DRAFT (version 1, 8/30/18)

LCA Results - Atmospheric Water Generation (AWG) Technologies and Alternative Potable Water Emergency Respons

>>Select parameters of interest from drop down in green cells

e Options

Parameter Description	Select Value	Instructions
Reusable Container Washing Method	Handwash	Select "Dishwash" or "Handwash
Jug Transport Distance	Average	Select "Average" if 75 miles, "Mi
Single-serve Bottle Weight	Minimum	Select Minimum (9.3 g) or Maxir
Single-serve Bottle Recycled Content	None	Select "0%" or "10%"
Recycling Allocation Method	Cutoff	Select "Cutoff" or "System Expan
Bottled Water Source	Spring Water	Select "Spring Water" or "Treate
AWG Vendor	Ecoloblue	Select "WaterGen" or "Ecoloblue
AWG Water Production	Maximum	Select "Minimum", "Average", or
AWG Electrical Grid	Average US	Select "Average US", "RFCW", or

1. Summary Comparative Results on an Equivalent Volume of Water Delivered Basis

		Tota	
Category	**Unit**	Single-serve bottle	Reusable Jug
Acidification Potential	*kg SO2 eq*	5.1E-04	1.5E-04
Cumulative Energy Demand	*MJ*	2.54	0.62
Eutrophication Potential	*kg N eq*	1.8E-05	8.4E-06
Fossil Depletion	*kg oil eq*	0.054	0.013
Global Warming Potential	*kg CO2 eq*	0.12	0.041
Particulate Matter Formation Potential	*kg PM2.5 eq*	3.0E-05	1.1E-05
Smog Formation Potential	*kg O3 eq*	0.0079	0.0033
Solid Waste by Weight	*kg SW eq*	0.022	0.0011
Water Consumption	*liter H2O*	1.62	1.95

Category	Percent of Maximum		
	Single-serve bottle	Reusable Jug	AWG (Large Scale)
Acidification Potential	29%	9%	100%
Cumulative Energy Demand	56%	14%	100%
Eutrophication Potential	61%	28%	100%
Fossil Depletion	64%	16%	100%
Global Warming Potential	42%	15%	100%
Particulate Matter Formation Potential	33%	12%	100%
Smog Formation Potential	51%	21%	100%
Solid Waste by Weight	68%	3%	100%
Water Consumption	49%	59%	100%

2. Percent Contribution Results by Life Cycle Stage

	S		
Category	Raw Material Production	Conversion	Water Treatment
Acidification Potential	39%	36%	0%
Cumulative Energy Demand	51%	16%	0%
Eutrophication Potential	49%	20%	3%
Fossil Depletion	53%	15%	0%
Global Warming Potential	43%	22%	0%
Particulate Matter Formation Potential	45%	31%	0%
Smog Formation Potential	40%	26%	0%
Solid Waste by Weight	12%	13%	0%
Water Consumption	11%	10%	72%

	Mul		
Category	Raw Material Production	Conversion	Water Treatment
Acidification Potential	17%	6%	1%
Cumulative Energy Demand	18%	4%	0%
Eutrophication Potential	17%	2%	7%
Fossil Depletion	17%	3%	0%
Global Warming Potential	21%	4%	0%
Particulate Matter Formation Potential	37%	4%	0%
Smog Formation Potential	10%	3%	0%
Solid Waste by Weight	0%	16%	2%
Water Consumption	1%	0%	60%

	Large-Scale AWG Percent C		
Category	Capital Equipment	Transport to Point of Use	Operation
Acidification Potential	0%	0%	100%
Cumulative Energy Demand	0%	0%	100%
Eutrophication Potential	6%	0%	93%
Fossil Depletion	0%	0%	100%
Global Warming Potential	0%	0%	100%
Particulate Matter Formation Potential	1%	0%	99%
Smog Formation Potential	0%	0%	100%
Solid Waste by Weight	0%	0%	100%
Water Consumption	0%	0%	82%

Medium-Scale AWG Percent

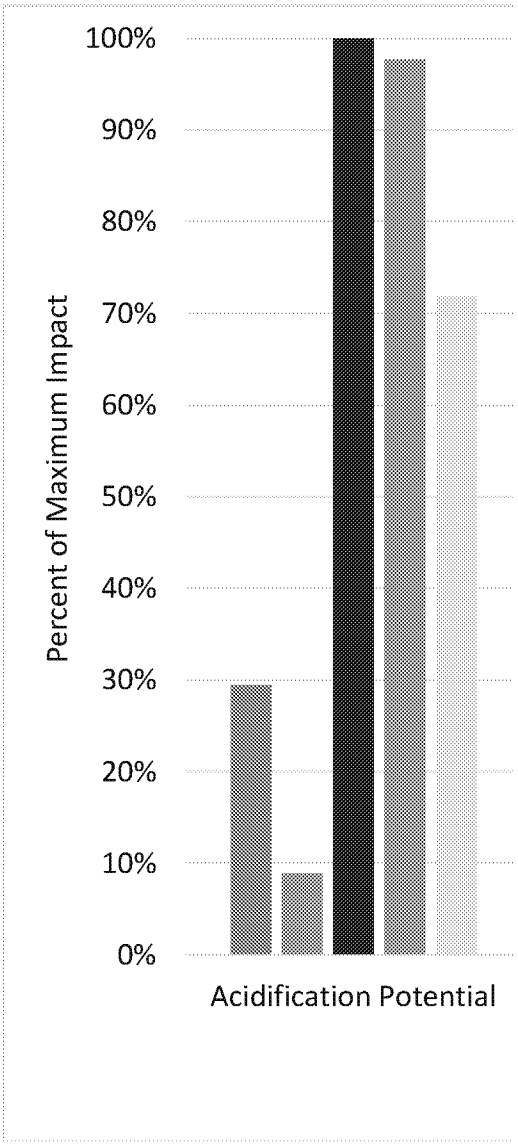
Category	Capital Equipment	Transport to Point of Use	Operation
Acidification Potential	0%	0%	100%
Cumulative Energy Demand	0%	0%	100%
Eutrophication Potential	9%	0%	90%
Fossil Depletion	0%	0%	100%
Global Warming Potential	0%	0%	100%
Particulate Matter Formation Potential	2%	0%	98%
Smog Formation Potential	0%	0%	100%
Solid Waste by Weight	0%	0%	100%
Water Consumption	0%	0%	82%

			Home/Office-Scale AWG Perce
Category	Capital Equipment	Transport to Point of Use	Operation
Acidification Potential	1%	0%	99%
Cumulative Energy Demand	1%	0%	99%
Eutrophication Potential	21%	0%	78%
Fossil Depletion	1%	0%	99%
Global Warming Potential	2%	0%	98%
Particulate Matter Formation Potential	4%	0%	96%
Smog Formation Potential	1%	0%	99%
Solid Waste by Weight	0%	0%	100%
Water Consumption	0%	0%	79%

	Default
"	Dishwash
nimum" if 25 miles, "Maximum" if 125 miles	Average
num (10.9 g). Only lightweight options provided.	Minimum
	None
sion"	Cutoff
d Municipal Water"	Spring Water
"	WaterGen
"Maximum"; Function of relative humidity and temperature (See Table 1)	Average
"FRCC". RFCW and FRCC are eGRID subregions.	Average US

l Impacts Per Liter			
AWG (Large Scale)	AWG (Medium Scale)	AWG (Home/Office Scale)	*Max*
0.0017	0.0017	0.0012	*0.0017*
4.50	4.40	3.24	*4.50*
3.0E-05	3.0E-05	2.5E-05	*3.0E-05*
0.085	0.083	0.061	*0.085*
0.28	0.27	0.20	*0.28*
9.2E-05	9.0E-05	6.7E-05	*9.2E-05*
0.015	0.0151	0.011	*0.015*
0.032	0.031	0.023	*0.032*
3.32	3.28	2.84	*3.32*

