



Powering the Future of the Western Balkans with Renewables

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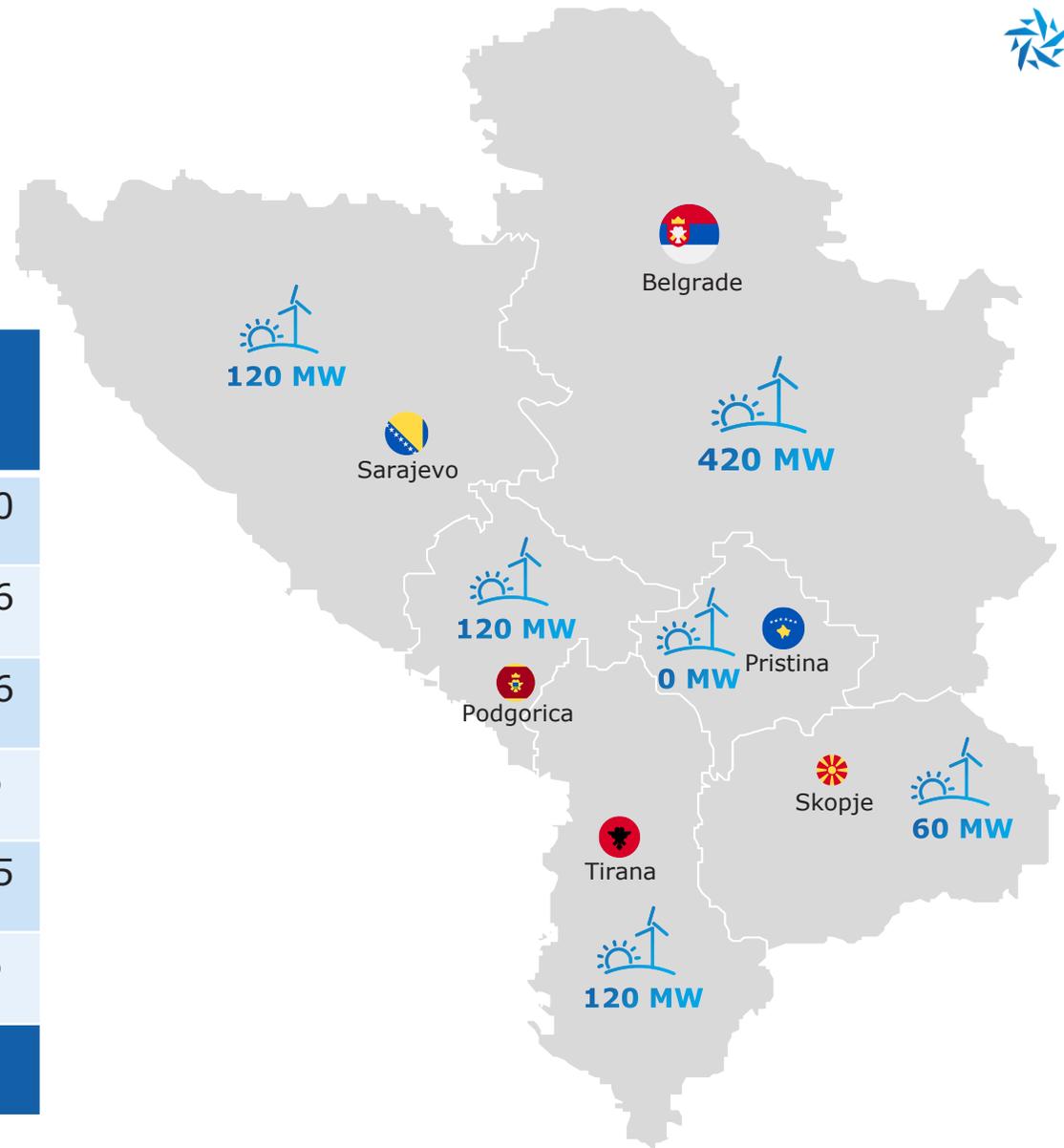
SVP Business Development Europe at CWP Global

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WESTERN BALKANS

RES Projects (solar and wind, without HPPs):

	IN OPERATION	TARGET
Serbia	420MW	2000MW by 2030
Bosnia and Herzegovina	120MW	1000MW by 2026
Montenegro	120MW	1000MW by 2026
Albania	20MW	500MW by 2026
North Macedonia	60MW	1500MW by 2025
Kosovo*	0MW	400MW by 2026
TOTAL	740MW	6400MW



