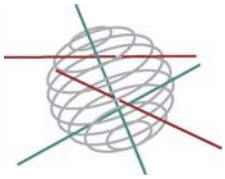
SCIENTIFIC SUPPORT PLAN FOR A SUSTAINABLE DEVELOPMENT POLICY
(SPSD II)



Part 1:
Sustainable production and consumption patterns

ANNEXES TO FINAL REPORT

LIQUID BIOFUELS IN BELGIUM IN A GLOBAL BIO-ENERGY CONTEXT ANNEX I & J

CP/53

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BELGIAN SCIENCE POLICY

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UCL

TABLE OF CONTENT

Annex I SPA chain calculations

This annex contains detailed results for the 62 chains used in the SPA analysis.

Every chain has its own table on a separate page. These tables were automatically generated with the SPA Matlab code and contain calculation results for energy, CO2 and cost.

The tables are sorted by internal code. A lookup table with chain names and internal codes is provided in Table Annex H-1.

Table Annex H.1: List of all considered chains (sorted by internal code)

Internal Code	Resources	Internal Code	Resources
1	Gasoline for transport	32	Wood for FT biodiesel - SRF
2	Gasoil for transport	33	Wood for FT biodiesel - forest waste
3	Natural gas for heat	34	Wood for FT biodiesel - imported
4	Electricity - imported	35	Wood for CHP (ORC) - SRF
5	Gasoil for heat	36	Wood for CHP (FBG with PE) - SRF
6	Coal for co-combustion	37	Wood for co-combustion - SRF
7	Wheat for ethanol, straw ploughed back	38	Wood for small steam power plant - SRF
8	Wheat for ethanol, straw for bedding	39	Wood for CHP (ORC) - forest waste
9	Wheat for ethanol, straw burnt	40	Wood for small steam power plant - forest waste
10	Wheat for ethanol - imported	41	Wood for heat - imported
11	Sugar beet for EtOH	42	Wood for CHP (ORC) - imported
12	Sugar beet for EtOH, pulp burnt	43	Wood for CHP (FBG with PE) - imported
13	Wood for ethanol - SRF	44	Wood for co-combustion - imported
14	Wood for ethanol - forest waste	45	Wood for small steam power plant - imported
15	Wood for ethanol - imported	46	Ethanol for gasoline - imported
16	Wheat for ETBE, straw ploughed back	47	Ethanol for ETBE - imported
17	Wheat for ETBE, straw for bedding	48	Methanol for MTBE - imported
18	Wheat for ETBE, straw burnt	49	Straw - imported
19	Wheat for ETBE - imported	50	Animal food (DDGS) - imported
20	Sugar beet for ETBE	51	Animal food (sugar beat pulp) - imported
21	Sugar beet for ETBE, pulp burnt	52	Animal food (rape seed) - imported
22	Wood for ETBE - SRF	53	Wood for heat - SRF
23	Wood for ETBE - forest waste	54	Wood for heat - forest waste
24	Wood for ETBE - imported	55	Wood for CHP (FBG with PE) - forest waste
25	Rapeseed for PPO - local	56	Wood for co-combustion - forest waste
26	Rapeseed for RME - local	57	Glycerine - imported
27	Rapeseed for RME, glycerine burnt	58	Heavy Fuel Oil
28	Rapeseed for RME - imported	59	Set aside land
29	Rapeseed for RME, glycerine burnt - imported	60	Wheat for ethanol, straw ploughed back (zero LHV)
30	Rapeseed Oil for RME - imported	61	Wheat for ethanol, straw for bedding (zero LHV)
31	Used vegetable oil for RME	62	Wheat for ethanol, straw burnt (zero LHV)

```
================================================
Gasoline for transport
Internal code: 1
Resource expressed in: liter
Resource LHV: 43200.0 MJ/ton
Produces product  1: transport (gasoline)
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  1:                                   7.45e-004  *  1.00e+000  *   4.32e+004  *     9.99e-001  *  4.46e-001   km/liter


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:            0.000  MJp/liter     6048.000         0.000          0.000            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:         0.000   kg/liter        0.000         0.000          0.000             0.000     3188.160   kg/ton
CO2 outside Belgium:        0.000   kg/liter      540.000         0.000          0.000             0.000        0.000   kg/ton
Costs:                      0.000  eur/liter      617.760         0.000          0.000             0.000       63.763  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Gasoil for transport
Internal code: 2
Resource expressed in: liter
Resource LHV: 43100.0 MJ/ton
Produces product  8: transport (diesel)
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  8:                                   8.32e-004  *  1.00e+000  *   4.31e+004  *     9.99e-001  *  5.46e-001   km/liter


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:           0.000  MJp/liter     6896.000         0.000          0.000            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/liter        0.000         0.000          0.000             0.000     3157.075   kg/ton
CO2 outside Belgium:      0.000   kg/liter      612.020         0.000          0.000             0.000        0.000   kg/ton
Costs:                    0.000  eur/liter      612.020         0.000          0.000             0.000       63.142  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Natural gas for heat
Internal code: 3
Resource expressed in: m3
Resource LHV: 44800.0 MJ/ton
Produces product  7: heat
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  7:                                   6.40e-004  *  1.00e+000  *   1.12e+004  *     9.50e-001  *  1.00e+000 kWhth/m3


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Other Imported:            0.000  MJp/m3           0.000         0.000        648.271            0.000         0.000  MJp/ton
Worldwide:
 Primary energy:            0.000  MJp/m3        2087.680         0.000        648.271            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:         0.000   kg/m3           0.000         0.000         45.379             0.000     2526.720   kg/ton
CO2 outside Belgium:        0.000   kg/m3         198.016         0.000          0.000             0.000        0.000   kg/ton
Costs:                      0.000  eur/m3         183.680         0.000         73.041             0.000       50.534  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Electricity - imported
Internal code: 4
Resource expressed in: kWhe
Resource LHV:     3.6 MJ/kWhe
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     9.50e-001  *  1.00e+000 kWhe/kWhe


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:           0.000  MJp/kWhe         6.727         0.000          0.000            0.000         0.000  MJp/kWhe


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 outside Belgium:       0.000   kg/kWhe         0.475         0.000          0.000             0.000         0.000   kg/kWhe
Costs:                     0.000  eur/kWhe         0.067         0.000          0.000             0.000         0.000  eur/kWhe
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Gasoil for heat
Internal code: 5
Resource expressed in: liter
Resource LHV: 43100.0 MJ/ton
Produces product  7: heat
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  7:                                   8.32e-004  *  1.00e+000  *   1.08e+004  *     9.50e-001  *  1.00e+000 kWhth/liter


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Other Imported:            0.000  MJp/liter        0.000         0.000        648.617            0.000         0.000  MJp/ton
Worldwide:
 Primary energy:            0.000  MJp/liter     6896.000         0.000        648.617            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:         0.000   kg/liter        0.000         0.000         45.403             0.000     3157.075   kg/ton
CO2 outside Belgium:        0.000   kg/liter      612.020         0.000          0.000             0.000        0.000   kg/ton
Costs:                      0.000  eur/liter      499.960         0.000         73.080             0.000       63.142  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Coal for co-combustion
Internal code: 6
Resource expressed in: ton
Resource LHV: 29400.0 MJ/ton
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.00e+000  *  1.00e+000  *   2.86e+003  *     9.50e-001  *  1.00e+000 kWhe/ton


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                    0.000   MJ/ton          0.000        43.000          0.000            0.000         0.000   MJ/ton
 Other Imported:            0.000  MJp/ton          0.000         0.000        357.500            0.000         0.000  MJp/ton
Worldwide:
 Primary energy:            0.000  MJp/ton       2763.600       269.880        357.500            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:        0.000   kg/ton          0.000         3.150         25.025             0.000     2831.220   kg/ton
CO2 outside Belgium:       0.000   kg/ton        450.996        18.061          0.000             0.000        0.000   kg/ton
Costs:                     0.000  eur/ton         50.000         0.000         34.355             0.000       56.624  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wheat for ethanol, straw ploughed back
Internal code: 7
Resource expressed in: ha
Resource LHV: 23525.0 MJ/ton wh
Produces product  1: transport (gasoline)
Produces product  3: DDGS
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	8.80e+000	*	9.90e-001	*	7.91e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 3:	8.80e+000	*	9.90e-001	*	3.71e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	332.915	MJ/ha	0.000	41.760	44.280	29.252	0.000	kWhe/ton wh
Natural Gas:	6947.988	MJ/ha	0.000	0.000	4078.800	0.000	0.000	MJ/ton wh
Diesel:	4078.927	MJ/ha	0.000	796.266	0.000	69.915	0.000	MJ/ton wh
Cheap diesel:	1280.275	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Coal:	794.772	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Other Imported:	2497.500	MJp/ha	0.000	0.000	62.798	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	17733.636	MJp/ha	0.000	1043.465	4458.696	165.017	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3429.734	kg/ha	0.000	58.326	234.440	5.121	0.000	kg/ton wh
CO2 outside Belgium:	153.263	kg/ha	0.000	16.817	23.871	4.852	0.000	kg/ton wh
Costs:	0.000	eur/ha	140.000	0.000	117.831	72.558	0.000	eur/ton wh

```
================================================
Wheat for ethanol, straw for bedding
Internal code: 8
Resource expressed in: ha
Resource LHV: 23525.0 MJ/ton wh
Produces product  1: transport (gasoline)
Produces product  2: straw
Produces product  3: DDGS
Produces product 11: land
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  1:                                   8.80e+000  *  9.90e-001  *   7.91e+003  *     9.99e-001  *  4.46e-001   km/ha
Product  2:                                   8.80e+000  *  9.00e-001  *   4.50e-001  *     1.00e+000  *  1.00e+000  ton/ha
Product  3:                                   8.80e+000  *  9.90e-001  *   3.71e-001  *     1.00e+000  *  1.00e+000  ton/ha
Product 11:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000   ha/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:             332.915   MJ/ha           0.000        41.760         44.280           29.252         0.000 kWhe/ton wh
 Natural Gas:            6947.988   MJ/ha           0.000         0.000       4078.800            0.000         0.000   MJ/ton wh
 Diesel:                 4294.083   MJ/ha           0.000       864.126          0.000           69.915         0.000   MJ/ton wh
 Cheap diesel:           1280.275   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wh
 Coal:                    794.772   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wh
 Other Imported:         2497.500  MJp/ha           0.000         0.000         62.798            0.000         0.000  MJp/ton wh
Worldwide:
 Primary energy:        17983.216  MJp/ha           0.000      1122.183       4458.696          165.017         0.000  MJp/ton wh


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:      3445.494   kg/ha           0.000        63.297        234.440             5.121        0.000   kg/ton wh
CO2 outside Belgium:      156.318   kg/ha           0.000        17.781         23.871             4.852        0.000   kg/ton wh
Costs:                      0.000  eur/ha         140.000         0.000        117.831            72.558        0.000  eur/ton wh
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wheat for ethanol, straw burnt
Internal code: 9
Resource expressed in: ha
Resource LHV: 23525.0 MJ/ton wh
Produces product  1: transport (gasoline)
Produces product  2: straw
Produces product  3: DDGS
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	8.80e+000	*	9.90e-001	*	7.91e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 2:	8.80e+000	*	9.00e-001	*	1.50e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 3:	8.80e+000	*	9.90e-001	*	3.71e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	332.915	MJ/ha	0.000	41.760	44.280	29.252	0.000	kWhe/ton wh
Natural Gas:	6947.988	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Diesel:	4294.083	MJ/ha	0.000	864.126	19.740	69.915	0.000	MJ/ton wh
Cheap diesel:	1280.275	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Coal:	794.772	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Other Imported:	2497.500	MJp/ha	0.000	0.000	101.605	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	17983.216	MJp/ha	0.000	1122.183	251.530	165.017	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3445.494	kg/ha	0.000	63.297	8.558	5.121	0.000	kg/ton wh
CO2 outside Belgium:	156.318	kg/ha	0.000	17.781	6.123	4.852	0.000	kg/ton wh
Costs:	0.000	eur/ha	140.000	0.000	113.930	72.558	0.000	eur/ton wh

```
================================================
Wheat for ethanol - imported
Internal code: 10
Resource expressed in: ton wh
Resource LHV: 17000.0 MJ/ton wh
Produces product  1: transport (gasoline)
Produces product  3: DDGS
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	1.00e+000	*	9.90e-001	*	7.91e+003	*	9.99e-001	*	4.46e-001	km/ton wh
Product 3:	1.00e+000	*	9.90e-001	*	3.71e-001	*	1.00e+000	*	1.00e+000	ton/ton wh

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	0.000	MJ/ton wh	0.000	41.760	44.280	29.252	0.000	kWhe/ton wh
Natural Gas:	0.000	MJ/ton wh	0.000	0.000	4078.800	0.000	0.000	MJ/ton wh
Diesel:	0.000	MJ/ton wh	0.000	645.466	0.000	69.915	0.000	MJ/ton wh
Other Imported:	0.000	MJp/ton wh	0.000	0.000	62.798	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	0.000	MJp/ton wh	1439.000	1766.377	4458.696	165.017	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	0.000	kg/ton wh	0.000	47.280	234.440	5.121	0.000	kg/ton wh
CO2 outside Belgium:	0.000	kg/ton wh	226.000	82.362	23.871	4.852	0.000	kg/ton wh
Costs:	0.000	eur/ton wh	140.000	0.000	117.831	72.558	0.000	eur/ton wh

```
================================================
Sugar beet for EtOH
Internal code: 11
Resource expressed in: ha
Resource LHV:  3840.0 MJ/ton sb
Produces product  1: transport (gasoline)
Produces product  4: animal feed from sugar beet
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	6.70e+001	*	9.70e-001	*	1.83e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 4:	6.70e+001	*	1.00e+000	*	5.10e-002	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	363.724	MJ/ha	0.000	0.000	69.776	6.783	0.000	kWhe/ton sb
Natural Gas:	4931.849	MJ/ha	0.000	0.000	959.089	0.000	0.000	MJ/ton sb
Diesel:	10307.364	MJ/ha	0.000	97.000	0.000	16.211	0.000	MJ/ton sb
Cheap diesel:	1027.007	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Coal:	510.360	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Other Imported:	134.900	MJp/ha	0.000	0.000	14.561	0.000	0.000	MJp/ton sb
Worldwide:								
Primary energy:	19984.572	MJp/ha	0.000	112.520	1218.511	38.262	0.000	MJp/ton sb

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	2416.162	kg/ha	0.000	7.105	55.112	1.187	0.000	kg/ton sb
CO2 outside Belgium:	230.813	kg/ha	0.000	1.377	13.446	1.125	0.000	kg/ton sb
Costs:	0.000	eur/ha	50.000	0.000	12.302	16.824	0.000	eur/ton sb

```
================================================
Sugar beet for EtOH, pulp burnt
Internal code: 12
Resource expressed in: ha
Resource LHV:  3840.0 MJ/ton sb
Produces product  1: transport (gasoline)
Produces product  6: electricity
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	6.71e+001	*	9.70e-001	*	1.83e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 6:	6.71e+001	*	1.00e+000	*	7.70e-001	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	363.724	MJ/ha	0.000	0.000	-2.728	6.783	0.000	kWhe/ton sb
Natural Gas:	4931.849	MJ/ha	0.000	0.000	107.631	0.000	0.000	MJ/ton sb
Diesel:	10307.364	MJ/ha	0.000	97.000	0.000	16.211	0.000	MJ/ton sb
Cheap diesel:	1027.007	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Coal:	510.360	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Other Imported:	134.900	MJp/ha	0.000	0.000	14.561	0.000	0.000	MJp/ton sb
Worldwide:								
Primary energy:	19984.572	MJp/ha	0.000	112.520	119.381	38.262	0.000	MJp/ton sb

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	2416.162	kg/ha	0.000	7.105	7.090	1.187	0.000	kg/ton sb
CO2 outside Belgium:	230.813	kg/ha	0.000	1.377	0.116	1.125	0.000	kg/ton sb
Costs:	0.000	eur/ha	50.000	0.000	8.140	16.824	0.000	eur/ton sb

```
================================================
Wood for ethanol - SRF
Internal code: 13
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  1: transport (gasoline)
Produces product  6: electricity
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	1.00e+001	*	1.00e+000	*	5.04e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 6:	1.00e+001	*	1.00e+000	*	7.50e+002	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	183.975	MJ/ha	0.000	0.000	0.000	27.765	0.000	kWhe/ton wd
Natural Gas:	3530.550	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Diesel:	2799.053	MJ/ha	0.000	149.231	284.480	66.360	0.000	MJ/ton wd
Cheap diesel:	654.375	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Coal:	334.200	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Other Imported:	518.779	MJp/ha	0.000	0.000	1354.850	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	9073.950	MJp/ha	0.000	173.108	1684.847	156.626	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	1552.370	kg/ha	0.000	10.931	106.088	4.861	0.000	kg/ton wd
CO2 outside Belgium:	89.104	kg/ha	0.000	2.119	4.040	4.606	0.000	kg/ton wd
Costs:	0.000	eur/ha	184.615	0.000	84.139	68.529	0.000	eur/ton wd

```
================================================
Wood for ethanol - forest waste
Internal code: 14
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  1: transport (gasoline)
Produces product  6: electricity
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	1.14e+001	*	1.00e+000	*	5.04e+003	*	9.99e-001	*	4.46e-001	km/ton wd
Product 6:	1.14e+001	*	1.00e+000	*	7.50e+002	*	9.50e-001	*	1.00e+000	kWhe/ton wd

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	0.000	MJ/ton wd	0.000	0.000	0.000	27.765	0.000	kWhe/ton wd
Diesel:	442.861	MJ/ton wd	0.000	149.231	284.480	66.360	0.000	MJ/ton wd
Other Imported:	497.890	MJp/ton wd	0.000	0.000	1354.850	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	1011.609	MJp/ton wd	0.000	173.108	1684.847	156.626	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	53.338	kg/ton wd	0.000	10.931	106.088	4.861	0.000	kg/ton wd
CO2 outside Belgium:	6.289	kg/ton wd	0.000	2.119	4.040	4.606	0.000	kg/ton wd
Costs:	0.000	eur/ton wd	160.000	0.000	84.139	68.529	0.000	eur/ton wd

```
================================================
Wood for ethanol - imported
Internal code: 15
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  1: transport (gasoline)
Produces product  6: electricity
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	1.00e+000	*	1.00e+000	*	5.04e+003	*	9.99e-001	*	4.46e-001	km/ton wd
Product 6:	1.00e+000	*	1.00e+000	*	7.50e+002	*	9.50e-001	*	1.00e+000	kWhe/ton wd

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	0.000	MJ/ton wd	0.000	0.000	0.000	27.765	0.000	kWhe/ton wd
Diesel:	0.000	MJ/ton wd	0.000	43.000	284.480	66.360	0.000	MJ/ton wd
Other Imported:	0.000	MJp/ton wd	0.000	0.000	1354.850	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	0.000	MJp/ton wd	88.000	1501.880	1684.847	156.626	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	0.000	kg/ton wd	0.000	3.150	106.088	4.861	0.000	kg/ton wd
CO2 outside Belgium:	0.000	kg/ton wd	5.100	115.781	4.040	4.606	0.000	kg/ton wd
Costs:	0.000	eur/ton wd	183.333	0.000	84.139	68.529	0.000	eur/ton wd

```
================================================
Wheat for ETBE, straw ploughed back
Internal code: 16
Resource expressed in: ha
Resource LHV: 23525.0 MJ/ton wh
Produces product 12: MTBE/ETBE
Produces product  3: DDGS
Produces product 11: land
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 12:                                   8.80e+000  *  9.90e-001  *   6.19e-001  *     1.00e+000  *  1.00e+000  ton/ha
Product  3:                                   8.80e+000  *  9.90e-001  *   3.71e-001  *     9.99e-001  *  1.00e+000  ton/ha
Product 11:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000   ha/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:             332.915   MJ/ha           0.000        41.760         73.591            0.000         0.000 kWhe/ton wh
 Natural Gas:            6947.988   MJ/ha           0.000         0.000       4080.622            0.000         0.000   MJ/ton wh
 Diesel:                 4078.927   MJ/ha           0.000       796.266          0.000            0.000         0.000   MJ/ton wh
 Cheap diesel:           1280.275   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wh
 Coal:                    794.772   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wh
 Other Imported:         2497.500  MJp/ha           0.000         0.000      16954.232            0.000         0.000  MJp/ton wh
Worldwide:
 Primary energy:        17733.636  MJp/ha           0.000      1043.465      21436.122            0.000         0.000  MJp/ton wh


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:      3429.734   kg/ha           0.000        58.326       1395.506             0.000        0.000   kg/ton wh
CO2 outside Belgium:      153.263   kg/ha           0.000        16.817         27.746             0.000        0.000   kg/ton wh
Costs:                      0.000  eur/ha         140.000         0.000        361.415             0.000        0.000  eur/ton wh
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wheat for ETBE, straw for bedding
Internal code: 17
Resource expressed in: ha
Resource LHV: 23525.0 MJ/ton wh
Produces product 12: MTBE/ETBE
Produces product  2: straw
Produces product  3: DDGS
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 12:	8.80e+000	*	9.90e-001	*	6.19e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 2:	8.80e+000	*	9.00e-001	*	4.50e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 3:	8.80e+000	*	9.90e-001	*	3.71e-001	*	9.99e-001	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	332.915	MJ/ha	0.000	41.760	73.591	0.000	0.000	kWhe/ton wh
Natural Gas:	6947.988	MJ/ha	0.000	0.000	4080.622	0.000	0.000	MJ/ton wh
Diesel:	4294.083	MJ/ha	0.000	864.126	0.000	0.000	0.000	MJ/ton wh
Cheap diesel:	1280.275	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Coal:	794.772	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Other Imported:	2497.500	MJp/ha	0.000	0.000	16954.232	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	17983.216	MJp/ha	0.000	1122.183	21436.122	0.000	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3445.494	kg/ha	0.000	63.297	1395.506	0.000	0.000	kg/ton wh
CO2 outside Belgium:	156.318	kg/ha	0.000	17.781	27.746	0.000	0.000	kg/ton wh
Costs:	0.000	eur/ha	140.000	0.000	361.415	0.000	0.000	eur/ton wh

```
================================================
Wheat for ETBE, straw burnt
Internal code: 18
Resource expressed in: ha
Resource LHV: 23525.0 MJ/ton wh
Produces product 12: MTBE/ETBE
Produces product  2: straw
Produces product  3: DDGS
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 12:	8.80e+000	*	9.90e-001	*	6.19e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 2:	8.80e+000	*	9.00e-001	*	1.50e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 3:	8.80e+000	*	9.90e-001	*	3.71e-001	*	9.99e-001	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	332.915	MJ/ha	0.000	41.760	73.591	0.000	0.000	kWhe/ton wh
Natural Gas:	6947.988	MJ/ha	0.000	0.000	1.822	0.000	0.000	MJ/ton wh
Diesel:	4294.083	MJ/ha	0.000	864.126	19.740	0.000	0.000	MJ/ton wh
Cheap diesel:	1280.275	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Coal:	794.772	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Other Imported:	2497.500	MJp/ha	0.000	0.000	17084.232	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	17983.216	MJp/ha	0.000	1122.183	17320.149	0.000	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3445.494	kg/ha	0.000	63.297	1176.008	0.000	0.000	kg/ton wh
CO2 outside Belgium:	156.318	kg/ha	0.000	17.781	9.998	0.000	0.000	kg/ton wh
Costs:	0.000	eur/ha	140.000	0.000	372.270	0.000	0.000	eur/ton wh

```
================================================
Wheat for ETBE - imported
Internal code: 19
Resource expressed in: ton wh
Resource LHV: 17000.0 MJ/ton wh
Produces product 12: MTBE/ETBE
Produces product  3: DDGS
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 12:                                   1.00e+000  *  9.90e-001  *   6.19e-001  *     1.00e+000  *  1.00e+000  ton/ton wh
Product  3:                                   1.00e+000  *  9.90e-001  *   3.71e-001  *     1.00e+000  *  1.00e+000  ton/ton wh


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/ton wh       0.000        41.760         73.549            0.000         0.000 kWhe/ton wh
 Natural Gas:              0.000   MJ/ton wh       0.000         0.000          1.816            0.000         0.000   MJ/ton wh
 Diesel:                   0.000   MJ/ton wh       0.000         0.000         19.740            0.000         0.000   MJ/ton wh
 Other Imported:           0.000  MJp/ton wh       0.000         0.000      15510.384            0.000         0.000  MJp/ton wh
Worldwide:
 Primary energy:           0.000  MJp/ton wh    1439.000      1017.637      15746.172            0.000         0.000  MJp/ton wh


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/ton wh       0.000         0.000       1067.692             0.000        0.000   kg/ton wh
CO2 outside Belgium:      0.000   kg/ton wh     226.000        73.196          9.993             0.000        0.000   kg/ton wh
Costs:                    0.000  eur/ton wh     145.000         0.000        336.792             0.000        0.000  eur/ton wh
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Sugar beet for ETBE
Internal code: 20
Resource expressed in: ha
Resource LHV:  3840.0 MJ/ton sb
Produces product 12: MTBE/ETBE
Produces product  4: animal feed from sugar beet
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 12:	6.70e+001	*	9.70e-001	*	1.45e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 4:	6.70e+001	*	1.00e+000	*	5.10e-002	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	363.724	MJ/ha	0.000	0.000	124.967	0.000	0.000	kWhe/ton sb
Natural Gas:	4931.849	MJ/ha	0.000	0.000	1920.687	0.000	0.000	MJ/ton sb
Diesel:	10307.364	MJ/ha	0.000	97.000	0.000	0.000	0.000	MJ/ton sb
Cheap diesel:	1027.007	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Coal:	510.360	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Other Imported:	134.900	MJp/ha	0.000	0.000	3616.058	0.000	0.000	MJp/ton sb
Worldwide:								
Primary energy:	19984.572	MJp/ha	0.000	112.520	5984.743	0.000	0.000	MJp/ton sb

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	2416.162	kg/ha	0.000	7.105	356.910	0.000	0.000	kg/ton sb
CO2 outside Belgium:	230.813	kg/ha	0.000	1.377	24.978	0.000	0.000	kg/ton sb
Costs:	0.000	eur/ha	50.000	0.000	77.613	0.000	0.000	eur/ton sb

