



Article

Decent, Inclusive, and Green? Mission Impossible?

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Abstract: This article discusses the interconnection between the green transition and the digital transformation, known as the twin transition. The article analyses the specific role of digitalisation and its impact on a regional entrepreneurial ICT ecosystem in Sofia, Bulgaria, where the digital transformation has led to decent work in the ICT sector but is completely disconnected from the green transition. The article argues that these processes need a policy lever to develop in parallel with one another and connect, as they are rather disconnected.

Keywords: green transition; digital transformation; entrepreneurial ecosystem; Bulgaria; European Union

1. Introduction

The European Commission, under the leadership of Ursula von den Leyen, formulated two major priorities in 2019: the European Green Deal and the digital transformation, known together as the twin transition (European Commission 2022). Moreover, EU-level discussions on the links between digitalisation and the environment have been gaining momentum in recent years. The EU recognizes that the green and digital transitions are interconnected and mutually reinforcing. Digital technologies can play a crucial role in enabling the green transition by providing tools for monitoring, optimizing, and managing energy consumption, supporting smart grids, facilitating the integration of renewable energy sources, and enabling more sustainable production and consumption patterns. Digital solutions can enhance the efficiency and effectiveness of environmental policies and enable the development of innovative green technologies. The European Commission has been systematically looking at the links between digitalisation and the environment, especially in the context of the European Green Deal, but also in that of the Digital Strategy and its New Industrial Strategy for Europe (2020) (Council of the European Union 2020). The relationship between the digital and the green has been further developed by new actors at an EU level, for example the European Green Digital Coalition (EGDC), an initiative of companies supported by the European Commission and the European Parliament and based on a request from the EU Council. The EGDC aims to harness the emission-reducing potential of digital solutions across all sectors, and in 2020 adopted a Declaration to support the Green and Digital Transformation of the EU (European Green Digital Coalition 2022). This declaration builds on the EU Council conclusions of December 2020 on “Digitalisation for the benefit of the environment” and recognises the ICT sector as a key player in the fight against climate change. In this context and in line with the 2015 Sustainable Development Goals (SDGs), adopted by the EU with the goal to eradicate poverty, establish socioeconomic inclusion, and protect the environment, it is also relevant to explore the impacts in terms of sustainability and green jobs. But, are these two major processes interconnected and do they lead to inclusive societies and decent work (Ghai 2003)? The main objective of this article is to reflect on the problematic relationship between digitalisation and the greening of the economy based on recent fieldwork from the European comparative project BEYOND4.0. More precisely, we analyse the specific role of digitalisation and its impact on the creation and consolidation of a regional entrepreneurial ICT ecosystem, illustrated by the case of



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Sofia where the digital transformation has led to decent work in the ICT sector, but remains completely disconnected from the green transition.

Bulgaria experienced extensive ecological damage by forced industrialisation during the communist period. Its path-dependency of heavy industry and a high level of energy consumption have also posed major environmental challenges throughout the post-communist transition since 1989. Many of the current obstacles in terms of the green transition are not new, but they have certainly been poorly addressed by the country over the last three decades. Indeed, it could be claimed that the country has never been actively involved in addressing the green transition. This is also true for the capital, Sofia, where rapid economic changes related to the growth of the Information Communication Technologies (henceforth ICT) and outsourcing industries in recent decades have not been accompanied by engagement in green transition-related action. The ICT sector had already been developing since the 1960s in socialist Bulgaria (Focacci and Kirov 2021), while the outsourcing industry was hardly known in Bulgaria in the middle of the 2000s (Kirov and Mircheva 2009). At present, more than 120,000 employees work in ICT and Business Process or Information Technology Outsourcing in Sofia, and almost 10% of Bulgaria's GDP is generated by those sectors (IME 2020).

The digital transformation was supposed to destroy many kinds of jobs, according to the dominant discourse launched with the seminal work of Frey and Osborne (2017). As we demonstrate, however, through the case of Sofia, the digital transformation has also created enormous opportunities for employment creation and inclusive work. The question is whether this trend coincides with the green transition. Based on our research, we show that these processes are rather disconnected and need a policy lever to develop in parallel with one another.

2. Digitalisation of Work

2.1. Regional Embeddedness

In order to explore digitalisation-driven change and its impacts in term of decent work and the just transition, we critically analyse the recent contributions investigating the impact of the digital transformation on work and employment.

