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MONITORING AND ASSESSMENT MECHANISM OF JUST ENERGY TRANSITION TRAJECTORIES. DO JUST TRANSITION OBSERVATORIES MATTER?

MEHANIZEM SPREMLJANJA IN OCENJEVANJA TRAJEKTORIJ PRAVIČNEGA PREHODA NA PODROČJU ENERGIJE. ALI SO OPAZOVALNICE PRAVIČNEGA PREHODA POMEMBNE?

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Keywords: just transition, monitoring mechanisms, observatory, governance

Abstract

The primary aim of the European Green Deal is to move towards climate neutrality in a socially just and inclusive way. To this end, the EU has set up the so-called 'Just Transition Mechanism' (JTM), which will provide funding and technical assistance to the regions of the EU most affected

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by the transition to a green economy. However, in addition to securing sufficient resources and providing technical assistance for their utilisation, a critical factor for the successful outcome of the transition in coal-dependent regions is the establishment of effective monitoring/assessment mechanisms and place-based governance models. This reflects the departure of European politics from horizontal and one-size-fits-all policies. This is done for two reasons: (a) the utilisation of local knowledge and local territorial capital deals better with problems and (b) the transfer of the level of decision-making and implementation of policies as close as possible to the citizens to whom they concern. An effective governance model; however, should be accompanied by an effective mechanism for scientifically monitoring, analysing, evaluating, and formulating substantiated policy proposals. Setting up and operating a Just Transition Observatory could be a valuable support mechanism, provided it has the presumption of multi-level expertise and objectivity, deep knowledge of local specificities and legitimacy to institutionally represent the public interest at the local level. Such an Observatory could function as an independent evaluation body (with periodic reports or focused studies) in the course of the Energy Transition Programmes, identifying potential difficulties, recording impacts, results and outcomes, as well as providing policy recommendations. Given that Just Transition Plans include a number of important transformational policies and transformative plans, the crucial question that arises is whether regional and central policy makers have the tools to evaluate these transformational policies and transformative projects. In this regard, it is necessary to design evaluation models based on predefined indicators and criteria that will be jointly defined in the context of public consultation. This will ensure objectivity on the basis of commonly agreed indicators and objectives, while also guaranteeing the legitimacy and acceptance of both strategic policies and specific investment plans. This paper attempts to examine to what extent there is room for the establishment of 'Just Transition Observatories' Platforms along the coal-dependent areas. More specifically, the potential of such mechanism to monitor, analyse and evaluate clean energy transition, and provide robust policy recommendations, will be explored. To this end, Just Transition Observatories will operate as an independent evaluation mechanism producing evidence-based reports and studies on clean energy transition. Thus, the Observatories will be able to deliver periodic reports based on indicators, comparative analysis and policy recommendations. In addition to this, such mechanisms could enhance networking at the EU, national and local level, mobilising scientific dialogue and debate on clean energy transition.

Povzetek

Primarni cilj evropskega zelenega dogovora je premik k podnebni nevtralnosti na socialno pravičen in vključujoč način. V ta namen je EU vzpostavila t. i. Mehanizem za pravični prehod (JTM), ki bo zagotovil finančno in tehnično pomoč regijam EU, ki jih je prehod v zeleno gospodarstvo najbolj prizadel. Poleg zagotavljanja zadostnih virov in tehnične pomoči za njihovo uporabo pa je ključni dejavnik za uspešen prehod v regijah, odvisnih od premoga, vzpostavitev učinkovitih mehanizmov spremljanja/ocenjevanja in modelov upravljanja na podlagi krajev, kar izraža odmik evropske politike od horizontalnih politik in politike ene velikosti za vse. To se izvaja iz dveh razlogov: (a) uporaba lokalnega znanja in lokalnega teritorialnega kapitala učinkovitejše rešuje probleme in (b) prenos ravni odločanja in izvajanja politik čim bližje državljanom, ki se jih neposredno tičejo. Učinkovit model upravljanja pa mora spremljati učinkovit mehanizem znanstvenega opazovanja, analiziranja, ocenjevanja in oblikovanja utemeljenih političnih predlogov. Vzpostavitev in delovanje Observatorija za pravični prehod bi lahko bil dragocen podporni mehanizem, če bi imel predpostavko o večnivojskem strokovnem znanju in objektivnosti, globokem poznavanju lokalnih posebnosti in legitimnosti za institucionalno zastopanje javnega interesa na

lokalni ravni. Takšen observatorij bi lahko deloval kot neodvisno ocenjevalno telo (z občasnimi poročili ali osredotočenimi študijami) poteka programov energetskega prehoda, pri čemer bi prepoznaval morebitne težave, beležil vplive, rezultate in izide ter tudi predlagal politična priporočila. Glede na to, da načrti pravičnega prehoda vključujejo številne pomembne transformacijske politike in transformativne načrte, se postavlja ključno vprašanje, ali imajo regionalni in centralni oblikovalci politik orodja za ovrednotenje teh transformacijskih politik in transformativnih projektov. Pri tem je potrebno oblikovati modele vrednotenja na podlagi vnaprej določenih indikatorjev in meril, ki jih bomo opredelili v okviru javne razprave. To bo na eni strani zagotovilo objektivnost na podlagi skupno dogovorjenih kazalnikov in ciljev ter na drugi strani legitimnost in sprejemljivost tako strateških politik kot posebnih naložbenih načrtov. Ta dokument skuša preučiti, v kolikšni meri obstaja prostor za vzpostavitev platform observatorijev za pravični prehod vzdolž območij, ki so odvisna od premoga. Natančneje bo preučen potencial mehanizma za opazovanje, analizo in vrednotenje prehoda na čisto energijo ter za zagotavljanje trdnih političnih priporočil. V ta namen bodo observatoriji pravičnega prehoda delovali kot neodvisen ocenjevalni mehanizem, ki bo pripravljal poročila in študije o prehodu na čisto energijo, ki temeljijo na dokazih. Na podlagi tega bodo observatoriji lahko predložili redna poročila, ki bodo temeljila na kazalnikih, primerjalnih analizah in priporočilih politike. Poleg tega bi lahko takšni mehanizmi okrepili povezovanje tako na ravni EU kot na nacionalni in lokalni ravni ter spodbudili znanstveni dialog in razpravo o prehodu na čisto energijo.

1 INTRODUCTION

Clean energy transition represents a topic that has received increased attention from policy makers across Europe, shedding light on the multifaceted interplay of socio-economic, technological and environmental aspects of the transition. To this end, just transition means that society shares both tangible and intangible costs and benefits of transitioning to a low-carbon economy in a socially-just trajectory (Petrakos et al, 2021, Topaloglou 2020, 2021). In this sense, transition can be seen as a means to tackle persistent problems related to transformative and cross-cutting changes, that calls for multi-level governance in light of climate challenges and all-embracing major shifts in governance approaches (Topaloglou and Ioannidis, 2022; Van Engelenburg and Maas, 2018; Jordan et al., 2015). However, in addition to securing sufficient resources and providing technical assistance for their utilisation, a critical factor for the successful outcome of the transition in coal-dependent regions is the establishment of effective monitoring and assessment mechanisms and place-based governance models.

