Enabling Grid Flexibility through Deep Learning-Based Transformer Load Forecasting

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Introduction

- Energy communities can offer grid services like peak shaving
- Accurate transformer-level load forecasting enables reliable flexibility provision to the distribution grid

Methodology

- <u>Input</u>: Transformer load and weather timeseries

- <u>Model</u>: LSTM-based encoder-decoder

- <u>Features</u>: Weather, time-based, lagged values, Fourier, rolling windows

- <u>Output</u>: Entire forecast horizon in one shot – no recursive errors

Accurate transformer-level load forecasting enables the reliable provision of flexibility to the distribution grid
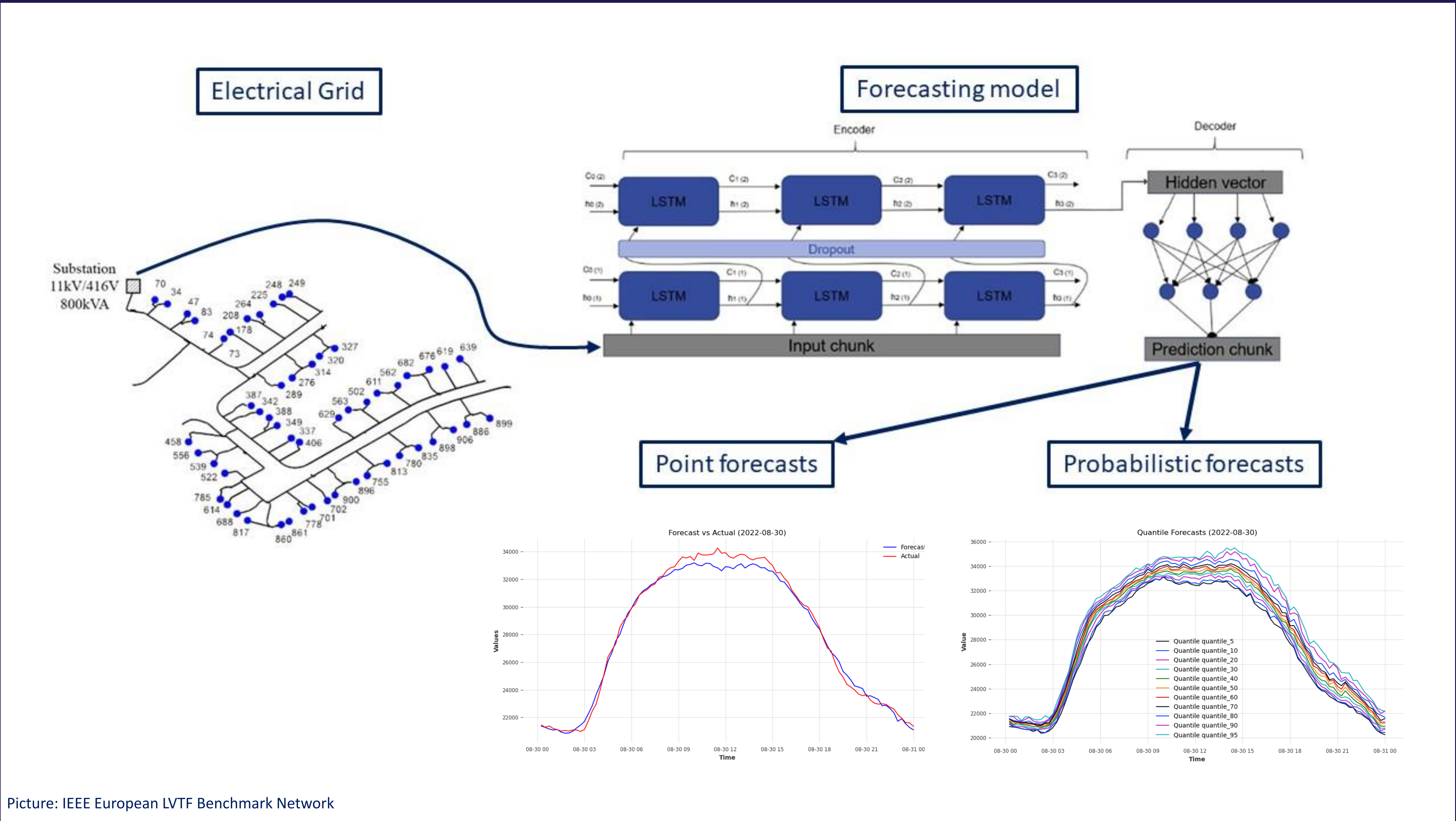
Picture: IEEE European LVTF Benchmark Network

Outcomes

- Delivers both point & probabilistic forecasts

- Full end-to-end AI pipeline from training to deployment

- Supports energy community flexibility with high-accuracy predictions

Project Partners

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