agricultural productivity, loss of land and property value and, in general, large economic and environmental disruptions (Gao & Giorgi, 2008; Gibelin & Déqué, 2003; Giorgi & Lionello, 2008; Lelieveld et al., 2012; UN Environment & Mediterranean Action Plan, 2017). Similarly, those same patterns would entail a strong adaptation effort by affected countries (UN Environment & Mediterranean Action Plan, 2017).

At the same time, Southern-European countries register an unemployment rate double that of the EU-average (6.9%): Spain (14.1%), Greece (16.8%), Southern Italy (>14%); with the regions of Western Macedonia (EL), Western Greece (EL), Extremadura (ES), Andalusia (ES), Calabria (IT), Campania (IT), Canary Islands (ES) and Sicilia (IT) experiencing record-breaking unemployment levels above 20%. (Eurostat, 2020). Thus, the Mediterranean area and Southern-European regions appear to be the most fragile part of the European economy, both from a climate-related and socio-economic point of view.

In this overall negative framework, a key positive role can be played by a vigorous deployment of renewable energy. Indeed, Southern-European countries register important economic and technical renewable energy potential (Creutzig et al., 2014), benefitting from a high level of solar radiations (ESPON, 2011) as well as suitability for wind power (ESPON, 2011), hydropower (European Environment Agency, 2020) and geothermal energy (European Commission, 2015).

Relevant benefits of a further renewable energy deployment may then come in form of net jobs creation at the local level and consequential decrease in unemployment, better air quality and quality of life, successful climate change mitigation and adaptation effort, gained energy independence and lowered reliance on fossil fuels, as well as regained political centrality at the European level through an excellent story of transformation. Thus, renewable energy seems to be able to truly foster the resilience of the Southern-European countries, tackling both environmental and socio-economic issues at the same time. (Creutzig et al., 2014; Ministry of Economic Development et al., 2019; UN Environment & Mediterranean Action Plan, 2017).

However, concern may be linked to public opinion (Vona, 2018). Indeed, it is not uncommon to see relatively new concepts or technologies being more or less fiercely opposed, despite the possible relevant benefits, due to fear, preconceptions or merely lack of knowledge, ignorance and low levels of awareness. It is equally easy to assume that, in our democracies, public opposition (or acceptance) may play a fundamental role in hindering (or fostering) the deployment of renewable energy by influencing local and central governments' choices, as well as choices made by the private sector, thus indirectly lowering (or increasing) the creation of job opportunities and worsening (or limiting) environmental harm. (Vona, 2018).

From this, the central question of this study: what is the public opinion on renewable energy? In order to answer, a survey has been conducted among Italian individuals. Indeed, on the basis of all that has been said, with the aim to restrict the focus of the analysis and due to feasibility reasons, Italy has been selected among Southern-European countries as major case study. Then, rephrasing the central question: ***what is the public opinion on renewable energy and related issues in Italy?*** In other words: ***how does the Italian population perceive renewable energy and its implications?***

Concerning the most prominent related issues as well as the most relevant drivers of public opinion, a central role is played by the so-called not-in-my-backyard-ism, the perception of economic costs, the perception of environmental and social impacts, the perception of employment effects and the possible lack of information on the subject. More in this sense is explained in the following sections.

The study is structured as follows. First, an overview of the current status of renewable energy technologies and renewable energy employment in Italy creates the necessary background. Second, an accurate literature review covers the main aspects relevant to the analysis, focusing on the already cited main drivers affecting public opinion and perception. Then, with this in mind, the survey design is introduced, followed by the descriptive statistics. Results are first commented and then statistically analysed, proceeding question-by-question. To conclude, possible explanations as well as relevant remarks arise.

1.1 Background: renewable energy and jobs in Italy

Within the framework of the European Union 2050 long-term strategy, aimed at reaching the ultimate goal of carbon neutrality (European Commission, 2012), Italy has developed its own climate and energy plan up to 2030 (Ministry of Economic Development et al., 2019), although no plan up to 2050 is yet officially available.

The opening statement "*Italy is fully aware of the potential benefits inherent to the increased availability of renewables and energy efficiency, connected to the reduction in polluting and climate-changing emissions, improvements in energy security, and economic and employment opportunities for families and for the production system*" (Ministry of Economic Development et al., 2019, p.4) is totally in line with the already highlighted relevant benefits linked to a fostered deployment of renewable energy, and thus with the areas of interest of this study. On the other hand, the issue of possible public opposition is briefly acknowledged only once (p.106). This is surprising, since it is difficult to imagine a national energy plan that does not preventively take into account the likelihood or extent of local opposition. One option could be that public opinion is in fact largely in favour of renewable energy deployment and related issues; another option could be that something is being overlooked.

As said, the survey employed in this study aims at shedding light in this sense, linking the highlighted benefits of renewable energy deployment with the related public perception and, consequently, public opinion.

Following, in order to provide for the necessary background, data collected from the International Energy Agency (IEA), International Renewable Energy Agency (IRENA) and World Bank are presented and discussed. This includes data on the Italian renewable energy system, renewable energy technologies and renewable energy employment. In order to allow for a better comparison, whenever possible, data for other Southern-European countries (i.e. Spain, Greece and Portugal) are added.

Both at the European and global level, Italy is a leader in terms of renewable energy, especially when it comes to solar (IRENA 2020a; IRENA 2020b). Despite this, more development is necessary in order to truly diversify away from fossil fuels and aim at reaching carbon neutrality in the long-term, preserving the environment, lowering pollution and adapting to climate change. Among Southern-European countries, Italy registers the highest level of total renewable energy production (Figure 1) (IEA, 2019), having experienced a steady growth (Figure 2) (IEA, 2019) since the early 2000s, partially due to favourable government policies. (IEA, 2016).

Figure 1: Total renewable energy production (Mtoe)
Source: IEA, 2019

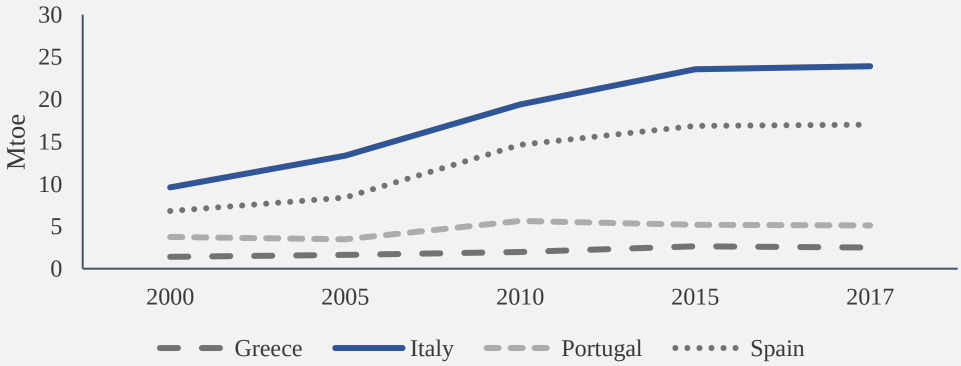
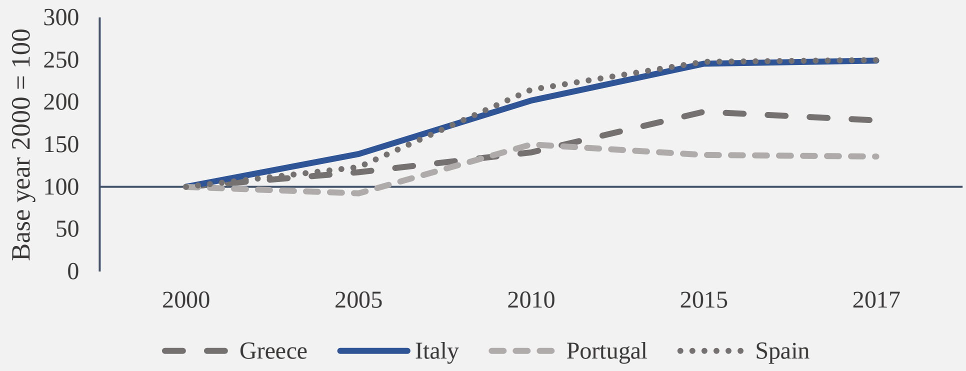


Figure 2: Total renewable energy production (Mtoe) - Indexed 2000
Source: IEA, 2019



In line with this, the share of renewables in the total domestic energy production has almost doubled over the same period, reaching 70% in 2017 (Figure 3) (IEA, 2019). While the result is encouraging, renewables are still not able to satisfactorily cover the large domestic energy demand (Figure 4) (World Bank, 2019).

Figure 3: Share of renewables in total energy production (%)
Source: IEA, 2019

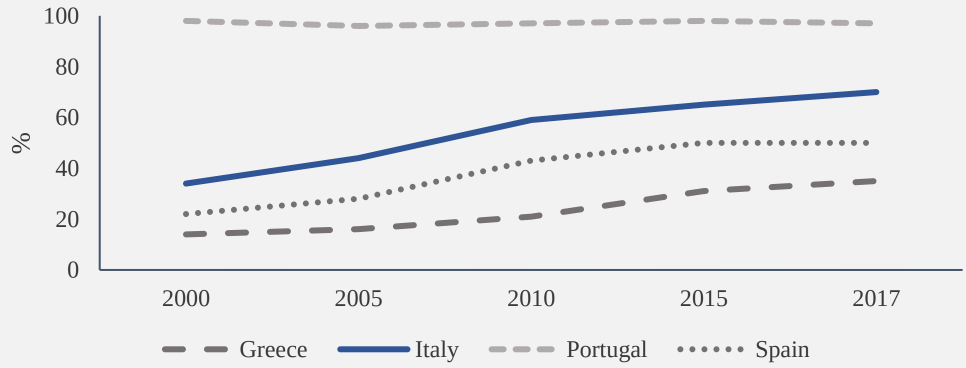
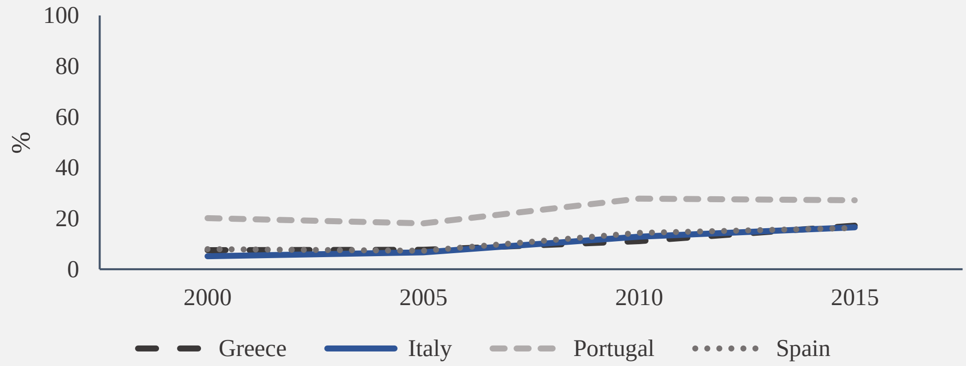


Figure 4: Share of renewables in total energy consumption (%)
Source: World Bank, 2019



Concerning the different renewable energy technologies – i.e. solar energy, wind power, bioenergy, hydropower and geothermal energy, each of them including the related subcategories – it appears Italy has consistently moved from a renewable energy sector almost exclusively based on hydropower to a diversified and growing sector. By 2019, hydropower, accounting for 34.3% of renewable energy capacity, has been surpassed by solar energy (37.8% of capacity), with wind energy lined up to do the same (19.5% of capacity) (Figure 5) (IRENA 2020a). The same results are applicable to renewable energy production (Figure 6) (IRENA 2020a).

Figure 5: Percentage distribution of renewable energy technologies: renewable energy capacity (%) - Italy
Source: IRENA, 2020a

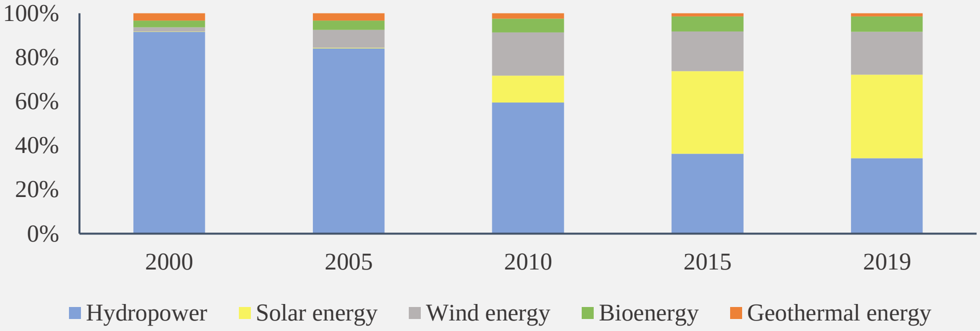
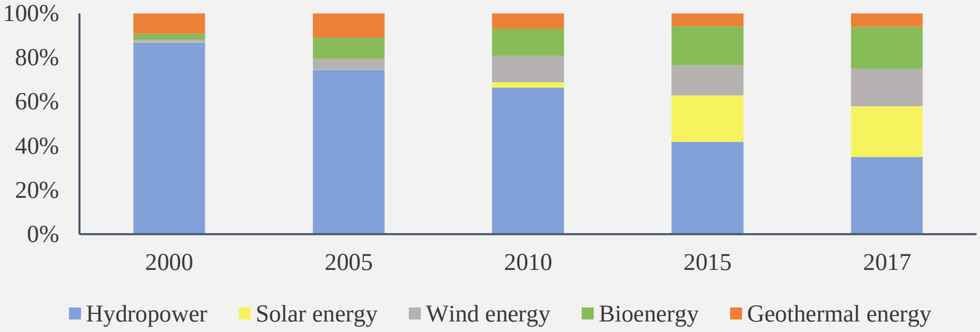


Figure 6: Percentage distribution of renewable energy technologies: renewable energy production (%) - Italy
Source: IRENA, 2020a



As anticipated in the Introduction section, with hydropower and geothermal energy almost fully exploited (Figure 7) (IRENA, 202b), most of the growing potential for the renewable energy sector is thus found in solar energy and wind power. In terms of production, however, bioenergy plays a key role, with hydropower being still the largest source (Figure 8) (IRENA, 2019).

Figure 7: Renewable energy capacity by technology (MW) - Italy
Source: IRENA, 2020b

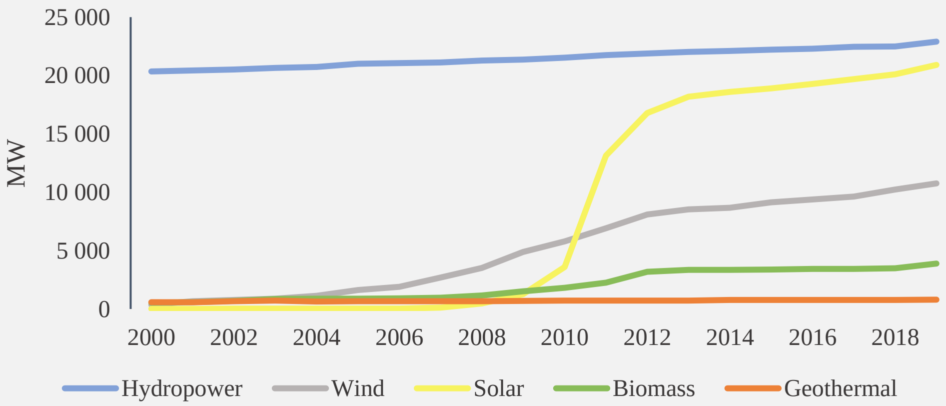
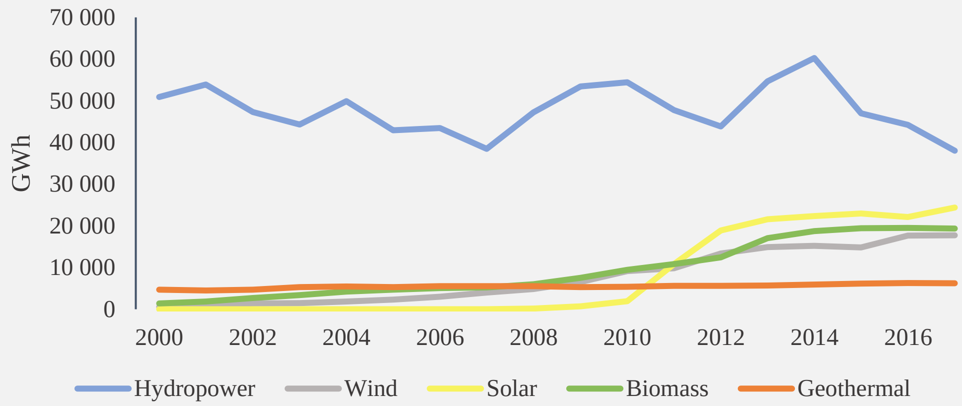


Figure 8: Renewable energy production by technology (GWh) - Italy
Soure: IRENA, 2019



Then, concerning employment, the Italian renewable energy sector accounted for 88.600 jobs in 2019 (Figure 9) (IRENA, 2020c), slightly less than Spain, the majority of them coming from bioenergy (55.400). Indeed, in line with the results experienced by the other Southern-European countries, bioenergy seems to hold the largest employment potential (Figure 10) (IRENA, 2020c).

Figure 9: Total renewable energy employment (number of jobs) - 2019
Source: IRENA, 2020c

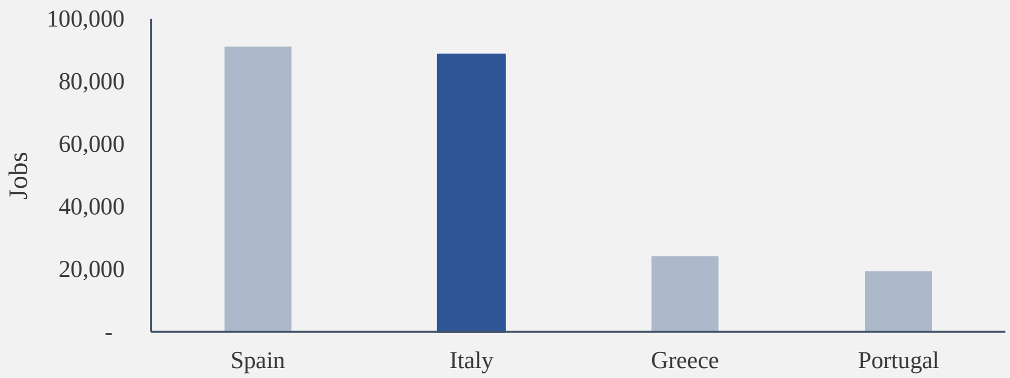
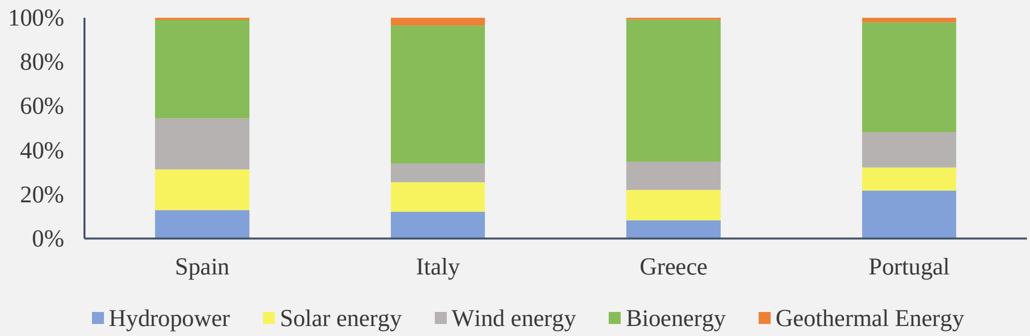


Figure 10: Percentage distribution of renewable energy employment by technology - 2019
Source: IRENA, 2020c



How to properly define and account for renewable energy jobs is a highly-debated issue (European Commission, 2013; ILO, 2018; IRENA, 2011; UNEP, ILO, IOE, & ITUC, 2008). In our context, and in order to avoid misunderstandings, we can take into account all the jobs inherently linked – directly or indirectly – to the renewable energy sector (IRENA, 2011). Direct jobs can thus represent all the jobs directly created by the activities within the industry; indirect jobs can relate to the supply side of the renewable energy sector (IRENA, 2011).

Thus, the renewable energy sector in Italy has experienced sustained development since 2011, with solar energy being the most promising technology in terms of capacity, production and future growth, while bioenergy plays an important role when it comes to employment. However, a further deployment of renewable energy seems necessary and, at the same time, achievable.

Having provided an overview of the historical and current development of renewable energy in Italy, the following section creates further background by accurately reviewing the literature. The issues covered are fundamental to the design of the survey and the analysis of its results.

1.2 Literature review

Having been already introduced, this literature review focuses on the following central issues, fundamental to this study: not-in-my-backyard-ism and related issues; perception of economic impacts; perception of social impacts; perception of environmental impacts and perception of the different renewable energy technologies; employment effects and perception of renewable energy jobs; level of awareness and knowledge concerning renewable energy. Overall, specific attention is devoted to Italy, always set in the wider and common framework of Southern-Europe.

Concerning the ability of renewable energy to create jobs, it seems results are extremely positive whenever a gross employment effect is considered (Henriques et al., 2016; Markaki et al., 2013; Caldés et al., 2009; Moreno & López, 2008; Tourkolias & Mirasgedis, 2011; Silva et al., 2013; Cai et al., 2017; Llera et al., 2013; Llera Sastresa et al., 2010; Blanco & Rodrigues, 2009; Lehr et al., 2008; Lehr et al., 2012); if a net employment effect is calculated, thus taking into account the interaction between jobs creation within the renewable energy sector and jobs destruction within others sectors of the economy (Lambert & Silva, 2012), the ability of renewable energy deployment to create jobs is downsized (Henriques et al., 2016; Böhringer et al., 2013; Lehr et al., 2008). Overall, there is however evidence of positive net employment effects (Markandya et al., 2016; Wei et al., 2010; Lehr et al., 2012) registered specifically by Southern-European countries, Spain and Italy above all (Markandya et al., 2016).

In terms of renewable energy technologies, extremely positive results are recorded by solar and wind power (Moreno & López, 2008; Llera Sastresa et al., 2010; Henriques et al., 2016; Silva et al., 2013; Cai et al., 2017; Tourkolias & Mirasgedis, 2011; Wei et al., 2010; Lehr et al., 2008), which appear to be by far the most mature and suitable technologies to create jobs in, mainly, installation, construction, maintenance and manufacture activities (Moreno & López, 2008; Llera Sastresa et al., 2010; Cai et al., 2017; Tourkolias & Mirasgedis, 2011; Markaki et al., 2013; Blanco & Rodrigues, 2009; Lehr et al., 2008; Lehr et al., 2012).

A huge role seems to be played by government subsidies to renewable energy. As long as subsidies are deployed, the employment effect peaks, with jobs creation being related to the fostered installation and construction effort increasing the renewable energy capacity of a country. As subsidies are phased out, the number of renewable energy jobs generally stabilises at lower levels, with installation and construction activities being replaced by maintenance (Cai et al., 2017; Llera et al., 2013).

Another key issue is represented by jobs leakage: while a country is subsidising its own renewable energy development, jobs creation may actually turn out to be lower than expected (Silva et al., 2013; Cai et al., 2017; Lehr et al., 2008; Lehr et al., 2012; Markandya et al., 2016). Indeed, as long as renewable energy equipment and components are imported, parts of the jobs end up being created abroad, to the benefit of exporting countries and their manufacture sector (Cai et al., 2017; Lehr et al., 2008; Lehr et al.).

An important remark is: many renewable energy jobs are created at the local and regional level, thus being able to create better socio-economic conditions in areas historically suffering from unemployment (Tourkolias & Mirasgedis, 2011; del Río & Burguillo, 2009). In those areas, even low levels of jobs creation may turn out to be profoundly beneficial, if compared to the few job opportunities available (del Río & Burguillo, 2009). This may truly be the case of the Southern regions of Italy where, as said, both levels of unemployment as well as renewable energy technical potential are among the highest in Europe (Creutzig et al., 2014). [1]

Looking at the main characteristics of renewable energy jobs, it appears engineering and managerial green skills are greatly required (Consoli et al., 2016; Vona et al., 2018), registering an increase in demand respectively higher than that associated with manual workers (Marin & Vona, 2019). In this sense, the literature highlights a general lack of qualified workers in the renewable energy sector (Lucas et al., 2018; Nowotny et al., 2018), which is reflected in higher-than-average wages (Peters, 2013). There is employment for manual workers requiring low levels of education, although salaries are generally low (Peters, 2013). Concerning the issue of retraining, workers coming from other sectors of the economy seem to be able to adapt easily to the renewable energy sector, for instance through on-the-job retraining (Bowen et al., 2018; Consoli et al., 2016).

On this basis, no strong evidence emerges supporting the argument that renewable energy destroys jobs more than it creates, and this may hold even in the long-term (Fankhauser et al., 2008). With some level of uncertainty to be taken into account, the overall employment benefits seem to outmatch the possible drawbacks. Despite this, the so-called “job-killing argument”, mainly in terms of low-skill jobs, remains a decisive aspect of public opposition towards the development of renewable energy and the implementation of renewable energy projects, peaking in areas where employment is linked to carbon-intensive and energy-related industries (Marin & Vona, 2019; Vona, 2018).

Further factors influence public opinion on renewable energy deployment. Concerning the different renewable energy technologies and accounting for the different externalities they create, survey-based studies conducted in Southern-Europe show that solar energy is generally preferred and positively perceived (Azarova et al., 2019; Cicia et al., 2012; Kaldellis et al., 2016; Ribeiro et al., 2014), followed by wind energy and hydropower, both facing ambiguous levels of acceptance (Kaldellis, 2005; Kaldellis et al., 2016; Ribeiro et al., 2014). Bioenergy and geothermal energy experience both largely positive attitude (Achillas et al., 2011; Manologlou et al., 2004; Montis & Zoppi, 2009) as well as strong and rising opposition (Borzoni et al., 2014; Cicia et al., 2012; Pellizzone et al., 2015; Ribeiro et al., 2014).

Key role in influencing public opinion seems to be played by a general lack of information or low trust on renewable energy technologies (Achillas et al., 2011; Kaldellis, 2005; Pellizzone et al., 2015;

[1] The initial five paragraphs of this literature review are based on the authors’ Research Project, part of MSc STREEM courses at VU Amsterdam, named “Tackling unemployment and climate change through renewable energy deployment: can Southern-Europe exploit its solar and wind power potential(s)?”, supervised by Prof. C. Fischer.

Zografakis et al., 2010), as well as a low level of environmental and climate change awareness diffused in a small but consistent subset of the population (Garcia de Jalon, 2013; Kaldellis et al., 2016; Zografakis et al., 2010). Similarly, this subset seems to have little perception of the benefits linked to renewable energy (Kaldellis et al., 2016; Strazzera & Statzu, 2017; Zografakis et al., 2010).

Another fundamental driver of public opposition is found in a generally low level of public engagement. Indeed, residents and local communities are usually excluded from the decision-making process when it comes to establishing new renewable energy plants (Sarrica et al., 2018). It appears that a higher level of involvement and cooperation of all interested stakeholders in the planning and development of renewable energy projects could decisively foster public acceptance, also reducing issues linked to not-in-my-backyard-ism. (Delicado et al., 2016; Friedl & Reichl, 2016; Oikonomou et al., 2009; Prados, 2010; Zaunbrecher & Ziefle, 2016).

