

LiCEA Audit Calzificio Viola

Date: 27/11/2014 Auditor: Nicola Galli Company contact person: Moira

Employees: 40 Turnover: 9500000 €/year Calze: 6100000 pieces 0 pieces

Yearly Company Consumption	Electricity: 1.500.000 kWh 350.000 € Specific cost: 0,23 €/kWh
	Fuels: Natural gas 29.000 Sm ³ 19.000 € 0,66 €/Sm ³ 0 0 €
	Product cost: 0,06 /pieces 0,0012 MWh/pieces

LCA analysis

Baseline scenario	GWP	CED	CED	Blue virtual
	t CO2 eq	GJ	MWh	m3.eq
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
	7	17	5	8

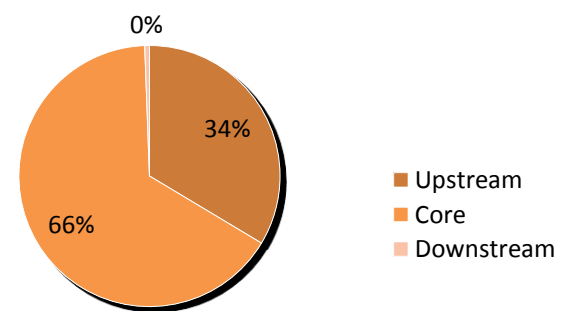
The Baseline scenario shows the environmental impact of the company production. The results are Global Warming Potential, Cumulated Energy Demand and Blue Virtual Water.

The upstream section show the environmental impact of the Company supplies, as collected during the LiCEA audit, by mail and during the visit: raw materials, semifinished products, outsource manufacturing and packaging. Possibilities of reduction imply change of supply (quality of materials, for example recycled rather than new, lower distances, different transports): they are listed on the

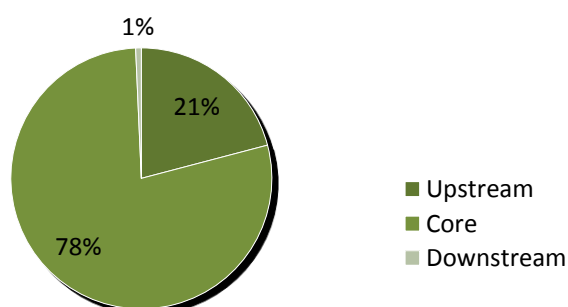
The core section show the environmental impact of the manufacturing inside the Company's factories. It regards internal water, power and fuel consumptions, as well as internal waste. Possibilities of reduction imply improvement of the efficiency of the Company's plants and systems. They are listed and evaluated on the second part of the report.

The downstream section consider the environmental impact of the Company's products for distribution and disposal at the end of life. The main possibility of reduction consist in change of transport system for distribution.

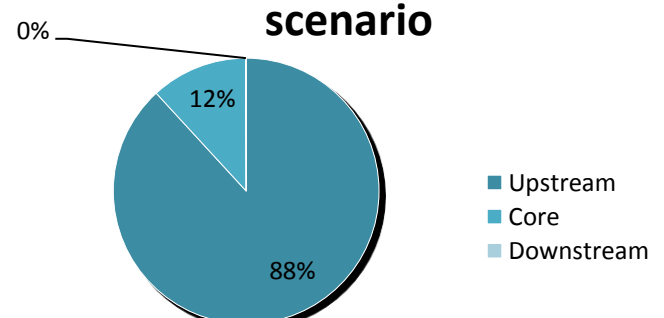
CED - Baseline scenario



GWP - Baseline scenario



Blue virtual water - Baseline scenario



SUMMARY baseline scenario	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222

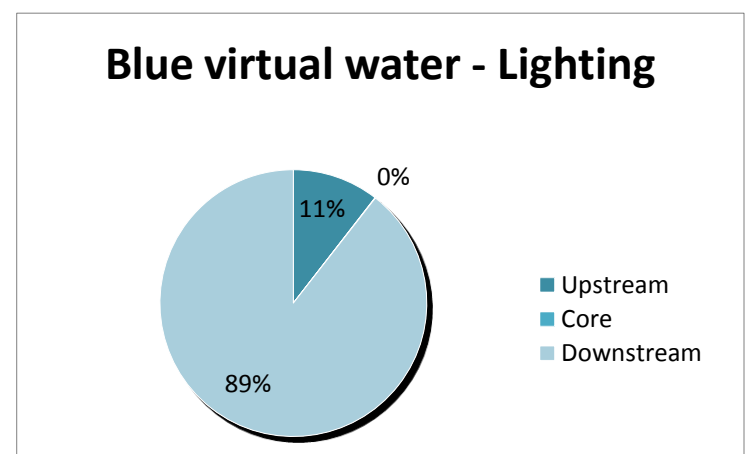
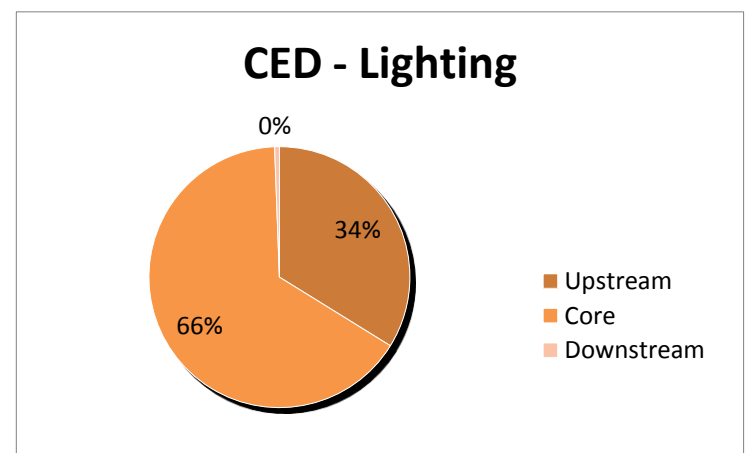
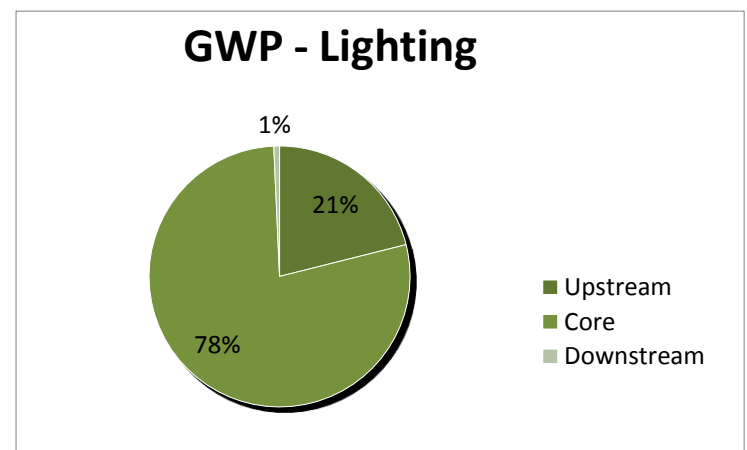
Core improvement action: Lighting

The improvement action consists in the replacement of 112 lamps in the enterprise, for a total power of 6.496 W. List of the lamps to be replaced:
 ☑ Sala macchine tessitura: for 112 existing lamps, the technology is F tub (neon) while the suggested new technology is LED. Sensors must be installed on new lamps: no.

