

Transport and Energy Community Joint Workshop on Sustainable and Green Mobility

Deployment of e-charging stations - limits, challenges and opportunities for cooperation

Vienna, 20 December 2023

Davor Bajs Energy Community Secretariat

ENERGY DEMAND

Shares per demand sector in final energy demand per CP and in the Western Balkans, 2020.



Source: E3Modelling, "Modernization, Decarbonization and Resilience - A Regional Transition Roadmap for the Western Balkans"



Transport consumes between 24% and 35% of the final energy demand.

Decarbonisation is not efficient without decarbonising the transport sector.

Electric vehicles will play a significant role if fueled by renewable electricity.

- by removing fossil fuels from the transport sector
- By providing additional flexibility to the power systems

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ELECTRICITY GENERATION





Gross electricity generation shares by plant type per WB6 CP, 2020.

To create a decarbonisation effect, electrification in the transport sector will have to go in line with the integration of renewable energy sources (RES).

Phasing out coal from electricity production will be a great challenge (50% to 95% of electricity is produced by coal-fired TPPs in WB6 except Albania).

Retail electricity prices in WB6 countries are significantly lower than in the EU (1/2 of the EU27 price or less).



Source: E3Modelling, "Modernization, Decarbonization and Resilience - A Regional Transition Roadmap for the Western Balkans"

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	Share of energy from renewable sources in	Target for share of energy from renewable sources in gross final	Target for share of energy from renewable sources in gross final
	gross final consumption of energy, 2005 (S2005)	consumption of energy, 2020 (S2020)	consumption of energy, 2030 (S2030)
Albania	31,2%	38%	52,0%
Bosnia and Herzegovina	34,0%	40%	43,6%
Georgia	n/a	n/a	27,4%
Kosovo*	18,9%	25%	32,0%
Moldova	11,9%	<mark>17%</mark>	27,0%
Montenegro	26,3%	33%	50,0%
North Macedonia	17,2%	23%	38,0%
Serbia	21,2%	27%	40,7%
Ukraine	5,5%	11%	27,0%
Overall Energy Community 2030 Target			31,0%

EnC TARGET

DIRECTIVE (EU) 2018/2001 of 11 December 2018 on the promotion of the use of energy from renewable sources

Incorporated and adapted by the Ministerial Council Decision 2021/14/MC-EnC of 30 November 2021 on incorporating Directive (EU) 2018/2001 in the Energy Community acquis communautaire and amending Article 20 and Annex I of the Treaty. Amended by the Ministerial Council Decision 2022/02/MC-EnC of 15 December 2022.

Article 25

Mainstreaming renewable energy in the transport sector

1. In order to mainstream the use of renewable energy in the transport sector, each **Contracting Party** shall set an obligation on fuel suppliers to ensure that the share of renewable energy within the final consumption of energy in the transport sector is at least 14 % by 2030 (minimum share) in accordance with an indicative trajectory set by the **Contracting Party** and calculated in accordance with the methodology set out in this Article and in Articles 26 and 27. <...>¹⁴



LEGISLATION

DIRECTIVE (EU) 2019/944 of 5 June 2019 on common rules for the internal market for electricity < ... >

Incorporated and adapted by the Decision of the Ministerial Council of the Energy Community 2021/13/ MC-EnC of 30 November 2021 amending Annex I to the Treaty Establishing the Energy Community (Energy Community Treaty) and incorporating Directive (EU) 2019/944 and Regulation (EU) 2019/941 in the Energy Community acquis communautaire, and amended by Decision 2022/03/MC-EnC of 15 December 2022 on the incorporation of Regulation (EU) 2019/942, Regulation (EU) 2019/943, Regulation (EU) 2015/1222, Regulation (EU) 2016/1719, Regulation (EU) 2017/2195, Regulation (EU) 2017/2196, Regulation (EU) 2017/1485 in the Energy Community acquis, amending Annex I of the Energy Community Treaty, and on the amendments of the Ministerial Council Decisions 2021/13/MC-EnC and 2011/02/MC-EnC.