Concerning not-in-my-backyard-ism, it appears to take different forms depending on the area and the type of renewable energy technology (Bergmann et al., 2008). Visual impacts are essential in determining public acceptance of wind energy (Mattmann et al., 2016; Strazzera et al., 2012) as well as hydropower projects (Ferrario & Castiglioni, 2017). Place attachment and landscape disruption also play a major role (Caporale & De Lucia, 2015; Prados, 2010; Strazzera et al., 2012), followed by concerns for biodiversity and wildlife (Mattmann et al., 2016). The major not-in-my-backyard issue linked to the deployment of large-scale solar energy plants is related to the loss of cropland and farmland (Delfanti et al., 2016), followed by, again, landscape disruption and concerns for animals and biodiversity (Delfanti et al., 2016; Tsoutos et al., 2005). Concerns related to a possible loss of property value due to the construction and installation of renewable energy plants nearby are grounded (Droes & Koster, 2016) but heterogeneous (Delicado et al., 2016). Since different communities living close to renewable energy plants experience different levels of public acceptance, it appears proximity is not necessarily a driver of opposition (Delicado et al., 2016). Differences may however be explained by land value (van der Horst, 2007). Indeed, people living in land degraded areas may be more likely to experience low levels of opposition, thinking that renewable energy installations may increase the value of the land. On the contrary, people living in beautiful, highly characteristics or archeologically relevant rural areas are more likely to oppose renewable energy. (Strazzera et al., 2012; van der Horst, 2007).

In this sense, regarding Southern-Europe and Italy, it appears an optimal solution to not-in-my-backyard-ism could imply the deployment of large-scale solar or wind energy plants in areas with poor or contaminated land not suitable for agriculture. This would increase land value, also removing the stigma associated with living in a degraded area, without incurring in issues linked to landscape disruption or place attachment, while exploiting a large renewable energy potential. (Perpina Castillo et al., 2016). Another solution to not-in-my-backyard-ism is related to the establishment of the so-called agrivoltaic systems. By combining food and solar energy production, competition over land use could be solved, fostering public acceptance. (Brudermann et al., 2013; Dupraz et al., 2011). Despite the benefits, agrivoltaic systems are still uncommon, being inherently linked to network effects (Brudermann et al., 2013). In this sense, support could come from cooperatives (Heras Saizarbitoria et al., 2011).

Further, public opinion is influenced by the environmental, economic and social impacts of renewable energy deployment. From an environmental point of view, apart from the benefits coming from the lowered level of local pollution, negative – to a certain extent – impacts seem to be linked to all renewable energy technologies, including also the largely preferred solar power (Bartolozzi et al., 2017; Bravi & Basosi, 2014; Delfanti et al., 2016; Otero et al., 2012; Tsoutos et al., 2005; Turney & Fthenakis, 2011). Indeed, a high level of land use is linked to large-scale solar power plants (Delfanti et al., 2016; Prados; Tsoutos et al., 2005; Turney & Fthenakis, 2011); concerns for water usage are linked to geothermal energy (Bartolozzi et al., 2017; Bravi & Basosi, 2014); landscape disruption is linked to wind power (Caporale & De Lucia, 2015; Otero et al., 2012; Prados, 2010). However, in general, it seems environmental benefits in terms of cleaner air outweigh the listed environmental harms, even more if the impact of renewable energy plants is compared with the negative effects caused by fossil fuel-based plants (Turney & Fthenakis, 2011).

From an economic point of view, the perception of the costs linked to renewable electricity is among the most relevant factors influencing public opinion (Hujits et al., 2012). In general, it appears renewable energy deployment is linked to lower wholesale electricity prices (Clò et al., 2015; Gelabert et al., 2011; Saenz de Miera et al., 2008), in contrast with the widespread idea that "renewables are expensive" (Saenz de Miera et al., 2008; Gullì & Balbo, 2015). Those lower prices are due to a decreased reliance on imported fossil fuels and higher domestic or local electricity supply (Burgos-Payan et al., 2013). Comparing the costs of subsidising renewable energy deployment through large public investments – as happened in Italy and Spain – and the benefits arising from the monetary savings linked to the lower wholesale electricity prices, results are more ambiguous and depend on the different renewable energy technologies (Clò et al., 2015; Ortega Izquierdo & del Rio, 2016). In general, it appears wind energy and hydropower more than repaid the investment; negative results are linked to solar energy and bioenergy (Clò et al., 2015; Ortega Izquierdo & del Rio, 2016). However, if environmental and employment benefits are also considered, the positive renewable energy impacts should more than compensate for the large upfront investment (Saenz de Miera et al., 2008).

Aside from costs perception, households' willingness to pay for a higher share of renewable energy in their electricity consumption is largely investigated. In general, evidence is heterogeneous, with studies finding a high (Vecchiato & Tempesta, 2015; Zografakis et al., 2010) and low (Gracia et al., 2012) willingness to pay in Southern-European countries. Overall, a higher willingness to pay is registered with respect to solar energy (Gracia et al., 2012; Vecchiato & Tempesta, 2015).

From the point of view of the regional economies and local communities, renewable energy is found to be profoundly beneficial in every aspect (Magnani & Vaona, 2013; Ohler & Fetters, 2014; Paiano & Lagioia, 2016). Local development can also benefit from a fostered tourism, attracted by areas characterised by high levels of sustainability (Cucculelli & Goffi, 2016; Manologlou et al., 2004; Michalena & Tripanagnostopoulos, 2010; Tampakis et al., 2013). This appears as particularly relevant for the Mediterranean islands, where the reliance on tourism and the need to shift completely towards renewable energy sources is even higher than on the mainland (Andaloro et al., 2012; Cosentino et al., 2012; Giatrakos et al., 2009; Kaldellis et al., 2012; Manologlou et al., 2004; Riva Sanseverino et al., 2014; Tampakis et al., 2013; Vicinanza et al.).

Thus, the literature highlights the presence of several factors influencing public opinion and perception, fostering acceptance or opposition, causing a certain degree of heterogeneity in public attitude towards renewable energy and the establishment of related projects in Southern-Europe and Italy. The main drivers of public opinion, as said, are found to be: not-in-my-backyard-ism and related issues; perception of economic impacts; perception of social impacts; perception of environmental impacts and perception of the different renewable energy technologies; employment effects and perception of renewable energy jobs; level of awareness and knowledge concerning renewable energy.

Those identified drivers of public opinion are the focus of the survey employed in this study and are explained in detail in the following sections.

2. SURVEY

In order to study public opinion and perception, implementing a survey represented the most logical and effective choice. As anticipated, among Southern-European countries, due to feasibility reasons and with the aim to restrict the scope of the analysis, Italy was selected as case study. The survey, designed for pc and smartphone and available in both English and Italian, was exclusively distributed via internet through messaging apps, social networks and emails, following the guidelines offered by the relevant literature (Alessi & Martin, 2010; Couper et al., 2004; Fan & Yan, 2010; Groves et al., 2004; Heerwegh et al., 2005; Sauermann & Roach, 2013; Vicente & Reis, 2010). In order to avoid issues linked to same respondents completing multiple surveys, the IP was tracked, although everything remains completely anonymous.

Thus, 864 complete responses – and 85 uncomplete responses – from Italian individuals currently residing in Italy were collected, recording a more than favourable 91% completion rate. This means that out of 10 individuals opening the survey on their mobile or laptop, more than 9 of them made it to the end – despite the recorded average duration necessary to complete the survey, excluding outliers, averaging 8 minutes. With internet-based surveys usually facing strong levels of break-off with respect to face-to-face or phone interviews (Fan & Yan, 2010; Fricker, 20005; Heiervang & Goodman, 2009; Groves, 2006; Kaplowitz et al., 2004; Manfreda et al., 2008; Shih & Fan, 2008; Vicente & Reis, 2010), the reasons for this highly satisfying result are likely to be found in the accurate and user-friendly survey design as well as in the general public interest for the subject being analysed (Alessi & Martin; Fan & Yan, 2010; Groves et al., 2004; Vicente & Reis, 2010).

Indeed, even if it was not required or requested, a highly positive feedback emerged. It seems many respondents did not only complete the survey but apparently forwarded the survey to their families, colleagues, friends or social media groups in large numbers. Few inputs were needed to start chain reactions of responses. This may be explained by the fact that the survey was conducted during the COVID-19 full lockdown, which was particularly strict in Italy. People may have been more willing to take or share surveys, already spending more time than normal chatting with relatives and friends and thus making it easier and quicker to forward the survey. The high completion rate is however likely to be an effect of, as said, the general public interest for the subject and the user-friendly survey design.

In fact, technical language was avoided as much as possible; personalized invites were sent whenever applicable; the survey was optimized for mobile use; the importance of visual impacts was addressed by choosing pleasant fonts and background colours; no scroll or next button were needed, with the survey automatically moving to the next question; respondents never had to manually enter text; no matrix tables were included. To conclude, a certain number of respondents even wrote back asking for more information on the subject or demanding to receive the final highlights of the survey; others shared their disappointment concerning how unexpectedly little they knew about the subject and their willingness to learn more about it.

Thus, the survey is structured as follows, with some questions being inspired by Ribeiro et al. (2014) and Vecchiato (2014). First, socio-demographic characteristics of respondents are collected, namely age, gender, level of education, region of origin (N.B. Italy is divided into 20 regions) and degree of knowledge regarding renewable energy (N.B. this socio-demographic characteristic is derived from a multiple-choice question where respondents are asked to select renewable energy sources among a set of choices including non-renewable and dirty energy sources). Then, a second part analyses the respondents' perception of renewable energy development at the national, regional and sub-regional level (i.e. province), as well as their attitude towards a further deployment of renewable energy at all three levels. Further, reasons behind not-in-my-backyard-ism are investigated at the sub-regional level. Following, a third part analyses the economic impacts of renewable energy deployment, focusing on the perception of electricity costs and respondents' willingness to pay; then, the perception of environmental impacts is studied, allowing to diversify among the different renewable energy technologies; the perception of social impacts is also investigated, including the idea of benefits for the local communities. Then, a fourth part focuses on renewable energy jobs, analysing respondents' perception with respect to several jobs' characteristics and overall jobs quality. The attitude towards the so-called jobs killing argument is also analysed. To conclude, the last questions concern the level of respondents' perceived knowledge regarding the issues highlighted by the survey.

This structure allowed to study respondents' public opinion on renewable energy and related implications by collecting information about their perception of different sub-fields inherently linked to the world of renewable energy. Thus, public opinion is derived from public perception. Those already cited sub-fields being analysed are, as seen: not-in-my-backyard-ism and related issues; perception of economic impacts; perception of social impacts; perception of environmental impacts and perception of the different renewable energy technologies; employment effects and perception of renewable energy jobs; level of awareness and knowledge concerning renewable energy.

This structure, however, did not allow to truly diversify among renewable energy technologies. Indeed, all questions consider renewable energy technologies as a unique bloc. Although this can be seen as a limit of this study, the intention was exactly to grasp the overall public perception and attitude towards renewable energy – i.e. all renewable energy technologies. Comparing public perception of the different renewable energy technologies, including in this analysis the study of public opinion related to the different renewable energy technologies, would have required a definitely longer survey, increasing the likelihood of a low completion rate. Anyway, one question tries to address this issue by asking respondents to rank renewable energy technologies in terms of environmental friendliness, thus allowing to make a general comparison among renewable energy technologies and relate public opinion when it comes to environmental impacts.

The main difficulty, rather than on survey design or structure, lied on spreading collection responses across as many regions as possible. With the survey collection being exclusively internet-based and relying on people forwarding the survey to other people, it was indeed hard to reach a balanced amount of responses from different areas of Italy. In the end, although with a prominent portion of answers coming from the central region of Emilia-Romagna – the region where the author is from and where a higher number of responses was more achievable –, the aim was reached. In this sense, more will be explained in the following sections, while statistically analysing socio-demographics and questions results. For now, the survey questions are reported using the English version. Variables names are reported in square brackets.

Part 1: Socio-demographic characteristics.

I) Age [AGE]
0-18; 19-29; 30-39; 40-49; 50-59; 60-69; 70-79; >80

II) Gender [GEN]
Male; Female

III) Education [EDU]
No high-school diploma; High-school diploma; Undergraduate degree; Graduate degree; Postgraduate degree/Doctorate

IV) Region [REG]
Abruzzo; Basilicata; Calabria; Campania; Emilia-Romagna; Friuli-Venezia Giulia; Lazio; Liguria; Lombardia; Marche; Molise; Piemonte; Puglia; Sardegna; Sicilia; Toscana; Trentino-Alto Adige; Umbria; Valle d'Aosta; Veneto

V) Which of the following energy sources are renewables? [KNOW] [2] [3]
Wind, solar; bioenergy; natural gas; hydropower; coal; geothermal; oil; none of the above; all of these

Part 2: Perception of renewable energy development and attitude towards further renewable energy deployment, including not-in-my-backyard-ism.

I) To what extent do you think renewable energy is developed in your country? [DEV_c]
Definitely underdeveloped; Underdeveloped; Normal; Developed; Definitely developed
Note: most questions report possible answers on a 1-5 scale, from the most negative to the most positive answer, as in this case

II) To what extent do you think renewable energy is developed in your region? [DEV_r]
Definitely underdeveloped; Underdeveloped; Normal; Developed; Definitely developed

III) To what extent do you think renewable energy is developed in your province? [DEV_p]
Definitely underdeveloped; Underdeveloped; Normal; Developed; Definitely developed

IV) In your opinion, should more renewable energy plants be deployed in your country? (Think about the construction of solar plants, geothermal power plants, biomass power plants, hydropower plants, wind farms in your country) [NIMBY_c]
Definitely disagree; Disagree; Indifferent; Agree; Definitely agree

V) In your opinion, should more renewable energy plants be deployed in your region? (Think about the construction of solar plants, geothermal power plants, biomass power plants, hydropower plants, wind farms in your region) [NIMBY_r]
Definitely disagree; Disagree; Indifferent; Agree; Definitely agree

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[2] Answers were displayed in randomized order to respondents with the aim to lower the likelihood of starting point bias.
[3] As said, this question was designed to obtain a socio-demographic characteristic that could truly identify respondents with good or bad knowledge concerning renewable energy.

VI) In your opinion, should more renewable energy plants be deployed in your province? (Think about the construction of solar plants, geothermal power plants, biomass power plants, hydropower plants, wind farms in your province) [NIMBY_p]
Definitely disagree; Disagree; Indifferent; Agree; Definitely agree

VII) Among the following, which are the most relevant reasons why you may disagree with a further construction of renewable energy plants in your province? [NIMBY_why] [4] [5]
Noise;
Place attachment (you don't want your surroundings to change);
Bad smell;
Loss of cropland and farmland (the land is occupied by the renewable energy plants);
Danger for wildlife and biodiversity;
Loss of property value (you fear your house will lose value);
Aesthetics (you consider renewable energy installations "ugly");
Landscape disruption (you don't want the landscape to be "ruined");
Other

Part 3: Perception of economic, environmental and social impacts of renewable energy deployment.

I) In terms of costs, what do you think about renewable electricity compared to non-renewable electricity? [ECON_cost]
Definitely more expensive; Slightly more expensive; Same cost; Slightly less expensive; Definitely less expensive

II) To what extent would you be willing to pay more in order to have greener electricity? (Think about the electricity you/your household consumes) [ECON_wtp]
Definitely not willing; Not willing; Indifferent; Willing; Definitely willing

III) In your opinion, to what extent renewable energy installations can be beneficial for the surrounding environment? (Think about the impact on pollution, land, nature...) [ENV_env]
Definitely not beneficial; Not beneficial; Indifferent; Beneficial; Definitely beneficial

IV) According to you, rank the following energy sources in terms of environmental impact (1 = most environmental-friendly; 5 = Least environmental-friendly) [ENV_rankbio] [ENV_ranksun] [ENV_rankhydro] [ENV_rankgeo] [ENV_rankwind] [6] [7]
Biomass; Solar; Hydropower; Geothermal; Wind

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[4] Answers were displayed in randomized order to respondents with the aim to lower the likelihood of starting point bias.
[5] This question was designed to analyse the motives behind the issue of not-in-my-backyard-ism – or rather not-in-my-province-ism. For this reason, it was displayed solely to respondents having answered to the previous question (VI) with *Definitely disagree*, *Disagree* or *Indifferent*, thus opposing or somehow not supporting a further deployment of renewable energy in their own province.
[6] Respondents had to drag and drop answers in order to rank them; this was the only question requiring a minimal level of effort.
[7] As anticipated, this question is useful to evaluate the attitude and opinion of respondents towards the different types of renewable energy technologies.

V) In your opinion, to what extent renewable energy can be beneficial in terms of improving your quality of life? [SOC_life]
Definitely not beneficial; Not beneficial; Indifferent; Beneficial; Definitely beneficial

VI) In your opinion, to what extent the deployment of renewable energy is beneficial for the local community? (Think about the impact on employment, commercial businesses, property value, tourism...) [SOC_comm]
Definitely not beneficial; Not beneficial; Indifferent; Beneficial; Definitely beneficial

Part 4: Perception of renewable energy jobs and attitude towards the jobs-killing argument.

I) What do you think about the salaries paid to employees in the renewable energy sector? [JOB_wage]
Very low salaries; Low salaries; Normal salaries; High salaries; Very high salaries

II) What do you think about the duration of the contracts in the renewable energy sector? (Think about job stability) [JOB_dur]
Mostly temporary jobs; More temporary then permanent jobs; Equally temporary and permanent jobs; More permanent than temporary jobs; Mostly permanent jobs

III) What do you think about the skills required to work in the renewable energy sector? [JOB_skill]
Mostly low-skills jobs (ex. construction workers); More low-skills than high-skills jobs; Equally low-skills and high-skills jobs; More high-skills jobs than low-skills jobs; Mostly high-skills jobs (ex. engineers)

IV) What do you think about the ability of renewable energy to lead to net jobs creation? (the idea that jobs created within the renewable energy sector are more than jobs destroyed within other sectors) [JOB_kill]
Definitely more jobs destroyed than created; Slightly more jobs destroyed than created; No net effect; Slightly more jobs created than destroyed; Definitely more jobs created than destroyed

V) Overall, what do you think about the quality of the jobs offered by the renewable energy sector? (Think about wages, job stability, tasks, safety...) [JOB_qual]
Very low-quality jobs; Low-quality jobs; Normal; High-quality jobs; Very high-quality jobs

Part 5: Respondents' perceived knowledge concerning renewable energy and related issues.

I) In general, how often do you hear/read/talk about renewable energy? (Consider TV, newspapers, social media, conversations with family, friends, colleagues...) [INFO_hrt]
Very rarely; Rarely; Sometimes; Often; Very often

II) While answering the questions, did you feel you had good knowledge about renewable energy sources? [INFO_ren]

Very limited knowledge; Little knowledge; Enough knowledge; More than enough knowledge; Great knowledge

III) While answering the questions, did you feel you had good knowledge about renewable energy jobs? [INFO_job]
Very limited knowledge; Little knowledge; Enough knowledge; More than enough knowledge; Great knowledge

With this in mind, it is possible to proceed with the analysis of the survey responses. First, frequency tables display the descriptive statistics for the socio-demographic characteristics employed in the study (from Table 1 to Table 5); Table 6 report p-values obtained from all socio-demographic contingency tables (see Appendix – Section A for the full contingency tables) by testing for Pearson's chi-square test and Fisher's exact test. The resulting discussion encompasses comments on possible multicollinearity issues.

Then, the attention shifts to survey responses, which are commented and statistically analysed on a question-by-question basis. For each question, graphs (from Figure 12 to Figure 23) are uniformly built using a scale of colour ranging from red to green, passing through yellow, allowing to rapidly understand how answers are distributed (see Appendix – Section B for all frequency tables). Thus, results of the statistical analysis are summarised in tables. Table 12 reports all p-values obtained by performing univariate analysis, testing answers to each question for Pearson's chi-square, Fisher's exact, Kruskal-Wallis and Wilcoxon-Mann-Whitney tests. More tables summarise outputs from the full ordered logistic regressions performed (from Table 7 to Table 11) (see Appendix – Section C for each question's ordered logistic regressions, adding socio-demographic characteristics one at a time).

The resulting discussion, performed on a question-by-question basis, is divided according to the different and already identified drivers of public opinion: not-in-my-backyard-ism and related issues; perception of economic impacts; perception of social impacts; perception of environmental impacts and perception of the different renewable energy technologies; employment effects and perception of renewable energy jobs; level of awareness and knowledge concerning renewable energy.

2.1 Socio-demographic characteristics

As said, 864 suitable complete responses were collected from Italian individuals currently residing in Italy. Regarding the socio-demographic characteristics taken into account, age, gender, level of education and region of origin of respondents have been recorded. The level of renewable energy knowledge of respondents has been derived from a survey question.

The age of respondents has been divided into three levels (Table 1): younger respondents, from 0 to 29 years old; middle-aged respondents, between 30 and 59 years old; older respondents, above 60 years old. In other words, the age of respondents has been divided so that the different levels can contain respondents from three different layers of society with usually diverging views: sons (0-29), parents (30-59) and grandparents (60+). All respondents specified their gender as male or female (Table 2).

The level of education of respondents has been divided as well into three levels (Table 3): respondents holding high-school diploma or no high-school diploma; respondents holding undergraduate or graduate degrees; respondents holding post-graduate degrees. Since only 17 respondents holding no high school diploma completed the survey, they have been included in the first level. This means that respondents turned out as generally quite educated and this limitation has to be taken into account while considering the results.

As already said, due to the high volume of responses collected from the region of Emilia-Romagna compared to the others, the region of origin of respondents has been divided into three main groups (Table 4): Northern-Italy, including respondents from the Northern regions (Valle d'Aosta, Piemonte, Liguria, Lombardia, Trentino-Alto Adige, Friuli-Venezia Giulia, Veneto); Emilia-Romagna; Central & Southern Italy, including respondents from the Central and Southern regions (Toscana, Marche, Umbria, Lazio, Abruzzo, Molise, Basilicata, Puglia, Campania, Calabria, Sicilia, Sardegna). In this sense, it is worth underlining that Italy is characterized by deep historical, economic, social and cultural differences between Northern and Central-Southern regions. The main exception is Emilia-Romagna, which is often considered as half in Northern Italy (Emilia) and half in Central Italy (Romagna). Thus, by dividing this way the region of origin of respondents, the three groups created are expected to be rather heterogeneous – between them – and homogeneous – within them. Results from Emilia-Romagna can also represent a separate case study confirming (or not) a general national trend. More discussion in this direction is however left to the dedicated section.

As said, the level of renewable energy knowledge of respondents (Table 5) has been derived from a multiple-choice question at the beginning of the survey. Respondents have been asked: "In your opinion, which of the following energy sources are renewables?". The possible answers, displayed to each respondent in randomized order with the aim to avoid biases, included: sun, wind, hydro (water), biomass, oil, coal, natural gas, geothermal heat, all of them or none of them. Nuclear energy was not included as all nuclear energy plants in Italy have been completely phased out after the Chernobyl disaster (Dipartimento per gli Affari Interni e Territoriali). The derived level of renewable energy knowledge had been considered as "bad" whenever the answers included a non-renewable energy source – for instance, 91 out of 864 respondents, more than 10% of them, selected natural gas. "Bad" level of renewable energy knowledge was also attributed to respondents missing to include at least one among sun or wind, thus not recognizing solar and wind energy as renewables. Therefore, "good" and "bad" level of renewable energy knowledge has been derived as a further socio-demographic characteristic (Table 5). Results used to derive the socio-demographic are displayed in Figure 11. The figure shows how many times each energy source was selected. Since the question was a multiple choice and allowed an unlimited number of answers, the figure should be interpreted simply as a display of which energy sources are most widely considered as renewables.

Figure 11: In your opinion, which of the following energy sources are renewables?

Highlights from the frequency tables below (from Table 1 to Table 5) show that, concerning the age of respondents, the majority of them are almost equally distributed among young or middle-aged, with the remaining 15.5% being older than 60 years old (Table 1). Concerning gender, females, 60%, are more than men, 40% (Table 2). Regarding the level of education, 69% of respondents hold a university degree. Respondents holding only a high school diploma, 31%, are almost twice as many as those holding a post-graduate degree, 16% (Table 3). Concerning the region of origin, respondents from Emilia-Romagna make up for, as anticipated, almost half of the sample. The remaining half is divided equally among Northern Italy and Central & Southern Italy (Table 4). Further, the percentage of respondents recording a "good" level of renewable energy knowledge is almost 70% (Table 5).

Table 1: Age of respondents

Age	Freq.	Percent	Cum.
Younger (0-29)	391	45.25	45.25
Middle-aged (30-59)	339	39.24	84.49
Older (60+)	134	15.51	100
Total	864	100	

Table 2: Gender of respondents

Gender	Freq.	Percent	Cum.
Male	346	40.05	40.05
Female	518	59.95	100
Total	864	100	

Table 3: Level of education of respondents

Education	Freq.	Percent	Cum.
High school diploma	267	30.9	30.9
Undergraduate & Graduate	456	52.78	83.68
Post-Graduate	141	16.32	100
Total	864	100	

Table 4: Region of origin of respondents

Region	Freq.	Percent	Cum.
Northern Italy	200	23.15	23.15
Emilia-Romagna	456	52.78	75.93
Central & Southern-Italy	208	24.07	100
Total	864	100	

Table 5: Derived level of renewable energy knowledge of respondents

Knowledge	Freq.	Percent	Cum.
Good	593	68.63	68.63
Bad	271	31.37	100
Total	864	100	

In order to see whether statistically significant relationships arise, socio-demographic characteristics have been tested employing Pearson's chi-square and Fisher's exact tests (Table 6).

It appears statistically significant association exists between the age of respondents and their level of education (p=0.000, Pearson's chi-square). This is however due to the mere nature of the two socio-demographic characteristics: younger respondents may be too young to have access to university – in case they are under 18 years old – and, even more, to have completed post-graduate degrees; similarly, older respondents are more likely, with respect to younger respondents, to hold post-graduate degrees. Indeed, the related contingency table (Appendix – Section A – Table A2) shows that, for the reasons expressed above, only 7% of younger respondents hold a post-graduate degree. At the same time, 58% of those holding a post-graduate degree are middle-aged, while 50% of those holding an undergraduate or graduate degree are younger respondents. Similarly, almost half of those holding only a high-school diploma (or less) are younger respondents. This is because, among them, 15% are less than 18 years old, while others may have not completed yet undergraduate degrees. Thus, as said, this socio-demographic association between the age and the level of education of respondents should be merely explained by the fact that younger respondents may have not completed yet their educational path, and should not be considered as a sample selection bias.

Another statistically significant association arises between the age of respondents and their region of origin (p=0.001, Pearson's chi-square). In this case, it appears 69% of older respondents are from Emilia-Romagna (Appendix – Section A – Table A3). This may be explained by the fact that older respondents are generally less likely to take surveys via smartphone, social media or even laptops, being overall less digital-friendly. Thus, more responses from older individuals have been recorded in Emilia-Romagna, where, as said, it was easier for the author to collect completed surveys. In any case, this could be considered as a possible sample selection bias.

The last statistically significant association occurs between the gender of respondents and their level of renewable energy knowledge (p=0.000, Pearson's chi-square). Indeed, it appears 71% of the respondents recording a "bad" level of renewable energy knowledge are females (Appendix – Section A – Table A7).

Concerning all other possible relationships between socio-demographic characteristics, tested using Pearson's chi-square and Fisher's exact tests, no statistically significant associations arise (Table 6). Thus, there is no statistically significant relationship between: the age of respondents and their gender (p=0.588) (see Appendix – Section A – Table A1); the age of respondents and their level of renewable energy knowledge (p=0.938) (see Appendix – Section A – Table A4); the gender of respondents and their level of education (p=0.155) (see Appendix – Section A – Table A5); the gender of respondents and their region of origin (p=0.122) (see Appendix – Section A – Table A6); the level of education of respondents and their level of renewable energy knowledge (p=0.101) (see Appendix – Section A – Table A9); the region of origin of respondents and their level of renewable energy knowledge (p=0.338) (see Appendix – Section A – Table A10). The relationship between the level of education of respondents and their region of origin is poorly significant at the 10% significance level (p=0.086) (see Appendix – Section A – Table A8).

