

Data for the table 3. in Koponen et al. "Assessing and comparing short term load forecasting performance"

Publication year	Forecasting horizon	Forecasting time resolution h	Max Power kW/site	Mean Power kW/site	Annual Energy MWh/site	Number of Sites	Method	Criterion value in verification					Reference		
								NRMSE %	RMSE%/maxP	mean error	std	std %	MAPE	Author(year)	nro
2020	14 ... 37 h	1	26,642	3,5272	30,8595	350	SBN-phys-hybrid	27,800	3,681				14,25	Koponen (2020)	1
2020	14 ... 37 h	1	25,414	3,2741	28,6451	377	SBN-phys-hybrid	33,900	4,367				17,46	Koponen (2020)	1
2020	14 ... 37 h	1	26,642	3,5272	30,8595	350	SBN-phys-hybrid	20,113	2,663				12,24	Koponen (2020)	1
2020	14 ... 37 h	1	25,414	3,2741	28,6451	377	SBN-phys-hybrid	26,800	3,453				14,30	Koponen (2020)	1
2020	14 ... 37 h	1	26,642	3,5261	30,8595	350	SVR	43,986	5,822	0,480	1,475	41,8269	22,08	Koponen (2020)	1
2020	14 ... 37 h	1	25,414	3,273	28,6451	377	SVR	40,403	5,203	0,144	1,315	40,1646	23,72	Koponen (2020)	1
2020	14 ... 37 h	1	26,642	3,5261	30,8595	350	SVR-phys-hybrid	34,406	4,554	0,208	1,195	33,8992	22,29	Koponen (2020)	1
2020	14 ... 37 h	1	25,414	3,273	28,6451	377	SVR-phys-hybrid	39,650	5,106	0,016	1,298	39,6473	22,97	Koponen (2020)	1
2019	14 ... 37 h	0,05	2,499	1,518	13,296	59 000	Ensemble 2.1	2,970	1,804				2,31	Koponen (2019)	2
2019	14 ... 37 h	0,05	2,499	1,518	13,296	59000	SD	3,710	2,253				2,90	Koponen (2019)	2
2019	14 ... 37 h	0,05	2,499	1,518	13,296	59000	MLP	4,600	2,794					Koponen (2019)	2
2019	14 ... 37 h	0,05	2,499	1,518	13,296	59000	SVR	5,040	3,061					Koponen (2019)	2
2017	14 ... 37 h	1	5,532	1,885	16,515	1103	MLP	6,587	2,245	0,005	0,124	6,583	4,86	Koponen(2017)	3
2017	14 ... 37 h	1	5,589	1,921	16,831	916	MLP	7,100	2,441	0,001	0,136	7,099	5,31	Koponen(2017)	3
2017	14 ... 37 h	1	3,208	1,083	9,484	1104	MLP	16,934	5,714	-0,054	0,175	16,173	10,92	Koponen(2017)	3
2017	14 ... 37 h	1	2,998	1,075	9,419	917	MLP	15,300	5,488	-0,056	0,155	14,379	8,08	Koponen(2017)	3
2017	14 ... 37 h	1	5,532	1,885	16,515	1103	SVR	7,806	2,660	0,007	0,147	7,797	5,26	Koponen(2017)	3
2017	14 ... 37 h	1	5,589	1,921	16,831	916	SVR	7,959	2,736	0,003	0,153	7,958	5,43	Koponen(2017)	3
2017	14 ... 37 h	1	3,208	1,083	9,484	1104	SVR	20,968	7,076	-0,040	0,224	20,643	16,23	Koponen(2017)	3
2017	14 ... 37 h	1	2,998	1,075	9,419	917	SVR	20,292	7,278	-0,040	0,215	19,950	15,52	Koponen(2017)	3
2017	14 ... 37 h	1	5,5324	1,8853	16,515	1103	MLP-phys -hybrid	6,035	2,057	0,006	0,114	6,026	4,90	Koponen(2017)	3
2017	14 ... 37 h	1	5,5887	1,9213	16,831	916	MLP-phys -hybrid	8,113	2,789	0,010	0,156	8,099	5,81	Koponen(2017)	3
2017	14 ... 37 h	1	3,2084	1,0827	9,484	1104	MLP-phys -hybrid	15,046	5,077	-0,025	0,161	14,861	11,35	Koponen(2017)	3
2017	14 ... 37 h	1	2,9976	1,0752	9,419	917	MLP-phys -hybrid	16,722	5,998	-0,026	0,178	16,555	12,03	Koponen(2017)	3
2017	14 ... 37 h	1	5,5324	1,8853	16,515	1103	SVR-phys-hybrid	6,496	2,214	0,0075	0,1222	6,482	5,10	Koponen(2017)	3
2017	14 ... 37 h	1	5,5887	1,9213	16,831	916	SVR-phys-hybrid	8,113	2,789	0,0055	0,1245	6,480	5,06	Koponen(2017)	3
2017	14 ... 37 h	1	3,2084	1,0827	9,484	1104	SVR-phys-hybrid	15,700	5,298	-0,0177	0,1609	14,861	13,05	Koponen(2017)	3
2017	14 ... 37 h	1	2,9976	1,0752	9,419	917	SVR-phys-hybrid	15,164	5,439	-0,0176	0,1621	15,076	12,35	Koponen(2017)	3
2012	14 ... 37 h	1	4,9	1,944	17,029	4008	Residual hybrid of simple phys models	4,450	1,765	-0,100	0,087	4,450		Koponen(2012)	4 *
2015	14 ... 37 h	1	1,869	0,835	7,315	3516	MLP	3,780	1,688		0,11518	13,793	3,06	Niska(2015)	5
2014	14 ... 37 h	1	1,869	0,835	7,315	3516	Sener load profiles	17,740	7,924	-0,0545			14,03	Koponen(2014)	6
2014	14 ... 37 h	1	1,869	0,835	7,315	3516	Static polynomial&l&ag (Wiener model)	10,120	4,520	-0,0053			8,82	Koponen(2014)	6
2014	14 ... 37 h	1	1,869	0,835	7,315	3516	Cluster load profiles	6,200	2,769	-0,0119			4,09	Koponen(2014)	6
2014	14 ... 37 h	1	1,869	0,835	7,315	3516	Partly physically based load type composition	6,230	2,783	-0,0007			4,52	Koponen(2014)	6
2014	14 ... 37 h	1	1,869	0,835	7,315	3516	Neural Network (MLP)	5,640	2,519	-0,0064			3,76	Koponen(2014)	6
2015	14 ... 37 h	24	1,869	0,835	7,315	3516	MLP	2,725	1,217		0,08	9,580	2,05	Niska(2015)	5
2014	14 ... 37 h	24	1,869	0,835	7,315	3516	Sener load profiles	14,770	6,597	-0,0545	0,1372		10,07	Koponen(2014)	6
2014	14 ... 37 h	24	1,869	0,835	7,315	3516	Static polynomial&l&ag (Wiener model)	7,430	3,319	-0,0053	0,0759		5,70	Koponen(2014)	6
2014	14 ... 37 h	24	1,869	0,835	7,315	3516	Cluster load profiles	4,340	1,939	-0,0119	0,0434		2,80	Koponen(2014)	6
2014	14 ... 37 h	24	1,869	0,835	7,315	3516	Partly physically based load type composition	4,690	2,095	-0,0007	0,0469		3,07	Koponen(2014)	6
2014	14 ... 37 h	24	1,869	0,835	7,315	3516	Neural Network (MLP)	4,120	1,840	-0,0064	0,0407		2,59	Koponen(2014)	6
Notes															
* Verification and identification parallel in time!															