Contracting Parties (CPs) shall provide the necessary regulatory framework to facilitate the connection of publicly accessible and private recharging points (RPs) to the distribution networks. CPs shall ensure that DSOs cooperate on a non-discriminatory basis with any undertaking that owns, develops, operates or manages recharging points for EVs, including with regard to connection to the grid.

DSOs shall not own, develop, manage or operate recharging points for EVs, but derogation is possible if:

- open, transparent and non-discriminatory tendering procedure, has not been awarded to other parties a right to own, develop, manage or operate recharging points for electric vehicles, or could not deliver those services at a reasonable cost and in a timely manner;
- the regulatory authority has carried out an ex-ante review of the conditions of the tendering procedure under previous point and has granted its approval;
- the distribution system operator operates the recharging points on the basis of third-party access and does not discriminate between system users or classes of system users, and in particular in favour of its related undertakings;

Where CPs have implemented the conditions set out in paragraph 3, CPs or their designated competent authorities shall perform, at regular intervals or at least every five years, a public consultation in order to re-assess the potential interest of other parties in owning, developing, operating or managing recharging points for electric vehicles. Where the public consultation indicates that other parties are able to own, develop, operate or manage such points, CPs shall ensure that DSOs activities in this regard are phased-out, subject to the successful completion of the tendering procedure. As part of the conditions of that procedure, regulatory authorities may allow the distribution system operator to recover the residual value of its investment in recharging infrastructure;





- ~ 95% of electricity produced by RES (HPPs)
- ~ 110 e-charging stations



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- Significant development around 2035 is expected
- In 2050 around 72% share of electric vehicles in the total number of vehicles
- Large electricity consumption growth expected
- Infrastructure will have to be developed (transmission, distribution)

Year	2015	2020	2025	2030	2035	2040	2045	2050
Total stock per category and per fuel (in thousand vehicles)	481	523	608	781	950	1083	1172	1275
electric (light duty) cars	0	0	0	4	130	366	664	895
electric (heavy duty) cars	0	0	0	1	3	11	21	29
Total electric	0	0	0	5	132	377	685	924
Share (%)	0,0	0,0	0,0	0,6	13,9	34,9	58,5	72,4
Electricity consumption (GWh) - TOTAL	5896	6258	6493	6821	8274	9779	11836	13769
Electricity consumption (GWh) - Transport	0	2	5	41	477	1620	2774	3473







BiH Energy Community

- · Significant development after 2030 is expected
- In 2050 around 83% share of electric vehicles in the total number of vehicles
- Large electricity consumption growth expected
- Infrastructure will have to be developed (transmission, distribution)

Year	2015	2020	2025	2030	2035	2040	2045	2050
Total stock per category and per fuel (in thousand vehicles)	911	1244	1445	1647	1607	1645	1681	1706
electric (light duty) cars	0	0	1	15	204	636	1109	1389
electric (heavy duty) cars	0	0	0	0	2	11	19	28
Total electric	0	0	1	15	206	647	1128	1417
Share (%)	0,0	0,0	0,1	0,9	12,8	39,3	67,1	83,1
Electricity consumption (GWh) - TOTAL	14298	12795	14448	14089	15377	20353	24227	26468
Electricity consumption (GWh) - Transport	91	72	114	162	779	1927	2838	3234



~ 5% of electricity produced by RES

~ 70 e-charging stations









- Significant development after 2030 is expected
- In 2050 around 83% share of electric vehicles in the total number of vehicles
- Significant electricity consumption growth expected
- Infrastructure will have to be further developed (mainly distribution)