The digital transformation or digitalisation is seen either as a “revolutionary process” transforming societies or as “evolutionary”, a process of gradual change. Although this debate is still open, both views bring certain ideas about how change should be analysed and what should be done to adapt societies, companies, and individuals to it. Both very pessimistic and optimistic scenarios predict the end of working as we know it: the former through the use of automation, robots, and algorithms, thereby making workers superfluous (Frey and Osborne 2017); the latter through a mix of technology and peer-to-peer cooperation and collaboration, making traditional forms of organizing economies superfluous (Benkler 2006; Rifkin 2014). Digitalisation is nothing new; what is new is the pace and scope of technological change and its transformative potential (Meil and Kirov 2017). This process of digital transformation involves two main manifestations or organisational models, Industrie 4.0 (Industry 4.0) and platformisation. Their emergence and their initial disruptive effects are fundamental to understanding the impact of the digital transformation. In the continuum of pessimistic to optimistic scenarios about job destruction/job creation/job change/job replacement (Degryse 2016), we claim a more nuanced view on the possibility of job destruction, focusing on job change (Warhurst et al. 2019; Kornelakis et al. 2022).

In a context where the bulk of research on the digital transformation has been based on econometric analysis (Frey and Osborne 2017; Nedelkoska and Quintini 2018), there is still a visible gap in the empirical research on the impact of the digital transformation in particular locations, despite the increasing number of publications broadly on the future of work. A particularly suitable lens for investigating those impacts on work and employment in situ is to focus on regions and regionally embedded entrepreneurial ecosystems. The notion of an entrepreneurial ecosystem, defined as “a set of interdependent actors and

factors coordinated in such a way that they enable productive entrepreneurship within a particular territory” (Stam and Spigel 2016: 1), is used here to interpret and explain how the digital transformation has taken shape in Sofia and what its effects have been. The framework comprises of ten elements of ecosystems (Figure 1). This analysis will then be linked to the issues of decent work and to inclusiveness.

Entrepreneurial ecosystem elements

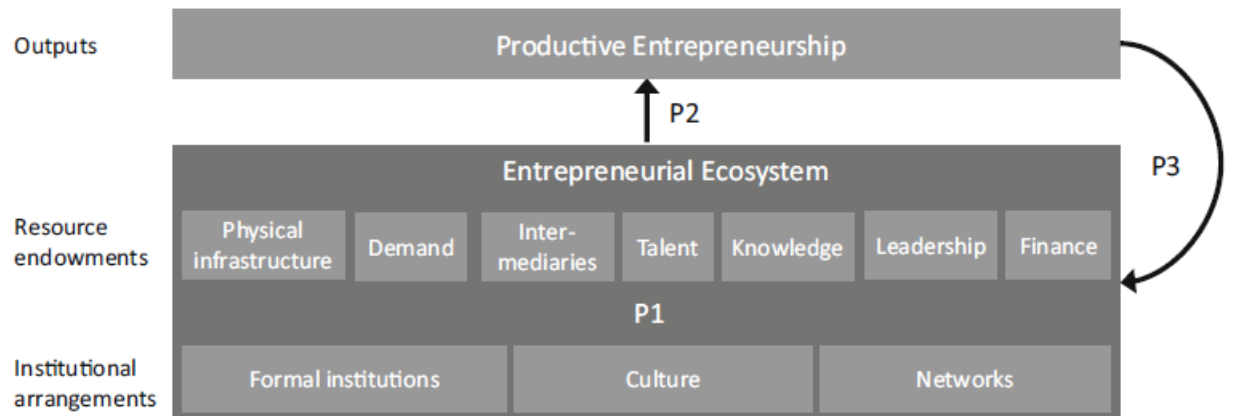


Figure 1. Elements and outputs of the entrepreneurial ecosystem. Source: Based on (Stam 2015).

2.2. Digital and Green: The Broken Link

In line with political expectations that the digital and the green should go together, it could be expected that the 2015 Sustainable Development Goals (SDGs) should presumably allow for the simultaneous pursuit of sustainability and decent work. However, we argue that this relationship is neither automatic nor self-evident. It has been well demonstrated (Spaiser et al. 2017: 467) that “over the past 30 years, there has been an inherent conflict between socio-economic development and ecological sustainability” (Redclift 2002, 2010; Jorgenson 2010; Rich 2013). The results of a recent study by Spaiser et al. (2017: 468) have brought about quantified evidence that there could be inconsistencies between the different SDGs and that economic growth “fulfils socio-economic goals while simultaneously hindering environmental goals”. But, while those examples of inconsistencies have been identified mainly in developing countries, there could also be visible illustrations on the periphery of the EU, as shown further in our analysis on Sofia. As underlined in earlier research (Martinez-Alier 2003), there are varieties of environmentalism, e.g., eco-efficient environmentalism, which co-exists with a growing ‘environmentalism of the poor’ and ‘cult to the wilderness’. In Central and Eastern Europe, a so-called ‘vocal’ environmentalism accompanied the fall of communism, but it has subsequently lost its prominence and vigour (Botcheva 1996). This type of environmentalism has never been prominent at the level of the workplace (Kirov et al. 2014). By contrast, the greening of the economy has long been associated with particular sectors in Bulgaria, e.g., recycling, and the increase in manual jobs with problematic qualities of work, as previously underlined by Kirov and van den Berge (2012).