```
================================================
Sugar beet for ETBE, pulp burnt
Internal code: 21
Resource expressed in: ha
Resource LHV:  3840.0 MJ/ton sb
Produces product 12: MTBE/ETBE
Produces product  6: electricity
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 12:	6.70e+001	*	9.70e-001	*	1.45e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 6:	6.70e+001	*	1.00e+000	*	7.70e-001	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	363.724	MJ/ha	0.000	0.000	-28.753	0.000	0.000	kWhe/ton sb
Natural Gas:	4931.849	MJ/ha	0.000	0.000	116.460	0.000	0.000	MJ/ton sb
Diesel:	10307.364	MJ/ha	0.000	97.000	0.000	0.000	0.000	MJ/ton sb
Cheap diesel:	1027.007	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Coal:	510.360	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton sb
Other Imported:	134.900	MJp/ha	0.000	0.000	3616.058	0.000	0.000	MJp/ton sb
Worldwide:								
Primary energy:	19984.572	MJp/ha	0.000	112.520	3655.461	0.000	0.000	MJp/ton sb

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	2416.162	kg/ha	0.000	7.105	255.152	0.000	0.000	kg/ton sb
CO2 outside Belgium:	230.813	kg/ha	0.000	1.377	-3.279	0.000	0.000	kg/ton sb
Costs:	0.000	eur/ha	50.000	0.000	65.311	0.000	0.000	eur/ton sb

```
================================================
Wood for ETBE - SRF
Internal code: 22
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product 12: MTBE/ETBE
Produces product  6: electricity
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 12:	1.00e+001	*	1.00e+000	*	5.94e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 6:	1.00e+001	*	1.00e+000	*	7.50e+002	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	183.975	MJ/ha	0.000	0.000	27.780	0.000	0.000	kWhe/ton wd
Natural Gas:	3530.550	MJ/ha	0.000	0.000	1.724	0.000	0.000	MJ/ton wd
Diesel:	2799.053	MJ/ha	0.000	149.231	603.098	0.000	0.000	MJ/ton wd
Cheap diesel:	654.375	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Coal:	334.200	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Other Imported:	518.779	MJp/ha	0.000	0.000	17450.356	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	9073.950	MJp/ha	0.000	173.108	18231.447	0.000	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	1552.370	kg/ha	0.000	10.931	1226.881	0.000	0.000	kg/ton wd
CO2 outside Belgium:	89.104	kg/ha	0.000	2.119	12.237	0.000	0.000	kg/ton wd
Costs:	0.000	eur/ha	184.615	0.000	393.901	0.000	0.000	eur/ton wd

```
================================================
Wood for ETBE - forest waste
Internal code: 23
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product 12: MTBE/ETBE
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 12:                                   1.14e+001  *  1.00e+000  *   5.94e-001  *     1.00e+000  *  1.00e+000  ton/ha
Product  6:                                   1.14e+001  *  1.00e+000  *   7.50e+002  *     9.50e-001  *  1.00e+000 kWhe/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/ha           0.000         0.000         27.780            0.000         0.000 kWhe/ton wd
 Natural Gas:              0.000   MJ/ha           0.000         0.000          1.724            0.000         0.000   MJ/ton wd
 Diesel:                 442.861   MJ/ha           0.000       149.231        603.098            0.000         0.000   MJ/ton wd
 Other Imported:         497.890  MJp/ha           0.000         0.000      17450.356            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:        1011.609  MJp/ha           0.000       173.108      18231.447            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       53.338   kg/ha           0.000        10.931       1226.881             0.000        0.000   kg/ton wd
CO2 outside Belgium:       6.289   kg/ha           0.000         2.119         12.237             0.000        0.000   kg/ton wd
Costs:                     0.000  eur/ha         160.000         0.000        393.901             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood for ETBE - imported
Internal code: 24
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product 12: MTBE/ETBE
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 12:                                   1.00e+000  *  1.00e+000  *   5.94e-001  *     1.00e+000  *  1.00e+000  ton/ton wd
Product  6:                                   1.00e+000  *  1.00e+000  *   7.50e+002  *     9.50e-001  *  1.00e+000 kWhe/ton wd


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/ton wd       0.000         0.000         27.780            0.000         0.000 kWhe/ton wd
 Natural Gas:              0.000   MJ/ton wd       0.000         0.000          1.724            0.000         0.000   MJ/ton wd
 Diesel:                   0.000   MJ/ton wd       0.000        43.000        603.098            0.000         0.000   MJ/ton wd
 Other Imported:           0.000  MJp/ton wd       0.000         0.000      17450.356            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:           0.000  MJp/ton wd      88.000      1501.880      18231.447            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/ton wd       0.000         3.150       1226.881             0.000         0.000   kg/ton wd
CO2 outside Belgium:      0.000   kg/ton wd       5.100       115.781         12.237             0.000         0.000   kg/ton wd
Costs:                    0.000  eur/ton wd     183.333         0.000        393.901             0.000         0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Rapeseed for PPO - local
Internal code: 25
Resource expressed in: ha
Resource LHV: 23800.0 MJ/ton rs
Produces product  5: rape meal
Produces product  8: transport (diesel)
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 5:	3.60e+000	*	9.47e-001	*	6.70e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 8:	3.60e+000	*	9.47e-001	*	1.24e+004	*	1.00e+000	*	5.46e-001	km/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	338.010	MJ/ha	0.000	41.760	151.525	0.000	0.000	kWhe/ton rs
Natural Gas:	6883.314	MJ/ha	0.000	192.241	0.000	0.000	0.000	MJ/ton rs
Diesel:	5556.972	MJ/ha	0.000	38.800	0.000	9.094	0.000	MJ/ton rs
Cheap diesel:	1315.450	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton rs
Coal:	786.076	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton rs
Other Imported:	27.480	MJp/ha	0.000	0.000	682.622	0.000	0.000	MJp/ton rs
Worldwide:								
Primary energy:	16954.255	MJp/ha	0.000	366.004	1117.302	10.549	0.000	MJp/ton rs

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3279.824	kg/ha	0.000	13.684	47.784	0.666	0.000	kg/ton rs
CO2 outside Belgium:	174.738	kg/ha	0.000	6.911	19.993	0.129	0.000	kg/ton rs
Costs:	0.000	eur/ha	240.000	0.000	57.925	0.142	0.000	eur/ton rs

```
================================================
Rapeseed for RME - local
Internal code: 26
Resource expressed in: ha
Resource LHV: 23800.0 MJ/ton rs
Produces product  5: rape meal
Produces product  8: transport (diesel)
Produces product  9: glycerine
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 5:	3.60e+000	*	9.47e-001	*	6.00e-001	*	9.99e-001	*	1.00e+000	ton/ha
Product 8:	3.60e+000	*	9.47e-001	*	1.36e+004	*	1.00e+000	*	5.46e-001	km/ha
Product 9:	3.60e+000	*	1.00e+000	*	3.55e-002	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	338.010	MJ/ha	0.000	41.760	149.230	55.974	0.000	kWhe/ton rs
Natural Gas:	6883.314	MJ/ha	0.000	0.000	1228.443	0.000	0.000	MJ/ton rs
Diesel:	5556.972	MJ/ha	0.000	250.441	118.085	83.187	0.000	MJ/ton rs
Cheap diesel:	1315.450	MJ/ha	0.000	0.000	64.539	0.000	0.000	MJ/ton rs
Coal:	786.076	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton rs
Other Imported:	27.480	MJp/ha	0.000	0.000	983.350	0.000	0.000	MJp/ton rs
Worldwide:								
Primary energy:	16954.255	MJp/ha	0.000	410.308	3607.810	257.069	0.000	MJp/ton rs

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3279.824	kg/ha	0.000	18.345	147.505	6.093	0.000	kg/ton rs
CO2 outside Belgium:	174.738	kg/ha	0.000	9.066	80.756	8.567	0.000	kg/ton rs
Costs:	0.000	eur/ha	240.000	0.000	43.918	61.466	0.000	eur/ton rs

```
================================================
Rapeseed for RME, glycerine burnt
Internal code: 27
Resource expressed in: ha
Resource LHV: 23800.0 MJ/ton rs
Produces product  5: rape meal
Produces product  8: transport (diesel)
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 5:	3.60e+000	*	9.47e-001	*	6.00e-001	*	9.99e-001	*	1.00e+000	ton/ha
Product 8:	3.60e+000	*	9.47e-001	*	1.36e+004	*	9.99e-001	*	5.46e-001	km/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	338.010	MJ/ha	0.000	41.760	149.230	55.974	0.000	kWhe/ton rs
Natural Gas:	6883.314	MJ/ha	0.000	0.000	655.748	0.000	0.000	MJ/ton rs
Diesel:	5556.972	MJ/ha	0.000	250.441	118.085	83.187	0.000	MJ/ton rs
Cheap diesel:	1315.450	MJ/ha	0.000	0.000	57.092	0.000	0.000	MJ/ton rs
Coal:	786.076	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton rs
Other Imported:	27.480	MJp/ha	0.000	0.000	998.559	0.000	0.000	MJp/ton rs
Worldwide:								
Primary energy:	16954.255	MJp/ha	0.000	410.308	3015.445	257.069	0.000	MJp/ton rs

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3279.824	kg/ha	0.000	18.345	115.669	6.093	0.000	kg/ton rs
CO2 outside Belgium:	174.738	kg/ha	0.000	9.066	78.175	8.567	0.000	kg/ton rs
Costs:	0.000	eur/ha	240.000	0.000	48.884	61.466	0.000	eur/ton rs

```
================================================
Rapeseed for RME - imported
Internal code: 28
Resource expressed in: ton rs
Resource LHV: 23800.0 MJ/ton rs
Produces product  5: rape meal
Produces product  8: transport (diesel)
Produces product  9: glycerine
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 5:	1.00e+000	*	9.90e-001	*	6.00e-001	*	1.00e+000	*	1.00e+000	ton/ton rs
Product 8:	1.00e+000	*	9.90e-001	*	1.36e+004	*	1.00e+000	*	5.46e-001	km/ton rs
Product 9:	1.00e+000	*	1.00e+000	*	3.55e-002	*	9.99e-001	*	1.00e+000	ton/ton rs

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	0.000	MJ/ton rs	0.000	41.760	149.230	55.974	0.000	kWhe/ton rs
Natural Gas:	0.000	MJ/ton rs	0.000	0.000	1228.443	0.000	0.000	MJ/ton rs
Diesel:	0.000	MJ/ton rs	0.000	0.000	118.085	83.187	0.000	MJ/ton rs
Cheap diesel:	0.000	MJ/ton rs	0.000	0.000	57.092	0.000	0.000	MJ/ton rs
Other Imported:	0.000	MJp/ton rs	0.000	0.000	983.350	0.000	0.000	MJp/ton rs
Worldwide:								
Primary energy:	0.000	MJp/ton rs	5633.000	1017.637	3599.619	257.069	0.000	MJp/ton rs

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	0.000	kg/ton rs	0.000	0.000	146.905	6.093	0.000	kg/ton rs
CO2 outside Belgium:	0.000	kg/ton rs	986.000	73.196	80.707	8.567	0.000	kg/ton rs
Costs:	0.000	eur/ton rs	210.000	0.000	43.831	61.466	0.000	eur/ton rs

```
================================================
Rapeseed for RME, glycerine burnt - imported
Internal code: 29
Resource expressed in: ton rs
Resource LHV: 23800.0 MJ/ton rs
Produces product  5: rape meal
Produces product  8: transport (diesel)
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 5:	1.00e+000	*	9.90e-001	*	6.00e-001	*	1.00e+000	*	1.00e+000	ton/ton rs
Product 8:	1.00e+000	*	9.90e-001	*	1.36e+004	*	1.00e+000	*	5.46e-001	km/ton rs

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	0.000	MJ/ton rs	0.000	41.760	149.230	55.974	0.000	kWhe/ton rs
Natural Gas:	0.000	MJ/ton rs	0.000	0.000	593.878	0.000	0.000	MJ/ton rs
Diesel:	0.000	MJ/ton rs	0.000	0.000	118.085	83.187	0.000	MJ/ton rs
Cheap diesel:	0.000	MJ/ton rs	0.000	0.000	57.092	0.000	0.000	MJ/ton rs
Other Imported:	0.000	MJp/ton rs	0.000	0.000	998.559	0.000	0.000	MJp/ton rs
Worldwide:								
Primary energy:	0.000	MJp/ton rs	5633.000	1017.637	2950.692	257.069	0.000	MJp/ton rs

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	0.000	kg/ton rs	0.000	0.000	112.180	6.093	0.000	kg/ton rs
CO2 outside Belgium:	0.000	kg/ton rs	986.000	73.196	77.902	8.567	0.000	kg/ton rs
Costs:	0.000	eur/ton rs	210.000	0.000	48.561	61.466	0.000	eur/ton rs

```
================================================
Rapeseed Oil for RME - imported
Internal code: 30
Resource expressed in: ton rsoil
Resource LHV: 37500.0 MJ/ton rsoil
Produces product  8: transport (diesel)
Produces product  9: glycerine
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  8:                                   1.00e+000  *  9.99e-001  *   3.50e+004  *     9.99e-001  *  5.46e-001   km/ton rsoil
Product  9:                                   1.00e+000  *  1.00e+000  *   9.50e-002  *     1.00e+000  *  1.00e+000  ton/ton rsoil


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/ton rsoil    0.000       127.500         78.660          151.497         0.000 kWhe/ton rsoil
 Natural Gas:              0.000   MJ/ton rsoil    0.000         0.000       1331.900            0.000         0.000   MJ/ton rsoil
 Diesel:                   0.000   MJ/ton rsoil    0.000         0.000        152.950          225.150         0.000   MJ/ton rsoil
 Cheap diesel:             0.000   MJ/ton rsoil    0.000         0.000        152.950            0.000         0.000   MJ/ton rsoil
 Other Imported:           0.000  MJp/ton rsoil    0.000         0.000       2340.413            0.000         0.000  MJp/ton rsoil
Worldwide:
 Primary energy:           0.000  MJp/ton rsoil 8890.000      1817.759       6188.237          695.772         0.000  MJp/ton rsoil


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/ton rsoil    0.000         0.000        258.449           16.492         0.000   kg/ton rsoil
CO2 outside Belgium:      0.000   kg/ton rsoil 1557.000       131.993        162.862           23.186         0.000   kg/ton rsoil
Costs:                    0.000  eur/ton rsoil  520.000         0.000         48.902          166.361         0.000  eur/ton rsoil
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Used vegetable oil for RME
Internal code: 31
Resource expressed in: ton uvo
Resource LHV: 37500.0 MJ/ton uvo
Produces product  8: transport (diesel)
Produces product  9: glycerine
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  8:                                   1.00e+000  *  9.99e-001  *   3.22e+004  *     9.99e-001  *  5.46e-001   km/ton uvo
Product  9:                                   1.00e+000  *  1.00e+000  *   1.74e-001  *     1.00e+000  *  1.00e+000  ton/ton uvo


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/ton uvo      0.000       127.500          0.000          139.536         0.000 kWhe/ton uvo
 Natural Gas:              0.000   MJ/ton uvo      0.000         0.000          3.413            0.000         0.000   MJ/ton uvo
 Diesel:                   0.000   MJ/ton uvo      0.000       194.000          0.000          207.375         0.000   MJ/ton uvo
 Other Imported:           0.000  MJp/ton uvo      0.000         0.000       3983.426            0.000         0.000  MJp/ton uvo
Worldwide:
 Primary energy:           0.000  MJp/ton uvo      0.000       590.799       7306.893          640.843         0.000  MJp/ton uvo


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/ton uvo      0.000        14.210        270.691           15.190        0.000   kg/ton uvo
CO2 outside Belgium:      0.000   kg/ton uvo      0.000        19.578        252.917           21.356        0.000   kg/ton uvo
Costs:                    0.000  eur/ton uvo    250.000         0.000         51.031          148.380        0.000  eur/ton uvo
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood for FT biodiesel - SRF
Internal code: 32
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
Produces product  8: transport (diesel)
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.00e+001	*	1.00e+000	*	7.04e+002	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 7:	1.00e+001	*	1.00e+000	*	1.79e+002	*	9.50e-001	*	1.00e+000	kWhth/ha
Product 8:	1.00e+001	*	1.00e+000	*	5.25e+003	*	9.99e-001	*	5.46e-001	km/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	183.975	MJ/ha	0.000	0.000	0.000	19.407	0.000	kWhe/ton wd
Natural Gas:	3530.550	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Diesel:	2799.053	MJ/ha	0.000	149.231	0.000	23.610	0.000	MJ/ton wd
Cheap diesel:	654.375	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Coal:	334.200	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Other Imported:	518.779	MJp/ha	0.000	0.000	318.392	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	9073.950	MJp/ha	0.000	173.108	318.392	83.062	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	1552.370	kg/ha	0.000	10.931	16.301	1.729	0.000	kg/ton wd
CO2 outside Belgium:	89.104	kg/ha	0.000	2.119	0.000	2.896	0.000	kg/ton wd
Costs:	0.000	eur/ha	184.615	0.000	86.494	21.210	0.000	eur/ton wd

```
================================================
Wood for FT biodiesel - forest waste
Internal code: 33
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
Produces product  8: transport (diesel)
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.14e+001	*	1.00e+000	*	7.04e+002	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 7:	1.14e+001	*	1.00e+000	*	1.79e+002	*	9.50e-001	*	1.00e+000	kWhth/ha
Product 8:	1.14e+001	*	1.00e+000	*	5.25e+003	*	9.99e-001	*	5.46e-001	km/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	0.000	MJ/ha	0.000	0.000	0.000	19.407	0.000	kWhe/ton wd
Diesel:	442.861	MJ/ha	0.000	149.231	0.000	23.610	0.000	MJ/ton wd
Other Imported:	497.890	MJp/ha	0.000	0.000	365.392	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	1011.609	MJp/ha	0.000	173.108	365.392	83.062	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	53.338	kg/ha	0.000	10.931	19.591	1.729	0.000	kg/ton wd
CO2 outside Belgium:	6.289	kg/ha	0.000	2.119	0.000	2.896	0.000	kg/ton wd
Costs:	0.000	eur/ha	160.000	0.000	86.559	21.210	0.000	eur/ton wd

```
================================================
Wood for FT biodiesel - imported
Internal code: 34
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
Produces product  8: transport (diesel)
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.00e+000	*	1.00e+000	*	7.04e+002	*	9.50e-001	*	1.00e+000	kWhe/ton wd
Product 7:	1.00e+000	*	1.00e+000	*	1.79e+002	*	9.50e-001	*	1.00e+000	kWhth/ton wd
Product 8:	1.00e+000	*	1.00e+000	*	5.25e+003	*	9.99e-001	*	5.46e-001	km/ton wd

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	0.000	MJ/ton wd	0.000	0.000	0.000	19.407	0.000	kWhe/ton wd
Diesel:	0.000	MJ/ton wd	0.000	43.000	0.000	23.610	0.000	MJ/ton wd
Other Imported:	0.000	MJp/ton wd	0.000	0.000	318.392	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	0.000	MJp/ton wd	88.000	1501.880	318.392	83.062	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	0.000	kg/ton wd	0.000	3.150	16.301	1.729	0.000	kg/ton wd
CO2 outside Belgium:	0.000	kg/ton wd	5.100	115.781	0.000	2.896	0.000	kg/ton wd
Costs:	0.000	eur/ton wd	183.333	0.000	86.494	21.210	0.000	eur/ton wd

```
================================================
Wood  for CHP (ORC) - SRF
Internal code: 35
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.00e+001	*	1.00e+000	*	7.50e+002	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 7:	1.00e+001	*	1.00e+000	*	4.00e+003	*	9.50e-001	*	1.00e+000	kWhth/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	183.975	MJ/ha	0.000	0.000	0.000	0.000	0.000	kWhe/ton wd
Natural Gas:	3530.550	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Diesel:	2799.053	MJ/ha	0.000	149.231	0.000	0.000	0.000	MJ/ton wd
Cheap diesel:	654.375	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Coal:	334.200	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Other Imported:	518.779	MJp/ha	0.000	0.000	1690.000	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	9073.950	MJp/ha	0.000	173.108	1690.000	0.000	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	1552.370	kg/ha	0.000	10.931	118.300	0.000	0.000	kg/ton wd
CO2 outside Belgium:	89.104	kg/ha	0.000	2.119	0.000	0.000	0.000	kg/ton wd
Costs:	0.000	eur/ha	184.615	0.000	122.279	0.000	0.000	eur/ton wd

```
================================================
Wood  for CHP (FBG with PE) - SRF
Internal code: 36
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.00e+001	*	1.00e+000	*	1.25e+003	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 7:	1.00e+001	*	1.00e+000	*	2.75e+003	*	9.50e-001	*	1.00e+000	kWhth/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	183.975	MJ/ha	0.000	0.000	0.000	0.000	0.000	kWhe/ton wd
Natural Gas:	3530.550	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Diesel:	2799.053	MJ/ha	0.000	149.231	0.000	0.000	0.000	MJ/ton wd
Cheap diesel:	654.375	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Coal:	334.200	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wd
Other Imported:	518.779	MJp/ha	0.000	0.000	317.945	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	9073.950	MJp/ha	0.000	173.108	317.945	0.000	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	1552.370	kg/ha	0.000	10.931	22.256	0.000	0.000	kg/ton wd
CO2 outside Belgium:	89.104	kg/ha	0.000	2.119	0.000	0.000	0.000	kg/ton wd
Costs:	0.000	eur/ha	184.615	0.000	181.543	0.000	0.000	eur/ton wd

