IRMO & CETEOR
Ana-Maria Boromisa, IRMO

LABOUR MARKET EFFECTS ANALYSIS: DATA ANALYSIS INTERPRETATION, VISUALISATIONS AND RECOMMENDATIONS

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Research questions

RQ1: How many jobs will be lost in the energy sector due to phasing out fossil fuels, and how many jobs will be created in the renewable energy sector?

RQ2: Which skills are preconditions and missing in the energy labour workforce for achieving decarbonisation targets in the energy sector? (e.g., the need for construction workers, digitalisation, etc.)

RQ3: What are the key challenges and opportunities for matching the supply of energy sector professionals with the evolving demand in the WB region in renewable energy and energy efficiency sectors?

Contents

Introduction

- Aim: is to identify the labour market effects of decarbonisation of the electricity sector in the Western Balkans (WB).

- It quantifies the need for skilled workers in the renewable-based energy sector by 2030 in Western Balkans (WB) countries.

- Methodology: GIZ analytical tool ELMA (Employment and Labour Market Analyis) , projections based on IRENA and ILO methodologies; interviews

Background: energy transition in WB

- Current electricity mix; role of hydro and coal

- Challenges, e.g. age of infrastructure

- Commitments & developments (Energy Community Treaty, 2020 Sofia Declaration, external factors – CBAM 2026)

- Decommissioning plans

Current jobs

	Albania	Kosovo	Montenegro	North Macedonia	Serbia	Bosnia and Herzegovina
Coal mining		3249	750	2980	12331	14472
Coal power plants		1482	171	678	2931	2466
RES jobs	12703	n/a	80	251	654	200

Sources: JRC (2021), data for 2018, IRENA and ILO (2024), based on employment factors and capacity dana

Potential job losses

	41510 jobs in coal-related sectors in the WB countries	33,782 jobs in the mining industry (90,000 with Ukraine) 7,728 jobs in coal-based TPPs (49,000 with Ukraine)

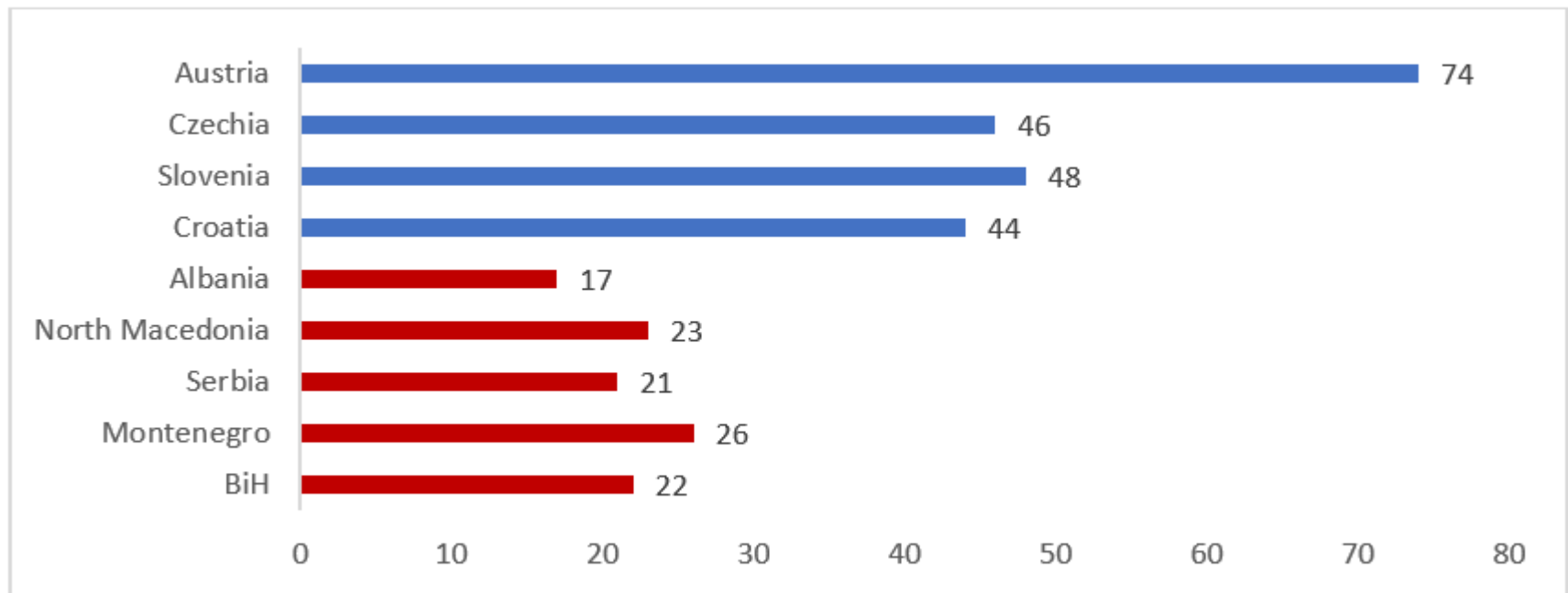|			
	workforce affected	0.4% in Montenegro	1.4% in Kosovo
		0.6% in Serbia	1.3% in BiH
		0.5% in North Macedonia	