The estimated cost for the replacement of the lamps is 13.000 €. The expected savings are 17.100 kWh, 3.990 €, 1,14% of the total electricity consumption. The simple payback time is 3,3 year, while the discounted payback time is 3,6 years with a discount rate of 4%.

New product cost: 0,06 €/pieces 0,0011 MWh/pieces

Lighting	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.586	16.503	4.584	8.352
Water consumption	0	28	8	5.320
Electricity consumption	1.483	14.829	4.119	2.966
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8



Lighting	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.586	16.503	4.584	8.352
Downstream	14	148	41	39
Total	2.028	25.159	6.989	71.188

Core improvement action: Electric motors

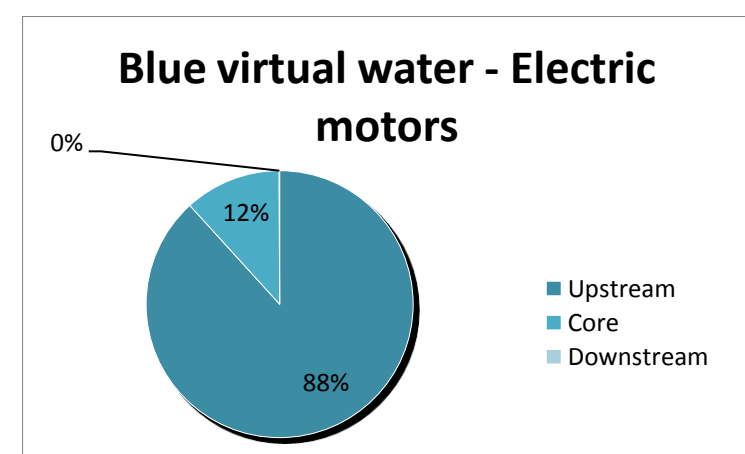
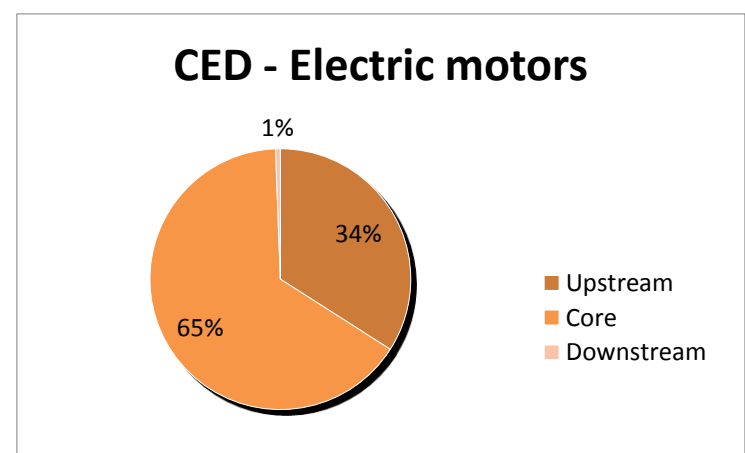
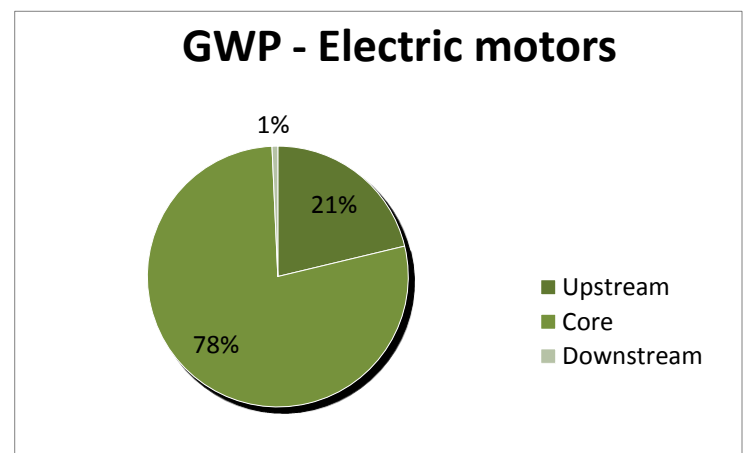
The improvement action consists in the replacement of 1 electric motor(s) in the enterprise, for a total power of 19 kW. List of the motor(s) to be replaced:

☑ Motore aspirazione: 1 motor(s) have a power of 18,5 kW and efficiency class eff2. We suggest to replace them with high efficiency IE3 motor(s). The estimated cost is 3.150 €. The expected saving are 33.905 kWh, 7.911 €.

The total estimate cost of the action is 3.150 €. The global result of the action is a saving of 33.905 kWh, 7.911 €, 2,26% of the totalelectricity consumption. The simple payback time is 0,4 years, while the discounted payback time is 0,4 years with a discount rate of 4%.

New product cost: 0,06 €/pieces 0 MWh/pieces

Electric motors	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Description:				
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Packaging	162	2.506	696	6.780
Water consumption	0	28	8	5.320
Electricity consumption	1.466	14.661	4.072	2.932
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Packaging	162	2.506	696	6.780
Total	14	148	41	39



Electric motors	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.569	16.335	4.538	8.319
Downstream	14	148	41	39
Total	2.011	24.991	6.942	71.155

Core improvement action: Heating

The improvement action consists in the replacement of 4 heat generators. List of the heat generator(s) to be replaced:

☒THERMITAL THE-Q 166: rated power 153 kW, fuel natural gas, efficiency 92%. New heat generator fuel natural gas, type: condensing, efficiency 99%;

☒THERMITAL THE-Q 255: rated power 234 kW, fuel natural gas, efficiency 95%. New heat generator fuel natural gas, type: condensing, efficiency 95%;

- Immergas - Super Eolo 25: rated power 35 kW, fuel natural gas, efficiency 91%. New heat generator fuel natural gas, type: condensing, efficiency 91%;