AWG (Medium Scale)	AWG (Home/Office Scale)
98%	72%
98%	72%
100%	85%
98%	72%
98%	72%
98%	74%
98%	72%
98%	71%
99%	85%



ingle-Serve Bottle Percent Contribution

Filling	Transportation to Retail	Closure Life Cycle	Label Life Cycle	Secondary Packaging Life Cycle	Bottle End-of-Life	*Total*
1%	12%	6%	3%	4%	0%	**100%**
0%	8%	9%	4%	11%	0%	**100%**
0%	18%	4%	2%	3%	1%	**100%**
0%	9%	8%	4%	10%	0%	**100%**
0%	12%	7%	3%	9%	4%	**100%**
1%	9%	6%	3%	5%	1%	**100%**
0%	22%	5%	2%	4%	1%	**100%**
0%	1%	8%	6%	11%	49%	**100%**
0%	2%	2%	1%	2%	0%	**100%**

ti-Serve Reusable Jug Percent Contribution

Filling	Transportation to and from User	Closure Life Cycle	Reusable Container Washing	Jug Washing	Jug Recycling	*Total*
2%	56%	7%	1%	10%	0%	**100%**
1%	56%	13%	1%	7%	0%	**100%**
1%	56%	3%	4%	11%	0%	**100%**
1%	59%	13%	0%	6%	0%	**100%**
1%	60%	7%	1%	6%	0%	**100%**
1%	42%	6%	1%	8%	0%	**100%**
1%	77%	4%	0%	4%	0%	**100%**
5%	31%	16%	2%	27%	0%	**100%**
0%	2%	1%	31%	5%	0%	**100%**

Contribution

Reusable Container Washing	Disposal	*Total*
0%	0%	**100%**
0%	0%	**100%**
1%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
18%	0%	**100%**

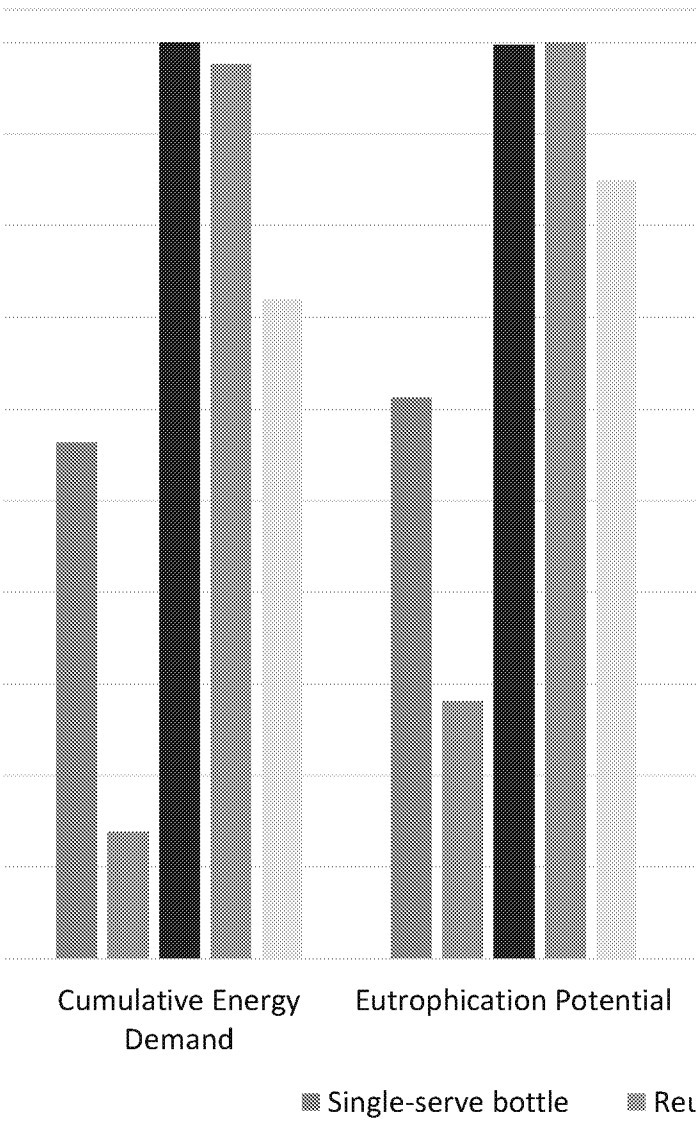
: Contribution

Reusable Container Washing	Disposal	*Total*
0%	0%	**100%**
0%	0%	**100%**
1%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
18%	0%	**100%**

ent Contribution

Reusable Container Washing	Disposal	*Total*
0%	0%	**100%**
0%	0%	**100%**
1%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
0%	0%	**100%**
21%	0%	**100%**

Relevant Systems
Multi-serve reusable jug, AWG
Multi-serve reusable jug
Single-serve plastic bottle
Single-serve plastic bottle
Single-serve plastic bottle, Multi-serve reusable jug
Single-serve plastic bottle, Multi-serve reusable jug
AWG
AWG
AWG