3. Methodology

The analysis builds on a regional case study of the Sofia ICT ecosystem, drawing on 25 in-depth interviews with representatives of stakeholders (the municipality, business associations, educational providers, financial institutions, and so on), as well as interviews from 5 company case studies in the ICT/BPO ecosystem (5–6 interviews with managers and employees) (see Table 1) and a review of secondary sources including official, corporate, and sector publications. The case studied companies were selected to illustrate the two main types—subsidiaries of foreign multinationals (2) and local SMEs (3). The research is part of a larger EU project, H2020 (Beyond 4.0), which focused on, among other aspects,

the economic impact of digital transformation on European regions that are located in Bulgaria, Finland, Germany, the Netherlands, Spain, and the UK. The interviews were carried out in 2020 and 2021 using a common guide and centred around the development of the ecosystem and its outcomes. All interviews have been transcribed and analysed thematically.

Table 1. List of Interviews used for the analysis.

| Interview | Organisation | Function | Date |
|-----------|--------------------------------------|---------------------|---------------|
| 1 | Technical University | Vice-Rector | December 2020 |
| 2 | Private IT Academy | Trainer | February 2021 |
| 3 | Private Academy of IT skills | Founder | November 2020 |
| 4. | Planning Service of the Municipality | Expert | January 2021 |
| 5. | Business organisation of start-ups | President | January 2021 |
| 6. | University | Professor | December 2020 |
| 7 | Local ICT SME | CEO | March 2021 |
| 8. | Sofia Municipality | High-Level Official | March 2021 |

4. ICT in Sofia

The development of the ICT ecosystem in Bulgaria started in the 1960s, when the country was still a planned economy of the Soviet-type, belonging to the Council for Mutual Economic Assistance (CMEA)—the economic alliance of the former socialist countries. The development of Bulgarian electronics was part of the general industrialisation process that started in the country in the early 1950s following the Soviet model. In the 1970s and 1980s, Bulgaria was already producing storage devices, microprocessors, and all the necessary equipment for computers. Just before the fall of the communist regime in 1989, the electronics and telecommunications sectors accounted for 25% of industrial production in Bulgaria, employing about 130,000 people, including 8000 highly qualified engineers (Boyanov 2014). After the political changes of 1989, the ICT industry in Bulgaria underwent a profound change. At the beginning of the 1990s, all the large state-owned enterprises in the sector were dismantled in the process of de-monopolisation, with R&D centres closing and most companies losing their market share. But, while hardware production had all but disappeared, in the 1990s an emerging private sector was already developing around individuals and teams of managers and programmers from the formerly state-owned companies who started private businesses, mainly in software production.

By the late 1990s and the beginning of the new decade, many of these software companies had become well integrated in the global value chains (GVCs), initially as sub-contractors combining good technical skills with low labour costs. Gradually, several of those companies were able to move upwards in their respective value chains to more complex tasks and high-value-added projects. The country could not become a technology champion but it successfully developed a niche production of software as early as 2000, becoming the 25th fastest growing ICT market in the world between 2003 and 2007 (ARC Fund 2019: 102). This process was boosted after Bulgaria joined the European Union in 2007. EU membership granted access to different European funding mechanisms. The ICT sector developed without external support until the late 2000s, but the existence of EU funds has been crucial for its further development. Following this robust development, the country's IT sector, concentrated in Sofia, was proclaimed the best performing industry in Bulgaria in 2018. A decade's worth of 600% increased income since the European Union accession in 2007 made it the country's fastest growing sector.

