

Probability Distribution of Wind Power

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Overview

The objective is to calculate probability distributions for regional and GB wind power in three time frames: longterm, winter and during peak demand of electricity.

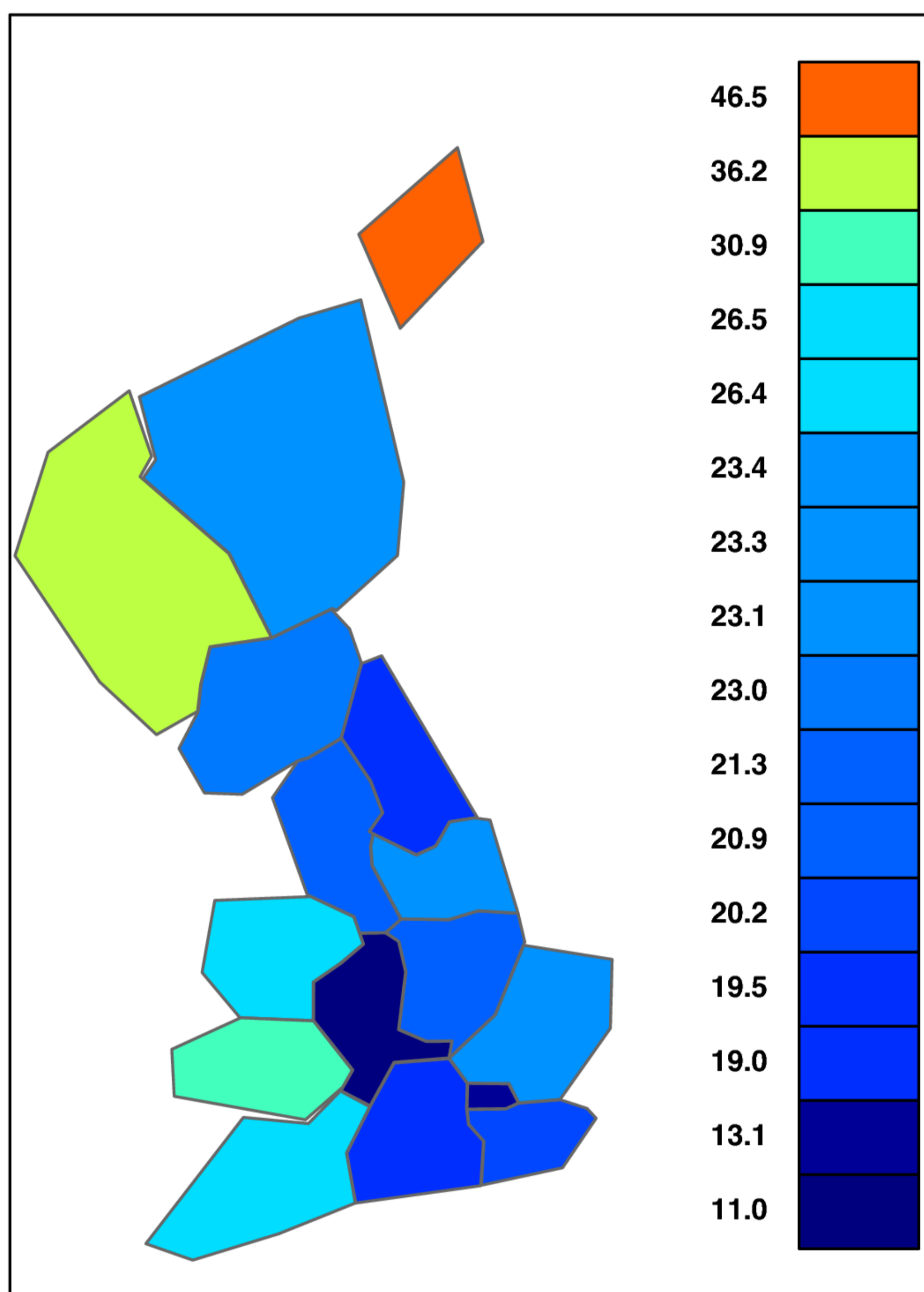
The methodology models wind speed observations as a fraction of the rated power output (capacity factor) of a wind turbine.

