

Table S1. Cataloging Relevant Information

Reference	Purpose	Application	Data type	Forecast Models	Forecasting technique(s)	Time Horizon	Target Variable	Performance	Performance (metric)
[43]	Demand side management	Commercial (Building complex)	Real data	Blackbox	ANN-MLP	1 day	Building electricity consumption	Static 8.44–11.16% Accumulative 7.97–9.91% Sliding window 8.74–9.62%	CV%
[44]	Planning and optimization	Institutional (College campus)	Real data	Blackbox	ANN-NARX	24 hr	Heating load Cooling load Electrical load	Cooling–0.964; Heating–0.986; Electrical–0.933	R ²
[45]	Demand side management	Institutional (University buildings)	Real data	Blackbox	ANN-MLP	Daily - 22 days	Daily energy consumption	0.9852 to 0.9694	R ²
[46]	N/s	Institutional (University buildings)	Real data	Blackbox	Polynomial Exponential Mixed AR ANN-N/s SVM	2 day to 6 days	Overall electricity consumption	Polynomial-7.43–13.86%; Exponential-18%; Mixed-7.59–23%; AR-5.3–8.72%; ANN -N/s-7.89–12.55%; SVM-5.79–9.28%	MAPE
[47]	Energy management	Institutional (University building)	Real data	Blackbox	ANN-NARX	1 min 1 hr	Overall electricity demand	1 minute: 1–3.16%; 1 hour -5.49–33.29%	CV%
[48]	Energy management	District	Real data	Blackbox	ANN-Recurrent ANN-RBF-NARMA ANN-FFNN	24 hr	Cooling load	ANN-Recurrent 3.22×10^{-3} ANN-RBF-NARMA 1.69×10^{-3} ANN-FFNN 1.12×10^{-3}	MSE

[49]	Optimizing thermal energy storage	Commercial (Office buildings)	Simulated (ESP-r)	Blackbox	ANN-GRNN	1 hr	Cooling load	0.89–0.96	R ²
[50]	N/s	ASHRAE shootout Commercial (Office buildings)	Real data	Blackbox	ANN-MLP	1 hr 24 hr	Cooling load	ASHRAE 8.98 to 11.4%; Office 1 hr-2.39–3.02%; 24 hr-5.47 to 12.58%	CV%
[51]	Building energy management	ASHRAE shootout PROBE N benchmark	Benchmark	Blackbox	ANN-Feedback	1 hr	Energy consumption	ASHRAE 1.44% PROBEN (Real data) 2.55%	CV%
[52]	Demand side management	Institutional (University campus)	Real data Benchmark	Blackbox	AR model Polynomial ANN-N/S SVM	1-6 day	Electricity consumption ASHRAE data EUNITE data set	1day 1–6 days AR: 5.74–13.78%; 7.35-10.97%; SVM: 5.88-14.25%; 7.92-11.58%; Poly: 6.94–19.78% 11.91–15.75% ANN: 6.63–17.64% 10.97–17.11%	MAPE (%)
[53]	Demand side management	Institutional (University campus)	Real data	Blackbox	ANN-MLP	1 day	Overall electricity usage	2.59–5.42%	MAPE (%)
[54]	Demand side management	Commercial (Shopping centers)	Real data	Blackbox	MA LR PLR ANN-N/S	1 day	Overall electricity usage	ANN-N/s-11.06%; MA-25.4%; Linear Regression-17.96%; Piecewise linear regression-21.65%	MAPE (%)
[55]	Building energy management	Institutional (Hospital)	Real data	Blackbox	ANN-BPNN	Daily	Overall electricity usage	6.97 to 11.15%	MAPE (%)
[56]	N/s	Commercial (Center)	Real data	Blackbox Hybrid-ensemble	MLR ARIMA SVM DT (RF) ANN-MLP	Daily	Overall energy consumption	Consumption Peak MLR-4.23– 6.08%; ARIMA-5.45– 8.74%;	MAPE (%)

