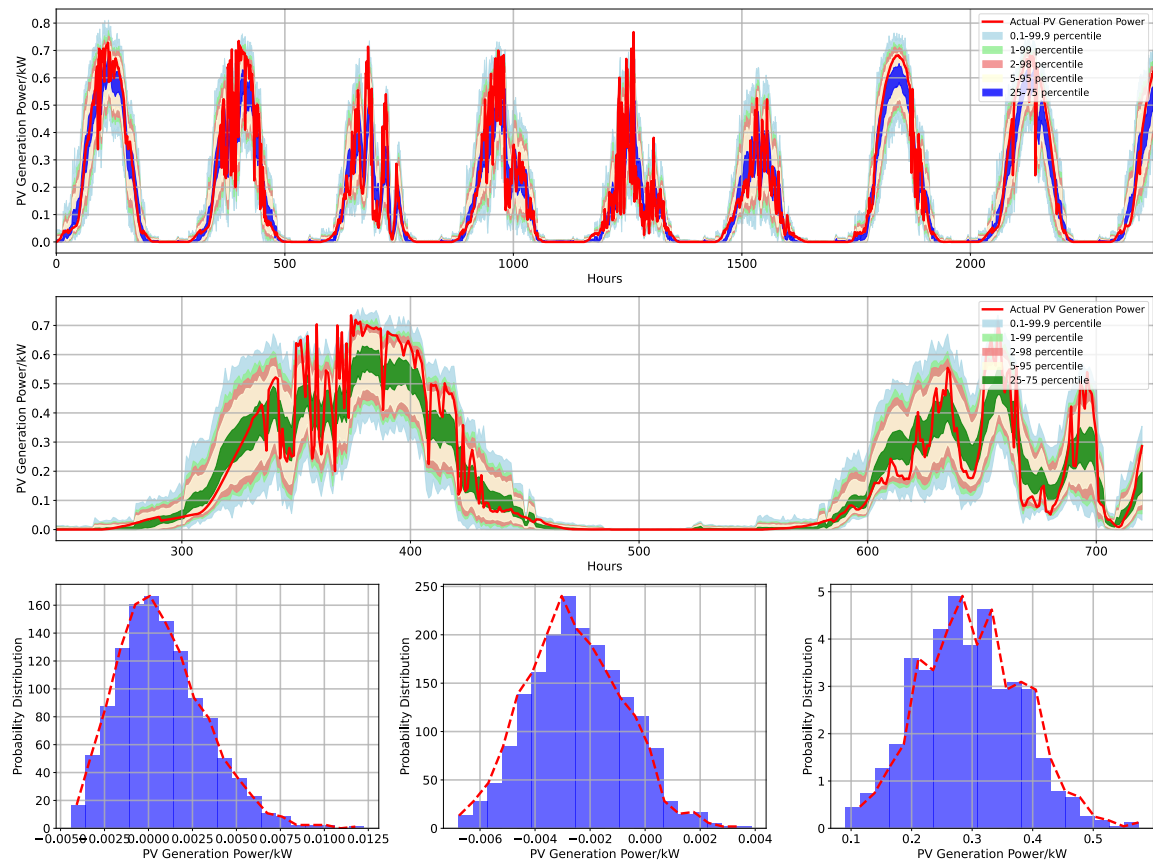**Support Information**

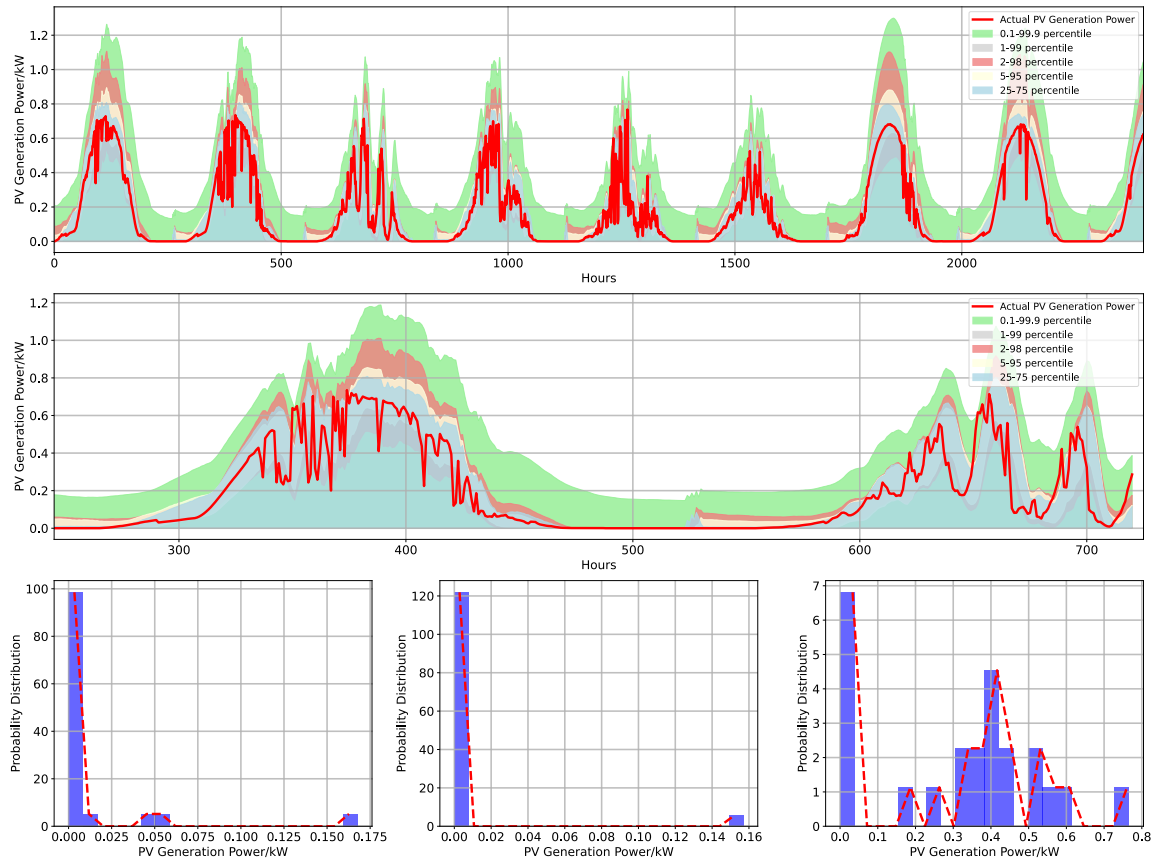Figure 1: Probability PV Solar Generation Forecasting Based on CPLF.