The GB distribution is calculated from a *weighted* average of the regional distributions. The weights reflect current and future wind generation capacity in each of the regions.

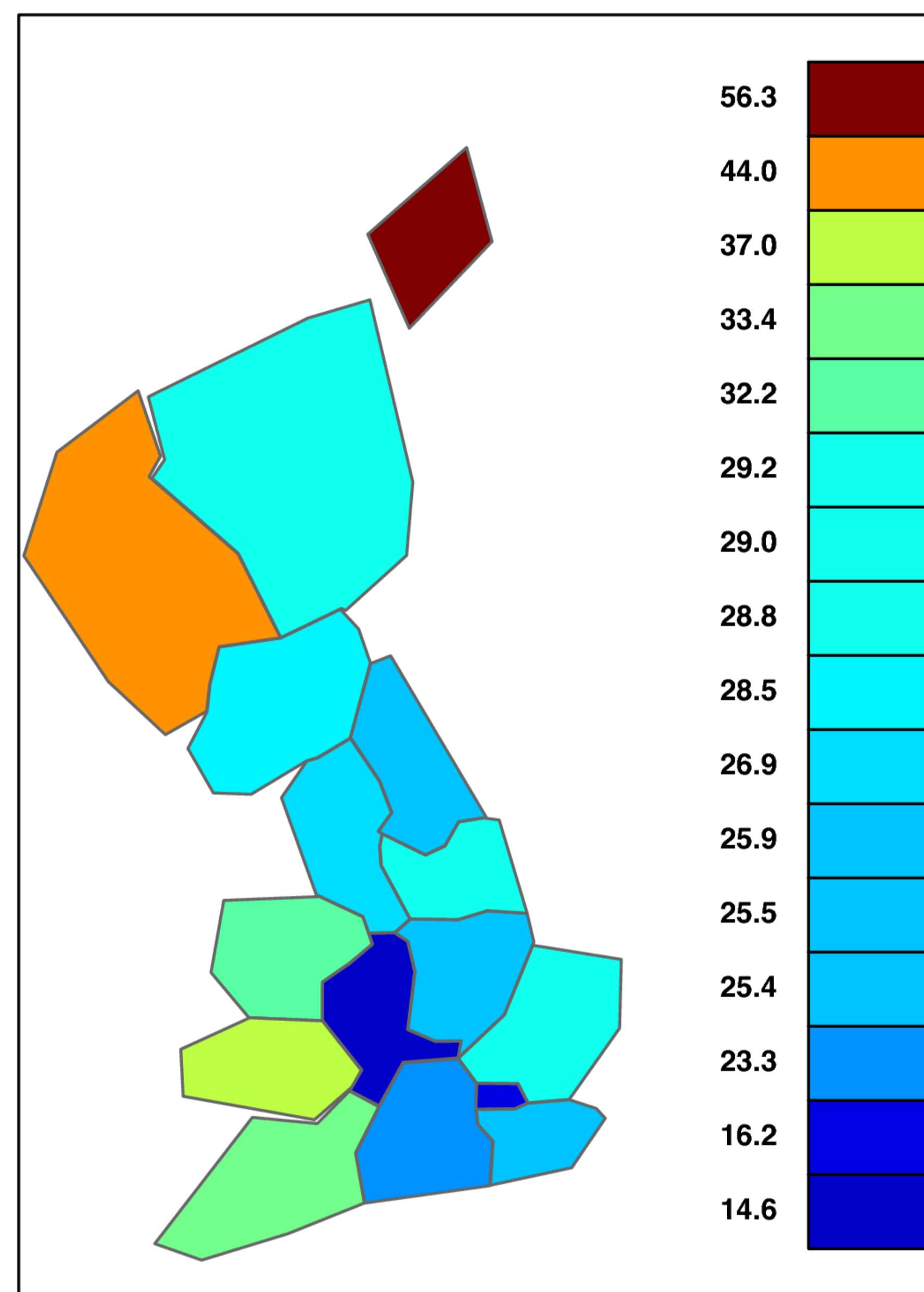
Conclusions

- GB average during peak demand is better than the longterm, but worse than the winter averages.
- Weights make a difference: weighted mean is better.

