



HAL
open science

VARIABILTY OF LONG TERM ESTIMATES OF HYDRO POWER GENERATION ON A EUROPEAN SCALE

Valentina Sessa, Edi Assoumou, Sílvia Carvalho

► **To cite this version:**

Valentina Sessa, Edi Assoumou, Sílvia Carvalho. VARIABILTY OF LONG TERM ESTIMATES OF HYDRO POWER GENERATION ON A EUROPEAN SCALE. Internation Conference on Applied Energy, Aug 2019, Vasteras, Switzerland. hal-02317459

HAL Id: hal-02317459

<https://hal-mines-paristech.archives-ouvertes.fr/hal-02317459>

Submitted on 16 Oct 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

VARIABILITY OF LONG TERM ESTIMATES OF HYDRO POWER GENERATION ON A EUROPEAN SCALE

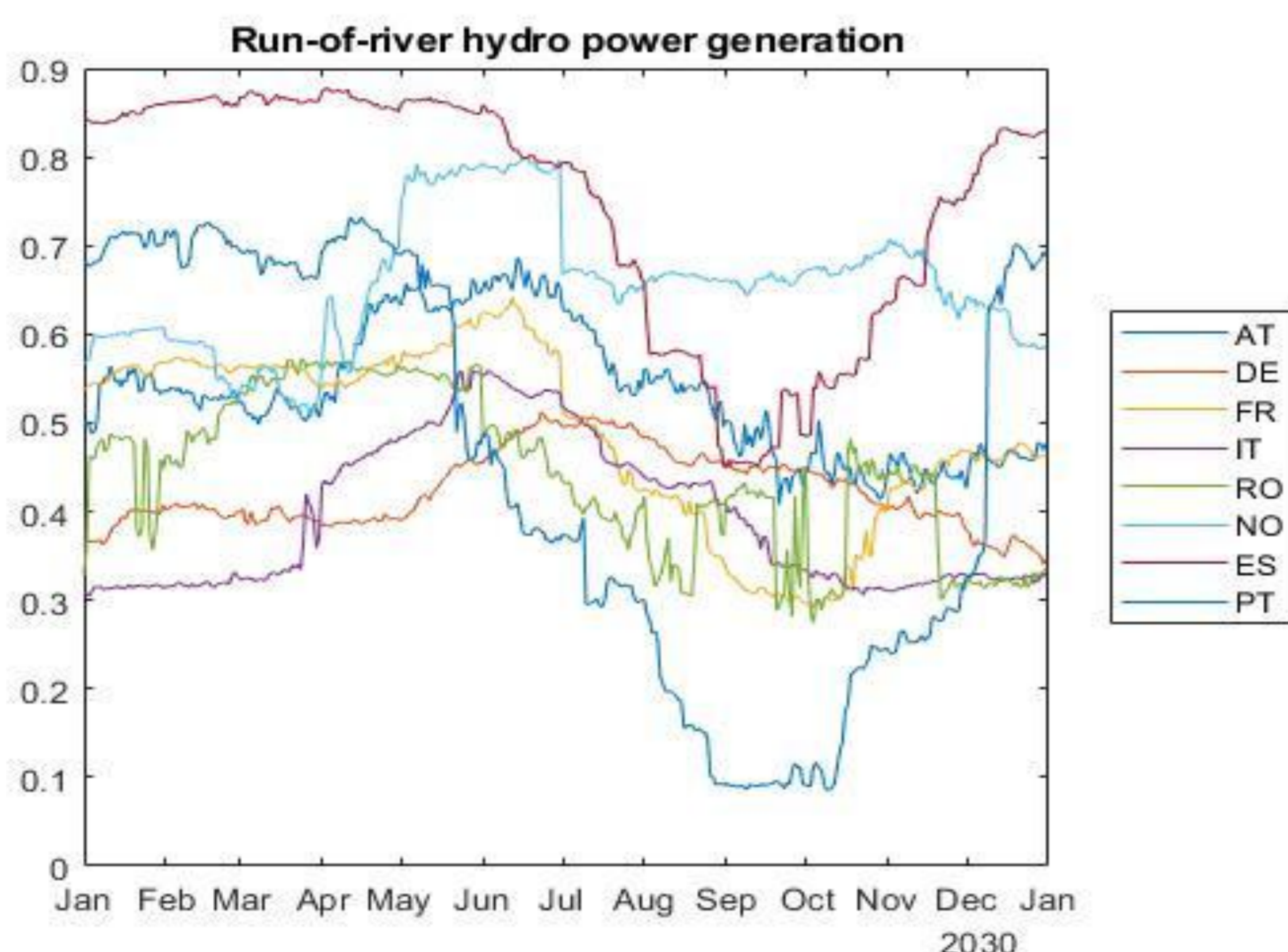
Valentina Sessa^{1*}, Edi Assoumou¹, Sílvia Carvalho²