```
================================================
Wood for co-combustion - SRF
Internal code: 37
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product 11: land
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.00e+001  *  1.00e+000  *   1.75e+003  *     9.50e-001  *  1.00e+000 kWhe/ha
Product 11:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000   ha/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:             183.975   MJ/ha           0.000         0.000          0.000            0.000         0.000 kWhe/ton wd
 Natural Gas:            3530.550   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Diesel:                 2799.053   MJ/ha           0.000       149.231          0.000            0.000         0.000   MJ/ton wd
 Cheap diesel:            654.375   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Coal:                    334.200   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Other Imported:          518.779  MJp/ha           0.000         0.000       1072.500            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:         9073.950  MJp/ha           0.000       173.108       1072.500            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:      1552.370   kg/ha           0.000        10.931         75.075             0.000        0.000   kg/ton wd
CO2 outside Belgium:       89.104   kg/ha           0.000         2.119          0.000             0.000        0.000   kg/ton wd
Costs:                      0.000  eur/ha         184.615         0.000         84.224             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood for small steam power plant - SRF
Internal code: 38
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product 11: land
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.00e+001  *  1.00e+000  *   1.00e+003  *     9.50e-001  *  1.00e+000 kWhe/ha
Product 11:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000   ha/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:             183.975   MJ/ha           0.000         0.000          0.000            0.000         0.000 kWhe/ton wd
 Natural Gas:            3530.550   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Diesel:                 2799.053   MJ/ha           0.000       149.231          0.000            0.000         0.000   MJ/ton wd
 Cheap diesel:            654.375   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Coal:                    334.200   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Other Imported:          518.779  MJp/ha           0.000         0.000        612.333            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:         9073.950  MJp/ha           0.000       173.108        612.333            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:      1552.370   kg/ha           0.000        10.931         42.863             0.000        0.000   kg/ton wd
CO2 outside Belgium:       89.104   kg/ha           0.000         2.119          0.000             0.000        0.000   kg/ton wd
Costs:                      0.000  eur/ha         184.615         0.000         67.035             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood  for CHP (ORC) - forest waste
Internal code: 39
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.14e+001	*	1.00e+000	*	7.50e+002	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 7:	1.14e+001	*	1.00e+000	*	4.00e+003	*	9.50e-001	*	1.00e+000	kWhth/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Diesel:	442.861	MJ/ha	0.000	149.231	0.000	0.000	0.000	MJ/ton wd
Other Imported:	497.890	MJp/ha	0.000	0.000	1690.000	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	1011.609	MJp/ha	0.000	173.108	1690.000	0.000	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	53.338	kg/ha	0.000	10.931	118.300	0.000	0.000	kg/ton wd
CO2 outside Belgium:	6.289	kg/ha	0.000	2.119	0.000	0.000	0.000	kg/ton wd
Costs:	0.000	eur/ha	160.000	0.000	122.279	0.000	0.000	eur/ton wd

```
================================================
Wood for small steam power plant - forest waste
Internal code: 40
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.14e+001  *  1.00e+000  *   1.00e+003  *     9.50e-001  *  1.00e+000 kWhe/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                442.861   MJ/ha           0.000       149.231          0.000            0.000         0.000   MJ/ton wd
 Other Imported:        497.890  MJp/ha           0.000         0.000        612.333            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:       1011.609  MJp/ha           0.000       173.108        612.333            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       53.338   kg/ha           0.000        10.931         42.863             0.000        0.000   kg/ton wd
CO2 outside Belgium:       6.289   kg/ha           0.000         2.119          0.000             0.000        0.000   kg/ton wd
Costs:                     0.000  eur/ha         160.000         0.000         67.035             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood for heat - imported
Internal code: 41
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  7: heat
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  7:                                   1.00e+000  *  1.00e+000  *   4.25e+003  *     9.50e-001  *  1.00e+000 kWhth/ton wd


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/ton wd       0.000         0.000          0.000          159.470         0.000 kWhe/ton wd
 Diesel:                   0.000   MJ/ton wd       0.000        43.000          0.000          194.000         0.000   MJ/ton wd
 Other Imported:           0.000  MJp/ton wd       0.000         0.000        537.762            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:           0.000  MJp/ton wd      88.000      1501.880        537.762          682.512         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/ton wd       0.000         3.150         37.643            14.210        0.000   kg/ton wd
CO2 outside Belgium:      0.000   kg/ton wd       5.100       115.781          0.000            23.796        0.000   kg/ton wd
Costs:                    0.000  eur/ton wd     183.333         0.000         60.709             6.016        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood  for CHP (ORC) - imported
Internal code: 42
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.00e+000	*	1.00e+000	*	7.50e+002	*	9.50e-001	*	1.00e+000	kWhe/ton wd
Product 7:	1.00e+000	*	1.00e+000	*	4.00e+003	*	9.50e-001	*	1.00e+000	kWhth/ton wd

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Diesel:	0.000	MJ/ton wd	0.000	43.000	0.000	0.000	0.000	MJ/ton wd
Other Imported:	0.000	MJp/ton wd	0.000	0.000	1690.000	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	0.000	MJp/ton wd	88.000	1501.880	1690.000	0.000	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	0.000	kg/ton wd	0.000	3.150	118.300	0.000	0.000	kg/ton wd
CO2 outside Belgium:	0.000	kg/ton wd	5.100	115.781	0.000	0.000	0.000	kg/ton wd
Costs:	0.000	eur/ton wd	183.333	0.000	122.279	0.000	0.000	eur/ton wd

```
================================================
Wood  for CHP (FBG with PE) - imported
Internal code: 43
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.00e+000	*	1.00e+000	*	1.25e+003	*	9.50e-001	*	1.00e+000	kWhe/ton wd
Product 7:	1.00e+000	*	1.00e+000	*	2.75e+003	*	9.50e-001	*	1.00e+000	kWhth/ton wd

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Diesel:	0.000	MJ/ton wd	0.000	43.000	0.000	0.000	0.000	MJ/ton wd
Other Imported:	0.000	MJp/ton wd	0.000	0.000	317.945	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	0.000	MJp/ton wd	88.000	1501.880	317.945	0.000	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	0.000	kg/ton wd	0.000	3.150	22.256	0.000	0.000	kg/ton wd
CO2 outside Belgium:	0.000	kg/ton wd	5.100	115.781	0.000	0.000	0.000	kg/ton wd
Costs:	0.000	eur/ton wd	183.333	0.000	181.543	0.000	0.000	eur/ton wd

```
================================================
Wood for co-combustion - imported
Internal code: 44
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.00e+000  *  1.00e+000  *   1.75e+003  *     9.50e-001  *  1.00e+000 kWhe/ton wd


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                    0.000   MJ/ton wd       0.000        43.000          0.000            0.000         0.000   MJ/ton wd
 Other Imported:            0.000  MJp/ton wd       0.000         0.000       1072.500            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:            0.000  MJp/ton wd      88.000      1501.880       1072.500            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:        0.000   kg/ton wd       0.000         3.150         75.075             0.000        0.000   kg/ton wd
CO2 outside Belgium:       0.000   kg/ton wd       5.100       115.781          0.000             0.000        0.000   kg/ton wd
Costs:                     0.000  eur/ton wd     183.333         0.000         84.224             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood for small steam power plant - imported
Internal code: 45
Resource expressed in: ton wd
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.00e+000  *  1.00e+000  *   1.00e+003  *     9.50e-001  *  1.00e+000 kWhe/ton wd


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                    0.000   MJ/ton wd       0.000        43.000          0.000            0.000         0.000   MJ/ton wd
 Other Imported:            0.000  MJp/ton wd       0.000         0.000        612.333            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:            0.000  MJp/ton wd      88.000      1501.880        612.333            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:        0.000   kg/ton wd       0.000         3.150         42.863             0.000        0.000   kg/ton wd
CO2 outside Belgium:       0.000   kg/ton wd       5.100       115.781          0.000             0.000        0.000   kg/ton wd
Costs:                     0.000  eur/ton wd     183.333         0.000         67.035             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Ethanol for gasoline - imported
Internal code: 46
Resource expressed in: liter
Resource LHV: 26800.0 MJ/ton eth
Produces product  1: transport (gasoline)
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  1:                                   7.94e-004  *  1.00e+000  *   2.68e+004  *     9.99e-001  *  4.46e-001   km/liter


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/liter        0.000         0.000          0.000           99.160         0.000 kWhe/ton eth
 Diesel:                   0.000   MJ/liter        0.000         0.000          0.000          237.000         0.000   MJ/ton eth
Worldwide:
 Primary energy:           0.000  MJp/liter     2680.000      2200.000          0.000          559.380         0.000  MJp/ton eth


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/liter        0.000         0.000          0.000            17.360        0.000   kg/ton eth
CO2 outside Belgium:      0.000   kg/liter      266.427       174.500          0.000            16.449        0.000   kg/ton eth
Costs:                    0.000  eur/liter      550.000         0.000          0.000           244.747        0.000  eur/ton eth
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Ethanol for ETBE - imported
Internal code: 47
Resource expressed in: liter
Resource LHV: 26800.0 MJ/ton eth
Produces product 12: MTBE/ETBE
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 12:                                   7.94e-004  *  1.00e+000  *   2.12e+000  *     1.00e+000  *  1.00e+000  ton/liter


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/liter        0.000         0.000         99.216            0.000         0.000 kWhe/ton eth
 Natural Gas:              0.000   MJ/liter        0.000         0.000          1.370            0.000         0.000   MJ/ton eth
 Other Imported:           0.000  MJp/liter        0.000         0.000      52268.600            0.000         0.000  MJp/ton eth
Worldwide:
 Primary energy:           0.000  MJp/liter     2680.000      2200.000      52554.655            0.000         0.000  MJp/ton eth


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/liter        0.000         0.000       3592.496             0.000         0.000   kg/ton eth
CO2 outside Belgium:      0.000   kg/liter      266.427       174.500         13.097             0.000         0.000   kg/ton eth
Costs:                    0.000  eur/liter      550.000         0.000        769.993             0.000         0.000  eur/ton eth
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Methanol for MTBE - imported
Internal code: 48
Resource expressed in: liter
Resource LHV: 19937.2 MJ/ton meth
Produces product 12: MTBE/ETBE
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 12:                                   7.96e-004  *  1.00e+000  *   2.75e+000  *     1.00e+000  *  1.00e+000  ton/liter


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:              0.000   MJ/liter        0.000         0.000        128.700            0.000         0.000 kWhe/ton meth
 Natural Gas:              0.000   MJ/liter        0.000         0.000          7.986            0.000         0.000   MJ/ton meth
 Other Imported:           0.000  MJp/liter        0.000         0.000      81256.250            0.000         0.000  MJp/ton meth
Worldwide:
 Primary energy:           0.000  MJp/liter    18213.972         0.000      81633.810            0.000         0.000  MJp/ton meth


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/liter     1375.090         0.000       5584.997             0.000        0.000   kg/ton meth
CO2 outside Belgium:      0.000   kg/liter     1384.910         0.000         17.017             0.000        0.000   kg/ton meth
Costs:                    0.000  eur/liter      153.077         0.000       1151.885             0.000        0.000  eur/ton meth
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Straw - imported
Internal code: 49
Resource expressed in: ton
Resource LHV: 14600.0 MJ/ton
Produces product  2: straw
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  2:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     9.90e-001  *  1.00e+000  ton/ton


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                   0.000   MJ/ton          0.000         0.000          0.000           97.000         0.000   MJ/ton
Worldwide:
 Primary energy:           0.000  MJp/ton       1236.000       214.484          0.000          112.520         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/ton          0.000         0.000          0.000             7.105        0.000   kg/ton
CO2 outside Belgium:      0.000   kg/ton        194.000        16.170          0.000             1.377        0.000   kg/ton
Costs:                    0.000  eur/ton         50.000         0.000          0.000            37.751        0.000  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Animal food (DDGS) - imported
Internal code: 50
Resource expressed in: ton
Resource LHV: 18200.0 MJ/ton
Produces product  3: DDGS
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  3:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000  ton/ton


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:           0.000  MJp/ton       8979.000       214.484          0.000            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 outside Belgium:       0.000   kg/ton        522.000        16.170          0.000             0.000         0.000   kg/ton
Costs:                     0.000  eur/ton        113.043         0.000          0.000             0.000         0.000  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Animal food (sugar beat pulp) - imported
Internal code: 51
Resource expressed in: ton
Resource LHV: 15600.0 MJ/ton
Produces product  4: animal feed from sugar beet
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  4:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000  ton/ton


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:           0.000  MJp/ton      13100.000       214.484          0.000            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 outside Belgium:      0.000   kg/ton          0.858        16.170          0.000             0.000         0.000   kg/ton
Costs:                    0.000  eur/ton         50.000         0.000          0.000             0.000         0.000  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Animal food (rape seed) - imported
Internal code: 52
Resource expressed in: ton
Resource LHV: 16400.0 MJ/ton
Produces product  5: rape meal
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  5:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000  ton/ton


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:           0.000  MJp/ton       3888.000       356.642          0.000            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 outside Belgium:      0.000   kg/ton        681.000        26.887          0.000             0.000         0.000   kg/ton
Costs:                    0.000  eur/ton        110.000         0.000          0.000             0.000         0.000  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood for heat - SRF
Internal code: 53
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  7: heat
Produces product 11: land
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  7:                                   1.00e+001  *  1.00e+000  *   4.30e+003  *     9.50e-001  *  1.00e+000 kWhth/ha
Product 11:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000   ha/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Electricity:             183.975   MJ/ha           0.000         0.000          0.000            0.000         0.000 kWhe/ton wd
 Natural Gas:            3530.550   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Diesel:                 2799.053   MJ/ha           0.000       149.231          0.000            0.000         0.000   MJ/ton wd
 Cheap diesel:            654.375   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Coal:                    334.200   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ton wd
 Other Imported:          518.779  MJp/ha           0.000         0.000        537.762            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:         9073.950  MJp/ha           0.000       173.108        537.762            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:      1552.370   kg/ha           0.000        10.931         37.643             0.000        0.000   kg/ton wd
CO2 outside Belgium:       89.104   kg/ha           0.000         2.119          0.000             0.000        0.000   kg/ton wd
Costs:                      0.000  eur/ha         184.615         0.000         60.709             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood for heat - forest waste
Internal code: 54
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  7: heat
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  7:                                   1.14e+001  *  1.00e+000  *   4.30e+003  *     9.50e-001  *  1.00e+000 kWhth/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                 442.861   MJ/ha           0.000       149.231          0.000            0.000         0.000   MJ/ton wd
 Other Imported:         497.890  MJp/ha           0.000         0.000        537.762            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:        1011.609  MJp/ha           0.000       173.108        537.762            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       53.338   kg/ha           0.000        10.931         37.643             0.000         0.000   kg/ton wd
CO2 outside Belgium:       6.289   kg/ha           0.000         2.119          0.000             0.000         0.000   kg/ton wd
Costs:                     0.000  eur/ha         160.000         0.000         60.709             0.000         0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wood  for CHP (FBG with PE) - forest waste
Internal code: 55
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
Produces product  7: heat
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 6:	1.14e+001	*	1.00e+000	*	1.25e+003	*	9.50e-001	*	1.00e+000	kWhe/ha
Product 7:	1.14e+001	*	1.00e+000	*	2.75e+003	*	9.50e-001	*	1.00e+000	kWhth/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Diesel:	442.861	MJ/ha	0.000	149.231	0.000	0.000	0.000	MJ/ton wd
Other Imported:	497.890	MJp/ha	0.000	0.000	317.945	0.000	0.000	MJp/ton wd
Worldwide:								
Primary energy:	1011.609	MJp/ha	0.000	173.108	317.945	0.000	0.000	MJp/ton wd

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	53.338	kg/ha	0.000	10.931	22.256	0.000	0.000	kg/ton wd
CO2 outside Belgium:	6.289	kg/ha	0.000	2.119	0.000	0.000	0.000	kg/ton wd
Costs:	0.000	eur/ha	160.000	0.000	181.543	0.000	0.000	eur/ton wd

```
================================================
Wood for co-combustion - forest waste
Internal code: 56
Resource expressed in: ha
Resource LHV: 18000.0 MJ/ton wd
Produces product  6: electricity
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  6:                                   1.14e+001  *  1.00e+000  *   1.75e+003  *     9.50e-001  *  1.00e+000 kWhe/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                442.861   MJ/ha           0.000       149.231          0.000            0.000         0.000   MJ/ton wd
 Other Imported:        497.890  MJp/ha           0.000         0.000       1072.500            0.000         0.000  MJp/ton wd
Worldwide:
 Primary energy:       1011.609  MJp/ha           0.000       173.108       1072.500            0.000         0.000  MJp/ton wd


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       53.338   kg/ha           0.000        10.931         75.075             0.000        0.000   kg/ton wd
CO2 outside Belgium:       6.289   kg/ha           0.000         2.119          0.000             0.000        0.000   kg/ton wd
Costs:                     0.000  eur/ha         160.000         0.000         84.224             0.000        0.000  eur/ton wd
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Glycerine - imported
Internal code: 57
Resource expressed in: ton gl
Resource LHV: 17000.0 MJ/ton gl
Produces product  9: glycerine
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product  9:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000  ton/ton gl


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:           0.000  MJp/ton gl    7384.000       356.642          0.000            0.000         0.000  MJp/ton gl


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 outside Belgium:       0.000   kg/ton gl    2150.000        26.887          0.000             0.000         0.000   kg/ton gl
Costs:                     0.000  eur/ton gl     900.000         0.000          0.000             0.000         0.000  eur/ton gl
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Heavy Fuel Oil
Internal code: 58
Resource expressed in: liter
Resource LHV: 40500.0 MJ/ton
Produces product 10: transport (HFO)
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 10:                                   9.70e-004  *  1.00e+000  *   0.00e+000  *     1.00e+000  *  1.00e+000   km/liter


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
Worldwide:
 Primary energy:           0.000  MJp/liter     4050.000         0.000          0.000            0.000         0.000  MJp/ton


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       0.000   kg/liter        0.000         0.000          0.000             0.000     3157.075   kg/ton
CO2 outside Belgium:      0.000   kg/liter      612.020         0.000          0.000             0.000        0.000   kg/ton
Costs:                    0.000  eur/liter        0.000         0.000          0.000             0.000       63.142  eur/ton
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Set aside land
Internal code: 59
Resource expressed in: ha
Resource LHV:     0.0 MJ/ha
Produces product 11: land
================================================

Conversion factors:                          Production     Transport     Conversion     Distribution       End use
-------------------------------------------------------------------------------------------------------------------
Product 11:                                   1.00e+000  *  1.00e+000  *   1.00e+000  *     1.00e+000  *  1.00e+000   ha/ha


Utility consumptions:  Production             Production     Transport     Conversion     Distribution       End Use
-------------------------------------------------------------------------------------------------------------------
Inside Belgium:
 Diesel:                1365.408   MJ/ha           0.000         0.000          0.000            0.000         0.000   MJ/ha
 Other Imported:          16.000  MJp/ha           0.000         0.000          0.000            0.000         0.000  MJp/ha
Worldwide:
 Primary energy:        1599.873  MJp/ha           0.000         0.000          0.000            0.000         0.000  MJp/ha


CO2 & Costs:           Production             Production     Transport     Conversion      Distribution      End Use
-------------------------------------------------------------------------------------------------------------------
CO2 inside Belgium:       727.536   kg/ha           0.000         0.000          0.000             0.000        0.000   kg/ha
CO2 outside Belgium:       19.389   kg/ha           0.000         0.000          0.000             0.000        0.000   kg/ha
-------------------------------------------------------------------------------------------------------------------
```

```
================================================
Wheat for ethanol, straw ploughed back (zero LHV)
Internal code: 60
Resource expressed in: ha
Resource LHV: 17000.0 MJ/ton wh
Produces product  1: transport (gasoline)
Produces product  3: DDGS
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	8.80e+000	*	9.90e-001	*	7.91e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 3:	8.80e+000	*	9.90e-001	*	3.71e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	332.915	MJ/ha	0.000	41.760	44.280	29.252	0.000	kWhe/ton wh
Natural Gas:	6947.988	MJ/ha	0.000	0.000	4078.800	0.000	0.000	MJ/ton wh
Diesel:	4078.927	MJ/ha	0.000	796.266	0.000	69.915	0.000	MJ/ton wh
Cheap diesel:	1280.275	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Coal:	794.772	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Other Imported:	2497.500	MJp/ha	0.000	0.000	62.798	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	17733.636	MJp/ha	0.000	1043.465	4458.696	165.017	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3429.734	kg/ha	0.000	58.326	234.440	5.121	0.000	kg/ton wh
CO2 outside Belgium:	153.263	kg/ha	0.000	16.817	23.871	4.852	0.000	kg/ton wh
Costs:	0.000	eur/ha	140.000	0.000	117.831	72.558	0.000	eur/ton wh

```
================================================
Wheat for ethanol, straw for bedding (zero LHV)
Internal code: 61
Resource expressed in: ha
Resource LHV: 17000.0 MJ/ton wh
Produces product  1: transport (gasoline)
Produces product  2: straw
Produces product  3: DDGS
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	8.80e+000	*	9.90e-001	*	7.91e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 2:	8.80e+000	*	9.00e-001	*	4.50e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 3:	8.80e+000	*	9.90e-001	*	3.71e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	332.915	MJ/ha	0.000	41.760	44.280	29.252	0.000	kWhe/ton wh
Natural Gas:	6947.988	MJ/ha	0.000	0.000	4078.800	0.000	0.000	MJ/ton wh
Diesel:	4294.083	MJ/ha	0.000	864.126	0.000	69.915	0.000	MJ/ton wh
Cheap diesel:	1280.275	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Coal:	794.772	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Other Imported:	2497.500	MJp/ha	0.000	0.000	62.798	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	17983.216	MJp/ha	0.000	1122.183	4458.696	165.017	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3445.494	kg/ha	0.000	63.297	234.440	5.121	0.000	kg/ton wh
CO2 outside Belgium:	156.318	kg/ha	0.000	17.781	23.871	4.852	0.000	kg/ton wh
Costs:	0.000	eur/ha	140.000	0.000	117.831	72.558	0.000	eur/ton wh

```
================================================
Wheat for ethanol, straw burnt (zero LHV)
Internal code: 62
Resource expressed in: ha
Resource LHV: 17000.0 MJ/ton wh
Produces product  1: transport (gasoline)
Produces product  2: straw
Produces product  3: DDGS
Produces product 11: land
================================================
```

Conversion factors:	Production		Transport		Conversion		Distribution		End use	
Product 1:	8.80e+000	*	9.90e-001	*	7.91e+003	*	9.99e-001	*	4.46e-001	km/ha
Product 2:	8.80e+000	*	9.00e-001	*	1.50e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 3:	8.80e+000	*	9.90e-001	*	3.71e-001	*	1.00e+000	*	1.00e+000	ton/ha
Product 11:	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	*	1.00e+000	ha/ha

Utility consumptions:	Production		Production	Transport	Conversion	Distribution	End Use	
Inside Belgium:								
Electricity:	332.915	MJ/ha	0.000	41.760	44.280	29.252	0.000	kWhe/ton wh
Natural Gas:	6947.988	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Diesel:	4294.083	MJ/ha	0.000	864.126	19.740	69.915	0.000	MJ/ton wh
Cheap diesel:	1280.275	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Coal:	794.772	MJ/ha	0.000	0.000	0.000	0.000	0.000	MJ/ton wh
Other Imported:	2497.500	MJp/ha	0.000	0.000	101.605	0.000	0.000	MJp/ton wh
Worldwide:								
Primary energy:	17983.216	MJp/ha	0.000	1122.183	251.530	165.017	0.000	MJp/ton wh

CO2 & Costs:	Production		Production	Transport	Conversion	Distribution	End Use	
CO2 inside Belgium:	3445.494	kg/ha	0.000	63.297	8.558	5.121	0.000	kg/ton wh
CO2 outside Belgium:	156.318	kg/ha	0.000	17.781	6.123	4.852	0.000	kg/ton wh
Costs:	0.000	eur/ha	140.000	0.000	113.930	72.558	0.000	eur/ton wh

Annex J Detailed results SPA analysis

This annex contains detailed results for all scenarios considered in the SPA analysis.

Every scenario has its own set of tables (one for every perturbed resource) and a summary table on a separate page. These tables were automatically generated with the SPA Matlab code.

The tables are sorted by scenario number. A lookup table with scenario numbers and internal codes/chain names is provided in Table Annex I-1.

Table Annex I-1: List of all considered scenarios (sorted by scenario number)

Scenario nr	Internal Code	Chain	Scenario	Internal Code	Chain
1	7	Wheat for ethanol, straw ploughed back	24	41	Wood for heat - imported
2	8	Wheat for ethanol, straw for bedding	25	42	Wood for CHP (ORC) - imported
3	9	Wheat for ethanol, straw burnt	26	43	Wood for CHP (FBG with PE) - imported
4	10	Wheat for ethanol - imported	27	44	Wood for co-combustion - imported
5	13	Wood for ethanol - SRF	28	45	Wood for small steam power plant - imported
6	14	Wood for ethanol - forest waste	29	46	Ethanol for gasoline - imported
7	15	Wood for ethanol - imported	30	53	Wood for heat - SRF
8	25	Rapeseed for PPO - local	31	54	Wood for heat - forest waste
9	26	Rapeseed for RME - local	32	55	Wood for CHP (FBG with PE) - forest waste
10	27	Rapeseed for RME, glycerine burnt	33	56	Wood for co-combustion - forest waste
11	28	Rapeseed for RME - imported	34	16	Wheat for ETBE, straw ploughed back
12	29	Rapeseed for RME, glycerine burnt - imported	35	17	Wheat for ETBE, straw for bedding
13	30	Rapeseed Oil for RME - imported	36	18	Wheat for ETBE, straw burnt
14	31	Used vegetable oil for RME	37	19	Wheat for ETBE - imported
15	32	Wood for FT biodiesel - SRF	38	47	Ethanol for ETBE - imported
16	33	Wood for FT biodiesel - forest waste	39	22	Wood for ETBE - SRF
17	34	Wood for FT biodiesel - imported	40	23	Wood for ETBE - forest waste
18	35	Wood for CHP (ORC) - SRF	41	24	Wood for ETBE - imported
19	36	Wood for CHP (FBG with PE) - SRF	42	11	Sugar beet for EtOH
20	37	Wood for co-combustion - SRF	43	12	Sugar beet for EtOH, pulp burnt
21	38	Wood for small steam power plant - SRF	44	20	Sugar beet for ETBE
22	39	Wood for CHP (ORC) - forest waste	45	21	Sugar beet for ETBE, pulp burnt
23	40	Wood for small steam power plant - forest waste	46	18	Wheat for ETBE, straw burnt

