

24° ΕΘΝΙΚΟ ΣΥΝΕΔΡΙΟ «ΕΝΕΡΓΕΙΑ + ΑΝΑΠΤΥΞΗ»

9^η Συνεδρία «Αγορές Ηλεκτρισμού στα Δυτικά Βαλκάνια»
Αθήνα 22 Νοεμβρίου 2019



Creating Markets, Creating Opportunities

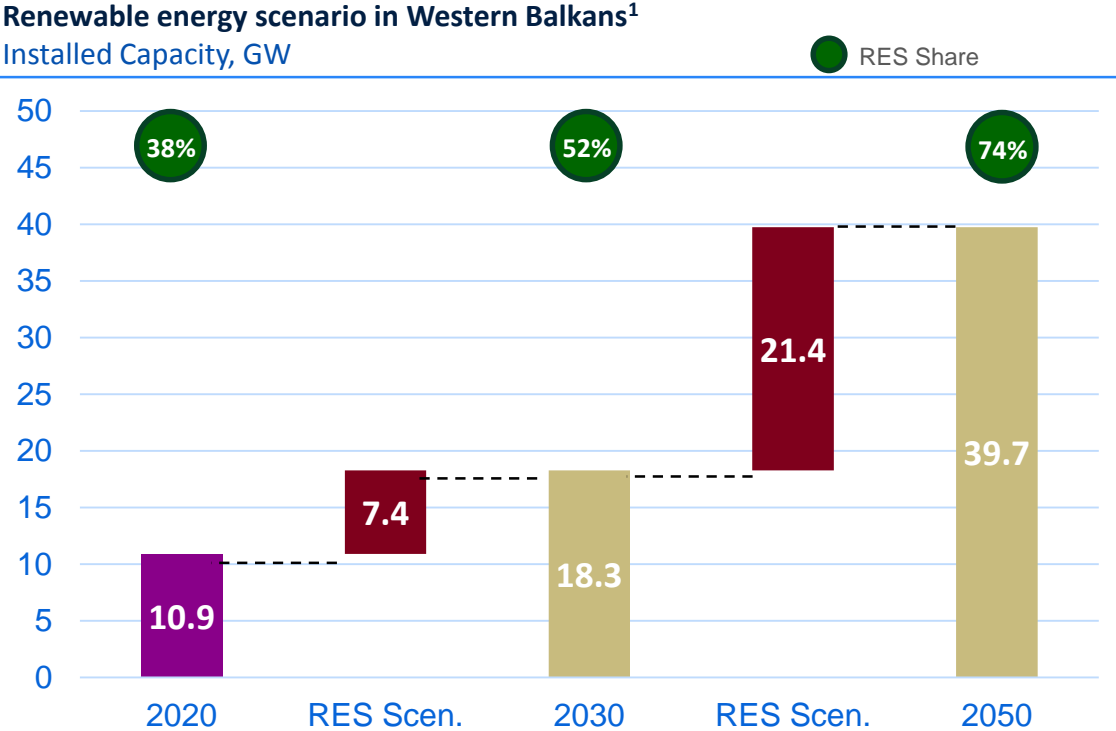
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COAL IS A PROBLEM AS SOURCE OF ELECTRICITY IN WB6

- ❑ The largest source of power in WB6 lignite (60% of WB6 generation comes from lignite plants), is heavily affected by the adoption of the EU energy legislation due to Energy Community membership - (LCPD and IED)
- ❑ The refurbishments to comply with emissions standards are too expensive for most plants which are expected to close. Compliance to LCPD and IED is expected to add an annualized amount between **EUR 30-45/kW** as refurbishment costs to existing plants (or enter Limited Lifetime Derogation)
- ❑ This will result in massive decommissioning of existing and cancellation of new lignite fired plants (more than c. **7 GW** in WB6 alone!)
- ❑ It is expected that RES will account for at least **55%** of power generation in Europe and 50% in SEE by 2030. This is a win-win situation, due to RES technologies falling costs.
- ❑ Nearly 70% of renewable power in SEE will stem from wind and solar, and will present some issues regarding Generation Adequacy, and will increase dramatically the value of **Flexibility**.