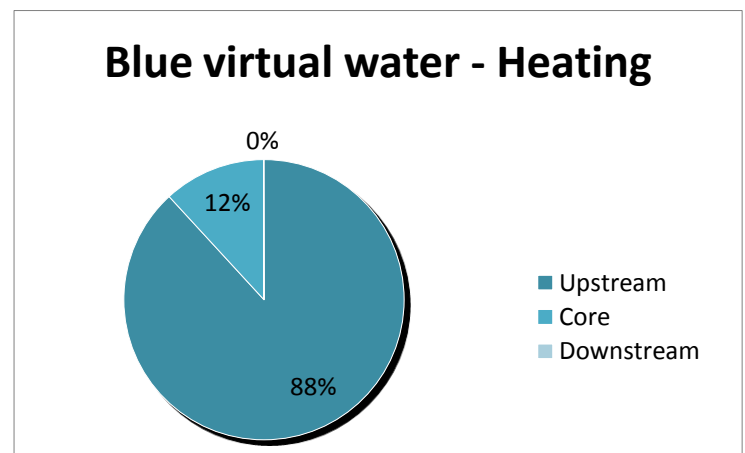
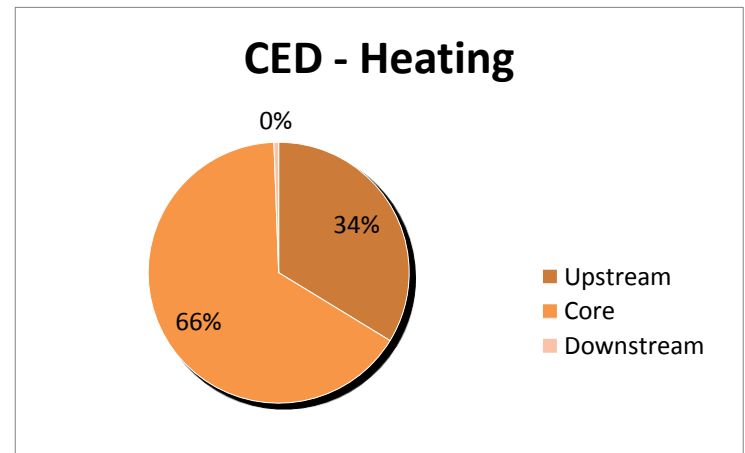
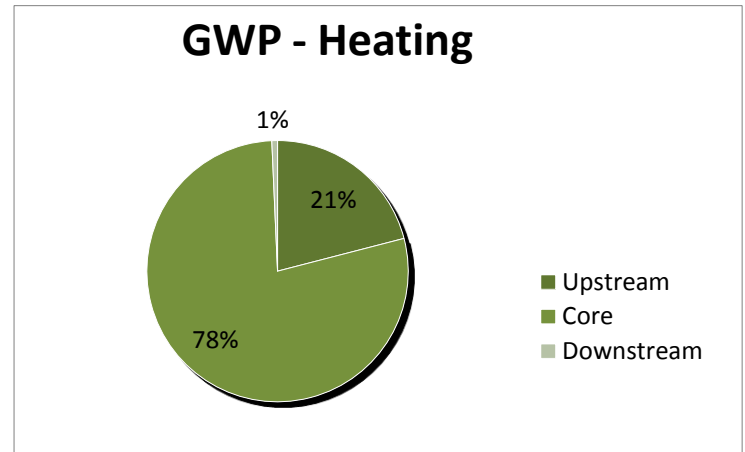
- Immergas - Super Eolo 25: rated power 35 kW, fuel natural gas, efficiency 91%. New heat generator fuel natural gas, type: condensing, efficiency 91%;

The total estimate cost of the action is 15.000 €. The global result of the action is a saving of 20.023 kWh, 1.366 €, 1,13% of the total energy used by the enterprise. The simple payback time is 11 years, while the discounted payback time is 14,7 years with a discount rate of 4%.

New product cost: 0,06 €/pieces 0 MWh/pieces

Heating	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.597	16.576	4.604	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	81	1.265	351	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
	0	0	0	0
Distribution	8	131	36	31
End of life	7	17	5	8

Heating	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.597	16.576	4.604	8.387
Downstream	14	148	41	39
Total	2.039	25.232	7.009	71.222



Core improvement action: Forklift

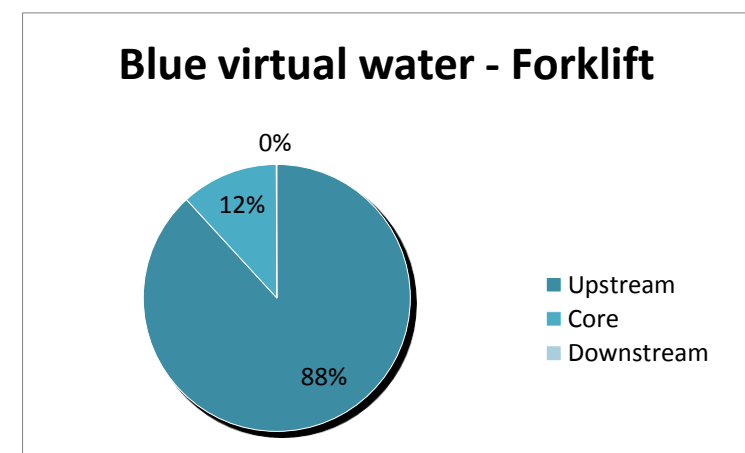
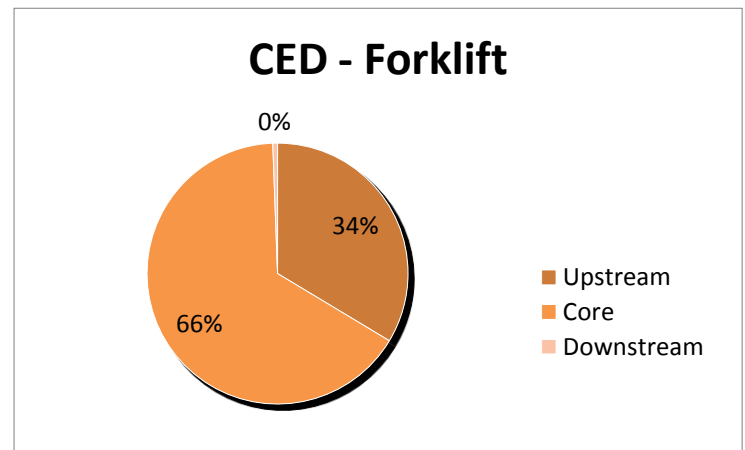
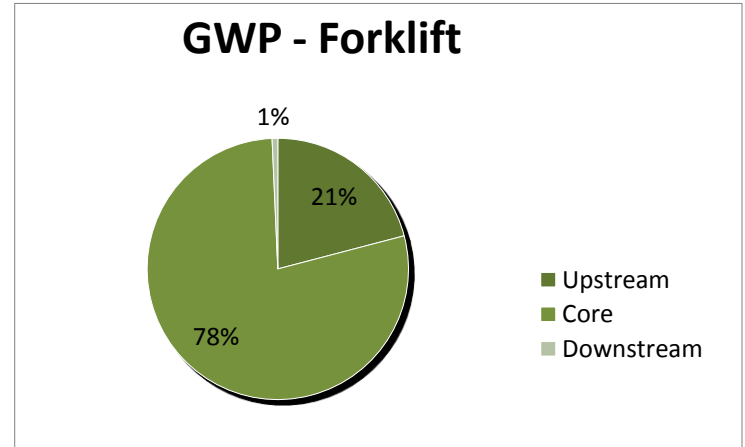
Description of the action.

