

## 1. Background and Goal of the present work

In 2008 UNEP defined Green Jobs as those which contribute to “preserving or restoring environmental quality”. Over time, UNEP’s definition has been implemented by Institutions and scholars, but the more they try to restraint the boundaries of the green jobs sector, the more it becomes elusive. In this respect, the EU-OSHA underlined how there “has been a shifting of risks from the environment to workers, and also between jobs” (EU-OSHA, 2020 Report).

The purpose of this work is to use the notion of culture, given by Socrates’ within the green jobs sector context, reflecting on how to build a safety culture making system, useful to stakeholders who are involved in green activities that may include radiation production as a side effect of their processes.

## 2. Current situation

Stakeholders of the green jobs sector are represented by a broader category compared to other stakeholders’ groups, due to the involvement of environment, thus everyone is an expectant stakeholder (Mitchell et al., 1997). Unfortunately, National and International Agencies underline that a widespread perception exists, according to which green jobs are less dangerous than other jobs because they are related to Nature somehow. Besides, ILO warns that the majority of the green jobs is “dirty, dangerous and difficult” (ILO, 2008), since the definition of green activity is often the result of a comparison between different approaches, where the one labelled as green is the least harmful to the environment. This is the case of geothermal energy production, which can be considered green, even if it has the side effect of increasing the production of radioactive materials, such as NORM/TENORM. The problem related to occupational safety in this case is twofold, due to the coexistence of national plants and domestic use plants.

### 2.1. Geothermal Energy in Italy

Geothermal energy has been produced in several Italian regions, such as Tuscany, because of the geographical structure of those areas, and recently it has been taken into consideration instead of nuclear energy, thus pushing the Country towards a green transition. In many rural regions, several accommodation facilities already have in use such a domestic energy production system to be labelled as green and, consequently, be included in the green vacation circuits.

Italian legislation has been improved recently by the D.Lgs. n. 101/2020 (law decree), regulating water use related to the above mentioned activities, in implementation of the 2013/59/Euratom Directive. Nevertheless, a legislative act that regulates geothermal activities already existed, it is the D.Lgs. n. 22/2010, that introduced important control mechanism in order to build plants which do not harm the communities of the involved territories.

Critical aspects emerge in relation to domestic use plants, since they can be built upon a regional authorization, according to a regional law, that varies from region to region. Those differences can impact the amount of radioactive produced material (NORM/TENORM) and released in a relatively small area. Furthermore, the owner of the domestic plant cannot be considered as an employer, but he could have peculiar obligations towards the employees, in terms of information or timeline maintenance. *De iure condendo*, owner’s profile should be considered in relation to occupational safety legislation.

### 2.2. Occupational safety legislation in Italy

However, occupational safety legislation in Italy is well-structured and responsive, and easily adaptable to any field and new technologies. In fact, art. 2087 Italian Civil Code consists in a general provision prescribing the obligation of the entrepreneur to provide the employees with the highest level of occupational safety system according to the current level of knowledge and technology. In such a system, the employer can delegate some duties related to occupational safety to supervisors within the company, in order to ensure the highest level of expertise on the matter. Nevertheless, article 37, 7 of D.Lgs. n. 81/2008, as modified by D.L. n. 146/2021, has introduced an obligation for the employer in taking training courses, to be updated over time. This innovation has an important impact on daily work thus aiming to involve the employer in the occupational safety system at a basic level, making him aware of the risks that his employees may face and of the value of the supervisor in charge of safety.

## 3. Towards a sustainable future

### 3.1. Sustainable Development Goals

The majority of the SDGs is related to the employment field, therefore a change in the occupational safety culture is needed in order to meet those goals. Virtuous habits at the workplace can be developed as triggered by legislation. Since many issues raised by the SDGs are bundled together, a synchronous intervention is required. The connection between those issues highlights the importance of creating a shared concept of safety culture not limited to workers but extended to stakeholders too. SDGs reporting system is fulfilled on voluntary basis but in future a binding agreement could be the right path to be followed.



