Smarter Stoves
Partnership

Author: Pavle Golicin

Western Balkan labour market and mass change-out of stoves

August 2021

This Report was prepared within the project *Smarter Stoves Partnership*, which aims to create a regional knowledge platform to replace inefficient individual heating devices in households across the Western Balkans. The project is being implemented by the RES Foundation, funded by the Austrian Ministry of Climate and European Climate Foundation (ECF). Attitudes and opinions expressed in this report are solely the views of the author and do not necessarily represent the views of RES Foundation or the project donors.

Table of contents

Executive Summary

This analysis is part of the project that seeks to contribute to climate change mitigation by increasing efficiency of residential heating in the Western Balkans (Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia and Serbia), where at least 3 million households operate wood or coal stoves and furnaces as the main source of heating and cooking. Replacing the stoves with new, alternative heating and cooking technologies is a necessity and essential for the achievement of the goals of the Agenda 2030 and of the European Green Deal. Change-out schemes may provide for job creation and are well suited for financing in the COVID-19 and post COVID-19 environments, important as the pandemic plunged the Western Balkan countries, like the rest of the world, into deep recession.

This report used data from national Labour Force Surveys in examining key labour market indicators for the Western Balkan countries. The COVID-19 crisis has led to significant job losses, but still the data shows a much brighter picture than it actually is. This is due to the fact that large numbers of people dropped out of the labour force discouraged by the poor economic prospects and became inactive, or emigrated, as well as because labour market indicators count people, and not hours of work, which would certainly show a very different and not that bright picture.

Loss of jobs in the Western Balkans was the greatest in construction, manufacturing, hospitality industry, trade, and transport. Although data is not that narrow and industry specific, it is clear that a massive change-out scheme of stoves and devices can be an impetus for reversing these trends.

Technology providers and producers of solid fuel household heating devices are expecting that they will need more workers in the next 18 to 24 months. Depending on the quantities, i.e. the percentage increase, it is estimated that between 5 to 10 percent more employees will be necessary in production. For instance, in the case of one of the biggest producers from Serbia, which currently produces 85,000 stoves and heating devices based on solid fuel, this is approximately between 40 and 80 additional workers in absolute terms. In addition to that, the number of required workers will depend on a number of natural annual outflows of labour – which is currently around 5 to 10 percent – as there will be a certain number of workers who will retire in the coming period, as well as workers who will leave the company and go abroad due to better working conditions.

The producers will be mostly in need of graduate mechanical engineers for design, specialized as thermo-technicians or thermal power engineers, and mechanical technicians for the work in production. They prefer young people, offering them training and employment straight from education. This, as well as the fact that those occupations are mostly operated by men, should be taken into account in order to give more opportunities to older workers and women.

Firms that are producing stoves and heating devices are in general satisfied with the programmes and training that are being offered, both from theoretical and practical side. However, they also expressed some concerns over the structural challenges and more overarching approach by different stakeholders involved. Besides support in funds or eventual state subsidies, link with the academia and cooperation with the Technical Faculties, secondary Technical Schools or other relevant institutes for standardization would be beneficial in that regard.

Excluding all other externalities, it is however difficult to make a proper assessment about net job creation out of replacement of obsolete stoves. A massive change-out, if 3 million households change the stoves and heating devices, can create up to 45,000 direct and 15,000 indirect additional jobs. Based on the limited information provided by technology providers, it can be expected that the effect of those externalities on employment will be certainly positive, albeit the extent of their total impact still remains to be seen.

In untapping the full potential of massive change-out schemes, it is important to recognize the role that technology providers have when providing advice and guidance on technology choices. Enhancing their skills and knowledge and thereby removing a possible inclination towards the well-known solutions would increase the extent to which actual substitution opportunities are recognised, considered and selected.

Also, in developing efficient support schemes, the cost competitiveness to the consumers' needs to be improved. Consumer price is a key factor to stimulate consumer demand and should be supported along the process.

