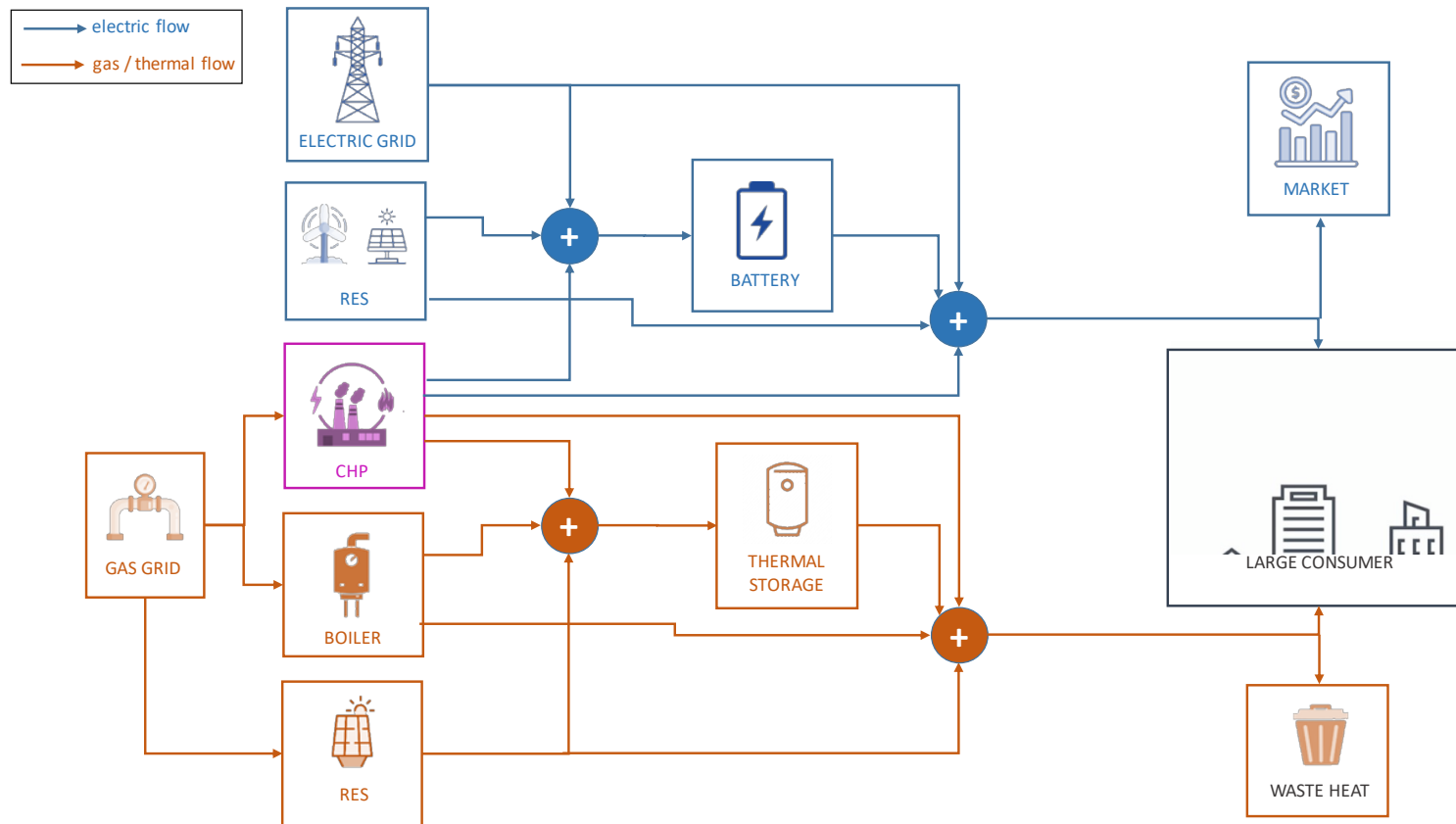# LIST OF FIGURES

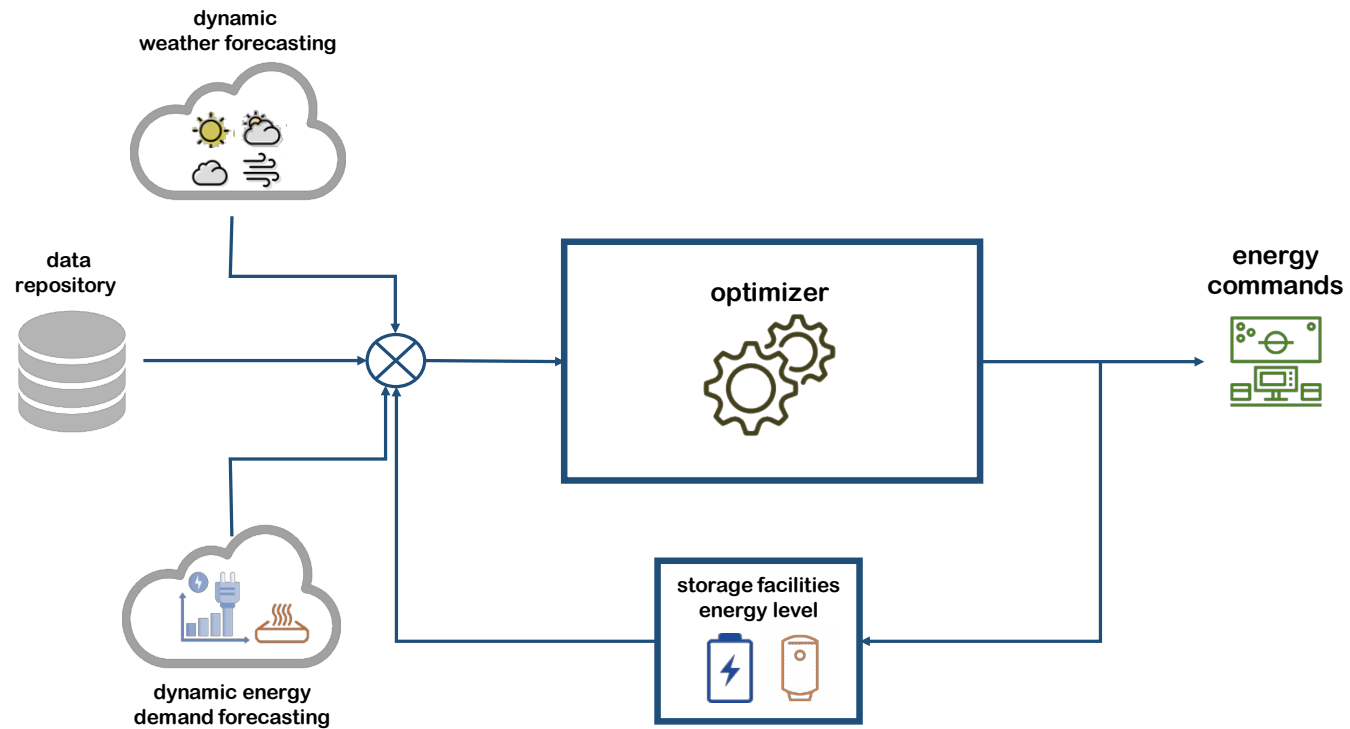**Figure 1. Conceptual architecture of the global system**

Figure 2. Distributed Energy Resource Control System (DERCS)
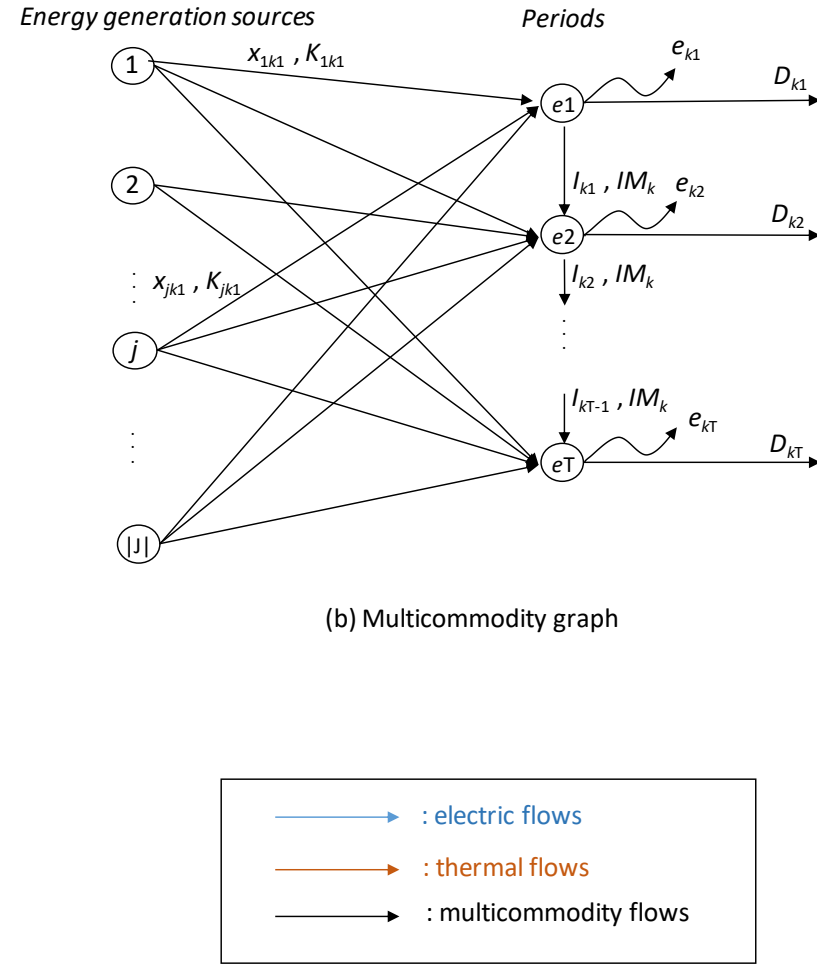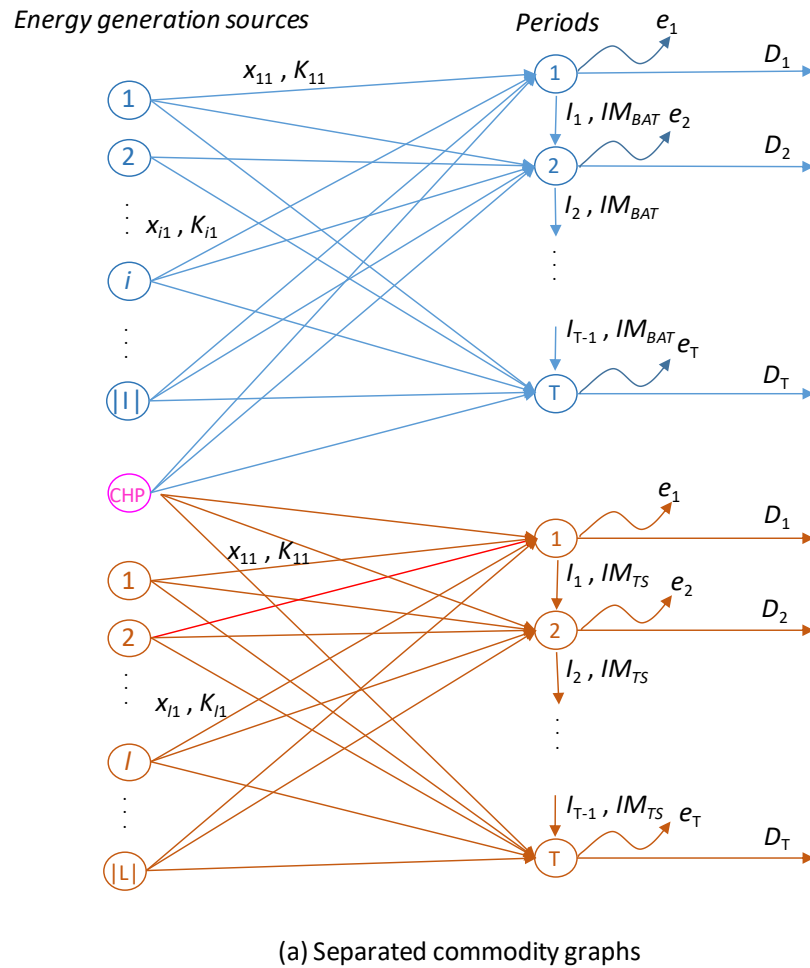