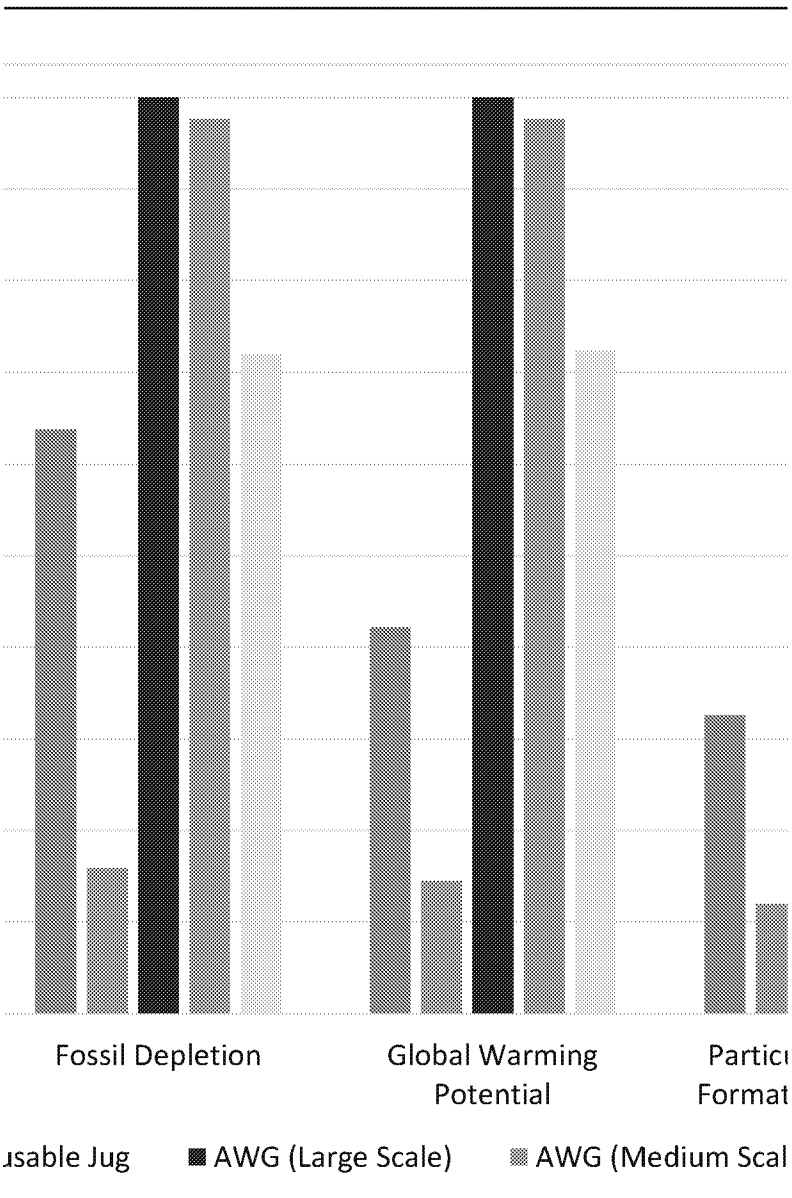
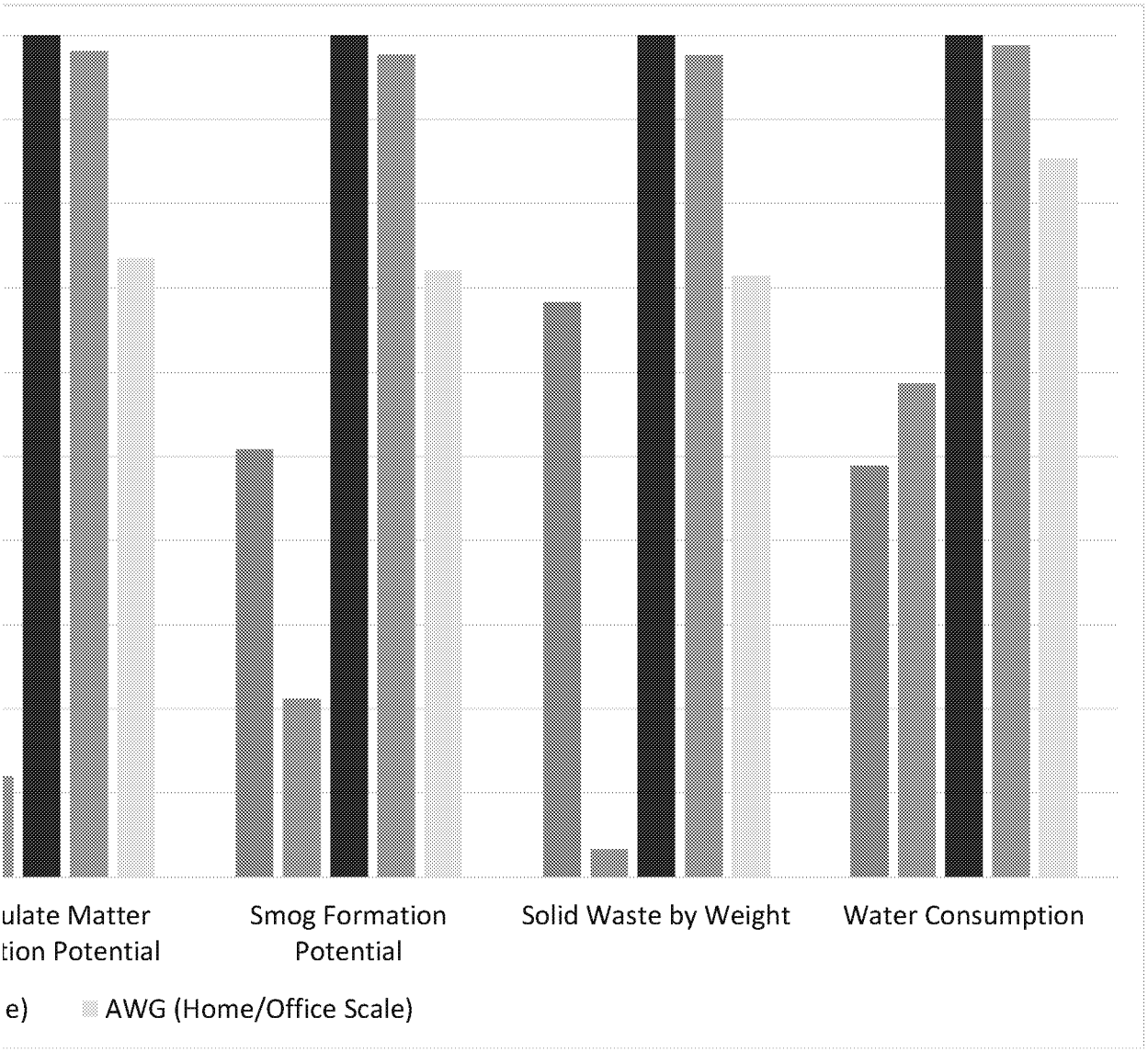

Fossil Depletion
Global Warming Potential
Partic
Format
usable Jug
AWG (Large Scale)
AWG (Medium Scal

Table 1

Vendor	Watergen			Ecolob	
Scale	Large	Medium	Home/Office	Large	Medium
Maximum water produced (L/day)	4000	578	25	4781	962
Minimum water produced (L/day)	3000	38	15	193	50
Modeled value average water produced (L/day)	3000	400	25	3000	600
Relative Humidity range (%)	60	20-70	60	30-80	30-80
Temperature range (°C)	26.7	15-40	26.7	0-55	0-55



ɔlue
Home/Office
30
20
30
0-60
25-100

AWG lifecycle stage both venders percent contribution by impact category

Watergen	Capital Equipment			Operation	
	Large Scale	Medium Scale	Home Office	Large Scale	Medium Scale
Acidification P	1%	1%	1%	99%	99%
Cumulative Er	1%	1%	1%	99%	99%
Eutrophicatio	16%	30%	32%	83%	69%
Fossil Depletic	0%	1%	1%	99%	99%
Global Warmi	1%	2%	2%	99%	98%
Particulate Ma	4%	8%	9%	96%	92%
Smog Formati	1%	2%	2%	99%	98%
Solid Waste b	0%	0%	0%	100%	100%
Water Consur	0%	1%	1%	80%	79%

Ecoloblue	Capital Equipment			Operation	
Category	Large Scale	Medium Scale	Home Office	Large Scale	Medium Scale
Acidification P	0%	0%	1%	100%	100%
Cumulative Er	0%	0%	1%	100%	100%
Eutrophicatio	10%	13%	21%	89%	86%
Fossil Depletic	0%	0%	1%	100%	100%
Global Warmi	1%	1%	2%	99%	99%
Particulate Ma	2%	3%	4%	98%	97%
Smog Formati	0%	1%	1%	99%	99%
Solid Waste b	0%	0%	0%	100%	100%
Water Consur	0%	0%	0%	82%	82%

Reusable bottle transportation distance

			Jug Transport	
		Default	% change	% change
npact Categori	Units	75 Miles	Low Transport (25 mi)	High Transport (125 mi)
Acidification P	kg SO2 eq	0.31	-0.58	0.38
Cumulative Er	MJ	0.35	-0.57	0.35
Eutrophicatio	kg N eq	0.28	-0.59	0.41
Fossil Depletic	kg oil eq	0.38	-0.56	0.33
Global Warmi	kg CO2 eq	0.38	-0.55	0.33
Particulate Ma	kg PM2.5 eq	0.26	-0.60	0.42
Smog Formati	kg O3 eq	0.58	-0.46	0.20
Solid Waste b	kg SW eq	0.10	-0.64	0.56
Water Consur	liter H2O	0.02	-0.66	0.64