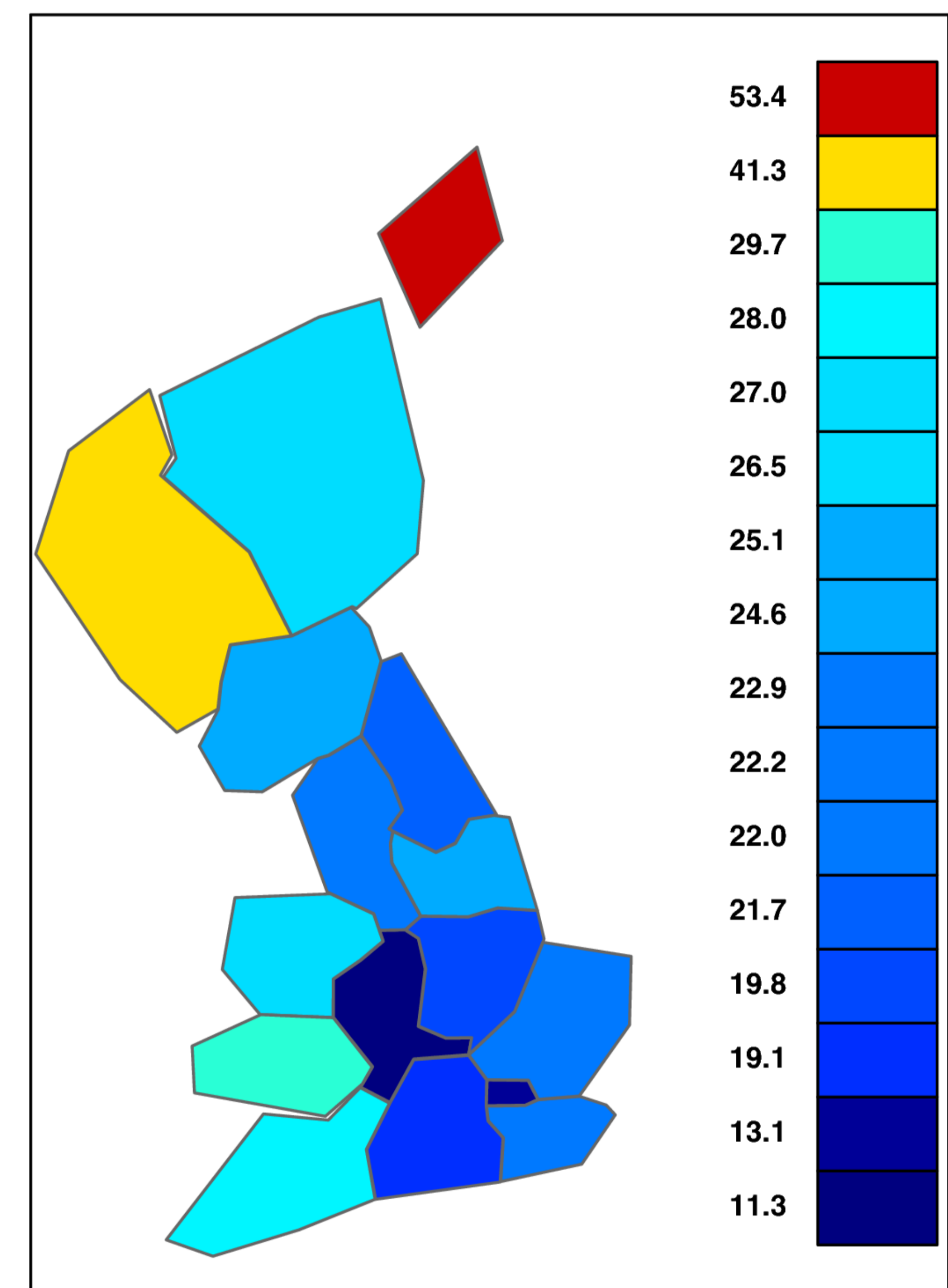
Capacity factors (Longterm)