In order to seize the opportunity and make a systemic, effective and rapid change-out scheme, all interested parties should be involved in the process.

1. Introduction

Labour market analysis is a part of the "Smarter Stoves Partnership" project, which seeks to contribute to climate change mitigation by increasing efficiency of residential heating in the contracting parties of the Energy Community Treaty from the Western Balkans: Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia and Serbia. It is estimated that at least 3 million households in the region operate wood or coal stoves and furnaces as the main source of heating. These devices, even when new, are inefficient, consume disproportionally high amounts of fuel and emit large quantities of polluting substances. Moreover, as of 1st January 2022, the new standard for efficiency and emissions of individual space heaters is becoming effective in the European Union, in line with the provisions of the Eco-design directive governing this particular area.

Therefore, exploring a variety of alternatives to the current heating practices with particular focus on technologies, financial and implementation schemes, and the needs of the most vulnerable populations, primarily exposed to energy poverty, is a must. Replacing those obsolete devices and finding alternative heating (and cooking) technologies can have huge mitigation effects on both indoor and outdoor air pollution. The implementation of schemes for replacing the stoves and furnaces is essential for achieving the goals of the Agenda 2030 and of the European Green Deal. Such massive change-out schemes may deliver different externalities depending on the technology used, including substantive job creation, which we will try to examine in this paper.

The main aim of the study is to make assessment of labour market effects, direct and indirect net jobs gain and loss resulting from implementing technology upgrades and different strategies for the implementation of change-out schemes. Please, however, note that the research is based on a limited number of interviews with technology providers and that the sample might be boosted in the eventual follow-ups.

The structure of this study is as follows. After this introductory section, in Section 2 we present an overview of the current situation in the labour market of the above-mentioned six contracting parties to the Energy Community Treaty from the Western Balkans region. Overview of supply-side of labour markets is based on desk research, and mostly relies on data from Labour Force Surveys in the individual countries. Further in Section 2, overview of demand-side dynamics of labour markets resulting from the

replacement of inefficient household heating devices or stoves is given. This is based on a tailor-made questionnaire and interviews with technology providers. Assessment of skills profiles, required by alternative change-out technologies and strategies for their implementation, including production, installation and maintenance is discussed. In Section 3, we look at the capacity gaps, based on the previously mentioned demand- and supply-side analysis. Different options to bridge the existing gaps and for standardizing vocational training and licensing are listed. In Section 4, assessment of labour market effects, direct and indirect net jobs gain and loss resulting from implementing technology upgrades and different strategies for the implementation of change-out schemes are given. Finally, Section 5 discusses challenges that lie ahead, and brings some conclusions and recommendations.

2. Assessment of the current situation in the labour market

2.1. Supply-side

The situation in the labour market was heavily influenced by the pandemic in 2020. COVID-19 plunged the Western Balkan countries, like the rest of the world, into a deep recession. Economic activity contracted by an estimated 3.4 percent, according to the World Bank.

The primary causes were the drop in both domestic and foreign demand and disruptions in supply chains, especially early in the year when activity in a number of sectors simply shut down. Countries like Montenegro that have a services or tourism-oriented economy, and those where more stringent containment measures and lockdowns were imposed fared the worst. The economy somewhat began to reactivate in the second half of 2020, supported by a partial easing of stringent lockdowns and the revival of global demand as vaccine development advanced. However, in late 2020 restrictions were renewed in response to a resurgence of infections across most of the region. The crisis has led to significant job losses and interruptions in welfare improvements, but the labour market is slowly taking pace and rebounding from the recession due to job support schemes and other government measures, which limited the labour market fallout and helped to prevent steeper spikes in poverty. However, large numbers of people are still unemployed, and many dropped out of the labour force discouraged by the poor economic prospects. Moreover, workers with less education, women, youth, those in contact-intensive sectors, and those informally employed have suffered disproportionate livelihood and income losses.