	Low Transport (25 m	High Transport (125 mi)
Acidification P	-0.209454505	0.208934112
Cumulative Er	-0.230893897	0.230320239
Eutrophicatio	-0.184680747	0.184221918
Fossil Depletic	-0.251299545	0.250675178
Global Warmi	-0.252176923	0.251550409
Particulate Ma	-0.172373761	0.171945506

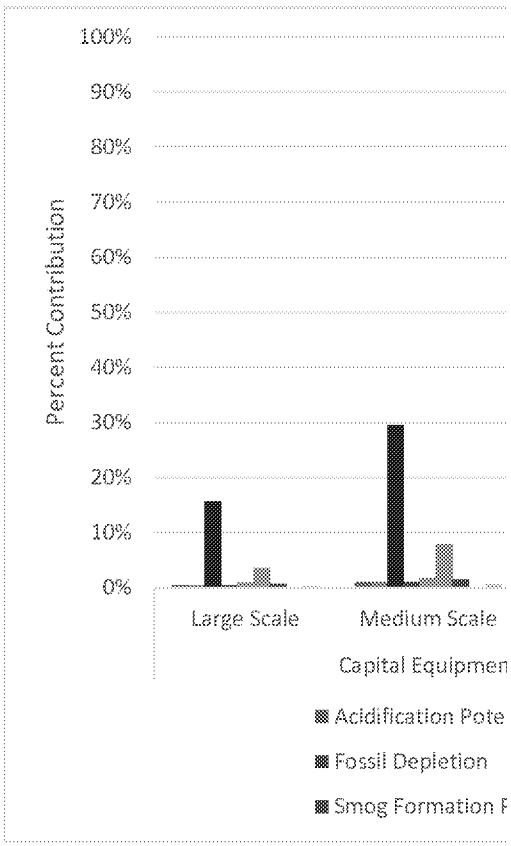
Smog Formati	-0.385328495	0.384371163
Solid Waste b	-0.069629324	0.06945633
Water Consur	-0.015438772	0.015400415

	25 Miles	75 Miles	125 Miles
Acidification P	0.00021932	0.000277429	0.000335393
Cumulative Er	0.776488053	1.00959809	1.242128963
Eutrophicatio	1.37386E-05	1.68505E-05	1.99548E-05
Fossil Depletic	0.015799226	0.021102199	0.026391997
Global Warmi	0.048440875	0.064775849	0.08107024
Particulate Ma	1.47667E-05	1.78423E-05	2.09102E-05
Smog Formati	0.002702772	0.0043971	0.006087219
Solid Waste b	0.002998904	0.003223343	0.003447225
Water Consur	1.806331595	1.834656438	1.862910909

Particulate

Reusable Container Washing

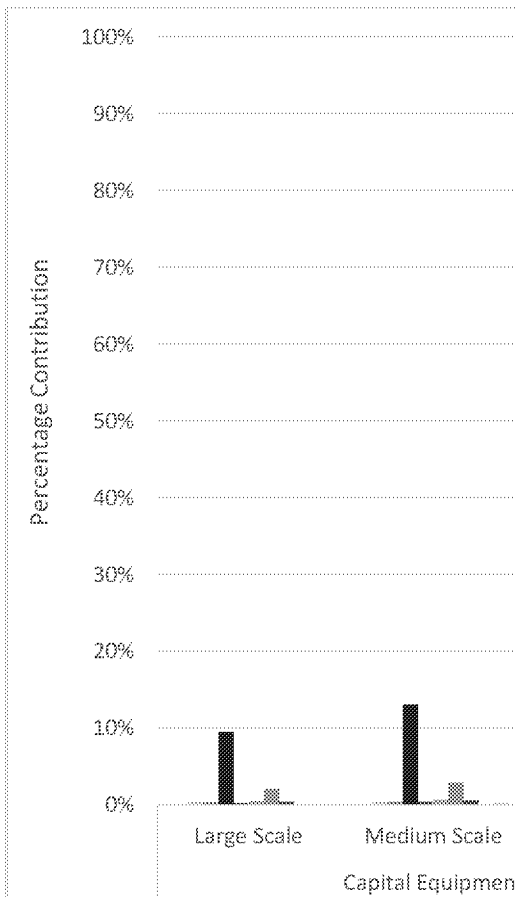
Home Office	Large Scale	Medium Scale	Home Office
99%	0%	0%	0%
99%	0%	0%	0%
67%	1%	1%	1%
99%	0%	0%	0%
98%	0%	0%	0%
91%	0%	0%	0%
98%	0%	0%	0%
100%	0%	0%	0%
78%	20%	20%	21%