					MARS Knn Ensemble		(kWh) Peak demand (kW)	SVM-3.11–3.34%; DT (RF)-3.17–3.63%; ANN-MLP-4.75– 6.46%; MARS -4.07– 5.94%; kNN-4.01– 5.77%; Ensemble-2.32– 2.85%	
[57]	Optimizing thermal energy use	Commercial (Office)	Real data	Blackbox	ELM MLR ANN-BPNN SVR	40 min	Heating load	MLR 0.11–0.14 3.86–4.28 kWh BPNN 0.13–0.14 4.10–4.26 kWh SVR 0.15–0.16 4.46–4.68 kWh ELM 0.12–0.14 3.82–4.26 kWh	MAPE RMSE (kWh)
[58]	Energy policy and decision making	Sector (Residential)	Real data	Hybrid-grey Blackbox	ANN-NAR Regression Polynomial	Annual	Electricity consumption Total building energy consumption	Energy Consumption ANN-NAR-0.937 Regression-0.910 Polynomial-0.874 Grey-0.964 Electricity Consumption ANN-NAR-0.971 Regression-0.922 Polynomial-0.897 Grey-0.954	R ²
[59]	Demand and supply management	Commercial (Office) Residential (Apartment)	Simulated (EnergyPlus)	Blackbox	MLR AR ARX ANN-BPNN	1 hr	Heating loads Cooling loads	Commercial Heating Cooling MLR 173–249 47.5–48.5% AR 124.6–185.9 32.4–37.6% ARX 49.6–178 8.8–34% ANN-BPNN 121.2–174.9 25.3–30.6% Residential Heating Cooling	CV%

								MLR 58.5–70.7 17.9–25.9% AR 14.7–23.7 8.3–8.6% ARX 10.8–22 5.0–6.9% ANN-BPNN 23–23.3 6.4–7.1%	
[60]	Demand side management	Institutional (University campus)	Real data	Blackbox	ANN-BPNN	1 hr	Overall electricity usage	2.22–9.93%	MAPE (%)
[61]	Demand side management	Commercial and Industrial buildings	Real data	Hybrid-ensemble	ANN-E-FFNN	1 day	Electricity usage	3–8%	MAPE (%)
[62]	Energy demand and supply management	Institutional (University building)	Real data	Blackbox	AR model ARIMAL ANN-N/S Bayesian N	1 day 2 days	Overall electricity consumption	1 day 2 days AR 4.26–8.14% 7.86–13.26% ARIMA 13.13–13.54% 13.05–14.62% ANN 3.46–4.11% 9.12–14.46% Bayesian 6.87–22.75% N/a	MAPE (%)
[63]	Demand side management	Institutional (University building)	Real data	Blackbox	ANN-MLP	4 days	Heating demand	0.61 – 085	R ²
[64]	Demand response	Commercial (Office building)	Real data	Hybrid-grey	ANN-NAR	1 to 6-hr	Electric demand of supply fan	Supply fan modulation – 5.5% (RMSE)–17.6% Electric demand –1.4 kW (RMSE)– 30%	RMSE (% , kW) CV%
[65]	Energy management	Institutional (University buildings)	Real data	Blackbox	Random forest ANN-FFNN FIR ARIMA	1 day	Electricity consumption	LIBRARY Random forest 139.8–225.6% ANN-FFNN 60.2 –265.4%	MAPE (%)

								FIR 14.8– 173.2% ARIMA 140.4–191.7% BAR Random forest 16.5–46.7% ANN-FFNN 22.3–98.8% FIR 13.9–123.6% ARIMA 89.2–131.3% CLASS Random forest 18.2– 26.2% ANN-FFNN 21.6–39.9% FIR 4.5–10.4% ARIMA 19.8–21.2%	
[66]	Energy management	Institutional (University buildings)	Real data	Blackbox	ANN-NAR ANN-NARX ANN-ENN	1 hr	Energy consumption	ANN-NAR 0.002953– 0.12060 ANN-NARX 0.003324– 0.011442 ANN-ENN 0.001376– 0.007585	MSE
[67]	Energy management	Institutional (University buildings)	Real data	Blackbox	ANN(NAR) ANN(NARX)	1 hr	Energy consumption	ANN-NAR 1.26 ANN-NARX 1.10	MSE
[68]	Demand side management	Residential (Houses)	Real data	Blackbox	Persistence AR ANN-WT LS-based ST ANN-based ST NM-AR WT-NM-AR Proposed	6 hr 24 hr	Electricity load	6 h 24 hr Persistence 18.83–19.21 21.93–22.85 AR 15.50–18.64 18.01– 19.42 ANN-WT 13.22–16.46 16.41–17.65 LS 12.55–16.06 15.51–17.21 ANN 12.31–15.83 15.11– 17.10	RMSE (%)