¹ MINES ParisTech, Centre de Mathématiques Appliquées (CMA), Sophia Antipolis, France.

² Climate Change Impacts Adaptation & Modelling (CCIAM), Faculdade de Ciências da Universidade de Lisboa, Portugal

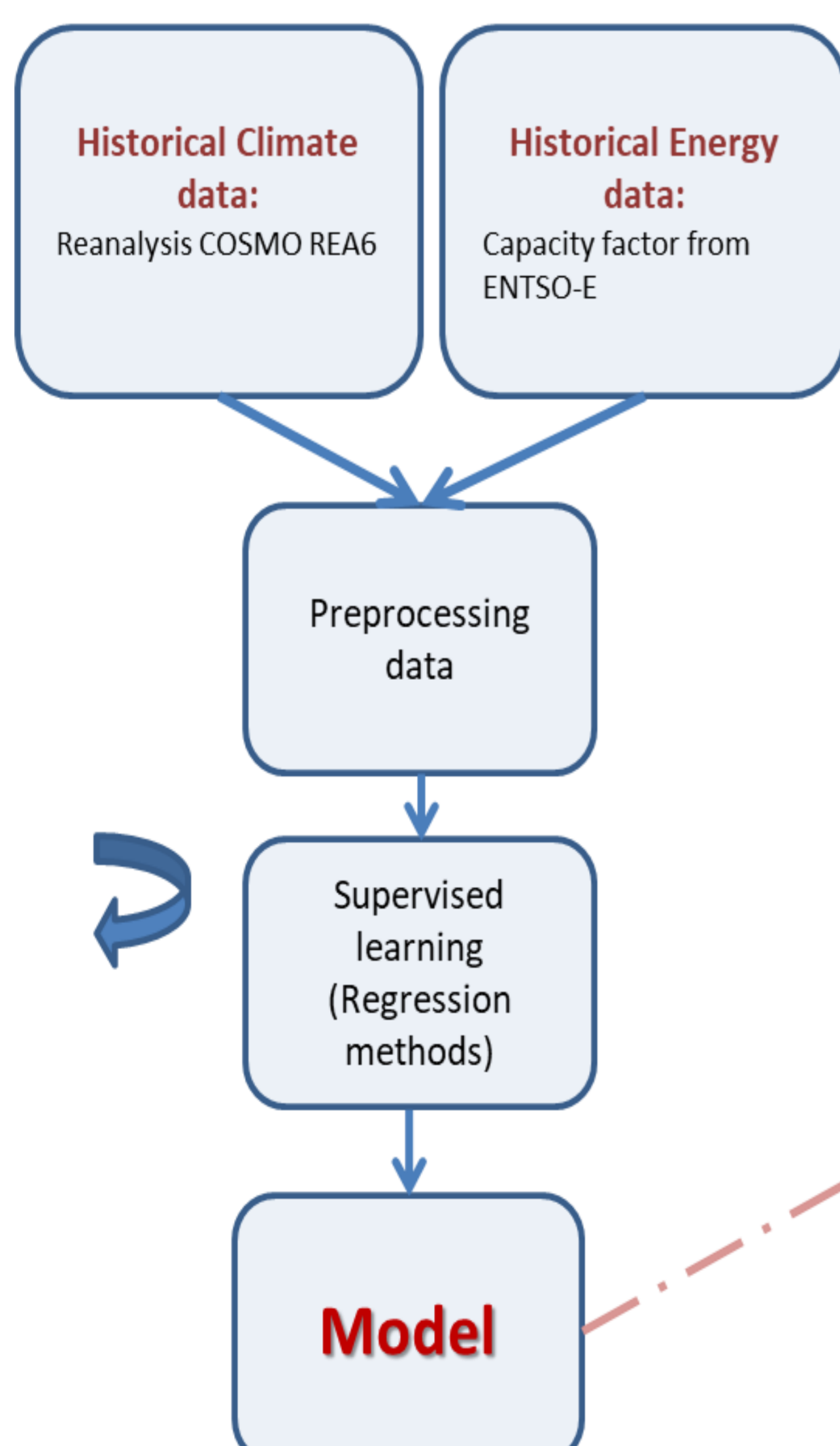
- Hydropower is the world's most dominant (86%) source of renewable electrical energy.
- It strictly depends on the geography and weather peculiarity of locations where power plants are settled.
- We use machine learning techniques for producing long term estimates of hydro power capacity factors for all European countries based on future climate scenarios.