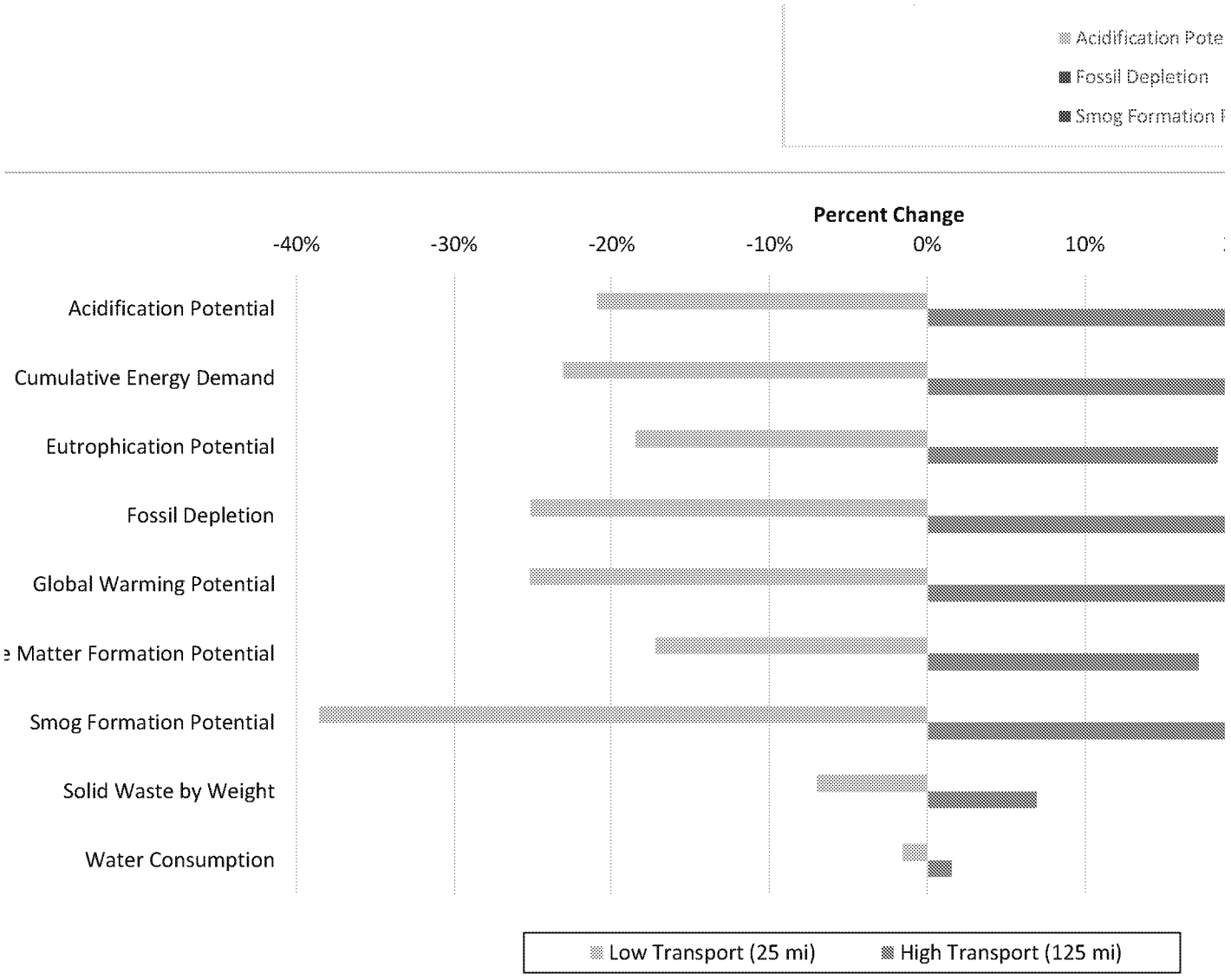


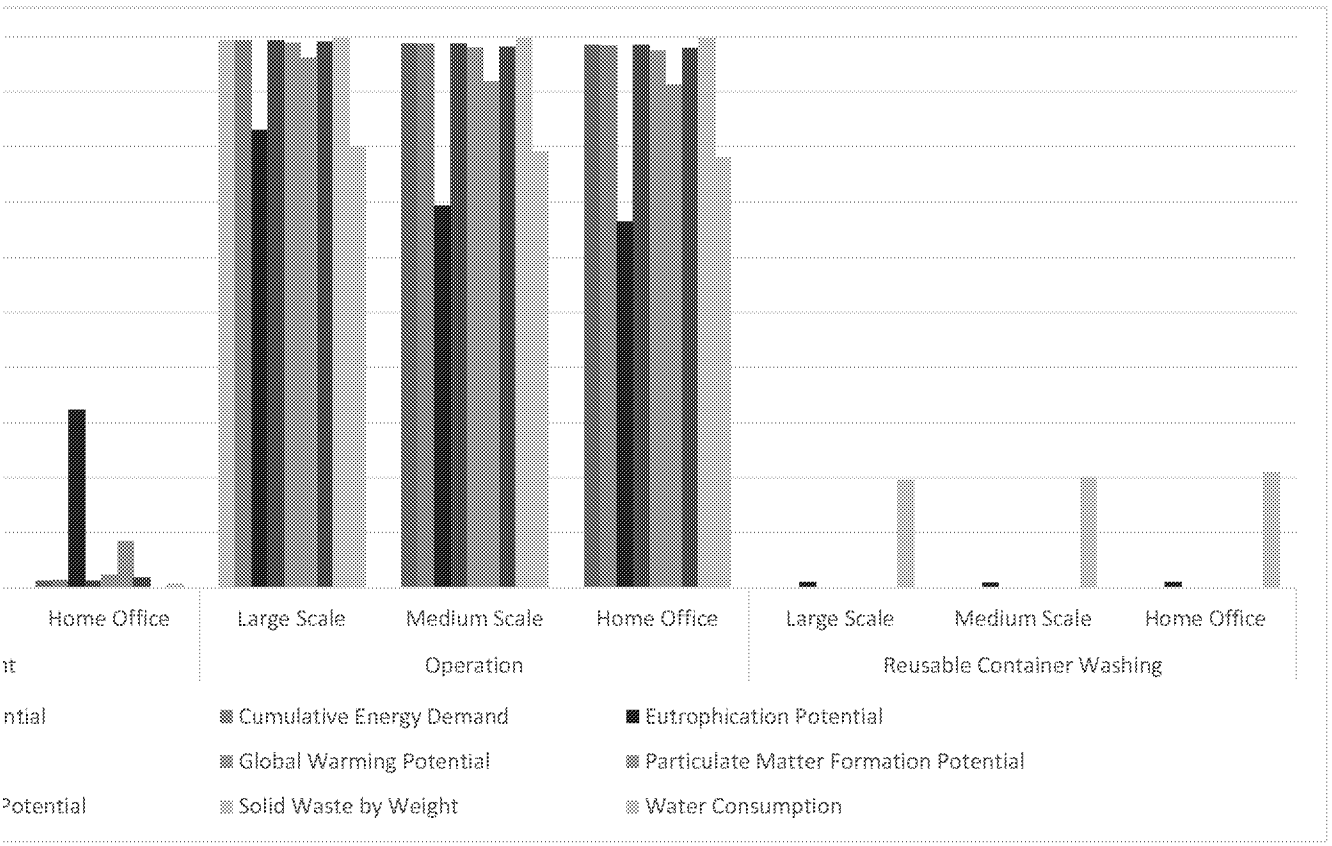
Reusable Container Washing

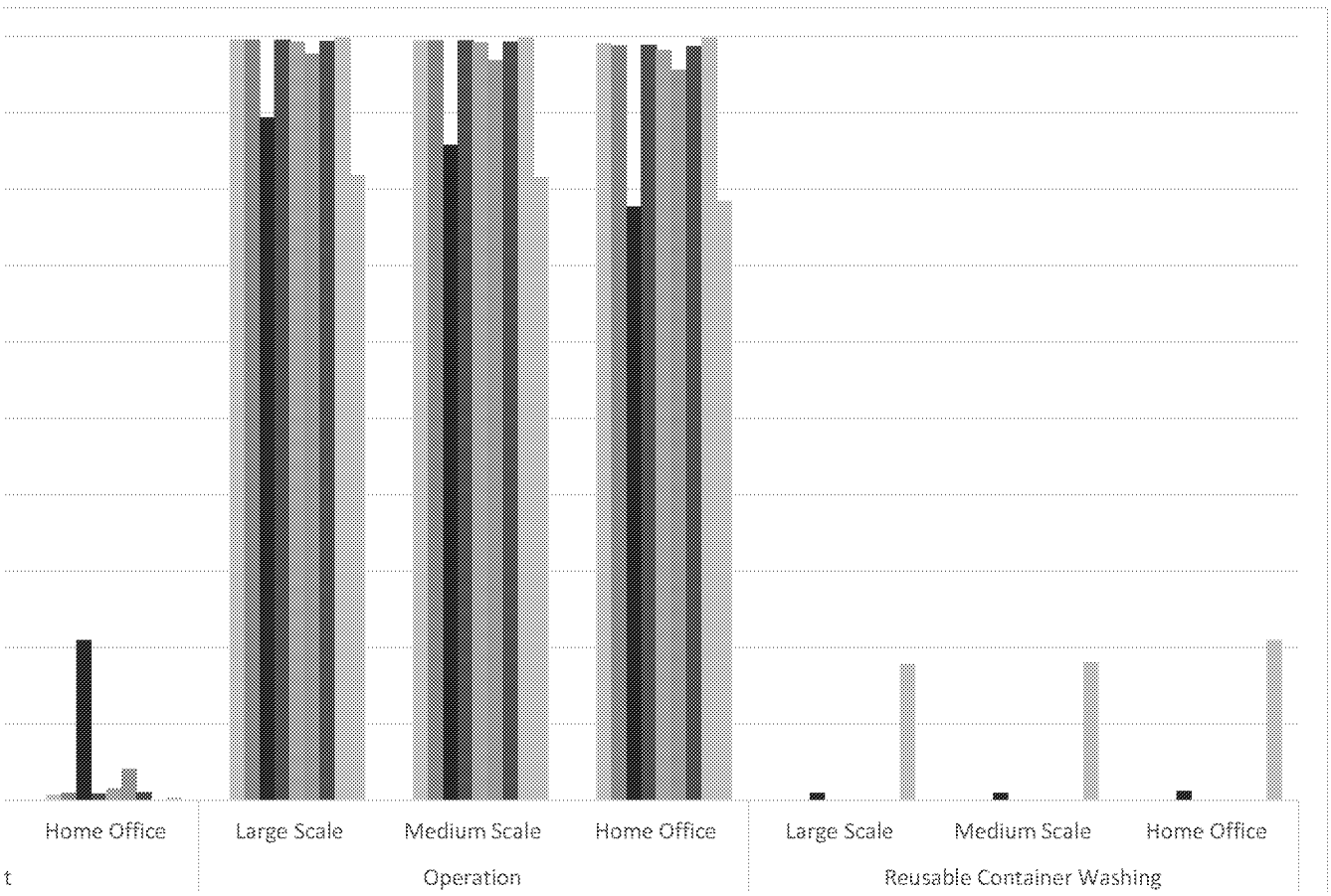
Home Office	Large Scale	Medium Scale	Home Office
99%	0%	0%	0%
99%	0%	0%	0%
78%	1%	1%	1%
99%	0%	0%	0%
98%	0%	0%	0%
96%	0%	0%	0%
99%	0%	0%	0%
100%	0%	0%	0%
79%	18%	18%	21%