The added value of efficiency measurement for policy formation and evaluation is plainly cited by Lord Kelvin 1824-1907, '*To measure is to know. If you cannot measure it, you cannot improve it. When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind*' (Thomshon, 1916). Given that Just Transition Plans include a number of important transformational policies and transformative plans, the critical question that arises is whether Just Transition Observatories in coal-dependent regions matter, and whether they aim to provide to policy makers the tools to monitor and evaluate transformational policies and transformative projects. In this regard, it is necessary to design evaluation models based on predefined indicators and criteria that will be jointly defined in the context of public consultation.

This paper's scope is, first, to address the main challenges of green strategy and climate neutrality in Europe in terms of policymaking and the need for monitoring mechanisms. Secondly, it seeks to critically review the relative scientific discussion. Thirdly, this paper aims to introduce a conceptualisation of the Just Transition Observatory by testifying its need against various critical socio-economic factors.

The paper is organised as follows. The subsequent section provides a critical theoretical review on the nature of energy transition and the need for monitoring mechanisms. Then, the following section outlines just energy transition policymaking. Section 3 attempts to provide a conceptualisation of a Just Energy Observatory, while Section 4 focuses on the analysis of two selected indicators that could be embedded in the Just Energy Observatory. The final section provides various conclusions and policy recommendations.

2 LITERATURE REVIEW

Over the last decade, innumerable studies have examined the complex interplay of social, economic, environmental, and technological aspects of energy transitions. Although the evidence is mixed, it should be a relatively safe prediction to argue that energy transition can be delivered only if there is a co-evolution of technology, policy, infrastructure, scientific knowledge, social, and governance practices in order to foster regime destabilisation (Geels, 2011). Given the multi-level and multi-faceted character of climate change, the issue of monitoring energy transition has received surprisingly little attention, not just by scholars but also by practitioners and policymakers. While a plethora of scholarly publications are available addressing governance of energy transition at the local and national level (Betsil and Bulkelev, 2006; Kemp et al, 2007; Loorbach et al, 2007), there have been remarkably few that have focused on the governing of energy transition based on monitoring and assessing mechanisms. The need for tailored approaches to energy transition is very apparent in regions that currently have or have an inheritance of carbon-intensive productive bases (Topaloglou, 2021). For these regions, due to the dominant presence of carbon intensive industry in local economies, the move to a low-carbon economy will deeply influence local jobs, industry infrastructure, and the entirety of the regional economy.

From a policy-making point of view, transition management takes place in a multi-actor environment, placing particular emphasis on the role of central government as an agent of change. At the same time, the role of local and regional authorities, energy business actors, key stakeholders and civil society organisations appears to be of great importance. OECD (2013), in a working paper entitled 'monitoring the transition to a low-carbon economy', argues that local governments, together with other local institutions, will be central agents in the success of the transition of regional areas to low-carbon economies (OECD 2013). Local governments typically hold multiple roles as decision-makers, planning authorities, managers of municipal assets, operators of local energy providers and role models for the public (ICLEI 2012). Local government also has an important amount of land property and a large degree of impact over land-use policies, which means they can influence, to some extent, the regulatory limits for energy activities (Miranda and Larcombe, 2012). Seen in this respect, Petrakos et al, (2021), argue that the endeavour of transition requires a multi-level governance environment that influences the decision-making process, the financial means, and interventions.

As a result, transition arenas usually unfold in a multi-actor development of visions, deliberative decision, and policymaking, as well as coordination of actions to set up, manage and evaluate

transition experiments that contribute to niche development (Loorbach, 2008). To this end, a major limitation of an effective clean energy transition process is the lack of a comprehensive and defensible monitoring mechanism for collecting, collating, analysing, assessing, and providing policy recommendations at multiple scales. Evidence shows that so far, the existing data are very incomplete, fragmented, heterogeneous and not easily available to end users (Hoppe and Miedema, 2020).

This observational framework seems to be lacking at present, yet it would significantly help in identifying, monitoring, and evaluating the just energy transition. The outcomes of such an Observatory, could be used to develop and evaluate a targeted and effective just energy transition. In this aftermath, the multidimensional nature of energy transition calls for a multi-indicator framework for effective measuring and monitoring, gaining greater recognition in literature (Kagimu & Ustun, 2016) and deserves to be replicated. Such a framework would offer the possibility of establishing specific monitoring mechanisms to observe just energy transition in each area, strongly affected by climate change. Through the deliberative process of deciding 'what' to measure, monitor and use as indicators for performance, stakeholders can develop a shared understanding and responsibility for developing and populating indicators (OECD, 2015). Therefore, this monitoring mechanism should reflect the views of different actors and emphasise the engagement of all key-stakeholders (Topaloglou and Ioannidis, 2022), taking into account the various institutionalised modes of social coordination to provide collective goods (Börzel and Risse, (2010).

A crucial factor in the transition monitoring mechanism seems to be the prioritisation of indicators to track progress and effectiveness of interventions, given the amount of public and private investment and projects being made in each of these areas to facilitate the transition. Evidence shows that agreement on a set of common indicators for measuring and populating these indicators requires stakeholder engagement to inform and validate the indicator selection process. It is noteworthy that while many initiatives at the national and local level can certainly be found, there is also a significant number of inconsistencies and a lack of agreement concerning the indicators needed to be analysed and assessed. It is widely recognised that energy transition indicators must begin from a baseline. If we are to accurately assess energy transition, then this baseline will need to incorporate the critical local assets. Each area has an array of existing production base, including the labour force and capital stock (OECD, 2015). These initial conditions and assets shape the trajectory of the local area's pathway to a climate neutral paradigm. To this end, local trajectories will be unique for each area because of the different compositions of stocks and activities (Topaloglou, 2021).

3 JUST ENERGY TRANSITION POLICYMAKING

The adoption of the 17 Sustainable Development Goals (SDGs) by the UN in the 2030 Agenda reflects the just transition policymaking at a global level. The SDGs aim to ensure sustainable global, social and economic development as well as universal peace. At European level, seen from a just transition perspective within the context of the European Green Deal, the European Commission has set out a roadmap for a new growth policy for the EU towards climate neutrality by 2050, aiming to leave no person and no region behind. The European Green Deal for the European Union (EU) and its citizens is a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy

where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. The main goals that need to be monitored and assessed deal with climate ambition targets, supplying clean, affordable and secure energy, accelerating sustainable mobility, designing the 'Farm to Fork Strategy', preserving and restoring biodiversity and supporting a zero-pollution policy. From the above, an effective mechanism able to monitor and assess the fulfilment of these ambitious goal is vital.

In this setting, the Just Transition Mechanism focuses on the regions and sectors that are most affected by the transition due to their dependence on fossil fuels. The mechanism consists of three pillars. Firstly, the Just Transition Fund, secondly, a dedicated scheme under the InvestEU programme, and thirdly, a public sector loan facility provided by the European Investment Bank to mobilise additional investments in the regions concerned. The Just Transition Fund receives the lion's share aiming to support the territories most affected by the transition and for preventing an increase in regional disparities, as well as mitigating any negative repercussions on employment.