Estimated capacity factor of run-of-river hydro power generation over 2030.

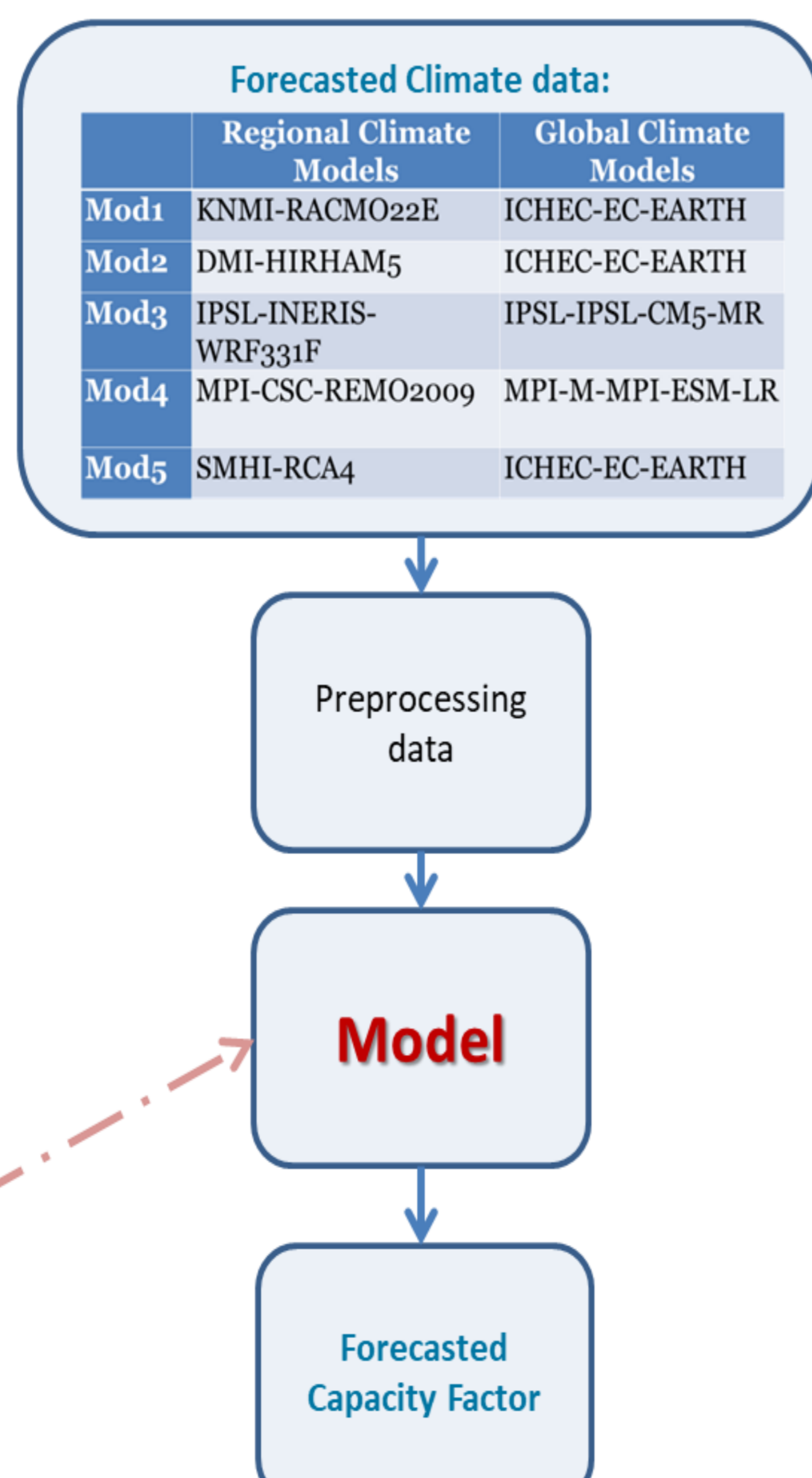


METHODOLOGY

Training

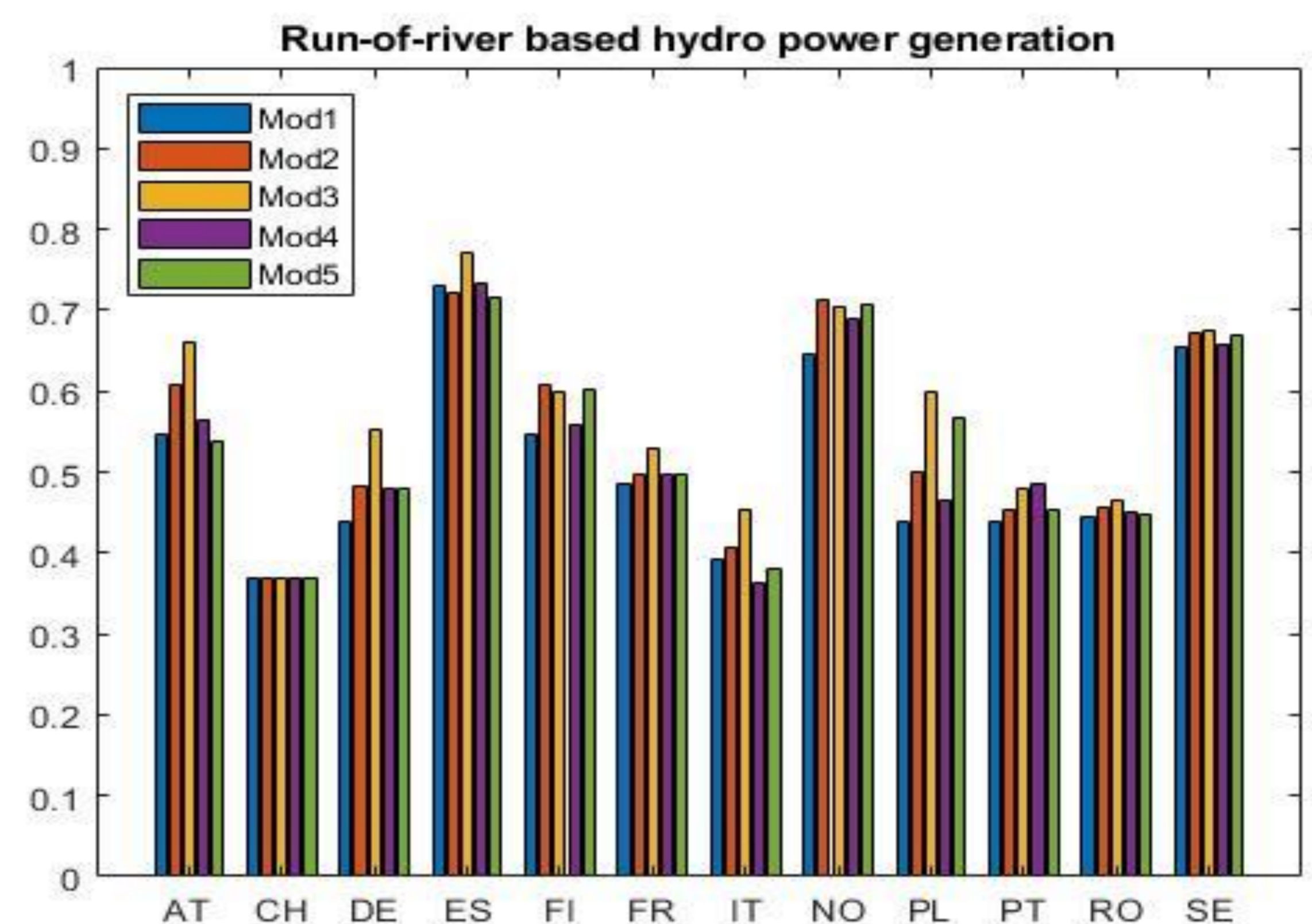