According to the World Bank, since the beginning of the pandemic, approximately 139,000 jobs have been lost in the region and between 165,000 and 336,000 people in the region were pushed into poverty. All Western Balkan markets had introduced job retention measures through partial or full compensation for wage costs, in addition to health protection measures, tax relief, guarantee schemes, subsidized credit lines, and social assistance measures to mitigate the effects of pandemic. These measures were mostly in place until end-2020, although less intensive and more targeted as economies started recovering. Several markets also kept wage subsidies in place even in early 2021.

Nevertheless, the employment rate declined in most countries; Montenegro being heavily hit by a drop of more than 8 percentage points, as closures and travel bans caused serious damage to tourism. As before the pandemic, Albania and Serbia still have the highest employment rates in the region, while Kosovo* is at the other side of the spectrum with only about 30 percent of the working-age population that have jobs, as can be seen in the table 1 below.

It has to be noted that decline looks much smoother than it has actually been, as labour market indicators count people, and not hours of work, which would certainly show a very different and not that bright picture.

Table 1: Trend of key economic and labour market indicators

	Activity rates				**Employment rates**				**Unemployment rates**			
	‘19 Q3	‘20 Q1	‘20 Q2	‘20 Q3	‘19 Q3	‘20 Q1	‘20 Q2	‘20 Q3	‘19 Q3	’20 Q1	‘20 Q2	’20 Q3
Total (15-64)												
Montenegro	68.4	65.2	60.8	61.2	57.8	54.4	51.2	49.3	15.6	16.6	15.7	19.6
North Macedonia	66.2	66.5	65.6	65.0	54.8	55.6	54.5	54.1	17.3	16.4	16.9	16.7
Serbia	68.4	67.6	65.2	68.8	61.5	60.7	60.2	62.2	10.0	10.2	7.7	9.5
Bosnia and Herzegovina	55.5	57.6	57.6	58.7	46.4	47.8	48.2	50.2	16.4	17.0	16.3	14.5
Albania	69.8	69.6	68.1	69.8	61.5	61.4	59.6	61.3	11.8	11.9	12.5	12.1
Kosovo*	41.9	38.8	33.2	40.0	31.6	29.1	24.1	30.1	24.5	25.0	27.2	24.6
Women (15-64)												

Montenegro	60.6	59.6	54.7	53.2	51.4	49.1	46.0	42.6	15.2	17.6	15.9	19.9
North Macedonia	55.5	54.7	54.7	53.9	44.6	46.1	45.4	45.2	19.6	15.8	16.9	16.0
Serbia	61.0	61.9	58.4	61.3	54.1	55.3	53.7	55.2	11.3	10.6	8.0	9.9
Bosnia and Herzegovina	44.4	44.9	45.2	47.3	35.6	35.9	36.3	39.5	19.7	19.9	19.6	16.5
Albania	62	61.9	60.7	61.8	54.7	54.2	53.2	54.2	11.8	12.4	12.4	12.3
Kosovo*	22.2	20.3	17.6	21.5	14.1	14.1	12.1	14.4	36.4	30.6	31.4	33.1

Note: Data for Bosnia and Herzegovina are given for 2019 instead of third quarter 2019.

Source: National Statistical Offices

Also, the improvement in the unemployment rate was not due to more people having jobs but to a rise in inactivity. This was largely due to unemployed people giving up their job search temporarily because the economic prospects were so poor, which removes them from the labour force. It was also driven by people retiring or emigrating abroad as seasonal workers. According to the World Bank, by year-end there were 121,000 more people inactive than in 2019, and 138,000 fewer people in the labour force. For example, the inactivity rate in Kosovo* topped 60 percent. For the entire region, the labour force participation dropped, with women being more affected. The largest declines were in Montenegro and Kosovo*.