								NM-AR 12.04–14.99 13.72–16.17 WT-NM 1.91–13.93 13.11– 14.41 Proposed 11.88–13.58 12.92–14.06	
[69]	Model predictive controllers	Commercial (Office)	Simulated (EnergyPlus)	Blackbox	ANN-FFNN	1 hr	Temperature Radiant temperature Electrical power	Heating Cooling Temp 0.902–0.953 0.819–0.936 Temp rad 0.856–0.940 0.865–0.893 Elect 0.828–0.952 0.864–0.962	R ²
[70]	Demand side management and demand response	Commercial (Office buildings)	Real data	Blackbox	ARIMA SVM ANN-BPNN ANN-RBFNN ANN-GRNN FA WT+BPNN WT+RBFNN WT+GRNN WT+FA WT+FF+FA WT+MI-MI+NN Proposed	1hr 24hr 2 days 1 week	Overall building energy consumption	1 hr 2 days ARIMA 4.26–21.83% 22.65% SVM 11.87–34.21% 22.02% ANN-BPNN 9.48–27.8% 21.1% ANN-RBFNN 8.4–14.05% 17.01% ANN-GRNN N/S 13.21% FA N/S 11.23% WT+BPNN 7.43–12.42% 9.34% WT+RBFNN 6.32–9.54% 8.22% WT+GRNN N/S 8.03% WT+FA N/S 7.25% WT+FF+FA N/S 6.98% WT+ +NN 4.59–8.94%	MAPE (%)

								6.02%	
								Proposed 2.14–3.95%	
								2.14%	
[71]	N/s	Residential (Houses)	Real data	Hybrid-grey	Hybrid ANN-MLP SVR LSSVM GMM GPR	1 hr 24 hr	Total building consumption , Non-AC building electricity consumption	1 hr 24 hr Hybrid 11.2–26.2% 11.3–29.2% ANN-MLP 12.5–28.2% 12.6–34.4% SVR 12.8–27.3% 12.4–31.9% LSSVM 13.2–28.7% 11.8–31.4% GMM 19.5–31.9% 20.2–37.8% GPR 21.4–32.3% 22.7–39.3%	CV%
[72]	HVAC optimization	Commercial (Air handling unit)	Real data	Hybrid-ensemble	ANN-E-MLP	30 min	Energy consumption , Room temperature	Energy consumption-0.067 Room temperature-0.004	MAPE
[73]	Power systems operation and planning	Sectors	Real data	Blackbox	x2 Moving average x1 expo smoothing x2 expo smoothing ARMA ANN-BPNN GMHD network	Monthly	Sector energy consumption	Double moving avg 1.82–6.14% x1 expo smoothing 1.59–6.2% x2 expo. Smoothing 1.61–5.3% ARMA 1.86–3.9% ANN-BPNN 1.34–3.86% GMHD network 0.83–2.69%	MAPE (%)
[74]	District energy management	Residential (District)	Real data	Blackbox	ANN-D-MLP	30 mins	Overall building	0.995–0.999	R