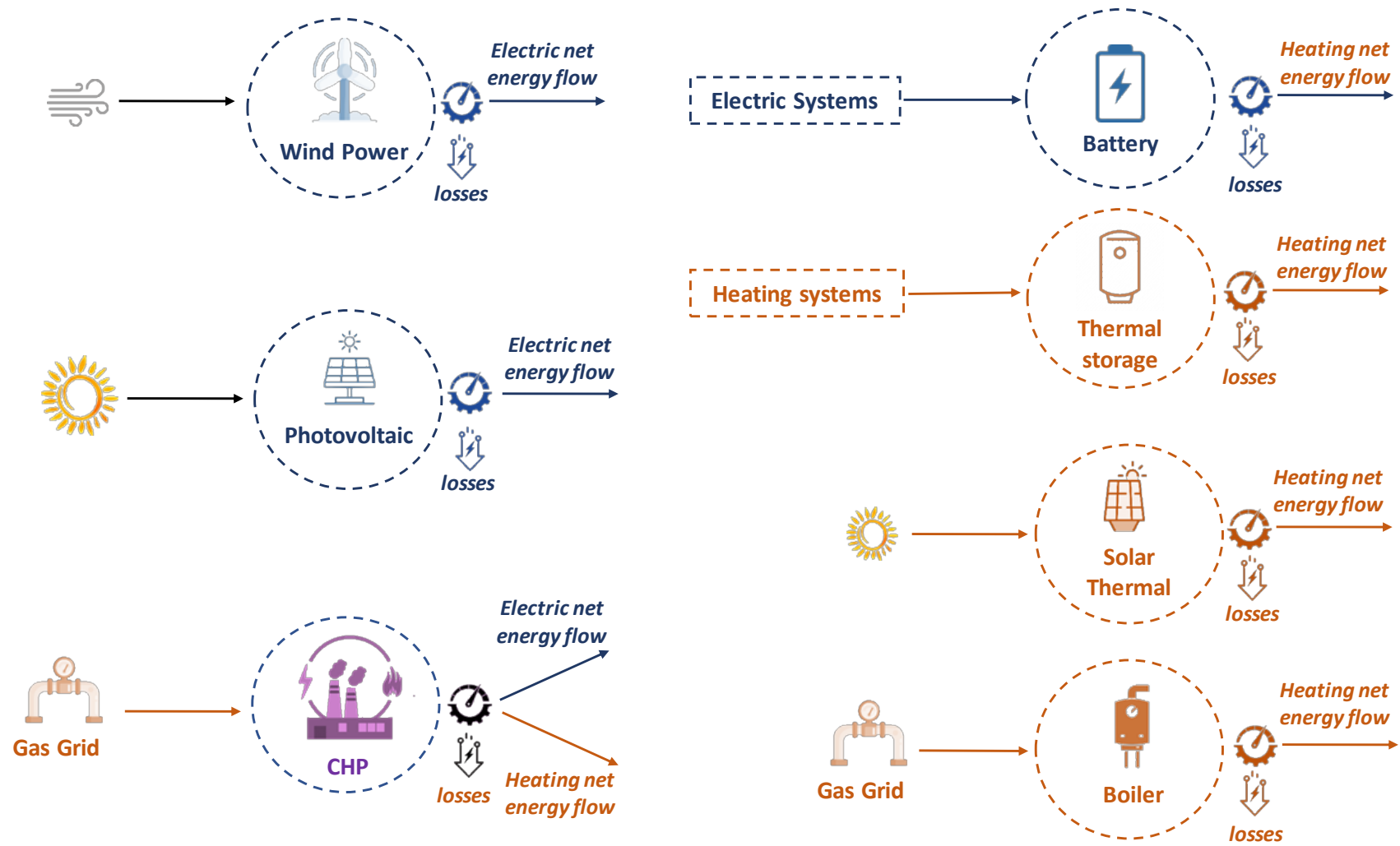Figure 3. Production-inventory graph with multiple production sources and capacitated arcs

Figure 4. Performance at the energy systems

	CHP		GRID		BOILER		BATTERY			THERMAL ST			PHV RES		WIND RES		SOLAR RES	
Instance	Av	Set-up	Av	Set-up	Av	Set-up	Av	Initial charge	Set-up	Av	Initial charge	Set-up	Av	Set-up	Av	Set-up	Av	Set-up