```
================================================================================================
Scenario  1
Perturbation by   1.0 ha of resource nr 7 Wheat for ethanol, straw ploughed back
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -2140.103 liter
Resource decrease with utilities    =   -2140.103 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -9642.790        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -5083.128
CO2 outside [kg]:             -860.963        0.000        0.000          0.000        0.000
Cost [euro]:                  -984.942        0.000        0.000          0.000     -101.663


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 7 Wheat for ethanol, straw ploughed back (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             332.915      367.488      389.664        257.419        0.000
Natural Gas [MJ]:            6947.988        0.000    35893.440          0.000        0.000
Diesel [MJ]:                 4078.927     7007.137        0.000        615.252        0.000
Coal [MJ]):                   794.772        0.000        0.000          0.000        0.000
Other imported [MJp]:        2497.500        0.000      552.624          0.000        0.000
World primary energy [MJp]: 17733.636     9182.492    39236.527       1452.151        0.000
CO2 inside [kg]:             3429.734      513.273     2063.074         45.067        0.000
CO2 outside [kg]:             153.263      147.989      210.063         42.702        0.000
Cost [euro]:                 1232.000        0.000     1036.911        638.507        0.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 50 Animal food (DDGS) - imported  (LHV =    18200.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -3.232 ton
Resource decrease with utilities    =      -3.232 ton

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
```

```
World primary energy [MJp]: -29021.493     -693.245        0.000          0.000        0.000
CO2 inside [kg]:                0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:           -1687.183      -52.262        0.000          0.000        0.000
Cost [euro]:                 -365.374        0.000        0.000          0.000        0.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha

                          Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------
Diesel [MJ]:               -1365.408        0.000        0.000          0.000        0.000
Other imported [MJp]:        -16.000        0.000        0.000          0.000        0.000
World primary energy [MJp]:  -1599.873        0.000        0.000          0.000        0.000
CO2 inside [kg]:             -727.536        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -19.389        0.000        0.000          0.000        0.000
Cost [euro]:                    0.000        0.000        0.000          0.000        0.000
```

```
================================================================================================
Scenario  1
Perturbation by   1.0 ha of resource nr 7 Wheat for ethanol, straw ploughed back
Summary report
================================================================================================
Perturbed Resource nr  1 by   -2140.10 liter Gasoline for transport
Perturbed Resource nr  2 by     288.24 liter Gasoil for transport
Perturbed Resource nr  3 by    1494.19 m3 Natural gas for heat
Perturbed Resource nr  4 by     374.30 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr  7 by       1.00 ha Wheat for ethanol, straw ploughed back
Perturbed Resource nr 50 by      -3.23 ton Animal food (DDGS) - imported
Perturbed Resource nr 58 by      32.59 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   3034.12 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -9243 MJ
Effect on renewable energy import in Belgium         -58825 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -42230 MJp
Effect on worldwide renewable energy consumption     148195 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        -240 kg
CO2eq saving outside Belgium       2066 kg
------------------------------------------------------------------------------------------------
Cost                               1455 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.28 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.06 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  43.2 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               -26.0 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium       10.82 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        9999 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium          157.5 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
================================================================================================
```

```
================================================================================================
Scenario  2
Perturbation by   1.0 ha of resource nr 8 Wheat for ethanol, straw for bedding
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -2140.103 liter
Resource decrease with utilities    =   -2140.103 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -9642.790        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -5083.128
CO2 outside [kg]:             -860.963        0.000        0.000          0.000        0.000
Cost [euro]:                  -984.942        0.000        0.000          0.000     -101.663


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Perturbed Resource nr 8 Wheat for ethanol, straw for bedding (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             332.915      367.488      389.664        257.419        0.000
Natural Gas [MJ]:            6947.988        0.000    35893.440          0.000        0.000
Diesel [MJ]:                 4294.083     7604.305        0.000        615.252        0.000
Coal [MJ]):                   794.772        0.000        0.000          0.000        0.000
Other imported [MJp]:        2497.500        0.000      552.624          0.000        0.000
World primary energy [MJp]: 17983.216     9875.207    39236.527       1452.151        0.000
CO2 inside [kg]:             3445.494      557.015     2063.074         45.067        0.000
CO2 outside [kg]:             156.318      156.469      210.063         42.702        0.000
Cost [euro]:                 1232.000        0.000     1036.911        638.507        0.000


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Perturbed Resource nr 49 Straw - imported (LHV =    14600.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -3.600 ton
Resource decrease with utilities    =      -3.600 ton
```

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	0.000	0.000	0.000	-349.200	0.000
World primary energy [MJp]:	-4449.600	-772.142	0.000	-405.072	0.000
CO2 inside [kg]:	0.000	0.000	0.000	-25.579	0.000
CO2 outside [kg]:	-698.400	-58.210	0.000	-4.959	0.000
Cost [euro]:	-180.000	0.000	0.000	-135.905	0.000

++
Perturbed Resource nr 50 Animal food (DDGS) - imported (LHV = 18200.0 MJ/ton)
++
Resource decrease without utilities = -3.232 ton
Resource decrease with utilities = -3.232 ton

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-29021.493	-693.245	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-1687.183	-52.262	0.000	0.000	0.000
Cost [euro]:	-365.374	0.000	0.000	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario  2
Perturbation by   1.0 ha of resource nr 8 Wheat for ethanol, straw for bedding
Summary report
================================================================================================
Perturbed Resource nr  1 by   -2140.10 liter Gasoline for transport
Perturbed Resource nr  2 by     301.15 liter Gasoil for transport
Perturbed Resource nr  3 by    1494.19 m3 Natural gas for heat
Perturbed Resource nr  4 by     374.30 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr  8 by       1.00 ha Wheat for ethanol, straw for bedding
Perturbed Resource nr 49 by      -3.60 ton Straw - imported
Perturbed Resource nr 50 by      -3.23 ton Animal food (DDGS) - imported
Perturbed Resource nr 58 by      32.59 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   3034.12 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -8780 MJ
Effect on renewable energy import in Belgium        -111385 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -46914 MJp
Effect on worldwide renewable energy consumption      95635 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        -274 kg
CO2eq saving outside Belgium       2816 kg
------------------------------------------------------------------------------------------------
Cost                               1140 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.49 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.09 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  54.2 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               -31.3 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium       11.39 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        9999 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium          129.8 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario  3
Perturbation by   1.0 ha of resource nr 9 Wheat for ethanol, straw burnt
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
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Resource decrease without utilities =   -2140.103 liter
Resource decrease with utilities    =   -2140.103 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -9642.790        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -5083.128
CO2 outside [kg]:             -860.963        0.000        0.000          0.000        0.000
Cost [euro]:                  -984.942        0.000        0.000          0.000     -101.663


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Perturbed Resource nr 9 Wheat for ethanol, straw burnt (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             332.915      367.488      389.664        257.419        0.000
Natural Gas [MJ]:            6947.988        0.000        0.000          0.000        0.000
Diesel [MJ]:                 4294.083     7604.305      173.712        615.252        0.000
Coal [MJ]):                   794.772        0.000        0.000          0.000        0.000
Other imported [MJp]:        2497.500        0.000      894.126          0.000        0.000
World primary energy [MJp]: 17983.216     9875.207     2213.461       1452.151        0.000
CO2 inside [kg]:             3445.494      557.015       75.313         45.067        0.000
CO2 outside [kg]:             156.318      156.469       53.881         42.702        0.000
Cost [euro]:                 1232.000        0.000     1002.587        638.507        0.000


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Perturbed Resource nr 49 Straw - imported (LHV =    14600.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -1.200 ton
Resource decrease with utilities    =      -1.200 ton
```

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	0.000	0.000	0.000	-116.400	0.000
World primary energy [MJp]:	-1483.200	-257.381	0.000	-135.024	0.000
CO2 inside [kg]:	0.000	0.000	0.000	-8.526	0.000
CO2 outside [kg]:	-232.800	-19.403	0.000	-1.653	0.000
Cost [euro]:	-60.000	0.000	0.000	-45.302	0.000

++
Perturbed Resource nr 50 Animal food (DDGS) - imported (LHV = 18200.0 MJ/ton)
++
Resource decrease without utilities = -3.232 ton
Resource decrease with utilities = -3.232 ton

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-29021.493	-693.245	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-1687.183	-52.262	0.000	0.000	0.000
Cost [euro]:	-365.374	0.000	0.000	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario  3
Perturbation by   1.0 ha of resource nr 9 Wheat for ethanol, straw burnt
Summary report
================================================================================================
Perturbed Resource nr  1 by   -2140.10 liter Gasoline for transport
Perturbed Resource nr  2 by     312.49 liter Gasoil for transport
Perturbed Resource nr  3 by     242.33 m3 Natural gas for heat
Perturbed Resource nr  4 by     374.30 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr  9 by       1.00 ha Wheat for ethanol, straw burnt
Perturbed Resource nr 49 by      -1.20 ton Straw - imported
Perturbed Resource nr 50 by      -3.23 ton Animal food (DDGS) - imported
Perturbed Resource nr 58 by      32.59 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   3375.63 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -43925 MJ
Effect on renewable energy import in Belgium         -76345 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -80186 MJp
Effect on worldwide renewable energy consumption     130675 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        1696 kg
CO2eq saving outside Belgium       2464 kg
------------------------------------------------------------------------------------------------
Cost                               1316 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.61 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.34 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  51.9 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                38.6 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        2.28 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          59 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           30.0 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            776 euro                    /ton CO2eq saved Belgium
================================================================================================
```

```
================================================================================================
Scenario  4
Perturbation by   1.0 ton wh of resource nr 10 Wheat for ethanol - imported
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
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Resource decrease without utilities =    -243.194 liter
Resource decrease with utilities    =    -243.194 liter

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -1095.772        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000     -577.628
CO2 outside [kg]:              -97.837        0.000        0.000          0.000        0.000
Cost [euro]:                  -111.925        0.000        0.000          0.000      -11.553


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Perturbed Resource nr 10 Wheat for ethanol - imported (LHV =    17000.0 MJ/ton wh)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton wh
Resource increase with utilities    =       1.000 ton wh

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000       41.760       44.280         29.252        0.000
Natural Gas [MJ]:                0.000        0.000     4078.800          0.000        0.000
Diesel [MJ]:                     0.000      645.466        0.000         69.915        0.000
Other imported [MJp]:            0.000        0.000       62.798          0.000        0.000
World primary energy [MJp]:   1439.000     1766.377     4458.696        165.017        0.000
CO2 inside [kg]:                 0.000       47.280      234.440          5.121        0.000
CO2 outside [kg]:              226.000       82.362       23.871          4.852        0.000
Cost [euro]:                   140.000        0.000      117.831         72.558        0.000


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Perturbed Resource nr 50 Animal food (DDGS) - imported  (LHV =    18200.0 MJ/ton)
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Resource decrease without utilities =      -0.367 ton
Resource decrease with utilities    =      -0.367 ton

                            Production    Transport   Conversion   Distribution      End use
```

World primary energy [MJp]:	-3297.897	-78.778	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-191.725	-5.939	0.000	0.000	0.000
Cost [euro]:	-41.520	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario  4
Perturbation by   1.0 ton wh of resource nr 10 Wheat for ethanol - imported
Summary report
================================================================================================
Perturbed Resource nr  1 by    -243.19 liter Gasoline for transport
Perturbed Resource nr  2 by      19.95 liter Gasoil for transport
Perturbed Resource nr  3 by     142.26 m3 Natural gas for heat
Perturbed Resource nr  4 by      32.03 kWhe Electricity - imported
Perturbed Resource nr 10 by       1.00 ton wh Wheat for ethanol - imported
Perturbed Resource nr 50 by      -0.37 ton Animal food (DDGS) - imported
Perturbed other resources by     62.80 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -2855 MJ
Effect on renewable energy import in Belgium          10315 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption         -4470 MJp
Effect on worldwide renewable energy consumption      10315 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         291 kg
CO2eq saving outside Belgium        -42 kg
------------------------------------------------------------------------------------------------
Cost                                165 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.43 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.28 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  55.7 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               101.9 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           57.9 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            569 euro                    /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario  5
Perturbation by   1.0 ha of resource nr 13 Wood for ethanol - SRF
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
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Resource decrease without utilities =   -1565.996 liter
Resource decrease with utilities    =   -1565.996 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -7056.000        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -3719.520
CO2 outside [kg]:             -630.000        0.000        0.000          0.000        0.000
Cost [euro]:                  -720.720        0.000        0.000          0.000      -74.390


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -7498.400 kWhe
Resource decrease with utilities    =   -7370.171 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -50444.136        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -3561.740        0.000        0.000          0.000        0.000
Cost [euro]:                  -503.892        0.000        0.000          0.000        0.000


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Perturbed Resource nr 13 Wood for ethanol - SRF (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             183.975        0.000        0.000        277.648        0.000
Natural Gas [MJ]:            3530.550        0.000        0.000          0.000        0.000
Diesel [MJ]:                 2799.053     1492.308     2844.800        663.600        0.000
```

Coal [MJ]):	334.200	0.000	0.000	0.000	0.000
Other imported [MJp]:	518.779	0.000	13548.500	0.000	0.000
World primary energy [MJp]:	9073.950	1731.077	16848.468	1566.265	0.000
CO2 inside [kg]:	1552.370	109.312	1060.877	48.609	0.000
CO2 outside [kg]:	89.104	21.191	40.396	46.057	0.000
Cost [euro]:	1846.154	0.000	841.394	685.290	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario  5
Perturbation by   1.0 ha of resource nr 13 Wood for ethanol - SRF
Summary report
================================================================================================
Perturbed Resource nr  1 by   -1566.00 liter Gasoline for transport
Perturbed Resource nr  2 by     179.43 liter Gasoil for transport
Perturbed Resource nr  3 by     123.14 m3 Natural gas for heat
Perturbed Resource nr  4 by   -7370.17 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.01 ton Coal for co-combustion
Perturbed Resource nr 13 by       1.00 ha Wood for ethanol - SRF
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by  14051.28 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -51928 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -107274 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        1676 kg
CO2eq saving outside Belgium       4014 kg
------------------------------------------------------------------------------------------------
Cost                               2074 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.60 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.29 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  53.0 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                32.3 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.93 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          60 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           39.9 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           1237 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario  6
Perturbation by   1.0 ton wd of resource nr 14 Wood for ethanol - forest waste
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -1785.235 liter
Resource decrease with utilities    =   -1785.235 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -8043.840        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -4240.253
CO2 outside [kg]:             -718.200        0.000        0.000          0.000        0.000
Cost [euro]:                  -821.621        0.000        0.000          0.000      -84.805


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =   -8548.176 kWhe
Resource decrease with utilities    =   -8460.254 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -57506.315        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -4060.384        0.000        0.000          0.000        0.000
Cost [euro]:                  -574.437        0.000        0.000          0.000        0.000


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Perturbed Resource nr 14 Wood for ethanol - forest waste (LHV =        0.0 MJ/ton wd)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000        0.000        0.000        316.519        0.000
Diesel [MJ]:                   442.861     1701.231     3243.072        756.504        0.000
Other imported [MJp]:          497.890        0.000    15445.290          0.000        0.000
```

World primary energy [MJp]:	1011.609	1973.428	19207.254	1785.542	0.000
CO2 inside [kg]:	53.338	124.615	1209.399	55.414	0.000
CO2 outside [kg]:	6.289	24.157	46.052	52.505	0.000
Cost [euro]:	1824.000	0.000	959.190	781.231	0.000

```
================================================================================================
Scenario  6
Perturbation by   1.0 ton wd of resource nr 14 Wood for ethanol - forest waste
Summary report
================================================================================================
Perturbed Resource nr  1 by   -1785.23 liter Gasoline for transport
Perturbed Resource nr  2 by     171.33 liter Gasoil for transport
Perturbed Resource nr  4 by   -8460.25 kWhe Electricity - imported
Perturbed Resource nr 14 by       1.00 ton wd Wood for ethanol - forest waste
Perturbed other resources by  15943.18 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -65826 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -129802 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        2797 kg
CO2eq saving outside Belgium       4650 kg
------------------------------------------------------------------------------------------------
Cost                               2084 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.63 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.32 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  57.4 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                42.5 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.52 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          36 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           31.7 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            745 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario  7
Perturbation by   1.0 ton wd of resource nr 15 Wood for ethanol - imported
================================================================================================

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Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -156.600 liter
Resource decrease with utilities    =    -156.600 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:   -705.600        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000     -371.952
CO2 outside [kg]:              -63.000        0.000        0.000          0.000        0.000
Cost [euro]:                   -72.072        0.000        0.000          0.000       -7.439


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -749.840 kWhe
Resource decrease with utilities    =    -742.128 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -5044.414        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -356.174        0.000        0.000          0.000        0.000
Cost [euro]:                   -50.389        0.000        0.000          0.000        0.000


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Perturbed Resource nr 15 Wood for ethanol - imported (LHV =    18000.0 MJ/ton wd)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:              0.000        0.000        0.000         27.765        0.000
Diesel [MJ]:                   0.000       43.000      284.480         66.360        0.000
Other imported [MJp]:          0.000        0.000     1354.850          0.000        0.000
```

World primary energy [MJp]:	88.000	1501.880	1684.847	156.626	0.000
CO2 inside [kg]:	0.000	3.150	106.088	4.861	0.000
CO2 outside [kg]:	5.100	115.781	4.040	4.606	0.000
Cost [euro]:	183.333	0.000	84.139	68.529	0.000

```
================================================================================================
Scenario  7
Perturbation by   1.0 ton wd of resource nr 15 Wood for ethanol - imported
Summary report
================================================================================================
Perturbed Resource nr  1 by    -156.60 liter Gasoline for transport
Perturbed Resource nr  2 by      10.98 liter Gasoil for transport
Perturbed Resource nr  4 by    -742.13 kWhe Electricity - imported
Perturbed Resource nr 15 by       1.00 ton wd Wood for ethanol - imported
Perturbed other resources by   1354.85 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -5963 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -10058 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         258 kg
CO2eq saving outside Belgium        290 kg
------------------------------------------------------------------------------------------------
Cost                                206 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.56 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.33 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  54.4 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                43.2 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           34.6 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            799 euro                    /ton CO2eq saved Belgium
================================================================================================
```

```
================================================================================================
Scenario  8
Perturbation by   1.0 ha of resource nr 25 Rapeseed for PPO - local
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -1177.654 liter
Resource decrease with utilities    =   -1055.956 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -6756.757        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -3093.328
CO2 outside [kg]:             -599.662        0.000        0.000          0.000        0.000
Cost [euro]:                  -599.662        0.000        0.000          0.000      -61.867


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 25 Rapeseed for PPO - local (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             338.010      150.336      545.490          0.000        0.000
Natural Gas [MJ]:            6883.314      692.068        0.000          0.000        0.000
Diesel [MJ]:                 5556.972      139.680        0.000         32.738        0.000
Coal [MJ]):                   786.076        0.000        0.000          0.000        0.000
Other imported [MJp]:          27.480        0.000     2457.439          0.000        0.000
World primary energy [MJp]:  16954.255     1317.616     4022.287         37.976        0.000
CO2 inside [kg]:              3279.824       49.264      172.021          2.398        0.000
CO2 outside [kg]:              174.738       24.878       71.974          0.465        0.000
Cost [euro]:                   864.000        0.000      208.531          0.513        0.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 52 Animal food (rape seed) - imported  (LHV =    16400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -2.284 ton
Resource decrease with utilities    =      -2.284 ton
```

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-8880.830	-814.629	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-1555.516	-61.413	0.000	0.000	0.000
Cost [euro]:	-251.258	0.000	0.000	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario  8
Perturbation by   1.0 ha of resource nr 25 Rapeseed for PPO - local
Summary report
================================================================================================
Perturbed Resource nr  2 by   -1055.96 liter Gasoil for transport
Perturbed Resource nr  3 by     264.21 m3 Natural gas for heat
Perturbed Resource nr  4 by     287.18 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr 25 by       1.00 ha Rapeseed for PPO - local
Perturbed Resource nr 52 by      -2.28 ton Animal food (rape seed) - imported
Perturbed Resource nr 58 by      33.48 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   2468.92 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -24686 MJ
Effect on renewable energy import in Belgium         -37460 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -37950 MJp
Effect on worldwide renewable energy consumption      48220 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         317 kg
CO2eq saving outside Belgium       1964 kg
------------------------------------------------------------------------------------------------
Cost                                160 euro
------------------------------------------------------------------------------------------------
Energy efficiency world           0.79 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         0.51 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                 60.1 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               12.9 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium       4.05 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        315 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           6.5 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           505 euro                    /ton CO2eq saved Belgium
================================================================================================
```

```
================================================================================================
Scenario  9
Perturbation by   1.0 ha of resource nr 26 Rapeseed for RME - local
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -1298.050 liter
Resource decrease with utilities    =   -1135.812 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -7447.524        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -3409.570
CO2 outside [kg]:             -660.968        0.000        0.000          0.000        0.000
Cost [euro]:                  -660.968        0.000        0.000          0.000      -68.191


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Perturbed Resource nr 26 Rapeseed for RME - local (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             338.010      150.336      537.230        201.506        0.000
Natural Gas [MJ]:            6883.314        0.000     4422.396          0.000        0.000
Diesel [MJ]:                 5556.972      901.588      425.106        299.473        0.000
Coal [MJ]):                   786.076        0.000        0.000          0.000        0.000
Other imported [MJp]:          27.480        0.000     3540.060          0.000        0.000
World primary energy [MJp]:  16954.255     1477.110    12988.116        925.450        0.000
CO2 inside [kg]:              3279.824       66.041      531.018         21.936        0.000
CO2 outside [kg]:              174.738       32.639      290.722         30.840        0.000
Cost [euro]:                   864.000        0.000      158.104        221.278        0.000


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Perturbed Resource nr 52 Animal food (rape seed) - imported  (LHV =    16400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -2.043 ton
Resource decrease with utilities    =      -2.043 ton
```

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-7945.029	-728.789	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-1391.606	-54.942	0.000	0.000	0.000
Cost [euro]:	-224.782	0.000	0.000	0.000	0.000

++
Perturbed Resource nr 57 Glycerine - imported (LHV = 17000.0 MJ/ton gl)
++
Resource decrease without utilities = -0.128 ton gl
Resource decrease with utilities = -0.128 ton gl

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-943.675	-45.579	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-274.770	-3.436	0.000	0.000	0.000
Cost [euro]:	-115.020	0.000	0.000	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario  9
Perturbation by   1.0 ha of resource nr 26 Rapeseed for RME - local
Summary report
================================================================================================
Perturbed Resource nr  2 by   -1135.81 liter Gasoil for transport
Perturbed Resource nr  3 by     394.31 m3 Natural gas for heat
Perturbed Resource nr  4 by     340.86 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr 26 by       1.00 ha Rapeseed for RME - local
Perturbed Resource nr 52 by      -2.04 ton Animal food (rape seed) - imported
Perturbed Resource nr 57 by      -0.13 ton gl Glycerine - imported
Perturbed Resource nr 58 by      39.40 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   3551.54 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -22311 MJ
Effect on renewable energy import in Belgium         -35686 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -32913 MJp
Effect on worldwide renewable energy consumption      49994 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         238 kg
CO2eq saving outside Belgium       1876 kg
------------------------------------------------------------------------------------------------
Cost                                174 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.66 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.45 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  64.2 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                10.7 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        4.48 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium         420 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium            7.8 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            732 euro                    /ton CO2eq saved Belgium
================================================================================================
```