The total estimate cost of the action is 2.800 €. The global result of the action is a saving of 1.760 kWh, 411 €, 0,12% of the total bill for electricity. The simple payback time is 6,8 years, while the discounted payback time is 8,1 years with a discount rate 4%.

New product cost: 0,06 /pieces 0,00 MWh/pieces

Forklift	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.601	16.657	4.627	8.383
Water consumption	0	28	8	5.320
Electricity consumption	1.498	14.982	4.162	2.996
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Forklift	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.601	16.657	4.627	8.383
Downstream	14	148	41	39
Total	2.043	25.313	7.031	71.219



Core improvement action: Air compressors

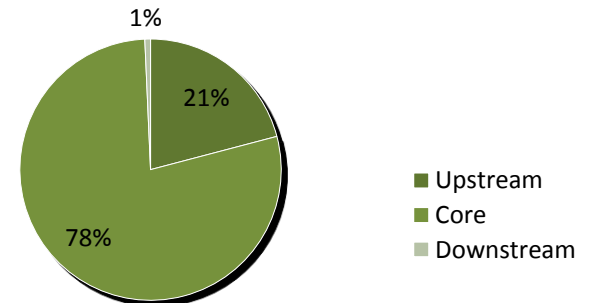
Description of the action.

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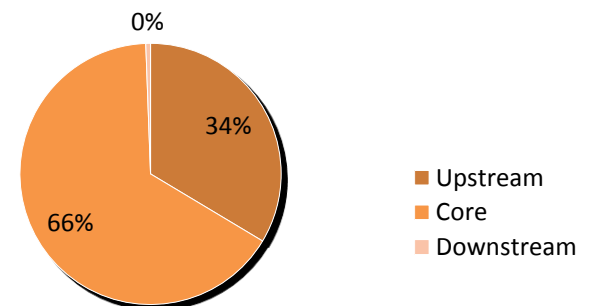
Air compressors	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Description:				
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Air compressors	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222

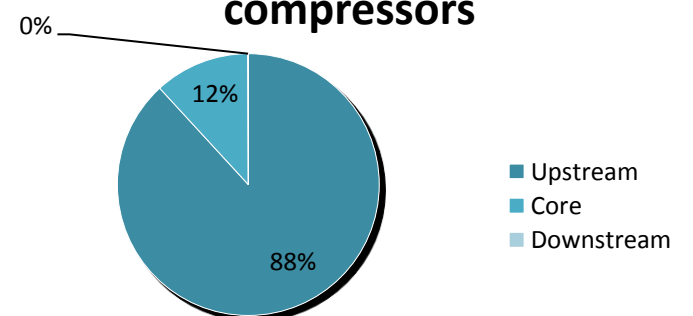
GWP - Air compressors



CED - Air compressors



Blue virtual water - Air compressors



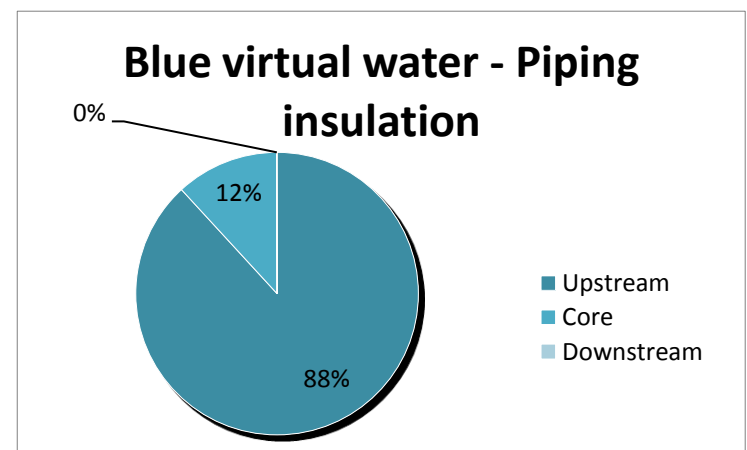
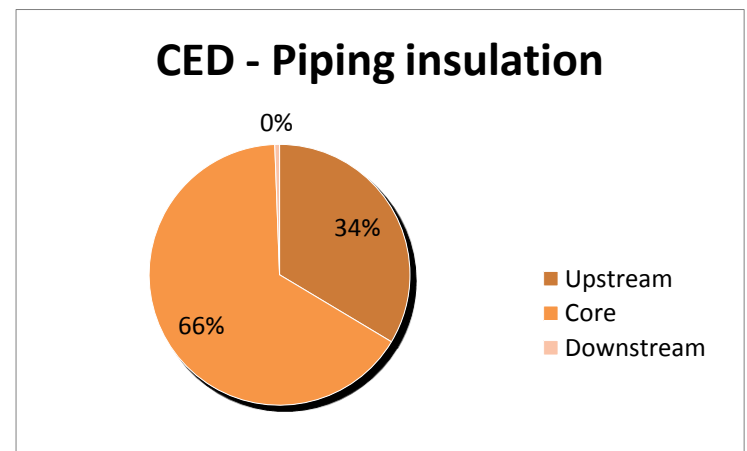
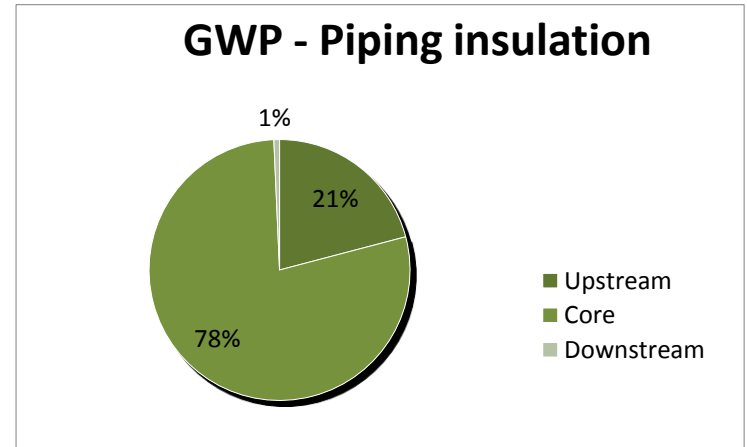
Core improvement action: Piping insulation

Description of the action.