Table 6: Socio-demographic contingency tables p-values (see Appendix – section A for full tables: from table A1 to table A10), testing for Pearson's chi-square test and Fisher's exact test

Pearson's chi-square [Fisher's exact]					
	Age	**Gender**	**Education**	**Region**	**Knowledge**
Age	-	p=0.588 [0.599]	p=0.000***	p=0.001***	p=0.938 [0.945]
Gender	-	-	p=0.155 [0.155]	p=0.122 [0.122]	p=0.000*** [0.000]
Education	-	-	-	p=0.086*	p=0.101 [0.102]
Region	-	-	-	-	p=0.338 [0.336]
Knowledge	-	-	-	-	-

Overall, the presence of the highlighted statistically significant relationships between some socio-demographic characteristics may mean that those socio-demographic characteristics are related. In turn, this may give rise to multicollinearity issues and influence estimates obtained from the ordered logit models employed in the following section. In order to account for this as well as in order to avoid biased results, while running the ordered logistic regressions on a question-by-question basis (from Table 7 to Table 11), socio-demographic characteristics are added one at a time (see Appendix – Section C – from Table C1 to Table C24), checking for sudden changes in statistical significance of p-values and comparing them with those obtained from univariate tests, namely: Pearson's chi-square, Fisher's exact, Kruskal-Wallis and Wilcoxon-Mann-Whitney test (Table 12).

Based on the statistical analysis, it is already possible to anticipate that the highlighted multicollinearities do not have an influence on the obtained estimates or on the significance of regression results (Appendix – Section C – from Table C1 to Table C24), since for each question no sudden changes in the level of significance are recorded as more socio-demographic characteristics are included in the models. Thus, we can focus on Tables 7 to 11, summarising p-values obtained from the full ordered logistic regressions, and Table 12, reporting p-values obtained from the already cited tests.

3. DISCUSSION OF RESULTS

This section contains the discussion and statistical analysis of survey results, proceeding on a question-by-question basis and, as anticipated, grouping questions in accordance with the already identified drivers of public opinion: not-in-my-backyard-ism and related issues; perception of economic impacts; perception of social impacts; perception of environmental impacts and perception of the different renewable energy technologies; employment effects and perception of renewable energy jobs; level of awareness and knowledge concerning renewable energy. First, results are commented referring to the graphs (from Figure 12 to Figure 23) (see Appendix – Section B – from Table B1 to Table B25 for all questions frequency tables); then comments concerning the statistical analysis refer to the tables reporting logistic regression outputs (from Table 7 to Table 11) (see Appendix – Section C – from Table C1 to Table C25) and the table summarising p-values obtained by testing for Pearson's chi-square, Fisher's exact, Kruskal-Wallis and Wilcoxon-Mann-Whitney (Table 12).

3.1 Not-in-my-province-ism

Respondents are first asked to what extent they think renewable energy is developed at the national, regional and sub-regional level (Figure 12).[8] This is to test whether perception of high (low) renewable energy development may be coupled with high (low) levels of not-in-my-backyard-ism (Caporale & De Lucia, 2015; Kaldellis, 2005). Indeed, it may be possible that perception of poor renewable energy development may lead people to accept more easily new renewable energy installations, while perception of already widespread development may lead people to oppose further installations (Caporale & De Lucia, 2015; Kaldellis, 2005). Therefore, respondents are asked whether more renewable energy plants should be deployed in Italy, in their region and in their province (Figure 13). Since a good portion of respondents was expected to have a somehow poor or imprecise idea of renewable energy (Figure 11), and since many respondents were expected to only consider solar and wind energy (Figure 11), the questions clearly state that respondents should "think about the construction of solar plants, geothermal power plants, biomass power plants, hydropower plants, wind farms in your country/region/province". The aim is to test whether the level of opposition grows (or not) moving from the national to the provincial level, thus implying (or not) a certain degree of not-in-my-backyard-ism, in this case expressed in the form of not-in-my-province-ism.

Survey results (Figure 12) show that the majority of respondents generally perceive renewable energy as poorly developed at all levels. Among them, a slightly less poor perception of renewable energy development is recorded at the regional level. In all cases, however, less than 10% of respondents perceive renewable energy as developed or definitely developed; on the contrary, between 60% and 70% of respondents perceive that renewable energy is underdeveloped or definitely underdeveloped.

Results show also that respondents are largely in favour of a further deployment of renewable energy and construction of renewable energy plants at all levels (Figure 13). At the national and regional level, an outstanding 97% of respondents agree with a further deployment of renewable energy plants. As expected, the share of respondents opposing a further deployment of renewable

[8] The regional and sub-regional levels refer to the region and province the respondent lives in.

energy plants slightly rises when it comes to the provincial level, although 95% of respondents remain in favour. An explanation for those surprising results may lie on the fact that most respondents are likely to live in cities and thus may be less affected or may not experience any impact from the construction of more renewable energy plants. This is however just a hypothesis. Indeed, it has to be recognized that, in this sense, a limitation of the survey lies on the fact that respondents were not asked whether they lived in cities, small towns or countryside/mountain/seaside. This would have helped when it comes to explain results reported in Figure 13.

In any case, those results are outstanding (Figure 13) and already allow us to draft some conclusions. Italian individuals perceive renewable energy as strongly underdeveloped (Figure 12) and, as expected and anticipated, this in fact translates into an extremely low level of not-in-my-backyard-ism or not-in-my-province-ism (Figure 13). Indeed – and this was not expected – this form of not-in-my-backyard-ism seems almost non-existent, with respondents being in favour of the construction of renewable energy plants in their province almost as much as at the national level. In other words, respondents seem to positively view the construction of more renewable energy plants regardless of their location and defying all expectations related to not-in-my-backyard issues.

Figure 12: To what extent do you think renewable energy is developed in your country/region/province? [DEV_c] [DEV_r] [DEV_p]

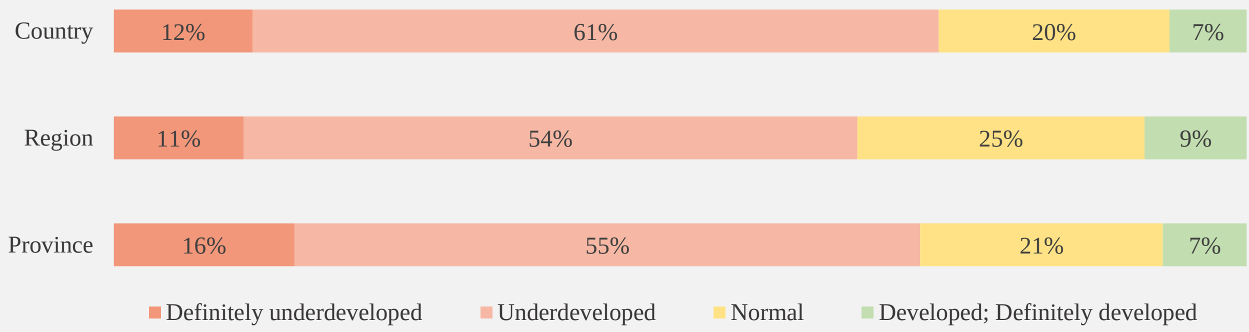
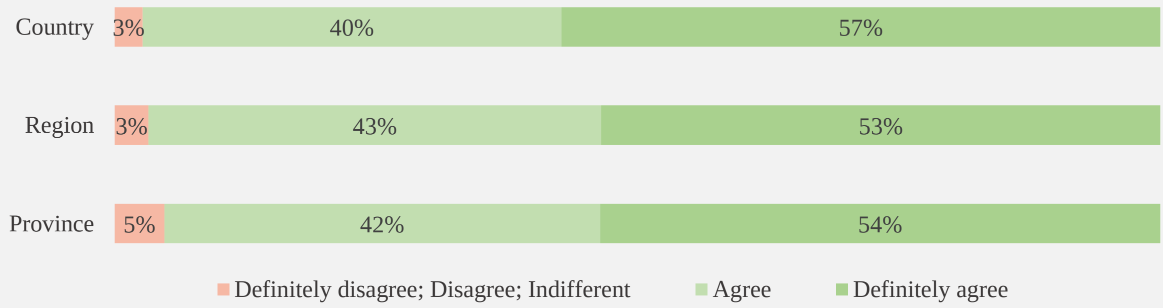


Figure 13: Should more renewable energy plants be deployed in your country/region/province? [NIMBY_c] [NIMBY_r] [NIMBY_p]



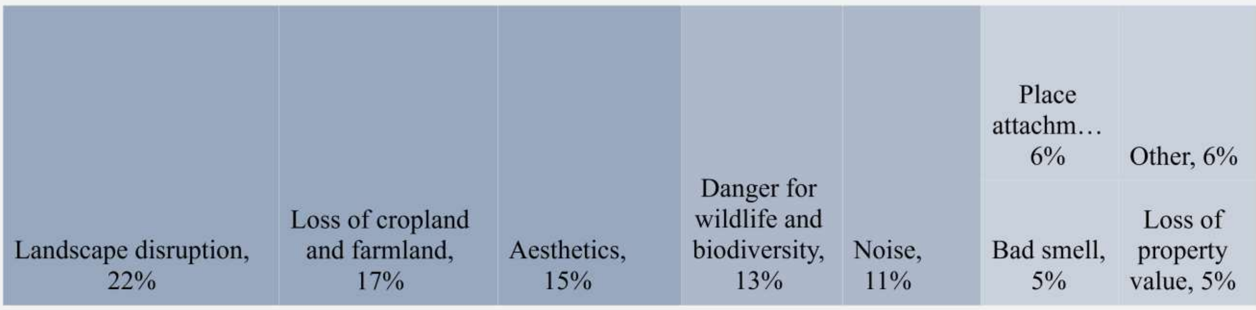
Concerning those issues (Figure 14), the 5% of respondents that exhibited some level of not-in-my-backyard-ism are asked for which reasons they are against a further construction of renewable energy plants in their province, with the possible options being based on evidence emerging from the literature (see the Literature Review section).

Among those possible options, visual impacts play, as expected, a central role (Caporale & De Lucia, 2015; Delfanti et al., 2016; Ferrario & Castiglioni, 2017; Mattmann et al., 2016; Prados, 2010; Strazzera et al., 2012; Tsoutos et al., 2005). Indeed, the not-in-my-province-ism experienced by respondents can be largely explained by the issue of landscape disruption and other aesthetic reasons – in total, they make up for 37% of recorded not-in-my-province-ism issues. This may be explained by the fact that Italy is well-known for its beautiful landscapes and highly-characteristic areas, whose preservation could create room for forms of not-in-my-backyard-ism (Strazzera et al., 2012; van der Horst, 2007). Indeed, in this sense, a further 6% of recorded not-in-my-province-ism seems to be explained by place attachment, meaning that people do not want the place where they live to change (Caporale & De Lucia, 2015; Strazzera et al., 2012).

Another large portion of not-in-my-province-ism, second only to landscape disruption, is explained, as expected, by the fear of a possible loss of cropland and farmland as well as by the possible danger for wildlife and biodiversity (Delfanti et al., 2016; Mattmann et al., 2016; Tsoutos et al., 2005), respectively making up for 17% and 13% of recorded not-in-my-province-ism. Further, noise and bad smell make up for, respectively, 11% and 5% of recorded not-in-my-province-ism. Another 5% is explained by concerns related to a possible loss of property value due to the construction and installation of renewable energy plants.

Overall, it appears expectations were well-grounded: the surprisingly small portion of respondents being against a further construction of renewable energy plants in their province mainly explain their not-in-my-backyard-ism through concerns related to visual impacts, landscape disruption and loss of cropland and farmland (Figure 14).

Figure 14: Which are the most relevant reasons why you may disagree with a further construction of renewable energy plants in your province? [NIMBY_why]



The statistical analysis shows that, at the national level, the perception of renewable energy development differs significantly among respondents depending on their age (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis) and gender (p=0.007, Pearson's chi-square; p=0.002, Kruskal-Wallis) (Table 12). The ordered logit model confirms those findings showing that, as age increases, middle-aged and older respondents are more likely than younger ones to perceive renewable energy as poorly developed (99% confidence interval, Table 7). Similarly, compared to males, females seem to generally perceive renewable energy as less developed (99% confidence interval, Table 7). When it comes to the level of education, the ordered logistic regression further shows that respondents holding a post-graduate degree have, compared to those holding only high school diploma, a more positive perception of renewable energy development (95% confidence interval, Table 7).

Similar results apply to the regional level, where the perception of renewable energy development differs significantly among respondents depending on their age (p=0.006, Pearson's chi-square; p=0.004, Kruskal-Wallis) and gender (p=0.005, Pearson's chi-square; p=0.025, Kruskal-Wallis) (Table 12). Less but still significant differences in how the question is answered arise also while checking for the level of education of respondents (p=0.021, Pearson's chi-square; p=0.078, Kruskal-Wallis) as well as, to a smaller extent, their level of renewable energy knowledge (p=0.080, Pearson's chi-square). Highly significant results in terms of perception of regional renewable energy development emerge when checking for the region of origin of respondents (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis). (Table 12). The ordered logit models confirm those findings showing that, as age increases, middle-aged and older respondents are more likely than younger ones to perceive renewable energy as poorly developed (99% confidence interval, Table 7). Similarly, compared to males, females seem to generally perceive renewable energy as less developed (95% confidence interval, Table 7). Further, respondents holding a post-graduate degree have, compared to those holding only high school diploma, a more positive perception of renewable energy development (99% confidence interval, Table 7). In addition, it appears that respondents from Emilia-Romagna, compared to respondents from Northern Italy as well as Central & Southern Italy, are more likely to perceive renewable energy as well-developed in their region (99% confidence interval, Table 7).

Moving to the provincial level, the perception of renewable energy development differs significantly among respondents – although to a lesser extent than compared to the national and regional level – depending on their age (p=0.081, Pearson's chi-square; p=0.049, Kruskal-Wallis) and gender (p=0.010, Pearson's chi-square; p=0.014, Kruskal-Wallis) (Table 12). Differences concerning the level of education exhibit again a small degree of significance (p=0.087, Kruskal-Wallis). As appeared at the regional level, highly significant differences in terms of perception of renewable energy development at the provincial level emerge when checking for the region of origin of respondents (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis). (Table 12). The ordered logit models confirm that, as age increases, respondents are more likely to perceive renewable energy as poorly developed (99% confidence interval, Table 7), although in this case the statistically significant difference applies only to middle-aged respondents compared to younger ones. As in the previous cases, compared to males, females seem to generally perceive renewable energy as less developed (99% confidence interval, Table 7). When it comes to the level of education, compared to respondents holding only a high school diploma, more educated ones are more likely to have a positive perception of renewable energy development at the provincial level (95% confidence interval for undergraduate and graduate; 99% confidence interval for post-graduate, Table 7). In addition, it appears again that respondents from Emilia-Romagna, compared to respondents from Northern Italy as well as Central & Southern Italy, are more likely to perceive renewable energy as well-developed in their province (99% confidence interval, Table 7).

The statistical analysis also shows that, when respondents are asked whether they would agree or not with a further construction of renewable energy plants in Italy, answers differ significantly among respondents depending on their age (p=0.007, Pearson's chi-square; p=0.002, Kruskal-Wallis) and level of renewable energy knowledge (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis). Significant differences, although to a lesser extent, emerge also depending on the gender of respondents (p=0.017, Pearson's chi-square). (Table 12). The ordered logistic regressions confirm those statistically significant findings, except for the differences related to the gender of respondents.

Indeed, it appears that, as age increases, respondents are more likely than younger ones to oppose or to be slightly less in favour of a further deployment of renewable energy (99% confidence interval, Table 7). The same applies to respondents recording a bad level of renewable energy knowledge, compared to the ones recording a higher level of knowledge (99% confidence interval, Table 7).

When respondents are asked whether they would agree or not with a further construction of renewable energy plants in their region, the statistical tests performed find significant differences in how the question is answered only depending on the level of renewable energy knowledge of respondents (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis). When it comes to the provincial level, the same applies (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis), in addition to a smaller degree of significance related to the age of respondents (p=0.054, Kruskal-Wallis). (Table 12). The ordered logistic regressions confirm those findings showing that a worse level of renewable energy knowledge is more likely to imply that respondents are against a further deployment of renewable energy in their region and province (99% confidence interval, Table 7). Concerning the age of respondents, middle-aged ones appear to be statistically more likely to be against a further construction of renewable energy plants in their region and province, if compared to younger respondents (95% confidence interval, Table 7).

Table 7: Full ordered logistic regression results, question-by-question

	DEV_c	**DEV_r**	**DEV_p**	**NIMBY_c**	**NIMBY_r**	**NIMBY_p**
AGE						
Middle-aged	-0.688***	-0.571***	-0.405***	-0.504***	-0.312**	-0.358**
	(0.154)	*(0.149)*	*(0.148)*	*(0.155)*	*(0.152)*	*(0.151)*
Older	-0.711***	-0.549***	-0.132	-0.561***	-0.210	-0.290
	(0.208)	*(0.195)*	*(0.195)*	*(0.207)*	*(0.204)*	*(0.203)*
GENDER						
Female	-0.431***	-0.333**	-0.365***	0.004	0.068	0.090
	(0.141)	*(0.136)*	*(0.136)*	*(0.145)*	*(0.142)*	*(0.141)*
EDUCATION						
Undergrad & Grad	0.242	0.242	0.308**	0.169	0.202	0.238
	(0.154)	*(0.149)*	*(0.149)*	*(0.157)*	*(0.155)*	*(0.153)*
Post-Grad	0.543**	0.705***	0.593***	0.246	0.242	0.200
	(0.214)	*(0.208)*	*(0.207)*	*(0.217)*	*(0.214)*	*(0.211)*
REGION						
Emilia-Romagna	0.158	0.519***	0.761***	-0.122	-0.130	-0.039
	(0.171)	*(0.168)*	*(0.170)*	*(0.176)*	*(0.172)*	*(0.171)*
Central & South	0.213	-0.324	-0.181	-0.215	-0.260	-0.029
	(0.197)	*(0.199)*	*(0.197)*	*(0.204)*	*(0.200)*	*(0.199)*
KNOWLEDGE						
Bad	-0.111	-0.128	-0.158	-0.611***	-0.558***	-0.575***
	(0.148)	*(0.143)*	*(0.143)*	*(0.151)*	*(0.149)*	*(0.147)*
Observations	864	864	864	864	864	864

Thus, the following conclusions can be drawn concerning not-in-my-backyard-ism and, in this case, not-in-my-province-ism. The majority of respondents generally perceive renewable energy as poorly developed at all levels. This translates into a widespread desire of fostered renewable energy deployment and plants construction, even at the provincial level, indicating that the issues generally linked to not-in-my-backyard-ism play only a minor role in affecting public opinion of renewable energy in Italy. Among those issues, however, visual impacts appear to be the most important.

Evidence coming from the statistical analysis shows that respondents tend to have different perception of renewable energy development as well as different attitudes towards a further renewable energy deployment depending on their age. Indeed, compared to younger respondents, older and, to a greater extent, middle-aged ones generally have a more negative perception of renewable energy development at all levels, while also being more likely to be part of the small fraction of respondents opposing a further construction of renewable energy plants. In general, compared to males, female respondents tend to consider renewable energy as more underdeveloped at all levels. On the contrary, holders of post-graduate degrees, compared to respondents holding only a high school diploma, are more likely to perceive renewable energy as well-developed at all levels. Further, respondents exhibiting a bad knowledge of renewable energy, compared to those showing good knowledge of it, seem more likely to be against a further deployment of renewable energy at all levels. Interestingly, respondents from Emilia-Romagna, compared to respondents from the other areas, seem to perceive renewable energy as more developed, both at regional and provincial level.

3.2 Perception of economic, environmental and social impacts

In this section, the focus shifts to how respondents perceive the economic, environmental and social impact usually linked to renewable energy (see Literature Review). Since the perception of the costs linked to renewable electricity is among the most relevant factors influencing public opinion (Hujits et al., 2012), respondents are first asked how do they perceive the cost of renewable electricity compared to the cost of non-renewable electricity (Figure 15). This is to test whether the idea that "renewables are expensive" is indeed widespread in Italy (Saenz de Miera et al., 2008; Gullì & Balbo, 2015), despite the evidence showing that, in general, renewable energy deployment is linked to lower wholesale electricity prices (Clò et al., 2015; Gelabert et al., 2011; Saenz de Miera et al., 2008).

Then, respondents are asked to what extent they would be willing to pay more in order to have greener electricity (Figure 16), replacing electricity generated using non-renewable energy sources. This is to test whether, as highlighted by the literature, willingness to pay more is indeed largely heterogeneous (Gracia et al., 2012; Vecchiato & Tempesta, 2015; Zografakis et al., 2010). It is important to point out that the question is deliberately non-specific. The idea is to grasp the attitude of respondents regarding the mere idea of "paying more to have greener electricity". This way, another piece of the puzzle composing public attitude towards renewable energy can be derived, this time focusing on the economic and costs-related aspect.

Following, the perception of environmental impacts is investigated, with respondents being asked to what extent they think renewable energy deployment can be beneficial for the surrounding environment (Figure 17). Investigating the perception of environmental impact of renewable energy deployment is necessary due to, apart from the benefits coming from the lowered level of local pollution, the various environmental disruptions caused by renewable energy plants (Bartolozzi et al., 2017; Bravi & Basosi, 2014; Caporale & De Lucia; Delfanti et al., 2016; Otero et al., 2012; Prados, 2010; Tsoutos et al., 2005; Turney & Fthenakis, 2011). The aim is however to understand whether, overall, respondents perceive that the environmental benefits in terms of cleaner air outweigh the listed environmental harms. As previously stated, the choice of not distinguishing among renewable energy technologies comes from the survey design. To compensate for this, as the next section (3.3) shows, respondents are asked to rank renewable energy sources in terms of environmental impact, thus giving us an idea of which renewable energy technologies are valued more or less positively.

Then, the perception of social impacts is investigated, with respondents being asked to what extent they think renewable energy deployment can be beneficial for their own quality of life and for the local communities (Figure 17). With renewable energy found to be profoundly beneficial in every aspect for the local economies (Magnani & Vaona, 2013; Ohler & Fetters, 2014; Paiano & Lagioia, 2016), the aim of those questions is to test whether the public is truly aware of those local benefits.

Survey results (Figure 15) interestingly show that, when it comes to the costs of renewable electricity, respondents equally divide themselves among those considering it more expensive than non-renewable electricity (41%) and those considering it less expensive than non-renewable electricity (42%), with the remaining respondents thinking renewable and non-renewable electricity have the same cost. Therefore, it seems the public is definitely confused when it comes to evaluating the cost of renewable electricity. This confusion may arise as a consequence of countervailing factors such as: the fluctuating prices of fossil fuels and thus non-renewable electricity, the general idea that "renewables are expensive" (Saenz de Miera et al., 2008; Gullì & Balbo, 2015), the subsidies and incentives for renewable electricity offered by the Italian government throughout the last decade. This is however a relevant result, since it highlights that more than 40% of respondents perceive renewable electricity, for reasons that may be highly heterogeneous, as more expensive than non-renewable electricity, creating room for possible negative public opinion. This is even more relevant since it happens despite the evidence emerging from the literature showing that, in general, renewable energy deployment is linked to lower wholesale electricity prices (Clò et al., 2015; Gelabert et al., 2011; Saenz de Miera et al., 2008).

Results also show that the majority of respondents (64%) is willing to pay more in order to have more green electricity in their electricity consumption, with only 21% of respondents being against (Figure 16). This means that, while 42% of respondents think that renewable electricity is more expensive than non-renewable electricity, only 21% of respondents is not willing to pay more in order to have greener electricity, thus implying that perceiving renewable electricity as expensive does not necessarily translate in a lack of willingness to pay more for it.

Concerning the perception of environmental impacts (Figure 17), it appears only 17% of respondents consider renewable energy as not beneficial. With 61% of respondents stating the opposite, this may mean that, overall, respondents tend to perceive that the environmental benefits in terms of cleaner air outweigh the environmental harms linked to the deployment of renewable energy and the construction of renewable energy plants (Bartolozzi et al., 2017; Bravi & Basosi, 2014; Caporale & De Lucia; Delfanti et al., 2016; Otero et al., 2012; Prados, 2010; Tsoutos et al., 2005; Turney & Fthenakis, 2011).

Concerning the social impacts (Figure 17), survey results unequivocally draw a positive perception of renewable energy development, with 92% of respondents thinking that renewable energy is beneficial for their own quality of life and 90% of respondents thinking that renewable energy is beneficial for the local communities. This means that the public is indeed aware of the wide benefits that, as emerged from the literature, local economies and communities can experience through a local development of renewable energy (Magnani & Vaona, 2013; Ohler & Fetters, 2014; Paiano & Lagioia, 2016).

Figure 15: In terms of costs, what do you think about renewable electricity compared to non-renewable electricity? [ECON_cost]

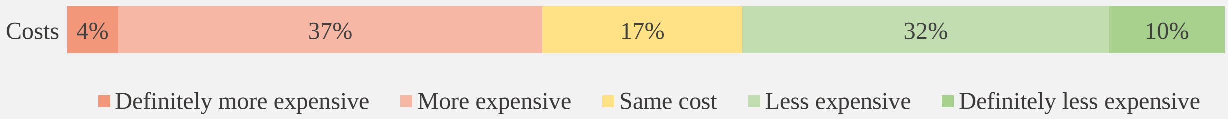


Figure 16: To what extent would you be willing to pay more in order to have greener electricity? [ECON_wtp]

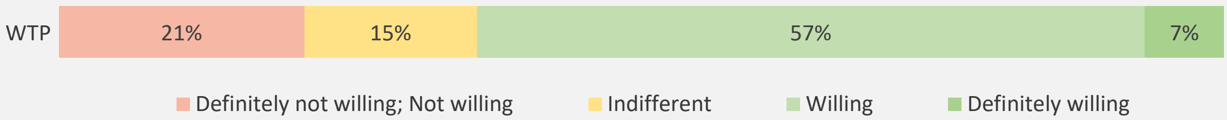
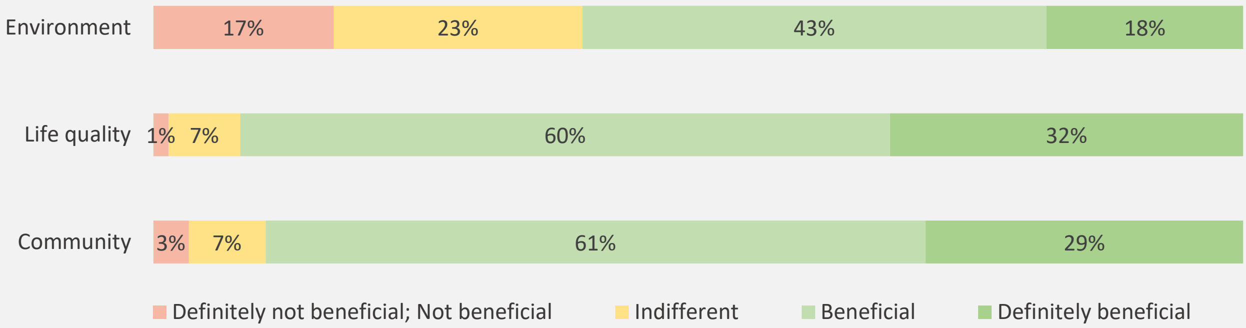


Figure 17: To what extent do you think renewable energy deployment can be beneficial for the surrounding environment/your quality of life/the local community? [ENV_env] [SOC_life] [SOC_comm]



The statistical analysis shows that the perception of renewable electricity costs, compared to the costs of non-renewable electricity, differ significantly among respondents depending on their age (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis) (Table 12). This is confirmed by the ordered logistic regressions showing that, as age increases, respondents are more likely to think that renewable electricity costs less than non-renewable electricity (99% confidence interval, Table 8). On the contrary, holders of post-graduate degrees are surprisingly more likely to think that renewable electricity is more expensive than non-renewable electricity, if compared to less educated respondents 99% confidence interval, Table 8). Similarly, concerning the region of origin of respondents, those residing in Central & Southern Italy, compared to those residing in other areas, seem to be more likely to think that renewable electricity is more expensive than non-renewable electricity (95% confidence interval, Table 8). Thus, as expected, results are mainly countervailing and confusing.