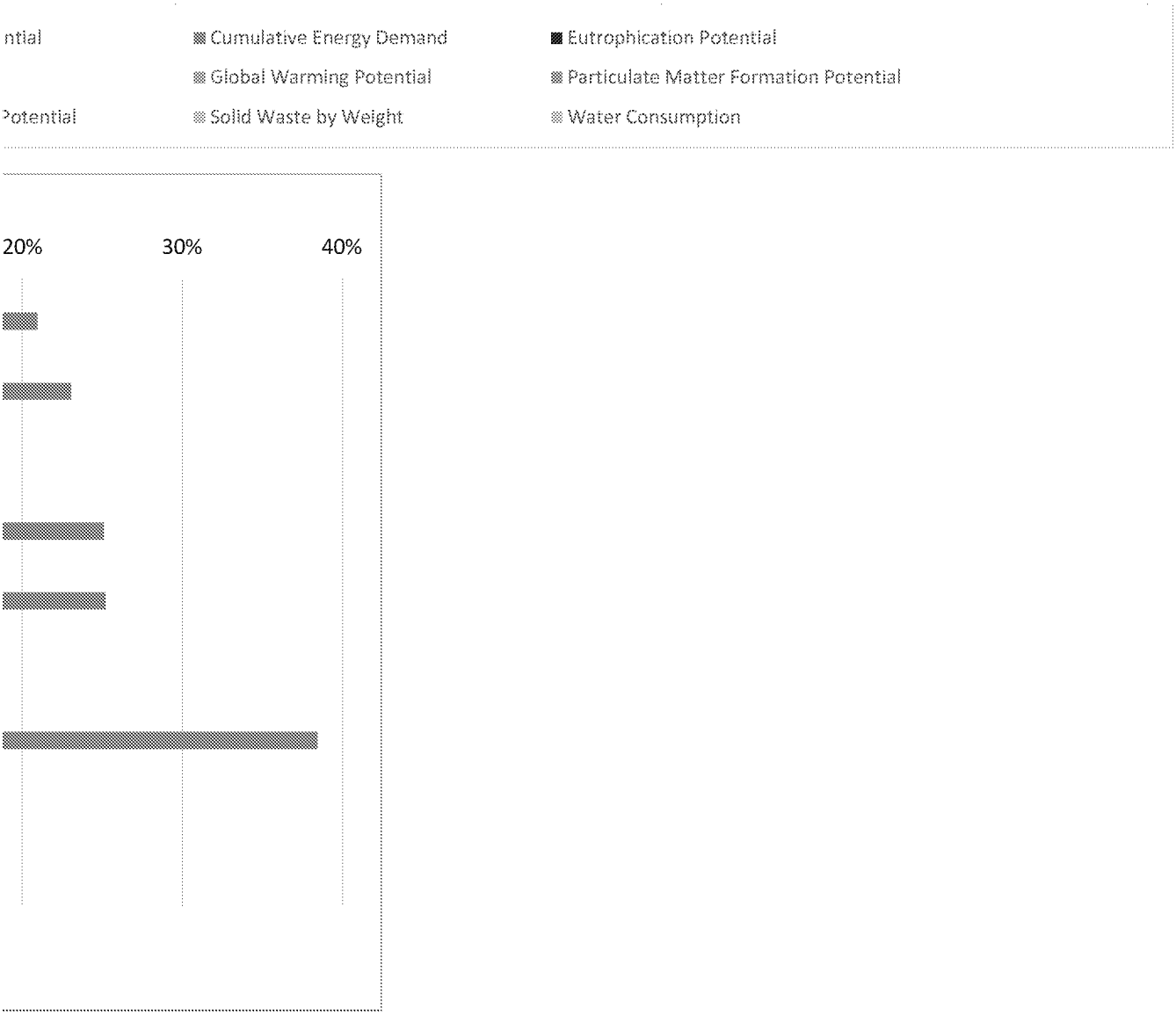
25 Miles	125 Miles
0.132310104	0.432600726
0.149918891	0.468591552
0.113116017	0.389393512
0.167615339	0.501703731
0.168397902	0.503103322
0.104008081	0.36725179
0.313053248	0.694990328
0.03737372	0.162565841
0.007830693	0.037964318




Acidification Pote
Fossil Depletion
Smog Formation I
Percent Change
-40%
-30%
-20%
-10%
0%
10%
Acidification Potential
Cumulative Energy Demand
Eutrophication Potential
Fossil Depletion
Global Warming Potential
e Matter Formation Potential
Smog Formation Potential
Solid Waste by Weight
Water Consumption
Low Transport (25 mi)
High Transport (125 mi)


Home Office
Large Scale
Medium Scale
Home Office
Large Scale
Medium Scale
Home Office
nt
Operation
Reusable Container Washing
ntial
Cumulative Energy Demand
Eutrophication Potential
Global Warming Potential
Particulate Matter Formation Potential
Potential
Solid Waste by Weight
Water Consumption


Home Office
Large Scale
Medium Scale
Home Office
Large Scale
Medium Scale
Home Office
t
Operation
Reusable Container Washing


ntial
Cumulative Energy Demand
Eutrophication Potential
Global Warming Potential
Particulate Matter Formation Potential
Potential
Solid Waste by Weight
Water Consumption
20%
30%
40%

All systems compared

Default	Total Impacts Per Liter	
Category	Single-serve bottle	Reusable Jug
Acidification Potential	5.08E-04	2.30E-04
Cumulative Energy Demand	2.54E+00	9.32E-01
Eutrophication Potential	1.83E-05	1.21E-05
Fossil Depletion	5.40E-02	2.01E-02
Global Warming Potential	1.18E-01	6.06E-02
Particulate Matter Formation Potential	2.98E-05	1.64E-05
Smog Formation Potential	7.87E-03	4.91E-03
Solid Waste by Weight	2.18E-02	1.58E-03
Water Consumption	1.62E+00	2.03E+00
	Percent of Max	
Category	Single-serve bottle	Reusable Jug
Acidification Potential	19.65%	8.89%
Cumulative Energy Demand	37.54%	13.79%
Eutrophication Potential	39.22%	26.02%
Fossil Depletion	42.52%	15.83%
Global Warming Potential	28.11%	14.43%
Particulate Matter Formation Potential	21.58%	11.84%
Smog Formation Potential	33.88%	21.12%
Solid Waste by Weight	45.57%	3.31%
Water Consumption	39.69%	49.61%