The past 10 years have seen the local ICT sector experience a transition from outsourcing, based on low-cost labour and low added value, to R&D-intensive and high-value-added products and services. Software product development, in which ICT multinationals have been establishing R&D centres since the early 2000s, has progressed, mainly through buying out their longstanding Bulgarian sub-contractors (e.g., VMWare Bulgaria, Software AG, SAP, Devexperts, Progress, Bosch Software Innovation Sofia, IDT Bulgaria, and Leanplum Bulgaria). In parallel, several authentic Bulgarian companies claim to rank among innovative global leaders, albeit within ‘narrower’ specialised market niches—such as software producer Chaos Software, the global leader in enterprise knowledge graph technology and semantic database engines Ontotext; the software producer Interconsult Bulgaria, the producer of mobile and business apps Mobile Systems; Software Group Bulgaria, specialising in digitalisation and integration solutions for institutions that provide financial services; and Sirma Medical Systems, delivering software applications and smart data management for healthcare. Bulgarian companies in this sector have now begun providing products and services to end-clients instead of being involved only in sub-contractor networks. Together with several dozen large companies, there are fast-growing small- and medium-sized enterprises (SMEs) in numerous segments from Fintech, Cleantech, and gaming to EdTech and entertainment (see more in [Focacci and Kirov 2021](#)).

5. The Development of the ICT Ecosystem in Sofia and Its Impacts on Employment

The main characteristics of the ecosystem are presented here using [Stam and Van de Ven’s \(2019\)](#) framework applied to entrepreneurial ecosystems (EES). There are nine elements, as summarised in the section below. The analysis in paragraphs below focuses on those which are particularly relevant to understanding the ecosystem under consideration. The description of the state of the elements refers to the situation immediately before the start of the COVID-19 pandemic, but some specific changes that have occurred since then and were mentioned by respondents are also indicated.

5.1. Formal Institutions

The role of formal institutions has been continuously questioned in the post-communist world. Increasing evidence of the “captured state” ([Dimitrova and Buzogány 2014](#)) and widespread corruption in Bulgaria and south-eastern Europe exists in general. While measuring such phenomena is extremely challenging ([CPI 2020](#)), most interviewees shared the view that this is a major barrier for the development of the entrepreneurial ICT ecosystem. The overall institutional environment is characterised not only by the ‘capture’ of the state by different oligarchic circles but also by perceptions about widespread corruption practices, an unreformed judicial system (in its 2014 country-specific recommendations, the Council (28) urged Bulgaria to improve the quality and independence of the judicial system and to fight corruption more effectively, as Bulgaria has made only limited progress in these areas. Council Recommendation on Bulgaria’s 2014 national reform programme and delivering a Council opinion on Bulgaria’s 2014 convergence programme), a persistently informal economy ([EurWORK 2020](#)), and so on. However, against the background of this situation, corruption in the ICT sector is lower than in other sectors (Interview 4). From this perspective, most of the respondents agreed that the development of the ecosystem is taking place despite institutions, not because of them or their support.

5.2. Entrepreneurship Culture

For historical reasons, entrepreneurial culture has been problematic in post-socialist societies. Private economic initiative was almost non-existent in Bulgaria from the end of the 1940s to 1989. Since the initial entrepreneurial push during the transition ([Dobrinisky 2000](#)), the Bulgarian population has not seemed so attracted to the idea of starting a business ([AGER 2020](#)). This cultural view reflects the conclusions of a recent Global Entrepreneurship Monitoring report, namely that entrepreneurship in Bulgaria is lower than the EU average. For example, “the number of potential entrepreneurs is extremely low at 7.1% (5.3% in 2015)

not only compared with the three benchmark groups but also globally. Arguably, both the relatively low perceived opportunities and weak individual capabilities (these include both skills and self-confidence) explain the result in the case of Bulgaria" (Andonova and Krusteff 2016–2017, p. 12). In this overall context, however, the ICT ecosystem has become very attractive for new entrepreneurs. Such successful developments in the sector have made it more attractive to "budding" entrepreneurs (ARC Fund 2019: 61). About 30% of the companies operating in 2018 were founded after 2014. Almost three-fourths of these new businesses operate in the ICT sector. According to some interviewees, the entrepreneurial culture in this ecosystem has been improving and there is a growing community of entrepreneurs with a high tolerance for risk. Thus, the ICT sector differs from other economic sectors.

5.3. Physical Infrastructure

The next ecosystem element examined here is infrastructure, including educational institutions, internet, and transport.

Sofia benefits from a concentration of educational institutions providing skills for the ecosystem. At present, there are 23 universities with more than 100,000 students (including 42,000 in STEM) and 63 research centres.¹ Furthermore, several private educational initiatives have been launched recently. Specific examples of such "academies" are *Software University*, called *SoftUni*, and *Telerik Academy*—both launched by founders of successful IT companies (Kozbunarova 2016) in order to fill the gap in practical coding skills that universities cannot fully provide.

