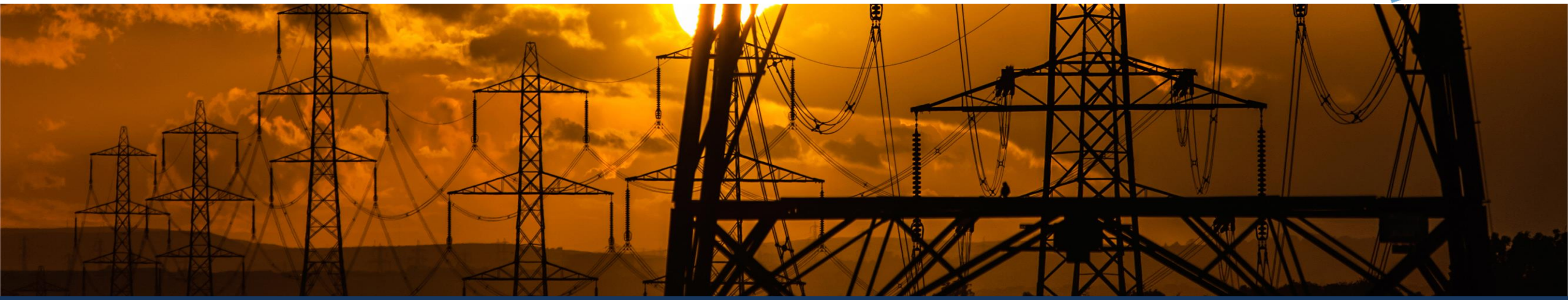


Is Africa leapfrogging to renewables or heading for carbon lock-in? Predicting success of power-generation projects

Galina Alova, Philipp Trotter, Alex Money

Work in progress. Paper under review.
Please do not cite.

NeurIPS 2020 Workshop Tackling Climate Change with Machine Learning
11 December 2020

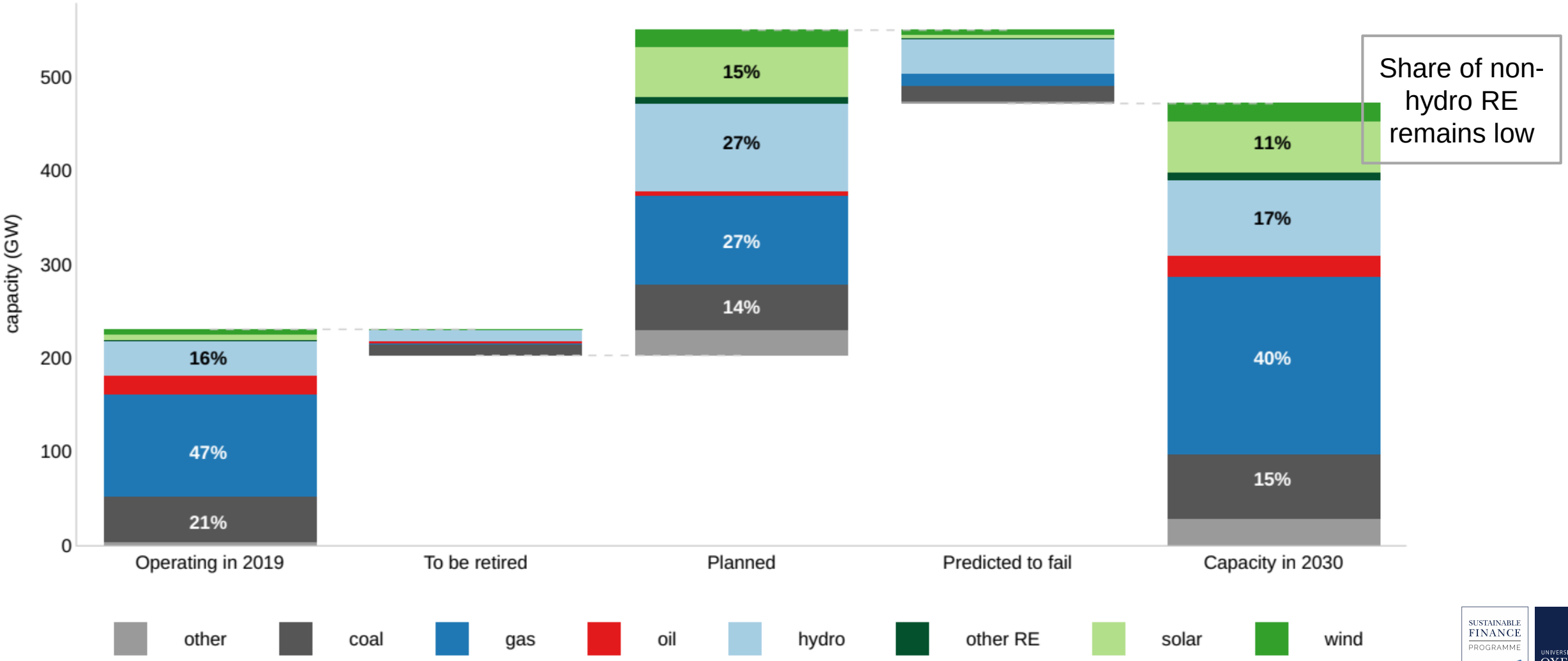
We predict probabilities of planned plant commissioning and estimate capacity mix in 2030