By looking at different sectors and how hard they were hit, it is interesting to note that almost no change in terms of employment occurred in the sector of utilities, while manufacturing significantly declined. Most of the losses were in tourism. However, new jobs could not compensate for the earlier losses. For instance, in Montenegro, employment fell to a 7-years low, with losses primarily in tourism, construction, transport, manufacturing, and trade, and it has yet to rebound. Loss of jobs in the Western Balkans was greatest in construction, manufacturing, hotels and restaurants, trade, and transport. The ICT industry weathered the crisis well and became an important employer in Serbia and North Macedonia. Except in Kosovo* and Montenegro, public sector employment grew in the region, cushioning the pandemic's impact but increasing the size of the already relatively large public sector in the Western Balkans.

Although services stood out as the most resilient sector, employment by section of activities has been differently affected across countries. Agricultural employment suffered the most, recording the year-on-year decline in the third quarter of 2020. Listed in order from the Labour Force Survey data provided by

national statistical offices - North Macedonia (-19.5%), Montenegro (-15.2%), Serbia (-10.5%) and Albania (-3.7%). Employment in industry decreased the most significantly in Montenegro (-17.1%) and North Macedonia (-5%), while remained unchanged in Albania and even increased in Serbia (4%). As expected, the least contact activity recorded the best result. The employment in services increased in all four markets but Montenegro, where the share of employment in tourism is very high.

Different reactions of the formal and informal labour market to the pandemic can be seen in the Serbian example. Government measures exclusively aimed at formally employed contributed to the preservation of formal jobs with formal employment recording a slight increase in the second quarter compared to the first quarter of 2020. Exempted from the government job retention scheme, informal employment plummeted around 8% concerning the previous quarter. A different path is observed in the following quarter. Relaxing the social distancing in the third quarter of 2020 led to a substantial increase in informal employment (18%) while formal employment remained unchanged, partially as a consequence of the condition that the subsidies receiving companies do not lay off workers for a certain period of time.

Country-wise, according to the World Bank, Albania was hit hard, first by an earthquake in November 2019 and then by COVID-19. As tourism and services shrank abruptly, GDP contracted by an estimated 3.3 percent. Reconstruction is likely to be the main driver of the recovery in 2021.

In Bosnia and Herzegovina, the economy contracted by 4.3 percent in 2020. The crisis highlights the country's need for long-delayed structural reforms to speed recovery. The economic outlook is however somewhat positive, but with downside risks, both domestic and external. The external risks are related to how slower-than-expected recovery in the EU could affect BiH accession prospects, and to tighter financial conditions in international markets; at home, general elections in 2022 are likely to generate political turmoil.

In Kosovo*, the economic activity contracted by an estimated 6.9 percent in 2020 driven by declines in diaspora related service exports, total investment, and private consumption. Policy support and a surge in remittances and goods exports cushioned the economic impact of the pandemic. Economic activity is expected to pick up in 2021, but global and domestic risks are significant, among them delays in vaccine procurement and distribution, international travel restrictions, and reinstatement of strict containment measures.

Montenegro experienced one of the deepest recessions in Europe in 2020, by 15 percent. Despite government support measures, employment fell significantly. The economy is forecast to rebound in 2021, but the magnitude of the recovery will depend on the evolution of the pandemic.

In North Macedonia, the economy is recovering from the deepest recession since independence, which affected almost all sectors of the economy. Government support partially mitigated the impact of the crisis on workers and firms, but fiscal space narrowed rapidly as public debt reached 60 percent of GDP. The near-term outlook for 2021 is positive but downside risks have intensified; the containment phase has not yet finished, and vaccine rollout is proving to be challenging.

In 2020, Serbia went through a relatively modest COVID-19-related recession of 1 percent. However, keeping the economy afloat during the pandemic had a high cost: the stimulus measures accounted for nearly 13 percent of GDP, of which fiscal revenue and spending measures cost 8 percent of GDP; the estimated 2020 fiscal deficit is therefore a record-high 8.1 percent. Full recovery is expected to start in 2021 with projected growth of 5 percent and a return to the previous growth path over the medium term.

2.2. Demand-side

This short assessment of skills profiles required by alternative change-out technologies is based on interviews with technology providers.