The statistical analysis also shows that, when it comes to the willingness to pay in order to have more green electricity, respondents answer in a significantly different way depending on their age (p=0.001, Pearson's chi-square; p=0.001, Kruskal-Wallis), their gender (p=0.000, Pearson's chi-square; p=0.001, Kruskal-Wallis), their level of education (p=0.001, Pearson's chi-square; p=0.000, Kruskal-Wallis), as well as their region of origin (p=0.018, Pearson's chi-square; p=0.022, Kruskal-Wallis). (Table 12). The ordered logistic regressions confirm most of those findings, showing that younger respondents, compared to older ones and specifically compared to middle-aged respondents, are more likely to be willing to pay more in order to have greener electricity (99% confidence interval, Table 8) – this may be explained by the fact that a large portion of younger respondents are living with their middle-aged parents and can therefore answer more idealistically, since they do not need to pay electricity bills. Further, females are more likely than males to be willing to pay more (99% confidence interval, Table 8). Similarly, undergraduate and graduate degree holders are more likely then less educated respondents to be willing to pay more – this time, this may be explained by differences in earnings (99% confidence interval, Table 8). Contrary to the findings obtained using statistical tests (Table 12), the ordered logistic regressions register no statistically significant differences in how the question is answered depending on the region of origin of respondents. On the opposite, it appears respondents with a worse knowledge of renewable energy are more likely to be not willing to pay more in order to have greener electricity, compared to respondents with better knowledge (95% confidence interval, Table 8).

Concerning the perception of environmental impacts related to the deployment of renewable energy, the Pearson's chi-square test shows that respondents' answers differ significantly depending on their age (p=0.050), gender (p=0.000) and level of renewable energy knowledge (p=0.006), although the Kruskal-Wallis test is never significant in all those cases (Table 12). The ordered logistic regressions show indeed that almost no significant difference in how the question is answered is recorded among the different groups, meaning that respondents within each group have answered in highly heterogeneous way (Table 8). The only exception, recording a low degree of significance, shows that females, more than males, generally perceive renewable energy as beneficial for the environment (90% confidence interval, Table 8).

Concerning the perception of social impacts related to the deployment of renewable energy and the idea that renewable energy can be beneficial (or not) for the respondents' quality of life, statistical tests show that respondents answer mainly in homogeneous way, with the only slightly significant difference depending on the level of renewable energy knowledge (p=0.090, Kruskal-Wallis). (Table 12). The ordered logistic regressions show indeed no statistically significant difference in the perception exhibited by the different groups (Table 8).

Concerning the idea that renewable energy can be beneficial (or not) for the local communities, statistical tests show that respondents answer differently depending on their gender (p=0.002, Kruskal-Wallis) – although this do not apply if we test for Pearson's chi-square –, their level of renewable energy knowledge (p=0.018, Pearson's chi-square; p=0.049, Kruskal-Wallis) and, with a lower degree of significance, their level of education (p=0.058, Pearson's chi-square) – although this, in turn, do not apply if we test for Kruskal-Wallis. (Table 12). Thus, as one would expect, the ordered logistic regressions show no significant results. The only slightly significant exception concerns the fact that respondents exhibiting a bad level of renewable energy knowledge, compared to those having better knowledge, are more likely to think that renewable energy is not beneficial for the local communities (90% confidence interval, Table 8), somehow confirming their low level of awareness of the benefits linked to the deployment of renewable energy at the local level.

Table 8: Full ordered logistic regression results, question-by-question

	ECON_cost	ECON_wtp	ENV_env	SOC_life	SOC_comm
AGE					
Middle-aged	0.856***	-0.514***	-0.084	-0.086	-0.112
	(0.141)	*(0.149)*	*(0.140)*	*(0.152)*	*(0.152)*
Older	0.847***	-0.162	-0.106	-0.086	-0.315
	(0.188)	*(0.201)*	*(0.184)*	*(0.204)*	*(0.204)*
GENDER					
Female	0.137	0.430***	0.237*	-0.058	-0.010
	(0.129)	*(0.138)*	*(0.130)*	*(0.142)*	*(0.143)*
EDUCATION					
Undergrad & Grad	-0.195	0.595***	0.038	0.125	0.028
	(0.142)	*(0.152)*	*(0.142)*	*(0.155)*	*(0.155)*
Post-Grad	-0.671***	0.236	-0.037	0.200	0.338
	(0.197)	*(0.203)*	*(0.192)*	*(0.216)*	*(0.214)*
REGION					
Emilia-Romagna	0.146	0.189	-0.025	-0.071	0.174
	(0.155)	*(0.167)*	*(0.156)*	*(0.172)*	*(0.174)*
Central & South	0.354**	-0.268	0.053	-0.151	-0.157
	(0.181)	*(0.193)*	*(0.182)*	*(0.198)*	*(0.202)*
KNOWLEDGE					
Bad	-0.022	-0.350**	-0.072	-0.219	-0.268*
	(0.138)	*(0.145)*	*(0.136)*	*(0.150)*	*(0.149)*
Observations	864	864	864	864	864

Thus, the following conclusions can be drawn concerning the perception of economic, environmental and social impacts linked to the deployment of renewable energy. In general, it seems the public has a highly heterogeneous and confusing perception of the costs of renewable electricity, when compared to non-renewable electricity. Most respondents are however willing to pay more in order to have greener electricity in their electricity consumption. Further, respondents homogeneously consider renewable energy as extremely beneficial for the local communities and for improving life quality. To a lesser but still relevant extent, respondents also consider renewable energy as generally beneficial for the surrounding environment. Thus, it seems public concerns are mainly related to the perceived costs of renewable energy and the idea that "renewables are expensive". In turn, the environmental and, even more, social impacts linked to the development of renewable energy seem to affect positively public opinion.

Evidence coming from the statistical analysis shows that, as age increases, respondents are more likely to think that renewable electricity is less expensive than non-renewable electricity, although they turn out as less willing to pay to consume more green electricity, compared to younger respondents. Further, female respondents are more likely than males to be willing to pay more in order to have more renewable electricity in their electricity consumption.

3.3 Perception of environmental impacts of different renewable energy technologies

In this section, the focus shifts entirely on the environmental impacts associated with renewable energy – already covered in the previous section (Figure 17) – , this time devoting specific attention to how the different renewable energy technologies are considered by the public in terms of environmental friendliness. The aim is to understand whether some renewable energy technologies are valued more positively than others when it comes to their environmental effects.

Thus, respondents are asked to rank renewable energy technologies – i.e. solar energy, wind energy, geothermal energy, bioenergy and hydropower – in terms of perceived environmental impact, ranging from the most environmental-friendly to the least. Therefore, each respondent assigns a value from 1 (most environmental-friendly) to 5 (least environmental-friendly) to each renewable energy technology, creating its own ranking. From this, it is possible to derive a general ranking showing the true public perception of the different renewable energy technologies in terms of environmental impact (Figure 18). It is worth reminding that the different renewable energy technologies to be ranked were displayed in randomized order to each respondent in order to avoid starting point biases. The results reported in Figure 18 are based on the derived general ranking.

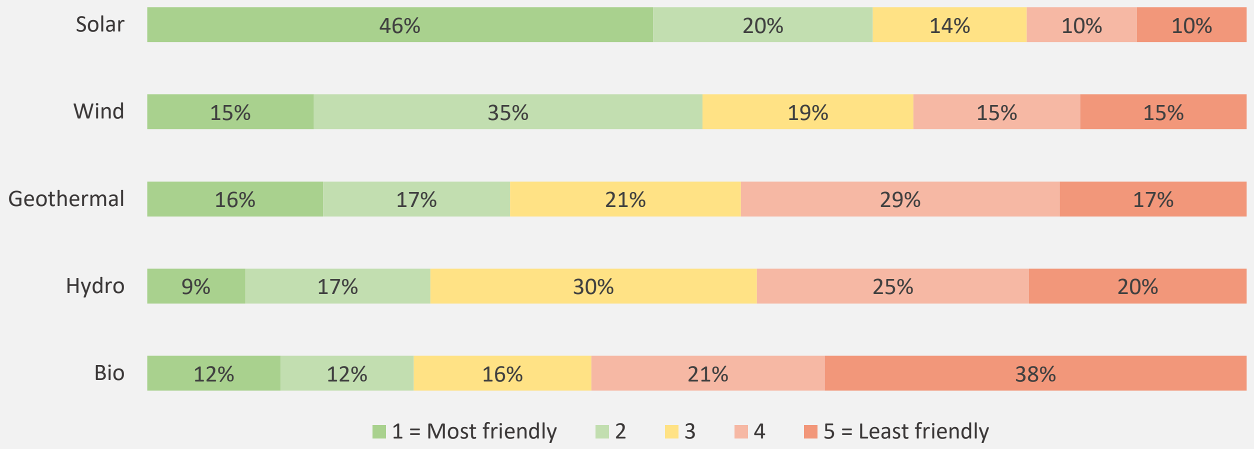
Those results show that solar energy is by far the most preferred, being considered as the most environmental-friendly technology by 46% of respondents – almost three times as much as wind power – and being labelled as least environmental-friendly by only 10% of respondents. Overall, 66% of respondents think that solar energy is the best or second-best renewable energy technology when it comes to environmental impact. (Figure 18). Although this result was expected (Azarova et al., 2019; Cicia et al., 2012; Kaldellis et al., 2016; Ribeiro et al., 2014), it is still surprising if we consider all the possible negative environmental impacts linked to the large-scale deployment of solar energy (Delfanti et al., 2016; Prados; Tsoutos et al., 2005; Turney & Fthenakis, 2011), from loss of cropland and farmland (Delfanti et al., 2016) to landscape disruption and concerns for biodiversity (Delfanti et al., 2016; Tsoutos et al., 2005).

Results also show wind energy as the second most friendly renewable energy technology when it comes to environmental impacts. Indeed, 35% of respondents rank wind energy at the second place, with another 15% considering it as the most environmental-friendly. (Figure 18). Again, this was expected, since wind energy generally faces more ambiguous levels of public acceptance than solar energy (Kaldellis, 2005; Kaldellis et al., 2016; Ribeiro et al., 2014). In this sense, huge role may be played by the negative visual impacts usually associated with wind turbines (Caporale & De Lucia, 2015; Delfanti et al., 2016; Ferrario & Castiglioni, 2017; Mattmann et al., 2016; Prados, 2010; Strazzera et al., 2012; Tsoutos et al., 2005), such as the disruption of the landscape and, probably, the perception of a disruption of the environment.

Going down the ladder, geothermal energy and hydropower register a highly heterogeneous perception of the related environmental impacts. In other words, the public seems to have diverging ideas concerning the environmental impacts associated with the two technologies. (Figure 18). This is even more true for geothermal energy, confirming the fact that the public has a general lack of knowledge concerning the technology (Borzoni et al., 2014; Pellizzone et al., 2015). Those results are again in line with the findings emerging from the literature, showing that geothermal energy is associated with positive public perception (Manologlou et al., 2004) as well as strong and rising opposition (Borzoni et al., 2014; Pellizzone et al., 2015). Thus, it seems this heterogeneous perception applies also to the environmental impacts linked to the technology, such as the concerns related to water usage (Bartolozzi et al., 2017; Bravi & Basosi, 2014).

To conclude, bioenergy appears to be the renewable energy technology more often considered as least environmental-friendly (Figure 18). This time, the result is to a certain extent surprising, since evidence emerging from the literature highlights a generally heterogeneous public attitude towards bioenergy (Achillas et al., 2011; Montis & Zoppi, 2009; Cicia et al., 2012).

Figure 18: Rank the following energy sources in terms of environmental impact. [ENV_ranksun] [ENV_rankwind] [ENV_rankgeo] [ENV_rankhydro] [ENV_rankbio]



The statistical analysis shows that the age of respondents has a statistically significant influence on the perception of the environmental impact associated with the different renewable energy technologies, and thus on how those technologies are ranked by respondents. Except for bioenergy, this seems to be true for wind energy (p=0.009, Pearson's chi-square; p=0.006, Kruskal-Wallis), geothermal energy (p=0.000, Pearson's chi-square; p=0.000, Kruskal-Wallis), hydropower (p=0.000, Pearson's chi-square; p=0.012, Kruskal-Wallis) and, with some uncertainty, solar energy (p=0.000, Pearson's chi-square). (Table 12).

The gender of respondents also plays a role, having a statistically significant influence on how female and male respondents rank renewable energy technologies. This seems to be particularly true when it comes to evaluate solar energy (p=0.001, Pearson's chi-square; p=0.000, Kruskal-Wallis), geothermal energy (p=0.004, Pearson's chi-square; p=0.000, Kruskal-Wallis) and, to a lesser extent, hydropower (p=0.081, Pearson's chi-square; p=0.027, Kruskal-Wallis). (Table 12).

While the level of education of respondents seems to never have a significant influence on how renewable energy technologies are ranked by the different groups of respondents, and while the region of origin of respondents seems to play only a minor or non-significant role (p=0.047 for hydropower, p=0.045 for wind energy, Pearson's chi-square), the level of renewable energy knowledge of respondents seems slightly more relevant, with respondents from different regions answering in significantly different way. This is true when it comes to, again, hydropower (p=0.052, Pearson's chi-square; p=0.005, Kruskal-Wallis) and wind energy (p=0.013, Pearson's chi-square; p=0.027, Kruskal-Wallis). (Table 12).

The ordered logistic regressions mostly confirm those results (Table 9). Proceeding technology-by-technology, it appears gender play a significant role in the ranking of solar energy, with females being significantly more likely than males to perceive solar energy as the most or second most environmental-friendly technology (99% confidence interval, Table 9). To a lesser extent of significance, it also appears that respondents from Emilia-Romagna generally have a more positive perception of solar energy, in terms of environmental impact, than respondents from Northern Italy (90% confidence interval, Table 9).

Concerning wind energy, the ordered logistic regression confirm that respondents rank the technology in significantly different way depending on their age. Indeed, as age increases, respondents are more likely to perceive wind energy as less environmental-friendly, compared to younger counterparts (90% confidence interval for middle-aged, 99% confidence interval for older, Table 9). Further, as anticipated, it appears respondents with a bad level of renewable energy knowledge are more likely to have a more positive perception of wind energy, in terms of environmental impact, compared to respondents recording a good level of renewable energy knowledge (95% confidence interval, Table 9).

The ordered logistic regressions also confirm findings concerning the ranking of geothermal energy, with females appearing to be more likely to have a negative perception of the technology, if compared to males (95% confidence interval, Table 9). On the contrary, as age increases, respondents are more likely than younger ones to rank more positively geothermal energy (99% confidence interval, Table 9). It also appears that respondents from Emilia-Romagna are more likely to value the environmental impacts associated with geothermal energy more negatively than done by respondents from Northern Italy (90% confidence interval, Table 9).

When it comes to hydropower, the ordered logistic regressions confirm that respondents rank the technology in significantly different way depending on their age. Indeed, as age increases, respondents are more likely to value hydropower negatively (99% confidence interval for middle-aged, 90% confidence interval for older respondents, Table 9). Similarly, although with a low degree of significance, females are more likely than males to value hydropower negatively (90% confidence interval, Table 9). The same applies to respondents recording a bad level of renewable energy knowledge, compared their counterparts (95% confidence interval, Table 9).

In line with the statistical tests, showing that no socio-demographic characteristic has a statistically significant influence on the ranking of bioenergy, the ordered logistic regressions show low levels of significance (90% confidence interval, Table 9). Thus, there is almost no or a very low degree of statistically significant difference concerning how the various groups rank bioenergy.

Table 9: Full ordered logistic regression results, question-by-question

	ENV_ranksun	ENV_rankwind	ENV_rankgeo	ENV_rankhydro	ENV_rankbio
AGE					
Middle-aged	-0.040	0.274*	-0.669***	0.416***	0.257*
	(0.145)	*(0.141)*	*(0.142)*	*(0.141)*	*(0.143)*
Older	-0.265	0.595***	-0.854***	0.343*	0.327*
	(0.200)	*(0.188)*	*(0.188)*	*(0.196)*	*(0.188)*
GENDER					
Female	-0.565***	-0.171	0.433***	0.253*	0.083
	(0.135)	*(0.130)*	*(0.131)*	*(0.131)*	*(0.130)*
EDUCATION					
Undergrad & Grad	0.035	-0.074	-0.133	0.165	0.058
	(0.149)	*(0.143)*	*(0.144)*	*(0.142)*	*(0.142)*
Post-Grad	0.119	-0.052	-0.019	-0.001	-0.024
	(0.203)	*(0.199)*	*(0.198)*	*(0.198)*	*(0.202)*
REGION					
Emilia-Romagna	-0.267*	-0.184	0.268*	0.083	0.138
	(0.160)	*(0.160)*	*(0.157)*	*(0.158)*	*(0.155)*

Central & South	-0.301	-0.203	0.262	0.075	0.243
	(0.187)	*(0.189)*	*(0.185)*	*(0.182)*	*(0.187)*
KNOWLEDGE					
Bad	0.044	-0.285**	-0.022	0.342**	-0.230*
	(0.145)	*(0.141)*	*(0.137)*	*(0.138)*	*(0.138)*
Observations	810	810	810	810	810

Thus, the following conclusions can be drawn concerning how respondents perceive the environmental impacts associated with the different renewable energy technologies, as well as concerning which renewable energy technologies are preferred by the public. Overall, it appears solar energy is by far considered as the most environmental-friendly technology, followed by wind energy. The perception of the environmental impacts associated with geothermal energy and hydropower is highly heterogeneous, while bioenergy is perceived as the least environmental-friendly technology. If we compare those results with the current situation of the Italian renewable energy system (Figure 7, Figure 8), with solar energy being the second most developed technology, apart from hydropower, both in terms of capacity and production, it seems that public opinion and the choices made by the Italian government are aligned. Solar energy, considered by the public as the most environmental-friendly technology and being in general the most preferred among the different renewable energy technologies, is being deployed on a large scale by the Italian government. Due to its relevant role in terms of renewable energy employment, the fact that bioenergy is by far perceived as the least environmental friendly technology is cause for concern.

Evidence coming from the statistical analysis shows that, in some cases, respondents rank in significantly different way the various renewable energy technologies depending on their age – this is true when it comes to wind energy, geothermal energy and hydropower – and gender – this is true when it comes to solar energy and geothermal energy. Interestingly, the ranks do not significantly differ depending on the region of origin of respondents or their level of education, while low degrees of significance are associated with the level of renewable energy knowledge of respondents.

3.4 Renewable energy jobs and employment effects

This section concerns how the public perceives renewable energy jobs as well as the employment effects linked to a further deployment of renewable energy. Indeed, respondents are asked to share their opinion on renewable energy jobs, including their perception of salaries paid (Figure 19), jobs stability (Figure 20), skills required (Figure 21) and overall jobs quality (Figure 23).

Although it is expected of many respondents to have a scarce knowledge, information, awareness of interest concerning renewable energy jobs, at least compared with renewable energy technologies in general, their thoughts matter and contribute to the public opinion on the subject. It is indeed relevant analysing how do people perceive renewable energy jobs, at least as much as it would be relevant to understand how people perceive jobs in the fossil fuels sector while studying public opinion on non-renewable energy. For sure, perceiving jobs as highly remunerative and permanent should have a positive impact on public opinion. Thus, understanding how people perceive the overall quality of the jobs offered by the renewable energy sector is indeed necessary in order to have a wider picture of public opinion, going deeper than the mere environmental impacts, while to a certain extent linking economic and social effects. This is even more relevant in a situation, as in the case of renewable energy, of recent and on-going development. The population is confronted with a rapidly changing energy system, shifting in a few years towards the widespread dominance of renewable energy technologies. Comprehensibly, some people may ask themselves whether the jobs brought by the renewed energy system are better or worse than those previously existing in the energy sector. Although many other people may be less or not at all concerned, as said, their thoughts matter and are part of the overall public opinion.

In addition, as anticipated, this section analyses the public perception of the employment effects linked to renewable energy deployment (Figure 22). In other words, the aim is to test for the so-called "job-killing argument" (Marin & Vona, 2019; Vona, 2018), understanding whether the public considers renewable energy as capable of creating, more than destroying, jobs – or rather the opposite. Indeed, the literature shows that, despite no strong evidence supporting the argument that renewable energy destroys jobs more than it creates (Blanco & Rodrigues, 2009; Cai et al., 2017; Caldés et al., 2009; Henriques et al., 2016; Lehr et al., 2008; Lehr et al., 2012; Llera et al., 2013; Llera Sastresa et al., 2010; Markandya et al., 2016; Markaki et al., 2013; Moreno & López, 2008; Silva et al., 2013; Tourkolias & Mirasgedis, 2011; Wei et al., 2010) the so-called "job-killing argument", mainly in terms of low-skill jobs, remains a decisive aspect of public opposition towards the development of renewable energy and the implementation of new renewable energy projects (Marin & Vona, 2019; Vona, 2018).

Thus, concerning the public perception of renewable energy jobs, survey results show that the majority of respondents, 76%, think that salaries within the renewable energy sector are "normal" (Figure 19). This means that the public, overall, does not expect renewable energy to bring neither higher-than-average nor lower-than-average wages. This is more or less in line with the evidence emerging from the literature, reporting higher-than-average wages for qualified workers and lower salaries for low-skilled or less-educated workers (Lucas et al., 2018; Nowotny et al., 2018; Peters, 2013).

However, respondents answer in a heterogeneous way then it comes to jobs stability and the duration of the contracts offered by the renewable energy sector (Figure 20), with 44% of respondents thinking that the jobs created are mainly temporary or, in any case, more temporary than permanent. On the other hand, 41% of respondents think that temporary and permanent jobs are offered in equal measure by the renewable energy sector. This slightly negative perception of the jobs created by renewable energy is in line with the evidence emerging from the literature: as long as the renewable energy sector expands, temporary jobs are created within installation and construction activities; in a second phase, jobs generally stabilise at lower levels, with the above activities being replaced by permanent jobs in maintenance (Cai et al., 2017; Llera et al., 2013).

Concerning the skills required to work in the renewable energy sector (Figure 21), it appears 57% of respondents consider renewable energy jobs as mostly high-skill or, in any case, more high than low-skill-jobs. In other words, the majority of the public think that the workforce within the renewable energy sector is composed of more engineers than maintenance, manufacture or construction workers. This may be explained by the fact that renewable energy may be generally perceived as something "new" and "technological", implying that a high level of education is necessary to be part of the workforce. In some way, this is however in line with the literature, showing that the renewable energy sector is currently experiencing a lack of qualified workers (Lucas et al., 2018; Nowotny et al., 2018).

Concerning the overall quality of renewable energy jobs (Figure 23), apart from the 50% of respondents labelling them again as "normal", 35% of respondents label them as high or very high-quality jobs, opposed to the remaining 15% labelling them as low or very-low quality jobs. Thus, always accounting for the fact that a difference between low-skills and high-skills jobs clearly exist, as well as recalling that a large portion of respondents may have poor levels of knowledge or interest concerning the subject, an overall positive perception of renewable energy jobs emerge. As said, this is what matters when analysing public opinion.

Further, when it comes to testing the so-called "job-killing argument" (Figure 22), survey results completely defy expectations. Indeed, it appears only 13% of respondents think the deployment of renewable energy is associated with a negative net employment effect. On the contrary, 50% of respondents think that renewable energy creates more than destroys jobs, with the remaining 37% thinking no net employment effect exists. In any case, the fact that half of respondents perceive renewable energy as a machine capable of creating more than destroying jobs is outstanding – even more if compared to the opposite mere 13% of respondents. Thus, survey results show that no "job-killing argument" is present, defying all expectations (Marin & Vona, 2019; Vona, 2018) and reinforcing the idea that the public generally perceives positively renewable energy when it comes to jobs and employment.

At this point, it would have been interesting to further ask respondents which renewable energy technology, in their opinion, is capable of creating a greater amount of jobs, if compared to the others. This was not however included in the survey, since such a response to the "job-killing argument" testing, with so many respondents thinking that positive net employment effects exist, was not expected.

Figure 19: What do you think about the salaries paid to employees in the renewable energy sector? [JOB_wage]

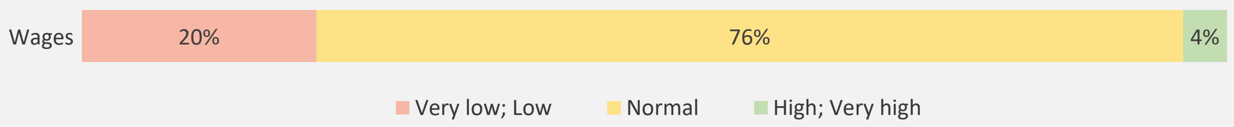


Figure 20: What do you think about the duration of the contracts in the renewable energy sector? [JOB_dur]

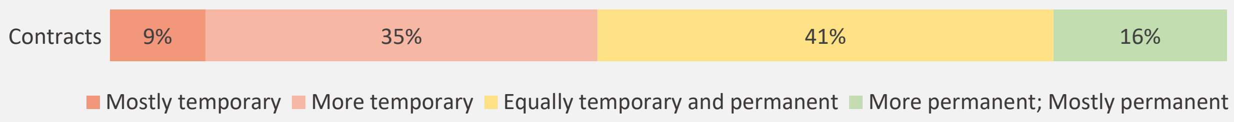


Figure 21: What do you think about the skills required to work in the renewable energy sector? [JOB_skill]

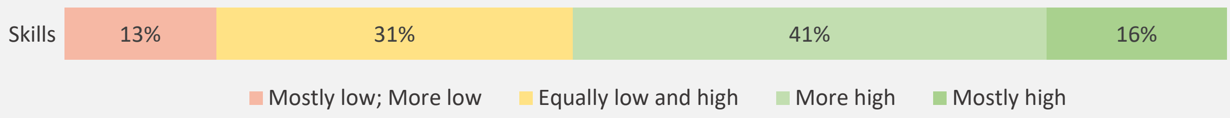


Figure 22: What do you think about the ability of renewable energy to lead to net jobs creation? [JOB_kill]

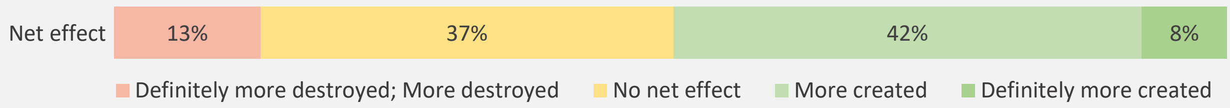
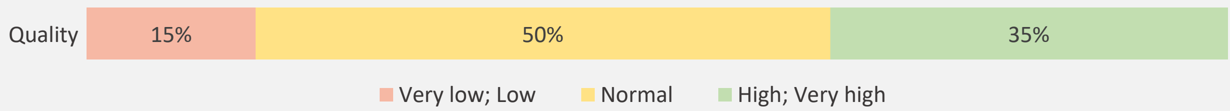


Figure 23: Overall, what do you think about the quality of the jobs offered by the renewable energy sector? [JOB_qual]



Moving to the statistical analysis, the tests performed (Table 12) show that respondents generally answer in a significantly different way depending on their age. This seems to be true when it comes to the salaries paid within the renewable energy sector (p=0.000, Pearson's chi-square; p=0.068, Kruskal-Wallis), the skills required (p=0.003, Pearson's chi-square) and, with lower level of significance, the duration of contracts (p=0.025, Pearson's chi-square). Further, this seems to be particularly true when it comes to testing the so-called "job-killing argument" (p=0.001, Pearson's chi-square; p=0.009, Kruskal-Wallis), meaning that the age of respondents is related to a significantly different attitude towards the perception of the employment effect generated by renewable energy. (Table 12).