Year	2015	2020	2025	2030	2035	2040	2045	2050
Total stock per category and per fuel (in thousand vehicles)	336	459	512	526	570	612	644	659
electric (light duty) cars	0	0	0	1	123	291	446	538
electric (heavy duty) cars	0	0	0	0	1	4	7	11
Total electric	0	0	0	1	125	295	453	549
Share (%)	0,0	0,0	0,1	0,2	21,9	48,1	70,4	83,3
Electricity consumption (GWh) - TOTAL	6239	6492	7167	7159	8042	9391	10038	10609
Electricity consumption (GWh) - Transport	0	1	2	5	208	667	1031	1269







- Significant development after 2035 is expected
- In 2050 around 90% share of electric vehicles in the total number of vehicles
- · Significant electricity consumption growth expected
- Infrastructure will have to be further developed (mainly distribution and network 110 kV)

Year	2015	2020	2025	2030	2035	2040	2045	2050
Total stock per category and per fuel (in thousand vehicles)	191	206	225	278	312	344	379	412
electric (light duty) cars	0	0	1	8	47	149	273	365
electric (heavy duty) cars	0	0	0	0	0	2	3	5
Total electric	0	0	1	8	48	151	276	370
Share (%)	0,0	0,0	0,3	3,0	15,4	43,8	73,0	89,7
Electricity consumption (GWh) - TOTAL	3540	3450	3650	3714	4120	4513	5073	5557
Electricity consumption (GWh) - Transport	20	16	26	45	139	307	496	629







~ 30% of electricity produced by RES

\sim 100 e-charging stations



The Energy Community Secretariat

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- Significant development after 2025 is expected
- In 2050 around 91% share of electric vehicles in the total number of vehicles
- Large electricity consumption growth expected
- Infrastructure will have to be further developed (mainly distribution and partially network 110 kV)

Year	2015	2020	2025	2030	2035	2040	2045	2050
Total stock per category and per fuel (in thousand vehicles)	420	547	534	675	759	792	862	945
electric (light duty) cars	0	0	2	154	307	480	672	845
electric (heavy duty) cars	0	0	0	0	2	6	10	14
Total electric	0	0	2	154	308	487	682	859
Share (%)	0,0	0,1	0,3	22,9	40,6	61,5	79,2	91,0
Electricity consumption (GWh) - TOTAL	8142	7655	8306	8618	9915	13346	16389	18649
Electricity consumption (GWh) - Transport	17	12	30	292	676	1546	2234	2701



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SERBIA

- · Significant development after 2025 is expected
- In 2050 around 91% share of electric vehicles in the total number of vehicles
- Large electricity consumption growth expected
- Infrastructure will have to be further developed (transmission and distribution)

Year	2015	2020	2025	2030	2035	2040	2045	2050
Total stock per category and per fuel (in thousand vehicles)	2042	2246	2418	2791	3204	3625	3911	4216
electric (light duty) cars	0	0	1	545	1200	2292	3078	3745
electric (heavy duty) cars	0	0	0	1	8	37	69	101
Total electric	0	0	1	546	1209	2330	3147	3846
Share (%)	0,0	0,0	0,0	19,6	37,7	64,3	80,5	91,2
Electricity consumption (GWh) - TOTAL	36337	36634	38647	36683	40392	53635	62968	67945
Electricity consumption (GWh) - Transport	346	321	399	1205	2514	5588	7500	8811



- Electric vehicles should be the main group of vehicles to decarbonise the transport sector.
- In order to reach the targets for 2030 and 2050, more significant development should start after 2025/30.
- The share of electric vehicles (EV) in road fleet climbs to 78% in the National scenario and 91% in the Regional scenario, according to the latest EnC study on the regional transition roadmap for the Western Balkans.
- Electric vehicles are not environmentally friendly if charged with "dirty" electricity.
- The majority of WB6 countries rely on coal-fired power plants, so EVs will not bring benefits without phasing out coal-fired power plants and integrating renewable energy sources on a large scale.
- Electricity infrastructure, mainly distribution networks, will have to be reinforced. Transmission networks as well, but probably later when electricity consumption increases to a much higher level than today.
- EVs may contribute to the increased flexibility in the power system (ability to equalise production and consumption at any time-unit), and support the integration of RES.
- National energy and climate plans (NECP) address this issue but do not elaborate on it further and in detail.