							electricity consumption		
[75]	N/s	State (Industrial sector)	Real data	Blackbox	ANN-D-MPL Regression	1 year	Industrial electricity consumption	ANN-D-MLP 0.0099 Regression 0.0750	MAPE
[76]	N/s	Institutional (Chiller-university)	Real data	Blackbox	Kernel Regression ANN-Dynamic SVR MP Regression	24hrs	Chiller electric power consumption	Kernel Regression 4.9% ANN-Dynamic 3.8–6.6% SVR 4.6–4.8% MP Regression 2.9–4.0%	CV%
[77]	Demand side management	Commercial (Office building)	Simulated (EnergyPlus)	Blackbox Hybrid-grey	Resistor-Capacitor ANN-D-N/s SVR N4SID	6 hr	Building cooling energy	R/C 0.81 – 0.87 ANN-D-N/s 0.57 – 0.93 SVR 0.69 – 0.73 N4SID 0.44 – 0.89 SID 0.86 – 0.96	R ²
[78]	Demand side management	Institutional (Building)	Real data	Blackbox	MLR ANN-FFNN ANN-NARX Regression Tress SVR	1 day	Building electricity consumption , Peak electricity load	Day ahead Peak MLR 3.49–7.71 5.27–11.28% ANN-FFNN 2.31–4.64 0.95–8.19% ANN-NARX 1.04–2.31 1.01–9.74% RTrees 2.31–8.60 3.23–9.3% SVR 3.69–5.55 4.19–9.53%	MAPE (%)
[35]	Emission estimation models	Commercial (Center)	Simulated (EnergyPlus)	Blackbox	ANN-FFNN NARX GPR Ridge regression MLR	Annual	Building gas load	ANN-FFNN 17–40% GPR 18–39% NARX 20–61% Ridge 22–61% MVR 21–69%	Relative error
[79]	Supply side management	Commercial (Office)	Real data	Blackbox	ANN-FFNN	1 hr	Cooling demand,	Cooling demand 8.2% Air temperature 7.12% Relative humidity 9.00%	Relative error

							Air temperature, Relative humidity		
[80]	Demand side management	Institutional (University)	Real data	Blackbox	ANN-FFNN ANFIS	Daily	Cooling load	ANN-FFNN 0.9700–0.9804 ANFIS 0.9696–0.9763	R ²
[81]	Power systems operation and planning	Sector (Residential)	Real data	Blackbox	SVR-PSO ANN-MLP ARIMA MLR	Monthly	Electricity demand	SVR-PSO 2.13% ANN-MLP 9.92% ARIMA 4.71% MLR 7.15%	MAPE (%)
[82]	Demand side management	N/s	Real data	Blackbox Hybrid-ensemble	ARIMA ANN-MLP ANN-E-MLP	Day	Cooling load	ARIMA 9.17% ANN-MLP 3.45–7.88% ANN-E-MLP 3.65%	MRE
[83]	Demand side management	Commercial (Office building)	Real data	Blackbox	Linear ANN-FFNN ANN-D-FFNN	1 hr	Heating load Cooling load	Heating Cooling Linear 0.61–0.62 0.09–0.29 ANN-FFNN 0.63–0.79 0.30–0.88 ANN-D-FFNN 0.63–0.80 0.27–0.91	R ²
[84]	Demand side management	Institutional (N/s)	Real data	Blackbox	ANN-FFNN CBR	1 hr to 6 hr	Electricity consumption	ANN-FFNN 1 2 3 4 5 6 All 8.38 8.09 8.01 7.94 8.05 7.95% PCA 8.48 7.97 7.91 7.51 7.56 7.30% CBR 1 2 3 4 5 6 All 14.3 13.8 13.7 13.7 13.6 13.5% PCA 13.4 13.1 13.3 13.5 13.6 13.6%	CV (RMSE)