While differences related to the level of education of respondents seems to be never significant, slightly significant differences in how the questions are answered depend on the gender (concerning salaries: p=0.096, Pearson's chi-square; p=0.015, Kruskal-Wallis) (concerning jobs stability: p=0.075, Pearson's chi-square) (concerning the skills required: p=0.060, Pearson's chi-square) and region of origin of respondents (concerning the skills required: p=0.035, Pearson's chi-square; p=0.090, Kruskal-Wallis) (concerning overall jobs quality: p=0.035, Pearson's chi-square). (Table 12).

In some cases, more significant differences in how the questions are answered seem to depend on the level of renewable energy knowledge of respondents. This seems to be particularly true when it comes to the skills required to work in the sector (p=0.000, Pearson's chi-square; p=0.041, Kruskal-Wallis) and, with a lower degree of significance or with some uncertainty, the duration of the contracts (p=0.037, Kruskal-Wallis) and the testing of the so-called "job-killing argument" (p=0.000, Pearson's chi-square). (Table 12).

The most significant of those results are confirmed by the ordered logistic regressions (Table 10). First of all, it is confirmed that the age of respondents, particularly considering middle-aged ones, play a key role in how questions concerning salaries, employment effects and overall jobs quality are answered. Indeed, middle-aged respondents appear to be more likely than younger ones to think that the renewable energy sector creates more than destroys jobs (99% confidence interval, Table 10). Further, middle-aged respondents tend to perceive renewable energy jobs as more well-paid (95% confidence interval, Table 10) and high-quality (90% confidence interval, Table 10) than how perceived by younger ones.

It is also confirmed that the gender of respondents plays a role, with male respondents being more likely to perceive renewable energy jobs as high-paid jobs, if compared to females (95% confidence interval, Table 10).

As anticipated, while no significant difference in how questions are answered seems to depend on the level of education of respondents, their region of origin is confirmed to play a role. Indeed, the ordered logistic regressions show that respondents from Central & Southern Italy are significantly more likely, compared to respondents from Northern Italy, to think that renewable energy jobs require low rather than high levels of specialization (95% confidence interval, Table 10).

Further, the ordered logistic regressions confirm that different levels of renewable energy knowledge are associated with significantly different answers. Indeed, it appears that respondents with worse renewable energy knowledge, compared to those with better knowledge, are more likely to think that renewable energy jobs require low rather than high levels of specialization (95% confidence interval, Table 10) and that employment within the sector is made of more temporary than permanent jobs (90% confidence interval, Table 10).

Table 10: Full ordered logistic regression results, question-by-question

	JOB_wage	JOB_dur	JOB_skill	JOB_kill	JOB_qual
AGE					
Middle-aged	0.353**	0.187	0.162	0.414***	0.259*
	(0.178)	*(0.141)*	*(0.141)*	*(0.143)*	*(0.145)*
Older	0.239	0.003	-0.026	0.131	-0.008
	(0.236)	*(0.190)*	*(0.180)*	*(0.188)*	*(0.190)*
GENDER					
Female	-0.362**	-0.153	0.100	0.037	0.041
	(0.168)	*(0.130)*	*(0.129)*	*(0.132)*	*(0.134)*
EDUCATION					
Undergrad & Grad	0.119	0.038	0.126	0.218	0.198
	(0.179)	*(0.143)*	*(0.144)*	*(0.145)*	*(0.148)*
Post-Grad	0.294	0.144	0.150	0.298	0.142
	(0.254)	*(0.197)*	*(0.194)*	*(0.199)*	*(0.202)*
REGION					
Emilia-Romagna	-0.150	-0.080	-0.109	-0.061	0.061
	(0.203)	*(0.157)*	*(0.156)*	*(0.159)*	*(0.159)*
Central & South	-0.174	-0.233	-0.405**	-0.286	-0.087
	(0.235)	*(0.183)*	*(0.185)*	*(0.186)*	*(0.189)*
KNOWLEDGE					
Bad	-0.181	-0.240*	-0.291**	-0.114	-0.072
	(0.171)	*(0.139)*	*(0.140)*	*(0.141)*	*(0.142)*

Observations	864	864	864	858	864

Thus, the following conclusions can be drawn concerning public opinion on renewable energy jobs and the employment effects linked to the renewable energy sector. The focal point is that the survey results surprisingly show, defying all expectations, that the so-called “job-killing argument” is not present. This reinforces the feeling that, as emerged from the survey responses, the public generally perceives positively renewable energy when it comes to jobs and employment. Although jobs may be more temporary than permanent, the overall quality is perceived to be higher-then-average.

More but less interesting results can be drawn from the statistical analysis, with respondents generally answering in significantly different way depending on their age. This seems to be particularly true when it comes to jobs creation, with middle-aged respondents likely to be significantly more aware than younger ones of the positive net employment effects associated with the deployment of renewable energy.

3.5 Information on renewable energy

This last section is devoted to understanding in a deeper way to what extent people have knowledge of renewable energy, as well as to what extent people are interested in renewable energy technologies and are involved in the issues related to renewable energy employment.

Indeed, the literature shows that a key role in influencing public opinion seems to be played by a general lack of information, which can in fact easily translate into a widespread low trust when it comes to renewable energy technologies (Achillas et al., 2011; Kaldellis, 2005; Pellizzone et al., 2015; Zografakis et al., 2010). Similarly, a general lack of interest may translate as well into a low level of awareness regarding the benefits linked to the deployment of renewable energy (Garcia de Jalon, 2013; Kaldellis et al., 2016; Zografakis et al., 2010), fostering public opposition.

Therefore, respondents are first asked how often do they hear, read or talk about renewable energy (Figure 24). This includes active conversations with family members, colleagues and friends, as well as hearing news, reading magazines and newspapers or chatting and interacting on social networks. As said, the aim is to understand whether respondents are in fact interested in the subject and used to talk, read or hear about it.

Interestingly, survey results show that respondents are divided almost equally, with 33% of them often or very often talking, reading or hearing about renewable energy and, on the opposite, 28% of them rarely or very rarely doing it; the remaining 39% of respondents state that they “sometimes” hear, read or talk about renewable energy. (Figure 24). This is a positive rather than negative result when it comes to evaluating the general interest people seem to have regarding renewable energy, with, as said, 33% of respondents being part of an active discussion concerning the subject and, overall, 72% of respondents being at least “sometimes” involved in the conversation. It is worth remarking that, in any case, being part of the active discussion and being interested in renewable energy and related issues may not necessarily imply a positive attitude towards the subject. In any case, the aim of this question is, as said, to understand whether people are generally interested in renewable energy. The outcome is mainly positive, although a general lack of interest is still present.

Following, respondents are asked to state which level of knowledge concerning renewable energy sources they feel they have after having answered all the previous questions and having reached the end of the survey. The same question is asked concerning renewable energy jobs. (Figure 25). The aim of those two questions is not to derive again a level of respondents’ renewable energy knowledge

– as already done initially in order to create a socio-demographic variable that could reflect the actual level of knowledge of respondents (Table 5). The aim is rather to understand whether respondents perceive themselves as lacking information on the subject.

Survey results show that the majority of respondents, 61%, feel they have very limited or little knowledge concerning renewable energy sources, while the remaining counterparts, 39%, feel they have enough, more than enough or great knowledge. The results are even more striking if we compare the respondents feeling to have very limited knowledge (21%), with the respondents feeling to have great knowledge (1%). (Figure 25).

The reason for that may be that, after having gone through the questionnaire, even respondents with a somehow good level of renewable energy knowledge may have felt they are actually more "ignorant" then they thought. Indeed, the survey raises many questions concerning multiple aspects linked to the various impacts renewable energy can have. It is thus not surprising that even highly-educated people, as anticipated in the survey design section (Section 2), came back to the author asking for more information or "correct" answers, while others wrote back sharing their disappointment on how unexpectedly little they knew and their willingness to learn more about it. It is indeed possible to infer that, if asked at the beginning of the survey, the answers to the questions reported in Figure 25 would have been rather different, with a supposedly larger portion of respondents feeling to have a more than enough or great knowledge concerning renewable energy sources.

It is also interesting to compare the derived socio-demographic characteristic representing the level of renewable energy knowledge of respondents, obtained from how respondents answered the question "Which of the following are renewable energy sources" (Table 5; Figure 11), and the level of renewable energy knowledge of respondents emerging from the question in Figure 25. In the first case, 68% of respondents are labelled as having a "good" level of renewable energy knowledge. In the second case, only 39% of respondents feel they have a "good" level of renewable energy knowledge. A possible explanation for this difference may be that, as said, respondents answer to the question reported in Figure 25 at the end of the survey. Thus, they may be disappointed and perceive themselves as more "ignorant" than in reality. Therefore, it is likely that the true percentage of respondents having a good level of renewable energy knowledge, based both on their own perception (Figure 25) and on how they answered a simple question concerning energy sources (Figure 11), may lie between the derived 68% (Table 5) and the reported 39% (Figure 25). Another possible explanation for this difference may be related to the fact that the question "Which of the following are renewable energy sources" solely analyses the level of knowledge of respondents concerning renewable energy sources. Although the question reported in Figure 25 refers as well to the level of knowledge of respondents concerning renewable energy sources, it is displayed after a long series of questions regarding all the various impacts – economic, social, environmental – associated with the different renewable energy technologies. Thus, respondents may have answered considering their knowledge of all those issues rather than the mere knowledge of the different sources of energy, therefore leading to a smaller percentage of respondents having a "good" level of knowledge.

In any case, the outcome shows that the lack of knowledge and information is widespread and seemingly more likely to have a large influence on public opinion than the less relevant, but still present, lack of interest on the subject.

To conclude, an even more profound lack of knowledge and information arises when it comes to renewable energy jobs (Figure 25), although this was clearly expected and adds little, up to now, to the conversation. In this sense, however, interesting results emerge from the statistical analysis.

Figure 24: How often do you hear/read/talk about renewable energy? [INFO_hrt]

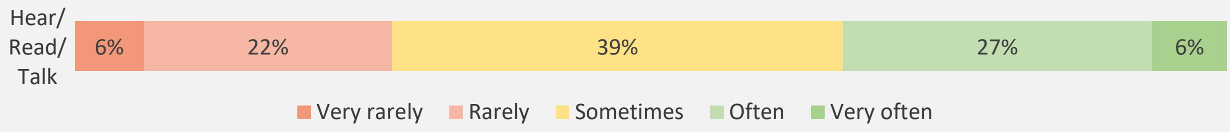
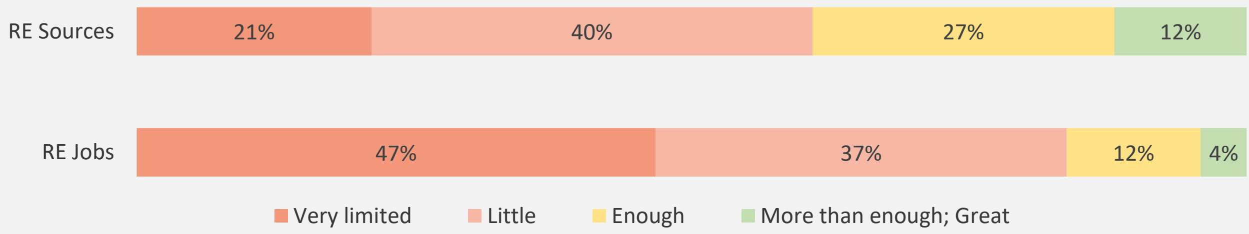


Figure 25: While answering the questions, which level of knowledge did you feel you have about renewable energy sources/jobs? [INFO_ren] [INFO_jobs]



The statistical analysis shows that respondents exhibit significantly different levels of interest concerning renewable energy (Figure 25) depending, first of all, on their gender (p=0.003, Pearson's chi-square; p=0.000 Kruskal-Wallis) and level of renewable energy knowledge (p=0.001, Pearson's chi-square; p=0.000 Kruskal-Wallis). Further, with a lower degree of significance, it seems respondents answer differently depending on their age (p=0.023, Pearson's chi-square; p=0.013 Kruskal-Wallis) and their level of education (p=0.018, Pearson's chi-square; p=0.002 Kruskal-Wallis). (Table 12).

This is confirmed by the ordered logistic regressions (Table 11). First of all, it appears female respondents are significantly more likely than male counterparts to be less interested in the subject (99% confidence interval, Table 11). The same applies, as one would expect, to respondents having a worse level of renewable energy knowledge compared to those recording better knowledge (99% confidence interval, Table 11). Further, higher levels of education make respondents significantly more likely, compared to those holding only a high school diploma or no diploma at all, to be more interested in the subject (99% confidence interval for post-graduate; 95% confidence interval for undergraduate and graduate, Table 11). In addition, although with a lower degree of significance, the age of respondents plays a role in shaping the answers: as age increases, respondents are more likely than younger ones to be interested in the subject (95% confidence interval for middle-aged, 90% confidence interval for older respondents, Table 11). In other words, male, well-educated and older respondents are generally more likely, compared to the counterparts, to hear, read or talk about renewable energy. The same applies to respondents with an already good knowledge of renewable energy.

When it comes to the level of information that respondents have concerning renewable energy sources and renewable energy jobs (Figure 25), answers differ significantly depending on the gender of respondents (in both cases: p=0.000, Pearson's chi-square; p=0.000 Kruskal-Wallis). Concerning renewable energy sources, this difference depends – as one would expect – on the level of (derived) renewable energy knowledge of respondents (Table 5) (p=0.000, Pearson's chi-square; p=0.000

Kruskal-Wallis). Concerning renewable energy jobs, this difference depends on the age of respondents (p=0.000, Pearson's chi-square; p=0.000 Kruskal-Wallis). Interestingly, answers do not differ significantly depending on the level of renewable energy knowledge of respondents. (Table 12).

The ordered logistic regressions (Table 11) confirm those results, showing that female respondents are significantly more likely than males to feel that they lack information concerning both renewable energy sources (99% confidence interval, Table 11) and renewable energy jobs (99% confidence interval, Table 11). Further, as one would clearly expect, when it comes to renewable energy sources, respondents with worse levels of renewable energy knowledge appear to be more likely than their counterparts to feel they lack information on the subject (99% confidence interval, Table 11). When it comes to the renewable energy jobs, as anticipated, it appears that, as age increases, respondents are more likely to feel that they have more information (99% confidence interval, Table 11).

Overall, it thus appears that male and older respondents are more likely than their counterparts to perceive themselves as already holding enough or good information. Having a good knowledge of renewable energy does not necessarily imply, however, that respondents have a better knowledge of renewable energy jobs, compared to the level of knowledge experienced by the counterpart. This may be explained by the fact that even respondents highly-interested in the subject may have never thought about renewable energy jobs or may be mainly concerned about environmental effects rather than social and employment effects.

Table 11: Full ordered logistic regression results, question-by-question

	INFO_hrt	**INFO_ren**	**INFO_job**
AGE			
Middle-aged	0.321**	0.059	0.572***
	(0.140)	*(0.140)*	*(0.147)*
Older	0.320*	-0.089	0.735***
	(0.184)	*(0.184)*	*(0.191)*
GENDER			
Female	-0.422***	-1.013***	-0.784***
	(0.130)	*(0.133)*	*(0.136)*
EDUCATION			
Undergrad & Grad	0.339**	0.034	-0.198
	(0.141)	*(0.142)*	*(0.148)*
Post-Grad	0.536***	0.232	-0.092
	(0.194)	*(0.193)*	*(0.203)*
REGION			
Emilia-Romagna	0.078	0.123	0.193
	(0.158)	*(0.159)*	*(0.166)*
Central & South	-0.288	0.063	0.325*
	(0.184)	*(0.185)*	*(0.193)*
KNOWLEDGE			
Bad	-0.430***	-0.529***	-0.068
	(0.137)	*(0.137)*	*(0.142)*
Observations	864	864	864

Thus, the following conclusions can be drawn concerning the level of interest and the level of information that respondents have concerning renewable energy. First, the majority of respondents shows a decent level of interest concerning renewable energy, with a relevant portion of the population being often involved in active discussion about it. However, a still relevant subset of respondents appears as not interested or rarely involved in the conversation. Second, the majority of respondents seem to experience a lack of information and knowledge concerning renewable energy sources. Although this may be exaggerated by the fact that the question is asked at the end of the survey, this lack of information is seemingly more likely to have a large influence on public opinion than the less widespread, but still present, lack of interest. In any case, it is possible to infer that the population seems generally interested and involved, although lacking information.

The statistical analysis clearly shows that different groups answer in significantly different way. Male, well-educated and older respondents are more likely, compared to the counterparts, to hear, read or talk about renewable energy. The same applies to respondents with an already good knowledge of renewable energy, except when it comes to the almost unexplored renewable energy jobs. Similarly, male and older respondents are more likely than their counterparts to perceive themselves as already holding a good amount of information.

In terms of public opinion, it is however worth reminding that, as a lack of interest and information may translate into a lack of trust, a lack of awareness of associated benefits and, in general, an overall negative attitude towards renewable energy, being actively involved in the discussion or holding good levels of knowledge may not necessarily imply a positive attitude towards renewable energy. This is to be taken into account when considering the role of interest, knowledge and information in influencing public opinion.

Table 12: Summary of p-values obtained by testing answers to each question for Pearson's chi-square (upper row), Fisher's exact (upper row, in brackets), Kruskal-Wallis (lower row) and Wilcoxon-Mann-Whitney (lower row, in brackets).

Pearson's chi-square [Fisher's exact]
Kruskal-Wallis [Wilcoxon-Mann-Whitney]

		Age	Gender		Education	Region	Knowledge	
DEV_c	p=	0.000***	0.007***	[0.007]	0.241	0.401	0.206	[0.216]
		0.000***	0.002***	[0.002]	0.216	0.566	0.221	[0.221]
DEV_r	p=	0.006***	0.005***	[0.004]	0.021**	0.000***	0.080*	[0.082]
		0.004***	0.025**	[0.025]	0.078*	0.000***	0.178	[0.178]
DEV_p	p=	0.081*	0.010***	[0.007]	0.189	0.000***	0.216	[0.240]
		0.049**	0.014**	[0.014]	0.087*	0.000***	0.105	[0.105]
NIMBY_c	p=	0.007***	0.017**	[0.013]	0.520	0.730	0.000***	[0.000]
		0.002**	0.572	[0.573]	0.418	0.408	0.000***	[0.000]
NIMBY_r	p=	0.500	0.176	[0.160]	0.540	0.382	0.000***	[0.000]
		0.143	0.982	[0.981]	0.302	0.327	0.000***	[0.000]
NIMBY_p	p=	0.254	0.256	[0.273]	0.433	0.895	0.003***	[0.001]
		0.054*	0.922	[0.922]	0.171	0.860	0.000***	[0.000]
ECON_cost	p=	0.000***	0.572	[0.575]	0.320	0.522	0.108	[0.097]
		0.000***	0.396	[0.396]	0.142	0.160	0.799	[0.799]
ECON_wtp	p=	0.001***	0.000***	[0.000]	0.001***	0.018**	0.122	[0.109]

		0.001***	0.001***	[0.001]	0.000***	0.022**	0.045	[0.045]
ENV_env	p=	0.050**	0.000***	[0.000]	0.384	0.261	0.006***	[0.010]
		0.682	0.075	[0.075]	0.738	0.898	0.811	[0.811]
ENV_ranksun	p=	0.000***	0.001***	[0.001]	0.685	0.364	0.599	[0.599]
		0.346	0.000***	[0.000]	0.893	0.142	0.635	[0.635]
ENV_rankwind	p=	0.009***	0.438	[0.435]	0.989	0.045**	0.013**	[0.012]
		0.006***	0.105	[0.105]	0.780	0.566	0.027**	[0.027]
ENV_rankgeo	p=	0.000***	0.004***	[0.005]	0.586	0.877	0.314	[0.311]
		0.000***	0.000***	[0.000]	0.490	0.384	0.618	[0.618]
ENV_rankhydro	p=	0.000***	0.081*	[0.084]	0.830	0.047**	0.052*	[0.050]
		0.012**	0.027**	[0.027]	0.556	0.704	0.005***	[0.005]
ENV_rankbio	p=	0.407	0.629	[0.621]	0.701	0.219	0.187	[0.180]
		0.103	0.754	[0.753]	0.791	0.454	0.116	[0.116]
SOC_life	p=	0.738	0.210	[0.212]	0.312	0.262	0.177	[0.140]
		0.874	0.557	[0.557]	0.593	0.723	0.090*	[0.090]
SOC_comm	p=	0.639	0.002***	[0.001]	0.058*	0.216	0.018**	[0.013]
		0.534	0.798	[0.798]	0.305	0.173	0.049**	[0.049]
JOB_wage	p=	0.000***	0.096*	[0.078]	0.412	0.339	0.283	[0.276]
		0.068*	0.015**	[0.015]	0.262	0.727	0.119	[0.119]
JOB_dur	p=	0.025**	0.060*	[0.057]	0.902	0.700	0.200	[0.214]
		0.260	0.133	[0.133]	0.567	0.444	0.037**	[0.037]
JOB_skill	p=	0.003***	0.075*	[0.074]	0.222	0.035**	0.000***	[0.000]
		0.398	0.601	[0.601]	0.617	0.090*	0.041**	[0.041]
JOB_kill	p=	0.001***	0.817	[0.827]	0.419	0.661	0.000***	[0.000]
		0.009***	0.916	[0.916]	0.133	0.390	0.337	[0.337]
JOB_qual	p=	0.232	0.793	[0.809]	0.515	0.024**	0.831	[0.798]
		0.160	0.767	[0.767]	0.395	0.795	0.575	[0.575]
INFO_hrt	p=	0.023**	0.003***	[0.004]	0.018**	0.222	0.001***	[0.001]
		0.013**	0.000***	[0.000]	0.002***	0.105	0.000***	[0.000]
INFO_ren	p=	0.470	0.000***	[0.000]	0.795	0.618	0.000***	[0.000]
		0.599	0.000***	[0.000]	0.189	0.856	0.000***	[0.000]
INFO_job	p=	0.000***	0.000***	[0.000]	0.260	0.552	0.276	[0.314]
		0.000***	0.000***	[0.000]	0.077*	0.219	0.229	[0.229]

4. CONCLUSION

This final section elaborates on the conclusions already drawn at the end of the related sub-sections (see sections 3.1, 3.2, 3.3, 3.4, 3.5) concerning each different driver of public opinion analysed, namely: not-in-my-backyard-ism and perception of renewable energy development, perception of economic impacts, perception of social impacts, perception of environmental impacts and environmental-friendliness of the different renewable energy technologies, employment effects and perception of renewable energy jobs, level of interest and knowledge concerning renewable energy. Focus is also devoted to analysing how different subsets of the population have answered differently to the survey.

Thus, the structure of this final section is as follows: first, the main results are summarised and merged together, providing for a complete all-round picture of the issue and the conclusions already highlighted. Then possible explanations of those results arise, followed by the most interesting remarks concerning how public opinion and perception of renewable energy in Italy could be improved, or rather which opportunities could be exploited so that most of the positive externalities related to the deployment of renewable energy may be harvested.

4.1 Summary and explanation of results

Starting from not-in-my-backyard-ism, it appears that the majority of respondents generally perceive renewable energy as poorly developed at all levels. This translates into a widespread desire of fostered renewable energy deployment and plants construction, even at the provincial level, indicating that the issues generally linked to not-in-my-backyard-ism – or, at least, the form of not-in-my-backyard-ism that we could refer to as “not-in-my-province” – play only a minor or almost irrelevant role in affecting the public opinion of renewable energy in Italy. Among those issues, however, visual impacts appear to be the most important. (see Section 3.1).

Further, concerning the perception of the economic impacts linked to the development of renewable energy, it seems the public has a highly heterogeneous perception of the costs of renewable electricity, when compared to non-renewable electricity. Indeed, a large portion of the population thinks, as expected, that “renewables are expensive”. Most respondents are however willing to pay more in order to have greener electricity in their electricity consumption. On the other hand, concerning the perception of the social impacts linked to the development of renewable energy, it seems respondents homogeneously consider renewable energy as extremely beneficial for the local communities and for improving life quality. Thus, it seems public concerns are mainly related to the perceived costs of renewable electricity, while the perception of the social impacts linked to the development of renewable energy seems to affect positively public opinion. (see Section 3.2).

In general, respondents also consider renewable energy as beneficial for the surrounding environment (see Section 3.2). However, concerning the different renewable energy technologies and the perception of the associated environmental impacts, it appears solar energy is by far considered as the most environmental-friendly technology, followed by wind energy. The perception of the environmental impacts associated with geothermal energy and hydropower is highly heterogeneous, while bioenergy is by far perceived as the least environmental-friendly technology (see Section 3.3).

In addition, moving to the public opinion on renewable energy jobs and the employment effects linked to the renewable energy sector, survey results surprisingly show, defying all expectations, that the so-called "job-killing argument" is not present. This reinforces the feeling that the public generally perceives positively renewable energy when it comes to jobs and employment, with the overall quality of the jobs offered being considered as higher-then-average. (see Section 3.4).

Further, it appears that the population is generally interested in the subject, although lacking information concerning renewable energy and related issues. Indeed, the majority of respondents shows a decent level of interest concerning renewable energy, with a relevant portion of the population being often involved in active discussion about it. However, a still relevant subset of respondents appears as not interested or rarely involved in the conversation. Concerning the level of knowledge of respondents, the majority of them seem to experience a lack of information concerning renewable energy sources. (see Section 3.5).

The age of respondents plays a central role in shaping how respondents are likely to answer. Indeed, as age increases, respondents generally have a more negative perception of renewable energy development at all levels, while also being significantly more likely to be part of the small fraction of respondents opposing a further construction of renewable energy plants (see Section 3.1). Further, as age increases, respondents appear to be significantly more likely to think that renewable electricity is less expensive than non-renewable electricity. Despite that, older respondents turn out as significantly less willing to pay to consume more green electricity, if compared to their younger counterparts. (see Section 3.2). Significantly different answers are also given when it comes to jobs creation, with middle-aged respondents likely to be significantly more aware than younger ones of the positive net employment effects associated with the deployment of renewable energy (see Section 3.4). The statistical analysis also shows that older respondents are significantly more likely than younger ones to hear, read or talk about renewable energy and to perceive themselves as already holding a good amount of information regarding the subject (see Section 3.5). The central role played by the age of respondents is also confirmed by the fact that, depending on their age, respondents rank in significantly different way the various renewable energy technologies when it comes to evaluating the related environmental impacts (see Section 3.3).

Another crucial role is played by the gender of respondents. Indeed, compared to their counterparts, males are significantly more likely to perceive renewable energy as underdeveloped at all levels (see Section 3.1), to be unwilling to pay more in order to have more renewable electricity in their electricity consumption (see Section 3.2) and to be more interested and feel to have a good knowledge concerning renewable energy (see Section 3.5). This crucial role played by the gender of respondents is also confirmed by the fact that, depending on their gender, respondents rank in significantly different way the various renewable energy technologies when it comes to evaluating the related environmental impacts (see Section 3.3).

Another relevant role is played by the level of renewable energy knowledge of respondents. Indeed, it appears that respondents exhibiting a (derived) bad knowledge of renewable energy, compared to those showing a (derived) good knowledge of it, seem significantly more likely to be against a further deployment of renewable energy at all levels (see Section 3.1). Similarly, they are more likely to be unwilling to pay more in order to have greener electricity in their consumption (see Section 3.2). Further, as one would expect, it appears that respondents holding a (derived) good knowledge of renewable energy are significantly more likely to confirm to have a good amount of information concerning the subject (see Section 3.5). At the same time, when it comes to the rank of renewable energy technologies in terms of their environmental impact, answers from the different groups of respondents with different levels of (derived) renewable energy knowledge vary only with a low degree of significance (see Section 3.3).