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Piping insulation	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Piping insulation	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222



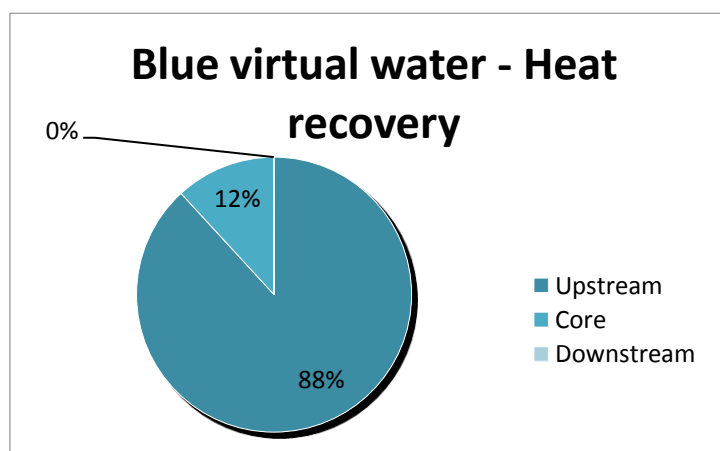
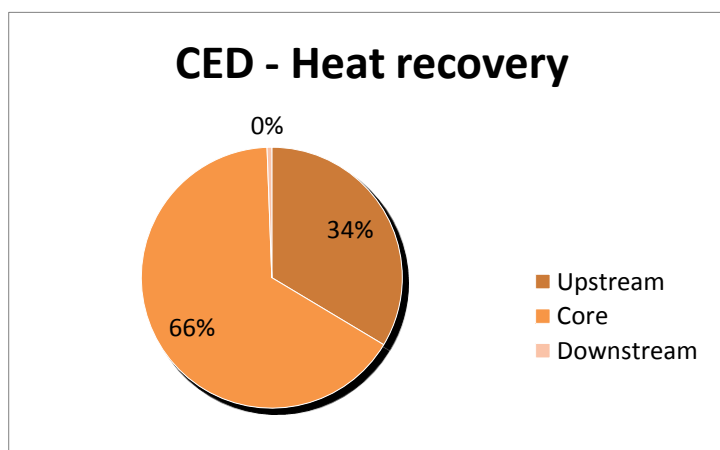
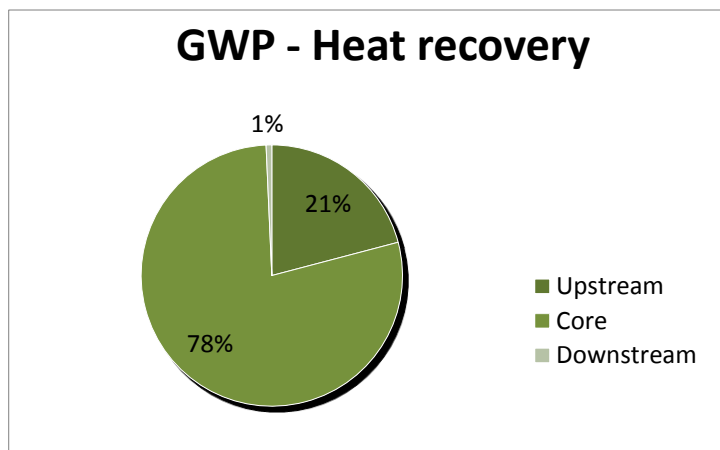
Core improvement action: Heat recovery

Description of the action.

#VALORE!

Heat recovery	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Description:				
LCA Upstream				
Total	427	8.509	2.363	62.797
	0	0	0	0
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Heat recovery	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222



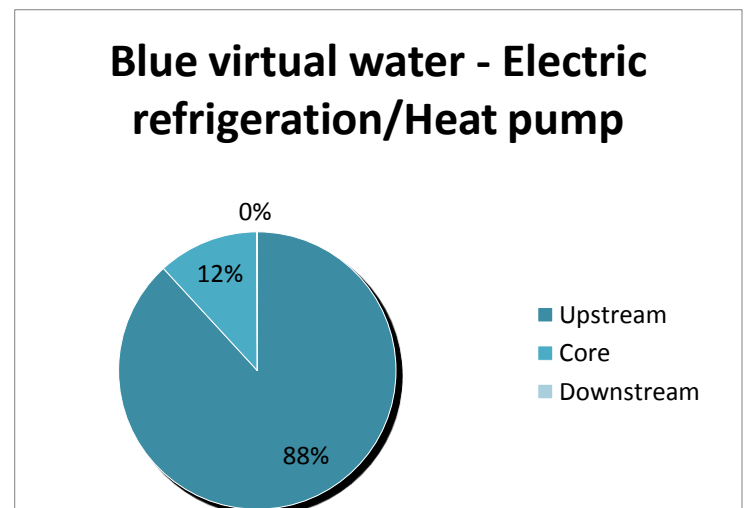
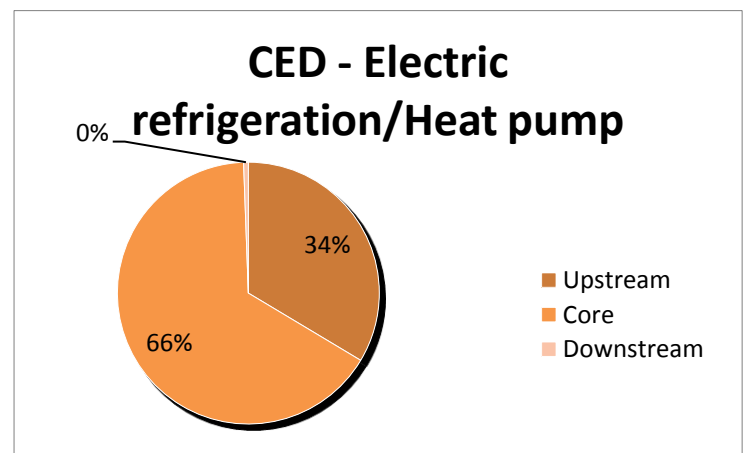
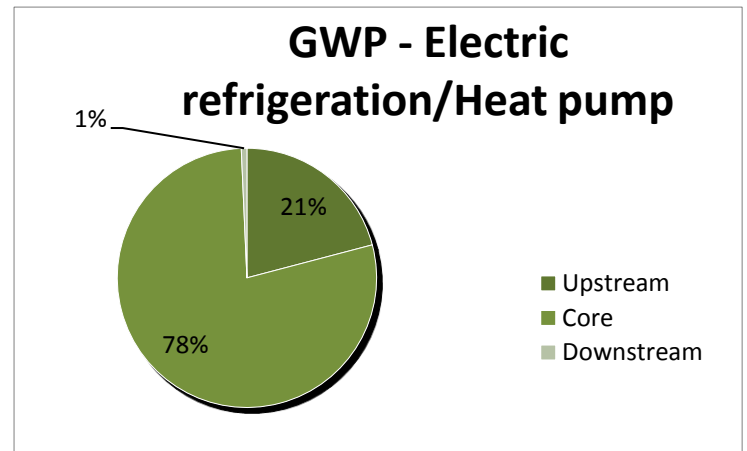
Core improvement action: Electric refrigeration/Heat pump

