

City Energy Analyst version 3.34.2

Running `cea optimization-new` with the following parameters:

- general:debug = False
(default: False)
- general:scenario = /Users/zshi/Dropbox/CEA2/Simulations/
Austrasse
(default: {general:project}/{general:scenario-name})
- general:multiprocessing = True
(default: True)
- general:number-of-cpus-to-keep-free = 1
(default: 1)
- optimization-new:network-type = DH
(default: DH)
- optimization-new:cooling-components =
['vapor_compression_chillers', 'absorption_chillers',
'unitary_air_conditioners']
(default: ['vapor_compression_chillers',
'absorption_chillers', 'unitary_air_conditioners'])
- optimization-new:heating-components =
['cogeneration_plants', 'heat_pumps', 'boilers']
(default: ['cogeneration_plants', 'heat_pumps', 'boilers'])
- optimization-new:heat-rejection-components =
['cooling_towers']
(default: ['cooling_towers'])
- optimization-new:maximum-number-of-networks = 2
(default: 2)
- optimization-new:objective-functions =
['system_energy_demand', 'anthropogenic_heat']
(default: ['system_energy_demand', 'anthropogenic_heat'])
- optimization-new:generate-detailed-outputs = True
(default: False)
- optimization-new:available-energy-sources = ['power_grid',
'fossil_fuels', 'bio_fuels']
(default: ['power_grid', 'fossil_fuels', 'bio_fuels'])
- optimization-new:available-energy-potentials =
['photovoltaic_panels', 'photovoltaic_thermal_panels',
'solar_thermal_panels', 'geothermal_energy', 'water_bodies',
'sewage']
(default: ['photovoltaic_panels',
'photovoltaic_thermal_panels', 'solar_thermal_panels',
'geothermal_energy', 'water_bodies', 'sewage'])
- optimization-new:component-efficiency-model-complexity =
constant
(default: constant)
- optimization-new:systems-algorithm = NSGAI3
(default: NSGAI3)
- optimization-new:systems-mutation-method = PolynomialBounded
(default: PolynomialBounded)
- optimization-new:systems-crossover-method = Uniform
(default: Uniform)