1a	✓	✓	✓		✓	✓												
2a	✓	✓			✓	✓	✓	1,000		✓	1,000		✓		✓		✓	
3a	✓				✓					✓	1,000		✓		✓		✓	
4a	✓	✓			✓		✓	0		✓	0		✓		✓		✓	
5a	✓				✓		✓	3,000		✓	2,000		✓		✓		✓	
6a			✓		✓	✓	✓	2,000		✓	1,500		✓		✓		✓	
7a	✓	✓			✓	✓	✓	2,500		✓	2,500		✓		✓		✓	
8a	✓	✓	✓		✓		✓	1,500		✓	1,500							
9a	✓	✓			✓	✓	✓	3,500		✓	3,500		✓		✓		✓	
10a	✓	✓			✓	✓	✓	4,000		✓	3,000		✓		✓		✓	
1b	✓		✓		✓													
2b	✓	✓			✓	✓												
3b	✓		✓		✓								✓		✓		✓	
4b	✓	✓	✓		✓	✓							✓		✓		✓	
5b					✓		✓	0		✓	0		✓		✓		✓	
6b					✓	✓	✓	0		✓	0		✓		✓		✓	
7b	✓						✓	500		✓	350		✓		✓		✓	
8b	✓	✓	✓		✓	✓	✓	0		✓	0		✓		✓		✓	