Capacity factors (Winter)

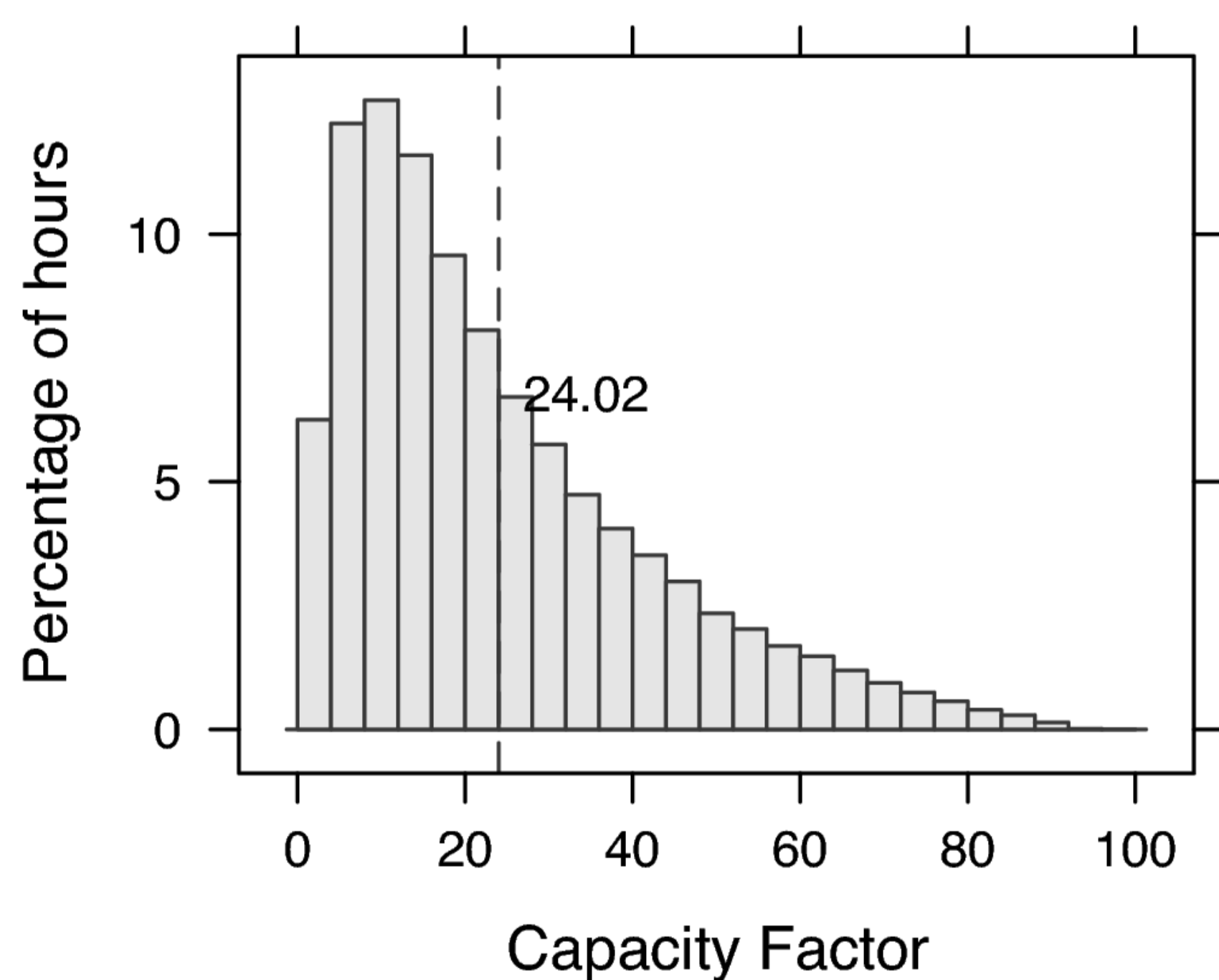


Capacity factors (5% peak)