- we use largest dataset on Africa's commissioned, failed & planned power plants, combined with country-level governance & economic indicators

- we build Gradient Boosted Trees (LightGBM) model, given its merits:
  - works well out-of-the-box
  - deals well missing values
  - good interpretability with SHAP values
  - high performance, low bias
  - captures non-linear relationships
  - possibility to inject domain knowledge

Capacity more than doubles, but transition to renewables slow

Africa's current capacity mix in 2019 and predicted capacity mix in 2030 by fuel type

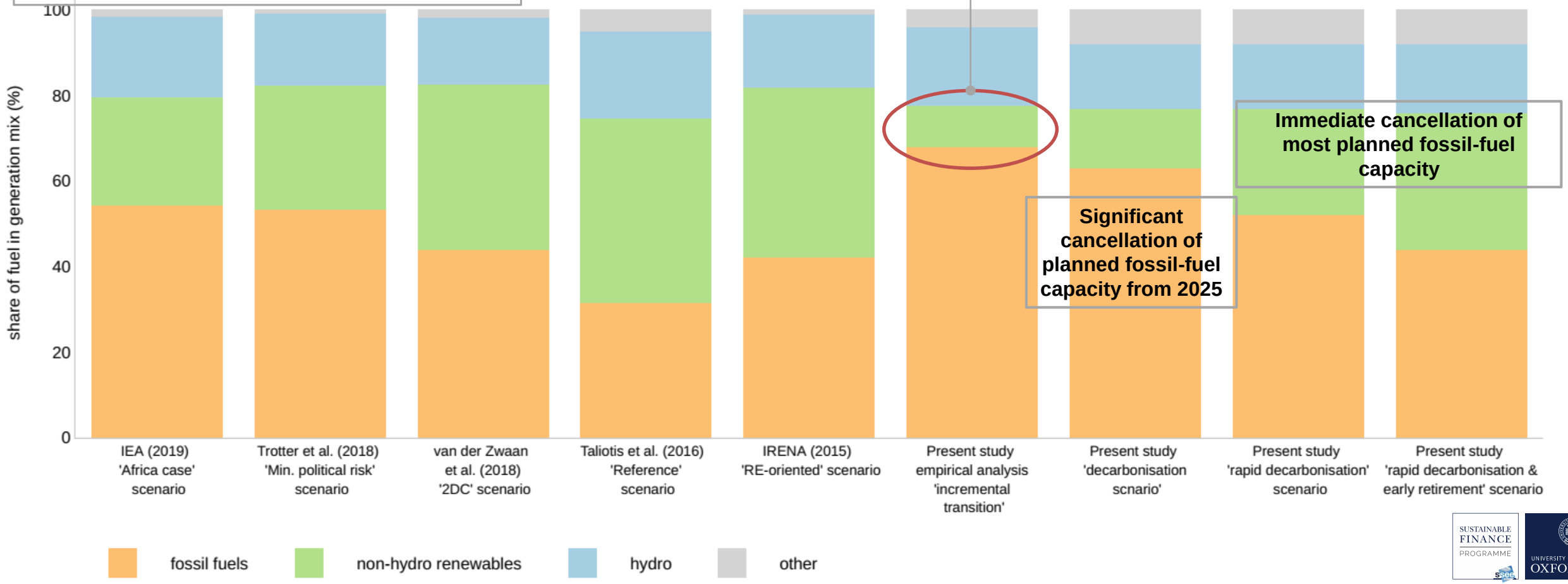


Reaching RE share of current studies requires immediate large-scale cancellation of majority of planned fossil-fuel plants

Comparison of projected generation mix for Africa in 2030 by extant studies and our study

In terms of overall generation, our prediction is similar to extant studies

but we predict much lower RE share



SUSTAINABLE FINANCE PROGRAMME
UNIVERSITY OF OXFORD

Stay in touch:

galina.alova@ouce.ox.ac.uk

Galina Alova

Read my new paper