The digital infrastructure is the second element. The percentage of households with internet access increased from 67.8% in 2015 to 85.9% in 2020 in the Yugozapaden region (NUTS 2), where Sofia is located. Here, data are available only at the level of NUTS2, not NUTS 3. According to the interviewees, the open competition and multitude of cable operators made this good accessibility and high-speed internet already possible in the 1990s, initially in Sofia and other large cities.

Finally, the ICT sector in Bulgaria operates mainly for foreign markets, and the country's transport accessibility is crucial in terms of bringing clients to the development centres and software producers. In this case, the most relevant indicator is air connectivity. Interviewees suggested that Sofia is preferred to other large Bulgarian cities because of its direct connections to major EU cities, as Sofia is located 1 to 3 h by plane from all major European capitals.

5.4. Finance

While the financial infrastructure in Sofia is improving, it is still insufficiently developed to sustain the ICT ecosystem. According to interviewees, this development within the country is supported mainly by the EU-funded JEREMIE initiative (the European Investment Fund's Joint European Resources for Micro to Medium Enterprises) and is managed in part through two funds: the early-stage accelerator Eleven and seed fund LAUNCHub, which both received 21 million euros between 2009 and 2015. In that same period, 349 million euros were allocated for investment in Bulgaria under the JEREMIE programme.

This thing developed the whole so-called ecosystem a lot, because it provided access to money. . . . At that time, money was being given to a good team with a good idea. . . . [it was] a romantic period. . . . everyone learned that business means money. (Interview 5)

However, the vision about financial access and the availability of resources diverges among interviewees. Some respondents consider it easier to attract capital from abroad (e.g., the USA), while others believe that, at present in Sofia, there are already enough financial resources for all types of companies in the ecosystem:

At the moment, there is money for practically everyone—there is money for beginners, there is money for the next stages. . . . Three or four years ago, there

was no start-up money at all. That is, for half a million euros and up, it was OK to find money, but if you needed only 100,000 euros, there was no one to give it to you. (Interview 5)

Respondents acknowledged that, in addition to venture capital and other funds, the existence of EU funds has also been of great importance for the ecosystem:

It is certainly extremely important, because European funds are the only fresh funds that companies can use, the big problem is the extremely high level of corruption in the absorption. Indeed, I can say this with the data we have shown, and from personal experience, many companies refuse to work because of corruption. (Interview 7)

5.5. Talent

The ICT sector in Bulgaria, concentrated mainly in Sofia, has been the most well paid in the country for years, with average wages of about BGN 5000² or almost eight times more than the [Minimum Wage—Bulgaria \(2023\)](#). The existing talent is one of the ecosystem's strongest elements. The supply of labour is concentrated in the city because of the universities located there. In addition, there has been a process of internal migration of IT specialists from other Bulgarian regions to Sofia. In general, the city's labour market has been growing in recent years. The average annual number of employees under a labour contract was 707,299 in 2015 and 768,471 in 2019. Unemployment levels in the city have also remained comparatively low over the last two decades.

At present, 14% of Sofia's exports are produced by the IT sector, which employs about 60,000 people (as of 2018) who are paid 3–4 times more than average wages in the city. Since 2009, the IT service and BPO sectors have had the highest levels of job creation. The number of employed people in these sectors increased by nearly 80,000 between 2008 and 2018, accounting for almost 30% of total employment in the city ([IME 2020](#), p. 25).

This talent development is certainly path-dependent and related to the ecosystem's long history. The academic educational institutions and private skills providers in general are evaluated highly, even if the former is more 'theoretically oriented' than the latter (Interview 2). The ecosystem has also developed because of the concentration of educational institutions and students who come from the whole country but then stay in the capital.

Here [Sofia] the students come, and then they stay. They find colleagues who are coming from different cities, have some ideas, and most of them stay here, fewer return to other cities. (Interview 6)

Many of the respondents confirmed the recent labour shortages within the ecosystem, even if their estimations about the scope of those shortages did not always match. One of their ideas to address them is to attract foreign workers

5.6. New Knowledge

The Bulgarian capital Sofia has been the region with the highest innovation activity in the country. However, Bulgaria itself has been systematically ranked low in terms of innovativeness among EU member states. The available data about R&D investments in Sofia (NUTS 3) provide a mixed picture. Such investments have been increasing moderately since 2016. The numbers of personnel involved in R&D have also experienced periods of decreases and increases. There are no available data about investment in intangibles. Although these general trends in Sofia can be described, there are no data about R&D investments or personnel in the EES, either.