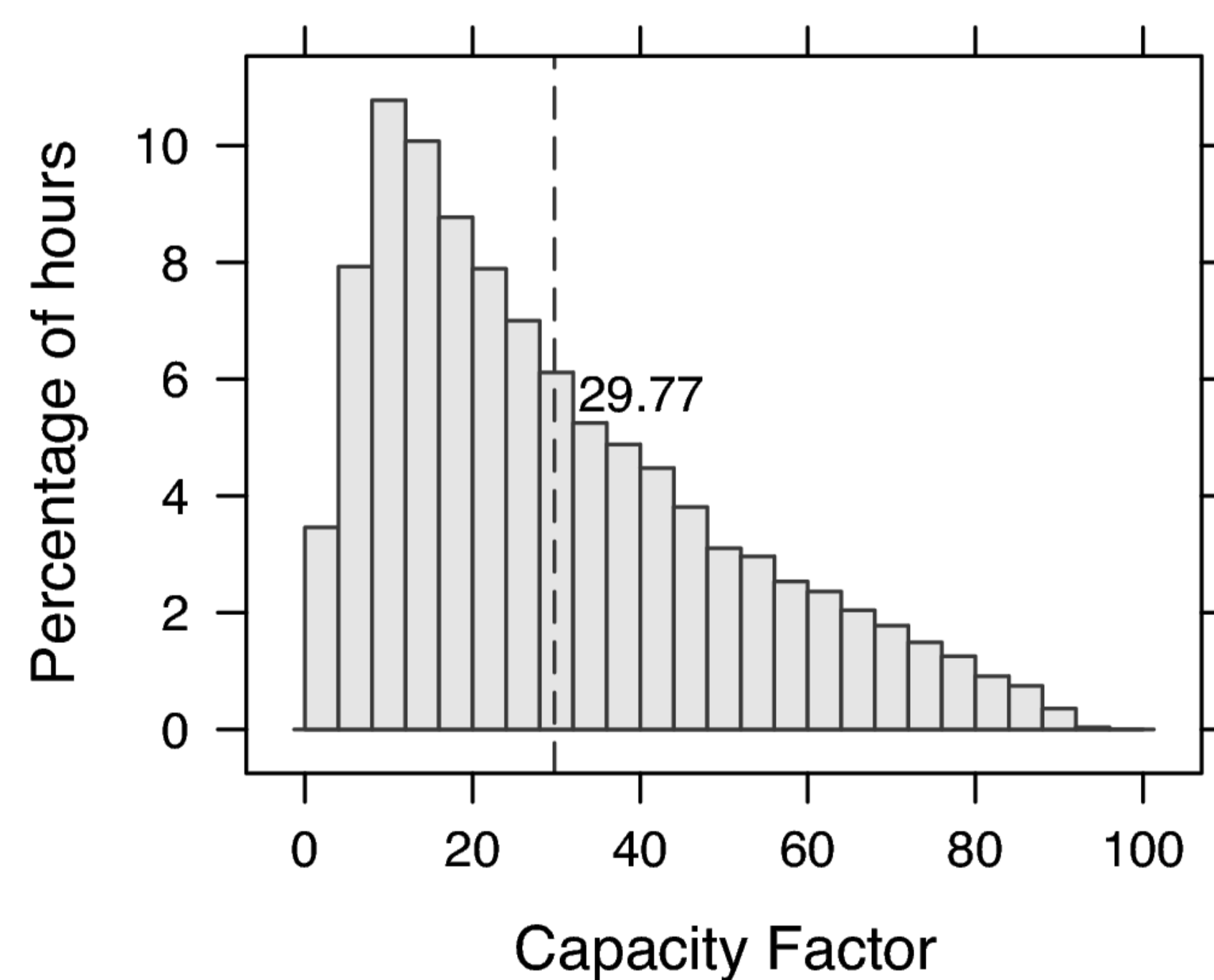


Above: Regional averages. Below: GB distributions.