Abbreviation	Brief Explanation
SBN	Stacked Booster Network , a deep neural network developed by Tuukka Salmi for short term forecasting
SBN-phys-hybrid	SBN forecasts the residual of a physically based load control response model.
SVR	Support Vector Regression
SVR-phys-hybrid	SVR forecasts the residual of a physically based load control response model.
MLP	Multi Layer Perceptron
MLP-phys-hybrid	MLP forecasts the residual of a physically based load control response model.
Ensemble 2.1	Ensemble of a two residual hybrids: Weighted mean of 1) a SD-phys-hybrid and 2) a SVR-phys-hybrid.
SD	A similar day method
Senor load profiles	Customer group based national load profiles from 1995 as explained in https://www.vttresearch.com/sites/default/files/pdf/publications/1996/P289.pdf .

Number	Reference
1	Koponen, P.; Salmi, T.; Evens, C.; Takala, S.; Hyttinen A.; Brester C.; Niska H. Aggregated forecasting of the load control responses using a hybrid model that combines a physically based model with machine learning, paper submitted to CIRED 2020 workshop, Berlin, 22-23 September 2020. 4 p.
2	Koponen, P.; Niska, H.; Mutanen, A. Mitigating the Weaknesses of Machine Learning in Short-Term Forecasting of Aggregated Power System Active Loads. Proceedings of the IEEE INDIN19, 22-25 July 2019, Helsinki-Espoo, Finland, 8 p.
3	Koponen, P.; Niska, H.; Huusko, R. Improving the performance of machine learning models by integrating partly physical control response models in short-term forecasting of aggregated power system loads, ITISE 2017 Granada Spain, 18-20 September 2017, 12 p.
4	Koponen, P. Short-term load forecasting model based on smart metering data. Daily energy prediction using physically based component model structure. Proceedings of the IEEE SG-TEP 2012, Nuremberg, 3 - 4 December 2012.
5	Niska, Harri; P. Koponen, Pekka; Mutanen Antti: "Evolving Smart Meter Data Driven Model for Short-Term Forecasting of Electric Loads". Tenth International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), Singapore, 7-9 April 2015.
6	Koponen, P.; Mutanen, A.; Niska H. Assessment of Some Methods for Short-Term Load Forecasting. IEEE PES ISGT 2014, Istanbul, Turkey, 12-15 October 2014.