Interestingly, the level of education of respondents seems to play only a minor role in shaping how questions are answered. Indeed, it merely appears that well-educated respondents are significantly more likely than the counterparts to perceive renewable energy as well-developed at all levels (see Section 3.1), to be actively involved in the public discussion concerning renewable energy (see Section 3.5) and to be willing to pay more in order to have greener electricity in their consumption (see Section 3.2).

Even more interestingly, and defying all expectations, the region of origin of respondents seems to play an almost irrelevant role. In other words, respondents from the different areas included in the analysis – Northern Italy, Emilia-Romagna, Central & Southern Italy – do not appear to answer in significantly different way, highlighting the absence, rather than the presence, of statistically significant regional differences when it comes to public opinion on renewable energy and related issues.

Thus, summing up, the survey results and the statistical analysis provide for an overall positive picture concerning the public attitude towards renewable energy in Italy, although it is always worth reminding that the sampled population is generally well-educated (i.e. only a few respondents do not hold a high-school diploma)

In any case, defying all expectations, the issues related to the so-called not-in-my-backyard-ism, which in this context is to be considered as “not-in-my-province-ism”, are almost irrelevant in influencing negatively public opinion. Surprisingly, the Italian population is indeed largely in favour of a further deployment of renewable energy at all levels – national, regional and provincial.

Among the reason for that, as highlighted by the survey, there may be that the Italian population seems to be almost fully aware of the social and personal benefits associated with the development of renewable energy at the local level, including the positive impacts on the local communities and the quality of life. Similarly, this may be due to the fact that the Italian population seems to consider the construction of more renewable energy plants as generally beneficial for the environment. In other words, the perceived benefits, for instance in terms of clean air, seem to outweigh the unavoidable negative environmental impacts.

This is even more true when it comes to solar energy, which is the most preferred as well as the most developed renewable energy technology in terms of both capacity and production, apart from hydropower. Again, this result seems to be extremely positive when it comes to public opinion. The most preferred and environmental-friendly technology is the most developed one, and the population seems definitely in favour of a further large-scale deployment. This is probably due to the fact that, compared to the installation of wind turbines and the construction of large wind farms, solar panels record lower visual impacts.

Adding to the already positive picture and defying again all expectations, the survey shows that the so-called “job-killing argument” is almost non-existent. On the contrary, the majority of the population perceives renewable energy as an instrument to create rather than destroy jobs. Although it seems difficult to grasp the reason behind this result, it is possible that the perception of a revolutionized energy system in growing expansion may be associated with jobs creation. In any case, this general perception of a positive net employment effect associated with renewable energy comes also with the idea that the jobs created are of higher-then-average quality. Thus, again, public opinion seems to be decisively positive.

However, some drawbacks necessarily emerge. Indeed, it appears that a relevant subset of the population is not interested in the subject or is never or rarely involved in the conversation concerning renewable energy. This also adds to a widespread and mainly expected lack of information. Since the lack of knowledge and interest can easily translate into a lack of awareness of the benefits associated with renewable energy, this may foster public opposition or affect negatively public opinion.

Further, on the negative side, the most relevant result emerging from the survey is linked to the perception of the costs of renewable electricity. Indeed, the Italian population seems to be largely unaware and confused regarding the costs of electricity generated using renewable energy sources. The large portion of the population sticking to the common idea that “renewables are expensive” is without any doubt painfully fuelling public opposition. The main reason for this is likely to be found in the widespread and already highlighted lack of information concerning all aspects of renewable energy.

When it comes to the different groups of the population, while significant differences in how questions are answered are normally expected between older and younger respondents as well as between males and females, and while those differences do not add much to this discussion, it is extremely interesting to point out that the level of education of respondents and the region of origin of respondents play, respectively, only a slightly relevant and an almost irrelevant role. Concerning the latter, this means that no significant regional differences emerge, despite the cultural, economic, social and environmental diversity.

A possible explanation for this may lie on the fact that Italy lacks fossil fuels deposits and, from North to South, heavily relies on imports from foreign countries to satisfy its demand (Figure 4). Thus, despite the many differences, it is possible to draw a common identity when it comes to energy needs and the energy system. A confirmation for this can be also found on the Italian attitude towards nuclear energy, homogeneously rejected both in 1987 and 2011, with no regional differences (Dipartimento per gli Affari Interni e Territoriali).

4.2 Remarks and opportunities

Based on all of the analysis and results, it seems relevant to conclude by highlighting how the public opinion and the perception of renewable energy in Italy could be improved, following along with a description of which opportunities could be exploited so that most of the various positive externalities related to the deployment of renewable energy may be beneficially harvested in different contexts.

First of all, the general lack of information concerning renewable energy appears to be the most pressing issue to be tackled. Indeed, as said, since the lack of knowledge and interest can easily translate into a lack of awareness of the benefits associated with renewable energy, this may foster public opposition or affect negatively public opinion. The fact that a relevant portion of the population thinks that “renewables are expensive” confirms the need for providing the public with better, clear, eye-opening information on the matter. Since it appears that most of the Italian population is already willing to pay more in order to increase the amount of clean energy in its electricity mix, public information campaigns, conducted in this sense, may in fact be highly successful. It is not hasty to predict that better public information regarding the true economic costs of renewable energy may translate into a fostered positive attitude towards it.

Specifically, better information should be provided concerning bioenergy. The survey shows, indeed, that bioenergy is by far considered as the least environmental-friendly technology among renewable energy sources, implying a mainly negative public attitude towards it when it comes to its environmental impacts. This widespread negative perception, fuelled by a deep lack of reliable information on the subject, is translated into rising public opposition towards the establishment of the now definitely safer thermal treatment plants (i.e. incinerators), as well as into a complete lack of awareness concerning the beneficial role played by biotreatment plants when it comes to energy (i.e. biogas) and material recovery (i.e. compost). Further, since the environmental aspect is likely to be preponderant while comparing the different renewable energy technologies and while evaluating each of them, it is likely that the public experiences a general, all-round negative perception of bioenergy. Nonetheless, data shows that more than half of renewable energy employment is created by bioenergy (Figure 9; Figure 10). Thus, it appears that a positive net employment effect could be achieved only by including bioenergy and its ability to create jobs. In other words, the mainly negative public attitude towards bioenergy seems to be strongly ill-founded and necessitates a focused public information campaign.

Further, since solar energy represents the cornerstone of the Italian renewable energy system, central and local authorities could facilitate the diffusion of the so-called "agrivoltaic" systems. The idea is that, by combining food and solar energy production, competition over land use could be solved, fostering the public acceptance of large-scale solar plants without incurring in the opposition or negative attitude caused by the loss of cropland and farmland (Brudermann et al., 2013; Dupraz et al., 2011). Although the perspective is certainly promising and the benefits are more than double for all the parts involved (i.e. farmers, society, environment, citizens consuming energy produced locally), "agrivoltaic" systems are still uncommon, being inherently linked to network externalities (Brudermann et al., 2013). Thus, as said, central and local authorities could incentivise their establishment, making farmers aware of this possibility and able to implement it. As more farmers transform their land into a hybrid capable of producing food as well as energy, others will certainly follow. In this sense, a huge role could also be played by local cooperatives (Heras Saizarbitoria et al., 2011), supporting farmers in financing and managing the new "agrivoltaic" activity and fostering a decentralization of the production of clean energy.

Concerning cooperatives, they are historically diffused in many areas of the Italian economy and society, although a joint effort within the renewable energy sector is generally lacking (Heras Saizarbitoria et al., 2011). In contrast, Central European countries are experiencing a rapid diffusion of the idea of community renewable energy, capable of fostering public acceptance by involving local communities in the decision-making process, by enabling them to carry forward new projects and by facilitating the financing (Walker et al., 2010; Bauwens et al., 2016). As said, this would be extremely beneficial in the context of the establishment of "agrivoltaic" systems in Italy (Bauwens et al., 2016). Thus, following the Central European model, the formation of cooperatives within the renewable energy system represents a relevant steppingstone towards a beneficial decentralization of the production of clean energy, with local communities at the centre rather than at the periphery.

Concerning the periphery, also degraded areas rapidly come to mind. Such degraded areas, including areas with poor or contaminated land not suitable for agriculture, areas characterised by an already disrupted landscape and environment, as well as areas perceived as “ugly” or unpleasant to live in for various factors, conceal an unexploited and relevant renewable energy potential. Indeed, the large-scale deployment of solar plants or wind farms in those areas is likely to increase the value of the land, without incurring in issues linked to visual impacts, to landscape disruption or to the loss of cropland and farmland, while also removing the stigma associated with living in a degraded area. (Perpina Castillo et al., 2016). In other words, renewable energy can be a highly beneficial instrument able to requalify degraded, unsuitable or stigmatised areas. This could be specifically relevant for the requalification of the so-called “Terra dei Fuochi” in Campania region (Southern-Italy, between the cities of Napoli and Caserta), literally “Land of Fires”. It is indeed common knowledge that organized crime has poisoned the land burying toxic wastes and dumping hazardous substances. As the degraded and unsuitable land is increasingly reclaimed by the actions of citizens and authorities, the large-scale deployment of renewable energy could truly represent a central figure in the puzzle of requalification, also bringing jobs to an area suffering from high levels of endemic unemployment (Eurostat, 2020).

Another opportunity to exploit the positive externalities linked to the development of renewable energy in Italy is linked to the improvement of the local energy systems of islands[9]. Indeed, islands are surrounded by renewable energy potential in various forms – wind, sun, waves, biomass, in some cases geothermal heat –; at the same time, whatever their size, they are rarely energy independent and rely heavily on the mainland. In smaller islands and archipelagos, also due to the usually low number of inhabitants, transitioning towards a 100% renewable energy system is not only achievable but also environmentally and economically beneficial (Andaloro et al., 2012; Cosentino et al., 2012; Giatrakos et al., 2009; Kaldellis et al., 2012; Vicinanza et al.). Indeed, small islands could truly set the example for a bright transformation of the local energy systems to be later applied to small towns and villages in rural areas on the mainland (De Luca et al., 2018). At the same time, with tourism being increasingly attracted by areas characterised by high levels of sustainability (Cucculelli & Goffi, 2016) and with Italy being a destination for millions of tourists every year, the local development of renewable energy can only be beneficial.

It is then possible to conclude that the overall positive attitude towards renewable energy experienced by the Italian population, captured by this survey, is nestled on a wide set of, rather than barriers, available opportunities and rooms for beneficial improvement.

[9] Italy has two main islands (Sicilia and Sardegna) and more than ten inhabited archipelagos of smaller islands.

5. BIBLIOGRAPHY

Achillas, Ch., Vlachokostas, Ch., Moussiopoulos, N., Banias, G., Kafetzopoulos, G., & Karagiannidis, A. (2011). Social acceptance for the development of a waste-to-energy plant in an urban area. *Resources, Conservation and Recycling*, *55*(9–10), 857–863. https://doi.org/10.1016/j.resconrec.2011.04.012

Alessi, E., & Martin, J. (2010). Conducting an Internet-based Survey: Benefits, Pitfalls, and Lessons Learned. *Social Work Research*, *34*(2), 122-128. Retrieved May 30, 2020, from www.jstor.org/stable/42659754

Andaloro, A. P. F., Salomone, R., Andaloro, L., Briguglio, N., & Sparacia, S. (2012). Alternative energy scenarios for small islands: A case study from Salina Island (Aeolian Islands, Southern Italy). *Renewable Energy*, *47*, 135–146. https://doi.org/10.1016/j.renene.2012.04.021

Azarova, V., Cohen, J., Friedl, C., & Reichl, J. (2019). Designing local renewable energy communities to increase social acceptance: Evidence from a choice experiment in Austria, Germany, Italy, and Switzerland. *Energy Policy*, *132*, 1176–1183. https://doi.org/10.1016/j.enpol.2019.06.067

Bartolozzi, I., Rizzi, F., & Frey, M. (2017). Are district heating systems and renewable energy sources always an environmental win-win solution? A life cycle assessment case study in Tuscany, Italy. *Renewable and Sustainable Energy Reviews*, *80*, 408–420. https://doi.org/10.1016/j.rser.2017.05.231

Bauwens, T., Gotchev, B., & Holstenkamp, L. (2016). What drives the development of community energy in Europe? The case of wind power cooperatives. *Energy Research & Social Science*, *13*, 136–147. https://doi.org/10.1016/j.erss.2015.12.016

Bergmann, A., Colombo, S., & Hanley, N. (2008). Rural versus urban preferences for renewable energy developments. *Ecological Economics*, *65*(3), 616–625. https://doi.org/10.1016/j.ecolecon.2007.08.011

Blanco, M. I., & Rodrigues, G. (2009). Direct employment in the wind energy sector: An EU study. *Energy Policy*,*37*(8), 2847–2857. https://doi.org/10.1016/j.enpol.2009.02.049

Böhringer, C., Keller, A., & van der Werf, E. (2013). Are green hopes too rosy? Employment and welfare impacts of renewable energy promotion. *Energy Economics*,*36*, 277–285. https://doi.org/10.1016/j.eneco.2012.08.029

Borzoni, M., Rizzi, F., & Frey, M. (2014). Geothermal power in Italy: A social multi-criteria evaluation. *Renewable Energy*, *69*, 60–73. https://doi.org/10.1016/j.renene.2014.03.026

Bowen, A., Kuralbayeva, K., & Tipoe, E. L. (2018). Characterising green employment: The impacts of ‘greening’ on workforce composition. *Energy Economics*, *72*, 263–275. https://doi.org/10.1016/j.eneco.2018.03.015

Bravi, M., & Basosi, R. (2014). Environmental impact of electricity from selected geothermal power plants in Italy. *Journal of Cleaner Production*, *66*, 301–308. https://doi.org/10.1016/j.jclepro.2013.11.015

Brudermann, T., Reinsberger, K., Orthofer, A., Kislinger, M., & Posch, A. (2013). Photovoltaics in agriculture: A case study on decision making of farmers. *Energy Policy*, *61*, 96–103. https://doi.org/10.1016/j.enpol.2013.06.081

Burgos-Payán, M., Roldán-Fernández, J. M., Trigo-García, Á. L., Bermúdez-Ríos, J. M., & Riquelme-Santos, J. M. (2013). Costs and benefits of the renewable production of electricity in Spain. *Energy Policy*, *56*, 259–270. https://doi.org/10.1016/j.enpol.2012.12.047

Cai, M., Cusumano, N., Lorenzoni, A., & Pontoni, F. (2017). A comprehensive ex-post assessment of RES deployment in Italy: Jobs, value added and import leakages. *Energy Policy*,*110*, 234–245. https://doi.org/10.1016/j.enpol.2017.08.013

Caldés, N., Varela, M., Santamaría, M., & Sáez, R. (2009). Economic impact of solar thermal electricity deployment in Spain. *Energy Policy*,*37*(5), 1628–1636. https://doi.org/10.1016/j.enpol.2008.12.022

Caporale, D., & De Lucia, C. (2015). Social acceptance of on-shore wind energy in Apulia Region (Southern Italy). *Renewable and Sustainable Energy Reviews*, *52*, 1378–1390. https://doi.org/10.1016/j.rser.2015.07.183

Cipolla, C. M. (2013). *Uomini, tecniche, economie*. Milano, Italy: Il Mulino.

Clò, S., Cataldi, A., & Zoppoli, P. (2015). The merit-order effect in the Italian power market: The impact of solar and wind generation on national wholesale electricity prices. *Energy Policy*, *77*, 79–88. https://doi.org/10.1016/j.enpol.2014.11.038

Creutzig, F., Goldschmidt, J. C., Lehmann, P., Schmid, E., von Blücher, F., Breyer, C., … Wiegandt, K. (2014). Catching two European birds with one renewable stone: Mitigating climate change and Eurozone crisis by an energy transition. *Renewable and Sustainable Energy*

Reviews, *38*, 1015–1028. https://doi.org/10.1016/j.rser.2014.07.028

Consoli, D., Marin, G., Marzucchi, A., & Vona, F. (2016). Do green jobs differ from non-green jobs in terms of skills and human capital? *Research Policy*, *45*(5), 1046–1060. https://doi.org/10.1016/j.respol.2016.02.007

Cosentino, V., Favuzza, S., Graditi, G., Ippolito, M. G., Massaro, F., Riva Sanseverino, E., & Zizzo, G. (2012). Smart renewable generation for an islanded system. Technical and economic issues of future scenarios. *Energy*, *39*(1), 196–204. https://doi.org/10.1016/j.energy.2012.01.030

Couper, M. P., Tourangeau, R., Conrad, F. G., & Crawford, S. D. (2004). What They See Is What We Get: Response Options for Web Surveys. *Social Science Computer Review*, *22*(1), 111–127. https://doi.org/10.1177/0894439303256555

Cucculelli, M., & Goffi, G. (2016). Does sustainability enhance tourism destination competitiveness? Evidence from Italian Destinations of Excellence. *Journal of Cleaner Production*, *111*, 370–382. https://doi.org/10.1016/j.jclepro.2014.12.069

De Luca, G., Fabozzi, S., Massarotti, N., & Vanoli, L. (2018). A renewable energy system for a nearly zero greenhouse city: Case study of a small city in southern Italy. *Energy, 143*, 347–362. https://doi.org/10.1016/j.energy.2017.07.004

de Sherbinin, A. (2013). Climate change hotspots mapping: what have we learned? *Climatic Change*, *123*(1), 23–37. https://doi.org/10.1007/s10584-013-0900-7

del Río, P., & Burguillo, M. (2009). An empirical analysis of the impact of renewable energy deployment on local sustainability. *Renewable and Sustainable Energy Reviews*, *13*(6–7), 1314–1325. https://doi.org/10.1016/j.rser.2008.08.001

Delicado, A., Figueiredo, E., & Silva, L. (2016). Community perceptions of renewable energies in Portugal: Impacts on environment, landscape and local development. *Energy Research & Social Science*, *13*, 84–93. https://doi.org/10.1016/j.erss.2015.12.007

Delfanti, L., Colantoni, A., Recanatesi, F., Bencardino, M., Sateriano, A., Zambon, I., & Salvati, L. (2016). Solar plants, environmental degradation and local socioeconomic contexts: A case study in a Mediterranean country. *Environmental Impact Assessment Review*, *61*, 88–93. https://doi.org/10.1016/j.eiar.2016.07.003

Dipartimento per gli Affari Interni e Territoriali. (n.d.-a). Archivio storico delle elezioni, Referendum 08/11/1987. Retrieved from https://elezionistorico.interno.gov.it/index.php?tpel=F&dtel=08/11/1987&tpa=I&tpe=A&lev0=0&levsut0=0&es0=S&ms=S

Dipartimento per gli Affari Interni e Territoriali. (n.d.-b). Archivio storico delle elezioni, Referendum 12/06/2011. Retrieved June 28, 2020, from https://elezionistorico.interno.gov.it/index.php?tpel=F&dtel=12/06/2011&tpa=Y&tpe=A&lev0=0&levsut0=0&es0=S&ms=S

Dowling, P. (2013). The impact of climate change on the European energy system. *Energy Policy*, *60*, 406–417. https://doi.org/10.1016/j.enpol.2013.05.093

Dröes, M. I., & Koster, H. R. A. (2016). Renewable energy and negative externalities: The effect of wind turbines on house prices. *Journal of Urban Economics*, *96*, 121–141. https://doi.org/10.1016/j.jue.2016.09.001

Dupraz, C., Marrou, H., Talbot, G., Dufour, L., Nogier, A., & Ferard, Y. (2011). Combining solar photovoltaic panels and food crops for optimising land use: Towards new agrivoltaic schemes. *Renewable Energy*, *36*(10), 2725–2732. https://doi.org/10.1016/j.renene.2011.03.005

ESPON. (2011). *Wind power and photovoltaic potential* [Map]. Retrieved from https://www.espon.eu/topics-policy/publications/maps-month/wind-power-and-photovoltaic-potential

European Commission. (2012). *Energy roadmap 2050*. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/2012_energy_roadmap_2050_en_0.pdf

European Commission. (2013). *Public Employment Services and Green Jobs*. Retrieved from file:///C:/Users/Giulio/Downloads/Analytical%20paper%20-%20Public%20Employment%20Services%20and%20Green%20Jobs%20(2013).pdf

European Commission. (2015). *Geothermal energy potential* [Map]. Retrieved from https://ec.europa.eu/jrc/en/news/new-report-analyses-geothermal-energy-sector

European Environment Agency. (2020). *Free flowing rivers in Europe* [Map]. Retrieved from https://www.eea.europa.eu/data-and-maps/figures/free-flowing-rivers-in-europe

Eurostat. (2020). *Unemployment statistics at regional level - Statistics Explained* [Dataset]. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics_at_regional_level#Regional_unemployment_rates_and_the_EU_average

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behavior*, *26*(2), 132–139. https://doi.org/10.1016/j.chb.2009.10.015

Fankhaeser, S., Sehlleier, F., & Stern, N. (2008). Climate change, innovation and jobs. *Climate Policy*, *8*(4), 421–429. https://doi.org/10.3763/cpol.2008.0513

Ferrario, V., & Castiglioni, B. (2017). Visibility/invisibility in the "making" of energy landscape. Strategies and policies in the hydropower development of the Piave river (Italian Eastern Alps). *Energy Policy*, *108*, 829–835. https://doi.org/10.1016/j.enpol.2017.05.012

Fricker, S. (2005). An Experimental Comparison of Web and Telephone Surveys. *Public Opinion Quarterly*, *69*(3), 370–392. https://doi.org/10.1093/poq/nfi027

Friedl, C., & Reichl, J. (2016). Realizing energy infrastructure projects – A qualitative empirical analysis of local practices to address social acceptance. *Energy Policy*, *89*, 184–193. https://doi.org/10.1016/j.enpol.2015.11.027

Gao, X., & Giorgi, F. (2008). Increased aridity in the Mediterranean region under greenhouse gas forcing estimated from high resolution simulations with a regional climate model. *Global and Planetary Change*, *62*(3–4), 195–209. https://doi.org/10.1016/j.gloplacha.2008.02.002

García de Jalón, S., Iglesias, A., Quiroga, S., & Bardají, I. (2013). Exploring public support for climate change adaptation policies in the Mediterranean region: A case study in Southern Spain. *Environmental Science & Policy*, *29*, 1–11. https://doi.org/10.1016/j.envsci.2013.01.010

Gelabert, L., Labandeira, X., & Linares, P. (2011). An ex-post analysis of the effect of renewables and cogeneration on Spanish electricity prices. *Energy Economics*, *33*, S59–S65. https://doi.org/10.1016/j.eneco.2011.07.027

Giatrakos, G. P., Tsoutsos, T. D., Mouchtaropoulos, P. G., Naxakis, G. D., & Stavrakakis, G. (2009). Sustainable energy planning based on a stand-alone hybrid renewableenergy/hydrogen power system: Application in Karpathos island, Greece. *Renewable Energy*, *34*(12), 2562–2570. https://doi.org/10.1016/j.renene.2009.05.019

Gibelin, A.-L., & Déqué, M. (2003). Anthropogenic climate change over the Mediterranean region simulated by a global variable resolution model. *Climate Dynamics*, *20*(4), 327–339. https://doi.org/10.1007/s00382-002-0277-1

Giorgi, F., & Lionello, P. (2008). Climate change projections for the Mediterranean region. *Global and Planetary Change*, *63*(2–3), 90–104. https://doi.org/10.1016/j.gloplacha.2007.09.005

Gracia, A., Barreiro-Hurlé, J., & Pérez y Pérez, L. (2012). Can renewable energy be financed with higher electricity prices? Evidence from a Spanish region. *Energy Policy*, *50*, 784–794. https://doi.org/10.1016/j.enpol.2012.08.028

Groves, Robert M. (2006). Nonresponse Rates and Nonresponse Bias in Household Surveys. *Public Opinion Quarterly*, *70*(5), 646–675. https://doi.org/10.1093/poq/nfl033

Groves, R. M., Presser, S., & Dipko, S. (2004). The Role of Topic Interest in Survey Participation Decisions. *Public Opinion Quarterly*, *68*(1), 2–31. https://doi.org/10.1093/poq/nfh002

Gullì, F., & Balbo, A. L. (2015). The impact of intermittently renewable energy on Italian wholesale electricity prices: Additional benefits or additional costs? *Energy Policy*, *83*, 123–137. https://doi.org/10.1016/j.enpol.2015.04.001

Heerwegh, D., Vanhove, T., Matthijs, K., & Loosveldt, G. (2005). The effect of personalization on response rates and data quality in web surveys. *International Journal of Social Research Methodology*, *8*(2), 85–99. https://doi.org/10.1080/1364557042000203107

Heiervang, E., & Goodman, R. (2009). Advantages and limitations of web-based surveys: evidence from a child mental health survey. *Social Psychiatry and Psychiatric Epidemiology*, *46*(1), 69–76. https://doi.org/10.1007/s00127-009-0171-9

Henriques, C. O., Coelho, D.H., & Cassidy, N. L. (2016). Employment impact assessment of renewable energy targets for electricity generation by 2020—An IO LCA approach. *Sustainable Cities and Society*,*26*, 519–530. https://doi.org/10.1016/j.scs.2016.05.013

Heras-Saizarbitoria, I., Cilleruelo, E., & Zamanillo, I. (2011). Public acceptance of renewables and the media: an analysis of the Spanish PV solar experience. *Renewable and Sustainable Energy Reviews*, *15*(9), 4685–4696. https://doi.org/10.1016/j.rser.2011.07.083

Huijts, N. M. A., Molin, E. J. E., & Steg, L. (2012). Psychological factors influencing sustainable energy technology acceptance: A review-based comprehensive framework. *Renewable and Sustainable Energy Reviews*, *16*(1), 525–531. https://doi.org/10.1016/j.rser.2011.08.018

IEA. (2016). *Energy Policies of IEA Countries: Italy 2016 Review*. Retrieved from https://webstore.iea.org/energy-policies-of-iea-countries-italy-2016-review

IEA. (2019). *IEA Energy Atlas* [Dataset]. Retrieved from http://energyatlas.iea.org/#!/tellmap/-1076250891/0

ILO. (2018). *World Employment and Social Outlook 2018: Greening with jobs*. Retrieved from https://www.ilo.org/weso-greening/documents/WESO_Greening_EN_web2.pdf

IRENA. (2011). *Renewable energy and jobs: status, prospects & policies*. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2012/RenewableEnergyJobs.pdf

IRENA. (2019). *Renewable energy statistics 2019*. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jul/IRENA_Renewable_energy_statistics_2019.pdf

IRENA. (2020a). *IRENA RE Time Series* [Dataset]. Retrieved from https://public.tableau.com/views/IRENARETimeSeries/Charts?:embed=y&:showVizHome=no&publish=yes&:toolbar=no

IRENA. (2020b). *Renewable energy capacity statistics 2020*. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Mar/IRENA_RE_Capacity_Statistics_2020.pdf

IRENA. (2020c). *Renewable Energy Employment by Country* [Dataset]. Retrieved from https://www.irena.org/Statistics/View-Data-by-Topic/Benefits/Renewable-Energy-Employment-by-Country

Kaldellis, J. K. (2005). Social attitude towards wind energy applications in Greece. *Energy Policy*, *33*(5), 595–602. https://doi.org/10.1016/j.enpol.2003.09.003

Kaldellis, J. K., Gkikaki, Ant., Kaldelli, El., & Kapsali, M. (2012). Investigating the energy autonomy of very small non-interconnected islands. *Energy for Sustainable Development*, *16*(4), 476–485. https://doi.org/10.1016/j.esd.2012.08.002

Kaldellis, J. K., Apostolou, D., Kapsali, M., & Kondili, E. (2016). Environmental and social footprint of offshore wind energy. Comparison with onshore counterpart. *Renewable Energy*, *92*, 543–556. https://doi.org/10.1016/j.renene.2016.02.018