Description of the action.

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Electric refrigeration/Heat pump	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
Waste				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Electric refrigeration/Heat pump	GWP	CED	CED	Blue virtual water
Description:	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222



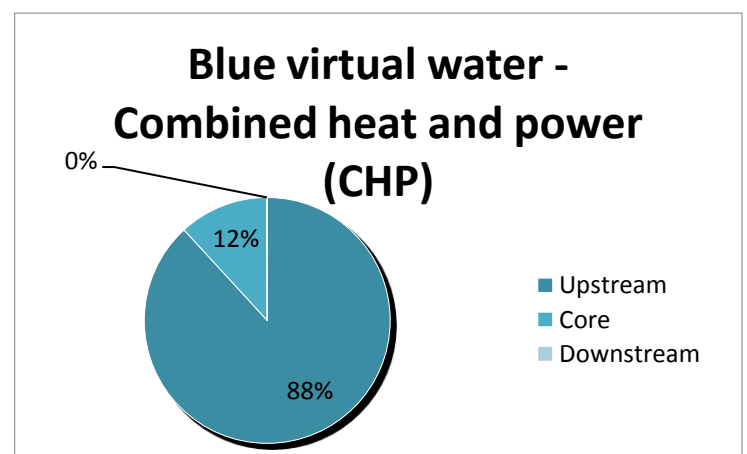
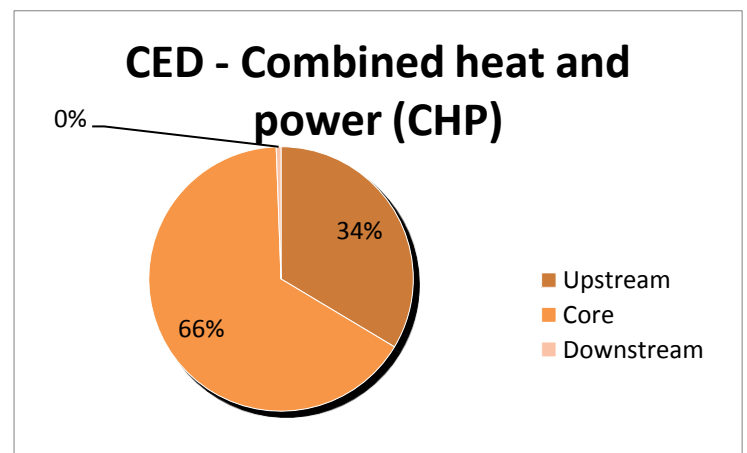
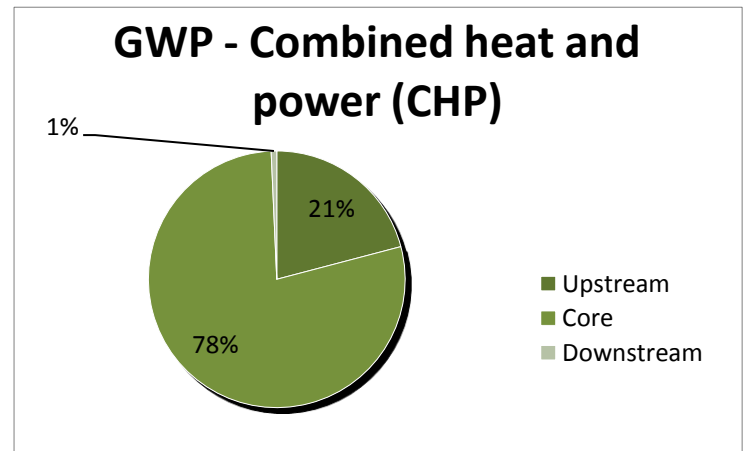
Core improvement action: Combined heat and power (CHP)

Description of the action.

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Combined heat and power (CHP)	GWP t CO2 eq	CED GJ	CED MWh	Blue virtual water m3.eq
Description:				
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Combined heat and power (CHP)	GWP t CO2 eq	CED GJ	CED MWh	Blue virtual water m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222



Core improvement action: Custom measure

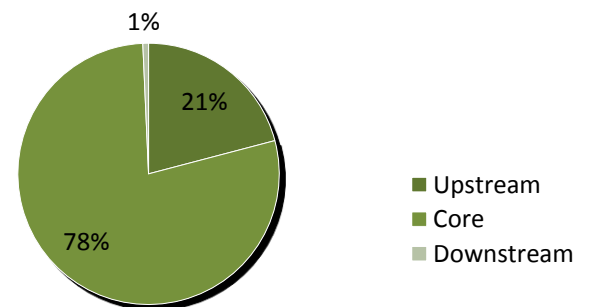
Description of the action.

