

(FRS) FUTURE RESILIENT SYSTEMS 未来韧性系统



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## MCDA Index Tool

# An interactive software to develop indices and rankings

*Introduction*

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## Program description

The MCDA Index Tool (<http://www.mcdaindex.net/>) is a web software that provides a practical and straightforward guide for the construction of indices and rankings. In particular, it contains a set of steps that can help develop indices by learning and assessing the quality of the outputs. Key features include robustness assessment of the outcomes and a wide range of results visualization.

It allows users to:

1. **Import data** (in CSV format) of the alternatives to be evaluated with respect to the chosen criteria.
2. **Define the polarity of each indicator** (positive polarity = the higher the value of the criterion the better; negative polarity = the lower the value of the criterion the better for the evaluation).
3. **Choose the weights** with a simple sliding bar. The user could also use the so-called SWING method (Riabacke et al. 2012) to assign weights.
4. **Select the normalization methods and aggregation functions** to build the indices. **31 combinations** are available, by accounting for multiple compensation levels and approaches to render the indicators on a comparable measurement scale.
5. Obtain the **normalized indicators** and **directly compare the alternatives** with respect to one or more criteria.
6. Obtain the **raw and normalized scores** as well as the **rankings to identify the overall performance of the alternatives**.
7. **Visualize** the proportion (in %) of **indices** which **rank** alternative  $x$  at the  $k$ -th position
8. **Compare** the **indices** according to the normalization methods or the aggregation functions.
9. **Select and compare the rankings** according to the chosen combinations.

This tool was developed in connection to a novel index – the Electricity Supply Resilience Index (ESRI), established within the Future Resilient Systems (FRS) program, at the Singapore-ETH Centre (SEC)<sup>1</sup>; see Gasser et al. (2017), Lindén (2018) and Suter (2018) for further details.

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<sup>1</sup> Cluster 2.1: Assessing and Measuring Energy Systems Resilience, <http://www.frs.ethz.ch/research/energy-and-comparative-system/energy-systems-resilience.html>

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