Kaplowitz, M. D., Hadlock, T. D., & Levine, R. (2004). A Comparison of Web and Mail Survey Response Rates. *Public Opinion Quarterly*, *68*(1), 94–101. https://doi.org/10.1093/poq/nfh006

Lambert, R. J., & Silva, P. P. (2012). The challenges of determining the employment effects of renewable energy. *Renewable and Sustainable Energy Reviews*, *16*(7), 4667–4674. https://doi.org/10.1016/j.rser.2012.03.072

Lehr, U., Nitsch, J., Kratzat, M., Lutz, C., & Edler, D. (2008). Renewable energy and employment in Germany. *Energy Policy*,*36*(1), 108–117. https://doi.org/10.1016/j.enpol.2007.09.004

Lehr, U., Lutz, C., & Edler, D. (2012). Green jobs? Economic impacts of renewable energy in Germany. *Energy Policy*,*47*, 358–364. https://doi.org/10.1016/j.enpol.2012.04.076

Lelieveld, J., Hadjinicolaou, P., Kostopoulou, E., Chenoweth, J., El Maayar, M., Giannakopoulos, C., … Xoplaki, E. (2012). Climate change and impacts in the Eastern Mediterranean and the Middle East. *Climatic Change*, *114*(3–4), 667–687. https://doi.org/10.1007/s10584-012-0418-4

Llera, E., Scarpellini, S., Aranda, A., & Zabalza, I. (2013). Forecasting job creation from renewable energy deployment through a value-chain approach. *Renewable and Sustainable Energy Reviews*,*21*, 262–271. https://doi.org/10.1016/j.rser.2012.12.053

Llera Sastresa, E., Usón, A. A., Bribián, I. Z., & Scarpellini, S. (2010). Local impact of renewables on employment: Assessment methodology and case study. *Renewable and Sustainable Energy Reviews*,*14*(2), 679–690. https://doi.org/10.1016/j.rser.2009.10.017

Lucas, H., Pinnington, S., & Cabeza, L. F. (2018). Education and training gaps in the renewable energy sector. *Solar Energy*, *173*, 449–455. https://doi.org/10.1016/j.solener.2018.07.061

Magnani, N., & Vaona, A. (2013). Regional spillover effects of renewable energy generation in Italy. *Energy Policy*, *56*, 663–671. https://doi.org/10.1016/j.enpol.2013.01.032

Manfreda, K. L., Bosnjak, M., Berzelak, J., Haas, I., & Vehovar, V. (2008). Web Surveys versus other Survey Modes: A Meta-Analysis Comparing Response Rates. *International Journal of Market Research*, *50*(1), 79–104. https://doi.org/10.1177/147078530805000107

Manologlou, E., Tsartas, P., & Markou, A. (2004). Geothermal energy sources for water production—socio-economic effects and people’s wishes on Milos island: a case study. *Energy Policy*, *32*(5), 623–633. https://doi.org/10.1016/s0301-4215(02)00315-4

Marin, G., & Vona, F. (2019). Climate policies and skill-biased employment dynamics: Evidence from EU countries. *Journal of Environmental Economics and Management*, *98*, 102253. https://doi.org/10.1016/j.jeem.2019.102253

Markandya, A., Arto, I., González-Eguino, M., & Román, M. V. (2016). Towards a green energy economy? Tracking the employment effects of low-carbon technologies in the European Union. *Applied Energy*,*179*, 1342–1350. https://doi.org/10.1016/j.apenergy.2016.02.122

Markaki, M., Belegri-Roboli, A., Michaelides, P., Mirasgedis, S., & Lalas, D. P. (2013). The impact of clean energy investments on the Greek economy: An input–output analysis (2010–2020). *Energy Policy*,*57*, 263–275. https://doi.org/10.1016/j.enpol.2013.01.047

Mattmann, M., Logar, I., & Brouwer, R. (2016). Wind power externalities: A meta-analysis. *Ecological Economics*, *127*, 23–36. https://doi.org/10.1016/j.ecolecon.2016.04.005

Michalena, E., & Tripanagnostopoulos, Y. (2010). Contribution of the solar energy in the sustainable tourism development of the Mediterranean islands. *Renewable Energy*, *35*(3), 667–673. https://doi.org/10.1016/j.renene.2009.08.016

Ministry of Economic Development, Ministry of the Environment and Protection of Natural Resources and Sea, & Ministry of Infrastructure and Transport. (2019). *Integrated national energy and climate plan*. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/it_final_necp_main_en.pdf

Montis, A. D., & Zoppi, C. (2009). Contingent Valuation of renewable energy innovations: vegetal biomass in Italy. *International Journal of Environmental Technology and Management*, *11*(1/2/3), 218. https://doi.org/10.1504/ijetm.2009.027196

Moreno, B., & López, A. J. (2008). The effect of renewable energy on employment. The case of Asturias (Spain). *Renewable and Sustainable Energy Reviews*,*12*(3), 732–751. https://doi.org/10.1016/j.rser.2006.10.011

Nowotny, J., Dodson, J., Fiechter, S., Gür, T. M., Kennedy, B., Macyk, W., … Rahman, K. A. (2018). Towards global sustainability: Education on environmentally clean energy technologies. *Renewable and Sustainable Energy Reviews*, *81*, 2541–2551. https://doi.org/10.1016/j.rser.2017.06.060

Ohler, A., & Fetters, I. (2014). The causal relationship between renewable electricity generation and GDP growth: A study of energy sources. *Energy Economics*, *43*, 125–139. https://doi.org/10.1016/j.eneco.2014.02.009

Oikonomou, E. K., Kilias, V., Goumas, A., Rigopoulos, A., Karakatsani, E., Damasiotis, M., … Marini, N. (2009). Renewable energy sources (RES) projects and their barriers on a regional scale: The case study of wind parks in the Dodecanese islands, Greece. *Energy Policy*, *37*(11), 4874–4883. https://doi.org/10.1016/j.enpol.2009.06.050

Ortega-Izquierdo, M., & del Río, P. (2016). Benefits and costs of renewable electricity in Europe. *Renewable and Sustainable Energy Reviews*, *61*, 372–383. https://doi.org/10.1016/j.rser.2016.03.044

Otero, C., Manchado, C., Arias, R., Bruschi, V. M., Gómez-Jáuregui, V., & Cendrero, A. (2012). Wind energy development in Cantabria, Spain. Methodological approach, environmental, technological and social issues. *Renewable Energy*, *40*(1), 137–149. https://doi.org/10.1016/j.renene.2011.09.008

Paiano, A., & Lagioia, G. (2016). Energy potential from residual biomass towards meeting the EU renewable energy and climate targets. The Italian case. *Energy Policy*, *91*, 161–173. https://doi.org/10.1016/j.enpol.2015.12.039

Pellizzone, A., Allansdottir, A., De Franco, R., Muttoni, G., & Manzella, A. (2015). Exploring public engagement with geothermal energy in southern Italy: A case study. *Energy Policy*, *85*, 1–11. https://doi.org/10.1016/j.enpol.2015.05.002

Perpiña Castillo, C., Batista e Silva, F., & Lavalle, C. (2016). An assessment of the regional potential for solar power generation in EU-28. *Energy Policy*, *88*, 86–99. https://doi.org/10.1016/j.enpol.2015.10.004

Peters, D. J. (2013). Understanding Green Occupations from a Task-Based Approach. *Applied Economic Perspectives and Policy*, *36*(2), 238–264. https://doi.org/10.1093/aepp/ppt026

Prados, M.-J. (2010). Renewable energy policy and landscape management in Andalusia, Spain: The facts. *Energy Policy*, *38*(11), 6900–6909. https://doi.org/10.1016/j.enpol.2010.07.005

Ribeiro, F., Ferreira, P., Araújo, M., & Braga, A. C. (2014). Public opinion on renewable energy technologies in Portugal. *Energy*, *69*, 39–50. https://doi.org/10.1016/j.energy.2013.10.074

Riva Sanseverino, E., Riva Sanseverino, R., Favuzza, S., & Vaccaro, V. (2014). Near zero energy islands in the

Mediterranean: Supporting policies and local obstacles. *Energy Policy*, *66*, 592–602. https://doi.org/10.1016/j.enpol.2013.11.007

Sáenz de Miera, G., del Río González, P., & Vizcaíno, I. (2008). Analysing the impact of renewable electricity support schemes on power prices: The case of wind electricity in Spain. *Energy Policy*, *36*(9), 3345–3359. https://doi.org/10.1016/j.enpol.2008.04.022

Sarrica, M., Biddau, F., Brondi, S., Cottone, P., & Mazzara, B. M. (2018). A multi-scale examination of public discourse on energy sustainability in Italy: Empirical evidence and policy implications. *Energy Policy*, *114*, 444–454. https://doi.org/10.1016/j.enpol.2017.12.021

Sauermann, H., & Roach, M. (2013). Increasing web survey response rates in innovation research: An experimental study of static and dynamic contact design features. *Research Policy*, *42*(1), 273–286. https://doi.org/10.1016/j.respol.2012.05.003

Shih, T.-H., & Fan, X. (2008). Comparing Response Rates from Web and Mail Surveys: A Meta-Analysis. *Field Methods*, *20*(3), 249–271. https://doi.org/10.1177/1525822X08317085

Silva, P. P. D., Oliveira, C., & Coelho, D. (2013). Employment effects and renewable energy policies: applying input-output methodology to Portugal. *International Journal of Public Policy*,*9*(3), 147. https://doi.org/10.1504/ijpp.2013.055702

Strazzera, E., Mura, M., & Contu, D. (2012). Combining choice experiments with psychometric scales to assess the social acceptability of wind energy projects: A latent class approach. *Energy Policy*, *48*, 334–347. https://doi.org/10.1016/j.enpol.2012.05.037

Strazzera, E., & Statzu, V. (2017). Fostering photovoltaic technologies in Mediterranean cities: Consumers' demand and social acceptance. *Renewable Energy*, *102*, 361–371. https://doi.org/10.1016/j.renene.2016.10.056

Tampakis, S., Tsantopoulos, G., Arabatzis, G., & Rerras, I. (2013). Citizens' views on various forms of energy and their contribution to the environment. *Renewable and Sustainable Energy Reviews*, *20*, 473–482. https://doi.org/10.1016/j.rser.2012.12.027

Tourkolias, C., & Mirasgedis, S. (2011). Quantification and monetization of employment benefits associated with renewable energy technologies in Greece. *Renewable and Sustainable Energy Reviews*, *15*(6), 2876–2886. https://doi.org/10.1016/j.rser.2011.02.027

Tsoutsos, T., Frantzeskaki, N., & Gekas, V. (2005). Environmental impacts from the solar energy technologies. *Energy Policy*, *33*(3), 289–296. https://doi.org/10.1016/s0301-4215(03)00241-6

Turney, D., & Fthenakis, V. (2011). Environmental impacts from the installation and operation of large-scale solar power plants. *Renewable and Sustainable Energy Reviews*, *15*(6), 3261–3270. https://doi.org/10.1016/j.rser.2011.04.023

UN Environment, & Mediterranean Action Plan. (2017). *Regional Climate Change Adaptation Framework for the Mediterranean Marine and Coastal Areas*. Retrieved from http://wedocs.unep.org/bitstream/id/56761/rccaf_eng.pdf

UNEP, ILO, IOE, & ITUC. (2008). *Green Jobs: towards decent work in a sustainable, low-carbon world*. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_098506.pdf

van der Horst, D. (2007). NIMBY or not? Exploring the relevance of location and the politics of voiced opinions in renewable energy siting controversies. *Energy Policy*, *35*(5), 2705–2714. https://doi.org/10.1016/j.enpol.2006.12.012

Vecchiato, D. (2014). How do you like wind farms? Understanding people's preferences about new energy landscapes with choice experiments. *Aestimum*, *64*, 15–37. https://doi.org/10.13128/Aestimum-14707

Vecchiato, D., & Tempesta, T. (2015). Public preferences for electricity contracts including renewable energy: A marketing analysis with choice experiments. *Energy*, *88*, 168–179. https://doi.org/10.1016/j.energy.2015.04.036

Vicente, P., & Reis, E. (2010). Using Questionnaire Design to Fight Nonresponse Bias in Web Surveys. *Social Science Computer Review*, *28*(2), 251–267. https://doi.org/10.1177/0894439309340751

Vicinanza, D., Contestabile, P., & Ferrante, V. (2013). Wave energy potential in the north-west of Sardinia (Italy). *Renewable Energy*, *50*, 506–521. https://doi.org/10.1016/j.renene.2012.07.015

Vona, F. (2018). Job losses and political acceptability of climate policies: why the 'job-killing' argument is so persistent and how to overturn it. *Climate Policy*, *19*(4), 524–532. https://doi.org/10.1080/14693062.2018.1532871

Vona, F., Marin, G., Consoli, D., & Popp, D. (2018). Environmental Regulation and Green Skills: An

Empirical Exploration. *Journal of the Association of Environmental and Resource Economists*, *5*(4), 713–753. https://doi.org/10.1086/698859

Walker, G., Devine-Wright, P., Hunter, S., High, H., & Evans, B. (2010). Trust and community: Exploring the meanings, contexts and dynamics of community renewable energy. *Energy Policy*, *38*(6), 2655–2663. https://doi.org/10.1016/j.enpol.2009.05.055

Wei, M., Patadia, S., & Kammen, D. M. (2010). Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US? *Energy Policy*,*38*(2), 919–931. https://doi.org/10.1016/j.enpol.2009.10.044

World Bank. (2019). *Renewable energy consumption (% of total final energy consumption) | Data* [Dataset]. Retrieved from https://data.worldbank.org/indicator/EG.FEC.RNEW.ZS

Zaunbrecher, B. S., & Ziefle, M. (2016). Integrating acceptance-relevant factors into wind power planning: A discussion. *Sustainable Cities and Society*, *27*, 307–314. https://doi.org/10.1016/j.scs.2016.08.018

Zografakis, N., Sifaki, E., Pagalou, M., Nikitaki, G., Psarakis, V., & Tsagarakis, K. P. (2010). Assessment of public acceptance and willingness to pay for renewable energy sources in Crete. *Renewable and Sustainable Energy Reviews*, *14*(3), 1088–1095. https://doi.org/10.1016/j.rser.2009.11.009

6. APPENDIX

6.1 Section A: Socio-demographics characteristics contingency tables

Table A1: Contingency table with age and gender of respondents, including row and column percentages, testing Pearson's chi-square

	Gender		
Age	Male	Female	Total
Younger (0-29)	151	240	391
	38.62	*61.38*	*100*
	43.64	*46.33*	*45.25*
Middle-aged (30-59)	143	196	339
	42.18	*57.82*	*100*
	41.33	*37.84*	*39.24*
Old (60+)	52	82	134
	38.81	*61.19*	*100*
	15.03	*15.83*	*15.51*
Total	346	518	864
	40.05	*59.95*	*100*
	100	*100*	*100*
Pearson chi2(2) = 1.0622			**Pr = 0.588**

Table A2: Contingency table with age and level of education of respondents, including row and column percentages, testing Pearson's chi-square

	Education			
Age	High school diploma	Undergraduate & Graduate	Post-Graduate	Total
Young (0-29)	133	231	27	391
	34.02	*59.08*	*6.91*	*100*
	49.81	*50.66*	*19.15*	*45.25*
Middle-aged (30-59)	92	165	82	339
	27.14	*48.67*	*24.19*	*100*
	34.46	*36.18*	*58.16*	*39.24*
Old (60+)	42	60	32	134
	31.34	*44.78*	*23.88*	*100*
	15.73	*13.16*	*22.7*	*15.51*
Total	267	456	141	864
	30.9	*52.78*	*16.32*	*100*
	100	*100*	*100*	*100*
Pearson chi2(4) = 47.2303				**Pr = 0.000**

Table A3: Contingency table with age and region of origin of respondents, including row and column percentages, testing Pearson's chi-square

	Region			
Age	Northern-Italy	Emilia-Romagna	Central & Southern-Italy	Total
Young (0-29)	101	198	92	391
	25.83	*50.64*	*23.53*	*100*
	50.5	*43.42*	*44.23*	*45.25*
Middle-aged (30-59)	80	166	93	339
	23.6	*48.97*	*27.43*	*100*
	40	*36.4*	*44.71*	*39.24*
Old (60+)	19	92	23	134
	14.18	*68.66*	*17.16*	*100*
	9.5	*20.18*	*11.06*	*15.51*
Total	200	456	208	864
	23.15	*52.78*	*24.07*	*100*
	100	*100*	*100*	*100*
Pearson chi2(4) = 17.8706				**Pr = 0.001**

Table A4: Contingency table with age and level of renewable energy knowledge of respondents, including row and column percentages, testing Pearson's chi-square

	Knowledge		
Age	Good	Low	Total
Young (0-29)	151	240	391
	38.62	*61.38*	*100*
	43.64	*46.33*	*45.25*
Middle-aged (30-59)	143	196	339
	42.18	*57.82*	*100*
	41.33	*37.84*	*39.24*
Old (60+)	52	82	134
	38.81	*61.19*	*100*
	15.03	*15.83*	*15.51*
Total	346	518	864
	40.05	*59.95*	*100*
	100	*100*	*100*
Pearson chi2(2) = 0.1290			**Pr = 0.938**

Table A5: Contingency table with gender and level of education of respondents, including row and column percentages, testing Pearson's chi-square

	Education			
Gender	High school diploma	Undergraduate & Graduate	Post-Graduate	Total
Male	114	169	63	346

	32.95	*48.84*	*18.21*	*100*
	42.7	*37.06*	*44.68*	*40.05*
Female	153	287	78	518
	29.54	*55.41*	*15.06*	*100*
	57.3	*62.94*	*55.32*	*59.95*
Total	267	456	141	864
	30.9	*52.78*	*16.32*	*100*
	100	*100*	*100*	*100*
Pearson chi2(2) = 3.7347				**Pr = 0.155**

Table A6: Contingency table with gender and region of origin of respondents, including row and column percentages, testing Pearson's chi-square

	Region			
Gender	Northern-Italy	Emilia-Romagna	Central & Southern-Italy	Total
Male	81	170	95	346
	23.41	*49.13*	*27.46*	*100*
	40.5	*37.28*	*45.67*	*40.05*
Female	119	286	113	518
	22.97	*55.21*	*21.81*	*100*
	59.5	*62.72*	*54.33*	*59.95*
Total	200	456	208	864
	23.15	*52.78*	*24.07*	*100*
	100	*100*	*100*	*100*
Pearson chi2(2) = 4.2127				**Pr = 0.122**

Table A7: Contingency table with gender and level of renewable energy knowledge of respondents, including row and column percentages, testing Pearson's chi-square

	Knowledge		
Gender	Good	Bad	Total
Male	268	78	346
	77.46	*22.54*	*100*
	45.19	*28.78*	*40.05*
Female	325	193	518
	62.74	*37.26*	*100*
	54.81	*71.22*	*59.95*
Total	593	271	864
	68.63	*31.37*	*100*
	100	*100*	*100*
Pearson chi2(1) = 20.8658			**Pr = 0.000**

Table A8: Contingency table with level of education and region of origin of respondents, including row and column percentages, testing Pearson's chi-square

	Region			
Education	Northern-Italy	Emilia-Romagna	Central & Southern-Italy	Total
High school diploma	60	154	53	267
	22.47	*57.68*	*19.85*	*100*
	30	*33.77*	*25.48*	*30.9*
Undergraduate & Graduate	115	224	117	456
	25.22	*49.12*	*25.66*	*100*
	57.5	*49.12*	*56.25*	*52.78*
Post-Graduate	25	78	38	141
	17.73	*55.32*	*26.95*	*100*
	12.5	*17.11*	*18.27*	*16.32*
Total	200	456	208	864
	23.15	*52.78*	*24.07*	*100*
	100	*100*	*100*	*100*
Pearson chi2(4) = 8.1655				**Pr = 0.086**

Table A9: Contingency table with level of education and level of renewable energy knowledge of respondents, including row and column percentages, testing Pearson's chi-square

	Knowledge		
Education	Good	Bad	Total
High school diploma	171	96	267
	64.04	*35.96*	*100*
	28.84	*35.42*	*30.9*
Undergraduate & Graduate	318	138	456
	69.74	*30.26*	*100*
	53.63	*50.92*	*52.78*
Post-Graduate	104	37	141
	73.76	*26.24*	*100*
	17.54	*13.65*	*16.32*
Total	593	271	864
	68.63	*31.37*	*100*
	100	*100*	*100*
Pearson chi2(2) = 4.5898			**Pr = 0.101**

Table A10: Contingency table with region of origin and level of renewable energy knowledge of respondents, including row and column percentages, testing Pearson's chi-square

	Knowledge		
Region	Good	Bad	Total
Northern-Italy	145	55	200
	72.5	*27.5*	*100*

	24.45	*20.3*	*23.15*
Emilia-Romagna	311	145	456
	68.2	*31.8*	*100*
	52.45	*53.51*	*52.78*
Central & Southern-Italy	137	71	208
	65.87	*34.13*	*100*
	23.1	*26.2*	*24.07*
Total	593	271	864
	68.63	*31.37*	*100*
	100	*100*	*100*
Pearson chi2(2) = 2.1687			**Pr = 0.338**

6.2 Section B: Answers to the survey questions

Table B1: To what extent do you think renewable energy is developed in your country?

DEV_c	Freq.	Percent	Cum.
Definitely underdeveloped	106	12.27	12.27
Underdeveloped	523	60.53	72.8
Normal	176	20.37	93.17
Developed	52	6.02	99.19
Definitely developed	7	0.81	100
Total	864	100	

Table B2: To what extent do you think renewable energy is developed in your region?

DEV_r	Freq.	Percent	Cum.
Definitely underdeveloped	99	11.46	11.46
Underdeveloped	468	54.17	65.63
Normal	219	25.35	90.97
Developed	71	8.22	99.19
Definitely developed	7	0.81	100
Total	864	100	

Table B3: To what extent do you think renewable energy is developed in your province?

DEV_p	Freq.	Percent	Cum.
Definitely underdeveloped	138	15.97	15.97
Underdeveloped	477	55.21	71.18
Normal	185	21.41	92.59
Developed	61	7.06	99.65
Definitely developed	3	0.35	100

Total	864	100	

Table B4: In your opinion, should more renewable energy plants be deployed in your country?

NIMBY_c	Freq.	Percent	Cum.
Definitely disagree	5	0.58	0.58
Disagree	6	0.69	1.27
Indifferent	12	1.39	2.66
Agree	346	40.05	42.71
Definitely agree	495	57.29	100
Total	864	100	

Table B5: In your opinion, should more renewable energy plants be deployed in your region?

NIMBY_r	Freq.	Percent	Cum.
Definitely disagree	4	0.46	0.46
Disagree	5	0.58	1.04
Indifferent	19	2.20	3.24
Agree	374	43.29	46.53
Definitely agree	462	53.47	100
Total	864	100	

Table B6: In your opinion, should more renewable energy plants be deployed in your province?

NIMBY_p	Freq.	Percent	Cum.
Definitely disagree	2	0.23	0.23
Disagree	14	1.62	1.85
Indifferent	25	2.89	4.75
Agree	360	41.67	46.41
Definitely agree	463	53.59	100
Total	864	100	

Table B7: Which are the most relevant reasons why you may disagree with a further construction of renewable energy plants in your province?

NIMBY_why	Freq.	Percent	Cum.
Noise	12	11.01	11.01
Place attachment	7	6.42	17.43
Bad smell	5	4.59	22.02
Loss of cropland and farmland	19	17.43	39.45

Danger for wildlife and biodiversity	14	12.84	52.29
Loss of property value	5	4.59	56.88
Aesthetics	16	14.68	71.56
Landscape disruption	24	22.02	93.58
Other	7	6.42	100
Total	109	100	

Table B8: In terms of costs, what do you think about renewable electricity compared to non-renewable electricity?

ECON_cost	Freq.	Percent	Cum.
Definitely more expensive	38	4.40	4.40
More expensive	317	36.69	41.09
Same cost	149	17.25	58.33
Less expensive	274	31.71	90.05
Definitely less expensive	86	9.95	100
Total	864	100	

Table B9: To what extent would you be willing to pay more in order to have greener electricity?

ECON_wtp	Freq.	Percent	Cum.
Definitely not willing	17	1.97	1.97
Not willing	165	19.10	21.06
Indifferent	128	14.81	35.88
Willing	495	57.29	93.17
Definitely willing	59	6.83	100
Total	864	100	

Table B10: In your opinion, to what extent renewable energy installations can be beneficial for the surrounding environment?

ENV_env	Freq.	Percent	Cum.
Definitely not beneficial	8	0.93	0.93
Not beneficial	135	15.63	16.55
Indifferent	197	22.80	39.35
Beneficial	368	42.59	81.94
Definitely beneficial	156	18.06	100
Total	864	100	

Table B11: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Bioenergy

ENV_rankbio	Freq.	Percent	Cum.
1=Most environmental-friendly	101	12.47	12.47
2	99	12.22	24.69
3	133	16.42	41.11
4	171	21.11	62.22
5=Least environmental-friendly	306	37.78	100
Total	810	100	

Table B12: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Solar energy

ENV_ranksun	Freq.	Percent	Cum.
1=Most environmental-friendly	376	46.42	46.42
2	161	19.88	66.30
3	111	13.70	80.00
4	83	10.25	90.25
5=Least environmental-friendly	79	9.75	100
Total	810	100	

Table B13: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Hydropower

ENV_rankhydro	Freq.	Percent	Cum.
1=Most environmental-friendly	76	9.38	9.38
2	135	16.67	26.05
3	239	29.51	55.56
4	201	24.81	80.37
5=Least environmental-friendly	159	19.63	100
Total	810	100	

Table B14: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Geothermal energy

ENV_rankgeo	Freq.	Percent	Cum.
1=Most environmental-friendly	133	16.42	15.31
2	135	16.67	49.88
3	170	20.99	69.26
4	231	28.52	84.57

5=Least environmental-friendly	141	17.41	100
Total	810	100	

Table B15: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Wind energy

ENV_rankwind	Freq.	Percent	Cum.
1=Most environmental-friendly	124	15.31	15.31
2	280	34.57	49.88
3	157	19.38	69.26
4	124	15.31	84.57
5=Least environmental-friendly	125	15.43	100
Total	810	100	

Table B16: In your opinion, to what extent renewable energy can be beneficial in terms of improving your quality of life?

SOC_life	Freq.	Percent	Cum.
Definitely not beneficial	2	0.23	0.23
Not beneficial	10	1.16	1.39
Indifferent	57	6.60	7.99
Beneficial	515	59.61	67.59
Definitely beneficial	280	32.41	100
Total	864	100	

Table B17: In your opinion, to what extent the deployment of renewable energy is beneficial for the local community?

SOC_comm	Freq.	Percent	Cum.
Definitely not beneficial	3	0.35	0.35
Not beneficial	25	2.89	3.24
Indifferent	61	7.06	10.30
Beneficial	523	60.53	70.83
Definitely beneficial	252	29.17	100
Total	864	100	

Table B18: What do you think about the salaries paid to employees in the renewable energy sector?

JOB_wage	Freq.	Percent	Cum.
Very low salaries	14	1.62	1.62

Low salaries	163	18.87	20.49
Normal salaries	654	75.69	96.18
High salaries	32	3.70	99.88
Very high salaries	1	0.12	100
Total	864	100	

Table B19: What do you think about the duration of the contracts in the renewable energy sector?

JOB_dur	Freq.	Percent	Cum.
Mostly temporary jobs	74	8.56	8.56
More temporary than permanent jobs	303	35.07	43.63
Equally temporary and permanent jobs	353	40.86	84.49
More permanent than temporary jobs	113	13.08	97.57
Mostly permanent jobs	21	2.43	100
Total	864	100	

Table B20: What do you think about the skills required to work in the renewable energy sector?