To accomplish the above objectives, the Just Transition Fund supports transformative investments in the involved areas, the reduction of GHG emissions, the regeneration of local economies, the reskilling of workers and technical assistance. Support will also be available for all Member States, focused on regions that are the most carbon-intensive or with the most people working in fossil fuels. Member States can gain access by preparing Territorial Just Transition Plans that cover the period up to 2030, identifying the territories that should receive the most support. These Plans should also set out ways to best address social, economic, and environmental challenges.

Given that many people and citizens are vulnerable to the transition, the Just Transition Mechanism aims to protect them by facilitating employment opportunities in new sectors, offering both reskilling and upskilling support, improving energy-efficient housing, fighting energy poverty, and facilitating access to clean, affordable and secure energy. On the other hand, companies and sectors active in carbon-intensive industries can be supported by the Just Transition Mechanism through creating attractive conditions for public and private investment, providing easier access to loans and financial support, investing in the creation of new firms, SMEs and start-ups, and devoting themselves to research and innovation activities.

In parallel, all Member States have embedded in their National Energy and Climate Plans (NECPs) targets, policies, and measures to reach the ambitious goals towards EU climate neutrality by 2050. It is worth noting that according to EC working Documents (EC 275, 2021), proposals to extend the geographical scope to territories where there is no clear transition process with an associated negative socio-economic impact by 2030 or before, should not be accepted. In this context, the TJTPs should describe the transition process at national and local levels, including a timeline for key transition steps towards 2030 and 2050 climate targets, in compliance with the respective NECP. The TJTP will also need to demonstrate clear evidence of a transition process and its impact at the level of the concerned territory in the near future. Based on the requirements of the TJTPs, several social, economic and environmental indicators are mandatory for monitoring and reporting (EC, 2020).

Having touched upon just transition policymaking, it is also necessary to address an appropriate framework of a Just Transition Observatory in the coal-dependent regions aiming to create a replicable model focusing on the governance of the energy transition applicable in each Euro-

pean region. These regions must integrate just energy transition policies into social, energy and environment policies from a multi-level governance perspective.

4 CONCEPTUALISATION OF A JUST TRANSITION OBSERVATORY

In order to conceptualise the proposed monitoring mechanism, it is useful to start from the assumption that the Just Transition Process deals with a drastic restructuring of the regional economic model and environmental and societal status, something which is well-established and has been operative for many decades. Thus, this transition process requires fast and robust actions in order to shift the local economy towards a sustainable, resilient and just development model by introducing coal-dependent areas to a carbon-free regime (Giannakopoulos et al, 2022).

Furthermore, we consider that the transition process goes beyond the boundaries of the phasing out of the carbon/lignite industry, tackled by Just Transition Mechanism, and instead involves shaping a new holistic regional development paradigm, which requires new infrastructure, new skills, and new business activities under a new regional branding. Within this context, a significant amount of information should be collected, assessed and discussed in order to support actions and measures, as well as to evaluate their progress and success. Due to the multidisciplinary character of the transition process and the involvement of EU, national, regional and local authorities/stakeholders, centralised and specialised data handling monitoring is considered a crucial parameter of success.

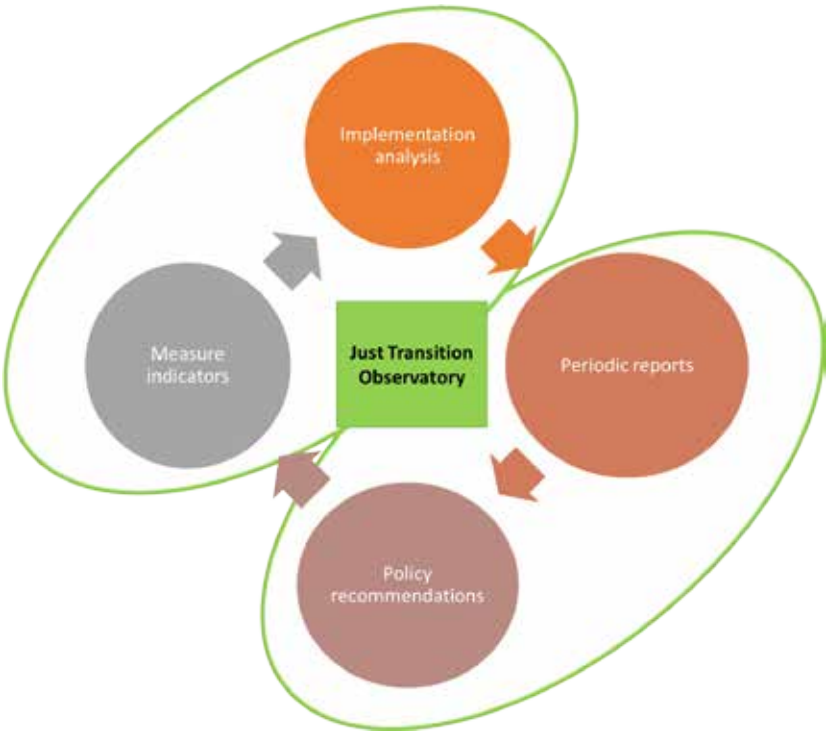


***Figure 1**: Conceptualization of a Just Transition Observatory.*

Additionally, we suggest that the Just Transition Observatories act as an independent mechanism that combine the Just Transition needs with the broader climate policies, measures and initiatives as formed in different levels (national, regional, municipal), in order to facilitate the transformation of local entities to a zero-carbon era. To this end, Just Transition Observatories' Platform along coal-dependent areas could incorporate data and information indicatively regarding NCEPs, TJTPs, ROPs, OECD SDGs reports, Covenant of Mayors reports, EUROSTAT, National Statistics etc., producing evidence-based reports and studies on clean energy transition, as well as comparative studies on transition processes on a regional and EU basis.

Taking into consideration the above analysis, Figure 1 illustrates the conceptual approach of the Just Transition Observatory articulated on an input-output logic. The input segment involves measurements based on predefined indicators and implementation analysis. The output part consists of periodic reports which assess the implementation and consistency with the predefined goals and policy recommendations aiming to improve transition policy efficiency.

Figure 2 demonstrates the critical stakeholders who should be actively involved in a Just Transition Observatory, such as central and local governments, academic and research institutions, the energy companies, the main societal actors and the European Commission.

***Figure 2**: Stakeholders of a Just Transition Observatory.*

Attempting to ensure the viability of the proposed monitoring mechanism, Figure 3 identifies the potential funding resources of the Just Transition Observatory, consisting of EU, national and private funds.