Macro-economic and institutional quality

- Macro-economic stability and growth - capacity to develop and sustain projects
- Policies: fiscal policies, investment climate, infrastructure
- GDP per capita <50% EU average
- EBRD (2024): 70 years to catch up with the EU
- Low labour productivity
- Demographic development, age dependence ratio
- Political situation and business environment (FDI inflow, market economy quality)

Labour productivity

Figure 6: GDP per hour worked (GDP constant 2017 international $ at PPP) in 2023

Country	GDP per hour worked
Austria	74
Czechia	46
Slovenia	48
Croatia	44
Albania	17
North Macedonia	23
Serbia	21
Montenegro	26
BiH	22

Source: ILOSTAT Statistics on labour productivity - ILOSTAT

Labour market trends

- Participation rate, employment rate, unemployment rate
- Differences between men and women
- Youth unemployment; NEET (not in education, employment or training)
- Informal employment
- Supply side: number of people (youth + unemployed +on job training)
- Education system
- STEM students – decrease faster than depopulation, competition for talents, brain drain

		Unemployment Rates (%)	Employment Rates (%)	Participation Rate (%)	Informal employment Total (2023)
Albania QII 2024	F	11,0	61.1	68.6	
	M	11,4	72.5	81.8	
	Total	2	66.7	75.1	
Bosnia and Herzegovina QII 2024	F	17,3	41	49.6	19.66%
	M	10,9	65.6	73.6	
	Total	13,4	53.4	61.7	
Kosovo* (2022)	F	16,5	18.4	22	Between 35.6% and 42.4%
	M	11,0	49.4	55.5	
	Total	12,6	33.8	38.6	
Montenegro QII 2024	F	12,9	56.9	65.4	
	M	10,4	71	79.3	
	Total	11,5	64.1	72.4	
North Macedonia QII2024	F	11.7	49.1	55.6	9.69%
	M	13,3	65.7	76.7	
	Total	12.6	57.4	65.7	
Serbia QII2024	F	8.6	60.9	66.6	16.98%
	M	8.6	71.7	78.7	
	Total	8.5	66.3	72.5	

Renewable sector and infrastructure conditions

- Current electricity mix

- Technical barriers

- Economic barriers

- Regulatory and policy barriers

- Social barriers

Jobs projections within renewables sector

APPROACHES:

1. using regional (EU) multipliers

2. calculating employment factors by phases (installation, manufacturing and operations and maintenance)

3. direct and indirect jobs

Regional multipliers

- projections based on employment factors calculated from IRENA and ILO data

- to estimate the number of jobs needed in the renewables sector every year up to 2030 (t=7)