```
================================================================================================
Scenario 10
Perturbation by   1.0 ha of resource nr 27 Rapeseed for RME, glycerine burnt
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -1296.752 liter
Resource decrease with utilities    =   -1134.514 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -7440.077        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -3406.160
CO2 outside [kg]:             -660.307        0.000        0.000          0.000        0.000
Cost [euro]:                  -660.307        0.000        0.000          0.000      -68.123


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 27 Rapeseed for RME, glycerine burnt (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             338.010      150.336      537.230        201.506        0.000
Natural Gas [MJ]:            6883.314        0.000     2360.694          0.000        0.000
Diesel [MJ]:                 5556.972      901.588      425.106        299.473        0.000
Coal [MJ]):                   786.076        0.000        0.000          0.000        0.000
Other imported [MJp]:          27.480        0.000     3594.813          0.000        0.000
World primary energy [MJp]:  16954.255     1477.110    10855.603        925.450        0.000
CO2 inside [kg]:              3279.824       66.041      416.410         21.936        0.000
CO2 outside [kg]:              174.738       32.639      281.431         30.840        0.000
Cost [euro]:                   864.000        0.000      175.983        221.278        0.000


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Perturbed Resource nr 52 Animal food (rape seed) - imported  (LHV =    16400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -2.043 ton
Resource decrease with utilities    =      -2.043 ton
```

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-7945.029	-728.789	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-1391.606	-54.942	0.000	0.000	0.000
Cost [euro]:	-224.782	0.000	0.000	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario 10
Perturbation by   1.0 ha of resource nr 27 Rapeseed for RME, glycerine burnt
Summary report
================================================================================================
Perturbed Resource nr  2 by   -1134.51 liter Gasoil for transport
Perturbed Resource nr  3 by     322.41 m3 Natural gas for heat
Perturbed Resource nr  4 by     340.86 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr 27 by       1.00 ha Rapeseed for RME, glycerine burnt
Perturbed Resource nr 52 by      -2.04 ton Animal food (rape seed) - imported
Perturbed Resource nr 58 by      38.72 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   3606.29 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -24298 MJ
Effect on renewable energy import in Belgium         -33513 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -34002 MJp
Effect on worldwide renewable energy consumption      52167 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         349 kg
CO2eq saving outside Belgium       1607 kg
------------------------------------------------------------------------------------------------
Cost                                308 euro
------------------------------------------------------------------------------------------------
Energy efficiency world           0.65 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         0.47 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                 57.5 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               14.4 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium       4.12 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        286 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium          12.7 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           881 euro                    /ton CO2eq saved Belgium
================================================================================================
```

```
================================================================================================
Scenario 11
Perturbation by   1.0 ton rs of resource nr 28 Rapeseed for RME - imported
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -376.942 liter
Resource decrease with utilities    =    -371.329 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -2162.692        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000     -990.107
CO2 outside [kg]:             -191.939        0.000        0.000          0.000        0.000
Cost [euro]:                  -191.939        0.000        0.000          0.000      -19.802


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 28 Rapeseed for RME - imported (LHV =    23800.0 MJ/ton rs)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton rs
Resource increase with utilities    =       1.000 ton rs

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000       41.760      149.230         55.974        0.000
Natural Gas [MJ]:                0.000        0.000     1228.443          0.000        0.000
Diesel [MJ]:                     0.000        0.000      118.085         83.187        0.000
Other imported [MJp]:            0.000        0.000      983.350          0.000        0.000
World primary energy [MJp]:   5633.000     1017.637     3599.619        257.069        0.000
CO2 inside [kg]:                 0.000        0.000      146.905          6.093        0.000
CO2 outside [kg]:              986.000       73.196       80.707          8.567        0.000
Cost [euro]:                   210.000        0.000       43.831         61.466        0.000


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Perturbed Resource nr 52 Animal food (rape seed) - imported  (LHV =    16400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.594 ton
Resource decrease with utilities    =      -0.594 ton

                           Production    Transport   Conversion   Distribution      End use
```

```
-------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -2309.472     -211.845        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -404.514      -15.971        0.000          0.000        0.000
Cost [euro]:                   -65.340        0.000        0.000          0.000        0.000


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Perturbed Resource nr 57 Glycerine - imported (LHV =    17000.0 MJ/ton gl)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.035 ton gl
Resource decrease with utilities    =      -0.035 ton gl

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------------
World primary energy [MJp]:   -261.870      -12.648        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:              -76.249       -0.954        0.000          0.000        0.000
Cost [euro]:                   -31.918        0.000        0.000          0.000        0.000
```

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================================================================================================
Scenario 11
Perturbation by   1.0 ton rs of resource nr 28 Rapeseed for RME - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by    -371.33 liter Gasoil for transport
Perturbed Resource nr  3 by      42.84 m3 Natural gas for heat
Perturbed Resource nr  4 by      68.60 kWhe Electricity - imported
Perturbed Resource nr 28 by       1.00 ton rs Rapeseed for RME - imported
Perturbed Resource nr 52 by      -0.59 ton Animal food (rape seed) - imported
Perturbed Resource nr 57 by      -0.04 ton gl Glycerine - imported
Perturbed Resource nr 58 by       1.45 liter Heavy Fuel Oil
Perturbed other resources by    983.35 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -10800 MJ
Effect on renewable energy import in Belgium          13456 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption         -7968 MJp
Effect on worldwide renewable energy consumption      13456 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         837 kg
CO2eq saving outside Belgium       -459 kg
------------------------------------------------------------------------------------------------
Cost                                  6 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.59 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.80 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  47.5 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                77.5 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium            0.6 euro                    /GJ fossil saved Belgium
Cost requirement Belgium              8 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 12
Perturbation by   1.0 ton rs of resource nr 29 Rapeseed for RME, glycerine burnt - imported
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -376.942 liter
Resource decrease with utilities    =    -371.329 liter

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -2162.692        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000     -990.107
CO2 outside [kg]:             -191.939        0.000        0.000          0.000        0.000
Cost [euro]:                  -191.939        0.000        0.000          0.000      -19.802


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Perturbed Resource nr 29 Rapeseed for RME, glycerine burnt - imported (LHV =    23800.0 MJ/ton rs)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton rs
Resource increase with utilities    =       1.000 ton rs

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000       41.760      149.230         55.974        0.000
Natural Gas [MJ]:                0.000        0.000      593.878          0.000        0.000
Diesel [MJ]:                     0.000        0.000      118.085         83.187        0.000
Other imported [MJp]:            0.000        0.000      998.559          0.000        0.000
World primary energy [MJp]:   5633.000     1017.637     2950.692        257.069        0.000
CO2 inside [kg]:                 0.000        0.000      112.180          6.093        0.000
CO2 outside [kg]:              986.000       73.196       77.902          8.567        0.000
Cost [euro]:                   210.000        0.000       48.561         61.466        0.000


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Perturbed Resource nr 52 Animal food (rape seed) - imported  (LHV =    16400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.594 ton
Resource decrease with utilities    =      -0.594 ton

                            Production    Transport   Conversion   Distribution      End use
```

World primary energy [MJp]:	-2309.472	-211.845	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-404.514	-15.971	0.000	0.000	0.000
Cost [euro]:	-65.340	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario 12
Perturbation by   1.0 ton rs of resource nr 29 Rapeseed for RME, glycerine burnt - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by    -371.33 liter Gasoil for transport
Perturbed Resource nr  3 by      20.71 m3 Natural gas for heat
Perturbed Resource nr  4 by      68.60 kWhe Electricity - imported
Perturbed Resource nr 29 by       1.00 ton rs Rapeseed for RME, glycerine burnt - imported
Perturbed Resource nr 52 by      -0.59 ton Animal food (rape seed) - imported
Perturbed Resource nr 58 by       1.45 liter Heavy Fuel Oil
Perturbed other resources by    998.56 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -11419 MJ
Effect on renewable energy import in Belgium          14058 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption         -8342 MJp
Effect on worldwide renewable energy consumption      14058 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         872 kg
CO2eq saving outside Belgium       -533 kg
------------------------------------------------------------------------------------------------
Cost                                 43 euro
------------------------------------------------------------------------------------------------
Energy efficiency world           0.59 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         0.81 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                 40.6 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               76.3 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           3.8 euro                    /GJ fossil saved Belgium
Cost requirement Belgium             49 euro                   /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 13
Perturbation by   1.0 ton rsoil of resource nr 30 Rapeseed Oil for RME - imported
================================================================================================

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Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =    -974.974 liter
Resource decrease with utilities    =    -964.430 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -5593.889        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -2560.952
CO2 outside [kg]:             -496.458        0.000        0.000          0.000        0.000
Cost [euro]:                  -496.458        0.000        0.000          0.000      -51.219


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Perturbed Resource nr 30 Rapeseed Oil for RME - imported (LHV =    37500.0 MJ/ton rsoil)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton rsoil
Resource increase with utilities    =       1.000 ton rsoil

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000      127.500       78.660        151.497        0.000
Natural Gas [MJ]:                0.000        0.000     1331.900          0.000        0.000
Diesel [MJ]:                     0.000        0.000      152.950        225.150        0.000
Other imported [MJp]:            0.000        0.000     2340.413          0.000        0.000
World primary energy [MJp]:   8890.000     1817.759     6188.237        695.772        0.000
CO2 inside [kg]:                 0.000        0.000      258.449         16.492        0.000
CO2 outside [kg]:             1557.000      131.993      162.862         23.186        0.000
Cost [euro]:                   520.000        0.000       48.902        166.361        0.000


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Perturbed Resource nr 57 Glycerine - imported (LHV =    17000.0 MJ/ton gl)
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Resource decrease without utilities =      -0.095 ton gl
Resource decrease with utilities    =      -0.095 ton gl

                           Production    Transport   Conversion   Distribution      End use
```

World primary energy [MJp]:	-701.480	-33.881	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-204.250	-2.554	0.000	0.000	0.000
Cost [euro]:	-85.500	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 13
Perturbation by   1.0 ton rsoil of resource nr 30 Rapeseed Oil for RME - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by    -964.43 liter Gasoil for transport
Perturbed Resource nr  3 by      46.45 m3 Natural gas for heat
Perturbed Resource nr  4 by      99.35 kWhe Electricity - imported
Perturbed Resource nr 30 by       1.00 ton rsoil Rapeseed Oil for RME - imported
Perturbed Resource nr 57 by      -0.09 ton gl Glycerine - imported
Perturbed Resource nr 58 by       3.89 liter Heavy Fuel Oil
Perturbed other resources by   2340.41 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -30401 MJ
Effect on renewable energy import in Belgium          35885 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -23699 MJp
Effect on worldwide renewable energy consumption      35885 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        2286 kg
CO2eq saving outside Belgium      -1172 kg
------------------------------------------------------------------------------------------------
Cost                                102 euro
------------------------------------------------------------------------------------------------
Energy efficiency world           0.66 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         0.85 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                 47.0 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               75.2 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           3.4 euro                    /GJ fossil saved Belgium
Cost requirement Belgium             45 euro                   /ton CO2eq saved Belgium
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```

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================================================================================================
Scenario 14
Perturbation by   1.0 ton uvo of resource nr 31 Used vegetable oil for RME
================================================================================================

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Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =    -896.947 liter
Resource decrease with utilities    =    -885.754 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -5146.209        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -2355.999
CO2 outside [kg]:             -456.726        0.000        0.000          0.000        0.000
Cost [euro]:                  -456.726        0.000        0.000          0.000      -47.120


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Perturbed Resource nr 31 Used vegetable oil for RME (LHV =    37500.0 MJ/ton uvo)
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Resource increase without utilities =       1.000 ton uvo
Resource increase with utilities    =       1.000 ton uvo

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000      127.500        0.000        139.536        0.000
Natural Gas [MJ]:                0.000        0.000        3.413          0.000        0.000
Diesel [MJ]:                     0.000      194.000        0.000        207.375        0.000
Other imported [MJp]:            0.000        0.000     3983.426          0.000        0.000
World primary energy [MJp]:      0.000      590.799     7306.893        640.843        0.000
CO2 inside [kg]:                 0.000       14.210      270.691         15.190        0.000
CO2 outside [kg]:                0.000       19.578      252.917         21.356        0.000
Cost [euro]:                   250.000        0.000       51.031        148.380        0.000


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Perturbed Resource nr 57 Glycerine - imported (LHV =    17000.0 MJ/ton gl)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.174 ton gl
Resource decrease with utilities    =      -0.174 ton gl

                           Production    Transport   Conversion   Distribution      End use
```

World primary energy [MJp]:	-1284.816	-62.056	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-374.100	-4.678	0.000	0.000	0.000
Cost [euro]:	-156.600	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 14
Perturbation by   1.0 ton uvo of resource nr 31 Used vegetable oil for RME
Summary report
================================================================================================
Perturbed Resource nr  2 by    -885.75 liter Gasoil for transport
Perturbed Resource nr  3 by       0.12 m3 Natural gas for heat
Perturbed Resource nr  4 by      74.18 kWhe Electricity - imported
Perturbed Resource nr 31 by       1.00 ton uvo Used vegetable oil for RME
Perturbed Resource nr 57 by      -0.17 ton gl Glycerine - imported
Perturbed other resources by   3983.43 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -27509 MJ
Effect on renewable energy import in Belgium          34542 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -30118 MJp
Effect on worldwide renewable energy consumption      34542 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        2056 kg
CO2eq saving outside Belgium        542 kg
------------------------------------------------------------------------------------------------
Cost                               -211 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.87 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.80 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  86.2 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                74.7 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           -7.7 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           -103 euro                    /ton CO2eq saved Belgium
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Scenario 15
Perturbation by   1.0 ha of resource nr 32 Wood for FT biodiesel - SRF
================================================================================================

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Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =   -1462.740 liter
Resource decrease with utilities    =   -1374.561 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -8392.432        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -3842.160
CO2 outside [kg]:             -744.828        0.000        0.000          0.000        0.000
Cost [euro]:                  -744.828        0.000        0.000          0.000      -76.843


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Perturbed Resource nr 3 Natural gas for heat  (LHV =       28.7 MJ/m3)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -249.721 m3
Resource decrease with utilities    =    -126.585 m3

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000     -103.608          0.000        0.000
World primary energy [MJp]:   -333.656        0.000     -103.608          0.000        0.000
CO2 inside [kg]:                 0.000        0.000       -7.253          0.000     -403.824
CO2 outside [kg]:              -31.647        0.000        0.000          0.000        0.000
Cost [euro]:                   -29.356        0.000      -11.673          0.000       -8.076


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -7044.000 kWhe
Resource decrease with utilities    =   -6938.986 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -47387.242        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
```

CO2 outside [kg]:	-3345.900	0.000	0.000	0.000	0.000
Cost [euro]:	-473.357	0.000	0.000	0.000	0.000

++
Perturbed Resource nr 32 Wood for FT biodiesel - SRF (LHV = 0.0 MJ/ha)
++
Resource increase without utilities = 1.000 ha
Resource increase with utilities = 1.000 ha

	Production	Transport	Conversion	Distribution	End use
Electricity [MJ]:	183.975	0.000	0.000	194.075	0.000
Natural Gas [MJ]:	3530.550	0.000	0.000	0.000	0.000
Diesel [MJ]:	2799.053	1492.308	0.000	236.098	0.000
Coal [MJ]):	334.200	0.000	0.000	0.000	0.000
Other imported [MJp]:	518.779	0.000	3183.925	0.000	0.000
World primary energy [MJp]:	9073.950	1731.077	3183.925	830.617	0.000
CO2 inside [kg]:	1552.370	109.312	163.010	17.294	0.000
CO2 outside [kg]:	89.104	21.191	0.000	28.960	0.000
Cost [euro]:	1846.154	0.000	864.936	212.105	0.000

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Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 15
Perturbation by   1.0 ha of resource nr 32 Wood for FT biodiesel - SRF
Summary report
================================================================================================
Perturbed Resource nr  2 by   -1374.56 liter Gasoil for transport
Perturbed Resource nr  3 by    -126.59 m3 Natural gas for heat
Perturbed Resource nr  4 by   -6938.99 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.01 ton Coal for co-combustion
Perturbed Resource nr 32 by       1.00 ha Wood for FT biodiesel - SRF
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   3583.10 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -73329 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -127968 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        3139 kg
CO2eq saving outside Belgium       4003 kg
------------------------------------------------------------------------------------------------
Cost                               1579 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.71 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.41 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  55.8 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                42.8 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.36 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          32 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           21.5 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            503 euro                    /ton CO2eq saved Belgium
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Scenario 16
Perturbation by   1.0 ha of resource nr 33 Wood for FT biodiesel - forest waste
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =   -1667.524 liter
Resource decrease with utilities    =   -1600.226 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -9567.373        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -4380.063
CO2 outside [kg]:             -849.104        0.000        0.000          0.000        0.000
Cost [euro]:                  -849.104        0.000        0.000          0.000      -87.601


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =   -8030.160 kWhe
Resource decrease with utilities    =   -7968.703 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -54021.456        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -3814.326        0.000        0.000          0.000        0.000
Cost [euro]:                  -539.627        0.000        0.000          0.000        0.000


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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -227.624 liter
Resource decrease with utilities    =    -227.624 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000     -122.837          0.000        0.000
World primary energy [MJp]:  -1305.984        0.000     -122.837          0.000        0.000
CO2 inside [kg]:                 0.000        0.000       -8.599          0.000     -597.896
```

CO2 outside [kg]:	-115.906	0.000	0.000	0.000	0.000
Cost [euro]:	-94.684	0.000	-13.840	0.000	-11.958

++
Perturbed Resource nr 33 Wood for FT biodiesel - forest waste (LHV = 0.0 MJ/ha)
++
Resource increase without utilities = 1.000 ha
Resource increase with utilities = 1.000 ha

	Production	Transport	Conversion	Distribution	End use
Electricity [MJ]:	0.000	0.000	0.000	221.245	0.000
Diesel [MJ]:	442.861	1701.231	0.000	269.152	0.000
Other imported [MJp]:	497.890	0.000	4165.474	0.000	0.000
World primary energy [MJp]:	1011.609	1973.428	4165.474	946.903	0.000
CO2 inside [kg]:	53.338	124.615	223.338	19.715	0.000
CO2 outside [kg]:	6.289	24.157	0.000	33.014	0.000
Cost [euro]:	1824.000	0.000	986.777	241.800	0.000

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================================================================================================
Scenario 16
Perturbation by   1.0 ha of resource nr 33 Wood for FT biodiesel - forest waste
Summary report
================================================================================================
Perturbed Resource nr  2 by   -1600.23 liter Gasoil for transport
Perturbed Resource nr  4 by   -7968.70 kWhe Electricity - imported
Perturbed Resource nr  5 by    -227.62 liter Gasoil for heat
Perturbed Resource nr 33 by       1.00 ha Wood for FT biodiesel - forest waste
Perturbed other resources by   4540.53 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -89692 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -153787 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        4566 kg
CO2eq saving outside Belgium       4716 kg
------------------------------------------------------------------------------------------------
Cost                               1456 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.75 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.44 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  60.4 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                50.9 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.11 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          22 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           16.2 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            319 euro                    /ton CO2eq saved Belgium
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Scenario 17
Perturbation by   1.0 ton wd of resource nr 34 Wood for FT biodiesel - imported
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 2 Gasoil for transport (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =    -146.274 liter
Resource decrease with utilities    =    -144.417 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:   -839.243        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000     -384.216
CO2 outside [kg]:              -74.483        0.000        0.000          0.000        0.000
Cost [euro]:                   -74.483        0.000        0.000          0.000       -7.684


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =    -704.400 kWhe
Resource decrease with utilities    =    -699.009 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -4738.724        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -334.590        0.000        0.000          0.000        0.000
Cost [euro]:                   -47.336        0.000        0.000          0.000        0.000


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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =     -19.967 liter
Resource decrease with utilities    =     -19.967 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000      -10.775          0.000        0.000
World primary energy [MJp]:   -114.560        0.000      -10.775          0.000        0.000
CO2 inside [kg]:                 0.000        0.000       -0.754          0.000      -52.447
```

CO2 outside [kg]:	-10.167	0.000	0.000	0.000	0.000
Cost [euro]:	-8.306	0.000	-1.214	0.000	-1.049

++
Perturbed Resource nr 34 Wood for FT biodiesel - imported (LHV = 18000.0 MJ/ton wd)
++
Resource increase without utilities = 1.000 ton wd
Resource increase with utilities = 1.000 ton wd

	Production	Transport	Conversion	Distribution	End use
Electricity [MJ]:	0.000	0.000	0.000	19.407	0.000
Diesel [MJ]:	0.000	43.000	0.000	23.610	0.000
Other imported [MJp]:	0.000	0.000	318.392	0.000	0.000
World primary energy [MJp]:	88.000	1501.880	318.392	83.062	0.000
CO2 inside [kg]:	0.000	3.150	16.301	1.729	0.000
CO2 outside [kg]:	5.100	115.781	0.000	2.896	0.000
Cost [euro]:	183.333	0.000	86.494	21.210	0.000

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Scenario 17
Perturbation by   1.0 ton wd of resource nr 34 Wood for FT biodiesel - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by    -144.42 liter Gasoil for transport
Perturbed Resource nr  4 by    -699.01 kWhe Electricity - imported
Perturbed Resource nr  5 by     -19.97 liter Gasoil for heat
Perturbed Resource nr 34 by       1.00 ton wd Wood for FT biodiesel - imported
Perturbed other resources by    307.62 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -8103 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -12209 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         416 kg
CO2eq saving outside Belgium        295 kg
------------------------------------------------------------------------------------------------
Cost                                151 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.68 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.45 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  58.3 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                51.4 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           18.6 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            363 euro                    /ton CO2eq saved Belgium
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Scenario 18
Perturbation by   1.0 ha of resource nr 35 Wood  for CHP (ORC) - SRF
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Perturbed Resource nr 3 Natural gas for heat  (LHV =       28.7 MJ/m3)
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Resource decrease without utilities =   -5580.357 m3
Resource decrease with utilities    =   -5457.221 m3

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000    -2315.255          0.000        0.000
World primary energy [MJp]:  -7456.000        0.000    -2315.255          0.000        0.000
CO2 inside [kg]:                 0.000        0.000     -162.068          0.000    -9024.000
CO2 outside [kg]:             -707.200        0.000        0.000          0.000        0.000
Cost [euro]:                  -656.000        0.000     -260.860          0.000     -180.480


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =   -7500.000 kWhe
Resource decrease with utilities    =   -7448.896 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -50454.900        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -3562.500        0.000        0.000          0.000        0.000
Cost [euro]:                  -504.000        0.000        0.000          0.000        0.000


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Perturbed Resource nr 35 Wood  for CHP (ORC) - SRF (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             183.975        0.000        0.000          0.000        0.000
Natural Gas [MJ]:            3530.550        0.000        0.000          0.000        0.000
```

Diesel [MJ]:	2799.053	1492.308	0.000	0.000	0.000
Coal [MJ]):	334.200	0.000	0.000	0.000	0.000
Other imported [MJp]:	518.779	0.000	16900.000	0.000	0.000
World primary energy [MJp]:	9073.950	1731.077	16900.000	0.000	0.000
CO2 inside [kg]:	1552.370	109.312	1183.000	0.000	0.000
CO2 outside [kg]:	89.104	21.191	0.000	0.000	0.000
Cost [euro]:	1846.154	0.000	1222.792	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario 18
Perturbation by   1.0 ha of resource nr 35 Wood  for CHP (ORC) - SRF
Summary report
================================================================================================
Perturbed Resource nr  2 by      81.60 liter Gasoil for transport
Perturbed Resource nr  3 by   -5457.22 m3 Natural gas for heat
Perturbed Resource nr  4 by   -7448.90 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.01 ton Coal for co-combustion
Perturbed Resource nr 35 by       1.00 ha Wood  for CHP (ORC) - SRF
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by  15087.52 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -164283 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -221121 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        7069 kg
CO2eq saving outside Belgium       4179 kg
------------------------------------------------------------------------------------------------
Cost                               1468 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.23 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.91 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  50.9 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                43.0 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        0.61 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          14 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium            8.9 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            208 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 19
Perturbation by   1.0 ha of resource nr 36 Wood  for CHP (FBG with PE) - SRF
================================================================================================

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Perturbed Resource nr 3 Natural gas for heat  (LHV =       28.7 MJ/m3)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -3836.496 m3
Resource decrease with utilities    =   -3713.360 m3

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000    -1591.738          0.000        0.000
World primary energy [MJp]:  -5126.000        0.000    -1591.738          0.000        0.000
CO2 inside [kg]:                 0.000        0.000     -111.422          0.000    -6204.000
CO2 outside [kg]:             -486.200        0.000        0.000          0.000        0.000
Cost [euro]:                  -451.000        0.000     -179.341          0.000     -124.080


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =  -12500.000 kWhe
Resource decrease with utilities    =  -12448.896 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -84091.500        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -5937.500        0.000        0.000          0.000        0.000
Cost [euro]:                  -840.000        0.000        0.000          0.000        0.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 36 Wood  for CHP (FBG with PE) - SRF (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             183.975        0.000        0.000          0.000        0.000
Natural Gas [MJ]:            3530.550        0.000        0.000          0.000        0.000
```