• LIMITS:

- Electricity infrastructure, especially at the distribution level (35 kV, 10 kV, 0,4 kV) and later at the transmission level (mainly 110 kV), should be reinforced.
- Number of EVs is limited to significantly develop infrastructure (price, range, discomfort regarding the charging...).
- EVs are not environmentally-friendly if charged with coal-fired power plants, large integration of RES in parallel with an increase of EVs needed.

CHALLENGES:

- Electricity prices in the WB6 countries will rise which will demotivate buyers of EVs.
- Proper policy measures should be made (subsidises, tax-exemption...).
- Competition in the e-charging ownership and operation should be developed, difficult with a limited number of EVs.

OPPORTUNITIES FOR COOPERATION:

- Within the TEN-E and TEN-T legislative framework (e-charging stations as part of the smart electricity grid projects).
- Reviewing and sharing the studies with common topics (electric vehicles, railway electrification, use of hydrogen in transport...).
- Jointly creating preconditions for larger investments in the e-charging infrastructure.
- ECDSO-E Coordination Group may support common efforts.

Policy measure code:	PM_D35	Title:	Development of the required infrastructure for recharging electric vehicles					
Main objective:	Increase s	hare of RES	in transport					
Quantified objective:	20.5 thou: buses 88 ktoe of	sand electri f electricity	c vehicles, 18.9 thousand electric LDV and 2.4 electric					
Description:	PM_D35 will facilitate the adoption of the legislative framework for the promotion of electromobility. Moreover, the design and deployment or the required infrastructure for charging the electric vehicles will be carrie out with the provision of economic support.							
Implementation Timeframe	2025-203	0						
Type of measure	Investmer	nt & Regula	tory					
Sectors covered/affected	Transport							
Implementing Entity	Ministry of Construction, Transport and Infrastructure DSO							
Monitoring Entity								
Progress indicators	Consumer Number o	d electricity of electric v	r in transport sector ehicles and electric LDV					
Other relevant Energy Union dimension(s) affected	• 6	inergy effic	iency					
Union policy which resulted in the implementation of the PaM	• 0	Directive 20	18/2001/EU					
Relevant National Planning Document (Legal, Regulatory Acts etc)								
Implementation cost	Budget in (PM_EE13	corporated 3)	into energy efficiency dimension measures					
Financing source(s)	EU and ot	her funds,	public funds and own funds					

cy measure code:	PM_D36	Title:	Provision of fiscal and economic incentives to foster the further deployment of electric vehicles
in objective:	Increase s	share of RE	S in transport
antified objective:	Contribut	ion to the	quantified objective of PM_D35
cription:	PM_D36 penetrati such as ta distinguis Indicative reduced reduction reduced t allowance	will provi on of elec axes, light-l hed for th e measure registratio as, the initi tolls, the fr e to use sp	de subsidies and fiscal incentives for the further tric vehicles focusing on energy-intensive categories, heavy duty vehicles etc. The planned incentives will be te acquisition and the operation of electric vehicles, s include the provision of purchase price grants, and utilization costs through tax exemptions and ation of special pricing policy in insurance programs, ee entrance and parking to the urban centres and the eclific parking areas.
lementation Timeframe	2025-203	0	
e of measure	Reform		
tors covered/affected	Transport	t	
lementing Entity	:	Ministry of Ministry of	Mining and Energy Construction, Transport and Infrastructure
nitoring Entity			
gress indicators	Consume Promoted	d electricit d electric v	y in transport sector ehicles
er relevant Energy Union ension(s) affected	- ÷ 1	Energy effi	ciency
on policy which resulted in the lementation of the PaM		Directive 2	018/2001/EU
evant National Planning Document gal, Regulatory Acts etc)	• •	Law on tax	for the use and carrying of goods
lementation cost	Budget in (PM_EE1)	icorporate 2, PM_EE1	d into energy efficiency dimension measures 4, PM_EE18)
ancing source(s)	EU and of	ther funds,	public funds and own funds

EXAMPLES - NECPs



PAM 31: Railway electrification

Short description and objective: The Energy Strategy includes the planned development of the electrification of the railway in Kosovo, which will reduce tuel consumption, and GHG emissions. Currently, there is no electrified railway line in the country. Therefore, the electrification should be realized gradually by increasing the share of electric trains to 14.6% in 2030 and 20% in 2040 (WEM), and to 25% in 2030 and 40% in 2040 (WAM).