NEW CAPACITY FROM RES OF 7.4 GW BY 2030 AND ADDITIONAL 21.4 GW BY 2050

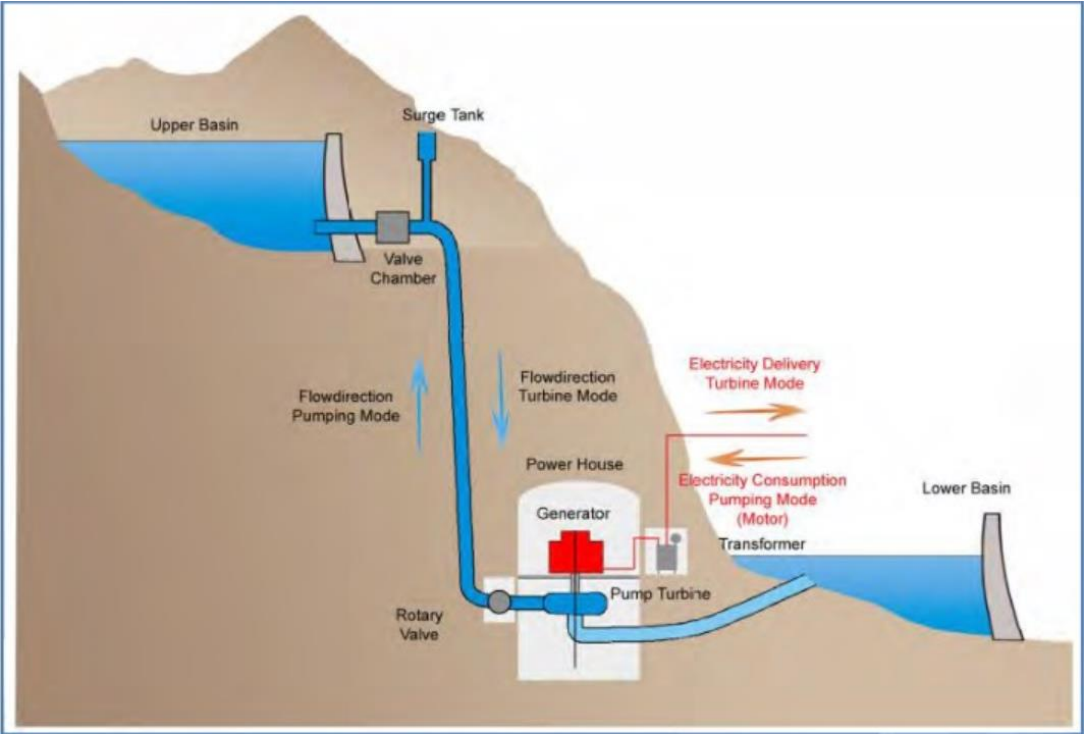


➔ To reach the ambitious decarbonization targets

- 7.4 GW of RES required by 2030
- And 21.4 GW by 2050
- Corresponds to capacity additions of 740 – 1100 MW per year

1. Corresponds to the Moderate Transition scenario presented in this presentation.

ESS - A VERSATILE MPP - "STACKING" OF REVENUE STREAMS



Bulk energy services	Ancillary services	Transmission infrastructure services
Electric energy time-shift (arbitrage)	Regulation	Transmission upgrade deferral
Electric supply capacity	Spinning, non-spinning and supplemental reserves	Transmission congestion relief
	Voltage support	
	Black start	

ESS can provide a multitude of Services acting in several **Market Segments** and therefore realizing a "STACK" of different Revenue Streams. The problem is that in SEE the **need exists** but the Markets are not yet any near **mature** to support those revenues.