9b	✓		✓		✓		✓	600		✓	200		✓		✓		✓	
10b	✓	✓	✓		✓	✓	✓	800		✓	450		✓		✓		✓	

Av: availability of the energy system
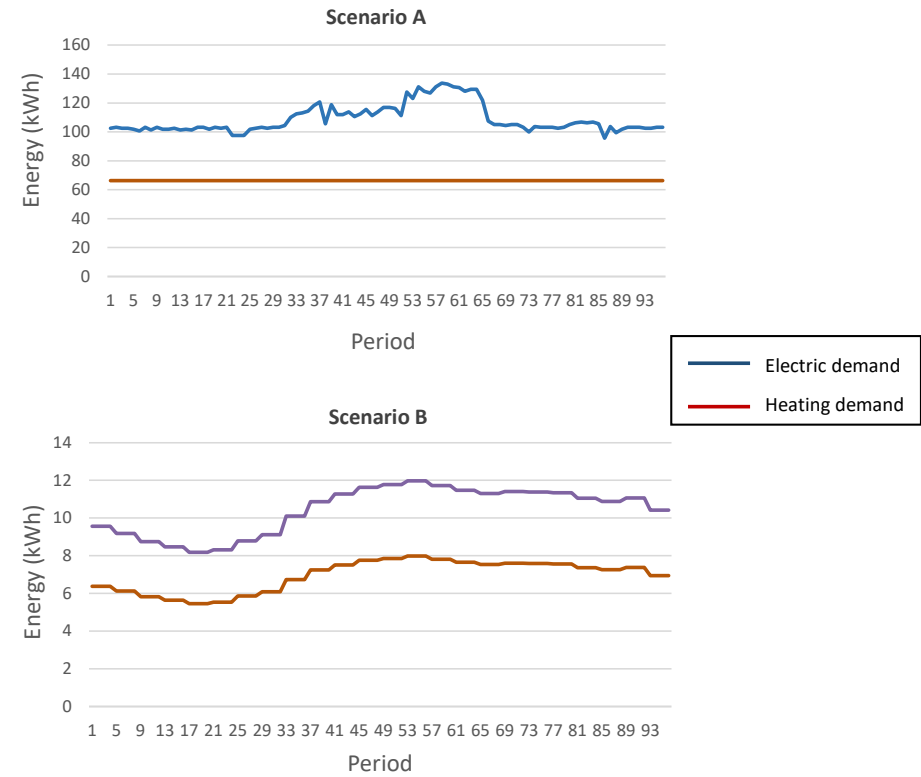Set-Up: initialization costs of the energy system

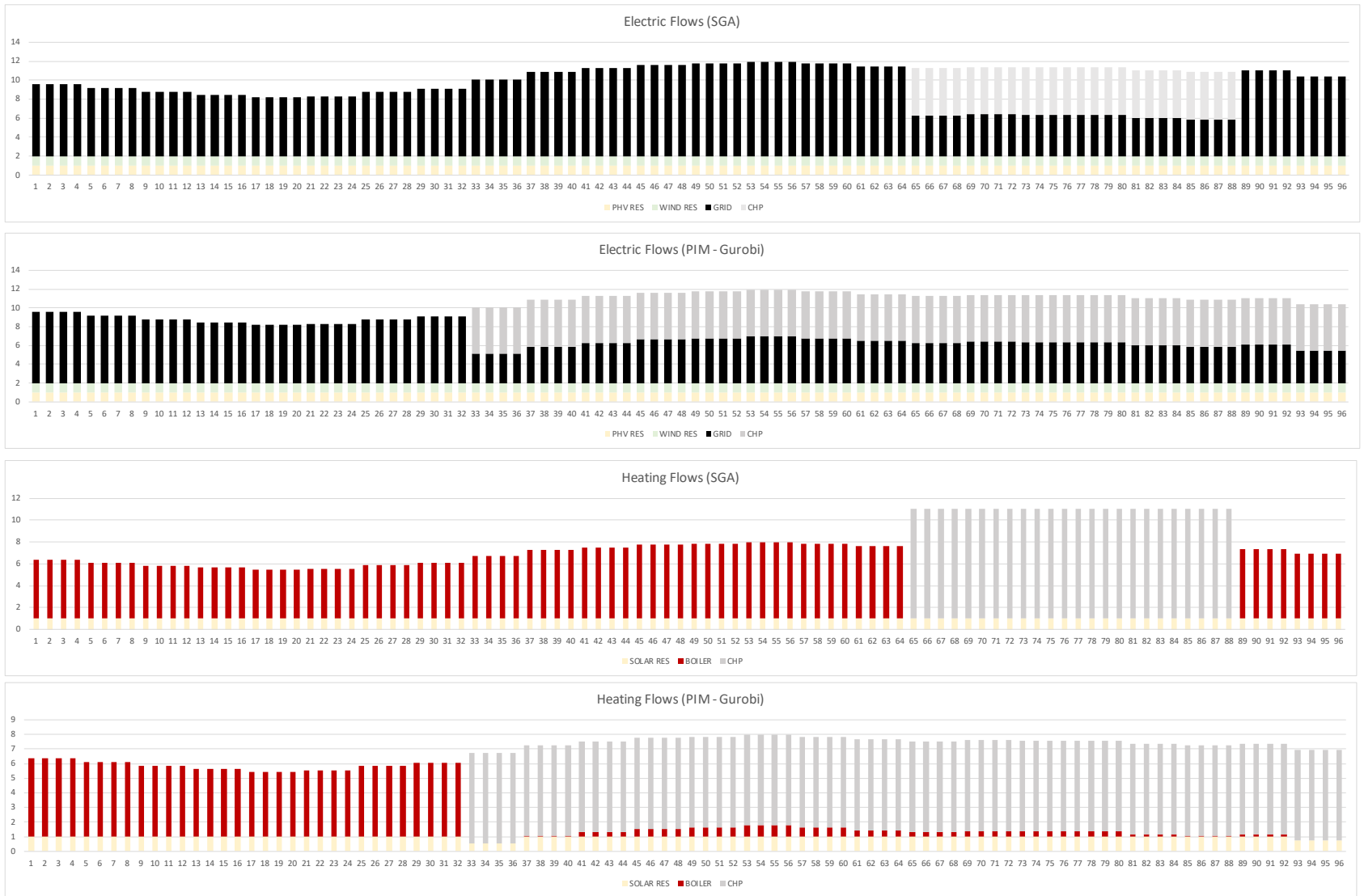**Figure 5. Scenarios and instances of the lab test library**