Sector/type	Energy/technical
Status of implementation	Under implementation/Planned
Quantitative effects	0.4 (1.4) ktoe of energy savings by 2030 (2040) in WAM compared to WEM
Investments	Pending action plan of the Multimodal transport strategy
Responsible institution	Infrakos/Trainkos
Progress indicators	Consumption of electricity in rail transport. Final energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

Measure 1A-1.1-1 Subsidising the purchase and promotion of the use of vehicles with low greenhouse gas emissions It is necessary to encourage the reduction of energy consumption in the transport sector by replacing existing (predominantly old, environmentally unacceptable, and energy inefficient) motor vehicles and purchasing new, environmentally acceptable, and EE vehicles. The measure refers to the procurement of environmentally acceptable and energy efficient: a) motorcycles, tricycles, and quadricycles, b) passenger cars, c) buses, d) duty vehicles. Facilitating subsidisation of the purchase of electric vehicles (motorcycles, scooters, passenger cars, and buses) from the state in order to increase the share of such vehicles in traffic. In addition to direct subsidies, it is necessary to introduce indirect subsidies, such as priority and cheaper parking, access to parts of the city with limited traffic, etc. For this measure, it is necessary to make changes to the Law on Public Procurement for the purpose of introducing green public procurement. Ministry of Communications and Transport of BiH, Entity ministries responsible for traffic, Government of BD, Cantonal Competent authorities: ministries responsible for traffic. Entity environmental protection funds, Public Procurement Agency

Regulatory, Economic, Information, Income from vehicle registration

Dimension 2, Dimension 5

Continuous

consumption of alternative fuels in traffic

Reduced emissions due to reduced use of fossil fuels Share of alternative fuel vehicles in the total number,

PAM 32: Increased share of alternative fueled vehicles

Short description and objective: The Multimodal Transport Strategy 2022-2030 recognized that promoting cleaner vehicles to reduce GHG emissions is one of the pillars for more sustainable transport. It is necessary to make transport more sustainable to achieve the goals set in the European Green Deal, Green Agenda, and Paris Agreement. According to the Transport Strategy, the promotion of cleaner transport encompases three aspects: 1. Monitoring emissions and introducing more stringent emission standards, 2. Setting the legal basis through adopting the alternative fuel infrastructure directive and setting up national policy frameworks for building a network of alternative fuel infrastructure (e.g., e-charging stations), and 3. Boosting the uptake of zero-emission vehicles. The aim of the strategy is to gradually increase the share of vehicles that use alternative fuels (hybrid, electric, hydrogen) to 10% by 2030. It is additionally assumed that alternative fueled vehicles will reach a share of 20% by 2040. Moreover, as a result of an additional e-charging stations' deployment, it is estimated that in by 2030 2% of the passenger cars in Kosovo will be electric and 5% Hybrid-gasoline, while the remaining 3% will be divided between PHEV-gasoline, Hybrid-diesel, and PHEV-diesel cars.

Sector/type	Energy/technical
Status of implementation	Under implementation/Planned
Quantitative effects	30 ktoe of energy savings by 2030 in WEM ¹ , additional 0.4 ktoe by 2030 in WAM
Investments	Pending action plan of the Multimodal transport strategy
Responsible institution	Private investors
Progress indicators	Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

No

Type of measure:

Sources of funding: Effect:

Monitoring method:

Deadlines:

Measure

Connection with other objectives:

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