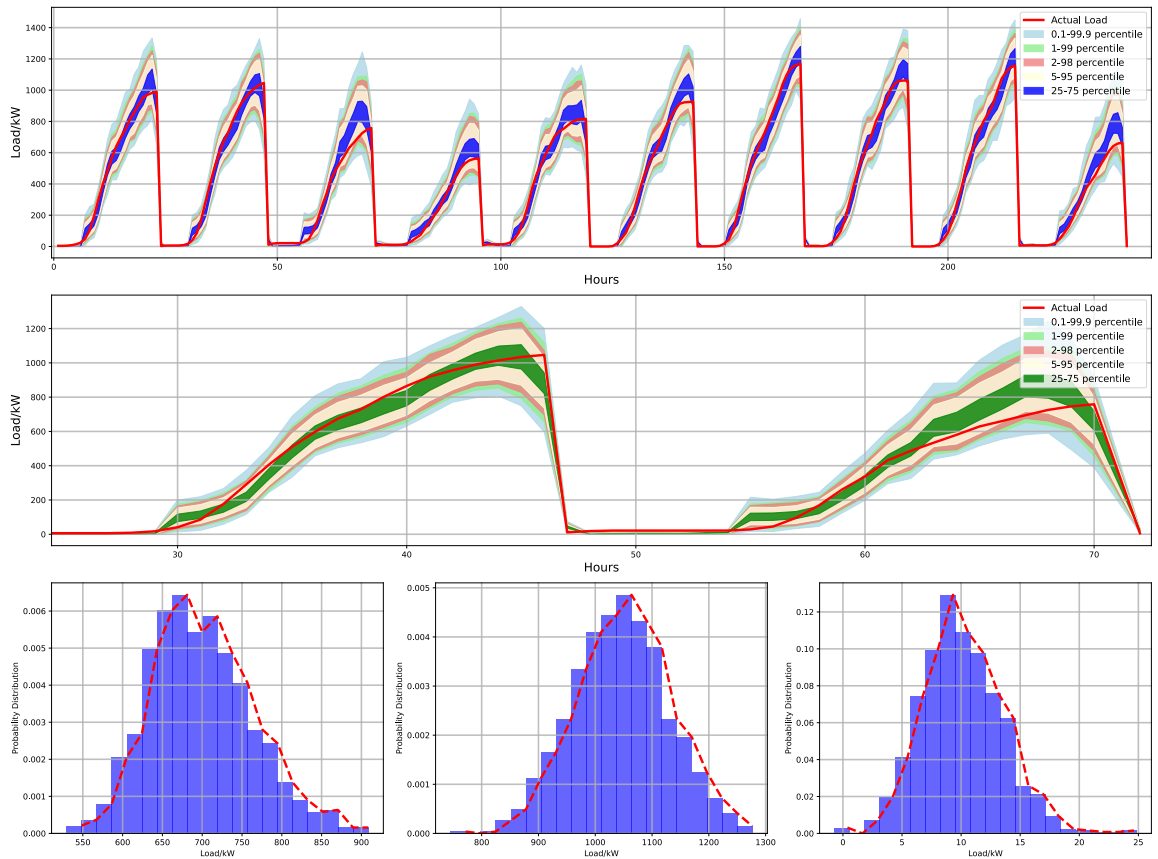Figure 2: Probability PV Solar Generation Forecasting based on QPLF.