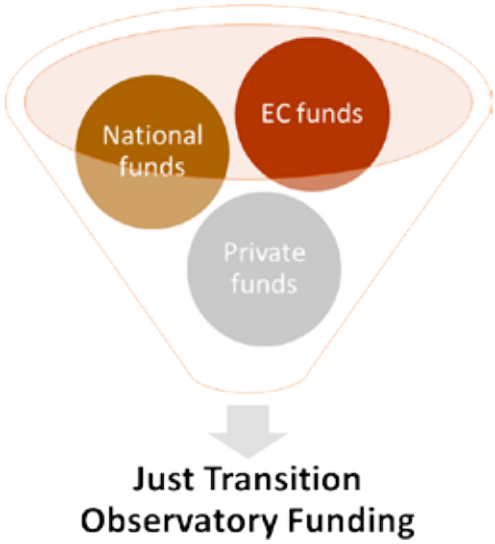


***Figure 3**: Funding of a Just Transition Observatory.*

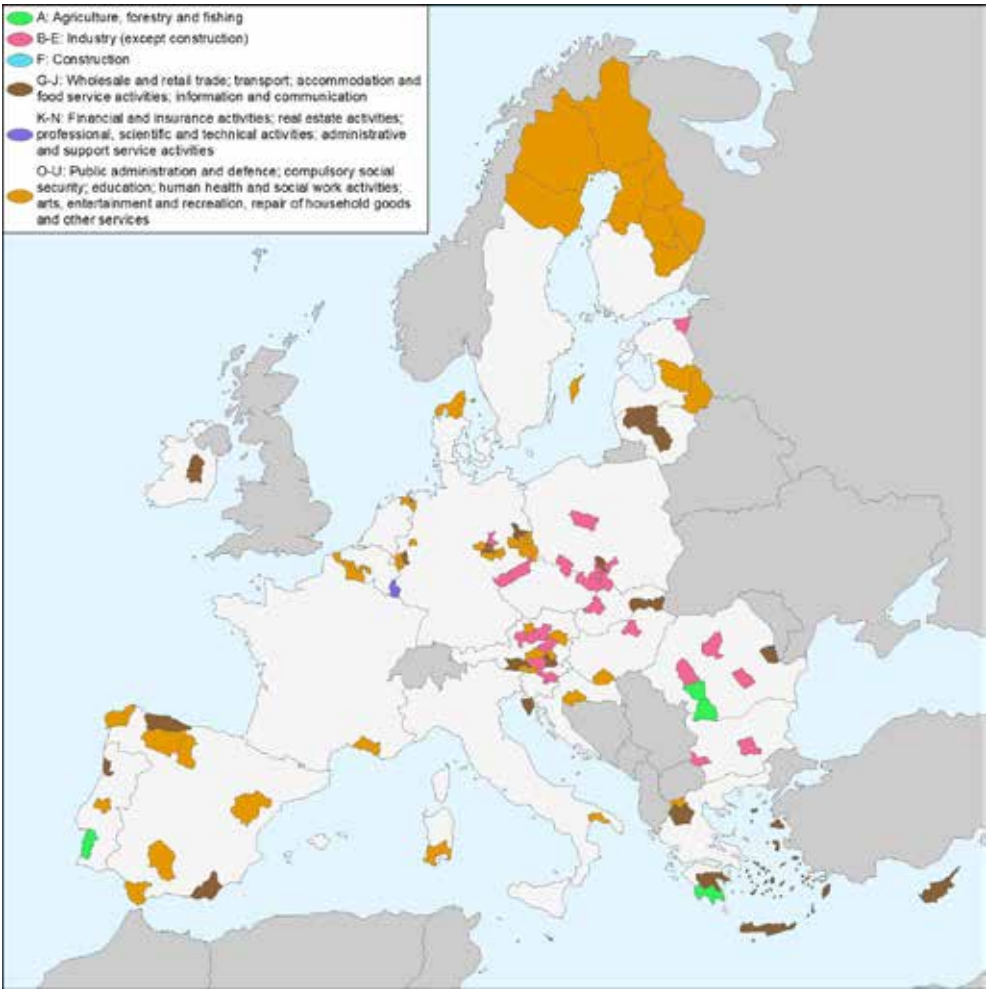
5 ANALYSIS

In order to ascertain the foreseen outcome of the discussed structure of the Just Transition Observatory, a preliminary analysis of selected parameters was carried out. Taking into consideration that employment, Gross Value Added and business environment growth are critical issues for just regional transition, an analysis of their characteristics at the regional level was carried out.

This work focused on the Just Transition Mechanism (JTM) territories, initiating their radical change from a heavily-dependent on CO_2 emissions technological and economical model to a climate-neutral economy. It must be mentioned that during the period 2021-2027, a goal of around €55 billion will be mobilised for the most-affected regions under the target, in order to ensure that no one will be left behind.

An analysis of the position of sectors' shares in the TJTP areas with respect to the national share, as well as the maximum and minimum share in all NUTS3 countries' areas, was carried out. In the following Map 1, we can see the dominant economic sector regarding employment in TJTP areas. For reasons of discussion, only four selected cases are presented, dealing with Germany, Greece, Bulgaria, and the Czech Republic, illustrated in Figure 4. Based on a level of further analysis, conclusions can be drawn for each individual area, with respect to their national position and national/local policies, as well as for groups of areas. For example, for many sectoral cases, a wide spread is observed, while for other cases, all national TJTP areas are either below the average national share (e.g. [K-N] Greece, [G-J] Bulgaria, [K-N] the Czech Republic) or above it ([B-E] & [O-U] the Czech Republic).

The selection of the countries examined, namely Germany, Greece, Bulgaria and the Czech Republic, was made with respect to the representation of significant dependency on the coal/lignite industry, phase out discussion readiness, and countries' profiles.



***Map 1**: Employment: Dominant sector per TJTP area (2019). Data source: Eurostat*

Amongst TJTP areas, [O-U] sector is dominant in 55 cases, representing 16.1% of the total number of employees, which deals with 19.9 million people for total areas (28.9% sectors total share in all TJTP areas). In addition to this, significant impact presents [G-J] dealing with 33 areas of 8.6% employees (27.0% share in total TJTP areas) and [B-E] in 26 areas with 7.5% (18.5% share in total TJTP areas). Sector [A] is dominant in only four areas related to 0.9% employees (5.3% share in total TJTP areas) and [K-N] deals with 1 area and 0.7% (13.4% share in total TJTP areas). Sector [F] has a total share of 6.8% in all TJTP areas in not governing any examined area. It must be noticed that [O-U] presents a key position as a local and total areas sector, while [G-J] and [B-E] are crucial in long scale with less significance in local scale.