## 5. Conclusions and Acknowledgements

Once the behaviours related to each development area of the Portage Model are customized into a regular pattern, instead of being considered as a corporate’s demand or a government’s imposition, a proper level of knowledge will be reached. As this change happens, culture of radiation occupational safety will be existing in the green jobs sector. Of course, tests and training programmes will need to be constantly updated, according to the latest research’s findings, to avoid missing potential alert caused by new discovered factors or actions harmful to human health.

## 3.2. Creating a safety culture

Culture is a process that requires time and willingness. Socratic thinking considered culture as the result of knowledge added to reason, and the only instrument to aim at good. Through culture, individuals operate choices that would care their personal growth as well as society’s flourishing.

Philosophy of Law identifies two different approaches aiming at creating a culture. The first one consists in recognising the sensibility which is simmering beneath the surface of the society in a specific moment in time and build a rule to legitimise that feeling. Besides, the second one is less appreciated in democratic societies, because it embraces a beforehand obligation. In fact, in this case the legislator/political representatives decide what is the right thing to do and then they create a binding norm that people must respect under penalty of punishment. So, they achieve a change by a top-down imposition.

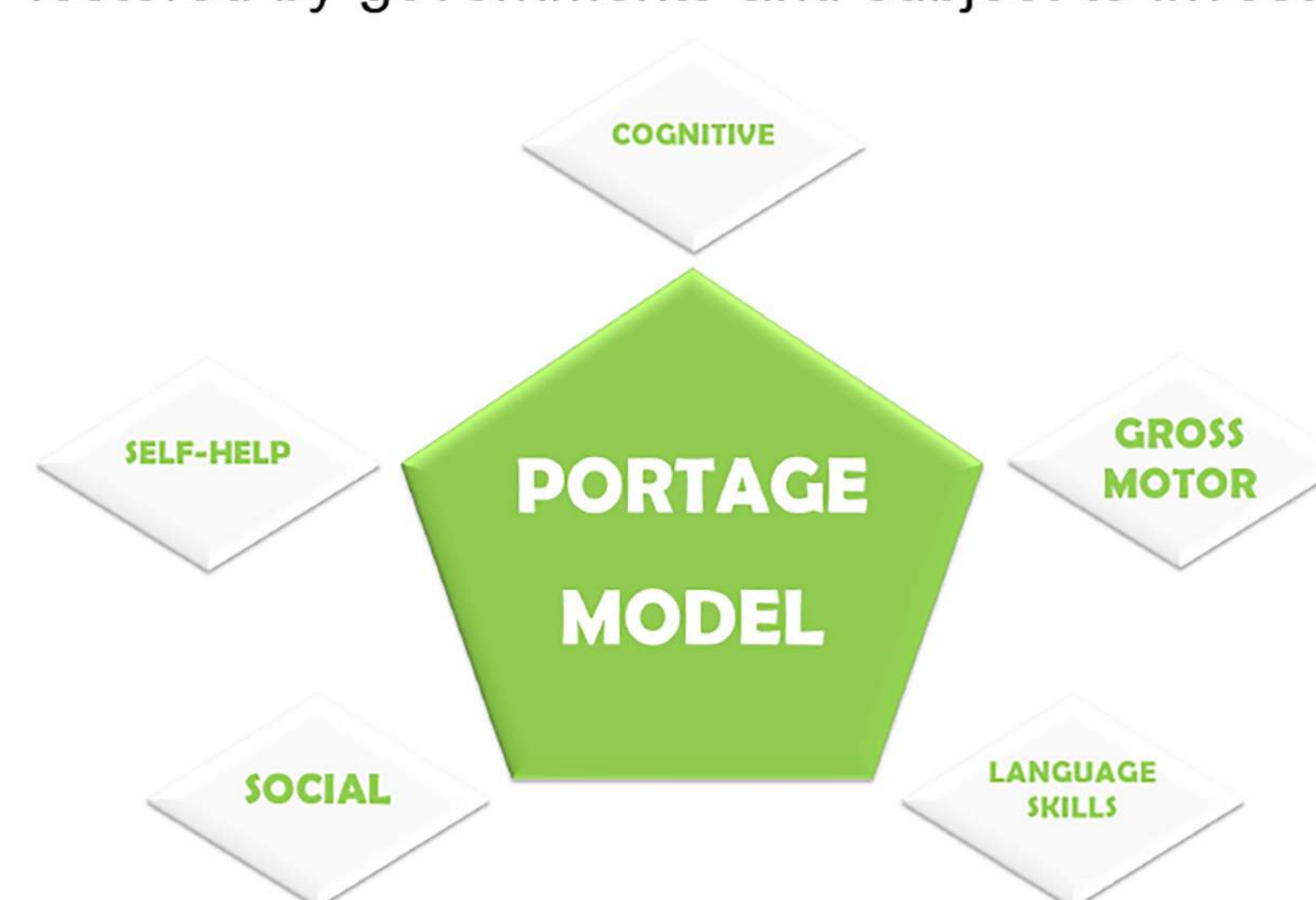
## 4. Educating workers

Regardless the chosen approach, stratification of habits is required to see a change in the society’s culture. In the considered field, occupational safety, virtuous behaviours need to be firstly understood, then taken ownership of, and finally shared by the workers. Therefore, a multidimensional approach is essential.

Since progression requires to know where the starting line is traced, tests sample should be provided by National and International organisations, in pursuance of verifying the starting knowledge levels of workers and, candidates too, on the topic. ILO has already underlined that, workers from non-renewable energy sectors will be needed to be transferred to the renewable energy sector, otherwise they will lose their jobs. For this reason, the current work aims to describe a modular system to educate them to safely cope this new challenge, according to their abilities and backgrounds.

