

Energy-efficiency vs. resilience

Code for optimization procedures and simulations

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To reproduce the steps of the algorithm presented in the paper, save attached files to a common directory and provide required tools.

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SOFTWARE REQUIREMENTS

- CPLEX (including OPL Interpreter): <http://www-01.ibm.com/software/commerce/optimization/cplex-optimizer/>
- MATLAB (including MATLAB Compiler): <http://www.mathworks.com/products/matlab/>

RISK-OPTIMIZATION-ENERGY-POLAND.DAT

This CPLEX data presents data suitable for the Poland network and the fine-grained risk optimization.

```

1 //*****
2 // OPL 12.6.0.0 Data
3 // Author: cholda
4 // Creation Date: 20 July 2014 at 15:03:30
5 //*****
6
7 Energy_baseline = 0.5215193;
8
9 Risk_baseline = 1255.857;
10
11 coefficient_energy = 52;
12
13 //coefficient_energy = 520;
14
15 //coefficient_energy = 5200;
16
17 coefficient_risk = 0.02;
18
19 //coefficient_risk = 0.2;
20
21 //coefficient_risk = 2;
22
23 RecoveryMethod = {NoRecovery,
24                   DedicatedPathProtection,
25                   DedicatedLinkProtection,
26                   SharedBackupPathProtection,
27                   SharedBackupLinkProtection};
28
29 Nodes = {Gdansk,
30          Bydgoszcz,
31          Kolobrzeg,
32          Katowice,
33          Krakow,
34          Bialystok,
35          Lodz,
36          Poznan,
37          Rzeszow,
38          Szczecin,
39          Warsaw,
40          Wroclaw};
41
42 Arcs = {<Gdansk,Warsaw>, <Gdansk,Kolobrzeg>,
43         <Bydgoszcz,Kolobrzeg>, <Bydgoszcz,Poznan>,
44         <Bydgoszcz,Warsaw>, <Kolobrzeg,Szczecin>,
45         <Katowice,Krakow>, <Katowice,Lodz>,
46         <Katowice,Wroclaw>, <Krakow,Rzeszow>,
47         <Krakow,Warsaw>, <Bialystok,Rzeszow>,
48         <Bialystok,Warsaw>, <Lodz,Warsaw>,
49         <Lodz,Wroclaw>, <Poznan,Szczecin>,
50         <Poznan,Wroclaw>, <Gdansk,Bialystok>};
51
52 Demands = {<Gdansk,Bydgoszcz>, <Gdansk,Kolobrzeg>,
53            <Gdansk,Katowice>, <Gdansk,Krakow>,
54            <Gdansk,Bialystok>, <Gdansk,Lodz>,
55            <Gdansk,Poznan>, <Gdansk,Rzeszow>,
56            <Gdansk,Szczecin>, <Gdansk,Warsaw>,
57            <Gdansk,Wroclaw>, <Bydgoszcz,Kolobrzeg>,
58            <Bydgoszcz,Katowice>, <Bydgoszcz,Krakow>,
59            <Bydgoszcz,Bialystok>, <Bydgoszcz,Lodz>,
60            <Bydgoszcz,Poznan>, <Bydgoszcz,Rzeszow>,
61            <Bydgoszcz,Szczecin>, <Bydgoszcz,Warsaw>,
62            <Bydgoszcz,Wroclaw>, <Kolobrzeg,Katowice>,
63            <Kolobrzeg,Krakow>, <Kolobrzeg,Bialystok>,
64            <Kolobrzeg,Lodz>, <Kolobrzeg,Poznan>,
65            <Kolobrzeg,Rzeszow>, <Kolobrzeg,Szczecin>,
66            <Kolobrzeg,Warsaw>, <Kolobrzeg,Wroclaw>,

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67 <Katowice,Krakow>, <Katowice,Bialystok>,
68 <Katowice,Lodz>, <Katowice,Poznan>,
69 <Katowice,Rzeszow>, <Katowice,Szczecin>,
70 <Katowice,Warsaw>, <Katowice,Wroclaw>,
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83 <Rzeszow,Wroclaw>, <Szczecin,Warsaw>,
84 <Szczecin,Wroclaw>, <Warsaw,Wroclaw>;
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86
87
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↵ +01 1.752198e+01 1.695603e+01 1.538298e+01 4.720883e+00 2.428500e+01 1.255413e+01 ↵
↵ 9.704139e+00 9.446951e+00 2.835007e+01 2.431252e+01 2.374714e+01 2.217613e+01 1.152361e↵
↵ +01 3.106967e+01 1.934999e+01 1.650153e+01 1.624671e+01 4.045199e+00 1.912326e+01 ↵
↵ 1.755013e+01 2.627371e+01 1.082150e+01 3.408425e+01 1.187184e+01 3.099103e+01 1.508278e↵
↵ +01 1.350910e+01 2.223554e+01 6.778372e+00 3.004848e+01 7.829089e+00 2.695420e+01 ↵
↵ 1.294224e+01 2.166982e+01 2.184797e+01 2.948371e+01 7.261743e+00 2.638886e+01 2.009731e↵
↵ +01 2.027639e+01 2.791426e+01 5.684874e+00 2.481696e+01 2.899571e+01 7.836561e+00 ↵
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92 [ 6.857497e-02 8.338391e-02 6.496697e-02 5.903253e-02 4.564394e-02 4.217473e-02 7.735536e-02 ↵
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93 ];
94
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