Diesel [MJ]:	2799.053	1492.308	0.000	0.000	0.000
Coal [MJ]):	334.200	0.000	0.000	0.000	0.000
Other imported [MJp]:	518.779	0.000	3179.447	0.000	0.000
World primary energy [MJp]:	9073.950	1731.077	3179.447	0.000	0.000
CO2 inside [kg]:	1552.370	109.312	222.561	0.000	0.000
CO2 outside [kg]:	89.104	21.191	0.000	0.000	0.000
Cost [euro]:	1846.154	0.000	1815.426	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 19
Perturbation by   1.0 ha of resource nr 36 Wood  for CHP (FBG with PE) - SRF
Summary report
================================================================================================
Perturbed Resource nr  2 by      81.60 liter Gasoil for transport
Perturbed Resource nr  3 by   -3713.36 m3 Natural gas for heat
Perturbed Resource nr  4 by  -12448.90 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.01 ton Coal for co-combustion
Perturbed Resource nr 36 by       1.00 ha Wood  for CHP (FBG with PE) - SRF
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   2090.49 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -145280 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -233425 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        5159 kg
CO2eq saving outside Belgium       6333 kg
------------------------------------------------------------------------------------------------
Cost                               2067 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.30 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.81 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  49.2 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                35.5 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        0.69 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          19 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           14.2 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            401 euro                    /ton CO2eq saved Belgium
================================================================================================
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Scenario 20
Perturbation by   1.0 ha of resource nr 37 Wood for co-combustion - SRF
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Perturbed Resource nr 6 Coal for co-combustion (LHV =    29400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -6.122 ton
Resource decrease with utilities    =      -6.111 ton

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                    0.000     -263.265        0.000          0.000        0.000
Other imported [MJp]:           0.000        0.000    -2188.776          0.000        0.000
World primary energy [MJp]: -16920.000    -1652.327    -2188.776          0.000        0.000
CO2 inside [kg]:                0.000      -19.284     -153.214          0.000   -17334.000
CO2 outside [kg]:           -2761.200     -110.575        0.000          0.000        0.000
Cost [euro]:                 -306.122        0.000     -210.337          0.000     -346.680


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Perturbed Resource nr 37 Wood for co-combustion - SRF (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             183.975        0.000        0.000          0.000        0.000
Natural Gas [MJ]:            3530.550        0.000        0.000          0.000        0.000
Diesel [MJ]:                 2799.053     1492.308        0.000          0.000        0.000
Coal [MJ]):                   334.200        0.000        0.000          0.000        0.000
Other imported [MJp]:         518.779        0.000    10725.000          0.000        0.000
World primary energy [MJp]:  9073.950     1731.077    10725.000          0.000        0.000
CO2 inside [kg]:             1552.370      109.312      750.750          0.000        0.000
CO2 outside [kg]:              89.104       21.191        0.000          0.000        0.000
Cost [euro]:                 1846.154        0.000      842.236          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
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Resource decrease without utilities =      -1.000 ha
```

Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 20
Perturbation by   1.0 ha of resource nr 37 Wood for co-combustion - SRF
Summary report
================================================================================================
Perturbed Resource nr  2 by      74.25 liter Gasoil for transport
Perturbed Resource nr  3 by     123.14 m3 Natural gas for heat
Perturbed Resource nr  4 by      51.10 kWhe Electricity - imported
Perturbed Resource nr  6 by      -6.11 ton Coal for co-combustion
Perturbed Resource nr 37 by       1.00 ha Wood for co-combustion - SRF
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   9039.00 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -163595 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -180831 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       15822 kg
CO2eq saving outside Belgium       2781 kg
------------------------------------------------------------------------------------------------
Cost                               1825 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.00 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.91 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                102.9 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               96.7 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        0.61 are Belgium            /GJ fossil saved Belgium
Surface requirement Belgium           6 are Belgium            /ton CO2eq saved Belgium
Cost requirement Belgium           11.2 euro                   /GJ fossil saved Belgium
Cost requirement Belgium            115 euro                   /ton CO2eq saved Belgium
================================================================================================
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Scenario 21
Perturbation by   1.0 ha of resource nr 38 Wood for small steam power plant - SRF
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =  -10000.000 kWhe
Resource decrease with utilities    =   -9948.896 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -67273.200        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -4750.000        0.000        0.000          0.000        0.000
Cost [euro]:                  -672.000        0.000        0.000          0.000        0.000


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Perturbed Resource nr 38 Wood for small steam power plant - SRF (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             183.975        0.000        0.000          0.000        0.000
Natural Gas [MJ]:            3530.550        0.000        0.000          0.000        0.000
Diesel [MJ]:                 2799.053     1492.308        0.000          0.000        0.000
Coal [MJ]):                   334.200        0.000        0.000          0.000        0.000
Other imported [MJp]:         518.779        0.000     6123.333          0.000        0.000
World primary energy [MJp]:  9073.950     1731.077     6123.333          0.000        0.000
CO2 inside [kg]:             1552.370      109.312      428.633          0.000        0.000
CO2 outside [kg]:              89.104       21.191        0.000          0.000        0.000
Cost [euro]:                 1846.154        0.000      670.349          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha
```

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario 21
Perturbation by   1.0 ha of resource nr 38 Wood for small steam power plant - SRF
Summary report
================================================================================================
Perturbed Resource nr  2 by      81.60 liter Gasoil for transport
Perturbed Resource nr  3 by     123.14 m3 Natural gas for heat
Perturbed Resource nr  4 by   -9948.90 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.01 ton Coal for co-combustion
Perturbed Resource nr 38 by       1.00 ha Wood for small steam power plant - SRF
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   6626.11 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -21745 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -87945 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       -1363 kg
CO2eq saving outside Belgium       4659 kg
------------------------------------------------------------------------------------------------
Cost                               1845 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.49 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.12 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  37.5 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               -62.7 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        4.60 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        9999 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           84.8 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 22
Perturbation by   1.0 ha of resource nr 39 Wood  for CHP (ORC) - forest waste
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -8550.000 kWhe
Resource decrease with utilities    =   -8550.000 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -57518.586        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -4061.250        0.000        0.000          0.000        0.000
Cost [euro]:                  -574.560        0.000        0.000          0.000        0.000


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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -5086.561 liter
Resource decrease with utilities    =   -5086.561 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000    -2744.959          0.000        0.000
World primary energy [MJp]: -29184.000        0.000    -2744.959          0.000        0.000
CO2 inside [kg]:                 0.000        0.000     -192.147          0.000   -13360.800
CO2 outside [kg]:            -2590.080        0.000        0.000          0.000        0.000
Cost [euro]:                 -2115.840        0.000     -309.275          0.000     -267.216


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Perturbed Resource nr 39 Wood  for CHP (ORC) - forest waste (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                  442.861     1701.231        0.000          0.000        0.000
Other imported [MJp]:         497.890        0.000    19266.000          0.000        0.000
```

World primary energy [MJp]:	1011.609	1973.428	19266.000	0.000	0.000
CO2 inside [kg]:	53.338	124.615	1348.620	0.000	0.000
CO2 outside [kg]:	6.289	24.157	0.000	0.000	0.000
Cost [euro]:	1824.000	0.000	1393.983	0.000	0.000

++

Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)

++

Resource decrease without utilities = -1.000 ha

Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 22
Perturbation by   1.0 ha of resource nr 39 Wood  for CHP (ORC) - forest waste
Summary report
================================================================================================
Perturbed Resource nr  2 by      21.72 liter Gasoil for transport
Perturbed Resource nr  4 by   -8550.00 kWhe Electricity - imported
Perturbed Resource nr  5 by   -5086.56 liter Gasoil for heat
Perturbed Resource nr 39 by       1.00 ha Wood  for CHP (ORC) - forest waste
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by  17002.93 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -195398 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -281976 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       12754 kg
CO2eq saving outside Belgium       6640 kg
------------------------------------------------------------------------------------------------
Cost                                -49 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.37 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.95 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  68.8 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                65.3 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        0.51 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium           8 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           -0.3 euro                    /GJ fossil saved Belgium
Cost requirement Belgium             -4 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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Scenario 23
Perturbation by   1.0 ha of resource nr 40 Wood for small steam power plant - forest waste
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =  -11400.000 kWhe
Resource decrease with utilities    =  -11400.000 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -76691.448        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -5415.000        0.000        0.000          0.000        0.000
Cost [euro]:                  -766.080        0.000        0.000          0.000        0.000


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Perturbed Resource nr 40 Wood for small steam power plant - forest waste (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                  442.861     1701.231        0.000          0.000        0.000
Other imported [MJp]:         497.890        0.000     6980.600          0.000        0.000
World primary energy [MJp]:  1011.609     1973.428     6980.600          0.000        0.000
CO2 inside [kg]:               53.338      124.615      488.642          0.000        0.000
CO2 outside [kg]:               6.289       24.157        0.000          0.000        0.000
Cost [euro]:                 1824.000        0.000      764.198          0.000        0.000
```

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================================================================================================
Scenario 23
Perturbation by   1.0 ha of resource nr 40 Wood for small steam power plant - forest waste
Summary report
================================================================================================
Perturbed Resource nr  2 by      59.79 liter Gasoil for transport
Perturbed Resource nr  4 by  -11400.00 kWhe Electricity - imported
Perturbed Resource nr 40 by       1.00 ha Wood for small steam power plant - forest waste
Perturbed other resources by   7478.49 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -31417 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -107766 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        -667 kg
CO2eq saving outside Belgium       5385 kg
------------------------------------------------------------------------------------------------
Cost                               1822 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.53 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.15 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  43.8 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               -21.2 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        3.18 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        9999 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           58.0 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
================================================================================================
```

```
================================================================================================
Scenario 24
Perturbation by   1.0 ton wd of resource nr 41 Wood for heat - imported
================================================================================================

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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =    -474.076 liter
Resource decrease with utilities    =    -474.076 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000     -255.835          0.000        0.000
World primary energy [MJp]:  -2720.000        0.000     -255.835          0.000        0.000
CO2 inside [kg]:                 0.000        0.000      -17.908          0.000    -1245.250
CO2 outside [kg]:             -241.400        0.000        0.000          0.000        0.000
Cost [euro]:                  -197.200        0.000      -28.825          0.000      -24.905


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Perturbed Resource nr 41 Wood for heat - imported (LHV =    18000.0 MJ/ton wd)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000        0.000        0.000        159.470        0.000
Diesel [MJ]:                     0.000       43.000        0.000        194.000        0.000
Other imported [MJp]:            0.000        0.000      537.762          0.000        0.000
World primary energy [MJp]:     88.000     1501.880      537.762        682.512        0.000
CO2 inside [kg]:                 0.000        3.150       37.643         14.210        0.000
CO2 outside [kg]:                5.100      115.781        0.000         23.796        0.000
Cost [euro]:                   183.333        0.000       60.709          6.016        0.000
```

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================================================================================================
Scenario 24
Perturbation by   1.0 ton wd of resource nr 41 Wood for heat - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by       6.61 liter Gasoil for transport
Perturbed Resource nr  4 by      44.30 kWhe Electricity - imported
Perturbed Resource nr  5 by    -474.08 liter Gasoil for heat
Perturbed Resource nr 41 by       1.00 ton wd Wood for heat - imported
Perturbed other resources by    281.93 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -16322 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -17166 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        1208 kg
CO2eq saving outside Belgium         97 kg
------------------------------------------------------------------------------------------------
Cost                                 -1 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.95 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.91 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  76.0 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                74.0 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           -0.1 euro                    /GJ fossil saved Belgium
Cost requirement Belgium             -1 euro                    /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 25
Perturbation by   1.0 ton wd of resource nr 42 Wood  for CHP (ORC) - imported
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -750.000 kWhe
Resource decrease with utilities    =    -750.000 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -5045.490        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -356.250        0.000        0.000          0.000        0.000
Cost [euro]:                   -50.400        0.000        0.000          0.000        0.000


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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -446.190 liter
Resource decrease with utilities    =    -446.190 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000     -240.786          0.000        0.000
World primary energy [MJp]:  -2560.000        0.000     -240.786          0.000        0.000
CO2 inside [kg]:                 0.000        0.000      -16.855          0.000    -1172.000
CO2 outside [kg]:             -227.200        0.000        0.000          0.000        0.000
Cost [euro]:                  -185.600        0.000      -27.129          0.000      -23.440


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Perturbed Resource nr 42 Wood  for CHP (ORC) - imported (LHV =    18000.0 MJ/ton wd)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                     0.000       43.000        0.000          0.000        0.000
Other imported [MJp]:            0.000        0.000     1690.000          0.000        0.000
```

World primary energy [MJp]:	88.000	1501.880	1690.000	0.000	0.000
CO2 inside [kg]:	0.000	3.150	118.300	0.000	0.000
CO2 outside [kg]:	5.100	115.781	0.000	0.000	0.000
Cost [euro]:	183.333	0.000	122.279	0.000	0.000

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================================================================================================
Scenario 25
Perturbation by   1.0 ton wd of resource nr 42 Wood  for CHP (ORC) - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by       1.20 liter Gasoil for transport
Perturbed Resource nr  4 by    -750.00 kWhe Electricity - imported
Perturbed Resource nr  5 by    -446.19 liter Gasoil for heat
Perturbed Resource nr 42 by       1.00 ton wd Wood  for CHP (ORC) - imported
Perturbed other resources by   1449.21 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -17208 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -23266 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        1067 kg
CO2eq saving outside Belgium        463 kg
------------------------------------------------------------------------------------------------
Cost                                 19 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.29 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.96 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  65.8 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                62.0 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium            1.1 euro                    /GJ fossil saved Belgium
Cost requirement Belgium             18 euro                    /ton CO2eq saved Belgium
================================================================================================
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Scenario 26
Perturbation by   1.0 ton wd of resource nr 43 Wood  for CHP (FBG with PE) - imported
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =   -1250.000 kWhe
Resource decrease with utilities    =   -1250.000 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -8409.150        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -593.750        0.000        0.000          0.000        0.000
Cost [euro]:                   -84.000        0.000        0.000          0.000        0.000


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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -306.755 liter
Resource decrease with utilities    =    -306.755 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000     -165.540          0.000        0.000
World primary energy [MJp]:  -1760.000        0.000     -165.540          0.000        0.000
CO2 inside [kg]:                 0.000        0.000      -11.588          0.000     -805.750
CO2 outside [kg]:             -156.200        0.000        0.000          0.000        0.000
Cost [euro]:                  -127.600        0.000      -18.651          0.000      -16.115


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Perturbed Resource nr 43 Wood  for CHP (FBG with PE) - imported (LHV =    18000.0 MJ/ton wd)
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Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                     0.000       43.000        0.000          0.000        0.000
Other imported [MJp]:            0.000        0.000      317.945          0.000        0.000
```

World primary energy [MJp]:	88.000	1501.880	317.945	0.000	0.000
CO2 inside [kg]:	0.000	3.150	22.256	0.000	0.000
CO2 outside [kg]:	5.100	115.781	0.000	0.000	0.000
Cost [euro]:	183.333	0.000	181.543	0.000	0.000

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================================================================================================
Scenario 26
Perturbation by   1.0 ton wd of resource nr 43 Wood  for CHP (FBG with PE) - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by       1.20 liter Gasoil for transport
Perturbed Resource nr  4 by   -1250.00 kWhe Electricity - imported
Perturbed Resource nr  5 by    -306.76 liter Gasoil for heat
Perturbed Resource nr 43 by       1.00 ton wd Wood  for CHP (FBG with PE) - imported
Perturbed other resources by    152.40 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -15305 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -23927 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium          792 kg
CO2eq saving outside Belgium         629 kg
------------------------------------------------------------------------------------------------
Cost                                 119 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.33 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.85 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  59.4 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                51.7 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium            7.7 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            150 euro                    /ton CO2eq saved Belgium
================================================================================================
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Scenario 27
Perturbation by   1.0 ton wd of resource nr 44 Wood for co-combustion - imported
================================================================================================

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Perturbed Resource nr 6 Coal for co-combustion (LHV =    29400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.612 ton
Resource decrease with utilities    =      -0.612 ton

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                    0.000      -26.327        0.000          0.000        0.000
Other imported [MJp]:           0.000        0.000     -218.878          0.000        0.000
World primary energy [MJp]:  -1692.000     -165.233     -218.878          0.000        0.000
CO2 inside [kg]:                0.000       -1.928      -15.321          0.000    -1733.400
CO2 outside [kg]:            -276.120      -11.058        0.000          0.000        0.000
Cost [euro]:                  -30.612        0.000      -21.034          0.000      -34.668


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Perturbed Resource nr 44 Wood for co-combustion - imported (LHV =    18000.0 MJ/ton wd)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                    0.000       43.000        0.000          0.000        0.000
Other imported [MJp]:           0.000        0.000     1072.500          0.000        0.000
World primary energy [MJp]:    88.000     1501.880     1072.500          0.000        0.000
CO2 inside [kg]:                0.000        3.150       75.075          0.000        0.000
CO2 outside [kg]:               5.100      115.781        0.000          0.000        0.000
Cost [euro]:                  183.333        0.000       84.224          0.000        0.000
```

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================================================================================================
Scenario 27
Perturbation by   1.0 ton wd of resource nr 44 Wood for co-combustion - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by       0.46 liter Gasoil for transport
Perturbed Resource nr  6 by      -0.61 ton Coal for co-combustion
Perturbed Resource nr 44 by       1.00 ton wd Wood for co-combustion - imported
Perturbed other resources by    853.62 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -17130 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -17414 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        1672 kg
CO2eq saving outside Belgium        166 kg
------------------------------------------------------------------------------------------------
Cost                                181 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.97 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.95 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                 105.6 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                97.6 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           10.6 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            108 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 28
Perturbation by   1.0 ton wd of resource nr 45 Wood for small steam power plant - imported
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -1000.000 kWhe
Resource decrease with utilities    =   -1000.000 kWhe

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -6727.320        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -475.000        0.000        0.000          0.000        0.000
Cost [euro]:                   -67.200        0.000        0.000          0.000        0.000


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Perturbed Resource nr 45 Wood for small steam power plant - imported (LHV =    18000.0 MJ/ton wd)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                     0.000       43.000        0.000          0.000        0.000
Other imported [MJp]:            0.000        0.000      612.333          0.000        0.000
World primary energy [MJp]:     88.000     1501.880      612.333          0.000        0.000
CO2 inside [kg]:                 0.000        3.150       42.863          0.000        0.000
CO2 outside [kg]:                5.100      115.781        0.000          0.000        0.000
Cost [euro]:                   183.333        0.000       67.035          0.000        0.000
```

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================================================================================================
Scenario 28
Perturbation by   1.0 ton wd of resource nr 45 Wood for small steam power plant - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by       1.20 liter Gasoil for transport
Perturbed Resource nr  4 by   -1000.00 kWhe Electricity - imported
Perturbed Resource nr 45 by       1.00 ton wd Wood for small steam power plant - imported
Perturbed other resources by    612.33 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -2945 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption         -8125 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium          -46 kg
CO2eq saving outside Belgium         354 kg
------------------------------------------------------------------------------------------------
Cost                                 183 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.45 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.16 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  37.9 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               -15.6 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           62.2 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 29
Perturbation by   1.0 liter of resource nr 46 Ethanol for gasoline - imported
================================================================================================

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Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.661 liter
Resource decrease with utilities    =      -0.661 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:     -2.979        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000       -1.570
CO2 outside [kg]:               -0.266        0.000        0.000          0.000        0.000
Cost [euro]:                    -0.304        0.000        0.000          0.000       -0.031


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Perturbed Resource nr 46 Ethanol for gasoline - imported (LHV =       21.3 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 liter
Resource increase with utilities    =       1.000 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000        0.000        0.000          0.079        0.000
Diesel [MJ]:                     0.000        0.000        0.000          0.188        0.000
World primary energy [MJp]:      2.128        1.747        0.000          0.444        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.014        0.000
CO2 outside [kg]:                0.212        0.139        0.000          0.013        0.000
Cost [euro]:                     0.437        0.000        0.000          0.194        0.000
```

```
================================================================================================
Scenario 29
Perturbation by   1.0 liter of resource nr 46 Ethanol for gasoline - imported
Summary report
================================================================================================
Perturbed Resource nr  1 by      -0.66 liter Gasoline for transport
Perturbed Resource nr  2 by       0.01 liter Gasoil for transport
Perturbed Resource nr  4 by       0.02 kWhe Electricity - imported
Perturbed Resource nr 46 by       1.00 liter Ethanol for gasoline - imported
Perturbed other resources by      0.00 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium               -21 MJ
Effect on renewable energy import in Belgium             21 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption           -20 MJp
Effect on worldwide renewable energy consumption         21 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium           2 kg
CO2eq saving outside Belgium         -0 kg
------------------------------------------------------------------------------------------------
Cost                                  0 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.94 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.99 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  73.2 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                74.1 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           14.1 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            190 euro                    /ton CO2eq saved Belgium
================================================================================================
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Scenario 30
Perturbation by   1.0 ha of resource nr 53 Wood for heat - SRF
================================================================================================

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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =   -4793.439 liter
Resource decrease with utilities    =   -4793.439 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000    -2586.776          0.000        0.000
World primary energy [MJp]: -27502.222        0.000    -2586.776          0.000        0.000
CO2 inside [kg]:                 0.000        0.000     -181.074          0.000   -12590.861
CO2 outside [kg]:            -2440.822        0.000        0.000          0.000        0.000
Cost [euro]:                 -1993.911        0.000     -291.453          0.000     -251.817


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Perturbed Resource nr 53 Wood for heat - SRF (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:              183.975        0.000        0.000          0.000        0.000
Natural Gas [MJ]:             3530.550        0.000        0.000          0.000        0.000
Diesel [MJ]:                  2799.053     1492.308        0.000          0.000        0.000
Coal [MJ]):                    334.200        0.000        0.000          0.000        0.000
Other imported [MJp]:          518.779        0.000     5377.618          0.000        0.000
World primary energy [MJp]:   9073.950     1731.077     5377.618          0.000        0.000
CO2 inside [kg]:              1552.370      109.312      376.433          0.000        0.000
CO2 outside [kg]:               89.104       21.191        0.000          0.000        0.000
Cost [euro]:                  1846.154        0.000      607.095          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha
```

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 30
Perturbation by   1.0 ha of resource nr 53 Wood for heat - SRF
Summary report
================================================================================================
Perturbed Resource nr  2 by      81.60 liter Gasoil for transport
Perturbed Resource nr  3 by     123.14 m3 Natural gas for heat
Perturbed Resource nr  4 by      51.10 kWhe Electricity - imported
Perturbed Resource nr  5 by   -4793.44 liter Gasoil for heat
Perturbed Resource nr  6 by       0.01 ton Coal for co-combustion
Perturbed Resource nr 53 by       1.00 ha Wood for heat - SRF
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   3293.62 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -160966 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -187395 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       11461 kg
CO2eq saving outside Belgium       2350 kg
------------------------------------------------------------------------------------------------
Cost                                -84 euro
------------------------------------------------------------------------------------------------
Energy efficiency world           1.04 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         0.89 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                 73.7 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               71.2 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium       0.62 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          9 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium          -0.5 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            -7 euro                    /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 31
Perturbation by   1.0 ha of resource nr 54 Wood for heat - forest waste
================================================================================================

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
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Resource decrease without utilities =   -5464.520 liter
Resource decrease with utilities    =   -5464.520 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000    -2948.925          0.000        0.000
World primary energy [MJp]: -31352.533        0.000    -2948.925          0.000        0.000
CO2 inside [kg]:                 0.000        0.000     -206.425          0.000   -14353.582
CO2 outside [kg]:            -2782.537        0.000        0.000          0.000        0.000
Cost [euro]:                 -2273.059        0.000     -332.256          0.000     -287.072