Figure 6. Comparison on the SGA and Gurobi command solutions for instance 3 in scenario B (3b)
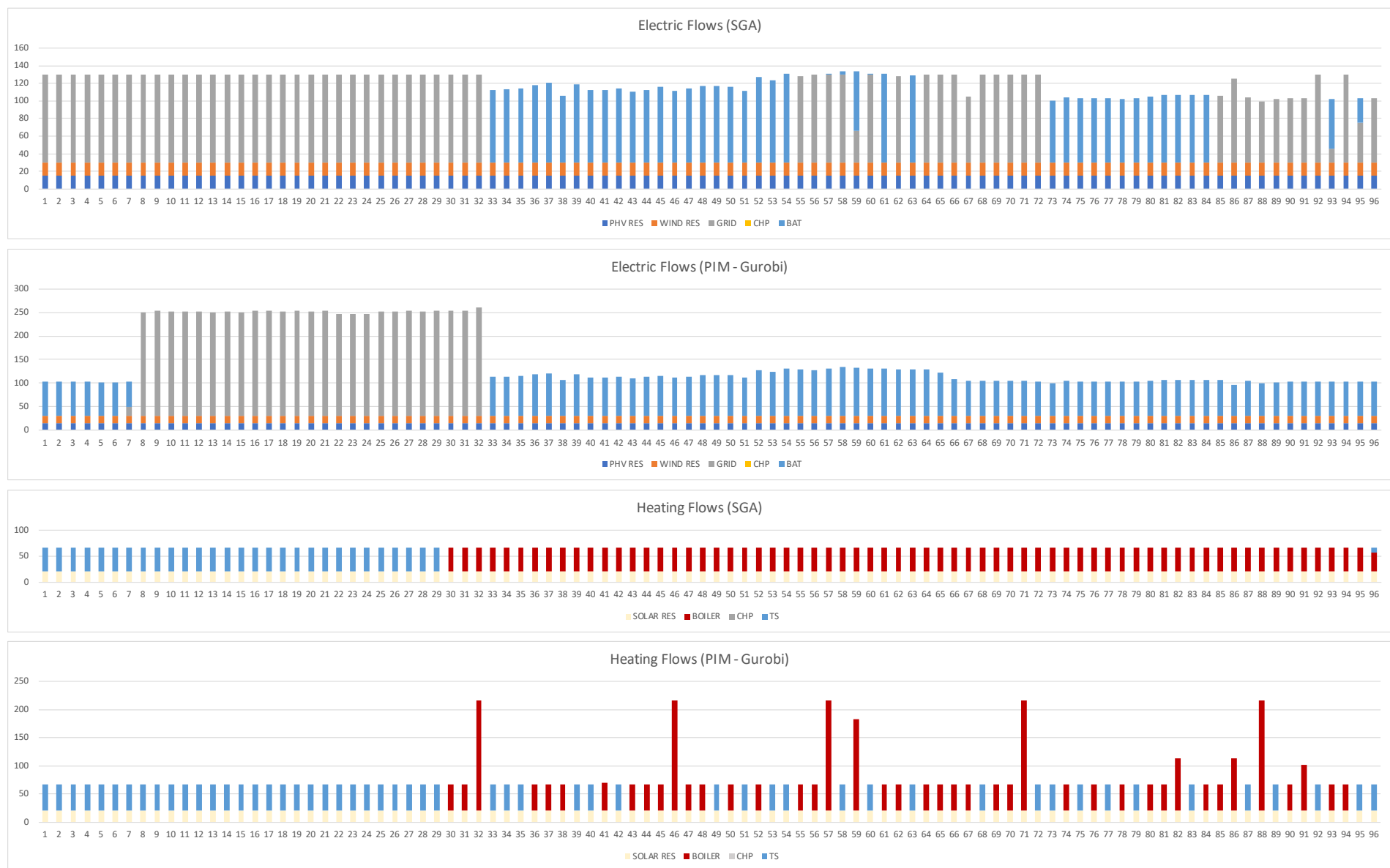
Figure 7. Comparison on the SGA and Gurobi command solutions for instance 6 in scenario A (6a)
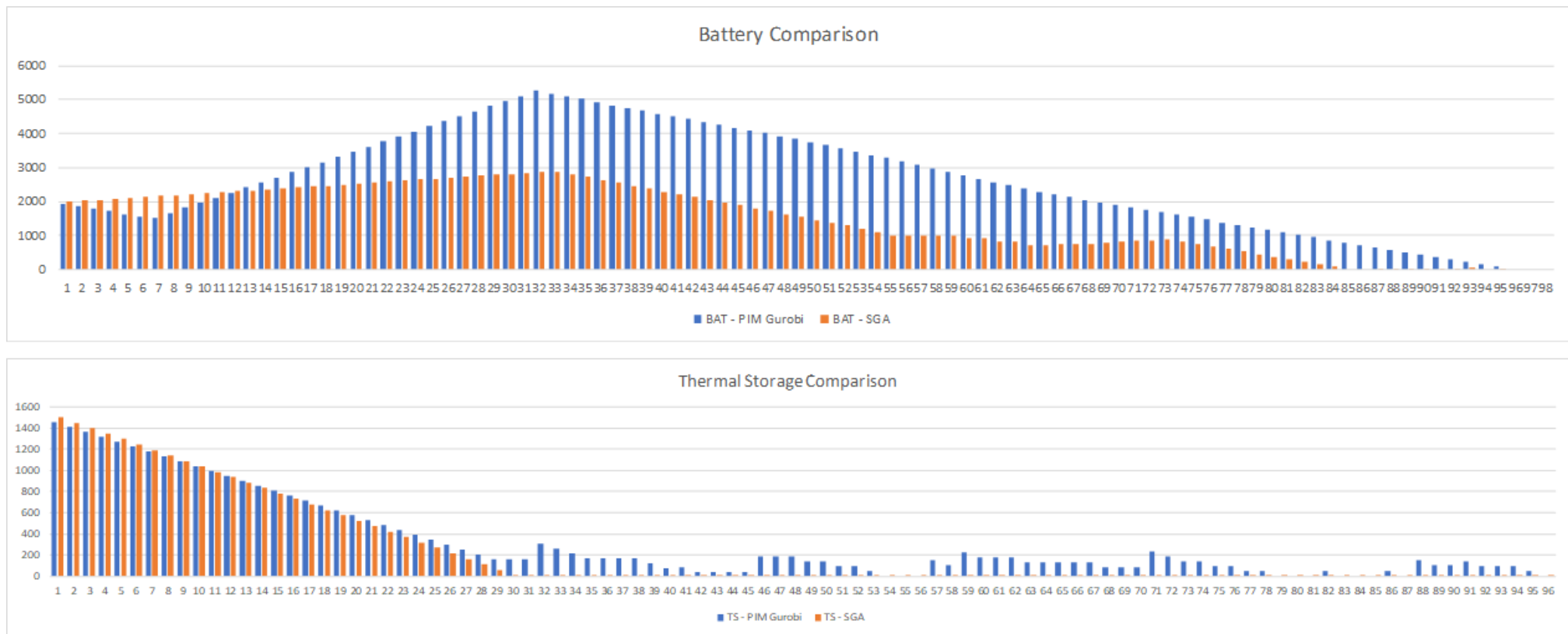
Figure 8. Comparison on the use of the storage facilities for instance 6a
