

## Congestion modeling

This is the case description for the data science application at Stedin. The goal of this assessment is to create a prediction for a fictional congestion location. This assessment should take you between 2 and 3 hours to complete, but you're allowed to take as much time as you want.

Stedin is responsible for the distribution grid for more than 2 million households in the Netherlands. Within this grid, we face many challenges due to the rising demand for electricity. Peak demand typically only happens every so often though. Therefore, predicting these peaks and preventing them reduces the need for expensive and partially unnecessary enhancements ("verzwaring") of the grid.

### Goal

Create a model that is able to predict at least 48 hours into the future and can be used by the operators of Stedin to define counter measures to prevent congestion before it happens.

The way you approach this is completely up to you, but you also need to provide evidence of the quality of your prognosis and explain why and how your model provides its results. You're also free to build additional features that can help improve the quality of your model.

### Data

You have received a dataset (pickle-file, load through pandas (pd) with `pd.read_pickle`). The dataset holds the history for this specific location and some additional information. You can assume that the acceptable operation range for this transformer is between 0 and 1.

Name	Description
Transformer load	Power usage
Radiation	Solar radiation level
Windspeed 10m	Windspeed (m/s) at 10 meters high
Windspeed 100m	Windspeed (m/s) at 100 meters high
Windspeed squall	Windspeed of squall ("rukwinden")
Nedu_EXX	Fraction of yearly energy usage that takes place in current time slot for customer profile EXX. Several different profiles have been provided, each with slightly different characteristics. Each household in holland is linked with one of these profiles.

Bonus questions:

- How should your model be used? What would the process look like?
- What additional improvements would you have made if you had more time?