SAIFI/SAIDI indicators and the growing RES penetration

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Background

Large shares of intermittent renewable generation (wind and photovoltaic) cause additional stress on the system and can affect the network reliability. In order to keep stability network management requires inter alia increased flexibility where flexibility sources may include flexible capacities within the electricity generation mix, interconnection capacity, energy storage or improved load control.

Did you <u>experience</u> any changes in the network reliability performance (SAIDI / SAIFI) in the last years?

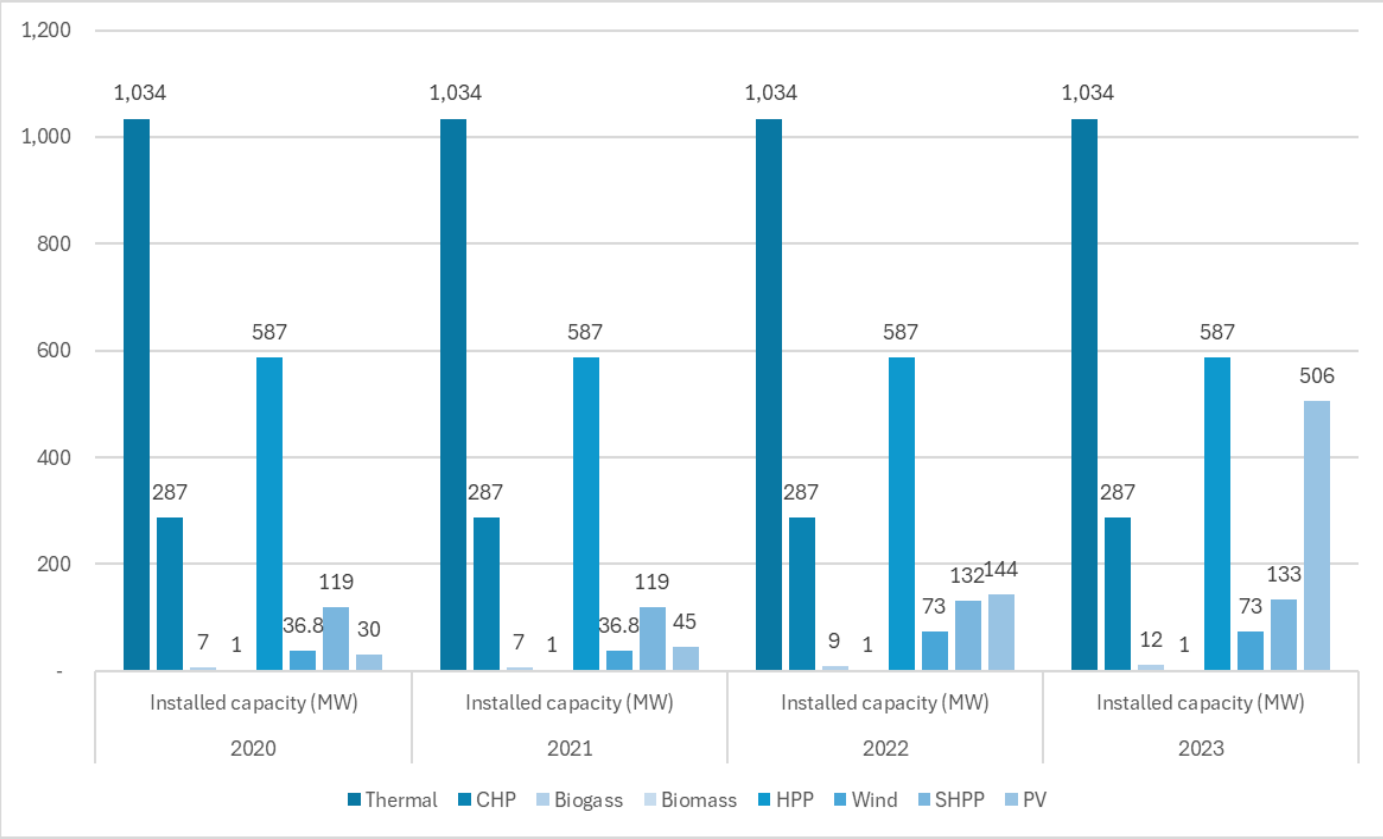
According to the existing regulatory framework ERC has data for SAIDI and SAIFI for the past two years, meaning 2022 and 2023.

Data have been reported by the DSO based on the Market monitoring rulebook obligations.

	2022			2023		
	35kV	10kV	Averge	35kV	10kV	Averge
SAIDI	57	776	**833**	54	895	**949**
SAIFI	2	20	**70**	2	25	**9**

Although DSOs report on SAIDI and SAIFI values, as well as the frequency and duration of outages across various voltage levels, data pertaining to customers on the low voltage level is currently not reported.

What are the major reasons and can you causally connect such changes with the increasing share of intermittent renewable generation?