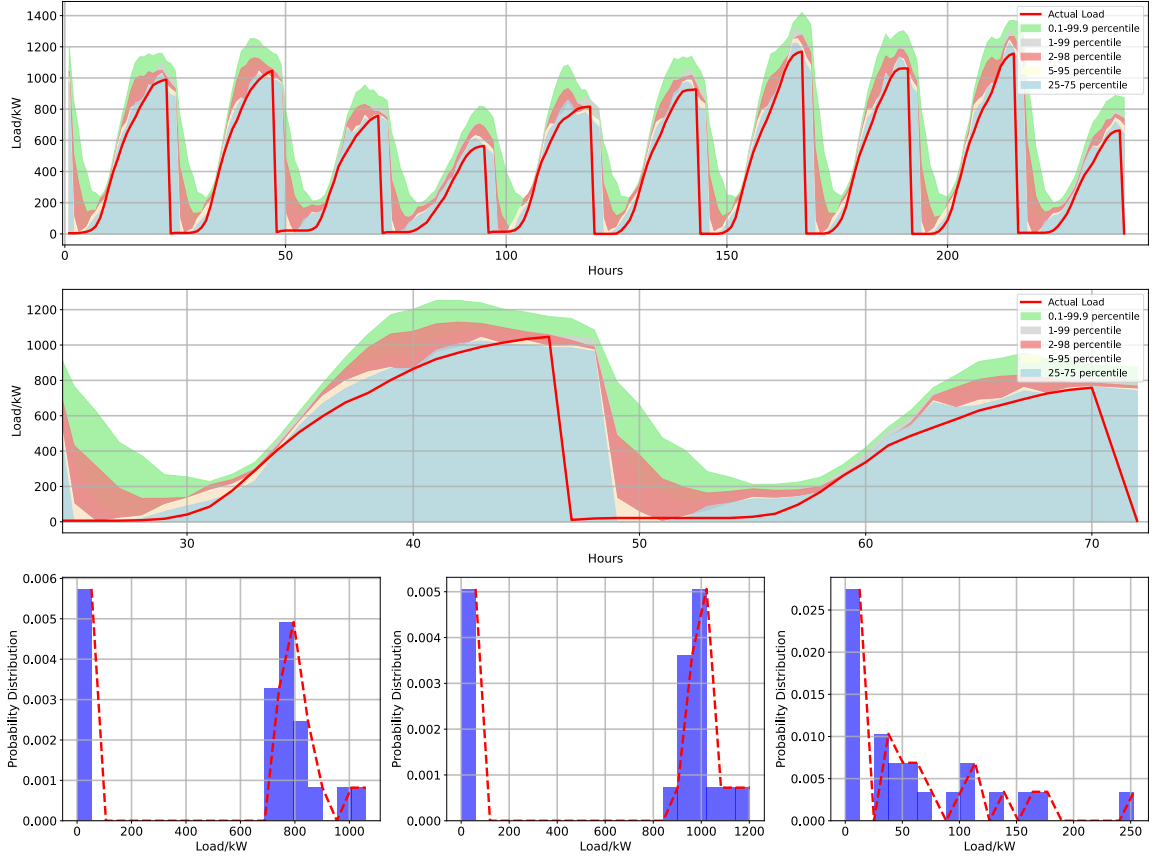Figure 3: Probability Vehicle Charging Load Forecasting based on CPLF.