JOB_skill	Freq.	Percent	Cum.
Mostly low skills	17	1.97	1.97
More low skills than high skills	96	11.11	13.08
Equally low and high skills	265	30.67	43.75
More high skills than low skills	352	40.74	84.49
Mostly high skills	134	15.51	100
Total	864	100	

Table B21: What do you think about the ability of renewable energy to lead to net jobs creation?

JOB_kill	Freq.	Percent	Cum.
Definitely more jobs destroyed than created	20	2.33	2.33
More jobs destroyed than created	93	10.84	13.17
No net effect	318	37.06	50.23
More jobs created than destroyed	361	42.07	92.31
Definitely more jobs created than destroyed	66	7.69	100
Total	858	100	

Table B22: Overall, what do you think about the quality of the jobs offered by the renewable energy sector?

JOB_qual	Freq.	Percent	Cum.
Very low quality	18	2.08	2.08

Low quality	110	12.73	14.81
Normal quality	435	50.35	65.16
High quality	279	32.29	97.45
Very high quality	22	2.55	100
Total	864	100	

Table B23: In general, how often do you hear/read/talk about renewable energy?

INFO_hrt	Freq.	Percent	Cum.
Very rarely	52	6.02	6.02
Rarely	186	21.53	27.55
Sometimes	338	39.12	66.67
Often	232	26.85	93.52
Very often	56	6.48	100
Total	864	100	

Table B24: While answering the questions, did you feel you had good knowledge about renewable energy sources?

INFO_ren	Freq.	Percent	Cum.
Very limited knowledge	183	21.18	21.18
Little knowledge	343	39.70	60.88
Enough knowledge	235	27.20	88.08
More than enough knowledge	92	10.65	98.73
Great knowledge	11	1.27	100
Total	864	100	

Table B25: While answering the questions, did you feel you had good knowledge about renewable energy jobs?

INFO_job	Freq.	Percent	Cum.
Very limited knowledge	404	46.76	46.76
Little knowledge	320	37.04	83.80
Enough knowledge	104	12.04	95.83
More than enough knowledge	30	3.47	99.31
Great knowledge	6	0.69	100
Total	864	100	

6.3 Section C: Ordered logistic regressions results, question-by question

The following specification applies to all tables showing ordered logistic regression results:

2.AGE = Middle-aged (30-59)
3.AGE = Older (60+)
compared to 1.AGE = Younger (0-29)

2.GEN = Female
compared to 1.GEN = Male

2.EDU = Undergraduate & Graduate
3.EDU = Post-Graduate
compared to 1.EDU = High school diploma

2.REG = Emilia-Romagna
3.REG = Central & Southern Italy
compared to 1.REG = Northern Italy

2.KNOW = Bad knowledge
compared to 1.KNOW = Good knowledge

Table C1: To what extent do you think renewable energy is developed in your country?

	(1) **DEV_c**	(2) **DEV_c**	(3) **DEV_c**	(4) **DEV_c**	(5) **DEV_c**
2.AGE	-0.592***	-0.605***	-0.684***	-0.687***	-0.688***
	(0.149)	(0.149)	(0.154)	(0.154)	(0.154)
3.AGE	-0.625***	-0.628***	-0.698***	-0.713***	-0.711***
	(0.203)	(0.203)	(0.206)	(0.208)	(0.208)
2.GEN		-0.436***	-0.446***	-0.445***	-0.431***
		(0.139)	(0.139)	(0.139)	(0.141)
2.EDU			0.246	0.248	0.242
			(0.153)	(0.153)	(0.154)
3.EDU			0.565***	0.553***	0.543**
			(0.214)	(0.214)	(0.214)
2.REG				0.154	0.158
				(0.171)	(0.171)
3.REG				0.207	0.213
				(0.197)	(0.197)
2.KNOW					-0.111
					(0.148)
Observations	864	864	864	864	864

Table C2: To what extent do you think renewable energy is developed in your region?

	(1) **DEV_r**	(2) **DEV_r**	(3) **DEV_r**	(4) **DEV_r**	(5) **DEV_r**
2.AGE	-0.464***	-0.471***	-0.580***	-0.570***	-0.571***
	(0.144)	(0.144)	(0.148)	(0.149)	(0.149)
3.AGE	-0.353*	-0.349*	-0.443**	-0.548***	-0.549***

	(0.190)	(0.190)	(0.194)	(0.195)	(0.195)
2.GEN		-0.309**	-0.309**	-0.351***	-0.333**
		(0.134)	(0.134)	(0.135)	(0.136)
2.EDU			0.171	0.248*	0.242
			(0.148)	(0.149)	(0.149)
3.EDU			0.649***	0.714***	0.705***
			(0.206)	(0.208)	(0.208)
2.REG				0.513***	0.519***
				(0.168)	(0.168)
3.REG				-0.334*	-0.324
				(0.198)	(0.199)
2.KNOW					-0.128
					(0.143)
Observations	864	864	864	864	864

Table C3: To what extent do you think renewable energy is developed in your province?

	(1) **DEV_p**	(2) **DEV_p**	(3) **DEV_p**	(4) **DEV_p**	(5) **DEV_p**
2.AGE	-0.320**	-0.326**	-0.409***	-0.403***	-0.405***
	(0.143)	(0.143)	(0.148)	(0.148)	(0.148)
3.AGE	0.042	0.046	-0.015	-0.133	-0.132
	(0.190)	(0.190)	(0.193)	(0.195)	(0.195)
2.GEN		-0.337**	-0.343**	-0.387***	-0.365***
		(0.134)	(0.134)	(0.135)	(0.136)
2.EDU			0.225	0.316**	0.308**
			(0.148)	(0.149)	(0.149)
3.EDU			0.554***	0.606***	0.593***
			(0.205)	(0.207)	(0.207)
2.REG				0.755***	0.761***
				(0.170)	(0.170)
3.REG				-0.193	-0.181
				(0.197)	(0.197)
2.KNOW					-0.158
					(0.143)
Observations	864	864	864	864	864

Table C4: In your opinion, should more renewable energy plants be deployed in your country?

	(1) **NIMBY_c**	(2) **NIMBY_c**	(3) **NIMBY_c**	(4) **NIMBY_c**	(5) **NIMBY_c**
2.AGE	-0.463***	-0.466***	-0.494***	-0.490***	-0.504***
	(0.150)	(0.150)	(0.153)	(0.154)	(0.155)
3.AGE	-0.542***	-0.541***	-0.559***	-0.553***	-0.561***
	(0.201)	(0.201)	(0.204)	(0.205)	(0.207)
2.GEN		-0.085	-0.092	-0.096	0.004
		(0.141)	(0.141)	(0.142)	(0.145)
2.EDU			0.200	0.204	0.169
			(0.155)	(0.156)	(0.157)
3.EDU			0.286	0.299	0.246
			(0.214)	(0.215)	(0.217)
2.REG				-0.140	-0.122
				(0.174)	(0.176)

3.REG				-0.254	-0.215
				(0.202)	(0.204)
2.KNOW					-0.611***
					(0.151)
Observations	864	864	864	864	864

Table C5: In your opinion, should more renewable energy plants be deployed in your region?

	(1) **NIMBY_r**	(2) **NIMBY_r**	(3) **NIMBY_r**	(4) **NIMBY_r**	(5) **NIMBY_r**
2.AGE	-0.285*	-0.285*	-0.307**	-0.303**	-0.312**
	(0.147)	(0.147)	(0.151)	(0.151)	(0.152)
3.AGE	-0.200	-0.200	-0.214	-0.208	-0.210
	(0.198)	(0.198)	(0.201)	(0.203)	(0.204)
2.GEN		-0.008	-0.016	-0.022	0.068
		(0.138)	(0.139)	(0.139)	(0.142)
2.EDU			0.231	0.237	0.202
			(0.153)	(0.153)	(0.155)
3.EDU			0.278	0.292	0.242
			(0.212)	(0.212)	(0.214)
2.REG				-0.151	-0.130
				(0.171)	(0.172)
3.REG				-0.298	-0.260
				(0.198)	(0.200)
2.KNOW					-0.558***
					(0.149)
Observations	864	864	864	864	864

Table C6: In your opinion, should more renewable energy plants be deployed in your province?

	(1) **NIMBY_p**	(2) **NIMBY_p**	(3) **NIMBY_p**	(4) **NIMBY_p**	(5) **NIMBY_p**
2.AGE	-0.339**	-0.339**	-0.351**	-0.350**	-0.358**
	(0.147)	(0.147)	(0.150)	(0.150)	(0.151)
3.AGE	-0.293	-0.293	-0.293	-0.287	-0.290
	(0.197)	(0.197)	(0.200)	(0.201)	(0.203)
2.GEN		0.009	-0.004	-0.003	0.090
		(0.137)	(0.138)	(0.138)	(0.141)
2.EDU			0.278*	0.277*	0.238
			(0.152)	(0.152)	(0.153)
3.EDU			0.250	0.253	0.200
			(0.209)	(0.210)	(0.211)
2.REG				-0.066	-0.039
				(0.170)	(0.171)
3.REG				-0.075	-0.029
				(0.197)	(0.199)
2.KNOW					-0.575***
					(0.147)
Observations	864	864	864	864	864

Table C7: In terms of costs, what do you think about renewable electricity compared to non-renewable electricity?

	(1) **ECON_cost**	(2) **ECON_cost**	(3) **ECON_cost**	(4) **ECON_cost**	(5) **ECON_cost**
2.AGE	0.754***	0.761***	0.859***	0.856***	0.856***
	(0.137)	(0.137)	(0.141)	(0.141)	(0.141)
3.AGE	0.749***	0.748***	0.846***	0.847***	0.847***
	(0.183)	(0.183)	(0.187)	(0.188)	(0.188)
2.GEN		0.133	0.127	0.134	0.137
		(0.127)	(0.127)	(0.128)	(0.129)
2.EDU			-0.184	-0.194	-0.195
			(0.141)	(0.142)	(0.142)
3.EDU			-0.641***	-0.668***	-0.671***
			(0.196)	(0.196)	(0.197)
2.REG				0.145	0.146
				(0.155)	(0.155)
3.REG				0.353*	0.354**
				(0.180)	(0.181)
2.KNOW					-0.022
					(0.138)
Observations	864	864	864	864	864

Table C8: To what extent would you be willing to pay more in order to have greener electricity?

	(1) **ECON_wtp**	(2) **ECON_wtp**	(3) **ECON_wtp**	(4) **ECON_wtp**	(5) **ECON_wtp**
2.AGE	-0.539***	-0.531***	-0.528***	-0.513***	-0.514***
	(0.144)	(0.145)	(0.149)	(0.149)	(0.149)
3.AGE	-0.138	-0.144	-0.124	-0.172	-0.162
	(0.196)	(0.196)	(0.199)	(0.201)	(0.201)
2.GEN		0.419***	0.388***	0.375***	0.430***
		(0.135)	(0.136)	(0.136)	(0.138)
2.EDU			0.571***	0.611***	0.595***
			(0.150)	(0.151)	(0.152)
3.EDU			0.238	0.267	0.236
			(0.202)	(0.202)	(0.203)
2.REG				0.177	0.189
				(0.167)	(0.167)
3.REG				-0.292	-0.268
				(0.192)	(0.193)
2.KNOW					-0.350**
					(0.145)
Observations	864	864	864	864	864

Table C9: In your opinion, to what extent renewable energy installations can be beneficial for the surrounding environment?

	(1) **ENV_env**	(2) **ENV_env**	(3) **ENV_env**	(4) **ENV_env**	(5) **ENV_env**
2.AGE	-0.101	-0.096	-0.084	-0.084	-0.084
	(0.136)	(0.136)	(0.140)	(0.140)	(0.140)
3.AGE	-0.127	-0.125	-0.113	-0.105	-0.106
	(0.180)	(0.180)	(0.183)	(0.184)	(0.184)

2.GEN		0.228*	0.223*	0.227*	0.237*
		(0.128)	(0.128)	(0.129)	(0.130)
2.EDU			0.048	0.043	0.038
			(0.141)	(0.141)	(0.142)
3.EDU			-0.028	-0.031	-0.037
			(0.191)	(0.192)	(0.192)
2.REG				-0.028	-0.025
				(0.156)	(0.156)
3.REG				0.047	0.053
				(0.182)	(0.182)
2.KNOW					-0.072
					(0.136)
Observations	864	864	864	864	864

Table C10: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Bioenergy

	(1) **ENV_rankbio**	(2) **ENV_rankbio**	(3) **ENV_rankbio**	(4) **ENV_rankbio**	(5) **ENV_rankbio**
2.AGE	0.243*	0.245*	0.251*	0.254*	0.257*
	(0.139)	(0.139)	(0.143)	(0.143)	(0.143)
3.AGE	0.319*	0.320*	0.325*	0.319*	0.327*
	(0.184)	(0.185)	(0.187)	(0.188)	(0.188)
2.GEN		0.050	0.047	0.052	0.083
		(0.128)	(0.129)	(0.129)	(0.130)
2.EDU			0.080	0.077	0.058
			(0.142)	(0.142)	(0.142)
3.EDU			0.017	0.004	-0.024
			(0.201)	(0.201)	(0.202)
2.REG				0.126	0.138
				(0.155)	(0.155)
3.REG				0.230	0.243
				(0.187)	(0.187)
2.KNOW					-0.230*
					(0.138)
Observations	810	810	810	810	810

Table C11: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Solar energy

	(1) **ENV_ranksun**	(2) **ENV_ranksun**	(3) **ENV_ranksun**	(4) **ENV_ranksun**	(5) **ENV_ranksun**
2.AGE	0.002	-0.032	-0.046	-0.040	-0.040
	(0.140)	(0.141)	(0.145)	(0.145)	(0.145)
3.AGE	-0.260	-0.284	-0.296	-0.265	-0.265
	(0.194)	(0.195)	(0.198)	(0.200)	(0.200)
2.GEN		-0.558***	-0.558***	-0.559***	-0.565***
		(0.132)	(0.132)	(0.133)	(0.135)
2.EDU			0.034	0.033	0.035
			(0.148)	(0.148)	(0.149)
3.EDU			0.103	0.115	0.119
			(0.202)	(0.202)	(0.203)
2.REG				-0.265*	-0.267*
				(0.160)	(0.160)
3.REG				-0.296	-0.301

				(0.187)	(0.187)
2.KNOW					0.044
					(0.145)
Observations	810	810	810	810	810

Table C12: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Hydropower

	(1) **ENV_rankhydro**	(2) **ENV_rankhydro**	(3) **ENV_rankhydro**	(4) **ENV_rankhydro**	(5) **ENV_rankhydro**
2.AGE	0.387***	0.405***	0.429***	0.429***	0.416***
	(0.137)	(0.137)	(0.140)	(0.140)	(0.141)
3.AGE	0.324*	0.325*	0.349*	0.338*	0.343*
	(0.192)	(0.192)	(0.194)	(0.196)	(0.196)
2.GEN		0.306**	0.295**	0.294**	0.253*
		(0.129)	(0.129)	(0.130)	(0.131)
2.EDU			0.144	0.145	0.165
			(0.142)	(0.142)	(0.142)
3.EDU			-0.031	-0.036	-0.001
			(0.197)	(0.198)	(0.198)
2.REG				0.101	0.083
				(0.158)	(0.158)
3.REG				0.106	0.075
				(0.182)	(0.182)
2.KNOW					0.342**
					(0.138)
Observations	810	810	810	810	810

Table C13: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Geothermal energy

	(1) **ENV_rankgeo**	(2) **ENV_rankgeo**	(3) **ENV_rankgeo**	(4) **ENV_rankgeo**	(5) **ENV_rankgeo**
2.AGE	-0.682***	-0.660***	-0.667***	-0.668***	-0.669***
	(0.138)	(0.139)	(0.142)	(0.142)	(0.142)
3.AGE	-0.803***	-0.803***	-0.815***	-0.854***	-0.854***
	(0.183)	(0.183)	(0.185)	(0.188)	(0.188)
2.GEN		0.421***	0.432***	0.430***	0.433***
		(0.129)	(0.129)	(0.130)	(0.131)
2.EDU			-0.136	-0.131	-0.133
			(0.143)	(0.144)	(0.144)
3.EDU			-0.008	-0.016	-0.019
			(0.197)	(0.197)	(0.198)
2.REG				0.267*	0.268*
				(0.157)	(0.157)
3.REG				0.261	0.262
				(0.184)	(0.185)
2.KNOW					-0.022
					(0.137)
Observations	810	810	810	810	810

Table C14: Rank the following energy sources in terms of environmental impact (1=Most environmental-friendly; 5=Least environmental-friendly): Wind energy

	(1) **ENV_rankwind**	(2) **ENV_rankwind**	(3) **ENV_rankwind**	(4) **ENV_rankwind**	(5) **ENV_rankwind**
2.AGE	0.277**	0.270**	0.273*	0.275*	0.274*
	(0.138)	(0.138)	(0.141)	(0.141)	(0.141)
3.AGE	0.561***	0.566***	0.565***	0.587***	0.595***
	(0.185)	(0.185)	(0.187)	(0.188)	(0.188)
2.GEN		-0.210	-0.209	-0.208	-0.171
		(0.128)	(0.129)	(0.129)	(0.130)
2.EDU			-0.052	-0.053	-0.074
			(0.142)	(0.143)	(0.143)
3.EDU			-0.040	-0.026	-0.052
			(0.198)	(0.199)	(0.199)
2.REG				-0.203	-0.184
				(0.160)	(0.160)
3.REG				-0.228	-0.203
				(0.188)	(0.189)
2.KNOW					-0.285**
					(0.141)
Observations	810	810	810	810	810

Table C15: In your opinion, to what extent renewable energy can be beneficial in terms of improving your quality of life?

	(1) **SOC_life**	(2) **SOC_life**	(3) **SOC_life**	(4) **SOC_life**	(5) **SOC_life**
2.AGE	-0.069	-0.071	-0.092	-0.089	-0.086
	(0.148)	(0.148)	(0.151)	(0.151)	(0.152)
3.AGE	-0.076	-0.078	-0.093	-0.091	-0.086
	(0.200)	(0.200)	(0.203)	(0.204)	(0.204)
2.GEN		-0.084	-0.090	-0.094	-0.058
		(0.139)	(0.139)	(0.140)	(0.142)
2.EDU			0.138	0.142	0.125
			(0.154)	(0.155)	(0.155)
3.EDU			0.214	0.224	0.200
			(0.215)	(0.215)	(0.216)
2.REG				-0.080	-0.071
				(0.172)	(0.172)
3.REG				-0.169	-0.151
				(0.197)	(0.198)
2.KNOW					-0.219
					(0.150)
Observations	864	864	864	864	864

Table C16: In your opinion, to what extent the deployment of renewable energy is beneficial for the local community?

	(1) **SOC_comm**	(2) **SOC_comm**	(3) **SOC_comm**	(4) **SOC_comm**	(5) **SOC_comm**
2.AGE	-0.062	-0.063	-0.119	-0.113	-0.112
	(0.148)	(0.148)	(0.152)	(0.152)	(0.152)

3.AGE	-0.221	-0.221	-0.274	-0.317	-0.315
	(0.199)	(0.199)	(0.202)	(0.203)	(0.204)
2.GEN		-0.036	-0.031	-0.050	-0.010
		(0.140)	(0.140)	(0.141)	(0.143)
2.EDU			0.021	0.046	0.028
			(0.154)	(0.154)	(0.155)
3.EDU			0.348	0.367*	0.338
			(0.212)	(0.213)	(0.214)
2.REG				0.161	0.174
				(0.173)	(0.174)
3.REG				-0.181	-0.157
				(0.201)	(0.202)
2.KNOW					-0.268*
					(0.149)
Observations	864	864	864	864	864

Table C17: What do you think about the salaries paid to employees in the renewable energy sector?

	(1) **JOB_wage**	(2) **JOB_wage**	(3) **JOB_wage**	(4) **JOB_wage**	(5) **JOB_wage**
2.AGE	0.397**	0.387**	0.351**	0.353**	0.353**
	(0.174)	(0.174)	(0.178)	(0.178)	(0.178)
3.AGE	0.257	0.259	0.226	0.239	0.239
	(0.232)	(0.232)	(0.235)	(0.236)	(0.236)
2.GEN		-0.389**	-0.390**	-0.391**	-0.362**
		(0.165)	(0.165)	(0.166)	(0.168)
2.EDU			0.131	0.131	0.119
			(0.178)	(0.178)	(0.179)
3.EDU			0.301	0.309	0.294
			(0.254)	(0.254)	(0.254)
2.REG				-0.157	-0.150
				(0.202)	(0.203)
3.REG				-0.188	-0.174
				(0.235)	(0.235)
2.KNOW					-0.181
					(0.171)
Observations	864	864	864	864	864

Table C18: What do you think about the duration of the contracts in the renewable energy sector?

	(1) **JOB_dur**	(2) **JOB_dur**	(3) **JOB_dur**	(4) **JOB_dur**	(5) **JOB_dur**
2.AGE	0.217	0.211	0.190	0.193	0.187
	(0.137)	(0.137)	(0.140)	(0.141)	(0.141)
3.AGE	0.028	0.025	0.008	0.006	0.003
	(0.186)	(0.186)	(0.188)	(0.189)	(0.190)
2.GEN		-0.185	-0.185	-0.190	-0.153
		(0.128)	(0.128)	(0.128)	(0.130)
2.EDU			0.046	0.057	0.038
			(0.142)	(0.143)	(0.143)
3.EDU			0.145	0.161	0.144
			(0.196)	(0.197)	(0.197)
2.REG				-0.090	-0.080
				(0.157)	(0.157)

3.REG				-0.252	-0.233
				(0.183)	(0.183)
2.KNOW					-0.240*
					(0.139)
Observations	864	864	864	864	864

Table C19: What do you think about the skills required to work in the renewable energy sector?

	(1) **JOB_skill**	(2) **JOB_skill**	(3) **JOB_skill**	(4) **JOB_skill**	(5) **JOB_skill**
2.AGE	0.166	0.167	0.160	0.167	0.162
	(0.137)	(0.137)	(0.140)	(0.141)	(0.141)
3.AGE	-0.024	-0.026	-0.031	-0.035	-0.026
	(0.176)	(0.176)	(0.179)	(0.180)	(0.180)
2.GEN		0.072	0.066	0.053	0.100
		(0.126)	(0.127)	(0.127)	(0.129)
2.EDU			0.120	0.141	0.126
			(0.143)	(0.144)	(0.144)
3.EDU			0.125	0.168	0.150
			(0.193)	(0.194)	(0.194)
2.REG				-0.119	-0.109
				(0.155)	(0.156)
3.REG				-0.417**	-0.405**
				(0.185)	(0.185)
2.KNOW					-0.291**
					(0.140)
Observations	864	864	864	864	864

Table C20: What do you think about the ability of renewable energy to lead to net jobs creation?

	(1) **JOB_kill**	(2) **JOB_kill**	(3) **JOB_kill**	(4) **JOB_kill**	(5) **JOB_kill**
2.AGE	0.430***	0.432***	0.409***	0.414***	0.414***
	(0.140)	(0.140)	(0.143)	(0.143)	(0.143)
3.AGE	0.170	0.169	0.143	0.133	0.131
	(0.184)	(0.184)	(0.187)	(0.188)	(0.188)
2.GEN		0.032	0.030	0.019	0.037
		(0.129)	(0.129)	(0.130)	(0.132)
2.EDU			0.201	0.224	0.218
			(0.144)	(0.145)	(0.145)
3.EDU			0.275	0.309	0.298
			(0.198)	(0.199)	(0.199)
2.REG				-0.065	-0.061
				(0.159)	(0.159)
3.REG				-0.292	-0.286
				(0.186)	(0.186)
2.KNOW					-0.114
					(0.141)
Observations	858	858	858	858	858

Table C21: Overall, what do you think about the quality of the jobs offered by the renewable energy sector?

	(1) **JOB_qual**	(2) **JOB_qual**	(3) **JOB_qual**	(4) **JOB_qual**	(5) **JOB_qual**
2.AGE	0.255*	0.257*	0.255*	0.260*	0.259*
	(0.142)	(0.142)	(0.145)	(0.145)	(0.145)
3.AGE	0.002	0.002	0.006	-0.007	-0.008
	(0.186)	(0.186)	(0.189)	(0.190)	(0.190)
2.GEN		0.049	0.036	0.029	0.041
		(0.131)	(0.132)	(0.132)	(0.134)
2.EDU			0.189	0.201	0.198
			(0.147)	(0.148)	(0.148)
3.EDU			0.140	0.148	0.142
			(0.201)	(0.201)	(0.202)
2.REG				0.058	0.061
				(0.159)	(0.159)
3.REG				-0.093	-0.087
				(0.189)	(0.189)
2.KNOW					-0.072
					(0.142)
Observations	864	864	864	864	864

Table C22: In general, how often do you hear/read/talk about renewable energy?

	(1) **INFO_hrt**	(2) **INFO_hrt**	(3) **INFO_hrt**	(4) **INFO_hrt**	(5) **INFO_hrt**
2.AGE	0.369***	0.368***	0.308**	0.320**	0.321**
	(0.136)	(0.136)	(0.140)	(0.140)	(0.140)
3.AGE	0.376**	0.396**	0.349*	0.320*	0.320*
	(0.180)	(0.179)	(0.182)	(0.183)	(0.184)
2.GEN		-0.453***	-0.462***	-0.481***	-0.422***
		(0.128)	(0.128)	(0.128)	(0.130)
2.EDU			0.333**	0.363***	0.339**
			(0.140)	(0.141)	(0.141)
3.EDU			0.547***	0.574***	0.536***
			(0.193)	(0.194)	(0.194)
2.REG				0.061	0.078
				(0.158)	(0.158)
3.REG				-0.331*	-0.288
				(0.183)	(0.184)
2.KNOW					-0.430***
					(0.137)
Observations	864	864	864	864	864

Table C23: While answering the questions, did you feel you had good knowledge about renewable energy sources?

	(1) **INFO_ren**	(2) **INFO_ren**	(3) **INFO_ren**	(4) **INFO_ren**	(5) **INFO_ren**
2.AGE	0.111	0.101	0.059	0.062	0.059
	(0.136)	(0.137)	(0.140)	(0.140)	(0.140)
3.AGE	-0.047	-0.039	-0.079	-0.093	-0.089
	(0.179)	(0.180)	(0.182)	(0.183)	(0.184)
2.GEN		-1.076***	-1.074***	-1.079***	-1.013***

		(0.131)	(0.132)	(0.132)	(0.133)
2.EDU			0.067	0.073	0.034
			(0.142)	(0.142)	(0.142)
3.EDU			0.286	0.288	0.232
			(0.193)	(0.193)	(0.193)
2.REG				0.099	0.123
				(0.158)	(0.159)
3.REG				0.015	0.063
				(0.184)	(0.185)
2.KNOW					-0.529***
					(0.137)
Observations	864	864	864	864	864

Table C24: While answering the questions, did you feel you had good knowledge about renewable energy jobs?

	(1) **INFO_job**	(2) **INFO_job**	(3) **INFO_job**	(4) **INFO_job**	(5) **INFO_job**
2.AGE	0.573***	0.578***	0.571***	0.571***	0.572***
	(0.142)	(0.144)	(0.147)	(0.147)	(0.147)
3.AGE	0.702***	0.745***	0.733***	0.733***	0.735***
	(0.185)	(0.186)	(0.189)	(0.190)	(0.191)
2.GEN		-0.804***	-0.793***	-0.794***	-0.784***
		(0.134)	(0.134)	(0.134)	(0.136)
2.EDU			-0.190	-0.193	-0.198
			(0.147)	(0.147)	(0.148)
3.EDU			-0.070	-0.086	-0.092
			(0.202)	(0.203)	(0.203)
2.REG				0.191	0.193
				(0.166)	(0.166)
3.REG				0.320*	0.325*
				(0.192)	(0.193)
2.KNOW					-0.068
					(0.142)
Observations	864	864	864	864	864