It is interesting to note that in the next 18 to 24 months, the technology providers expect that they will need more workers. This is of course only in case the sales growth trend continues in the forthcoming period as a precondition for this scenario. Depending on the quantities, i.e. the percentage increase in placements, it is estimated that it will be necessary between 5 to 10 percent more employees in production (5 percent next year, plus another 5 percent in a two years period). For instance, in case one of the biggest producers from Serbia, which currently produces 85,000 stoves and heating devices based on solid fuel, this is approximately between 40 and 80 additional workers in absolute terms.

Moreover, the number of required workers will depend on a number of natural outflows of labour, as there will be a certain number of workers who will retire in the coming period, as well as workers who will leave the company and go abroad due to better working conditions. The annual fluctuation of workers is

around 5 to 10 percent, but it is lately noticeable that the numbers are getting higher and that more workers tend to migrate towards capital cities and/or abroad.

In terms of workforce profiles needed (age, education, necessary skills, etc.) to produce a new generation of devices that would replace obsolete and inefficient appliances, the technology providers expressed the following opinion.

There is a shortage of graduate mechanical engineers for design (VII qualification degree[1]), specialized as thermo-technicians or thermal power engineers, and preferably young (average age 25-30). Engineers are expected to know technologies for the design and manufacture of machine parts, knowledge of working in software for modelling and machining and good command of English, while previous experience is not considered as a must.

Also, mechanical technicians (IV, V and VI qualification levels) are needed for the work in production. The required profiles of technicians are welders for metal inert gas (MIG), metal active gas (MAG) and tungsten inert gas (TIG) welding processes, preferably with experience and license and with the average age between 20 and 30 years old. Technicians are expected to have basic technical knowledge acquired in high school and/or college, as testing of knowledge and skills is usually done during the probationary period of employment.

Last but not least, a continuous number of installers and service technicians is needed in order to install and maintain devices. They are important because it is not possible to put such devices into operation without them. However, the current situation is such that the number of servicemen, especially in a high summer season is not enough. Although the seasonality is not as pronounced - if not different - as in installing air conditioning devices, it also influences the instalment and maintenance of heating devices and stoves. This is due to the fact that same persons usually deal with both, and especially because they do not have a basic occupation and try to find supplement to household income based on seasonal demand.

[1] The current qualification levels in Serbia are as following: I – elementary school, II – in addition to that, vocational training or training for work, III – vocational secondary education, IV – secondary education, V – master craftsman or specialized education, VI – undergraduate studies, VII – integrated academic studies and master studies, VIII – doctoral studies.

Although producers pay attention to gender, much less women are pursuing careers in mechanical engineering and similar occupations. Closing the gender gap and increasing awareness however goes beyond one technology provider or a sector or a country and thus is not part of this study.

As expected, technology producers are using all available channels in the recruitment process to get the adequate workforce. They recruit workers through the Public Employment Service and its database of unemployed persons, but also through other websites and portals such as Infostud. In addition, they advertise open positions in media (radio, local TV stations, etc.) and some try to hire workers by calling people from the database that they have created over time from previous recruitments.

It is important to emphasize that technology producers prefer to engage young people, already trained or whom they can quickly train if needed. Preference in hiring youngsters, immediately after school, is not an exception in different sectors across the board. In the last few years, they especially tried to get the early interest of candidates from technical schools through various internships, training and dual education with the possibility of permanent employment after high school, which made it possible to get the best and the most motivated future workers. The candidates were mainly trained to work with Computer Numerical Control (CNC) machines (benders, cutting lasers, etc.), and even with complex CNC milling machines and hydraulic presses. Training for welding was also used, enabling candidates to obtain a licence after a certain period of work.

Unlike in the European Union, where the average percent of population aged 25 to 64 who participated in education and training was 11.3 in 2019 (12.4 for women), in selected markets in the region is much lower. In Montenegro it was 2.5 (3.0 for women), in North Macedonia 2.8 (2.7 for women), or in Serbia 4.3 (4.8 for women). Comparing data with some frontrunner countries in life-long learning is even more illustrative. For instance, in Sweden as much as 34.3 percent (42.9 for women) of the adult population participated in some kind of education and training in 2019, while in Switzerland it was slightly less – 32.3 (31.3 for women).