Figure 4: Probability Vehicle Charging Load Forecasting based on QPLF.

Table 1: ANN Structure and Parameters

Model	Attributes	Parameters			
		Conv1D	Conv1D	Dropout	Flatten & FC
CNN	Layers	Kernel Size: [3,5], Padding: 1 Steps: [1,3,5], Output Channels: [8,16,32,64]	Kernel Size: [3,5], Padding: 1 Steps: [1,3,5], Output Channels: [8,16,32,64]	Rate: [0.1,0.2,0.3]	N/A
	Activation	ReLU	ReLu	N/A	Linear
LSTM	Layers	LSTM Units: [8,16,32,64]	LSTM Units: [8,16,32,64]	Dropout Rate: [0.1,0.2,0.3]	Flatten & FC N/A
	Activation	Linear	Linear	N/A	Linear
Bi-LSTM	Layers	Bi-LSTM Units: [8,16,32,64]	Bi-LSTM Units: [8,16,32,64]	Dropout Rate: [0.1,0.2,0.3]	Flatten & FC N/A
	Activation	Linear	Linear	N/A	Linear
CNN-LSTM	Layers	Conv1D Kernel Size: 3, Padding: same Steps: 1,3,5, Output Channels: [8,16,32,64]	LSTM Units: [8,16,32,64]	Dropout Rate: [0.1,0.2,0.3]	Flatten & FC N/A
	Activation	ReLU	Linear	N/A	Linear
FCN	Layers	FC Units: [8,16,32,64]	FC Units: [8,16,32,64]	FC Units: [8,16,32,64]	
	Activation	ReLu	Linear	Linear	

Table 2: Training Parameters Settings

Training	Learning rates	Batch sizes	Number of epochs
Parameters	[0.01, 0.001, 0.0001]	[32, 64, 128, 256]	[50, 100, 150, 200, 250, 300, 400, 500]

Table 3: Ablation Experiment on Switzerland Dataset

Algorithm	PRMSE/(MW)	PMAE/(MW)	Pinnball Loss/(MW)	CRPS/(MW)
FC+CVAE w/o E.F.	626.287	495.618	211.852	504.257
FC+CVAE w/ A.L.	566.646	439.594	183.314	451.262
LSTM-r+CVAE w/o E.F.	448.075	353.715	160.285	356.389
LSTM-r+CVAE w/ A.L.	430.150	334.799	154.656	336.371
Bi-LSTM-r+CVAE w/o E.F	462.036	344.924	156.958	348.227
Bi-LSTM-r+CVAE w/ A.L.	429.941	333.033	150.971	335.109
CNN+CVAE w/o E.F	476.763	369.487	161.672	375.000
CNN+CVAE w/ A.L.	439.854	340.281	148.351	346.474
CNN-LSTM+CVAE w/o E.F	476.823	374.339	171.380	376.966
CNN-LSTM+CVAE w/ A.L.	453.239	355.279	154.798	359.673