Interviewees were rather critical about the relatively low level of R&D investment in the country, as well as the fact that large private companies in general are not very keen to invest in R&D:

No. The investments in R&D are less than 1% of the GDP. . . There are some investments, but they are not enough. . . We are at the bottom of the EU. (Interview 1)

Most of the more traditional businesses do not recognise the need for investment in development. And this. . . in the conclusions of our reports, this is a problem for the city and for the state in general. Because it acts as a brake on the development of high value-added sectors. That is, in order to modernise traditionally low value-added sectors, we need to recognise this need for innovation. (Interview 4)

5.7. Intermediaries

Since the end of state socialism in 1989, actors in the ICT ecosystem have experienced certain difficulties with engaging in collective action and using intermediaries. That is why the main intermediaries evoked in the interviews are relatively recent—e.g., Sofia Tech Park or other institutions—and are often related to EU membership and funding opportunities.

Sofia Tech Park was launched with an overall investment of 34 million euros leading up to 2018 (IME 2020). This first science-and-technology park in Bulgaria was created with the aim to establish itself as a platform for exchanging knowledge and ideas among academia, businesses, government, and society. At present, it includes multiple labs, offices, business incubators, conference halls, and other facilities, and it hosted more than 40 companies by the end of 2020.

Another important player is the ICT cluster, acting as an umbrella organisation of the Bulgarian ICT industry, including ten members from the ICT associations, and comprising more than 280 SMEs from various industry segments, as well as six Bulgarian technical universities.

In 2020, the different business associations in the sector, such as BAIT, BASSCOM, and so on, combined themselves on a higher level into an organisation called BRAIT. This organisation has had the ambition to represent IT businesses at a state level by participating in the National Council for Tripartite Cooperation (NCTC) and pushing ideas that will benefit IT businesses in general, but this has not happened yet. In general those organisations have not shown yet any significant commitments in the field of sustainable development,

Business services are represented by subsidiaries of large foreign consulting companies, but also small local firms (law, accounting services, and so on).

Finally, regional authorities have also realised the importance of supporting the ICT EES. More precisely, the Sofia Investment Agency (known as *SofiaInvest*), a part of the Sofia Municipality, has acted in order to promote the city and attract investors in ICT. The *Innovative Sofia* team (a department within the Municipality) was involved in the formulation of the Digital Transformation Strategy for Sofia. The Strategy was developed as part of the European Commission's Digital Cities Challenge initiative. Sofia joined a network of 41 European cities that unite their efforts in facing the 21st-century challenges of a digital urban development (*Digital Transformation Strategy for Sofia 2018–2019*). Another major document, *Vision Sofia 2050 (2017)*, discusses specific steps, measures, and goals for the city's future sustainable development.

5.8. Leadership

Leadership is expressed by the leading companies' vision, the technological entrepreneurs present, and the ecosystem's strength (EES ties) compared with other competing EESs. The leadership of the Sofia ICT EES is shaped by a mixture of old and new entrepreneurs, some with experience in the previous political system or early post-communist transformation (path dependency) and others who are educated and/or have working experience in major global ICT centres such as Silicon Valley in the USA. What they have in common is their focus on upgrading value chains and shifting to more complex projects.

The majority of the respondents shared the view that the entrepreneurial ecosystem has well-identified leadership. For example, Interview 4 evaluated this leadership as satisfactory because it includes people who have gained the trust of the EES, showed the direction to follow, and generated a positive image for the ecosystem, thus attracting other people to it.

5.9. Networks

The entrepreneurial ecosystem is undergoing a transformation in terms of the cooperation among its various actors. A few years ago, many companies were in competition; now they collaborate more and more and involve other actors, as demonstrated in the quote below:

...the fierce, I would even call it harmful, competition that existed until ten years ago in the ICT sector—everyone was hiding, not turning around, very often looking for external contractors, not Bulgarian, out of fear that something would be stolen from you here in Bulgaria and for various other reasons—it has somehow been overcome, and the companies have started working a lot with each other. . . (Interview 7)

One of the positive processes contributing to the development of the EES is the specialisation and increasing collaboration taking place between companies.