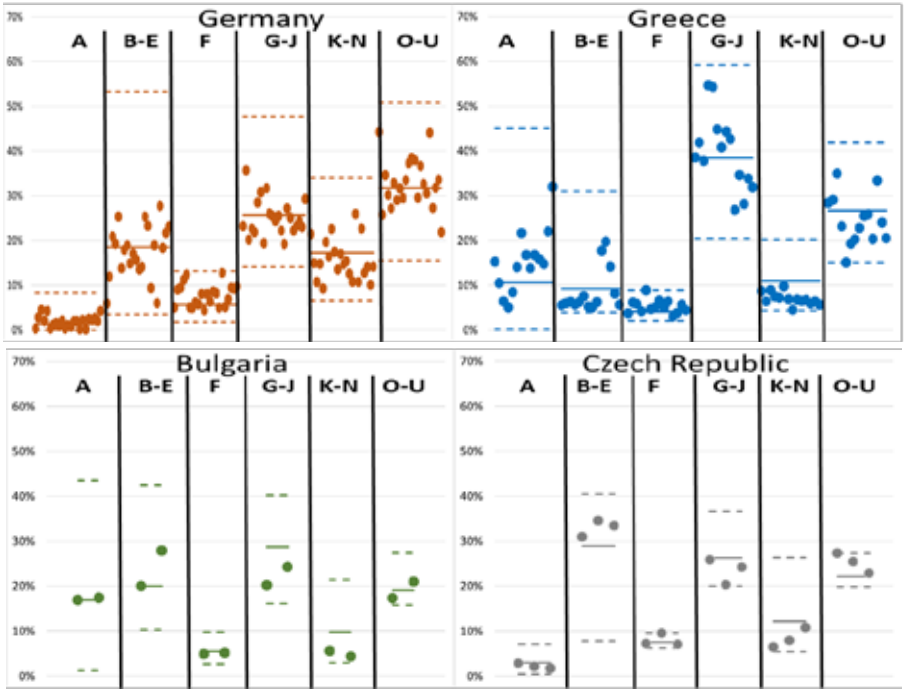
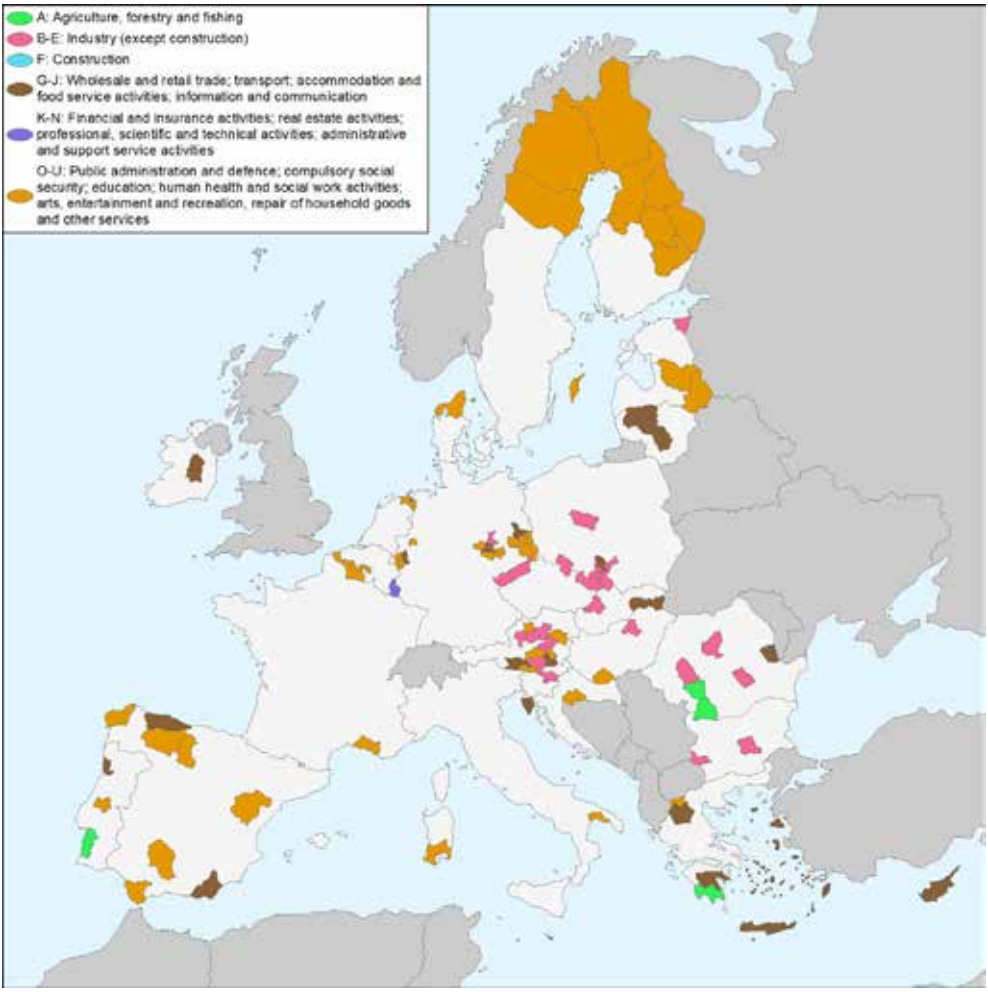


***Figure 4**: Percentage of employment per TJTP areas in Germany, Greece, Bulgaria, Germany and the Czech Republic compared to national characteristics (2019).*

Taking into consideration Gross Value Added (GVA), as we can see in Map 2, amongst TJTP areas, [B-E] sector is dominant in 50 cases representing 10.1% of the total examined areas GVA, which deals with 1,019.486 €, (21.6% sectors total share in all TJTP areas), followed by sector [O-U] dealing with 42 areas of 11.5% total GVA (24.0% share in total TJTP areas). Sector [G-J] is dominant in 21 areas with 5.0% (22.2% share in total TJTP areas) and [K-N] in only 6 areas related to 5.5% (23.5% share in total TJTP areas). Sectors [A] with a total share of 2.4% and [F] with 6.2% share in all TJTP areas are not governing any examined area. Moreover, in this case, we can see that [O-U] presents a key position as a local and total areas sector, followed by [B-E], while [G-J] and [K-N] are significant in long-scale analysis.

In Figure 5, the analysis of the position of the sectors' shares in the TJTP areas GVA, with respect to the national share, as well as the maximum and minimum share in all NUTS3 countries' areas, is illustrated for the same selected countries as above. In addition to this, in this case, a wider spread is observed for numerous sectoral contributions in individual areas amongst countries, resulting in required specific local policies, while in other cases sectoral measures may arise. In the countries examined, all national TJTP areas are either below the average national share (e.g. [G-J] Bulgaria, [G-J] & [K-N] the Czech Republic) or above it ([A] Bulgaria).



