

Methodology for Vietnam Simulated Zonal Hourly Demand

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Overview

These datasets contain simulated zonal hourly electricity demand for Vietnam, derived from PDP8 load projections.

- Source: PDP8 — Decision No. 500/QD-TTg, May 2023
- Zones: 6 PDP8 planning zones (BB, BTB, TTB, TN, NTB, NB), mapped from 3 PDP8 demand regions (North, Central, South)
- Horizon: 2030, 2035, 2040, 2045, 2050 (5-year intervals)
- Temporal resolution: 36 representative days $\times$ 24 h = 864 model hours/year, sample-weighted to represent the full 8,760-hour year

Zone definitions

Zone	Code	Region	Provinces
1	BB	North (Bắc Bộ)	25
2	BTB	North Central (Bắc Trung Bộ)	4
3	TTB	Central (Trung Trung Bộ)	5
4	TN	Central Highlands (Tây Nguyên)	4
5	NTB	South Central (Nam Trung Bộ)	6
6	NB	South (Nam Bộ)	19

Hourly Demand Profiles

Source: PDP8 (Decision No. 500/QD-TTg, May 2023), disaggregated from 3 PDP8 planning regions to 6 model zones.

Files: vn_zonal_hourly_demand_2030.csv through vn_zonal_hourly_demand_2050.csv (5 files), plus vn_demand_sample_weights.csv.

Format: each demand file has 864 rows, not 8,760. The model uses 36 representative days per year — 3 per month, each with 24 hours:

Per month	Day type	Description
1	Weekday (WD)	Typical weekday load shape
1	Weekend (WK)	Typical weekend load shape
1	Peak Day (PD)	Highest-demand day of the month

Columns: Hour, North, Central, South, BB, BTB, TTB, TN, NTB, NB. North, Central, and South are PDP8 regional demand (MW); BB through NB are the 6 model zone demands (MW), where North = BB + BTB, Central = TTB + TN, and South = NTB + NB.

Sample weights

Each representative day carries a sample weight (vn_demand_sample_weights.csv) specifying how many real hours that 24-hour block represents in the full 8,760-hour year. Weights sum to 8,760. Annual energy is recovered from the hourly profiles as:

$$\text{Annual_Energy_GWh} = \sum (\text{Demand_MW}[h] \times \text{Weight}[h]) / 1000, \text{ where} \\ \text{Weight}[h] = \text{Sub_Weights}[\text{day}] / 24$$

Sanity totals

Annual energy computed from each hourly profile using the formula above, verified against PDP8 published totals:

Year	Computed Total (TWh)	Peak System Demand (GW)
2030	550.9	83.4
2035	726.9	—
2040	864.0	—
2045	975.8	—
2050	1,092.5	—

Disaggregation ratios

PDP8 provides demand projections for 3 planning regions. These are decomposed into 6 model zones using fixed ratios derived from historical provincial electricity consumption:

PDP8 Region	Zone	Code	Ratio
North	Zone 1	BB	0.8595
North	Zone 2	BTB	0.1405
Central	Zone 3	TTB	0.6353
Central	Zone 4	TN	0.3647
South	Zone 5	NTB	0.1205
South	Zone 6	NB	0.8795

Data Fields

Dataset: vn_zonal_hourly_demand_YEAR.csv (×5)

Field	Description
Hour	Model hour index (1–864), not a calendar hour of the year
North, Central, South	PDP8 regional demand (MW)
BB, BTB, TTB, TN, NTB, NB	Model zone demand (MW)

Dataset: vn_demand_sample_weights.csv

Field	Description
Subperiods	Total number of representative days (36)
Hours_Per_Period	Hours per representative day (24)
Sub_Weights_No_PD	Sample weight excluding peak-day adjustment (hours represented)
Sub_Weights	Sample weight — real hours of the year represented by this day (sums to 8,760)
Month_Index	Calendar month of the representative day (1–12)
No_Of_Days	Number of days in that calendar month
No_Of_Days_In_Week	Count of matching weekdays/weekend days in the month
Coefficient	Peak-day indicator/adjustment coefficient
Sub_Weights_By_24	Sample weight expressed in days represented (Sub_Weights / 24)