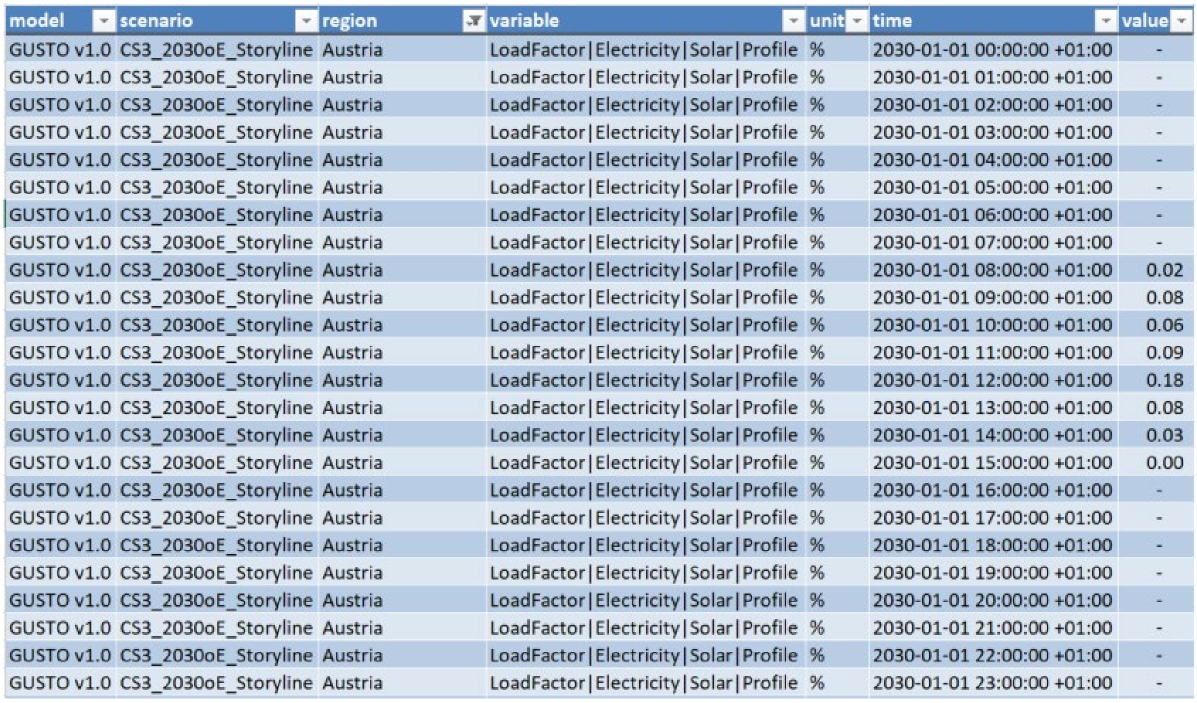
Modus operandi to get the information from the open platform (*Scenario Explorer*) into the modeling exercise

The following description refers to the folder structure in the GitHub repository of GUSTO, available here.

1. **Download** the data from Scenario Explorer **into** the subfolder ***'files'***.

It contains all information downloaded from the open platform. Note that the input file is located under 'Input'.

Exemplarily, the following Figure 1 shows the variable *LoadFactor|Electricity|Solar|Profile* downloaded from the open platform in the extended IAMC format.