***Map 2**: Gross Value Added: Dominant sector per TJTP area (2019). Data source: Eurostat.*

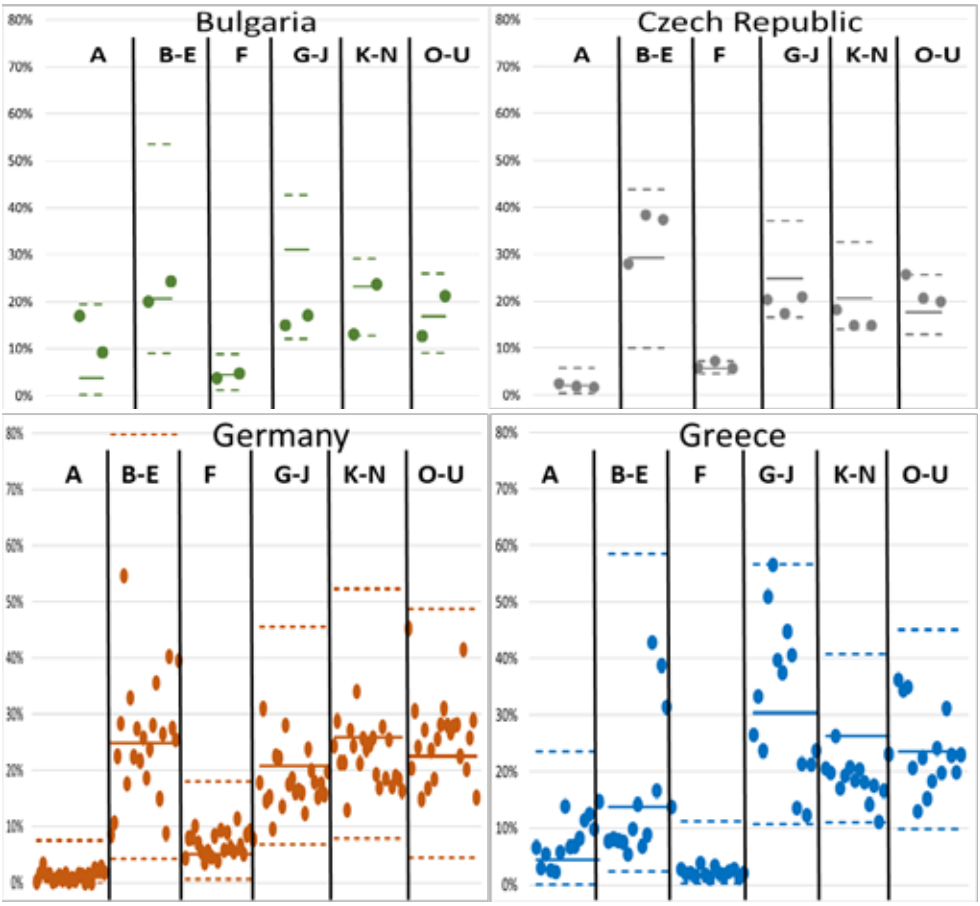


***Figure 5**: Share of Gross Value Added per TJTP areas in Germany, Greece, Bulgaria and Czech Republic (2019) compared to national characteristics.*

The examination of the ratio of employment per GVA could provide a valuable indicator for further analysis of growth potential at the national and regional level. Figure 6 illustrates the respective indicator for the four examined countries.

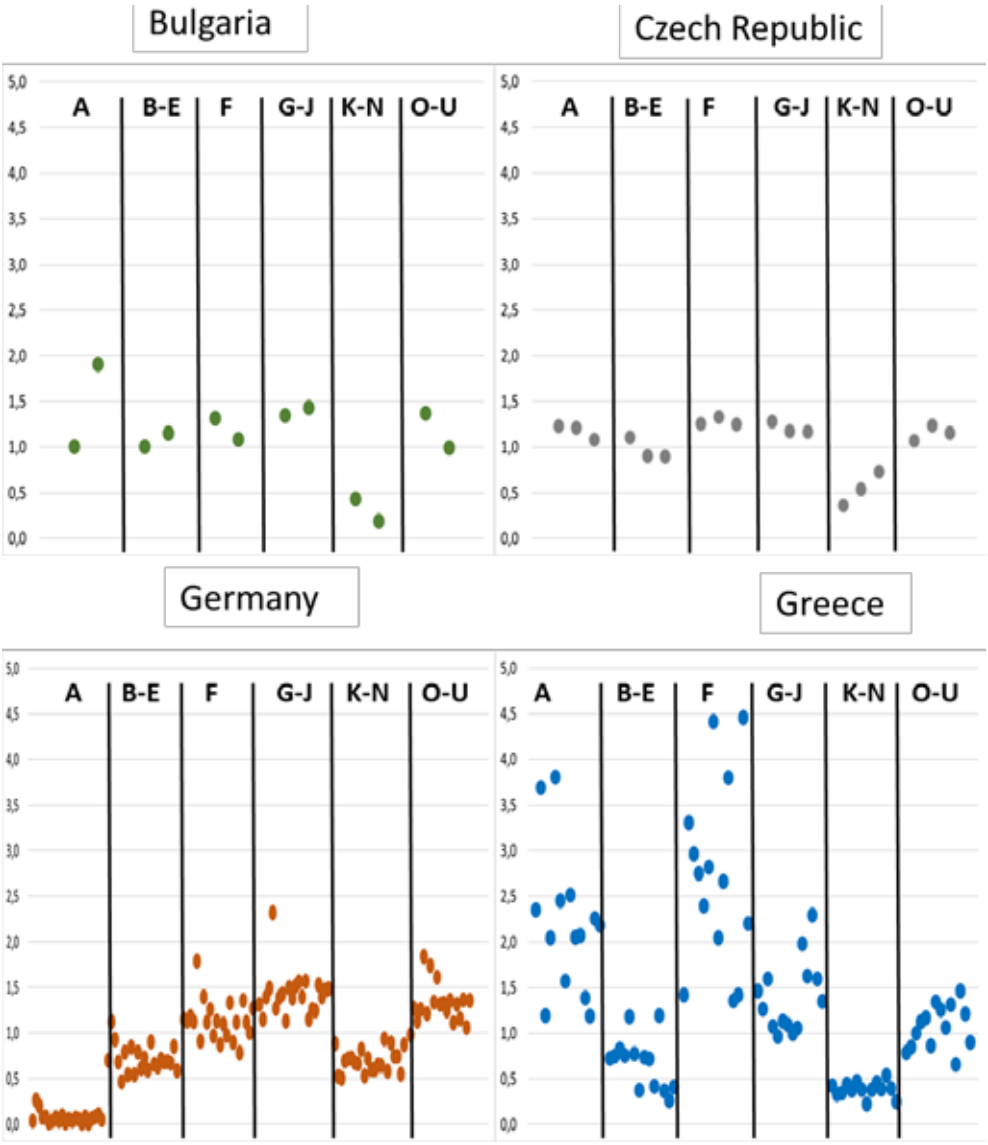
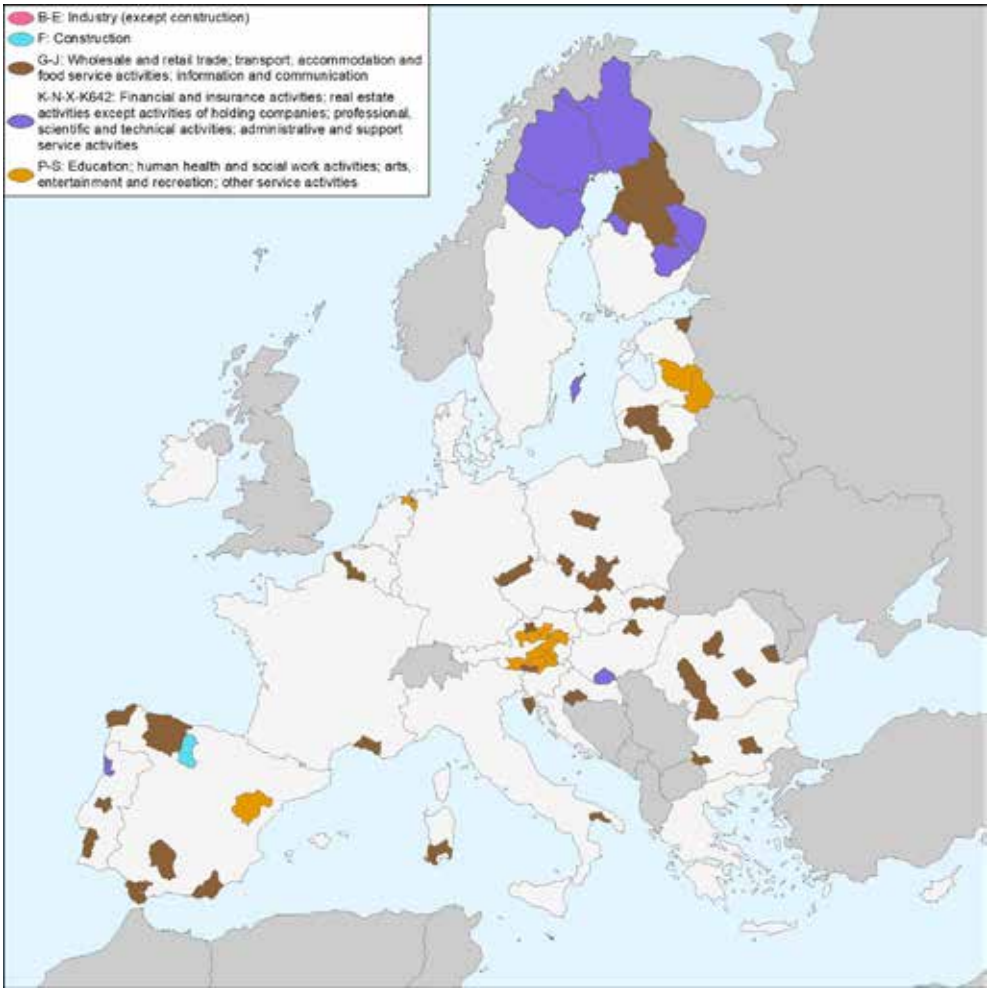


