

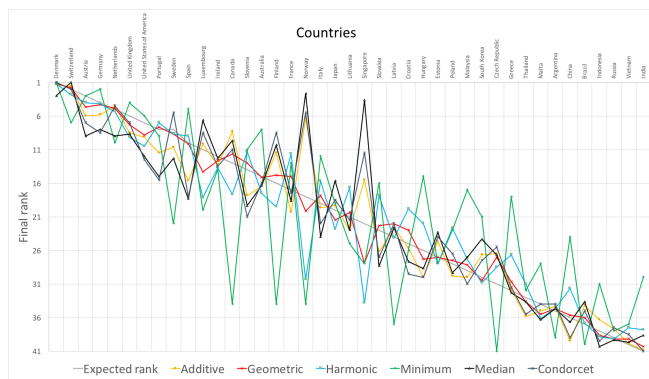
## Master thesis:

### Exploration of implicit weights in composite indicators: the case of resilience assessment of countries' electricity supply

#### Research background

Resilience of electricity supply has received increasing attention over the last decade due to a number of severe disruptions affecting our economies.

Within the FRS module 2.1 (<http://www.frs.ethz.ch/research/energy-and-comparative-system/energy-systems-resilience.html>) at Singapore-ETH Centre (<http://www.sec.ethz.ch/>) we have developed a set of indices (different colours in the figure below) to rank the resilience of countries from a security of electricity supply perspective.



#### Master thesis project context

This research project will look at a complementary and fundamental component of indices construction, namely **the weighting step**, which is used to assign different importance levels to the building blocks of indices, i.e. the indicators.

#### Objectives of the research project

1. Assess the implicit weights of the indicators for the construction of the resilience indices;
2. Provide recommendations about how to adjust them according to preferences of different decision-makers.

Practical contribution of this project consists in *discussing the learning process* enabled by the understanding of *how far weights are from the desired values*, which *indicators' weights have reduced impact* on the results and *could even be removed*.

#### Tasks

1. Literature review on weighting methods for construction of indices (1 month, PSI Switzerland);
2. Learn the Matlab toolbox for analysis and adjustment of weights (Mat-toolbox) in composite indicators (1 month, PSI Switzerland / just under 1 month, FRS-Lab Singapore);
3. Application of Mat-toolbox to the in-house dataset of 41 countries evaluated according to their resilience of electricity supply (just over 2 months, FRS-Lab Singapore);
4. Writing of thesis report and preparation of presentation (1 month, PSI Switzerland).

#### Timeframe

From January 2018, 6 months full-time

#### Location

Technology Assessment Group, Laboratory for Energy System Analysis (LEA), Paul Scherrer Institute (PSI), Switzerland (3 months)

Future Resilient Systems Lab (FRS), Singapore-ETH Centre (SEC), Singapore (3 months)

#### Benefits for the student

- Enhance the student's capacity of creation and management of rankings, which can equip him/her with key analytical and critical analysis skills for the next career steps, either in academia, industry or policy-making work settings;
- Learn how to write scientific reports and to present results for conferences/workshops;
- International research experience.

#### Student profile

Interested in implementation of statistical analysis methods. Matlab is the software to be used for the analysis.

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