[85]	Energy efficiency improvement	Residential (District heating)	Real data	Blackbox Hybrid Ensemble	LR ETR ANN-D-FFNN SVM Ensemble -HT	1 day	Thermal load	Static Dynamic (24 hr) LR 17.34% 17.27% ETR 12.34% 12.42% SVM 14.54% 14.72% ANN 11.92% 11.56% Expert 12.06% 11.95%	MAPE (%)
[86]	Model Predictive Controllers	Residential	Simulated	Blackbox	ANN-WNARx ANN-NARX	24 hrs	Heating demand	ANN-WNARX 99.8 ANN-NARX 95.10	R ²
[87]	Demand side management	Institutional (School)	Real data	Blackbox	ANN-NARN	1 month 3 month 6 month	Electric energy consumption	1 month: 0.89–0.97 3 month: 0.88–0.96 6 month: 0.84–0.96	R ²
[88]	Demand side management	Commercial (Office)	Real data	Blackbox	Tree bagger GPR MLR Bagged tree Boosted tree ANN-BPNN	7 days 14 days 1 month	Electric power demand	7 day 14 day 1 month GPR 20.51% 25.71% 35.36% MLR 14.14% 18.01% 23.01% TB 19.00% 23.57% 32.63% Boosted 20.35% 24.74% 32.01% Bagged 19.38% 23.94% 32.77% ANN 20.31% 25.45% 33.64%	CV%
[89]	N/s	Commercial (N/s)	Real data	Blackbox	ANN EP-ANN GA-ANN ACO-ANN	1 hr	Cooling load	ANN 3.44% EP-ANN 3.21% GA-ANN 3.15% ACO-ANN 2.99%	MAPE (%)

					PSO-ANN W-ANN DEA-ANN			PSO-ANN 2.73% W-ANN 2.57% DEA-ANN 2.39% Pro-ANN 2.29%	
[90]	Operations and control	District	Real data	Blackbox	ANN-FFNN ANN-Recurrent	24 hr	Heating load	ANN-FFNN 15.28 ² GJ ² ANN-Recurrent 11.33 ² GJ ²	MSE
[91]	Supply side management	Institutional (University campus)	Real data	Blackbox	ANN-SRWNN ANN-WNN ANN-MLP	24 hr	Electricity demand	ANN-SRWNN 3.47% ANN- WNN 4.26% ANN-MLP 6.54%	nMAE
[37]	Demand side management	Commercial (Office)	Simulated (TRNSYS)	Blackbox Hybrid-ensemble	ANN-FFDD ANN-E-FFNN	1 hr	Cooling load	ANN-FFNN-Model A-0.9308 ANN-FFNN-Model B-0.9287 ANN-E-FFNN-0.9596	R ²
[92]	Demand side management	Commercial (Office)	Real data	Blackbox	ANN-NARX SVR ARIMA LR	1 day 1 week 1 month	Power demand	1 day 1 week 1 month NARX 8–9% 9–12% 11–15% SVR 7–8% 9–10% 10–14% ARIMA 22–27% N/A N/A LR 11–13% 12–15% 15–17%	MAPE (%)
[93]	Demand response	Commercial (Office)	Real data	Blackbox	ANN-FFNN Linear Regression	1 min	Electric power demand	ANN-FFNN 3.92 – 9,705% LR 6.48–11,118%	MAPE (%)
[94]	Event detection/Control strategies	Commercial (Office)	Simulated (EnergyPlus)	Blackbox	XGBoost ANN-FFNN DDR	1 hr	Cooling electricity consumption Heating gas consumption	Cooling Heating XGBoost 0.95–0.99 0.88–0.96 ANN-FFNN 0.6–0.95 0.57–0.87 DDR 0.85 0.67	R ²