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- optimization-new:networks-algorithm = NSGAIIII
  (default: NSGAIIII)
- optimization-new:networks-mutation-method = UniformInteger
  (default: UniformInteger)
- optimization-new:networks-crossover-method = Uniform
  (default: Uniform)
- optimization-new:ga-population-size = None
  (default: None)
- optimization-new:ga-number-of-generations = 3
  (default: 3)
- optimization-new:ga-mutation-prob = 0.1
  (default: 0.1)
- optimization-new:ga-crossover-prob = 0.3
  (default: 0.3)
- optimization-new:ga-mutation-eta = 0.5
  (default: 0.5)
- optimization-new:min-head-substation = 20.0
  (default: 20.0)
- optimization-new:hw-friction-coefficient = 100
  (default: 100)
- optimization-new:peak-load-velocity = 2.0
  (default: 2.0)
- optimization-new:equivalent-length-factor = 0.2
  (default: 0.2)
- optimization-new:peak-load-percentage = 100.0
  (default: 100.0)
Time elapsed for loading buildings in domain:
0.802077054977417 s
Time elapsed for loading energy potentials: 0.4613780975341797
s
```

Initializing domain:

1. Creating available supply system components...
2. Finding possible network paths (this may take a while)...
3. Establishing district energy system structure...
4. Defining possible connectivity vectors...

Calculating operation of buildings' base-supply systems...
Starting optimisation of district energy systems (i.e.
networks + supply systems)...

DES: gen 1

DES: gen 2

DES: gen 3

Starting evaluation of connectivity vector: [0, 0, 0, 0, 0, 0,

0, 0, 0, 0]

Starting evaluation of connectivity vector: [0, 1, 0, 1, 0, 0, 0, 0, 1, 1]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 25% of offspring retained

N1001: gen 2 - 0% of offspring retained

N1001: gen 3 - 25% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.7793760299682617 s)

Starting evaluation of connectivity vector: [0, 1, 0, 1, 0, 0, 0, 0, 0, 0]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 31% of offspring retained

N1001: gen 2 - 0% of offspring retained

N1001: gen 3 - 12% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.7329339981079102 s)

Starting evaluation of connectivity vector: [0, 0, 1, 0, 1, 0, 0, 0, 0, 0]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 31% of offspring retained

N1001: gen 2 - 31% of offspring retained

N1001: gen 3 - 25% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.8810768127441406 s)

Starting evaluation of connectivity vector: [0, 0, 0, 0, 0, 0, 0, 0, 1, 1]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 19% of offspring retained

N1001: gen 2 - 0% of offspring retained

N1001: gen 3 - 25% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.7628180980682373 s)

Starting evaluation of connectivity vector: [2, 2, 2, 1, 2, 0, 1, 1, 0, 0]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 12% of offspring retained

N1001: gen 2 - 12% of offspring retained

N1001: gen 3 - 12% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.6772208213806152

s)

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1002.

N1002: gen 1 - 6% of offspring retained

N1002: gen 2 - 31% of offspring retained

N1002: gen 3 - 0% of offspring retained

Supply system N1002 optimised.(Time elapsed 0.6586530208587646 s)

Starting evaluation of connectivity vector: [2, 2, 0, 2, 2, 2, 0, 0, 0, 2]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1002.

N1002: gen 1 - 6% of offspring retained

N1002: gen 2 - 0% of offspring retained

N1002: gen 3 - 25% of offspring retained

Supply system N1002 optimised.(Time elapsed 0.7083888053894043 s)

Starting evaluation of connectivity vector: [0, 1, 2, 0, 2, 1, 2, 1, 2, 1]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 12% of offspring retained

N1001: gen 2 - 12% of offspring retained

N1001: gen 3 - 25% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.8083658218383789 s)

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1002.

N1002: gen 1 - 19% of offspring retained

N1002: gen 2 - 12% of offspring retained

N1002: gen 3 - 6% of offspring retained

Supply system N1002 optimised.(Time elapsed 0.7333447933197021 s)

Starting evaluation of connectivity vector: [0, 0, 2, 0, 1, 2, 1, 0, 2, 0]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 25% of offspring retained

N1001: gen 2 - 12% of offspring retained

N1001: gen 3 - 12% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.7120361328125 s)

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1002.

N1002: gen 1 - 12% of offspring retained

N1002: gen 2 - 0% of offspring retained
N1002: gen 3 - 0% of offspring retained
Supply system N1002 optimised.(Time elapsed 0.5879690647125244 s)
Starting evaluation of connectivity vector: [0, 2, 2, 2, 2, 1, 1, 1, 0, 2]
The format of the required maximum supply flow was corrected slightly.
Starting optimisation of supply system N1001.
N1001: gen 1 - 6% of offspring retained
N1001: gen 2 - 19% of offspring retained
N1001: gen 3 - 0% of offspring retained
Supply system N1001 optimised.(Time elapsed 0.7496309280395508 s)
The format of the required maximum supply flow was corrected slightly.
Starting optimisation of supply system N1002.
N1002: gen 1 - 0% of offspring retained
N1002: gen 2 - 0% of offspring retained
N1002: gen 3 - 25% of offspring retained
Supply system N1002 optimised.(Time elapsed 0.6258330345153809 s)
Starting evaluation of connectivity vector: [0, 1, 0, 2, 0, 2, 2, 0, 0, 1]
The format of the required maximum supply flow was corrected slightly.
Starting optimisation of supply system N1001.
N1001: gen 1 - 0% of offspring retained
N1001: gen 2 - 25% of offspring retained
N1001: gen 3 - 25% of offspring retained
Supply system N1001 optimised.(Time elapsed 0.7329490184783936 s)
The format of the required maximum supply flow was corrected slightly.
Starting optimisation of supply system N1002.
N1002: gen 1 - 12% of offspring retained
N1002: gen 2 - 12% of offspring retained
N1002: gen 3 - 31% of offspring retained
Supply system N1002 optimised.(Time elapsed 0.7639119625091553 s)
Starting evaluation of connectivity vector: [2, 0, 0, 0, 0, 2, 0, 0, 0, 0]
The format of the required maximum supply flow was corrected slightly.
Starting optimisation of supply system N1002.
N1002: gen 1 - 31% of offspring retained
N1002: gen 2 - 0% of offspring retained
N1002: gen 3 - 0% of offspring retained
Supply system N1002 optimised.(Time elapsed 0.6754748821258545 s)

Starting evaluation of connectivity vector: [0, 0, 2, 2, 0, 1, 1, 0, 0, 2]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 0% of offspring retained

N1001: gen 2 - 19% of offspring retained

N1001: gen 3 - 12% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.7262239456176758 s)

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1002.

N1002: gen 1 - 31% of offspring retained

N1002: gen 2 - 25% of offspring retained

N1002: gen 3 - 19% of offspring retained

Supply system N1002 optimised.(Time elapsed 0.8945860862731934 s)

Starting evaluation of connectivity vector: [2, 0, 0, 0, 2, 0, 0, 2, 0, 2]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1002.

N1002: gen 1 - 0% of offspring retained

N1002: gen 2 - 12% of offspring retained

N1002: gen 3 - 12% of offspring retained

Supply system N1002 optimised.(Time elapsed 0.671403169631958 s)

Starting evaluation of connectivity vector: [2, 0, 0, 0, 2, 0, 0, 2, 0, 0]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1002.

N1002: gen 1 - 12% of offspring retained

N1002: gen 2 - 12% of offspring retained

N1002: gen 3 - 0% of offspring retained

Supply system N1002 optimised.(Time elapsed 0.6482651233673096 s)

Starting evaluation of connectivity vector: [2, 1, 0, 1, 1, 2, 1, 1, 0, 2]

The format of the required maximum supply flow was corrected slightly.

Starting optimisation of supply system N1001.

N1001: gen 1 - 19% of offspring retained

N1001: gen 2 - 6% of offspring retained

N1001: gen 3 - 12% of offspring retained

Supply system N1001 optimised.(Time elapsed 0.7056479454040527 s)

The format of the required maximum supply flow was corrected slightly.