***Figure 6**: Ratio of employment / GVA per TJTP areas in Germany, Greece, Bulgaria and the Czech Republic (2019) compared to national characteristics.*



Map 3*: Business demography: Dominant sector per TJTP area (2019). Data source: Eurostat.*

The examination of Business demography amongst TJTP areas, Map 3, results in the requirement for further data availability, since published data are only available for 73 of the 119 areas examined. From this arises a further work and usefulness of proposed Observatory to act as an intermediate stakeholder amongst regional, national and EU authorities to identify information needed, data gaps and contribute to further actions for common EU indicators development.

In terms of the Business demography analysis, [G-J] sector is dominant in 48 cases, followed by 15 of [P-S], while [K-N-X-K642] is related to only 9 areas and [F] to one.

The analysis of the newly-born businesses in the last 3 years achieving the continuation of their activities as a share of total business activities in the examined area is proposed as an economic growth indicator to be used in the Observatory, as illustrated in the Figure 7. It must be noted that TJTF areas achieved a higher score than 90% of the examined cases areas in Austria, Bel-

gium, Latvia, Lithuania, Malta and Romania. Specific analysis of these may provide useful results for replication, as well as Best Practices that could then be developed and disseminated.

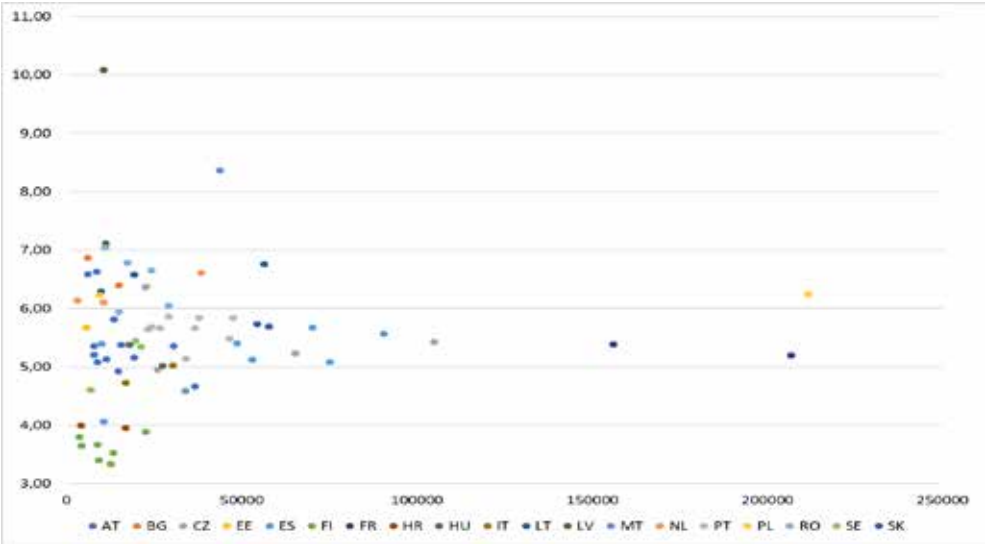


***Figure 7**: Percentage of newly-born active enterprises in the last 3 years per TJTP area (2019, Eurostat).*

6 CONCLUSIONS

Given the longitudinal nature of green transition and climate change, the theme of establishing an objective monitoring mechanism of just transition policies per each affected region across the EU is challenging and necessary, particularly at this time, in view of the Just Transition Fund's unfolding. Considering that climate neutral goals will remain in place over the next few decades, comprehensive and inclusive policies, as well as efficient means, instruments and valid indicators, are indispensable.

Hence, a consensus on both mechanisms and a set of common indicators for measuring these indicators requires stakeholder engagement and agreement to inform and validate the indicator selection process. By selecting, through consultation processes, 'what' exactly to measure, monitor and use as indicators for performance, stakeholders can develop a shared understanding and responsibility for developing and updating indicators. In turn, this has the potential to create a local platform for co-operation amongst institutions based on different and multi-layered responsibilities and expertise.

This paper addresses the need of establishing an Observatory, aiming to monitor and assess the just transition endeavour in each coal-dependent area in Europe, based on co-created and pre-defined indicators and criteria. For the sake of the discussion, three pilot indicators have been selected to be analysed in a comparative perspective at a European, national and regional level. In particular, the critical parameters of employment, gross value added, and business en-

vironment growth have been explored and evaluated per economic sector in Germany, Greece, Bulgaria and the Czech Republic.

The preceding analysis has shown that establishing a comprehensive local transition monitoring mechanism and developing collectively-agreed indicators in a participatory way, could essentially assist the Just Transition Goals of local policies. Multi-level governance practices and co-ordination between multi-layered stakeholders in these planning, implementation, and monitoring processes within and amongst regions could prove crucial. The truth is that institutional and regional boundaries do not often match up in real life. As a result, a tailor-made approach that ensures a process of stakeholder engagement must be developed per each involved area.