MAIN ISSUES IN RES PROJECTS IMPLEMENTATION

Serbia



- Adoption of RES Law in May 2021, by-laws pending
- Prospects of CfD auctions
- Bottleneck with the TSO

Bosnia and Herzegovina



- Implementation of projects through concession of resources/competitive procedure vs. strategic partnership
- Non-transparency and low effectiveness
- Strong both wind and solar resource

Montenegro



- Main generation connected to 110kV and 220kV (North); load center Podgorica and coastal area (South)
- 400kV OHL Lastva – Pljevlja to be in operation in 2023
- Grid interconnection provides high exchange capacities with AL (GR), BiH (CRO), RS, KS and IT
- Key grid element for energy exchange is HVDC cable IT-MNE (currently operates at 600MW, to be expanded to 1200MW in 2026)
- High demand for utility-scale PV, fewer (and smaller) wind capacity projects

MAIN ISSUES IN RES PROJECTS IMPLEMENTATION

Albania



- Imports 43% of its electricity; relies on hydro power/vulnerable position
- Amendment of legislation on environmental impact assessment
- The Connection Network Codes transposed but not implemented despite the expiry of the deadline
- Strong wind resource but non-existing large-scale wind projects

North Macedonia



- Power generation relies on lignite and HPPs, no sizeable wind or PV projects built, dependency on imports
- Strategic partnership model with the state/Long term lease for state land
- Excellent solar resource but expensive land
- Good interconnectors with SR, BG, GR, KS; free grid capacity on 400kV
- Efforts to set up the DAM and market coupling with BG

Kosovo*



- Power generation relies on two TPPs, RES amount to 10% of installed capacity (incl. HPPs)
- Government adopted the plan which aims to add 400MW of RES by 2026
- Since December 2020, allocation of feed-in tariffs suspended
- Allocation of capacities of the interconnections with Serbia not agreed

WHY WE DON'T NEED AUCTIONS FOR RES

- **Impossible to secure sufficient volume and predictability (min 3 -5 years planning cycle), ad-hoc approach doesn't work**
- **Projects permitted with old tech turbines cannot compete with the new projects in development (no level playing field)**
- **Likelihood of successful actions decreases with raising prices for the industry (even with the cap!); producers will seek to secure cPPA on the bilateral market/ low ceiling prices**
- **Grid developments cannot cope with the huge capacity in the pipeline – likely curtailments and additional grid reinforcement requests from the TSOs/additional compulsory storage (battery) capacity**

ENERGY STORAGE – A LIFEBOAT?

Implementation

- **No active operation of storage (BESS) in WB countries. Present HPPs are the only source of flexibility–sensitive to climate factor**
- **Implementation of large number RE sources will create an opportunity as the balancing and ancillary services will be come an issue**
- **Development in region emerges: Slovenia –frequency regulation and congestion management, Croatia – balancing services, Hungary – TSO requires 10% storage in last auction for RE connection**
- **Clear policy and regulation is needed as well as improvement in Market design (capacity market, intra-day)**

Revenue Streams:



Time shifting of energy – Price arbitrage on the intraday and day-ahead markets



Balancing cost reduction



Maximize grid connection utilization as we see less available capacity – oversize primary source



Ancillary services/Capacity market

- **Ideal case would be to combine 2 or more revenue streams simultaneously – price arbitrage with ancillary services. Time shifting will gradually take over as the main use case.**
- **First implementation of storage in WB is expected as hybrid, co-located storage with RE source**

CURRENT MARKET ENVIRONMENT

German calendar base load, the European benchmark, in 2022 marked **all time highs and significant volatility**.



The main drivers of such developments are:

- **Gas shortages** induced by war in Ukraine pushing the electricity price up;
- Excessively **hot summer** in Europe;
- **Nuclear capacities phase-off** in France and Germany.