In my opinion, specialisation should not be neglected, either. Gone are the days when ICT companies said, 'We can handle anything.' And they tried to handle everything. They, especially the larger companies, have realised that this is not a winning strategy and, very often, when there is a project that requires specific competencies, they prefer to look for another company in partnership to do so, but not to get out of it. Something that is their core competence because they see that it is not ultimately effective. Resources are wasted, etc. In other words, the processes and reasons are diverse but, in the end, this has led to much more intensified cooperation in the ICT sector. (Interview 7)

In addition, the role of the association of entrepreneurs in the EES has been increasingly moving towards a stronger collective voice, one that defends their interests. (Interview 8)

5.10. Productive Entrepreneurship, Decent Work, and Inclusiveness

This entrepreneurial ecosystem contributes to both economic and inclusive growth. It is seen by respondents as one of the engines and drivers of the future of Bulgaria's and Sofia's economies. In addition, the ecosystem is quite inclusive, as it has allowed many young and highly educated Bulgarians to stay, work, earn decent incomes, and live in their own country, instead of heading for richer EU member states. What is also particular for Bulgaria is that women are very well integrated in the ecosystem (the Eurostat data for the "Distribution of persons employed as ICT specialists by sex, education attainment level and age, 2019" suggests that 21.8% of Bulgarians working in the sector are women), which represents the highest share among EU member states (Eurostat 2022). In addition, this ecosystem counts on a highly educated and young labour force. At the same time, inclusiveness of older workers or low qualified individuals is still limited.

In conclusion, the strengths of the Sofia ICT ecosystem include its talent, relatively good infrastructure, and access to EU funds and instruments. Its weaknesses include the captured state and high level of corruption in the country. The opportunities are related to access to more complex projects with added value and the development of Bulgarian multinationals within the ecosystem. In addition, Bulgarian ICT specialists are known for their ability to understand technical challenges and customers' needs. The threats are mainly price competition from lower-wage destinations, a possible shortage of skilled labour, and emigration/brain drain.

6. Is Work in the Sofia ICT Ecosystem Decent and Green?

The first question in this section is to demonstrate if the work in the ecosystem is decent, and therefore good. The second is to see to what extent it is green.

Adopting the indicators for decent work (ILO 2023)—e.g., employment opportunities; adequate earnings and productive work; decent working time; balancing work, family, and personal life; stability and security of work; equal opportunity and treatment in

employment; safe work environment—we can see that the ICT ecosystem employees benefit from extremely good conditions, as explained below. Employees are paid wages that are much higher than the average wages in the country (IME 2020). Their jobs theoretically are not safe, but due to the deficit of qualified programmers and engineers, they can find a new job immediately, so companies are basically attentive to introducing policies to retain them. Normally, the sector has good traditions in Bulgaria (Yordanova and Kirov 2017) in terms of work–life balance policies, which is reflected in the fact that the country has the largest share of women in the ICT sector among EU member states³. Jobs in the ecosystem are offered based on equal opportunities.

But, if the jobs in the examined ecosystem are decent and inclusive, could they also be considered sustainable and, in this way, support the green transition? Despite some expectations of green jobs, the analysis of practices among companies in the ecosystem indicates that those elements are negligible; even when they are observable, this is an unintended consequence from other policies and circumstances instead of a result of some specific strategy.

First of all, during the pandemic, most employees quickly started working from their homes, and this has certainly had a net positive effect on green emissions. By enabling employees to work from home or remote locations, companies can lower transportation-related emissions, decrease office space requirements, and contribute to a more sustainable work environment. Yet, it was not a result of any particular policy of the involved companies, as it was also demonstrated in other studies (Anguelov and Angelova 2021). If this practice were maintained, the negative impacts on the environment could be reduced because of reduced commuting. However, the initiative was completely left up to the employees, without any measures initiated by companies in this respect. Flexible schemes were put in place to respond to employee expectations, but companies have missed an opportunity to promote sustainability in the framework of decent work, for example, by supporting ecological commuting solutions, car-sharing, and so on, in order to address the congestion and air pollution issues in the capital city of Sofia.

The second aspect is related to the specific companies' environmental objectives. The five company case studies in the research had no specific explicit policies or reporting related to sustainability and greening. As can be seen through the case studies carried out, only some large companies in this ecosystem, mostly subsidiaries of multinationals, have explicitly set such objectives, basically to comply with their headquarters' requirements. In such cases, they adopt specific goals and afterwards engage in the reporting of their actions. As one example, the local subsidiary of SAP in Bulgaria positions itself in line with the global vision of the company, aspiring to a "world with zero emissions, zero waste, and zero inequality. Our corporate sustainability approach is to create positive economic, social, and environmental impact within planetary boundaries—with a special focus on holistic steering and Environmental, social, and governance (ESG) reporting, climate action, circular economy, and social responsibility". Yet, there are no specific policies beyond SAP Labs Bulgaria's 2012 acquisition of ISO 14001 certification, the international standard for environmental management systems. While large companies are in a way pushed by their headquarters, local SMEs rarely have any ambitions in the sustainability domain, even in a declarative mode, as part of their Corporate Social Responsibility (CSR).