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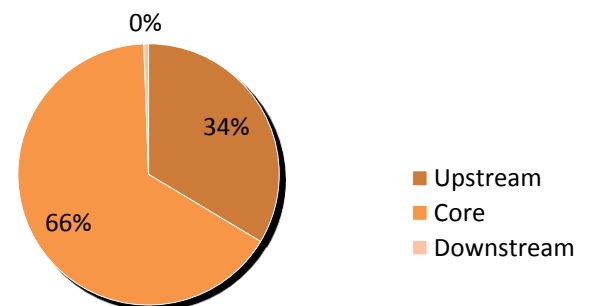
Custom measure	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Description: Absaugung-FU-Regelung mit				
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Custom measure	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222

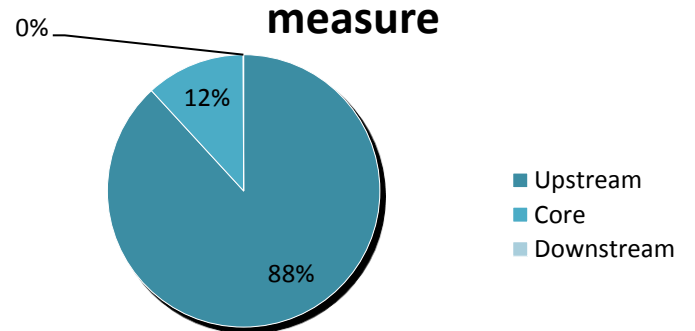
GWP - Custom measure



CED - Custom measure



Blue virtual water - Custom measure



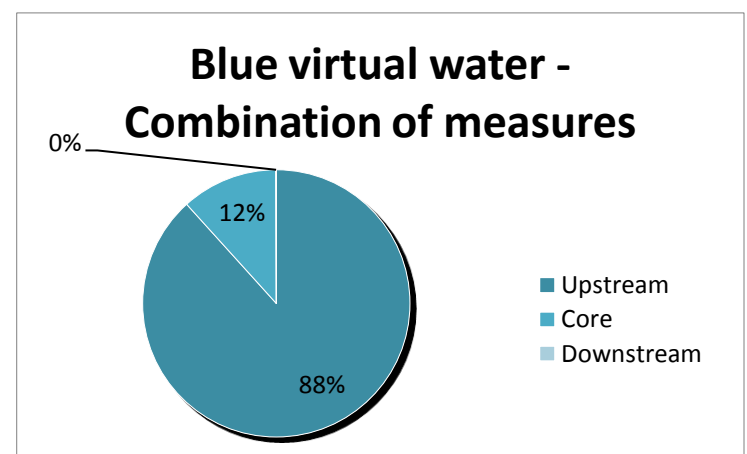
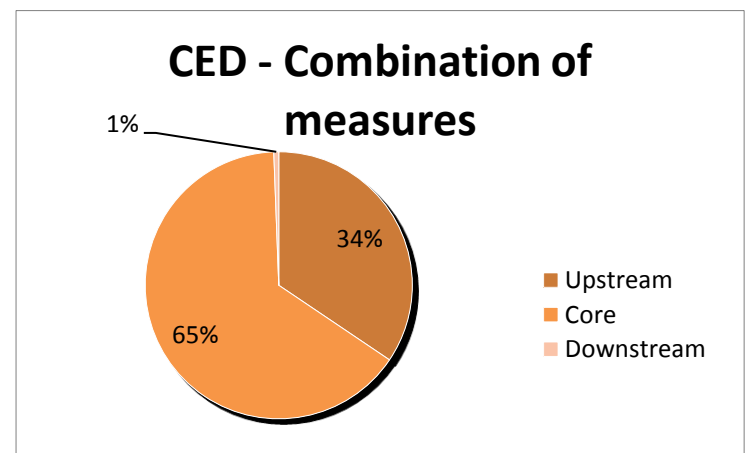
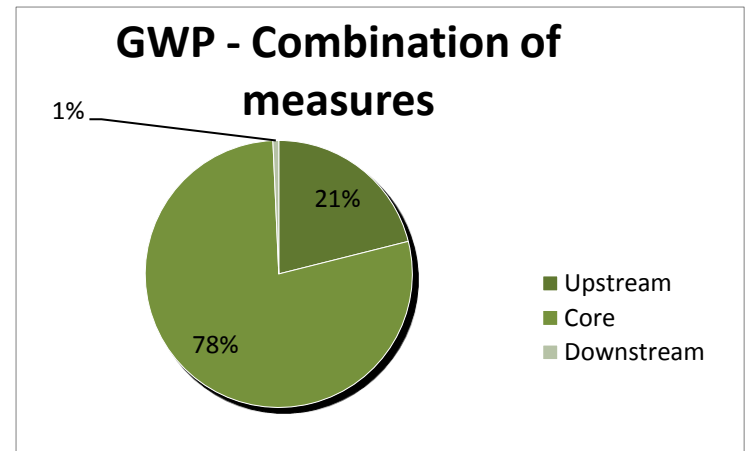
Core improvement action: Combination of measures

Description of the action.

New product cost: 0,06 €/pieces 0,00 MWh/pieces

Combination of measures	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Description:				
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.586	16.049	4.458	8.281
Water consumption	0	28	8	5.320
Electricity consumption	1.483	14.472	4.119	2.894
Natural gas	87	1.265	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

Combination of measures	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.586	16.049	4.458	8.281
Downstream	14	148	41	39
Total	2.028	24.705	6.862	71.117



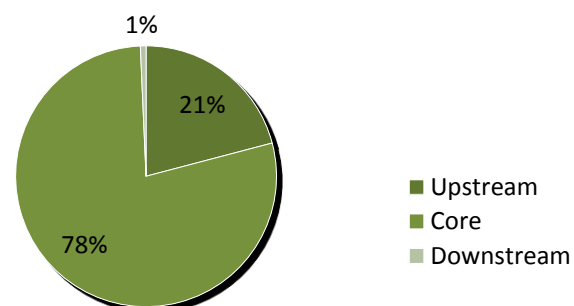
LCA improvement action: LCA 1

Description of the action.

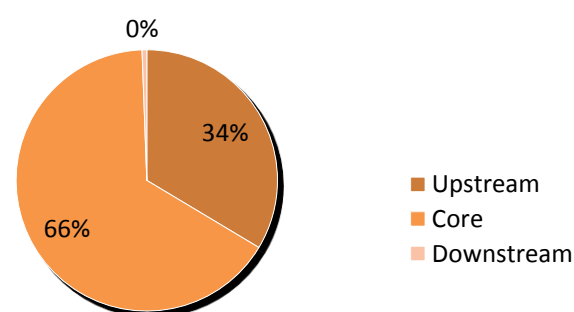
LCA 1	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Description: nur von WT Rohstoff anstelle von				
LCA Upstream				
Total	427	8.509	2.363	62.797
Raw materials	319	4.833	1.342	62.534
Semifinished products	0	0	0	0
Outsource manufacturing	0	0	0	0
Packaging	108	3.676	1.021	263
LCA Core				
Total	1.603	16.674	4.632	8.387
Water consumption	0	28	8	5.320
Electricity consumption	1.500	15.000	4.167	3.000
Natural gas	87	1.363	379	0
	0	0	0	0
	0	0	0	0
Internal transport	15	263	73	57
Wastewater treatment	0	0	0	4
Waste	1	20	5	5
LCA Downstream				
Total	14	148	41	39
Distribution	8	131	36	31
End of life	7	17	5	8