### 4.1. The Portage Model

The Portage Model was born as a re-educational programme for those children who suffer from pathologies related to development delays. Its versatility is proven by the fact that the Portage Model system is divided in five different areas of development, respectively: cognitive, physical, linguistic, social, autonomy. In its original form, it provides kids with tasks that must be fulfilled at home, at school, at social events. Since green activities that include radiation production as a side effect of their processes will be fostered by governments and subject to investments by privates, stakeholders should be



strongly instructed about NORM/TENORM materials. Moreover, workers who were used to relate to other types of dangerous materials, will need to re-set their daily routine at work not to put themselves at risk.

However, it is important to remember that scholars are still investigating the limit over which concentration of geothermal domestic use plants become harmful to human life. Given that this type of energy

production is often used by third sector companies (to be labelled as green), even the employees of that sector would be endangered.

The first thing to do in order to adapt the Portage Model to adults, and specifically to workers who handle radioactive materials, consists in redefining categories. Hence:

COGNITIVE would become KNOWLEDGE: learning is fundamental in developing exiting sectors and new ones.

GROSS MOTOR would become IMMERSIVE LEARNING: using information technology to build a virtual training field.

LANGUAGE SKILLS would become PROPER TECHNICAL LANGUAGE: every field has its own vocabulary.

SOCIAL would become TEAM COOPERATION: the workplace is a safe place when everyone is out of danger.

SELF-HELP would become HANDLING UNEXPECTED EVENTS: using the gained knowledge to develop new competencies.

#### 4.1.1. Gross motor area

Information technology would be pivotal in the gross motor area, thanks to game-based learning designed for workers. Immersive experiences can make workers aware of the real dangers they may face, and it gives them the opportunity of potential never-ending repetitions in a safe environment. Moreover, several studies have shown that most people learn better by repetition than by reading or listening. In addition to that, software and platforms can be easily adapted to companies of any size and sector, making them more affordable, and thereby the existing treatment gap between workers from different Countries would be covered, according to the SDGs.