Prediction

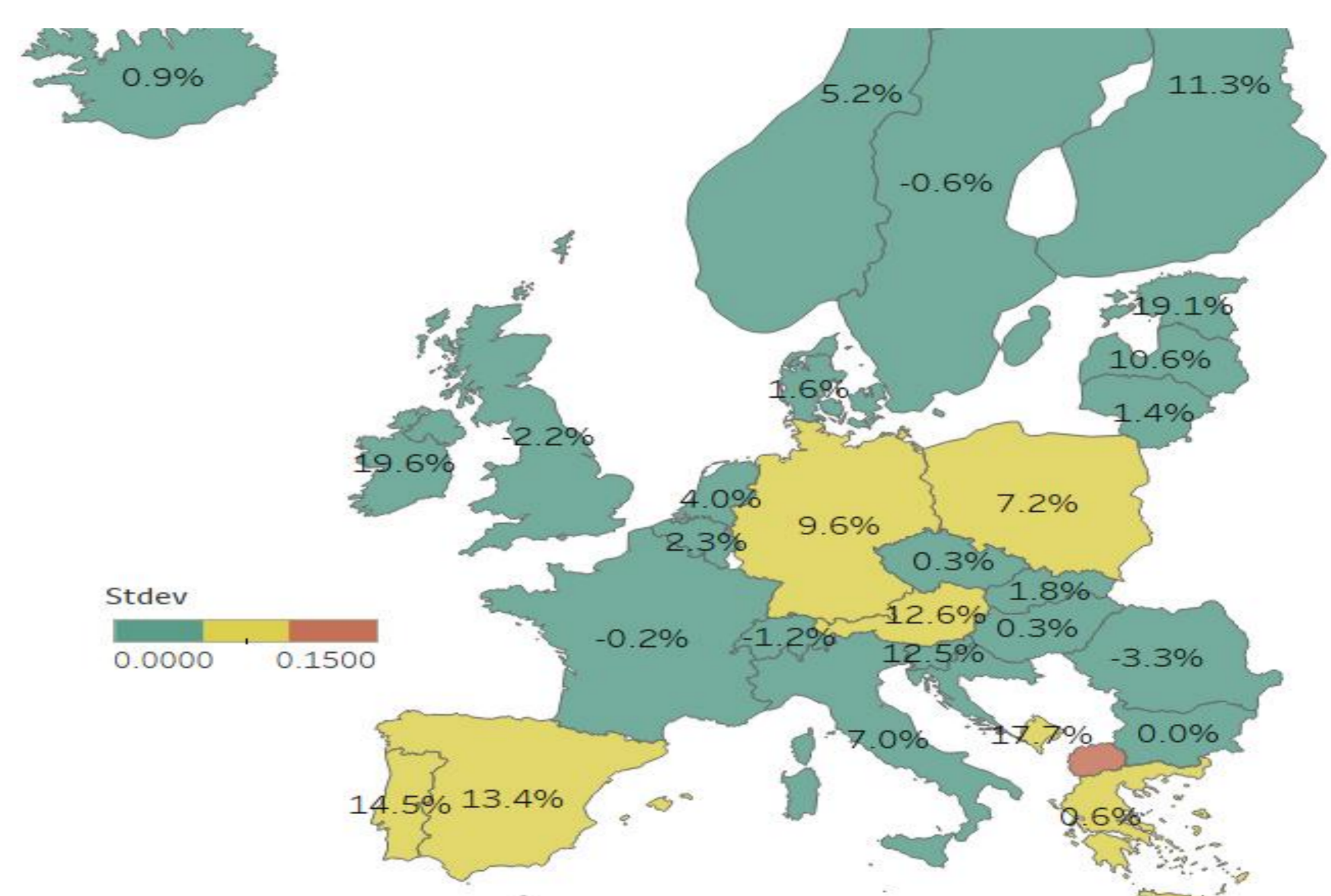


RESULTS

Annual mean of HP generation obtained by considering the five climate models over the year 2050.



Anomalies in the run-of-river HP generation for the year 2050 (winter period DJF).



Variability of capacity factor over 20 years around 2050 for Portugal.