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Perturbed Resource nr 54 Wood for heat - forest waste (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                   442.861     1701.231        0.000          0.000        0.000
Other imported [MJp]:          497.890        0.000     6130.484          0.000        0.000
World primary energy [MJp]:   1011.609     1973.428     6130.484          0.000        0.000
CO2 inside [kg]:                53.338      124.615      429.134          0.000        0.000
CO2 outside [kg]:                6.289       24.157        0.000          0.000        0.000
Cost [euro]:                  1824.000        0.000      692.088          0.000        0.000
```

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================================================================================================
Scenario 31
Perturbation by   1.0 ha of resource nr 54 Wood for heat - forest waste
Summary report
================================================================================================
Perturbed Resource nr  2 by      59.79 liter Gasoil for transport
Perturbed Resource nr  5 by   -5464.52 liter Gasoil for heat
Perturbed Resource nr 54 by       1.00 ha Wood for heat - forest waste
Perturbed other resources by   3679.45 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -190130 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -221139 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       13953 kg
CO2eq saving outside Belgium       2752 kg
------------------------------------------------------------------------------------------------
Cost                               -376 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.08 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.93 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  75.5 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                73.4 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        0.53 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium           7 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           -2.0 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            -27 euro                    /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 32
Perturbation by   1.0 ha of resource nr 55 Wood  for CHP (FBG with PE) - forest waste
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =  -14250.000 kWhe
Resource decrease with utilities    =  -14250.000 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -95864.310        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -6768.750        0.000        0.000          0.000        0.000
Cost [euro]:                  -957.600        0.000        0.000          0.000        0.000


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Perturbed Resource nr 5 Gasoil for heat (LHV =       35.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -3497.011 liter
Resource decrease with utilities    =   -3497.011 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Other imported [MJp]:            0.000        0.000    -1887.160          0.000        0.000
World primary energy [MJp]: -20064.000        0.000    -1887.160          0.000        0.000
CO2 inside [kg]:                 0.000        0.000     -132.101          0.000    -9185.550
CO2 outside [kg]:            -1780.680        0.000        0.000          0.000        0.000
Cost [euro]:                 -1454.640        0.000     -212.627          0.000     -183.711


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Perturbed Resource nr 55 Wood  for CHP (FBG with PE) - forest waste (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                  442.861     1701.231        0.000          0.000        0.000
Other imported [MJp]:         497.890        0.000     3624.569          0.000        0.000
```

World primary energy [MJp]:	1011.609	1973.428	3624.569	0.000	0.000
CO2 inside [kg]:	53.338	124.615	253.720	0.000	0.000
CO2 outside [kg]:	6.289	24.157	0.000	0.000	0.000
Cost [euro]:	1824.000	0.000	2069.586	0.000	0.000

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================================================================================================
Scenario 32
Perturbation by   1.0 ha of resource nr 55 Wood  for CHP (FBG with PE) - forest waste
Summary report
================================================================================================
Perturbed Resource nr  2 by      59.79 liter Gasoil for transport
Perturbed Resource nr  4 by  -14250.00 kWhe Electricity - imported
Perturbed Resource nr  5 by   -3497.01 liter Gasoil for heat
Perturbed Resource nr 55 by       1.00 ha Wood  for CHP (FBG with PE) - forest waste
Perturbed other resources by   2235.30 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -172321 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -287906 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        8886 kg
CO2eq saving outside Belgium       8519 kg
------------------------------------------------------------------------------------------------
Cost                               1085 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.40 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.84 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  60.5 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                51.6 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        0.58 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          11 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium            6.3 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            122 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 33
Perturbation by   1.0 ha of resource nr 56 Wood for co-combustion - forest waste
================================================================================================

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Perturbed Resource nr 6 Coal for co-combustion (LHV =    29400.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -6.980 ton
Resource decrease with utilities    =      -6.980 ton

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                    0.000     -300.122        0.000          0.000        0.000
Other imported [MJp]:           0.000        0.000    -2495.204          0.000        0.000
World primary energy [MJp]: -19288.800    -1883.652    -2495.204          0.000        0.000
CO2 inside [kg]:                0.000      -21.984     -174.664          0.000   -19760.760
CO2 outside [kg]:           -3147.768     -126.056        0.000          0.000        0.000
Cost [euro]:                 -348.980        0.000     -239.784          0.000     -395.215


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Perturbed Resource nr 56 Wood for co-combustion - forest waste (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Diesel [MJ]:                  442.861     1701.231        0.000          0.000        0.000
Other imported [MJp]:         497.890        0.000    12226.500          0.000        0.000
World primary energy [MJp]:  1011.609     1973.428    12226.500          0.000        0.000
CO2 inside [kg]:               53.338      124.615      855.855          0.000        0.000
CO2 outside [kg]:               6.289       24.157        0.000          0.000        0.000
Cost [euro]:                 1824.000        0.000      960.149          0.000        0.000
```

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================================================================================================
Scenario 33
Perturbation by   1.0 ha of resource nr 56 Wood for co-combustion - forest waste
Summary report
================================================================================================
Perturbed Resource nr  2 by      51.42 liter Gasoil for transport
Perturbed Resource nr  6 by      -6.98 ton Coal for co-combustion
Perturbed Resource nr 56 by       1.00 ha Wood for co-combustion - forest waste
Perturbed other resources by  10229.19 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium           -193127 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -213656 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       18924 kg
CO2eq saving outside Belgium       3243 kg
------------------------------------------------------------------------------------------------
Cost                               1800 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.04 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.94 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                103.8 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               98.0 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium       0.52 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          5 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           9.3 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            95 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 34
Perturbation by   1.0 ha of resource nr 16 Wheat for ETBE, straw ploughed back
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Perturbed Resource nr 16 Wheat for ETBE, straw ploughed back (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             332.915      367.488      647.603          0.000        0.000
Natural Gas [MJ]:            6947.988        0.000    35909.477          0.000        0.000
Diesel [MJ]:                 4078.927     7007.137        0.000          0.000        0.000
Coal [MJ]):                   794.772        0.000        0.000          0.000        0.000
Other imported [MJp]:        2497.500        0.000   149197.242          0.000        0.000
World primary energy [MJp]: 17733.636     9182.492   188637.878          0.000        0.000
CO2 inside [kg]:             3429.734      513.273    12280.453          0.000        0.000
CO2 outside [kg]:             153.263      147.989      244.167          0.000        0.000
Cost [euro]:                 1232.000        0.000     3180.456          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -2463.717 liter
Resource decrease with utilities    =   -2463.717 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000     -252.396          0.000        0.000
Natural Gas [MJ]:               0.000        0.000      -15.661          0.000        0.000
Other imported [MJp]:           0.000        0.000   -159353.153          0.000        0.000
World primary energy [MJp]: -35719.761        0.000   -160093.593          0.000        0.000
CO2 inside [kg]:             -2696.715        0.000   -10952.842          0.000        0.000
CO2 outside [kg]:            -2715.973        0.000      -33.371          0.000        0.000
Cost [euro]:                  -300.202        0.000    -2258.983          0.000        0.000


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Perturbed Resource nr 50 Animal food (DDGS) - imported  (LHV =    18200.0 MJ/ton)
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Resource decrease without utilities =      -3.229 ton
Resource decrease with utilities    =      -3.229 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
World primary energy [MJp]: -28992.471     -692.552        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -1685.496      -52.210        0.000          0.000        0.000
Cost [euro]:                  -365.008        0.000        0.000          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
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Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                 -1365.408        0.000        0.000          0.000        0.000
Other imported [MJp]:          -16.000        0.000        0.000          0.000        0.000
World primary energy [MJp]:  -1599.873        0.000        0.000          0.000        0.000
CO2 inside [kg]:              -727.536        0.000        0.000          0.000        0.000
CO2 outside [kg]:              -19.389        0.000        0.000          0.000        0.000
Cost [euro]:                     0.000        0.000        0.000          0.000        0.000
```

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================================================================================================
Scenario 34
Perturbation by   1.0 ha of resource nr 16 Wheat for ETBE, straw ploughed back
Summary report
================================================================================================
Perturbed Resource nr  2 by     271.08 liter Gasoil for transport
Perturbed Resource nr  3 by    1494.20 m3 Natural gas for heat
Perturbed Resource nr  4 by     304.34 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr 16 by       1.00 ha Wheat for ETBE, straw ploughed back
Perturbed Resource nr 48 by   -2463.72 liter Methanol for MTBE - imported
Perturbed Resource nr 50 by      -3.23 ton Animal food (DDGS) - imported
Perturbed Resource nr 58 by      32.59 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by  -7674.41 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium              8960 MJ
Effect on renewable energy import in Belgium         -58766 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -50643 MJp
Effect on worldwide renewable energy consumption     148254 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       -1846 kg
CO2eq saving outside Belgium       3961 kg
------------------------------------------------------------------------------------------------
Cost                               1488 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.34 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         -0.06 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  41.8 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               206.1 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium     9999.00 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        9999 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium         -166.1 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 35
Perturbation by   1.0 ha of resource nr 17 Wheat for ETBE, straw for bedding
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Perturbed Resource nr 17 Wheat for ETBE, straw for bedding (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             332.915      367.488      647.603          0.000        0.000
Natural Gas [MJ]:            6947.988        0.000    35909.477          0.000        0.000
Diesel [MJ]:                 4294.083     7604.305        0.000          0.000        0.000
Coal [MJ]):                   794.772        0.000        0.000          0.000        0.000
Other imported [MJp]:        2497.500        0.000   149197.242          0.000        0.000
World primary energy [MJp]: 17983.216     9875.207   188637.878          0.000        0.000
CO2 inside [kg]:             3445.494      557.015    12280.453          0.000        0.000
CO2 outside [kg]:             156.318      156.469      244.167          0.000        0.000
Cost [euro]:                 1232.000        0.000     3180.456          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -2463.717 liter
Resource decrease with utilities    =   -2463.717 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000     -252.396          0.000        0.000
Natural Gas [MJ]:               0.000        0.000      -15.661          0.000        0.000
Other imported [MJp]:           0.000        0.000   -159353.153          0.000        0.000
World primary energy [MJp]: -35719.761        0.000   -160093.593          0.000        0.000
CO2 inside [kg]:             -2696.715        0.000   -10952.842          0.000        0.000
CO2 outside [kg]:            -2715.973        0.000      -33.371          0.000        0.000
Cost [euro]:                  -300.202        0.000    -2258.983          0.000        0.000


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Perturbed Resource nr 49 Straw - imported (LHV =    14600.0 MJ/ton)
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Resource decrease without utilities =      -3.600 ton
Resource decrease with utilities    =      -3.600 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                    0.000        0.000        0.000       -349.200        0.000
World primary energy [MJp]:  -4449.600     -772.142        0.000       -405.072        0.000
CO2 inside [kg]:                0.000        0.000        0.000        -25.579        0.000
CO2 outside [kg]:            -698.400      -58.210        0.000         -4.959        0.000
Cost [euro]:                 -180.000        0.000        0.000       -135.905        0.000


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Perturbed Resource nr 50 Animal food (DDGS) - imported  (LHV =    18200.0 MJ/ton)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -3.229 ton
Resource decrease with utilities    =      -3.229 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
World primary energy [MJp]: -28992.471     -692.552        0.000          0.000        0.000
CO2 inside [kg]:                0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:           -1685.496      -52.210        0.000          0.000        0.000
Cost [euro]:                 -365.008        0.000        0.000          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                -1365.408        0.000        0.000          0.000        0.000
Other imported [MJp]:         -16.000        0.000        0.000          0.000        0.000
World primary energy [MJp]: -1599.873        0.000        0.000          0.000        0.000
CO2 inside [kg]:             -727.536        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -19.389        0.000        0.000          0.000        0.000
Cost [euro]:                    0.000        0.000        0.000          0.000        0.000
```

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================================================================================================
Scenario 35
Perturbation by   1.0 ha of resource nr 17 Wheat for ETBE, straw for bedding
Summary report
================================================================================================
Perturbed Resource nr  2 by     283.99 liter Gasoil for transport
Perturbed Resource nr  3 by    1494.20 m3 Natural gas for heat
Perturbed Resource nr  4 by     304.34 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr 17 by       1.00 ha Wheat for ETBE, straw for bedding
Perturbed Resource nr 48 by   -2463.72 liter Methanol for MTBE - imported
Perturbed Resource nr 49 by      -3.60 ton Straw - imported
Perturbed Resource nr 50 by      -3.23 ton Animal food (DDGS) - imported
Perturbed Resource nr 58 by      32.59 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by  -7674.41 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             9423 MJ
Effect on renewable energy import in Belgium       -111326 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -55328 MJp
Effect on worldwide renewable energy consumption     95694 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       -1880 kg
CO2eq saving outside Belgium       4711 kg
------------------------------------------------------------------------------------------------
Cost                               1172 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.58 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         -0.10 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  51.2 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               199.6 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium    9999.00 are Belgium              /GJ fossil saved Belgium
Surface requirement Belgium        9999 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium         -124.4 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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Scenario 36
Perturbation by   1.0 ha of resource nr 18 Wheat for ETBE, straw burnt
================================================================================================

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Perturbed Resource nr 18 Wheat for ETBE, straw burnt (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             332.915      367.488      647.603          0.000        0.000
Natural Gas [MJ]:            6947.988        0.000       16.037          0.000        0.000
Diesel [MJ]:                 4294.083     7604.305      173.712          0.000        0.000
Coal [MJ]):                   794.772        0.000        0.000          0.000        0.000
Other imported [MJp]:        2497.500        0.000   150341.242          0.000        0.000
World primary energy [MJp]: 17983.216     9875.207   152417.310          0.000        0.000
CO2 inside [kg]:             3445.494      557.015    10348.867          0.000        0.000
CO2 outside [kg]:             156.318      156.469       87.985          0.000        0.000
Cost [euro]:                 1232.000        0.000     3275.976          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
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Resource decrease without utilities =   -2463.717 liter
Resource decrease with utilities    =   -2463.717 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000     -252.396          0.000        0.000
Natural Gas [MJ]:               0.000        0.000      -15.661          0.000        0.000
Other imported [MJp]:           0.000        0.000   -159353.153          0.000        0.000
World primary energy [MJp]: -35719.761        0.000   -160093.593          0.000        0.000
CO2 inside [kg]:             -2696.715        0.000   -10952.842          0.000        0.000
CO2 outside [kg]:            -2715.973        0.000      -33.371          0.000        0.000
Cost [euro]:                  -300.202        0.000    -2258.983          0.000        0.000


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Perturbed Resource nr 49 Straw - imported (LHV =    14600.0 MJ/ton)
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Resource decrease without utilities =      -1.200 ton
Resource decrease with utilities    =      -1.200 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                    0.000        0.000        0.000       -116.400        0.000
World primary energy [MJp]:  -1483.200     -257.381        0.000       -135.024        0.000
CO2 inside [kg]:                0.000        0.000        0.000         -8.526        0.000
CO2 outside [kg]:            -232.800      -19.403        0.000         -1.653        0.000
Cost [euro]:                  -60.000        0.000        0.000        -45.302        0.000


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Perturbed Resource nr 50 Animal food (DDGS) - imported  (LHV =    18200.0 MJ/ton)
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Resource decrease without utilities =      -3.229 ton
Resource decrease with utilities    =      -3.229 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
World primary energy [MJp]: -28992.471     -692.552        0.000          0.000        0.000
CO2 inside [kg]:                0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:           -1685.496      -52.210        0.000          0.000        0.000
Cost [euro]:                 -365.008        0.000        0.000          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
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Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                -1365.408        0.000        0.000          0.000        0.000
Other imported [MJp]:         -16.000        0.000        0.000          0.000        0.000
World primary energy [MJp]: -1599.873        0.000        0.000          0.000        0.000
CO2 inside [kg]:             -727.536        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -19.389        0.000        0.000          0.000        0.000
Cost [euro]:                    0.000        0.000        0.000          0.000        0.000
```

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================================================================================================
Scenario 36
Perturbation by   1.0 ha of resource nr 18 Wheat for ETBE, straw burnt
Summary report
================================================================================================
Perturbed Resource nr  2 by     295.33 liter Gasoil for transport
Perturbed Resource nr  3 by     242.34 m3 Natural gas for heat
Perturbed Resource nr  4 by     304.34 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr 18 by       1.00 ha Wheat for ETBE, straw burnt
Perturbed Resource nr 48 by   -2463.72 liter Methanol for MTBE - imported
Perturbed Resource nr 49 by      -1.20 ton Straw - imported
Perturbed Resource nr 50 by      -3.23 ton Animal food (DDGS) - imported
Perturbed Resource nr 58 by      32.59 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by  -6530.41 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -24920 MJ
Effect on renewable energy import in Belgium         -76286 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -87797 MJp
Effect on worldwide renewable energy consumption     130734 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium          34 kg
CO2eq saving outside Belgium       4360 kg
------------------------------------------------------------------------------------------------
Cost                               1478 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.67 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.19 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  50.0 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                 1.4 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        4.01 are Belgium            /GJ fossil saved Belgium
Surface requirement Belgium        2920 are Belgium            /ton CO2eq saved Belgium
Cost requirement Belgium           59.3 euro                   /GJ fossil saved Belgium
Cost requirement Belgium          43176 euro                   /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 37
Perturbation by   1.0 ton wh of resource nr 19 Wheat for ETBE - imported
================================================================================================

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Perturbed Resource nr 19 Wheat for ETBE - imported (LHV =    17000.0 MJ/ton wh)
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Resource increase without utilities =       1.000 ton wh
Resource increase with utilities    =       1.000 ton wh

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000       41.760       73.549          0.000        0.000
Natural Gas [MJ]:               0.000        0.000        1.816          0.000        0.000
Diesel [MJ]:                    0.000        0.000       19.740          0.000        0.000
Other imported [MJp]:           0.000        0.000    15510.384          0.000        0.000
World primary energy [MJp]:  1439.000     1017.637    15746.172          0.000        0.000
CO2 inside [kg]:                0.000        0.000     1067.692          0.000        0.000
CO2 outside [kg]:             226.000       73.196        9.993          0.000        0.000
Cost [euro]:                  145.000        0.000      336.792          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -279.968 liter
Resource decrease with utilities    =    -279.968 liter

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000      -28.681          0.000        0.000
Natural Gas [MJ]:               0.000        0.000       -1.780          0.000        0.000
Other imported [MJp]:           0.000        0.000   -18108.313          0.000        0.000
World primary energy [MJp]:  -4059.064        0.000   -18192.454          0.000        0.000
CO2 inside [kg]:              -306.445        0.000    -1244.641          0.000        0.000
CO2 outside [kg]:             -308.633        0.000       -3.792          0.000        0.000
Cost [euro]:                   -34.114        0.000     -256.703          0.000        0.000


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Perturbed Resource nr 50 Animal food (DDGS) - imported  (LHV =    18200.0 MJ/ton)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.367 ton
```

Resource decrease with utilities = -0.367 ton

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-3297.897	-78.778	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-191.725	-5.939	0.000	0.000	0.000
Cost [euro]:	-41.520	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario 37
Perturbation by   1.0 ton wh of resource nr 19 Wheat for ETBE - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by       0.55 liter Gasoil for transport
Perturbed Resource nr  3 by       0.00 m3 Natural gas for heat
Perturbed Resource nr  4 by      24.06 kWhe Electricity - imported
Perturbed Resource nr 19 by       1.00 ton wh Wheat for ETBE - imported
Perturbed Resource nr 48 by    -279.97 liter Methanol for MTBE - imported
Perturbed Resource nr 50 by      -0.37 ton Animal food (DDGS) - imported
Perturbed other resources by  -2597.93 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -6935 MJ
Effect on renewable energy import in Belgium          10315 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -11868 MJp
Effect on worldwide renewable energy consumption      10315 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         483 kg
CO2eq saving outside Belgium        201 kg
------------------------------------------------------------------------------------------------
Cost                                149 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.15 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.67 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  57.7 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                69.7 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           21.6 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            309 euro                    /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 38
Perturbation by   1.0 liter of resource nr 47 Ethanol for ETBE - imported
================================================================================================

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Perturbed Resource nr 47 Ethanol for ETBE - imported (LHV =       21.3 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 liter
Resource increase with utilities    =       1.000 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000        0.079          0.000        0.000
Natural Gas [MJ]:               0.000        0.000        0.001          0.000        0.000
Other imported [MJp]:           0.000        0.000       41.501          0.000        0.000
World primary energy [MJp]:     2.128        1.747       41.728          0.000        0.000
CO2 inside [kg]:                0.000        0.000        2.852          0.000        0.000
CO2 outside [kg]:               0.212        0.139        0.010          0.000        0.000
Cost [euro]:                    0.437        0.000        0.611          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -0.769 liter
Resource decrease with utilities    =      -0.769 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000       -0.079          0.000        0.000
Natural Gas [MJ]:               0.000        0.000       -0.005          0.000        0.000
Other imported [MJp]:           0.000        0.000      -49.737          0.000        0.000
World primary energy [MJp]:   -11.149        0.000      -49.968          0.000        0.000
CO2 inside [kg]:               -0.842        0.000       -3.419          0.000        0.000
CO2 outside [kg]:              -0.848        0.000       -0.010          0.000        0.000
Cost [euro]:                   -0.094        0.000       -0.705          0.000        0.000
```

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================================================================================================
Scenario 38
Perturbation by   1.0 liter of resource nr 47 Ethanol for ETBE - imported
Summary report
================================================================================================
Perturbed Resource nr  3 by      -0.00 m3 Natural gas for heat
Perturbed Resource nr 47 by       1.00 liter Ethanol for ETBE - imported
Perturbed Resource nr 48 by      -0.77 liter Methanol for MTBE - imported
Perturbed other resources by     -8.24 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium               -20 MJ
Effect on renewable energy import in Belgium             21 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption           -28 MJp
Effect on worldwide renewable energy consumption         21 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium           1 kg
CO2eq saving outside Belgium          0 kg
------------------------------------------------------------------------------------------------
Cost                                  0 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            1.30 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.96 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  68.7 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                68.9 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           12.2 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            177 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 39
Perturbation by   1.0 ha of resource nr 22 Wood for ETBE - SRF
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =   -7498.400 kWhe
Resource decrease with utilities    =   -7447.296 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -50444.136        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -3561.740        0.000        0.000          0.000        0.000
Cost [euro]:                  -503.892        0.000        0.000          0.000        0.000


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Perturbed Resource nr 22 Wood for ETBE - SRF (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             183.975        0.000      277.805          0.000        0.000
Natural Gas [MJ]:            3530.550        0.000       17.238          0.000        0.000
Diesel [MJ]:                 2799.053     1492.308     6030.976          0.000        0.000
Coal [MJ]):                   334.200        0.000        0.000          0.000        0.000
Other imported [MJp]:         518.779        0.000   174503.560          0.000        0.000
World primary energy [MJp]:  9073.950     1731.077   182314.472          0.000        0.000
CO2 inside [kg]:             1552.370      109.312    12268.811          0.000        0.000
CO2 outside [kg]:              89.104       21.191      122.371          0.000        0.000
Cost [euro]:                 1846.154        0.000     3939.006          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =   -2711.741 liter
Resource decrease with utilities    =   -2711.741 liter
```

	Production	Transport	Conversion	Distribution	End use
Electricity [MJ]:	0.000	0.000	-277.805	0.000	0.000
Natural Gas [MJ]:	0.000	0.000	-17.238	0.000	0.000
Other imported [MJp]:	0.000	0.000	-175395.309	0.000	0.000
World primary energy [MJp]:	-39315.686	0.000	-176210.289	0.000	0.000
CO2 inside [kg]:	-2968.194	0.000	-12055.470	0.000	0.000
CO2 outside [kg]:	-2989.391	0.000	-36.731	0.000	0.000
Cost [euro]:	-330.423	0.000	-2486.396	0.000	0.000

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Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

```
================================================================================================
Scenario 39
Perturbation by   1.0 ha of resource nr 22 Wood for ETBE - SRF
Summary report
================================================================================================
Perturbed Resource nr  2 by     249.78 liter Gasoil for transport
Perturbed Resource nr  3 by     123.14 m3 Natural gas for heat
Perturbed Resource nr  4 by   -7447.30 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.01 ton Coal for co-combustion
Perturbed Resource nr 22 by       1.00 ha Wood for ETBE - SRF
Perturbed Resource nr 48 by   -2711.74 liter Methanol for MTBE - imported
Perturbed Resource nr 58 by      16.66 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   -388.97 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -56759 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -144480 MJp
Effect on worldwide renewable energy consumption     180000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        1821 kg
CO2eq saving outside Belgium       6375 kg
------------------------------------------------------------------------------------------------
Cost                               2464 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.80 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.32 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  56.7 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                32.1 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.76 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          55 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           43.4 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           1354 euro                    /ton CO2eq saved Belgium
================================================================================================
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Scenario 40
Perturbation by   1.0 ha of resource nr 23 Wood for ETBE - forest waste
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =   -8548.176 kWhe
Resource decrease with utilities    =   -8548.176 kWhe