LCA 1	GWP	CED	CED	Blue virtual water
	t CO2 eq	GJ	MWh	m3.eq
Upstream	427	8.509	2.363	62.797
Core	1.603	16.674	4.632	8.387
Downstream	14	148	41	39
Total	2.045	25.330	7.036	71.222

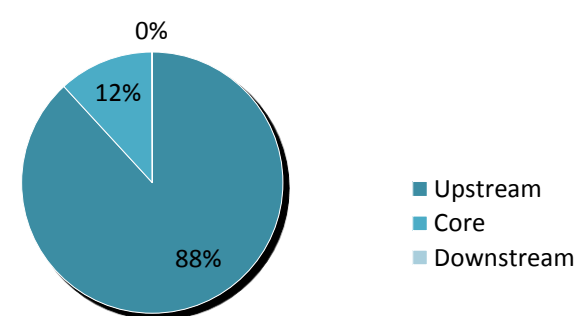
GWP - LCA 1



CED - LCA 1



Blue virtual water - LCA 1



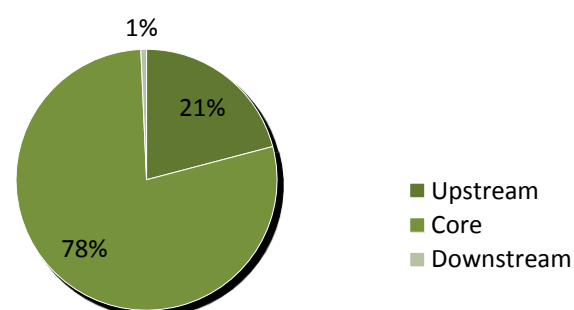
LCA improvement action: LCA 2

Description of the action

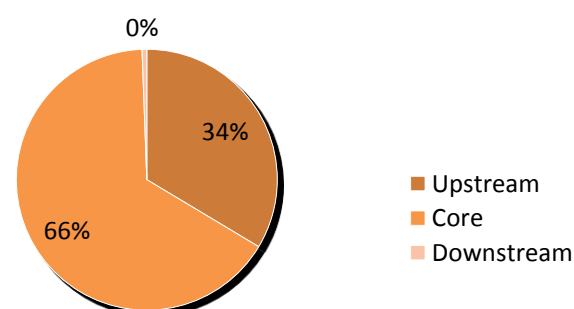
LCA 2		GWP	CED	CED	Blue virtual water
		t CO2 eq	GJ	MWh	m3.eq
Description: Nur Fremd-Fertigküchen					
LCA Upstream					
Total		427	8.509	2.363	62.797
	0	0	0	0	0
Raw materials		319	4.833	1.342	62.534
Semifinished products		0	0	0	0
Outsource manufacturing		0	0	0	0
Packaging		108	3.676	1.021	263
LCA Core					
Total		1.603	16.674	4.632	8.387
Water consumption		0	28	8	5.320
Electricity consumption		1.500	15.000	4.167	3.000
Natural gas		87	1.363	379	0
	0	0	0	0	0
	0	0	0	0	0
Internal transport		15	263	73	57
Wastewater treatment		0	0	0	4
Waste		1	20	5	5
LCA Downstream					
Total		14	148	41	39
	0	0	0	0	0
Distribution		8	131	36	31
End of life		7	17	5	8

LCA 2		GWP	CED	CED	Blue virtual water
		t CO2 eq	GJ	MWh	m3.eq
Upstream		427	8.509	2.363	62.797
Core		1.603	16.674	4.632	8.387
Downstream		14	148	41	39
Total		2.045	25.330	7.036	71.222

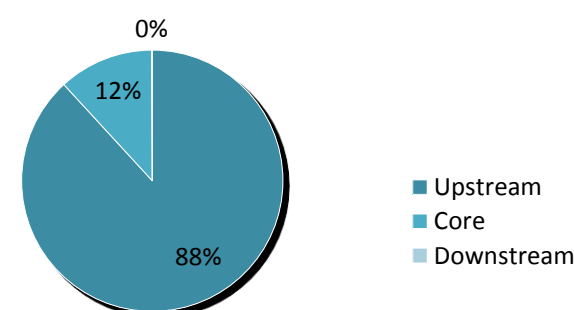
GWP - LCA 2



CED - LCA 2



Blue virtual water - LCA 2



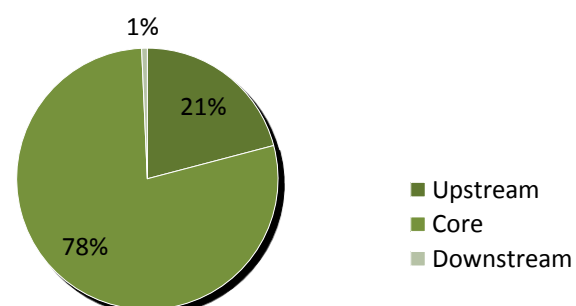
LCA improvement action: LCA 3

Description of the action

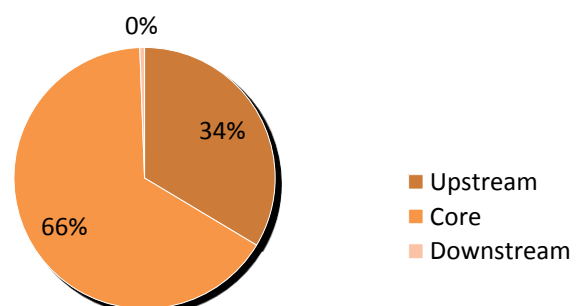
LCA 3		GWP	CED	CED	Blue virtual water
		t CO2 eq	GJ	MWh	m3.eq
Description: E-mobilität für 1 KFZ					
LCA Upstream					
Total		427	8.509	2.363	62.797
	0	0	0	0	0
Raw materials		319	4.833	1.342	62.534
Semifinished products		0	0	0	0
Outsource manufacturing		0	0	0	0
Packaging		108	3.676	1.021	263
LCA Core					
Total		1.603	16.674	4.632	8.387
Water consumption		0	28	8	5.320
Electricity consumption		1.500	15.000	4.167	3.000
Natural gas		87	1.363	379	0
	0	0	0	0	0
	0	0	0	0	0
Internal transport		15	263	73	57
Wastewater treatment		0	0	0	4
Waste		1	20	5	5
LCA Downstream					
Total		14	148	41	39
Distribution		8	131	36	31
End of life		7	17	5	8

LCA 3		GWP	CED	CED	Blue virtual water
		t CO2 eq	GJ	MWh	m3.eq
Upstream		427	8.509	2.363	62.797
Core		1.603	16.674	4.632	8.387
Downstream		14	148	41	39
Total		2.045	25.330	7.036	71.222

GWP - LCA 3



CED - LCA 3



Blue virtual water - LCA 3

