

BME's electricity market modelling results

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- Simulations with 1-hour resolution using Plexos
- Solving problems in 1-day steps
- Domain: HU + neighbours (2030)
- Modelling at energy source level
- Cross border capacities, pumped storage plants, batteries modelled
- Detailed technical and economic parameters of power plants
- Excluded: transmission grid, power plant maintenance, not expected outages

		Battery capacity scenarios			
		A (1 hour)	B (2 hour)	C (4 hour)	D (8 hour)
Power plant portfolios	No. 1	1-A	1-B	1-C	1-D
	No. 2	2-A	2-B	2-C	2-D
	No. 3	3-A	3-B	3-C	3-D

Hungarian consumption and capacity data in 2030

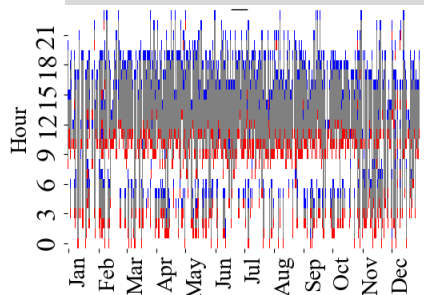
Portfolio name	Demand [TWh]	Nuclear [MW]	Gas [MW]	Solar [MW]	Wind [MW]	Hydro [MW]	Geo. [MW]	Biomass [MW]	Waste [MW]	Battery [MW]
No. 1 portfolio	57.8	4 400	2 400	6 400	329	58	3	796	100	100
No. 2 portfolio	57.8	2 000	2 400	6 400	329	58	3	796	100	100
No. 3 portfolio	68	4 400	4 000	12 000	329	58	3	796	100	100