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ANNEX

Table 1: *NUTS3 territories proposed or included in TJTPs*

NUTS3 Territory	Status	Area (%)
AT121–Mostviertel-Eisenwurzen	Included in approved TJTP	100%
AT122–Niederösterreich-Süd	Included in approved TJTP	100%
AT211–Klagenfurt-Villach	Included in approved TJTP	50%
AT212–Oberkärnten	Included in approved TJTP	13%
AT213–Unterkärnten	Included in approved TJTP	100%
AT221–Graz	Included in approved TJTP	89%
AT223–Östliche Obersteiermark	Proposed by EC and included in approved TJTP	100%
AT225–West- und Südsteiermark	Included in approved TJTP	38%
AT226–Westliche Obersteiermark	Included in approved TJTP	100%
AT312–Linz-Wels	Included in approved TJTP	29%
AT314–Steyr-Kirchdorf	Included in approved TJTP	55%
AT315–Traunviertel	Proposed by EC and included in approved TJTP	100%
BE323–Arr. Mons	Proposed by EC	100%
BE328–Arr. Tournai-Mouscron	Proposed by EC	86%
BE32B–Arr. Charleroi	Proposed by EC	100%
BE32C–Arr. Soignies	Proposed by EC	23%
BG344–Stara Zagora	Proposed by EC	100%
BG415–Kyustendil	Proposed by EC	100%
CY000–Kýpros	Proposed by EC and included in approved TJTP	100%
CZ041–Karlovarský kraj	Proposed by EC	100%
CZ042–Ústecký kraj	Proposed by EC	100%

NUTS3 Territory	Status	Area (%)
CZ080–Moravskoslezský kraj	Proposed by EC	100%
DE402–Cottbus, Kreisfreie Stadt	Proposed by EC	100%
DE406–Dahme-Spreewald	Proposed by EC	100%
DE407–Elbe-Elster	Proposed by EC	100%
DE40B–Oberspreewald-Lausitz	Proposed by EC	100%
DE40G–Spree-Neiße	Proposed by EC	100%
DEA15–Mönchengladbach, Kreisfreie Stadt	Included in approved TJTP	100%
DEA1D–Rhein-Kreis Neuss	Proposed by EC and included in approved TJTP	100%
DEA26–Düren	Proposed by EC and included in approved TJTP	100%
DEA27–Rhein-Erft-Kreis	Proposed by EC and included in approved TJTP	100%
DEA29–Heinsberg	Included in approved TJTP	100%
DEA2D–Städteregion Aachen	Included in approved TJTP	100%
DEA31–Bottrop, Kreisfreie Stadt	Included in approved TJTP	100%
DEA36–Recklinghausen	Included in approved TJTP	39%
DED2C–Bautzen	Proposed by EC	100%
DED2D–Görlitz	Proposed by EC	100%
DED51–Leipzig, Kreisfreie Stadt	Proposed by EC	100%
DED52–Leipzig	Proposed by EC	100%
DEE02–Halle (Saale), Kreisfreie Stadt	Proposed by EC	100%
DEE05–Anhalt-Bitterfeld	Proposed by EC	100%
DEE08–Burgenlandkreis	Proposed by EC	100%
DEE0A–Mansfeld-Südharz	Proposed by EC	100%
DEE0B–Saalekreis	Proposed by EC	100%
DK050–Nordjylland	Proposed by EC	100%
EE00A–Kirde-Eesti	Proposed by EC	100%
EL411–Lesvos, Limnos	Proposed by EC and included in approved TJTP	100%
EL412–Ikaria, Samos	Proposed by EC and included in approved TJTP	100%
EL413–Chios	Proposed by EC and included in approved TJTP	100%
EL421–Kalymnos, Karpathos, Kasos, Kos, Rodos	Proposed by EC and included in approved TJTP	100%
EL422–Andros, Thira, Kea, Milos, Mykonos, Naxos, Paros, Syros, Tinos	Proposed by EC and included in approved TJTP	100%
EL431–Irakleio	Proposed by EC and included in approved TJTP	100%
EL432–Lasithi	Proposed by EC and included in approved TJTP	100%
EL433–Rethymni	Proposed by EC and included in approved TJTP	100%
EL434–Chania	Proposed by EC and included in approved TJTP	100%
EL531–Grevena, Kozani	Proposed by EC and included in approved TJTP	100%
EL532–Kastoria	Proposed by EC and included in approved TJTP	100%
EL533–Florina	Proposed by EC and included in approved TJTP	100%
EL651–Argolida, Arkadia	Proposed by EC and included in approved TJTP	49%
EL653–Lakonia, Messinia	Included in approved TJTP	6%
ES111–A Coruña	Proposed by EC	100%
ES120–Asturias	Proposed by EC	100%
ES242–Teruel	Proposed by EC	100%
ES413–León	Proposed by EC	100%
ES414–Palencia	Proposed by EC	100%

NUTS3 Territory	Status	Area (%)
ES611–Almería	Proposed by EC	100%
ES612–Cádiz	Proposed by EC	100%
ES613–Córdoba	Proposed by EC	100%
FI1D1–Etelä-Savo	Proposed by EC	100%
FI1D2–Pohjois-Savo	Proposed by EC	100%
FI1D3–Pohjois-Karjala	Proposed by EC	100%
FI1D5–Keski-Pohjanmaa	Proposed by EC	100%
FI1D7–Lappi	Proposed by EC	100%
FI1D8–Kainuu	Proposed by EC	100%
FI1D9–Pohjois-Pohjanmaa	Proposed by EC	100%
FRE11–Nord	Proposed by EC	100%
FRL04–Bouches-du-Rhône	Proposed by EC	100%
HR028–Sisačko-moslavačka županija	Proposed by EC	100%
HR036–Istarska županija	Proposed by EC	100%
HU231–Baranya	Proposed by EC	100%
HU312–Heves	Proposed by EC	100%
IE063–Midland	Proposed by EC	100%
ITF43–Taranto	Proposed by EC	100%
ITG2H–Sud Sardegna	Proposed by EC	23%
LT022–Kauno apskritis	Proposed by EC	100%
LT026–Šiaulių apskritis	Proposed by EC	100%
LT028–Telšių apskritis	Proposed by EC	100%
LU000–Luxembourg	Proposed by EC	1%
LV005–Latgale	Proposed by EC	100%
LV008–Vidzeme	Proposed by EC	100%
MT001–Malta	Proposed by EC	11%
NL111–Oost-Groningen	Proposed by EC	100%
NL112–Delfzijl en omgeving	Proposed by EC	100%
NL113–Overig Groningen	Proposed by EC	100%
PL225–Bielski	Proposed by EC	100%
PL227–Rybnicki	Proposed by EC	100%
PL228–Bytomski	Proposed by EC	100%
PL229–Gliwicki	Proposed by EC	100%
PL22A–Katowicki	Proposed by EC	100%
PL22B–Sosnowiecki	Proposed by EC	100%
PL22C–Tyski	Proposed by EC	100%
PL414–Koniński	Proposed by EC	100%
PL517–Wałbrzyski	Proposed by EC	100%
PT11A–Área Metropolitana do Porto	Proposed by EC	3%
PT16I–Médio Tejo	Proposed by EC	100%
PT181–Alentejo Litoral	Proposed by EC	100%
RO125–Mureş	Proposed by EC	100%
RO224–Galaţi	Proposed by EC	100%
RO316–Prahova	Proposed by EC	100%
RO411–Dolj	Proposed by EC	100%

NUTS3 Territory	Status	Area (%)
RO412–Gorj	Proposed by EC	100%
RO423–Hunedoara	Proposed by EC	100%
SE214–Gotlands län	Included in approved TJTP	100%
SE331–Västerbottens län	Proposed by EC and included in approved TJTP	100%
SE332–Norrbottens län	Proposed by EC and included in approved TJTP	100%
SI034–Savinjska	Proposed by EC	100%
SI035–Zasavska	Proposed by EC	100%
SK022–Trenčiansky kraj	Proposed by EC	100%
SK042–Košický kraj	Proposed by EC	100%