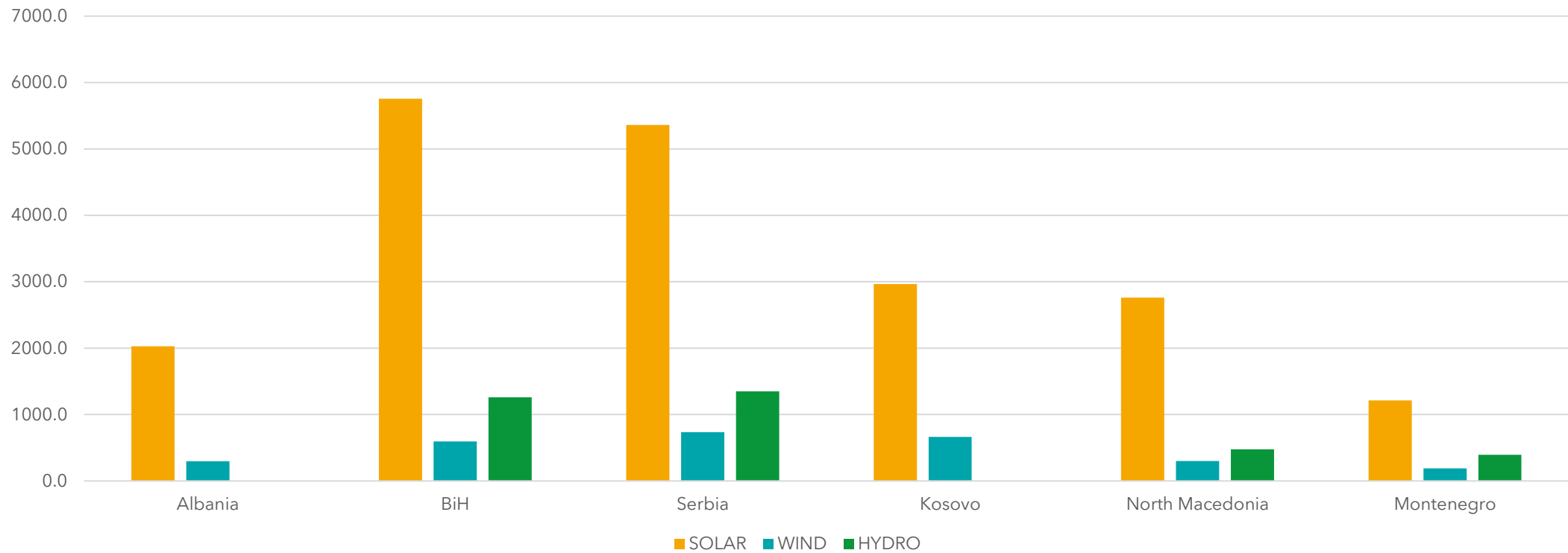**Multipliers (job/MW)**
Solar PV 3,5
Wind 1,6
Hydro 0,5

$$Projected\ installed\ capacity = Current\ installed\ capacity(MW) \times (1 + annual\ growth\ rate\ R)^t$$

$$annual\ growth\ rate\ R = \left(\frac{Installed\ capacity_{2030}}{Installed\ capacity_{2023}}\right)^{\frac{1}{t}} - 1$$

$$Projected\ number\ of\ jobs = Projected\ installed\ capacity \times Employment\ multiplier$$

Job projections

Estimated number of RES jobs up to 2030

	HYDRO	SOLAR	WIND
Albania	12483*	2065	480
BiH	1263	5222	960
Serbia	1255	5012	1190
Montenegro	412	1026	304
Kosovo	55**	2555	1072
North Macedonia	680	2998	484
TOTAL	3665 *,** (16148)	18878	4490

