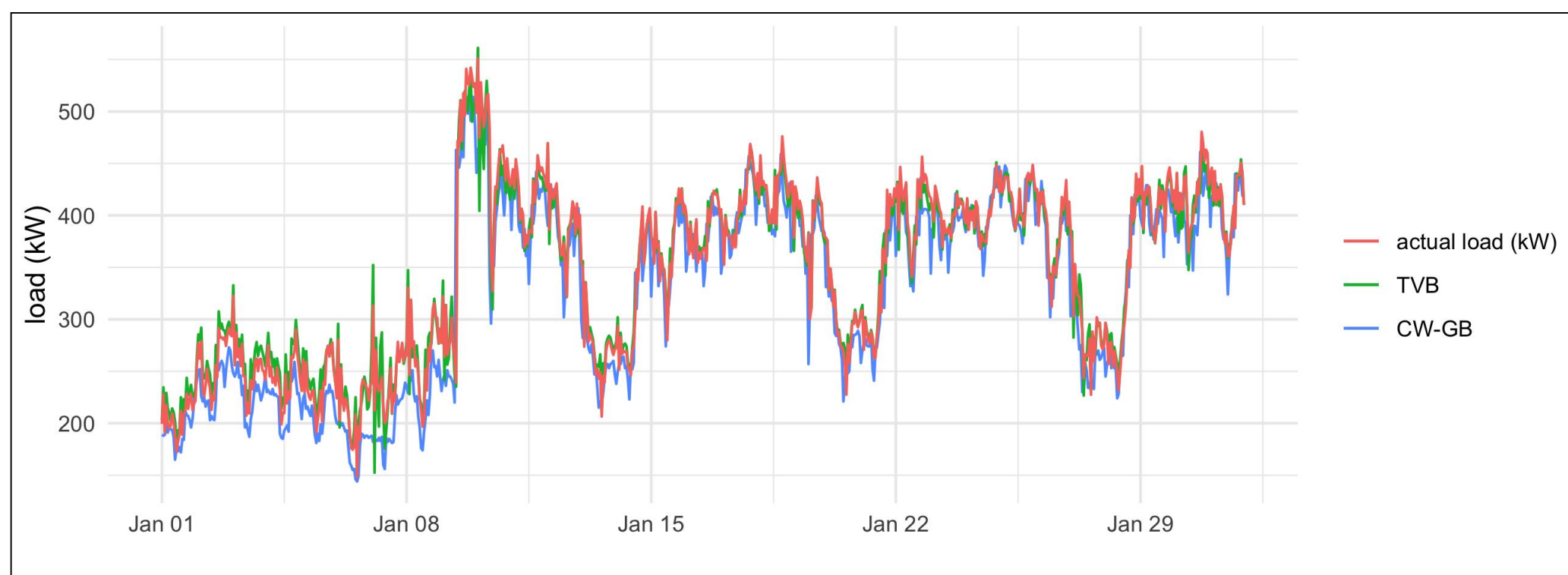


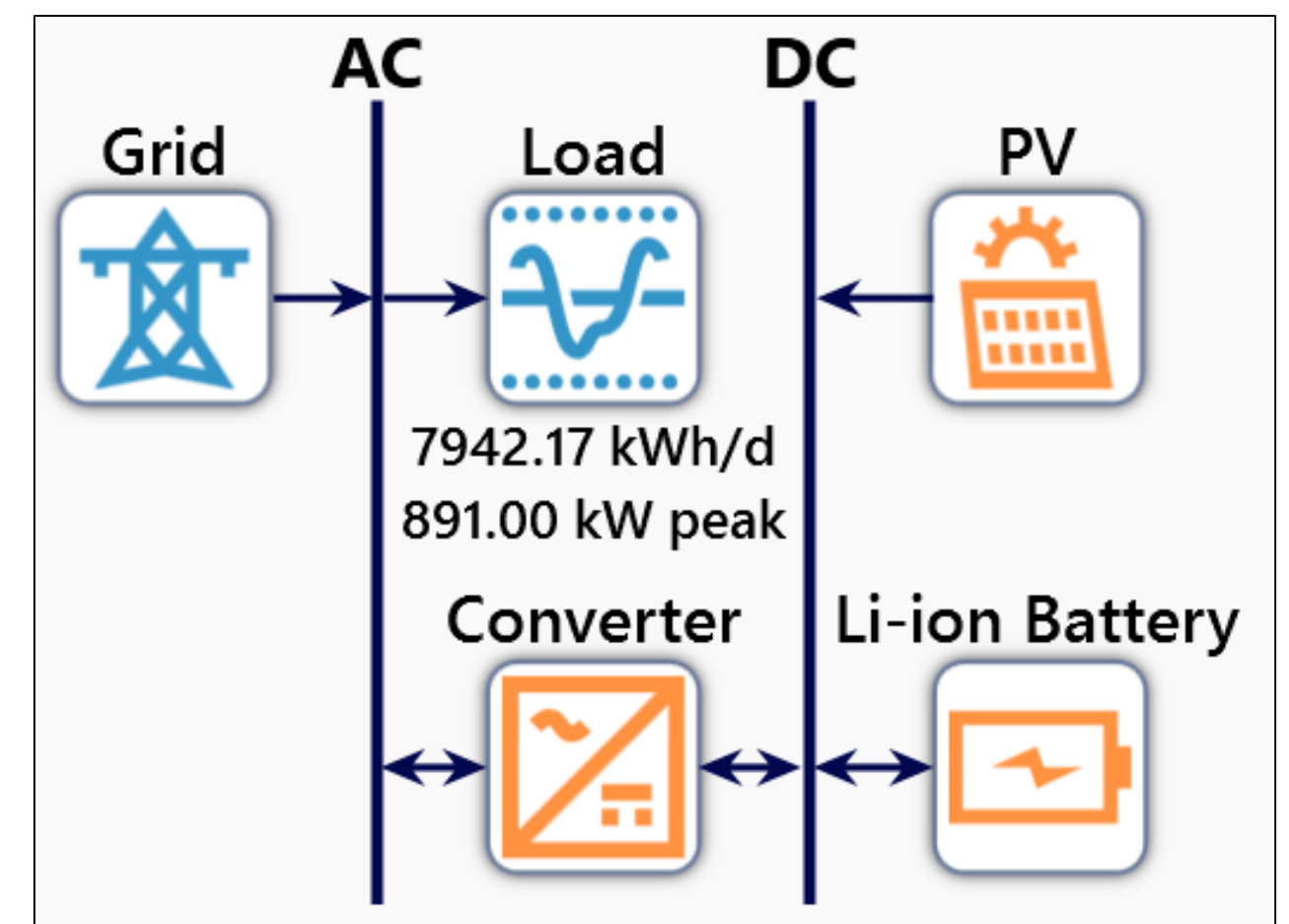
Forecasting and technoeconomic optimization of PV-battery systems for commercial buildings

Highlights

- Battery storage was only economically beneficial when forecasting was deployed
- Most of the savings came from peak shaving, not from increased self-consumption
- Accurate forecasting of electricity demand can be performed but the best model might be challenging in production



Actual loads (kW) for January 2018, and the predicted loads from TVB and CW-GB models, both models with the dependent variable lagged 1 hour.



Sketch of energy system. Figure adopted from Homer software.

Month	Case A	Case B	Case C		Case D
	Peak red. (%)	Peak red. (%)	Peak red. (%)	Demand Charge Saving (EUR)	Peak red. (%)
January	0	12	12	1680	5
February	0	9	9	950	0
March	0	11	11	630	0
April	0	6	6	60	0
May	9	15	15	170	9
June	10	27	27	350	10
July	6	17	18	170	8
August	7	20	22	200	8
September	14	23	24	170	15
October	7	29	32	220	9
November	9	26	26	830	11
December	0	17	17	1580	0

Monthly level of peak shaving reduction for the different cases, in % and in EUR.

Control	PV (kWp)	Battery (kWh)	COE (EUR/kWh)	Optimization
A) Cycle charging	240	0	0.0652	All components
B) Forecasting	240	135	0.0650	Only battery
C) Forecasting	322	135	0.0649	All components
D) Cycle charging	322	135	0.0658	No components

System dimensioning and cost of electricity.

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