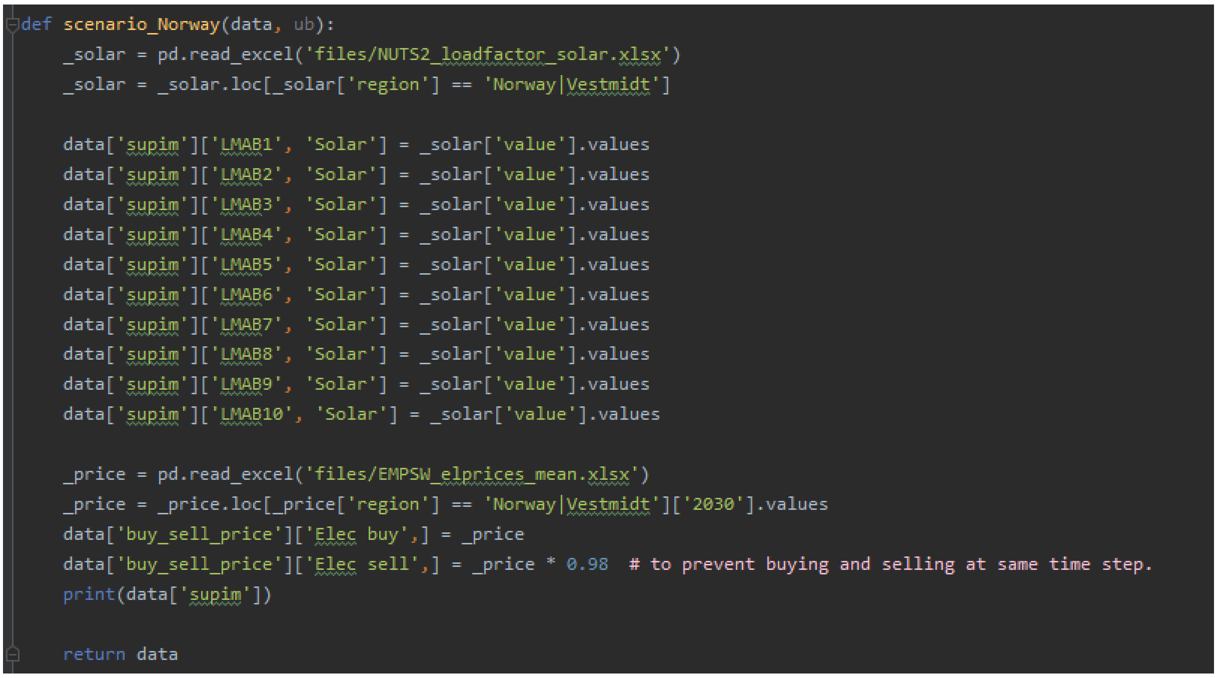


model	scenario	region	variable	unit	time	value
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 00:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 01:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 02:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 03:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 04:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 05:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 06:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 07:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 08:00:00 +01:00	0.02
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 09:00:00 +01:00	0.08
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 10:00:00 +01:00	0.06
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 11:00:00 +01:00	0.09
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 12:00:00 +01:00	0.18
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 13:00:00 +01:00	0.08
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 14:00:00 +01:00	0.03
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 15:00:00 +01:00	0.00
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 16:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 17:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 18:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 19:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 20:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 21:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 22:00:00 +01:00	-
GUSTO v1.0	CS3_2030oE_Storyline	Austria	LoadFactor|Electricity|Solar|Profile	%	2030-01-01 23:00:00 +01:00	-

Figure 1 LoadFactor|Electricity|Solar|Profile in the extended IAMC format

2. Linking the information into the modeling task

The script *scenarios.py* (see directory *urbs/scenarios.py*) contains all assumptions, especially those that differ by different scenarios (or storylines). The previously collected information can be used directly as input data. This is again exemplary for the solar profile, as well as the electricity prices shown in Figure 2. Note that in this Python script all desired information can be inserted and considered.



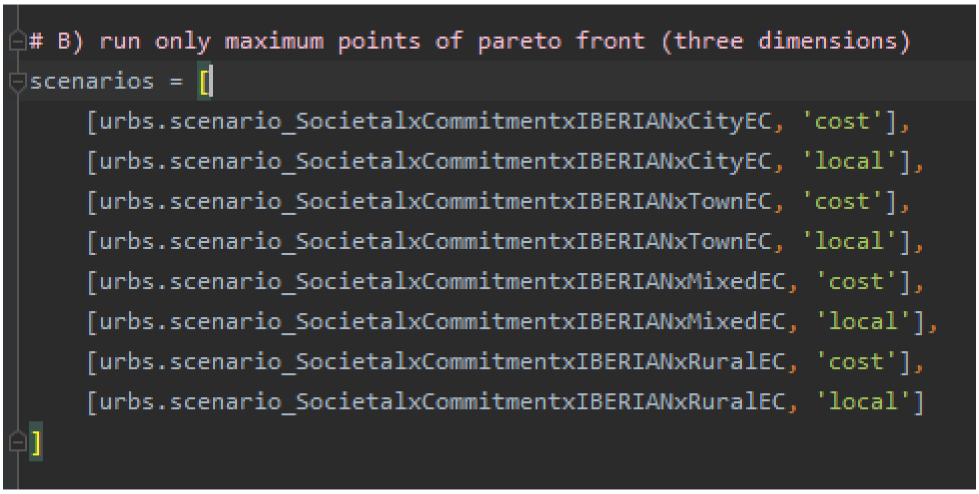
```
def scenario_Norway(data, ub):
    _solar = pd.read_excel('files/NUTS2_loadfactor_solar.xlsx')
    _solar = _solar.loc[_solar['region'] == 'Norway|Vestmidt']

    data['supim']['LMAB1', 'Solar'] = _solar['value'].values
    data['supim']['LMAB2', 'Solar'] = _solar['value'].values
    data['supim']['LMAB3', 'Solar'] = _solar['value'].values
    data['supim']['LMAB4', 'Solar'] = _solar['value'].values
    data['supim']['LMAB5', 'Solar'] = _solar['value'].values
    data['supim']['LMAB6', 'Solar'] = _solar['value'].values
    data['supim']['LMAB7', 'Solar'] = _solar['value'].values
    data['supim']['LMAB8', 'Solar'] = _solar['value'].values
    data['supim']['LMAB9', 'Solar'] = _solar['value'].values
    data['supim']['LMAB10', 'Solar'] = _solar['value'].values

    _price = pd.read_excel('files/EMPSW_elprices_mean.xlsx')
    _price = _price.loc[_price['region'] == 'Norway|Vestmidt']['2030'].values
    data['buy_sell_price']['Elec buy',] = _price
    data['buy_sell_price']['Elec sell',] = _price * 0.98  # to prevent buying and selling at same time step.
    print(data['supim'])

    return data
```

Figure 2 Link the information via scenarios.py script into the modeling exercise

3. Write results into the extended IAMC format

After the model run (see *run_model.py*), the results for the modified electricity load profile are written directly into the extended IAMC format. Note that all results can be seen under *Outputs* and, if necessary, further results can be written into the necessary extended IAMC format.

Note that the corresponding changed scenarios still have to be defined in the run_model.py script (see Figure 3).



```
# B) run only maximum points of pareto front (three dimensions)
scenarios = [
    [urbs.scenario_SocietalxCommitmentxIBERIANxCityEC, 'cost'],
    [urbs.scenario_SocietalxCommitmentxIBERIANxCityEC, 'local'],
    [urbs.scenario_SocietalxCommitmentxIBERIANxTownEC, 'cost'],
    [urbs.scenario_SocietalxCommitmentxIBERIANxTownEC, 'local'],
    [urbs.scenario_SocietalxCommitmentxIBERIANxMixedEC, 'cost'],
    [urbs.scenario_SocietalxCommitmentxIBERIANxMixedEC, 'local'],
    [urbs.scenario_SocietalxCommitmentxIBERIANxRuralEC, 'cost'],
    [urbs.scenario_SocietalxCommitmentxIBERIANxRuralEC, 'local']
]
```

Figure 3 Definition of the scenarios to run