Last but not least, the technology providers conveyed the message regarding the kind of support that would be useful to them in the whole process of hiring additional workers and/or their training and professional development, which is discussed in the following chapter.

3. Capacity gaps and how to overcome them

Excluding the macro-economic trends, and issues that are beyond the scope of technology providers and sector itself, firms producing stoves and heating devices are in general satisfied with the programmes and training that are being offered. They perceive them as satisfactory, both from a theoretical and practical side.

Available training and certification mostly relate to welders. There are a lot of trainings that also refer to CNC machines, mostly being conducted for employees in production by authorised technicians, i.e. manufacturers of machines for which certificates are obtained. Most often, training is organised during the commissioning of a new machine in production.

The situation is somewhat similar for mechanical engineers, as certificates are mostly obtained externally from machine manufacturers, but can also be obtained from authorised companies that deal with the implementation and maintenance of training for 3D software (software for programming CNC machines).

Producers of stoves and heating devices feel that the capacity gaps based on the mismatch between demand and supply in the labour market can be overcome by the existing vocational training to the most extent, but they also expressed some concerns over the structural challenges and more overarching approach by different stakeholders involved.

So far, they have done and financed from their own funds most of the workers' training, research and development activities and launching of new projects. Thus, any support or state subsidy for producers and investors who employ new workers would certainly make a difference.

What is even more important than funds in bridging the gaps is link with education? The support from the Technical Faculties, the Institutes for Standardisation, or the Chambers of Commerce for development of individual or joint projects regarding new technologies for stoves that should meet the new standards can lead to better and more efficient solutions.

Also, cooperation with secondary Technical Schools would be beneficial in organization of various trainings by professional staff, or even, if supported by local self-governments, the formation of specialized welding schools.

Closer cooperation between the business and academia can be a win-win situation for both, as it can encourage the exchange and sharing of knowledge, create long-term partnerships and opportunities and drive innovation, entrepreneurship and creativity. Most of all, it can help people to acquire the right skills and mindsets required on the job market, as well as for their own personal development.

The power of the education-industry partnership can be fostered through local employment partnerships, as a platform for networking, the exchange of ideas and good practices by bringing together not only education institutions and companies, but also business associations, public authorities and policymakers, as well as civil society organizations.

Also, Public Employment Services in all Western Balkans region organize various vocational education and training measures such as professional practice, acquisition of practical knowledge, trainings for labour market, trainings on employer's demand or programmes for young interns with secondary and high education, albeit more targeted approach for specific companies and sectors might be needed.

In many of these measures, the employer is entitled to reimbursement of wage costs for the involved person for a certain period of time or it can be paid for financing the costs of training. Particularly interesting can be training on employer’s demand, which are implemented for the needs of the employer and conducted by a publicly recognized organizer of adult education activities or a training provider licensed by the competent institution.

Market-wise, the Western Balkans need to boost their investments in quality education and job-relevant skills in order to avoid becoming trapped in a low-productivity and low-wages cycle. All countries need to step up their investment in skill development, as globalization and technology bring opportunities in terms of new markets, products, and services, but also threats in terms of job losses because of automation and skill losses because of outmigration.

Markets in the region may also be trapped in a cycle that is difficult to escape – one in which the lack of more productive jobs discourages individuals from acquiring new skills and encourages the migration of the highly skilled. In the short-run, investing in skills may engender more high-skill migration but, over time, a critical mass of workers with solid foundation and new skills could emerge and help disrupt the cycle.

Also, there is a need to improve education systems, which are sometimes stuck with outdated technologies in case education institutions have little contact with and understanding of private sector needs, and the lack of on-the-job training fails to impart students with both the technical and the socioemotional skills required for success in the job market.