[95]	National energy residential buildings	Sector (Residential)	Real data	Blackbox	ANN-FFNN MLR	Annual	Sector energy consumption	ANN-FFNN 0.989229–0.98957 MLR 0.95697–0.97168	R ²
[96]	Supply side management	Residential (N/s)	Real data	Blackbox	ANN-D-CNN ANN-D-LST ANN-RBM SVM ANN-FFNN	60 hr	Electricity demand	ANN-D-CNN 0.677 kW ANN-D-LST 0.625 kW ANN-RBM 0.663 kW SVM 0.814 kW ANN-FFNN 0.691 kW	RMSE (kW)
[97]	Demand side management	Institutional (Education building)	Real data	Blackbox	MLR ELN Random forest GBM SVR XGB ANN-DNN	24 hr	Cooling load	MLR 36.2–58% ELN 28.0–52.1% RF 21.9–52.8% GBM 19.7–29.8% SVR 19–32.9% XGB 19.5–38% DNN 21.6–29.3%	CV (RMSE)
[98]	Demand side management	Commercial (Office building)	Real data	Blackbox Hybrid-ensemble	Simple ANN-FFNN SVM ANN-D-BN	1 hr to 6 hr	Cooling load	Simple 31.21–37.86% ANN-FFNN 29.77–35.43% SVM 26.38–31.4% ANN-D-BN 21.38–27.88%	MAPE
[99]	Supply side management	Residential (N/s)	Real data	Blackbox	ANN SVM ANN-NARNET ANN-D-CRBM ANN-D-FCRBM	15 min, 1 hour, 1 day, 1 week, 1 year	Electricity demand overall, sub meters	ANN 0.246–2.53 kW SVM 0.188–1.99 kW ANN-NARNET 0.457–2.81 kW ANN-D-CRBM 0.18–1.07 kW ANN-D-FCRBM 0.170–0.899 kW	RMSE (kW)
[100]	Supply side management	Institutional (Public safety building) Residential (Houses)	Real data	Blackbox	ANN-MLP ANN-D-RNN	1 week, 1 year	Overall electricity consumption	Commercial (horizon 1 week) D-RNN: Model A 9.33–47.2% D-RNN: Model B 8.73–	RMSE

								6.8% MLP 10.02–84.4% Residential (horizon 1-year) D-RNN: 15–39% MLP 14–31%	
[101]	Operations and control	Institutional	Real data	Hybrid-ensemble	ANN-E-FFNN	1 hr	AHU energy Room Humidity Room temp	AHU energy 0.365 Room air humidity 0.02196 Room air temperature 0.0056	MAPE
[102]	N/s	Residential	Real data	Blackbox Hybrid-grey	ANN-FFNN-R/C SVM-R/C GMM-R/C ANN-FFNN SVM GMM	1 hr 1 day	Non-AC electric power consumption AC power consumption	1 hr 24 hr FFNN-R/C 8.6–22.8% 10.7–28.6% SVM-R/C 8.2–21.5% 10.0–27.5% GMM-R/C 12.5–27.2% 14.7–32.2% ANN-FFNN 9.3–23.9% 11.9–30.2% SVM 9.1–23.4% 10.4–28.9% GMM 4.3–28.4% 17.8–34.0%	MAPE
[103]	N/s	Residential	Real data	Blackbox	ANN-FFNN SVR Gaussian Process Regression	1 hr 24 hrs	Electric demand, consumption	peak 1 hr 24hr MLP 2.3–6.3% 6.6–14.5% 17–28% SVR 2.3–5.7% 6.1–13.2% 9–21% GPR 2.3–6.4% 7.8–18.0% 14–28%	CV (RMSE)

[104]	Optimal operation and demand side management	Commercial (Office)	N/s	Blackbox	ARIMA LR GM ANN Ensemble (Above)	Day	Cooling load	N/s	N/s
[105]	HVAC control	Institutional (Resource station)	Simulated	Hybrid-ensemble	ANN-E-FFNN	1 hr	HVAC energy consumption , Indoor temperature	Energy consumption 10% Indoor temperature 0.3%	MAPE
[106]	HVAC control and optimization	Institutional (Resource station)	Real data	Hybrid-ensemble	ANN-E-FFNN	15 mins	Chiller energy Supply fan energy Return fan energy Pump energy Supply air temperature Supply air static pressure Static pressure	Chiller energy 0.059 Supply fan energy 0.017 Return fan energy 0.011 Pump energy 0.001 Supply air temperature 0.001 Supply air static pressure 0.005	MAPE
[107]	Optimization and control	Commercial Wastewater treatment	Real data	Blackbox	ANN-MLP	15 mins	Pump energy consumption Pump output flow rate	Energy consumption 0.01–0.09% Output flow rate 0.01–0.07%	MAPE
[108]	Optimization and control	Institutional (University)	Real data	Blackbox	ANN-MLP	15 mins	Energy consumption ,	Energy 4.59–5.19% Room temperature: 0.1–0.24%	MAPE