Estimated **job creation** in the renewable energy sector until 2030
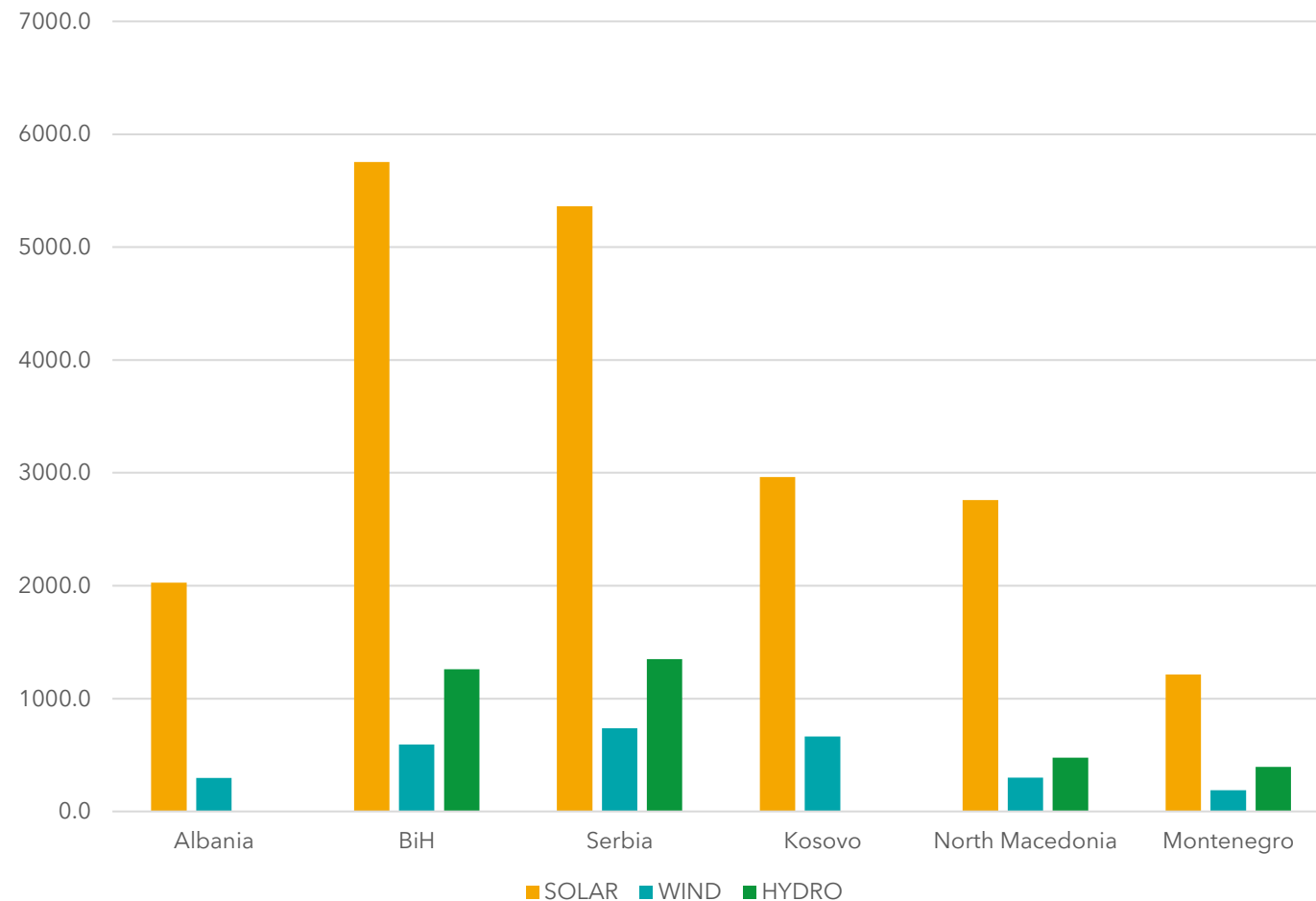
Employment factors by phases

Installation   38%
Manufacturing   44%
O&M   18%
Skills: workers &technicians 76%
Experts   11%
Engineers and highly qualified 8%
Administrative   5%

Technology	Manufacturing EF (Job-yrs/MW_{el})	Construction and Installation EF (Job-yrs/MW_{el})	Operation and Maintenance EF (Jobs/MW_{el}/year)
PV utility-scale	6.70	13.00	0.70
Hydro	3.50	7.40	0.20
Wind	4.70	3.20	0.30

No of jobs in 2030 by technology & phase

	Solar		Wind		Hydro	
	install	OM	install	OM	install	OM
Albania	1273	1180	69	257		
BiH	3614	2984	138	516	430	910
Serbia	3367	2864	171	640	427	904
Kosovo	1862	1460	154	576	19	40
North Macedonia	1733	1713	70	260	231	490
Montenegro	762	205	44	163	140	296
Total	**12611**	**10406**	**645**	**2413**	**1246**	**2639**

Direct & indirect jobs

Indirect multiplier

0.9 direct (transport, other services, Kim et al, 2022).

	Direct				Direct + indirect			
	Solar	**Wind**	**Hydr**	**Total**	**Solar**	**Wind**	**Hydr**	**Total**
Alb	2453	326	0	2779	4661	619	0	5281
BiH	6598	654	1339	8591	12536	1243	2544	16323
Srb	6231	811	1331	8373	11839	1541	2529	15908
Kos	3322	730	58	4110	6311	1388	111	7809
North Mcdn	3446	330	721	4496	6547	626	1370	8543
MNE	967	207	436	1610	1837	393	829	3059
Total	**23017**	**3058**	**3886**	**29960**	**43732**	**5810**	**7383**	**51644**

Potential job losses and job creation

41510 jobs in coal-related sectors in the WB countries
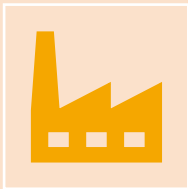
27033-29960 direct RES jobs (installation + O&M) in 2030

51644 direct+indirect

Barriers to faster decarbonisation of the power sector in WB

TECHNICAL

- **Grid Infrastructure**: existing power grids designed for centralized fossil fuel plants, may struggle to integrate renewable sources