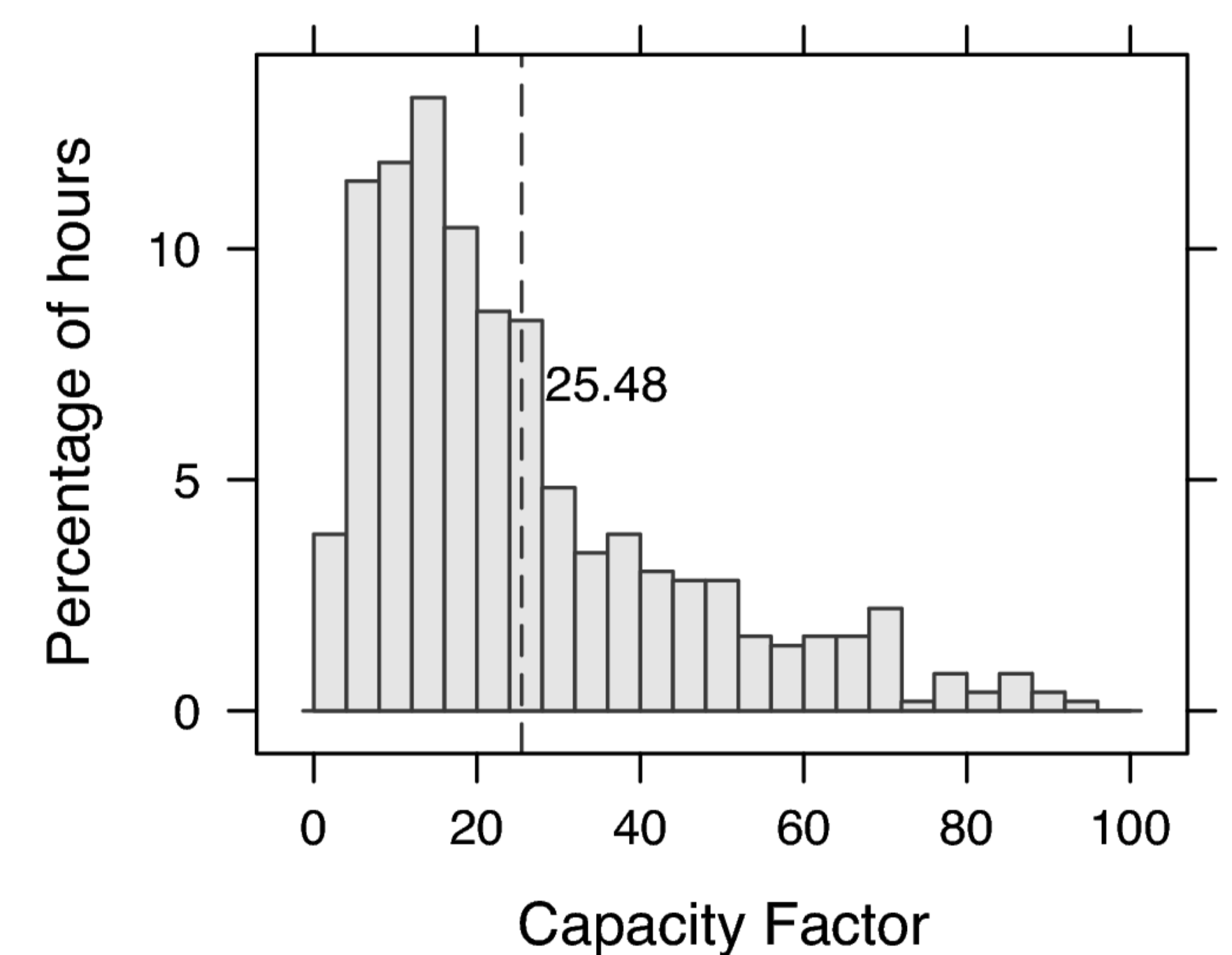
GB unweighted (Longterm)