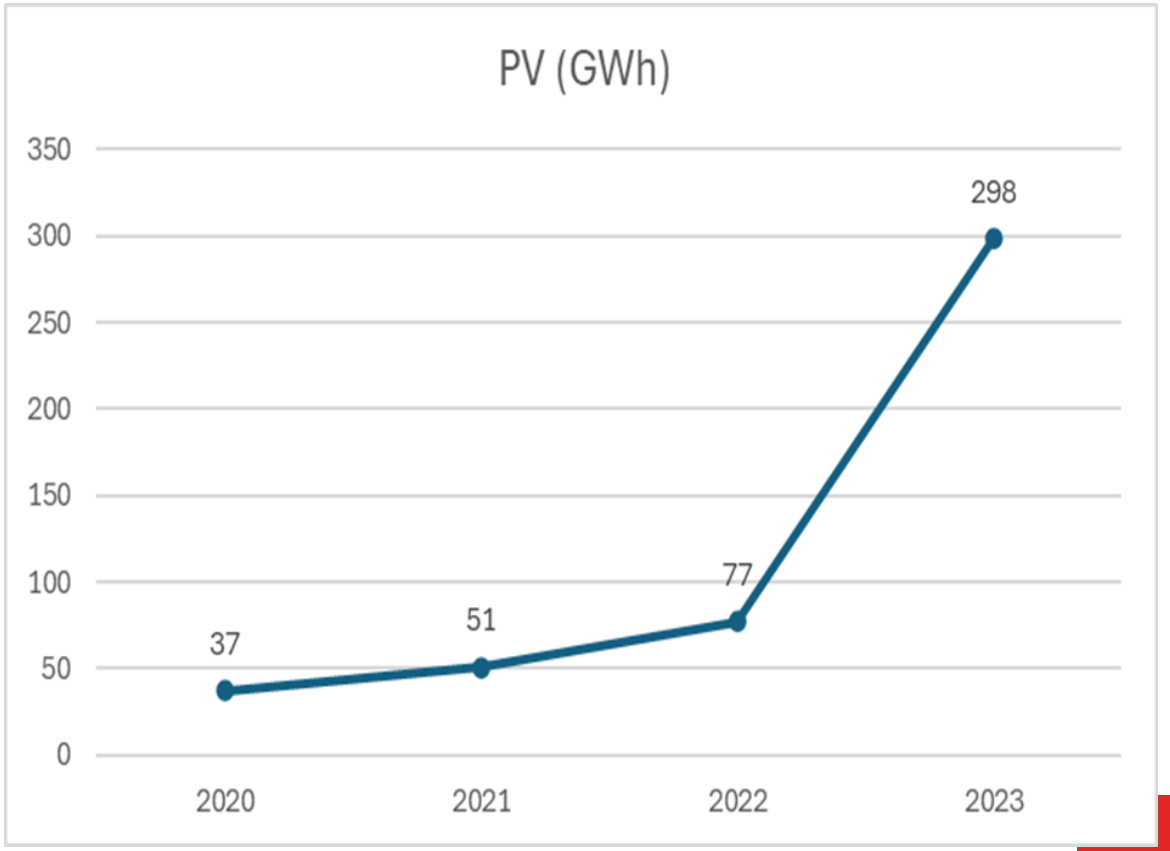


- Total installed capacity in North Macedonia is 2.633 MW
- RES is represented with 1.312 MW or 49,83%
- The highest share are HPP with 22,% and after that PVs with 19,22%
- PVs 252% installed capacity increased in 2023 compared to 2022!
- Till October 2024 additional 254 licences were issued with total installed capacity of 271MW.

What are the major reasons and can you causally connect such changes with the increasing share of intermittent renewable generation?

In the past years, the share od the RES has been increasing, particularly PV. Currently because of the lack of data we can not connect interruptions with the increasing share of RES.

	2020	2021	2022	2023
Type of PP	GWh	GWh	GWh	GWh
Total	5.127	5.284	5.633	6.553
TPP	2.51	2.105	3.034	3.032
CHP	1.119	1.517	967	1.348
RES	**1.498**	**1.662**	**1.632**	**2.173**
HPP	1.003	1.132	1.034	1.277
WPP	117	103	107	165
Small HPP	284	321	363	371
PV	**37**	**51**	**77**	**298**
Biogas	57	54	51	62
Biomas	0	0	0	0



Did you design / implement measures to prevent from potential deterioration of network reliability performance related that the increasing share of intermittent renewable generation?

- ERC is appealing body against the DSO performance including damage claim of the generators and consumers. Therefore, we have experienced claim compensation from RES generators, particularly biogas and small HPPs due to unforeseen interruptions.
- For each regulatory period DSO prepares and submits for approval to the ERC investment plan aimed to increase efficiency of its operation through decrease of electricity losses and improvement of the grid reliability and quality of supply in general,
- DSO is responsible for the long-term development planning of the electricity distribution system. DSO is obliged to prepare every year a system development plan for the next five years in which the projects are evaluated based on improvement of QoS (voltage level and interruptions).
- ERC has been working with the EBRD for possible inclusion of the performance-based indicators in the tariff and price regulation.

What is the role & potential of network flexibility in this context?

- The network flexibility has not been evaluated so far. ERC does not have reliable studies or analyses that shows flexibility options.
- Interconnections are widely developed and represent one of the options for the flexibility of the network for large scale RES integration. Interconnection points with neighbors - Greece (2x400 kV), Bulgaria (1x400 kV), Serbia (1x400 kV); and Kosovo (1x400 kV).
- The last one is ongoing project for construction of interconnection 400 kV line with Albania.
- Another flexibility option is market coupling. Currently, the ongoing project is possible market coupling in the region of Southeastern Europe among Greece, North Macedonia, Albania and Kosovo, supported by the USAID.

What are the major challenges encountered so far?

- DSO is obliged to set their own targets concerning their QoS performance and to 'improve' their performance through appropriate actions.
- ERC is not authorized by the Energy Law to specify QoS standards or to impose administrative fines, penalties or rewards to DSOs concerning their QoS performance.
- ERC is authorized to audit DSOs with respect to their data collection processes and the quality or accuracy of QoS data but has not performed such audit to date.
- ERC is not authorized to impose administrative fines or penalties on the DSOs with respect to the findings of QoS audits.
- ERC should specify relevant data collection templates.

THANK YOU FOR YOUR ATTENTION!

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