							Room temperature		
[109]	Optimization and control	Institutional (Research center)	Real data	Blackbox	ANN-FFNN	30 mins	HVAC consumption Indoor air temperature Indoor humidity	HVAC energy 0.1069% Temperature 0.0075–0.0083% Humidity 0.1034–0.1116%	MAPE
[110]	Optimization and control	Component (VAV)	Real data	Blackbox	ANN-FFNN RF SVM Boosting Pace Regression	1-8mins	Reheat energy Room humidity Room temperature	Reheat Temp RH MLP 58.2–64.5 0.22–0.36 0.22–0.37 RF 66.44 0.53 0.39 SVM 64.13 0.46 0.08 Boost 66.39 0.54 0.72 PR 68.75 0.61 0.55	MAE
[111]	Energy modeling	Institutional (University)	Real data	Blackbox	Regression ANN-FFNN EnergyPlus	Daily 24 hrs	Chilled water Steam	CW 24 hrs daily 24 hrs daily Regress 27% 18% 27% 16% FFNN 25% 18% 14% 8% EPlus 33% 24% 23% 17	CV%
[112]	Demand side management	Commercial	Real data	Blackbox	ANN-D-ELM ANN-FFNN SVR ANN-RBNN MLR	30 mins 60 mins	Energy Consumption	30min 60 min ANN-D-ELM 2.917% 3.642% ANN-FFNN 4.179% 6.392% SVR 3.692% 5.101% ANN-RBNN 3.893% 4.211% MLR 5.465% 5.956%	MRE
[113]	Optimization and control	Institutional	Simulated	Blackbox	ANN-FFNN	12 hrs	Heating load	Heating load 5.03–7.4% Internal air temperature	MAPE

			(Matlab)				Internal air temperature PMV	0.7–1.6% PMV 6.2–16.5%	
[114]	Demand response	Institutional (University)	Simulated (EnergyPlus)	Blackbox	ANN-E-FFNN SVM	24 hrs	Electric power demand Cooling electric power demand	Electrical Cooling ANN 0.267–0.272% 0.123–0.146% SVM 0.316–0.318% 0.068–0.100%	CV (RMSE)
[115]	Optimization and control	Commercial	Simulated (EnergyPlus)	Blackbox	ANN-FFNN	1 hr	Electric consumption	0.0109–0.68	CV
[116]	District energy management	District	Real data	Blackbox	ANN-NARX ANN-D-NARX SVM-RBF SVM-Poly	Monthly	Heating load Cooling load	Heating Cooling NARX 3.8–3.9 kWh 2.3–2.4 kWh D-NARX 3.8–4.1 kWh 2.4–2.8 kWh RBF 9.5–16.4 kWh 7.8–15 kWh Poly 8.9–13.0 kWh 5.8–13.9 kWh	MAE
[117]	District energy management	District	Real data	Blackbox	DEEP-RNN ANN-FFNN	24 hr	Heating load	DEEP-RNN MLP Engineering build. 0.271 0.278 Science hall 0.355 0.552 Marriot 0.347 0.439 Emery building 0.300 0.353	CV