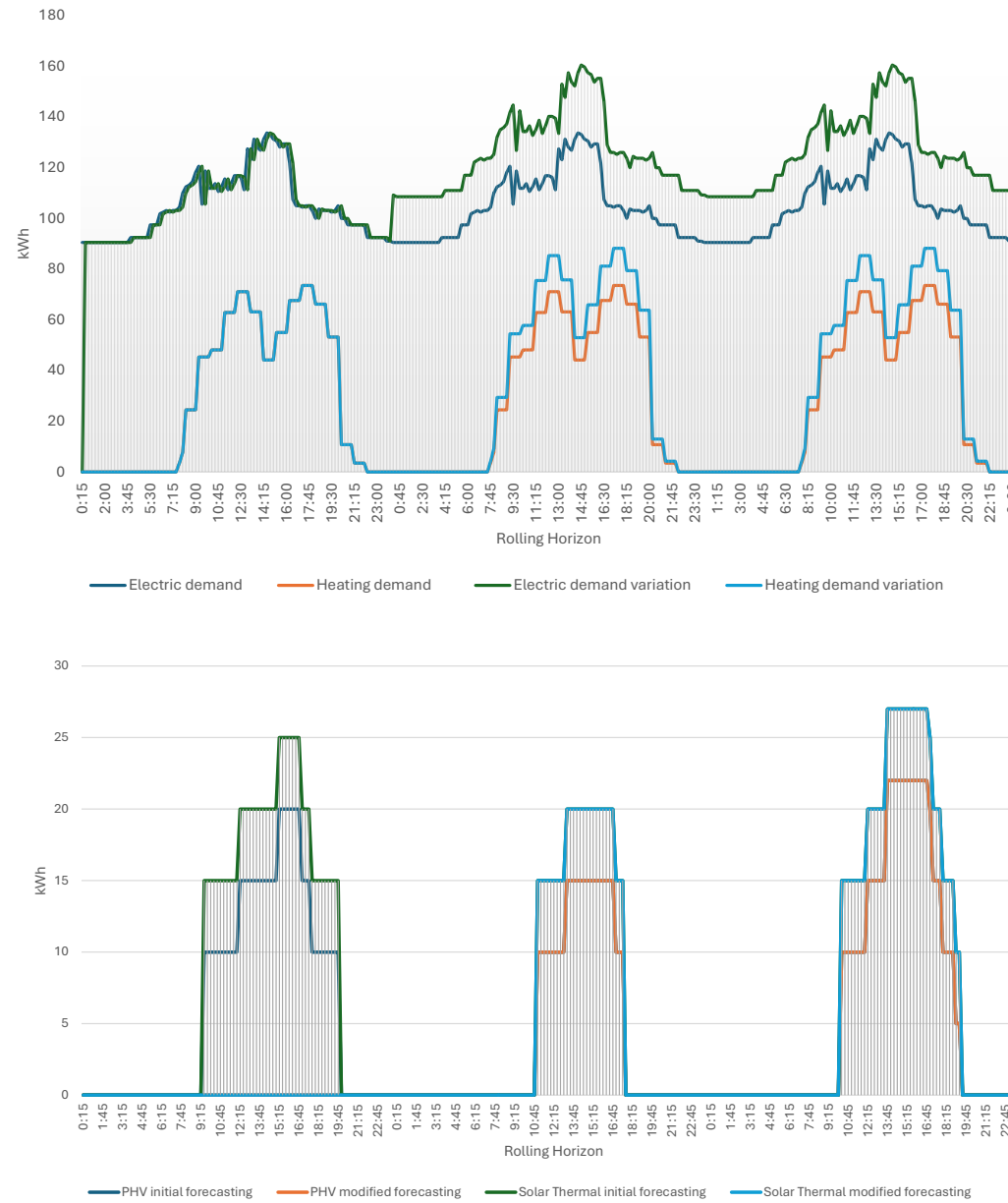
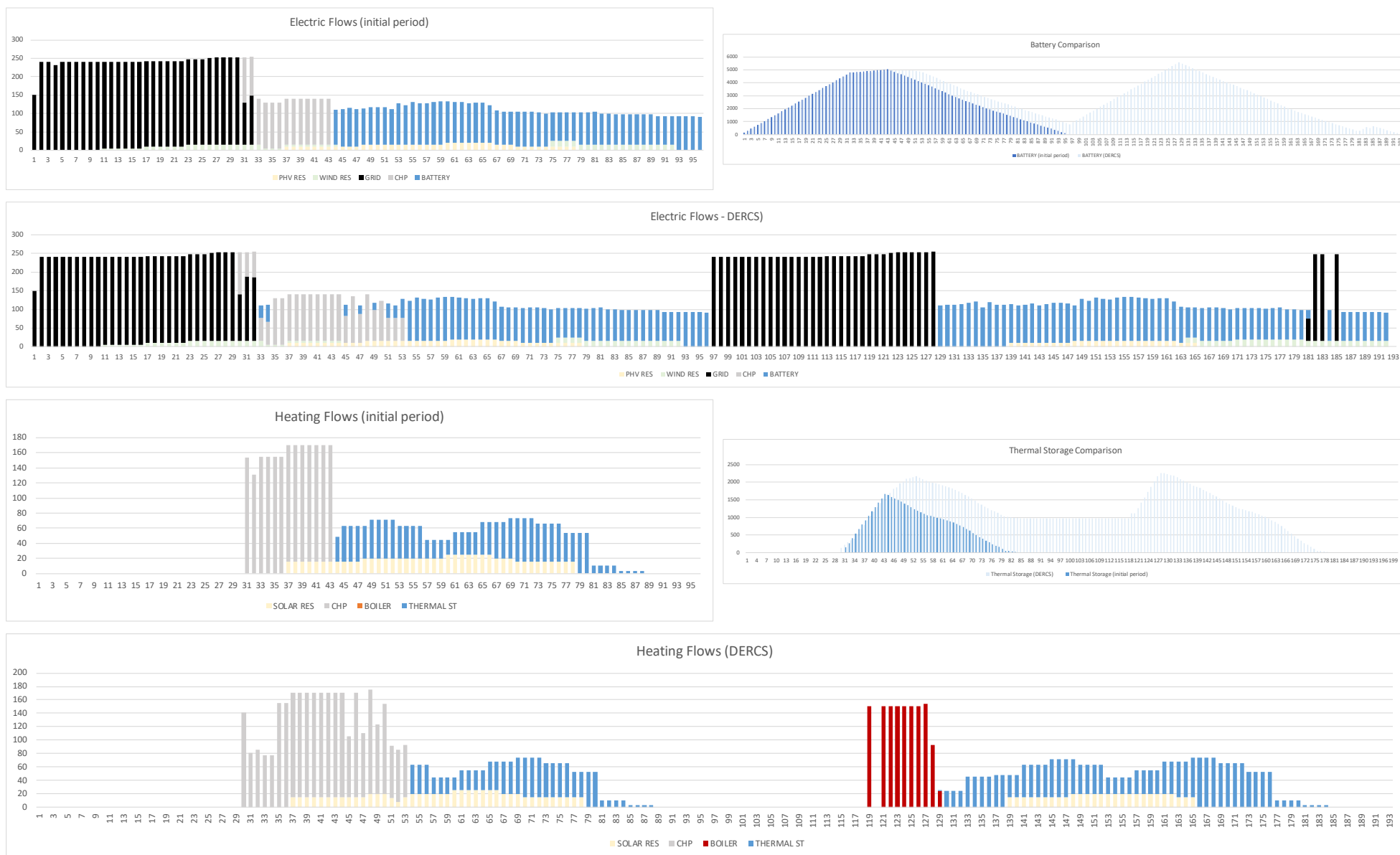**Figure 9. Base scenario and scenarios with the demand and weather forecasting modifications**

Figure 10. Comparison between the DERCS during the rolling horizon and the first solution provided by the PIM model at the beginning of the horizon