CHALLENGES FOR PPA TERMINATION/FINANCING

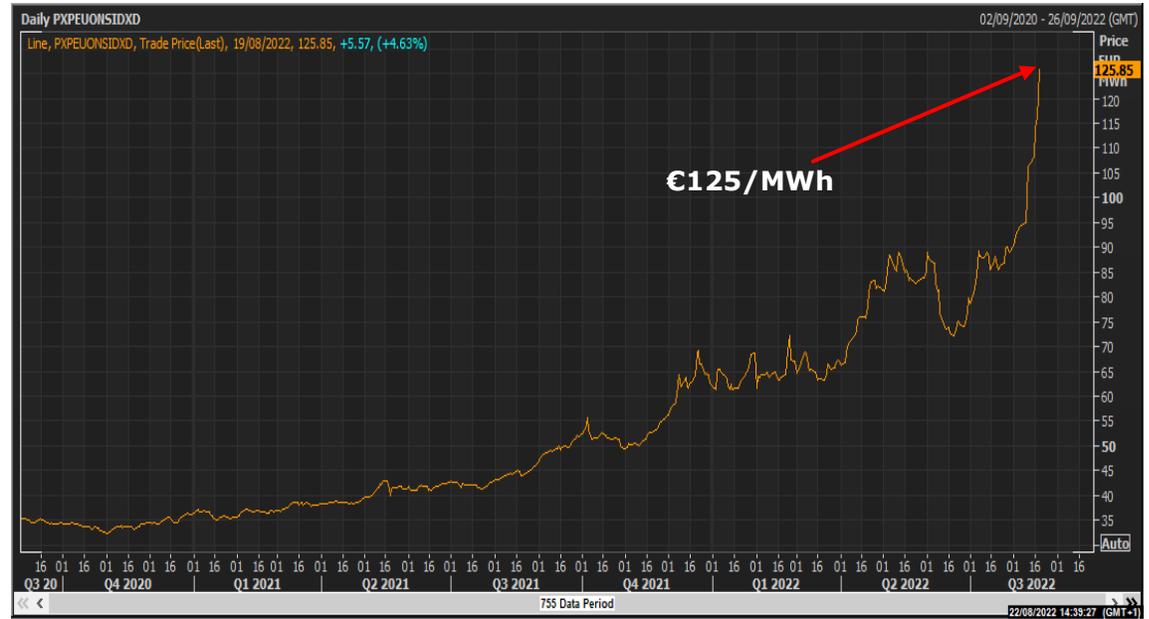
These developments led to the base load calendar delivery for 2023 to be traded above **€600/MWh**, and to level at around **€150/MWh** after 2029.

Baseload Power Curves

Tenor	DE Baseload	DE Peak	CZ Baseload	HU Baseload	RO Baseload	GR Baseload	SK Baseload	CZ Peakload	HU Peakload
Monthly									
Bal Mth						421.64	511.68	509.05	525.
Aug-22	464.51	496.30	471.68	482.62	468.48				
Sep-22	566.78	648.33	561.53	612.53	602.53	620.00	591.53	660.33	712.
Oct-22	610.00	800.96	610.32	664.32	659.32	626.00	630.32	809.96	863.
Nov-22	874.00	999.57	813.22	831.72			840.72	1008.57	1028.
Quarterly									
Q4-22	800.00	958.04	738.63	825.00	749.28	682.00	763.63	967.04	998.
Q1-23	820.00	1200.00	767.55	787.00		664.00	779.55	1173.76	1193.
Q2-23	564.00	793.43	566.70	585.25			577.70	798.43	812.
Q3-23	560.00	810.93	564.62	593.67			587.62	817.93	840.
Yearly									
2023	645.00	974.76	636.75	659.25	649.25		656.08	981.26	1001.
2024	588.74	615.00	390.74	395.49			394.74	611.50	616.
2025	275.92	355.00	277.62	280.67			279.12	361.50	364.
2026	207.00	256.06	208.50						
2027	180.00	203.19							
2028	172.50	185.75							
2029	160.00								
2030	158.00								
2031	161.19								