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -57506.315        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:            -4060.384        0.000        0.000          0.000        0.000
Cost [euro]:                  -574.437        0.000        0.000          0.000        0.000


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Perturbed Resource nr 23 Wood for ETBE - forest waste (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                            Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000        0.000      316.697          0.000        0.000
Natural Gas [MJ]:                0.000        0.000       19.651          0.000        0.000
Diesel [MJ]:                   442.861     1701.231     6875.313          0.000        0.000
Other imported [MJp]:          497.890        0.000   198934.058          0.000        0.000
World primary energy [MJp]:   1011.609     1973.428   207838.498          0.000        0.000
CO2 inside [kg]:                53.338      124.615    13986.444          0.000        0.000
CO2 outside [kg]:                6.289       24.157      139.503          0.000        0.000
Cost [euro]:                  1824.000        0.000     4490.467          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
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Resource decrease without utilities =   -3091.384 liter
Resource decrease with utilities    =   -3091.384 liter

                            Production    Transport   Conversion   Distribution      End use
```

Electricity [MJ]:	0.000	0.000	-316.697	0.000	0.000
Natural Gas [MJ]:	0.000	0.000	-19.651	0.000	0.000
Other imported [MJp]:	0.000	0.000	-199950.652	0.000	0.000
World primary energy [MJp]:	-44819.882	0.000	-200879.730	0.000	0.000
CO2 inside [kg]:	-3383.741	0.000	-13743.236	0.000	0.000
CO2 outside [kg]:	-3407.906	0.000	-41.873	0.000	0.000
Cost [euro]:	-376.683	0.000	-2834.492	0.000	0.000

```
================================================================================================
Scenario 40
Perturbation by   1.0 ha of resource nr 23 Wood for ETBE - forest waste
Summary report
================================================================================================
Perturbed Resource nr  2 by     251.52 liter Gasoil for transport
Perturbed Resource nr  4 by   -8548.18 kWhe Electricity - imported
Perturbed Resource nr 23 by       1.00 ha Wood for ETBE - forest waste
Perturbed Resource nr 48 by   -3091.38 liter Methanol for MTBE - imported
Perturbed other resources by   -518.70 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -71333 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -172216 MJp
Effect on worldwide renewable energy consumption     205200 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        2963 kg
CO2eq saving outside Belgium       7340 kg
------------------------------------------------------------------------------------------------
Cost                               2529 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.84 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.35 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  59.8 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                41.5 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.40 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          34 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           35.5 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            854 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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Scenario 41
Perturbation by   1.0 ton wd of resource nr 24 Wood for ETBE - imported
================================================================================================

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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -749.840 kWhe
Resource decrease with utilities    =    -749.840 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:  -5044.414        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -356.174        0.000        0.000          0.000        0.000
Cost [euro]:                   -50.389        0.000        0.000          0.000        0.000


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Perturbed Resource nr 24 Wood for ETBE - imported (LHV =    18000.0 MJ/ton wd)
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Resource increase without utilities =       1.000 ton wd
Resource increase with utilities    =       1.000 ton wd

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:                0.000        0.000       27.780          0.000        0.000
Natural Gas [MJ]:                0.000        0.000        1.724          0.000        0.000
Diesel [MJ]:                     0.000       43.000      603.098          0.000        0.000
Other imported [MJp]:            0.000        0.000    17450.356          0.000        0.000
World primary energy [MJp]:     88.000     1501.880    18231.447          0.000        0.000
CO2 inside [kg]:                 0.000        3.150     1226.881          0.000        0.000
CO2 outside [kg]:                5.100      115.781       12.237          0.000        0.000
Cost [euro]:                   183.333        0.000      393.901          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =    -271.174 liter
Resource decrease with utilities    =    -271.174 liter

                           Production    Transport   Conversion   Distribution      End use
```

Electricity [MJ]:	0.000	0.000	-27.780	0.000	0.000
Natural Gas [MJ]:	0.000	0.000	-1.724	0.000	0.000
Other imported [MJp]:	0.000	0.000	-17539.531	0.000	0.000
World primary energy [MJp]:	-3931.569	0.000	-17621.029	0.000	0.000
CO2 inside [kg]:	-296.819	0.000	-1205.547	0.000	0.000
CO2 outside [kg]:	-298.939	0.000	-3.673	0.000	0.000
Cost [euro]:	-33.042	0.000	-248.640	0.000	0.000

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================================================================================================
Scenario 41
Perturbation by   1.0 ton wd of resource nr 24 Wood for ETBE - imported
Summary report
================================================================================================
Perturbed Resource nr  2 by      18.02 liter Gasoil for transport
Perturbed Resource nr  4 by    -749.84 kWhe Electricity - imported
Perturbed Resource nr 24 by       1.00 ton wd Wood for ETBE - imported
Perturbed Resource nr 48 by    -271.17 liter Methanol for MTBE - imported
Perturbed other resources by    -89.17 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             -6446 MJ
Effect on renewable energy import in Belgium          18000 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -13779 MJp
Effect on worldwide renewable energy consumption      18000 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium         272 kg
CO2eq saving outside Belgium        526 kg
------------------------------------------------------------------------------------------------
Cost                                245 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.77 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.36 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  57.9 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                42.2 kg CO2eq Belgium        /GJ fossil saved Belgium
Cost requirement Belgium           38.0 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            900 euro                    /ton CO2eq saved Belgium
================================================================================================
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================================================================================================
Scenario 42
Perturbation by   1.0 ha of resource nr 11 Sugar beet for EtOH
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Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
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Resource decrease without utilities =   -3701.668 liter
Resource decrease with utilities    =   -3701.668 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -16678.826        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -8792.124
CO2 outside [kg]:            -1489.181        0.000        0.000          0.000        0.000
Cost [euro]:                 -1703.623        0.000        0.000          0.000     -175.842


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Perturbed Resource nr 11 Sugar beet for EtOH (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:              363.724        0.000     4675.018        454.430        0.000
Natural Gas [MJ]:             4931.849        0.000    64258.979          0.000        0.000
Diesel [MJ]:                 10307.364     6499.000        0.000       1086.124        0.000
Coal [MJ]):                    510.360        0.000        0.000          0.000        0.000
Other imported [MJp]:          134.900        0.000      975.564          0.000        0.000
World primary energy [MJp]:  19984.572     7538.840    81640.236       2563.528        0.000
CO2 inside [kg]:              2416.162      476.052     3692.496         79.559        0.000
CO2 outside [kg]:              230.813       92.286      900.867         75.383        0.000
Cost [euro]:                  3350.000        0.000      824.204       1127.177        0.000


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Perturbed Resource nr 51 Animal food (sugar beat pulp) - imported (LHV =    15600.0 MJ/ton)
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Resource decrease without utilities =      -3.417 ton
Resource decrease with utilities    =      -3.417 ton
```

	Production	Transport	Conversion	Distribution	End use
World primary energy [MJp]:	-44762.700	-732.892	0.000	0.000	0.000
CO2 inside [kg]:	0.000	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-2.932	-55.251	0.000	0.000	0.000
Cost [euro]:	-170.850	0.000	0.000	0.000	0.000

++

Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)

++

Resource decrease without utilities = -1.000 ha

Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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================================================================================================
Scenario 42
Perturbation by   1.0 ha of resource nr 11 Sugar beet for EtOH
Summary report
================================================================================================
Perturbed Resource nr  1 by   -3701.67 liter Gasoline for transport
Perturbed Resource nr  2 by     460.89 liter Gasoil for transport
Perturbed Resource nr  3 by    2413.18 m3 Natural gas for heat
Perturbed Resource nr  4 by    1525.88 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.02 ton Coal for co-combustion
Perturbed Resource nr 11 by       1.00 ha Sugar beet for EtOH
Perturbed Resource nr 51 by      -3.42 ton Animal food (sugar beat pulp) - imported
Perturbed Resource nr 58 by      26.14 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   1094.46 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -25292 MJ
Effect on renewable energy import in Belgium         -53305 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -71182 MJp
Effect on worldwide renewable energy consumption     203975 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        2855 kg
CO2eq saving outside Belgium        267 kg
------------------------------------------------------------------------------------------------
Cost                               3251 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.35 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.12 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  43.9 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium               112.9 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        3.95 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          35 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium          128.5 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           1139 euro                    /ton CO2eq saved Belgium
================================================================================================
```

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================================================================================================
Scenario 43
Perturbation by   1.0 ha of resource nr 12 Sugar beet for EtOH, pulp burnt
================================================================================================

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Perturbed Resource nr 1 Gasoline for transport (LHV =       32.2 MJ/liter)
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Resource decrease without utilities =   -3707.192 liter
Resource decrease with utilities    =   -3707.192 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]: -16703.719        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000    -8805.246
CO2 outside [kg]:            -1491.404        0.000        0.000          0.000        0.000
Cost [euro]:                 -1706.166        0.000        0.000          0.000     -176.105


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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =     -51.667 kWhe
Resource increase with utilities    =     124.938 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:   -347.580        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:              -24.542        0.000        0.000          0.000        0.000
Cost [euro]:                    -3.472        0.000        0.000          0.000        0.000


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Perturbed Resource nr 12 Sugar beet for EtOH, pulp burnt (LHV =        0.0 MJ/ha)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             363.724        0.000     -183.053        455.109        0.000
Natural Gas [MJ]:            4931.849        0.000     7222.011          0.000        0.000
Diesel [MJ]:                10307.364     6508.700        0.000       1087.745        0.000
```

Coal [MJ]):	510.360	0.000	0.000	0.000	0.000
Other imported [MJp]:	134.900	0.000	977.020	0.000	0.000
World primary energy [MJp]:	19984.572	7550.092	8010.453	2567.354	0.000
CO2 inside [kg]:	2416.162	476.762	475.713	79.677	0.000
CO2 outside [kg]:	230.813	92.424	7.769	75.495	0.000
Cost [euro]:	3355.000	0.000	546.163	1128.859	0.000

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Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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Scenario 43
Perturbation by   1.0 ha of resource nr 12 Sugar beet for EtOH, pulp burnt
Summary report
================================================================================================
Perturbed Resource nr  1 by   -3707.19 liter Gasoline for transport
Perturbed Resource nr  2 by     461.20 liter Gasoil for transport
Perturbed Resource nr  3 by     423.89 m3 Natural gas for heat
Perturbed Resource nr  4 by     124.94 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.02 ton Coal for co-combustion
Perturbed Resource nr 12 by       1.00 ha Sugar beet for EtOH, pulp burnt
Perturbed Resource nr 58 by      26.14 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by   1095.92 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -87537 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -100037 MJp
Effect on worldwide renewable energy consumption     257664 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        6084 kg
CO2eq saving outside Belgium       1129 kg
------------------------------------------------------------------------------------------------
Cost                               3144 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.39 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.34 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  72.1 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                69.5 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.14 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          16 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           35.9 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            517 euro                    /ton CO2eq saved Belgium
================================================================================================
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Scenario 44
Perturbation by   1.0 ha of resource nr 20 Sugar beet for ETBE
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Perturbed Resource nr 20 Sugar beet for ETBE (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             363.724        0.000     8372.819          0.000        0.000
Natural Gas [MJ]:            4931.849        0.000   128686.028          0.000        0.000
Diesel [MJ]:                10307.364     6499.000        0.000          0.000        0.000
Coal [MJ]):                   510.360        0.000        0.000          0.000        0.000
Other imported [MJp]:         134.900        0.000   242275.908          0.000        0.000
World primary energy [MJp]:  19984.572     7538.840   400977.812          0.000        0.000
CO2 inside [kg]:              2416.162      476.052    23913.003          0.000        0.000
CO2 outside [kg]:              230.813       92.286     1673.539          0.000        0.000
Cost [euro]:                  3350.000        0.000     5200.083          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
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Resource decrease without utilities =   -4305.194 liter
Resource decrease with utilities    =   -4305.194 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000     -441.046          0.000        0.000
Natural Gas [MJ]:               0.000        0.000      -27.367          0.000        0.000
Other imported [MJp]:           0.000        0.000   -278459.848          0.000        0.000
World primary energy [MJp]: -62418.089        0.000   -279753.721          0.000        0.000
CO2 inside [kg]:             -4712.343        0.000   -19139.419          0.000        0.000
CO2 outside [kg]:            -4745.996        0.000      -58.315          0.000        0.000
Cost [euro]:                  -524.585        0.000    -3947.435          0.000        0.000


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Perturbed Resource nr 51 Animal food (sugar beat pulp) - imported (LHV =    15600.0 MJ/ton)
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Resource decrease without utilities =      -3.417 ton
Resource decrease with utilities    =      -3.417 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
World primary energy [MJp]: -44762.700     -732.892        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:               -2.932      -55.251        0.000          0.000        0.000
Cost [euro]:                  -170.850        0.000        0.000          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
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Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                -1365.408        0.000        0.000          0.000        0.000
Other imported [MJp]:         -16.000        0.000        0.000          0.000        0.000
World primary energy [MJp]: -1599.873        0.000        0.000          0.000        0.000
CO2 inside [kg]:             -727.536        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -19.389        0.000        0.000          0.000        0.000
Cost [euro]:                    0.000        0.000        0.000          0.000        0.000
```

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================================================================================================
Scenario 44
Perturbation by   1.0 ha of resource nr 20 Sugar beet for ETBE
Summary report
================================================================================================
Perturbed Resource nr  2 by     430.60 liter Gasoil for transport
Perturbed Resource nr  3 by    4659.27 m3 Natural gas for heat
Perturbed Resource nr  4 by    2304.30 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.02 ton Coal for co-combustion
Perturbed Resource nr 20 by       1.00 ha Sugar beet for ETBE
Perturbed Resource nr 48 by   -4305.19 liter Methanol for MTBE - imported
Perturbed Resource nr 51 by      -3.42 ton Animal food (sugar beat pulp) - imported
Perturbed Resource nr 58 by      26.14 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by -36065.04 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium             54476 MJ
Effect on renewable energy import in Belgium         -53305 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -29089 MJp
Effect on worldwide renewable energy consumption     203975 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium       -2226 kg
CO2eq saving outside Belgium       2885 kg
------------------------------------------------------------------------------------------------
Cost                               3907 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.14 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium         -0.27 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  22.7 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                40.9 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium     9999.00 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium        9999 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium          -71.7 euro                    /GJ fossil saved Belgium
Cost requirement Belgium           9999 euro                    /ton CO2eq saved Belgium
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Scenario 45
Perturbation by   1.0 ha of resource nr 21 Sugar beet for ETBE, pulp burnt
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Perturbed Resource nr 4 Electricity - imported (LHV =        3.6 MJ/kWhe)
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Resource decrease without utilities =     -51.590 kWhe
Resource decrease with utilities    =    -608.193 kWhe

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
World primary energy [MJp]:   -347.062        0.000        0.000          0.000        0.000
CO2 inside [kg]:                 0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:              -24.505        0.000        0.000          0.000        0.000
Cost [euro]:                    -3.467        0.000        0.000          0.000        0.000


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Perturbed Resource nr 21 Sugar beet for ETBE, pulp burnt (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:              363.724        0.000    -1926.448          0.000        0.000
Natural Gas [MJ]:             4931.849        0.000     7802.788          0.000        0.000
Diesel [MJ]:                 10307.364     6499.000        0.000          0.000        0.000
Coal [MJ]):                    510.360        0.000        0.000          0.000        0.000
Other imported [MJp]:          134.900        0.000   242275.908          0.000        0.000
World primary energy [MJp]:  19984.572     7538.840   244915.904          0.000        0.000
CO2 inside [kg]:              2416.162      476.052    17095.188          0.000        0.000
CO2 outside [kg]:              230.813       92.286     -219.696          0.000        0.000
Cost [euro]:                  3350.000        0.000     4375.852          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
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Resource decrease without utilities =   -4305.194 liter
Resource decrease with utilities    =   -4305.194 liter
```

	Production	Transport	Conversion	Distribution	End use
Electricity [MJ]:	0.000	0.000	-441.046	0.000	0.000
Natural Gas [MJ]:	0.000	0.000	-27.367	0.000	0.000
Other imported [MJp]:	0.000	0.000	-278459.848	0.000	0.000
World primary energy [MJp]:	-62418.089	0.000	-279753.721	0.000	0.000
CO2 inside [kg]:	-4712.343	0.000	-19139.419	0.000	0.000
CO2 outside [kg]:	-4745.996	0.000	-58.315	0.000	0.000
Cost [euro]:	-524.585	0.000	-3947.435	0.000	0.000

++
Perturbed Resource nr 59 Set aside land (LHV = 0.0 MJ/ha)
++
Resource decrease without utilities = -1.000 ha
Resource decrease with utilities = -1.000 ha

	Production	Transport	Conversion	Distribution	End use
Diesel [MJ]:	-1365.408	0.000	0.000	0.000	0.000
Other imported [MJp]:	-16.000	0.000	0.000	0.000	0.000
World primary energy [MJp]:	-1599.873	0.000	0.000	0.000	0.000
CO2 inside [kg]:	-727.536	0.000	0.000	0.000	0.000
CO2 outside [kg]:	-19.389	0.000	0.000	0.000	0.000
Cost [euro]:	0.000	0.000	0.000	0.000	0.000

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Scenario 45
Perturbation by   1.0 ha of resource nr 21 Sugar beet for ETBE, pulp burnt
Summary report
================================================================================================
Perturbed Resource nr  2 by     430.60 liter Gasoil for transport
Perturbed Resource nr  3 by     443.19 m3 Natural gas for heat
Perturbed Resource nr  4 by    -608.19 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.02 ton Coal for co-combustion
Perturbed Resource nr 21 by       1.00 ha Sugar beet for ETBE, pulp burnt
Perturbed Resource nr 48 by   -4305.19 liter Methanol for MTBE - imported
Perturbed Resource nr 58 by      26.14 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by -36065.04 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -76892 MJ
Effect on renewable energy import in Belgium              0 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption       -140189 MJp
Effect on worldwide renewable energy consumption     257280 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium        4592 kg
CO2eq saving outside Belgium       4745 kg
------------------------------------------------------------------------------------------------
Cost                               3250 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.54 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.30 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  66.6 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                59.7 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        1.30 are Belgium             /GJ fossil saved Belgium
Surface requirement Belgium          22 are Belgium             /ton CO2eq saved Belgium
Cost requirement Belgium           42.3 euro                    /GJ fossil saved Belgium
Cost requirement Belgium            708 euro                    /ton CO2eq saved Belgium
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Scenario 46
Perturbation by   1.0 ha of resource nr 18 Wheat for ETBE, straw burnt
================================================================================================

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Perturbed Resource nr 18 Wheat for ETBE, straw burnt (LHV =        0.0 MJ/ha)
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Resource increase without utilities =       1.000 ha
Resource increase with utilities    =       1.000 ha

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:             332.915      367.488      647.603          0.000        0.000
Natural Gas [MJ]:            6947.988        0.000       16.037          0.000        0.000
Diesel [MJ]:                 4294.083     7604.305      173.712          0.000        0.000
Coal [MJ]):                   794.772        0.000        0.000          0.000        0.000
Other imported [MJp]:        2497.500        0.000   150341.242          0.000        0.000
World primary energy [MJp]: 17983.216     9875.207   152417.310          0.000        0.000
CO2 inside [kg]:             3445.494      557.015    10348.867          0.000        0.000
CO2 outside [kg]:             156.318      156.469       87.985          0.000        0.000
Cost [euro]:                 1232.000        0.000     3275.976          0.000        0.000


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Perturbed Resource nr 48 Methanol for MTBE - imported (LHV =       15.9 MJ/liter)
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Resource decrease without utilities =   -2463.717 liter
Resource decrease with utilities    =   -2463.717 liter

                           Production    Transport   Conversion   Distribution      End use
------------------------------------------------------------------------------------------------
Electricity [MJ]:               0.000        0.000     -252.396          0.000        0.000
Natural Gas [MJ]:               0.000        0.000      -15.661          0.000        0.000
Other imported [MJp]:           0.000        0.000   -159353.153          0.000        0.000
World primary energy [MJp]: -35719.761        0.000   -160093.593          0.000        0.000
CO2 inside [kg]:             -2696.715        0.000   -10952.842          0.000        0.000
CO2 outside [kg]:            -2715.973        0.000      -33.371          0.000        0.000
Cost [euro]:                  -300.202        0.000    -2258.983          0.000        0.000


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Perturbed Resource nr 49 Straw - imported (LHV =    14600.0 MJ/ton)
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Resource decrease without utilities =      -1.200 ton
Resource decrease with utilities    =      -1.200 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                    0.000        0.000        0.000       -116.400        0.000
World primary energy [MJp]:  -1483.200     -257.381        0.000       -135.024        0.000
CO2 inside [kg]:                0.000        0.000        0.000         -8.526        0.000
CO2 outside [kg]:            -232.800      -19.403        0.000         -1.653        0.000
Cost [euro]:                  -60.000        0.000        0.000        -45.302        0.000


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Perturbed Resource nr 50 Animal food (DDGS) - imported  (LHV =    18200.0 MJ/ton)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -3.229 ton
Resource decrease with utilities    =      -3.229 ton

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
World primary energy [MJp]: -28992.471     -692.552        0.000          0.000        0.000
CO2 inside [kg]:                0.000        0.000        0.000          0.000        0.000
CO2 outside [kg]:           -1685.496      -52.210        0.000          0.000        0.000
Cost [euro]:                 -365.008        0.000        0.000          0.000        0.000


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Perturbed Resource nr 59 Set aside land (LHV =        0.0 MJ/ha)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Resource decrease without utilities =      -1.000 ha
Resource decrease with utilities    =      -1.000 ha

                           Production    Transport   Conversion   Distribution      End use
-------------------------------------------------------------------------------------------
Diesel [MJ]:                -1365.408        0.000        0.000          0.000        0.000
Other imported [MJp]:         -16.000        0.000        0.000          0.000        0.000
World primary energy [MJp]: -1599.873        0.000        0.000          0.000        0.000
CO2 inside [kg]:             -727.536        0.000        0.000          0.000        0.000
CO2 outside [kg]:             -19.389        0.000        0.000          0.000        0.000
Cost [euro]:                    0.000        0.000        0.000          0.000        0.000
```

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================================================================================================
Scenario 46
Perturbation by   1.0 ha of resource nr 18 Wheat for ETBE, straw burnt
Summary report
================================================================================================
Perturbed Resource nr  2 by     295.33 liter Gasoil for transport
Perturbed Resource nr  3 by     242.34 m3 Natural gas for heat
Perturbed Resource nr  4 by     304.34 kWhe Electricity - imported
Perturbed Resource nr  6 by       0.03 ton Coal for co-combustion
Perturbed Resource nr 18 by       1.00 ha Wheat for ETBE, straw burnt
Perturbed Resource nr 48 by   -2463.72 liter Methanol for MTBE - imported
Perturbed Resource nr 49 by      -1.20 ton Straw - imported
Perturbed Resource nr 50 by      -3.23 ton Animal food (DDGS) - imported
Perturbed Resource nr 58 by      32.59 liter Heavy Fuel Oil
Perturbed Resource nr 59 by      -1.00 ha Set aside land
Perturbed other resources by  -6530.41 MJ
------------------------------------------------------------------------------------------------
Effect on fossil energy import in Belgium            -24920 MJ
Effect on renewable energy import in Belgium         -76286 MJ
------------------------------------------------------------------------------------------------
Effect on worldwide fossil energy consumption        -87797 MJp
Effect on worldwide renewable energy consumption     130734 MJp
------------------------------------------------------------------------------------------------
CO2eq saving inside Belgium          34 kg
CO2eq saving outside Belgium       4360 kg
------------------------------------------------------------------------------------------------
Cost                               1478 euro
------------------------------------------------------------------------------------------------
Energy efficiency world            0.67 GJp fossil saved world  /GJp renewable produced world
Energy efficiency Belgium          0.19 GJ fossil saved Belgium /GJp renewable produced world
CO2 savings world                  50.0 kg CO2eq world          /GJp fossil saved world
CO2 savings Belgium                 1.4 kg CO2eq Belgium        /GJ fossil saved Belgium
Surface requirement Belgium        4.01 are Belgium            /GJ fossil saved Belgium
Surface requirement Belgium        2920 are Belgium            /ton CO2eq saved Belgium
Cost requirement Belgium           59.3 euro                   /GJ fossil saved Belgium
Cost requirement Belgium          43176 euro                   /ton CO2eq saved Belgium
================================================================================================
```