EC STATE AID GUIDELINES FOR INTRODUCTION OF CRM

The European Commission has developed a **set of guidelines for the design of CRM to ensure their compliance with State Aid regulations**. Any capacity mechanism shall:

- Be clear need for state intervention and the objectives must be clearly defined. Objective must be consistent with phasing out environmentally harmful subsidies
- Aid should not change the behaviour of market players and not create undue market distortions and not limit cross-zonal trade;
- Must not go beyond what is necessary to address the adequacy concern;
- Select capacity providers by means of a transparent, non-discriminatory and competitive process;
- ensure that the remuneration is determined through the competitive process;
- set out the required technical conditions for the participation of capacity providers in advance of the selection process;
- apply appropriate penalties to capacity providers when not available in the event of system stress;

THE CASE FOR ESS - CALCULATING THE VALUE OF STORAGE

- ❑ Generation Adequacy study demonstrates the need for the plant for security of supply either on long or short-term markets, or both.
- ❑ Market study demonstrates that market revenue and price of arbitrage insufficient to make the business case for PSP
- ❑ Methodology to calculate value of asset including all System Services and Market products plus non-market externalities like displacement of CO₂, RES integration, reduced Load and RES curtailment costs, avoided start-up costs of thermal plants, etc. The comparison of “With” and “Without” will provide the Business Case
- ❑ CRM then can be offered so that total Fixed and Variable Costs would be compensated over a multi-year PPA minus the Market Revenues, which would be retained by the Owner. Could be subjected to a regulatory “Claw – Back” above a certain “Cap”.

THE BUSINESS MODEL FOR ESS

- ❑ The basic payment structure should be a cost-based capacity payment with performance incentives plus a variable operating cost compensation where markets don't exist or **“CAP and FLOOR” regime (as in UK) based on minimum availability targets.**
- ❑ The floor is set at a level that ensures that a MPP can cover its annual operating expenditure and service its debt. However, It must meet a minimum level of asset performance (availability – efficiency, etc).
- ❑ The cap is set to ensure that equity investors receive sufficient, but not excessive, returns. In order to incentivize maximum availability, the cap can increase or decrease by +/- X% depending on availability/efficiency performance. The width between the cap and floor levels is designed so that developers are exposed to the benefits that the MPP provides and so are incentivised to identify and develop projects in a way that maximises these benefits.