Battery states

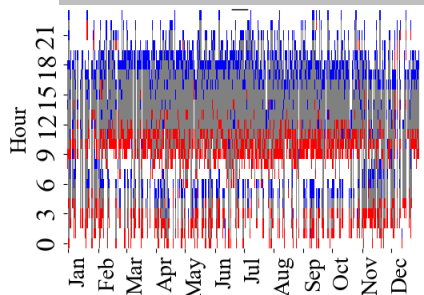
Battery states

Battery status at a given hour based on 2019 meteorological data

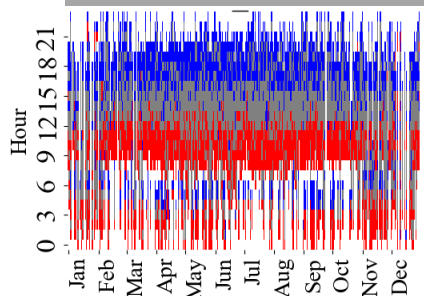
1 hour



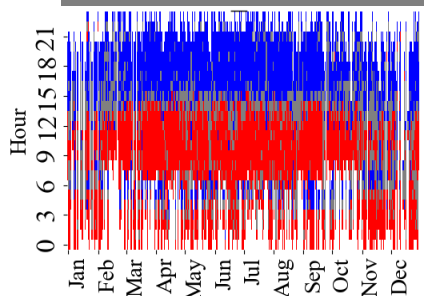
2 hour



4 hour



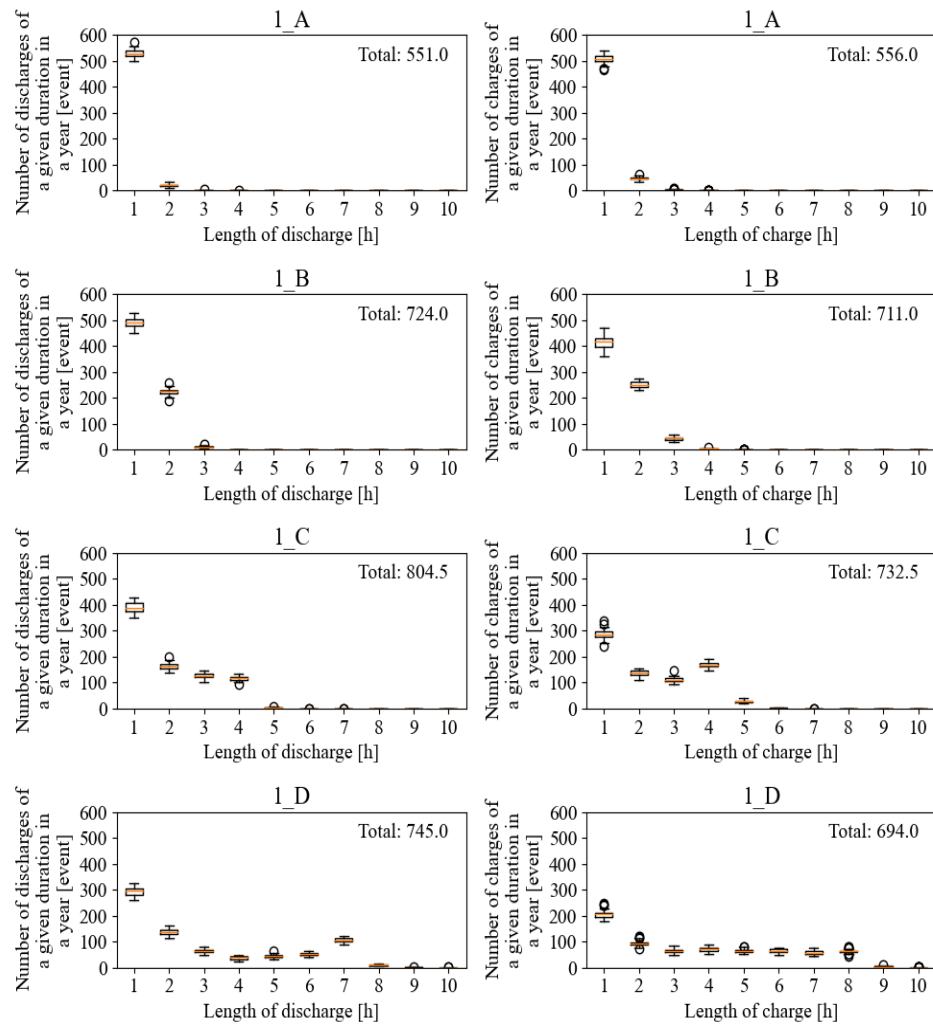
8 hour



□ Empty
■ Charge

■ Discharge
■ Storing

Charging time length [hours] and frequency [pcs]



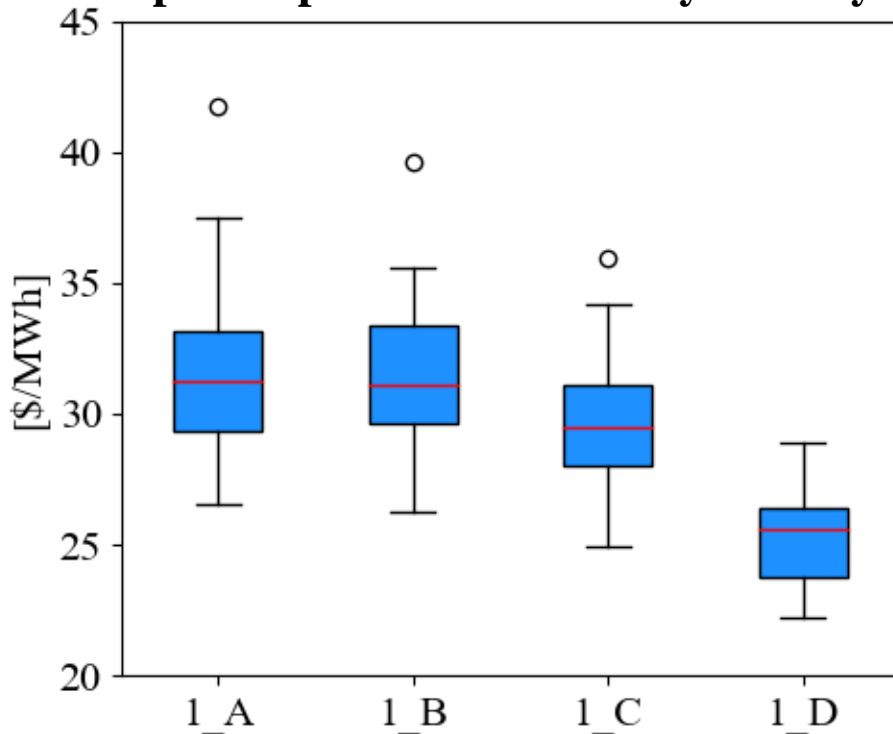
Discharge

Charge

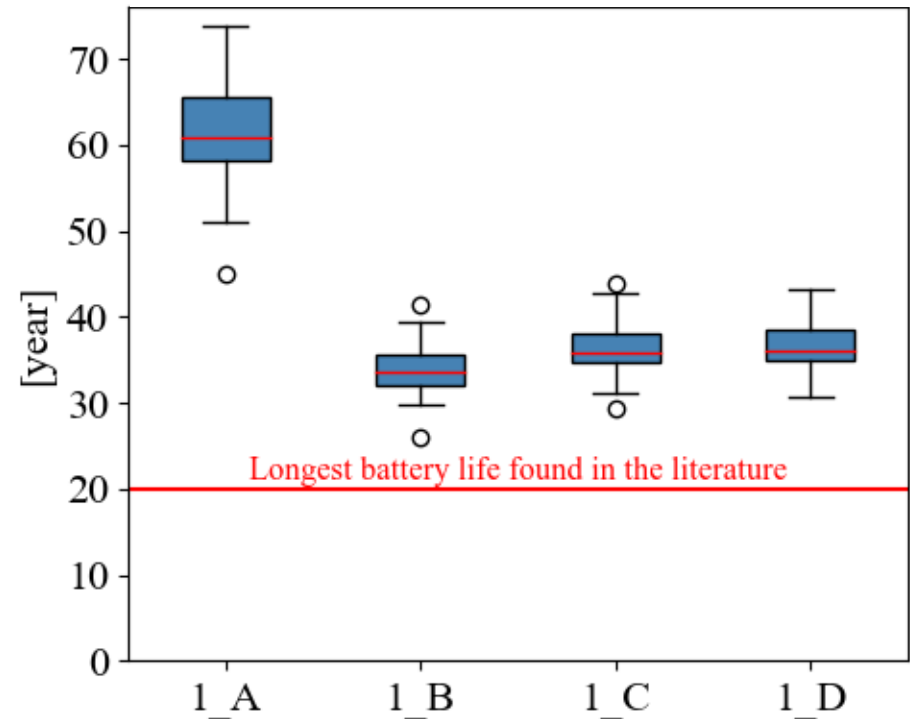
Source: Bence Biró, Attila Aszódi: Investigating the role of nuclear power and battery storage in Hungary using hourly resolution electricity market simulations; cikk szerkesztés alatt

Battery return on investment

Specific profit of the battery in one year



Time over which the battery would generate a return on investment based on price-arbitrage activity



Based on price arbitrage activity only

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