Bloomberg

Pexapark Index for Onshore Wind



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together better

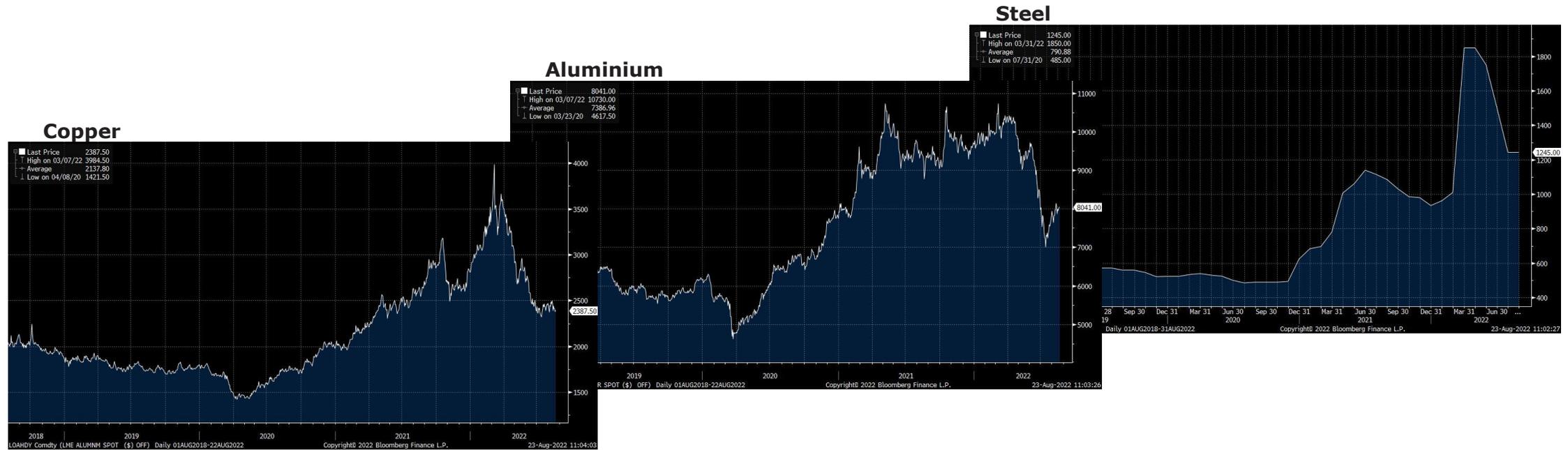
Although the power curve assumption is crucial in the long-term valuation and PPA pricing, **in the current volatile environment, significant discount is applied to the PPA pricing compared to the current level of futures**, as also **Pexapark PPA Pricing Index** (the analyst and trader consensus for 10-year as generated physical delivery) for Europe indicates, being around **€125/MWh** for onshore wind and **€140/MWh** for solar.

This is a significant challenge, as a potential off-taker wants to protect against a drop in price after Ukraine crisis is finished and in the event of eventual economy cooling.

On the other hand, this incentivizes developers to go fully merchant and to abandon project financing.

CHALLENGES FOR PROCUREMENT

Wind turbine manufacturers are raising prices to near-decade highs in an effort to preserve margins as metals' prices and uncertainties soar.



Bloomberg

Generally, after March 2020, metals' prices soared, culminating in March 2022. Currently, the downward trend is present, however, correction happened on a significantly higher level compared to history.

This, alongside with supply chain issues is driving costs for wind turbine manufacturers, and alongside general market uncertainties, manufacturers are reluctant to go forward with offers valid longer than 6-9 months.

This usually imposes the need to provide equity for financing turbines before the financial close.

CONCLUSIONS/MAIN CHALLENGES

The market environment and business reality have significantly changed in the last two years. Lenders' conditions are very unfavorable, given the present volatilities in the market, whereas the prices are in the continuing upward trend.

1. Securing long-term PPA under satisfactory conditions for sponsors

Since the prices on electricity markets are at all time highs, while PPA pricing is still far below them, more and more developers are seeking for financing opportunities that will allow them to stay fully merchant. Hedging is tremendously costly.

2. Securing offers from turbine manufacturers for horizons longer than 6-9 months

Disturbed supply chains and rising metals' prices are diminishing manufacturers' margins and increasing uncertainties for all stakeholders. Procurement risks are pronounced. Consequently, timelines for the project are becoming highly uncertain, which pressures all development activities.

Project financials are also negatively impacted, since the PPA price assumption remains on the low Pexapark levels, while CAPEX prices are soaring. Debt financing requirements are worsening in such conditions, and developers are forced to finance turbines from equity before the financial close.

3. Storage – doors are about to be open

Requirement for storage is well recognized in WB although region is falling behind in development. Planned capital hydro projects are uncertain and often takes decades to develop.

Identifying adequate revenue stream with current market tools is challenging. With increased demand, capital costs of storage has increased in 2022 by 20%. New wave of RE projects will be co-located with storage. Ancillary services as main use case for storage will be gradually replaced with time-shifting energy to enable high RE targets.