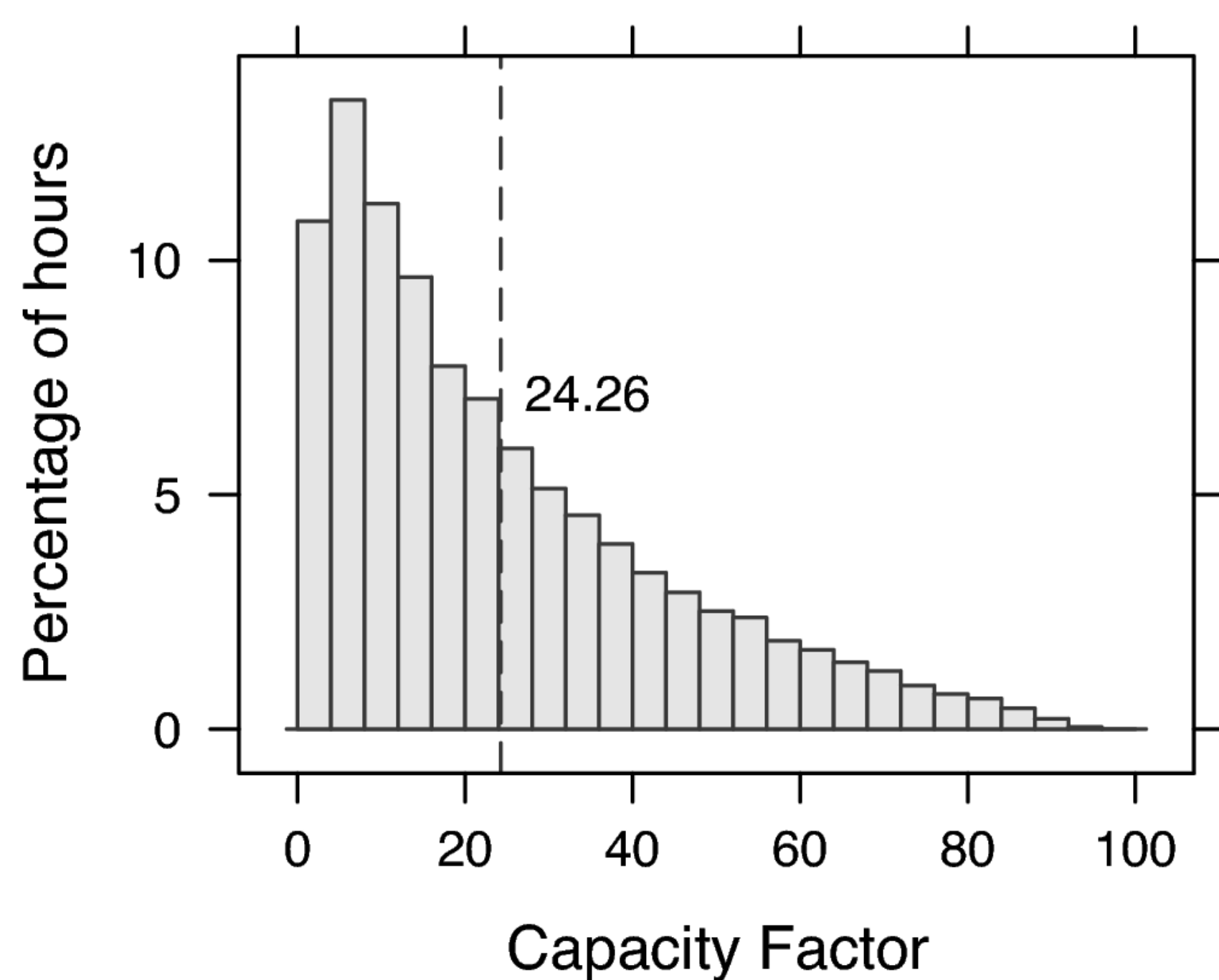
GB unweighted (Oct–Mar winter)