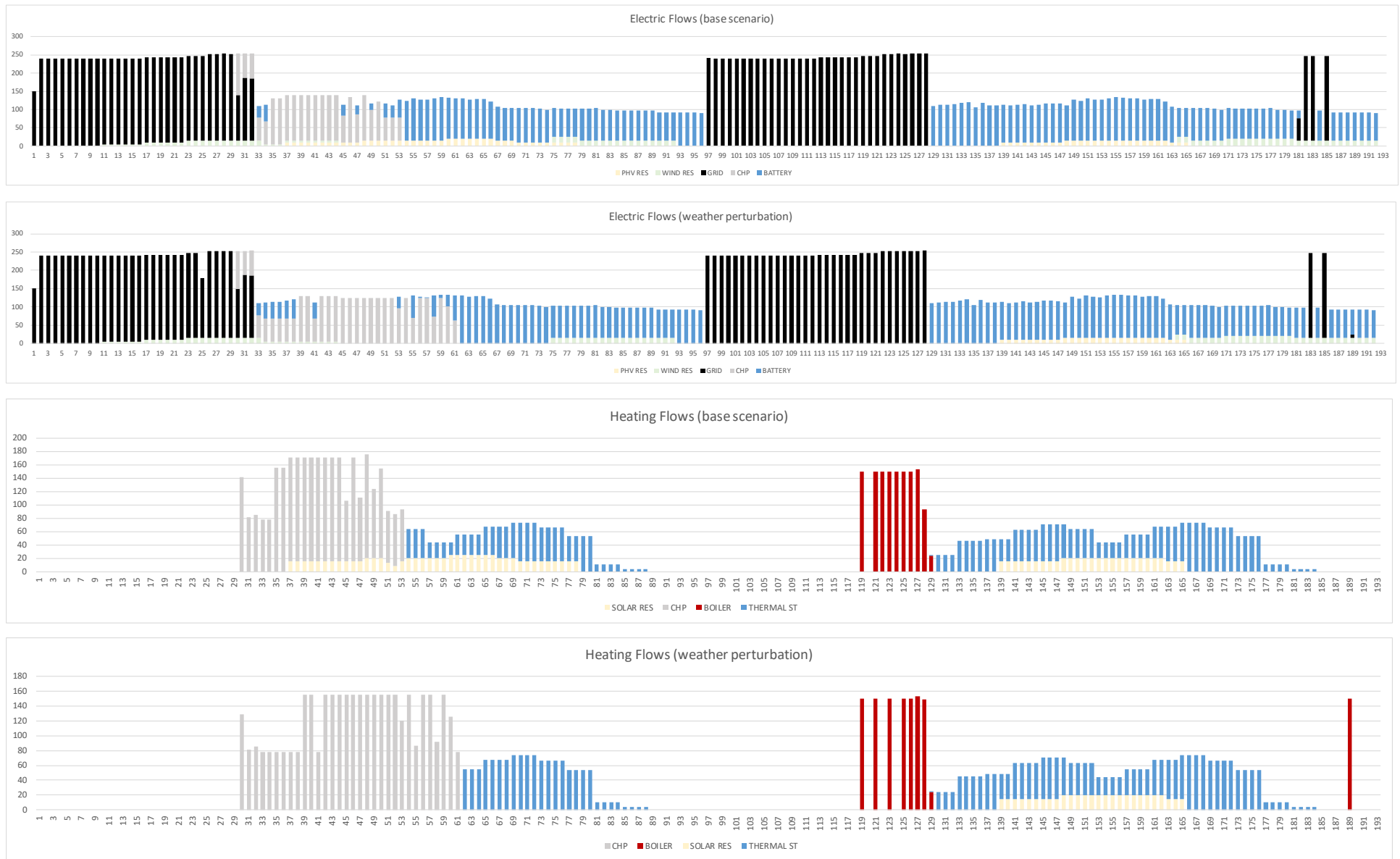
Figure 11. Analysis of the DERCS performance after a weather perturbation in the rolling horizon
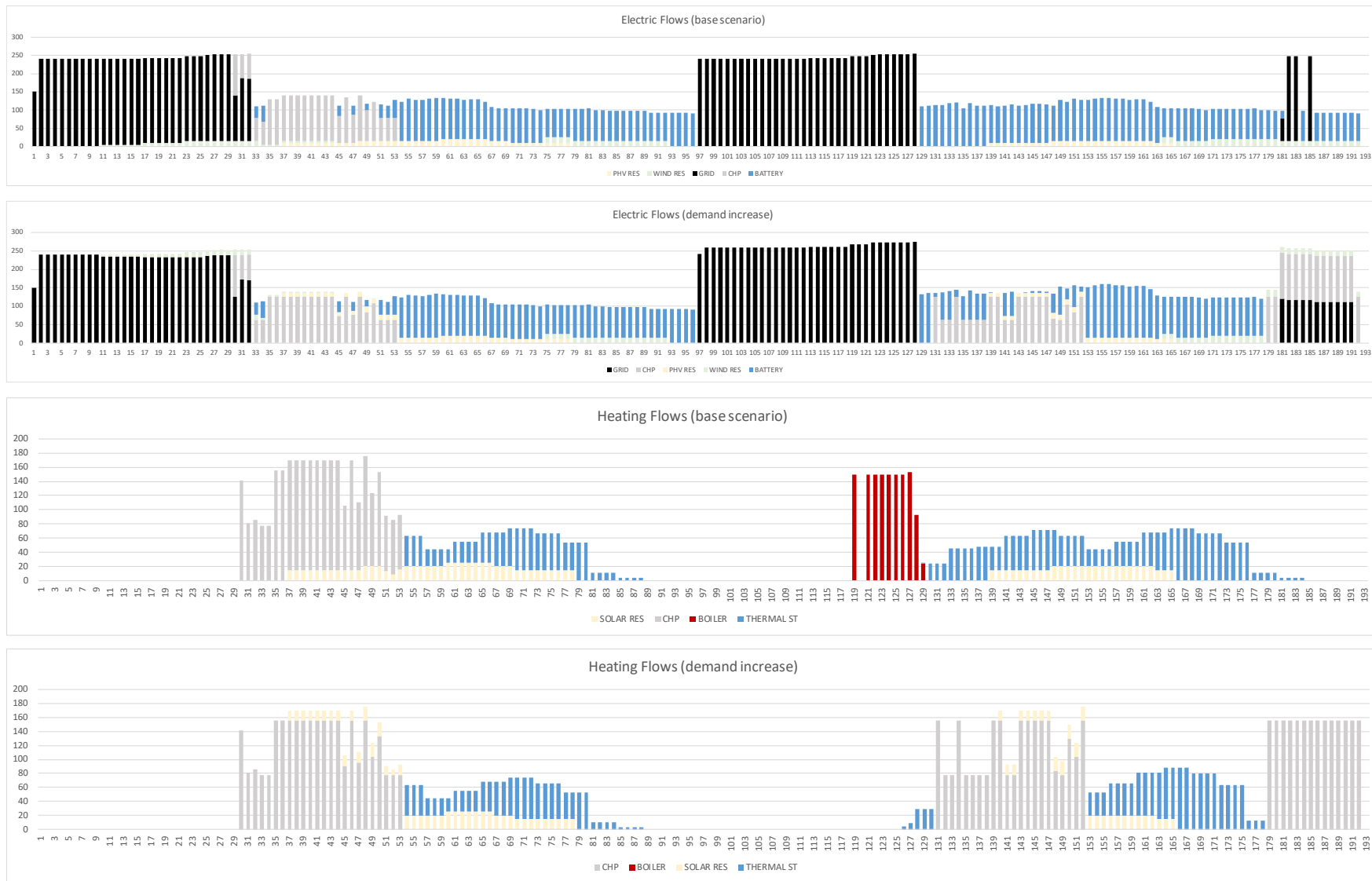
Figure 12. Analysis of the DERCS performance after an increase in the electric and heating demands in the rolling horizon