THE “CAP AND FLOOR” UK REGULATORY REGIME FOR MPP

Cap and floor building blocks

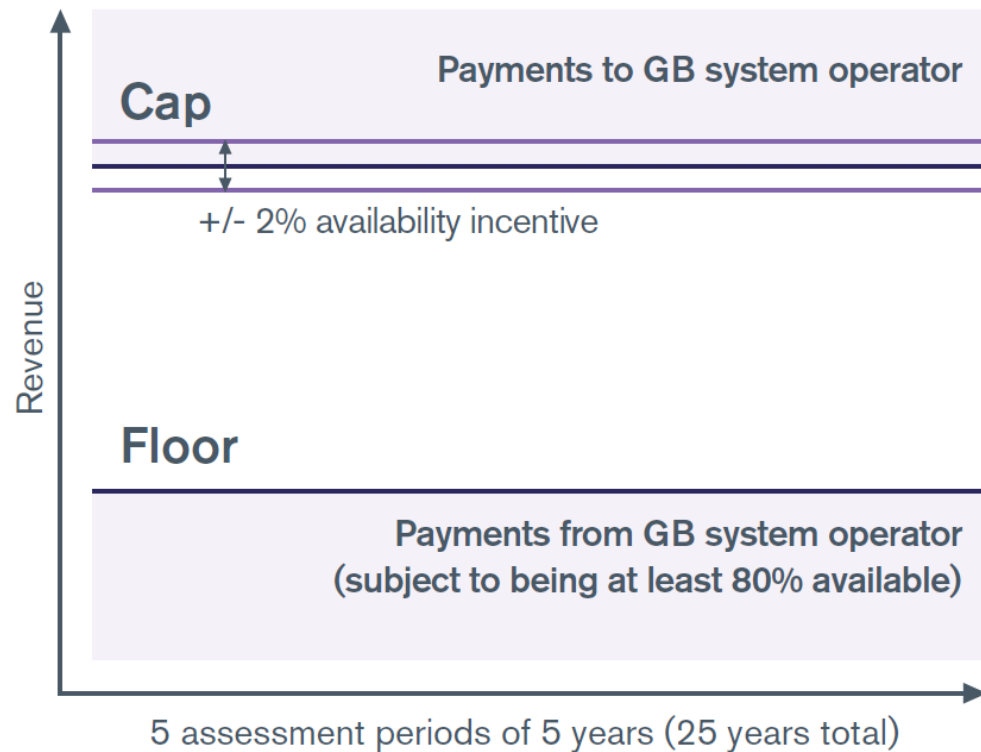
allowed return

tax

decommissioning costs

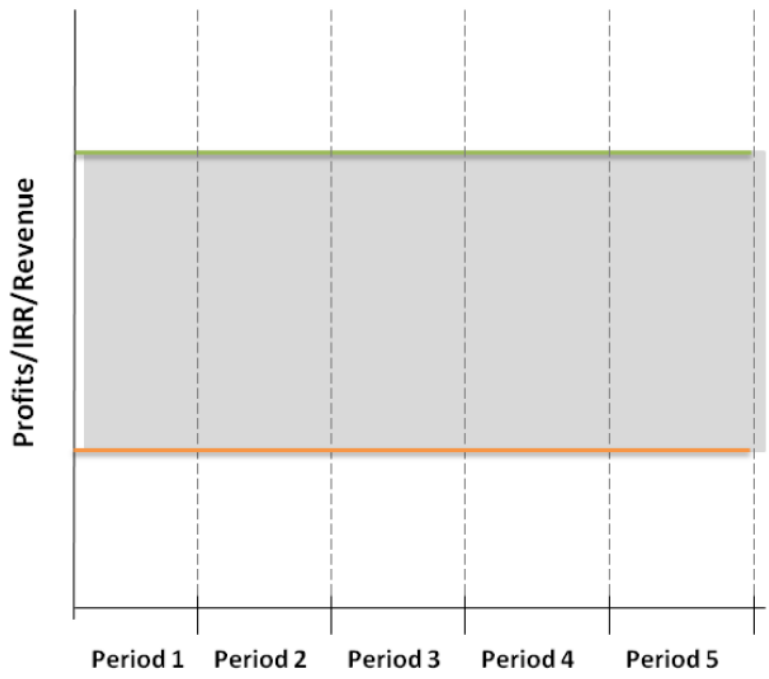
**operations and
maintenance costs**

capital costs

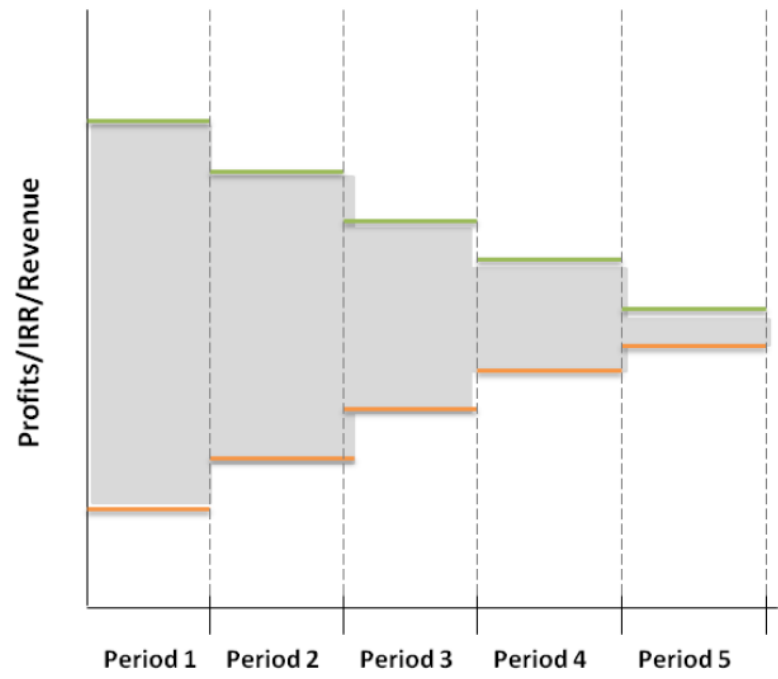


CONSTANT VERSUS VARIABLE “CAP AND FLOOR”

constant



variable



THANK YOU

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