Workers must also be given the opportunity to continue developing their skills throughout their working life. With changing technologies and aging populations lifelong learning is essential. Those already out of school, whether employed or unemployed, must be given the opportunity to continually equip themselves with new skills. Skill upgrading must be a joint effort of both the public and private sectors. Incentives should be provided to firms to develop the firm-specific or sector-specific technical skills of their workforce more effectively and on a larger scale.

4. Employment and net job creation

Employment can be considered as a function of energy.

The quantity and quality of employment depends, but not solely, on (a) the stage or stages in the overall energy system cycle (i.e., production, conversion, end use), (b) the conversion process and stage of the process, (c) which setting is being referred to (developing country/traditional/informal vs. developed country/modernised/subsidised or formalised), and (d) labour-intensive or mechanised systems.

Three different forms of employment are recognized, resulting from implementing technology upgrades and different strategies for the implementation of change-out schemes. Total employment is therefore consisted out of those three different forms:

1. Direct employment, which results from construction and replacement of stoves. This refers to total labour necessary for construction, operation, and maintenance of new devices, as well as managing waste of replacing stoves.
2. Indirect employment, which is a result of expenditures related to new technologies, and includes secondary activities such as transport and other services.
3. Induced employment, which is caused by spending additional wages and profits from new technologies.

Excluding all other externalities, it is difficult to make an assessment about net job creation that would be created out of the process of replacement of obsolete stoves. This is especially the case as it would not only have an impact on the jobs along its formal value chain, but potentially also in its downstream linkages among retailers, distributors and selling points.

Thus, the following estimate is an approximation and it is based on the limited information provided by producers of heating devices and stoves.

Regarding direct employment, including maintenance, the marginal gain in terms of job creation according to the current ratio of workers per device can be estimated at a maximum of 0.015 workers per additional device. In other words, if 3 million households change the stoves and heating devices, this might create 45,000 additional jobs. However, this is without taking into account the economy of scale, learning and increased productivity, as well as fast-paced technological advances in automation, engineering, and machine-learning converge, which can seriously undermine this number. Also, these effects on creating jobs in the short run may disappear in the longer term when infrastructure expansion has reached its saturation point.

According to the common productivity rules - which might be different in this sector - the ratio of direct labour to indirect labour is about 3 to 1. This means that 45,000 direct jobs might be eventually multiplied by 15,000 additional indirect jobs. A shift toward low-carbon, green technologies may also create additional employment opportunities in research and development, but may also crowd out investment-induced employment in non-green sectors.

Finally, the multiplier effect regarding induced employment may greatly vary depending on many factors such as taxation, how much of a worker's earnings are spent on consumption goods, etc, which go beyond this research.

As a reference point, it is worth mentioning that in general the renewable energy sector has a significant contribution to the EU economy. According to the European Commission, a rough estimate indicates that nearly half of the jobs created in the renewable energy sector are within the heating and cooling industry.

In exploring employment potential in the Western Balkans and proposed areas of new skills development in line with the market needs and future activities at local and regional level, it is necessary to keep continuous dialogue with different technology providers.

In any case, massive change-out schemes will deliver different externalities – including on employment – depending on the technology that will be used in the future. Based on the input from producers, it can be expected that the effect of externalities on employment will be certainly positive, albeit the extent of their total impact remains to be seen.

5. Concluding remarks

Changing obsolete devices and introducing a new generation of stoves can have an impact on the labour market in terms of employment generation and by changing skills demand.

Drive towards sustainable societies and green economic restructuring in general have a series of implications for education, training and skills. New technologies and production processes change the way traditional occupations are performed and create new occupations requiring new skills and knowledge. Thus, the transformation process requires a strong interaction between business on one and the education and training system on the other hand.

If the massive change-out scheme happens, the process should include reviewing current occupational profiles and qualifications, potentially developing new ones emerging from the production processes and products and designing new training programmes or updating the content of training programmes for traditional qualifications. Along those lines, the capacity of training providers to design and deliver relevant training programmes should be enhanced.