[119]	District energy management	District	Simulated (EnergyPlus)	Blackbox	ANN-D-FFNN	24 hr	Energy consumption PV	Energy consumption 0.9661 PV 0.9412	R ²
[118]	District energy management	District	Real data	Blackbox	Linear regression Kernel machine ANN-D-Recur 2-nodes	1 hr 24 hr	Natural gas consumption	1 hr 24 hr Linear regression 8.1% 6.1% Kernel machine 14% 9.7% ANN-D-Recurrent 9.3% .8% 2-node 9.8% 11.2% 2-node linear mem 15.4% 0.5% 2-node non lin mem 15.85% 8.6%	MAPE
[120]	Load management	Commercial (Office)	Real data	Blackbox	MLR GPR ANN-FFNN	7-day 1 month	Cooling load	7-day 1 month MLR 8.34% 68.22% GPR 2.05% 59.15% ANN-FFNN 2.03% 51.63%	CV%
[121]	Demand response / Demand management	Commercial and institutional	Real data	Blackbox	SARIMAX ANN-D-CNN ANN-D-RNN	1 hr 24 hr	Electricity demand	1 hr 24 hr SARIMAX 3.4–22.1% 5.2– 21 kW ANN-D-RNN 2.9–12.2% 4.7–45 kW ANN-D-CNN 2.7–10.9% 3.4–19 kW	CV% RMSE
[122]	Demand / grid supply management	Institutional (University)	Real data	Blackbox	ANN-FFNN	9 day	Electric load Peak load	4.7–8.4%	MAPE

[123]	N/s	Institutional (University)	Real data	Blackbox	MLR SVR ANN-FFNN XGB	30 mins 24 hrs	Cooling load	MLR 26.4–34.3% SVR 20.2–25.3% ANN-FFNN 20.1–25.1% XGB 17.7–19.3%	CV (RMSE)
[124]	Planning energy management	Residential (3 floor apartment)	Real data	Blackbox Hybrid-ensemble	ANN SVM LR C&R Tree E-SVR+LR E-ANN E-S-M-LSSVR E-S-P-LSSVR	24 hrs	Overall electricity consumption	ANN 36.83% SVM 43.22% LR 38.52% C&R Tree 48.20% E- SVR + LR 42.75% E-ANN 42.31% E-S-M-LSSVR15.66% E-S-PSO-L-SSVR 16.19%	MAPE
[125]	Energy management, equipment efficiency improvement	Commercial (Retail) Commercial (Office)	Real data	Blackbox	ANN-BPNN ELM SVR	30 mins 1 hr	Overall energy consumption	Retail BPNN ELM SVR HMTD 7.14% 4.85% 9.18% Bootstrap 8.08% 5.04% 8.60% Original 8.34% 5.45% 8.89% GAN 0.94% 0.95% 0.94% IDT 0.94% 0.95% 0.94% Office BPNN ELM SVR HMTD 16.46% 15.57% 21.57% Bootstrap 17.15% 15.12% 1.47% Original 19.10% 16.76% 21.78% GAN 0.954% 0.952% 0.944% IDT 0.952% 0.950% 0.943%	MAPE

[126]	Demand side management	Institutional (Government)	Real data	Blackbox	ANN-FFNN	24 hrs	Electricity Natural gas Cooling load	electricity 15.9–16.4% natural gas 20.1–22.1% cooling load 50.26–77.57%	MAPE
[127]	N/s	Commercial (Shopping mall)	Real data	Blackbox	SVR-chaos SVR-WD SVR ANN-FFNN	1 hr	Cooling load	SVR-chaos 2.28% SVR-WD 2.45% SVR 3.96% ANN-FFNN 3.97%	CV (RMSE)
[128]	Demand side management	Institutional (Research center)	Real data	Blackbox Hybrid-ensemble	Naïve SARIME ANN-FFNN ANN-E-FFNN ANN-RBF ANN-RBF-RNC	24 hrs	Electricity load	Naïve 6.40–7.61 SARIME 2.17-5.52 ANN-FFNN 9.10-13.55 ANN-E-FFNN 2.40-2.95 ANN-RBF 2.14-4.36; ANN-RBF-RNC 2.82-3.34	MSE
[129]	Energy conservation	Commercial (Office)	Real data	Blackbox	SVR ANN-FFNN	1 hr	Lighting usage	SVR 0.9273 ANN-FFNN 0.6980	R ²
[130]	Supply side management	Intutional (University)	Real data	Blackbox	ANN-FFNN	1 hr	Electricity usage	0.9943-0.9953	R
[131]	Demand side response	Residential (House)	Real data	Blackbox	ANN-FFNN	1 hr	Electricity load	0.034–0.111 kW	RMSE