Green procurement practices aim to reduce the environmental impact of the entire supply chain and encourage sustainability throughout the ICT industry. However, green procurement practices of the ICT companies in Bulgaria have been almost nonexistent and they have not been in use in the five case studies examined in the empirical research. In other words, the consideration of environmental criteria when procuring equipment, materials, and services and the prioritisation of suppliers that follow sustainable practices, use eco-friendly materials, or have appropriate environmental certifications has not been introduced yet.

Those larger companies also stimulate their employees to engage in different volunteering activities, some of them environmentally related. Examples of this include HPE,

TELUS International, and other companies engaged in joint projects with local environmental NGOs. As stated on the website of TELUS International, “‘Giving where we live’ is embedded in our corporate culture. This translates into organizing a variety of volunteer events and causes that we have the opportunity to dedicate ourselves to and support as employees of the company”.⁴ The effect of such initiatives is mainly promotional. Simultaneously, local companies have generally never been too careful in relation to such environmental objectives.

Specific companies, as part of the examined ecosystem, have also engaged in the development of green projects that can help their client companies to better address the climate challenges and, in this way, lead to compliance with their clients’ expectations. An example of such an activity could be illustrated by the case of the Green Monitor, co-produced by Interconsult Bulgaria: a technology that enables companies to reduce energy consumption, production waste, and consumption of oil while cutting fluids and the number of maintenance hours, which also allows for increased profitability (vander Eecken 2021). However, these examples are relatively rare and are pushed by the companies’ clients rather than by an internal vision.

Recent and increasing awareness about the so-called Environmental, Social, and corporate Governance (ESG) (EY LAW 2022) should certainly make Bulgarian companies more attuned to environmental issues. While the concept of non-financial reporting is not completely foreign to Bulgarian businesses, since 2016 listed companies must comply with an obligation to publish a statement of corporate governance, which is essentially a declaration of conformity by the issuer with a chosen (publicly available) Code of Corporate Governance, or, otherwise, an explanation with reasons for the failure to apply one. As of 2017, in line with the Non-Financial Reporting Directive (NFRD), all public-interest entities (PIEs) which are also large undertakings and whose number of employees exceeds 500 are required to include in their activity reports a non-financial statement, including the information necessary to understand the development, results, and condition of the enterprise, as well as the impact of its activities—at a minimum relating to environmental, social, and employee issues, respect for human rights, and the fight against corruption and bribery (Hahnkamper-Vandenbulcke 2021).

7. Conclusions

Despite the political discourse around articulating the deployment of processes for both the digital transformation and green jobs in the EU, the examined case clearly demonstrates that they remain disconnected.

The companies in the examined ICT ecosystem provide the necessary conditions for decent work and additionally contribute to ensuring inclusiveness for their employees. The findings of the analysis suggest an increasingly complex impact of digitalisation in the context of the COVID-19 pandemic. The concrete manifestations of these impacts include job changes and the move towards ‘higher value added’ service in both ICT and Business Process Outsourcing (BPO).

However, the aspects of greening are completely ignored, except in the cases of corporate narratives among a few large subsidiaries of multinationals. Local companies do not have a significant interest in engaging with sustainability issues and green jobs. These findings are in line with previous research suggesting that different SDGs could be inconsistent.

For this reason, a public policy response is needed in order to reconnect the two elements of the twin transition. Such public policy should provide levers to make companies go beyond the fragmented practices and greenwashing. It should also be supported by adequate EU and national funds that will allow for progress on both European Commission priorities related to the dual transition.

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Conflicts of Interest: The authors declare no conflict of interest.

Notes

- ¹ The overall number of students in Bulgaria has decreased in recent years, but students in STEM have increased (See: <https://www.nsi.bg/en/content/4897/students-educational-qualification-degree-and-narrow-field-education> (accessed on 1 July 2023)).
- ² <https://darik.news/en/the-average-salary-of-it-specialists-in-bulgaria-is-bgn-5000-the-growth-of-the-sector-is-over-20.html> (accessed on 1 July 2023).
- ³ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_in_employment#ICT_specialists_by_sex (accessed on 1 July 2023).
- ⁴ <https://dev.bg/company/telus-international-europe/> (accessed on 1 July 2023).

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