Such a transformation drives innovation in technologies, production processes, products and services, and business models across all sectors of the economy such as construction, energy, transport, agriculture, manufacturing, etc, and requires holistic approach in which economic, technological and social change are interwoven with skills development processes.

What is needed is to recognize the important role that technology providers have when providing advice and guidance on technology choices. Enhancing their skills and knowledge and thereby removing a possible inclination towards the well-known solutions would increase the extent to which actual substitution opportunities are recognised, considered and selected.

Also, in developing efficient support schemes, the cost competitiveness to the consumers' needs to be improved. Support can assist in this as it can drive prices down. Consumer price is a key factor to stimulate consumer demand and should be supported along the process.

In order to seize the opportunity and make a systemic, effective and rapid change-out scheme, everyone needs to be involved.

Taking that into account, the following recommendations might be given to:

Technology providers:

Ø Technology providers should invest into marketing campaigns of eco-design devices and the benefits for the consumers.

Ø They should give the opportunity to workers to continue developing their skills throughout their working life. Skill upgrading must be a joint effort of both the public and private sectors.

Ø If not the other way around, technical providers should approach education institutions – especially technical faculties and schools – as a successful transformation system requires a closer cooperation between business and academia.

Education sector:

Ø There is a need for more contact with the private sector in order to better understand the needs of the labour market. This can help people to acquire the right skills and mindsets required on the job market.

Ø In that regard, the model of dual education – both at the levels of secondary vocational technical schools and faculties – should be enriched and promoted by the Ministry(ies) of Education, Science and Technological Development.

Ø If the massive change-out scheme happens, the process should include reviewing current occupational profiles and qualifications, as well as potentially developing new ones emerging from the implementation of new technologies.

Policy and decision makers at all levels:

Ø It is necessary for policy and decision makers to recognize the important role of technology providers and to keep continuous dialogue with them, which would enable timely and up to date information on their production capacities to deliver, install and maintain equipment as well as to assess their perception on main challenges for financing and implementation of large change-out schemes.

Ø Incentives should be introduced to technology providers that work on new devices in line with the EU standards, but also levies if the replacement of old devices and appropriate waste management is not implemented.

Ø Also, in developing and implementing efficient change-out schemes, financial incentives and support should be given to consumers, as the price is a key factor in simulating buyers for such schemes. In that regard, customers should be timely informed about the available calls for the allocation of funds that would enable purchase of environmentally friendly devices under more favourable conditions.

Ø The power of the education-industry partnership can be fostered through local employment partnerships, as a platform for networking, the exchange of ideas and good practices by bringing together not only education institutions and companies, but also business associations, public authorities and policymakers, as well as civil society organizations.

Civil society:

Ø There is a need to generate and disseminate up-to-date analyses exploring relations between air pollution stemming from the inefficient combustion of household devices for solid fuel-burning and health impacts in the Western Balkans.

Ø Well-designed communication campaigns are necessary in order to seize the opportunity and make a systemic, effective and rapid change-out scheme. In that process civil society organizations can share the accumulated knowledge and ensure that everyone is involved.

Ø Civil society should ensure that energy poverty receives the recognition it deserves by policy-makers at all levels. Already strained public health systems in the Western Balkans, the economic recovery, social cohesion and environment all depend on shared determination to support the energy poor in accessing cleaner, cheaper, safer and more efficient heat, light and power for their homes and livelihoods.

References

European Commission, *Competitiveness of the heating and cooling industry and services*, Part 1, June 2019.

Statistical Office of Albania, *Labour Force Survey*, 2020.

Statistical Office of Bosnia and Herzegovina, *Labour Force Survey*, 2020.

Statistical Office of Kosovo*, *Labour Force Survey*, 2020.

Statistical Office of Montenegro, *Labour Force Survey*, 2020.

Statistical Office of North Macedonia, *Labour Force Survey*, 2020.

Statistical Office of Serbia, *Labour Force Survey*, 2020.

World Bank, *Subdued Recovery*, Western Balkans Regular Economic Report No.19, Spring 2021.