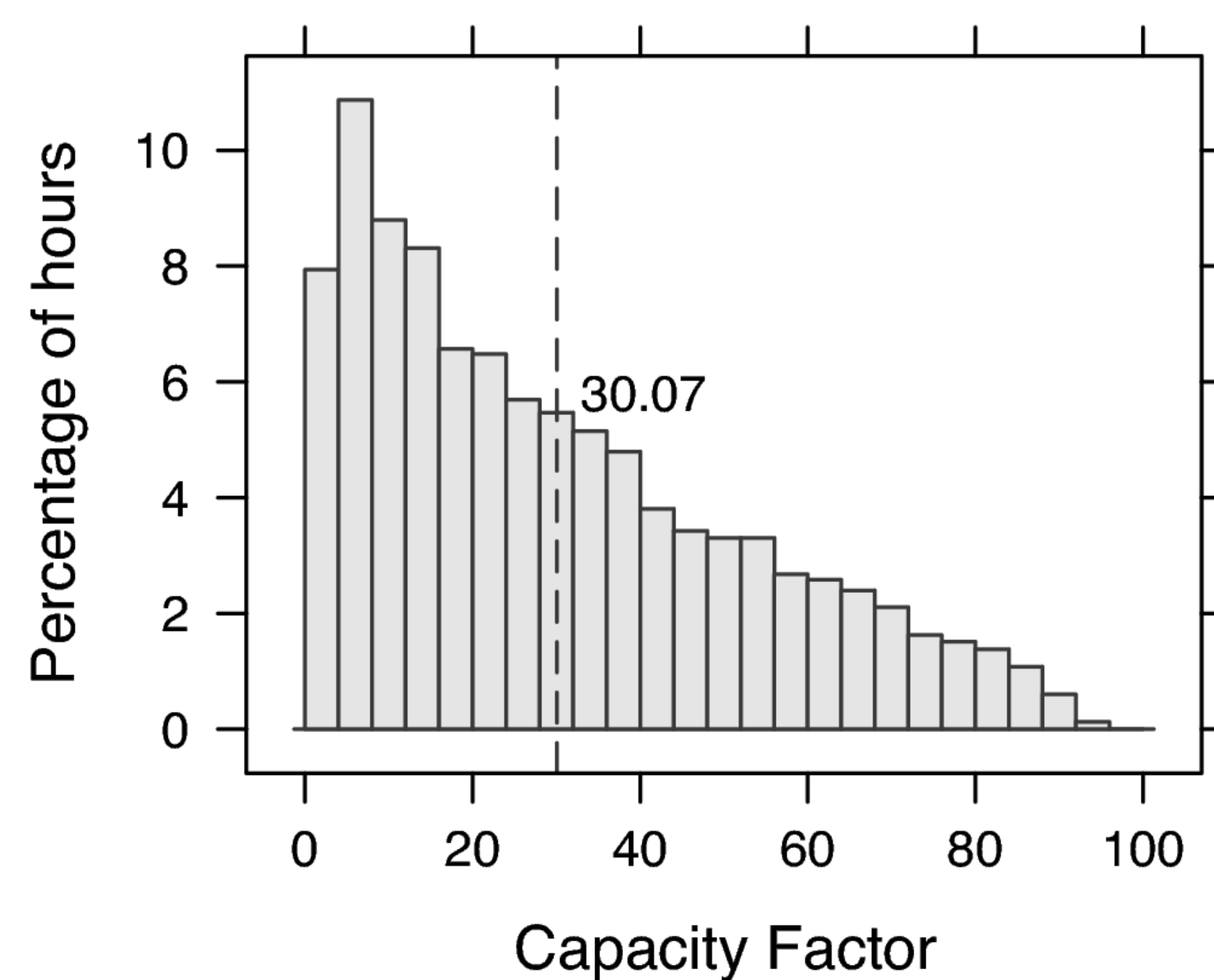
GB unweighted (5% Peak demand)



GB weighted (Longterm)



GB weighted (Oct–Mar winter)



GB weighted (5% Peak demand)