- **Energy Storage**: renewables require effective energy storage solutions to ensure a stable supply, current technologies expensive and not widely deployed

- **Integration Complexity**: complex managment variability of renewable energy, complex balance between supply and demand

FINANCIAL

- **High Initial Costs**: the upfront capital for generation capacities, grid upgrades, balancing and storage can be prohibitive

- **Market Structures**: Traditional energy markets not well-suited for renewables, ownership structure diminishes incentives for reforms - difficult for renewables to compete

Barriers to faster decarbonisation of the power sector in WB

REGULATORY AND POLICY BARRIERS

- **Inconsistent Policies**: need for consistent and long-term government policies supporting renewable energy

- **Permitting and Land Use**: obtaining permits for renewable energy projects lengthy and complex

SOCIAL

- **Skills gap**: a shift in demand from traditional energy sector jobs to jobs requiring advanced technical and digital skills (soon in demand); provide on-the-job training and upskill their existing staff; inclusion in the education system

- **Public Opposition**: opposition from local communities due to concerns over environmental and health impacts

- **Lack of Awareness**: need for public understanding and acceptance of renewables, can slow down deployment efforts

Recommendations based on the findings

1 Formally adopt climate neutrality goals and develop action plans for the phase-out of fossil TPPs

2 Improve the regulatory framework that enables the decarbonisati-on

3 Improve the business environment and investment climate

4 Develop financial instruments for restructuring (including social protection of workers)

5 Encourage inclusion in the formal labour market

6 Continue to develop general public awareness about the need to limit emissions and decarbonise power sector

7 Anticipate skills needs in the public sector and enable competence reinforcement

Missing Workforce Skills for Energy Sector Decarbonisation

- growth in the renewable energy sector changes the demand for jobs → **advanced digital and technical skills needed**

- addressing skill mismatch between the skills of the available workforce and available jobs → **on-the-job training** of existing staff

- implementation of decarbonization in the energy sector is in the **infant phase**

- most activities focused primarily on raising awareness

- minimal concern about the shortage of workers with specific skills in the renewable energy sector in WB
  - some KIs developing curricula for various professions in the renewable energy sector
  - some KIs believe that existing qualifications are sufficient if technicians receive short additional training
  - grid operators not perceived as attractive employers, so they need to invest significantly more effort in improving job quality to retain their current workforce and attract new

The key challenges and opportunities for matching the supply of energy sector professionals with the evolving demand in renewable energy and energy efficiency sectors

- worker shortages and lack of qualified individuals in the renewable energy and EE sectors

- low labour market participation rates

- mismatch between skills and knowledge of available workforce and requirements of jobs

- education system that fails to prepare students for the workforce

increase market participation among youth, women, older workers, discouraged workers, and individuals in the informal sector

adjustments in the formal education system to align with evolving demand; make high-capacity and flexible adult education system

Recommendations

R1

Formation of a **permanent working group** to horizontally integrate topics like EE and green economy into the formal education system, and across professions and occupations.

R2

IOs should support educational institutions by providing **expert and technical assistance** to help develop a methodology for creating vocational education standards

R3

Advocate with governments to support companies and vocational schools in **developing apprenticeships** in the renewable energy sector **and methods** of combining work-based learning with school-based education.

R4

BiH, ALB and KSV should consider designing specific policies to **improve the adult education system** and align them with EU strategies; WB could benefit from improving the NQF and learning accreditation systems.

Recommendations

R5

Governments should consider allocating more resources to adult learning infrastructure and programs (public-private partnerships).

R6

Governments should take a more proactive approach to access opportunities offered by EU programs such as Erasmus+ and IPA.

R7

Increase participation rates in adult training programs, focusing on education related to professions and vocations in the renewable energy sector, to resolve the absence of a qualified workforce.

R8

Make **information campaigns** promoting lifelong learning, adult education, and subsidized or free education programs in the renewable energy sector, and target underserved populations (e.g., low-income individuals, etc.)

Recommendations

R9

Improve vocational education and training programs related to the renewable energy sector to meet labour market demands.

R10

Support further development of vocational training programs to advance solar and wind energy production.

R11

Support further **development of Digital Learning and E-Learning Platforms**.

R12

Expand the **network of training centers** to reach more communities.

R13

Government and international organisations should support non-formal education (e.g. online learning programs).

R14

Government should provide **financial support** to companies facing challenges in finding a qualified workforce.