```
Starting optimisation of supply system N1002.
N1002: gen 1 - 12% of offspring retained
N1002: gen 2 - 6% of offspring retained
N1002: gen 3 - 0% of offspring retained
Supply system N1002 optimised.(Time elapsed 0.6477787494659424
s)
```

```
District energy system optimisation complete!
Time elapsed to optimise domain, including networks and supply
systems: 66.08054089546204 s
```

```
Traceback (most recent call last):
```

```
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
worker.py", line 146, in worker
    run_job(config, job, server)
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
worker.py", line 108, in run_job
    script(config=config, **parameters)
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
api.py", line 60, in __call__
    self._runner.__call__(*args, **kwargs)
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
api.py", line 38, in script_runner
    script_module.main(config)
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
optimization_new/domain.py", line 537, in main
    current_domain.generate_result_files()
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
optimization_new/domain.py", line 262, in
generate_result_files
    self._write_detailed_results_to_csv(des)
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
optimization_new/domain.py", line 382, in
_write_detailed_results_to_csv
```

```
Domain._write_detailed_network_performance(district_energy_sys
tem, network_perf_file)
```

```
File "/Users/zshi/Documents/GitHub/CityEnergyAnalyst/cea/
optimization_new/domain.py", line 482, in
_write_detailed_network_performance
    network_performance.columns = ['Average hourly network
losses [kWh]',
File "/Users/zshi/micromamba/envs/cea/lib/python3.8/site-
packages/pandas/core/generic.py", line 5915, in __setattr__
    return object.__setattr__(self, name, value)
File "pandas/_libs/properties.pyx", line 69, in
pandas._libs.properties.AxisProperty.__set__
File "/Users/zshi/micromamba/envs/cea/lib/python3.8/site-
packages/pandas/core/generic.py", line 823, in _set_axis
    self._mgr.set_axis(axis, labels)
File "/Users/zshi/micromamba/envs/cea/lib/python3.8/site-
```

```
packages/pandas/core/internals/managers.py", line 230, in
set_axis
    self._validate_set_axis(axis, new_labels)
File "/Users/zshi/micromamba/envs/cea/lib/python3.8/site-
packages/pandas/core/internals/base.py", line 70, in
_validate_set_axis
    raise ValueError(
ValueError: Length mismatch: Expected axis has 0 elements, new
values have 5 elements
```