Maximum Scenario	Total Impacts Per Liter	
Category	Single-serve bottle	Reusable Jug
Acidification Potential	5.53E-04	2.84E-04
Cumulative Energy Demand	2.44E+00	1.05E+00
Eutrophication Potential	2.07E-05	1.57E-05
Fossil Depletion	5.14E-02	2.32E-02
Global Warming Potential	1.22E-01	7.20E-02
Particulate Matter Formation Potential	3.20E-05	1.51E-05
Smog Formation Potential	8.32E-03	7.01E-03
Solid Waste by Weight	2.43E-02	2.03E-03
Water Consumption	1.91E+00	2.40E+00

Maximum Scenario	Average of Min-Max	
Category	Single-serve bottle	Reusable Jug
Acidification Potential	0.00003	0.00009
Cumulative Energy Demand	0.00402	0.33146
Eutrophication Potential	0.00000	0.00001
Fossil Depletion	-0.00007	0.00754
Global Warming Potential	0.00376	0.02398
Particulate Matter Formation Potential	0.00000	0.00000
Smog Formation Potential	0.00033	0.00272
Solid Waste by Weight	0.00134	0.00060
Water Consumption	0.14527	0.53696

Minimum Scenario	Total Impacts Per Liter	
Category	Single-serve bottle	Reusable Jug
Acidification Potential	4.96E-04	9.52E-05
Cumulative Energy Demand	2.43E+00	3.88E-01
Eutrophication Potential	1.78E-05	4.97E-06
Fossil Depletion	5.15E-02	8.10E-03
Global Warming Potential	1.15E-01	2.41E-02
Particulate Matter Formation Potential	2.89E-05	7.84E-06
Smog Formation Potential	7.66E-03	1.58E-03
Solid Waste by Weight	2.16E-02	8.28E-04
Water Consumption	1.62E+00	1.32E+00

Minimum Scenario	Percent of Max	
Category	Single-serve bottle	Reusable Jug
Acidification Potential	1%	4%
Cumulative Energy Demand	0%	5%
Eutrophication Potential	3%	12%
Fossil Depletion	0%	6%
Global Warming Potential	1%	6%
Particulate Matter Formation Potential	1%	3%
Smog Formation Potential	1%	12%
Solid Waste by Weight	3%	1%
Water Consumption	4%	13%

Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS	Ecoloblue MS	Ecoloblue H/O
2.16E-03	2.05E-03	1.87E-03	2.59E-03	2.53E-03	1.86E-03
5.64E+00	5.35E+00	4.88E+00	6.75E+00	6.60E+00	4.86E+00
4.11E-05	4.64E-05	4.40E-05	4.58E-05	4.66E-05	3.76E-05
1.06E-01	1.01E-01	9.17E-02	1.27E-01	1.24E-01	9.13E-02
3.52E-01	3.34E-01	3.06E-01	4.20E-01	4.11E-01	3.03E-01
1.17E-04	1.15E-04	1.06E-04	1.38E-04	1.36E-04	1.01E-04
1.94E-02	1.85E-02	1.69E-02	2.32E-02	2.27E-02	1.67E-02
3.98E-02	3.75E-02	3.41E-02	4.78E-02	4.66E-02	3.41E-02
3.66E+00	3.55E+00	3.38E+00	4.09E+00	4.03E+00	3.36E+00

Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS	Ecoloblue MS	Ecoloblue H/O
83.53%	79.24%	72.20%	100.00%	97.73%	71.74%
83.52%	79.22%	72.22%	100.00%	97.72%	71.92%
88.12%	99.52%	94.38%	98.31%	100.00%	80.64%
83.51%	79.18%	72.18%	100.00%	97.71%	71.90%
83.68%	79.59%	72.78%	100.00%	97.72%	72.19%
84.71%	83.54%	76.44%	100.00%	98.46%	72.96%
83.60%	79.54%	72.52%	100.00%	97.77%	71.92%
83.33%	78.57%	71.43%	100.00%	97.62%	71.43%
89.59%	86.91%	82.58%	100.00%	98.57%	82.19%

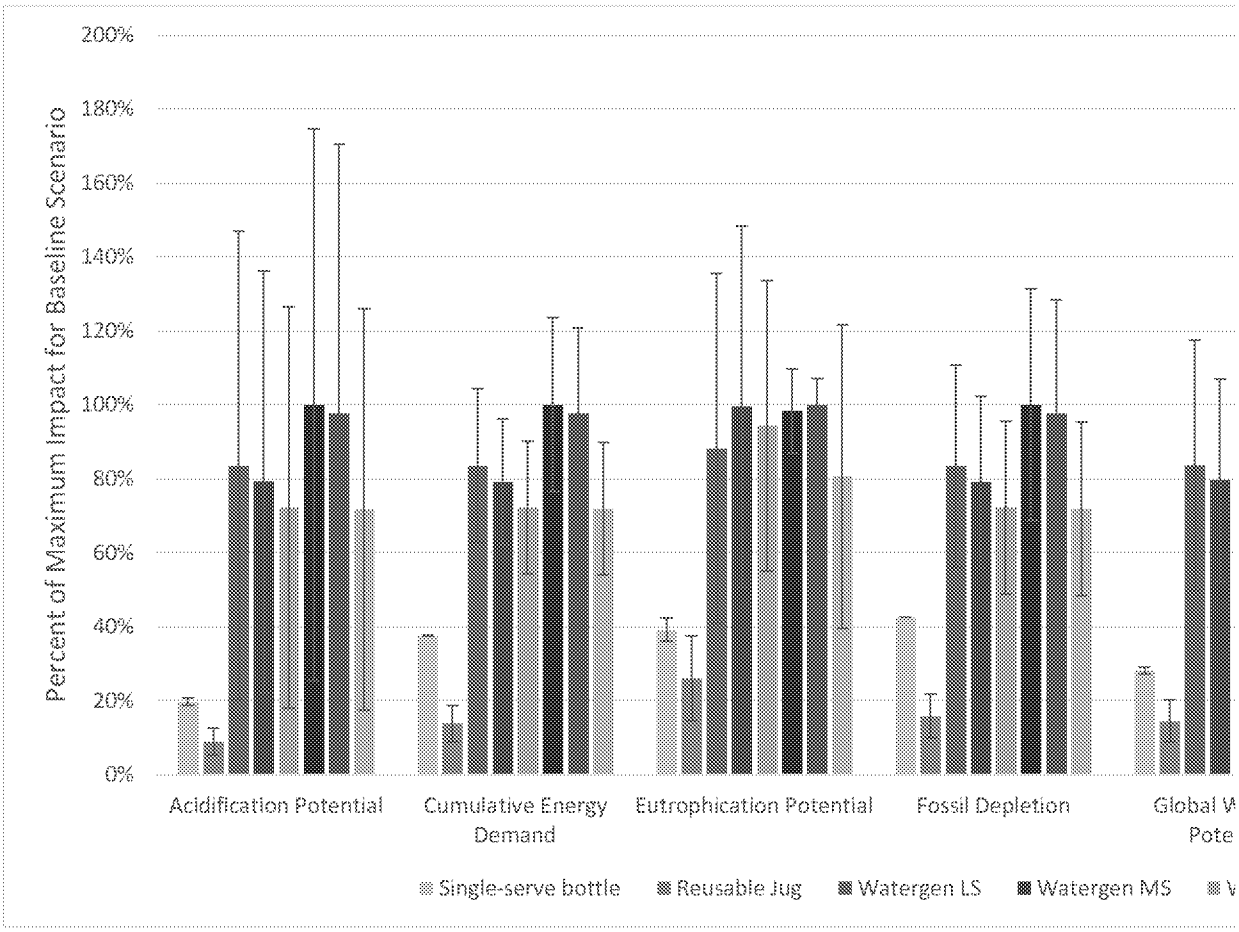
Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS	Ecoloblue MS	Ecoloblue H/O
3.54E-03	3.35E-03	3.05E-03	4.25E-03	4.15E-03	3.04E-03
6.33E+00	5.99E+00	5.48E+00	7.59E+00	7.41E+00	5.46E+00
5.70E-05	5.96E-05	5.99E-05	6.64E-05	6.60E-05	5.35E-05
1.31E-01	1.24E-01	1.13E-01	1.57E-01	1.53E-01	1.13E-01
4.62E-01	4.38E-01	4.01E-01	5.53E-01	5.40E-01	3.99E-01
1.82E-04	1.75E-04	1.63E-04	2.17E-04	2.12E-04	1.58E-04
2.97E-02	2.81E-02	2.57E-02	3.56E-02	3.48E-02	2.56E-02
6.82E-02	6.43E-02	5.85E-02	8.18E-02	7.99E-02	5.85E-02
2.80E+00	2.74E+00	2.64E+00	3.05E+00	3.02E+00	2.62E+00

Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS	Ecoloblue MS	Ecoloblue H/O
0.00164	0.00147	0.00140	0.00193	0.00188	0.00140
1.41129	1.14186	1.20674	1.59518	1.55542	1.21052
0.00002	-0.00002	0.00002	0.00001	0.00000	0.00002
0.03468	0.02936	0.02967	0.03984	0.03890	0.02974
0.14188	0.11489	0.12130	0.15964	0.15677	0.12171
0.00008	0.00005	0.00007	0.00008	0.00008	0.00007
0.01243	0.01076	0.01064	0.01443	0.01407	0.01065
0.03316	0.03126	0.02842	0.03979	0.03884	0.02842
0.08837	0.01405	0.10997	0.01456	0.01830	0.11183

Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS	Ecoloblue MS	Ecoloblue H/O
2.64E-04	4.06E-04	2.48E-04	3.87E-04	3.82E-04	2.33E-04
3.51E+00	3.71E+00	3.06E+00	4.40E+00	4.30E+00	3.04E+00
1.28E-05	1.05E-04	2.32E-05	5.57E-05	5.93E-05	1.52E-05
6.16E-02	6.52E-02	5.39E-02	7.73E-02	7.55E-02	5.34E-02
1.78E-01	2.08E-01	1.59E-01	2.34E-01	2.27E-01	1.55E-01
2.27E-05	8.29E-05	2.70E-05	5.38E-05	5.52E-05	2.11E-05
4.86E-03	6.62E-03	4.44E-03	6.74E-03	6.64E-03	4.27E-03
1.88E-03	1.77E-03	1.61E-03	2.25E-03	2.20E-03	1.61E-03
2.62E+00	2.71E+00	2.42E+00	3.03E+00	2.98E+00	2.40E+00

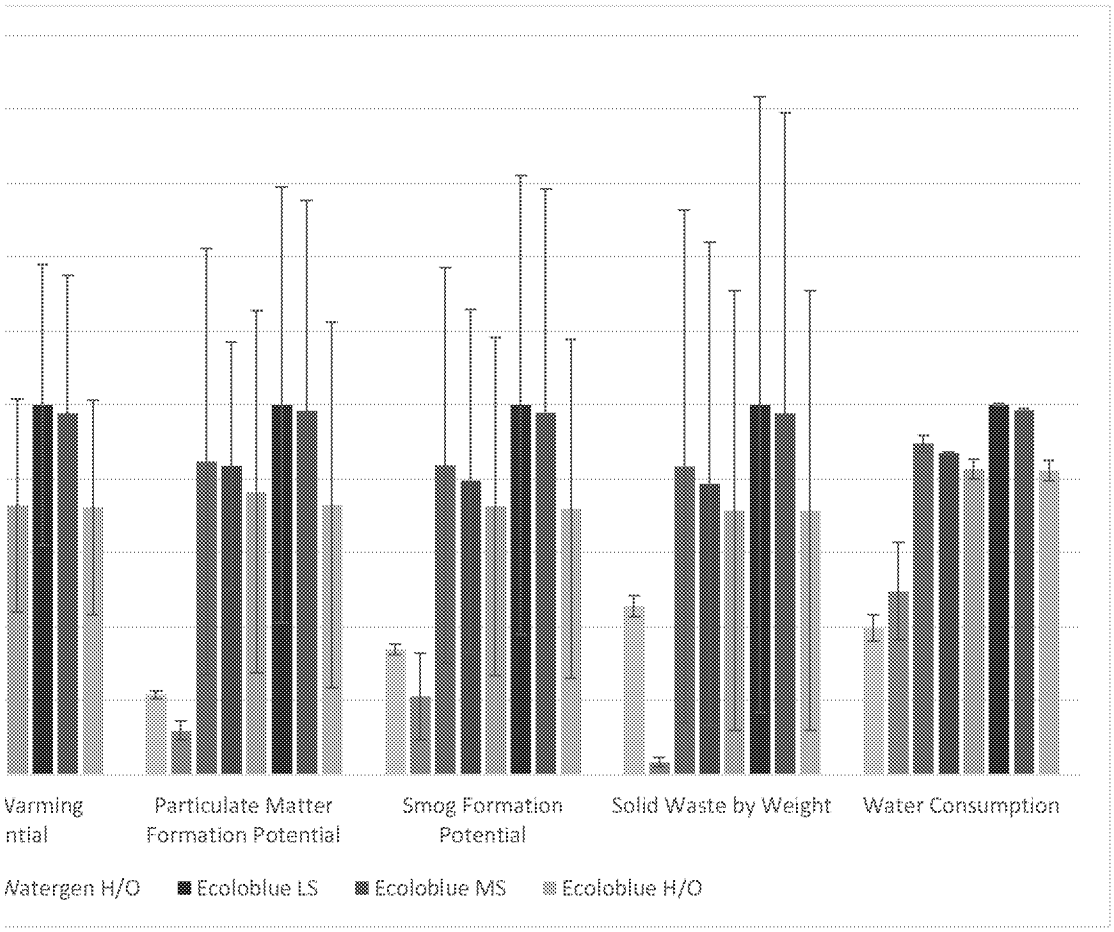
Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS	Ecoloblue MS	Ecoloblue H/O
63%	57%	54%	75%	73%	54%
21%	17%	18%	24%	23%	18%
47%	-49%	39%	11%	7%	41%
27%	23%	23%	31%	31%	23%
34%	27%	29%	38%	37%	29%
58%	33%	49%	59%	57%	49%
53%	46%	46%	62%	61%	46%
69%	65%	59%	83%	81%	59%
2%	0%	3%	0%	0%	3%

Max
2.59E-03
6.75E+00
4.66E-05
1.27E-01
4.20E-01
1.38E-04
2.32E-02
4.78E-02
4.09E+00



Max

0.00
4.40
0.00
0.08
0.23
0.00
0.01
0.02
3.03


Varming
ntial
Particulate Matter
Formation Potential
Smog Formation
Potential
Solid Waste by Weight
Water Consumption
Watergen H/O
Ecoloblue LS
Ecoloblue MS
Ecoloblue H/O

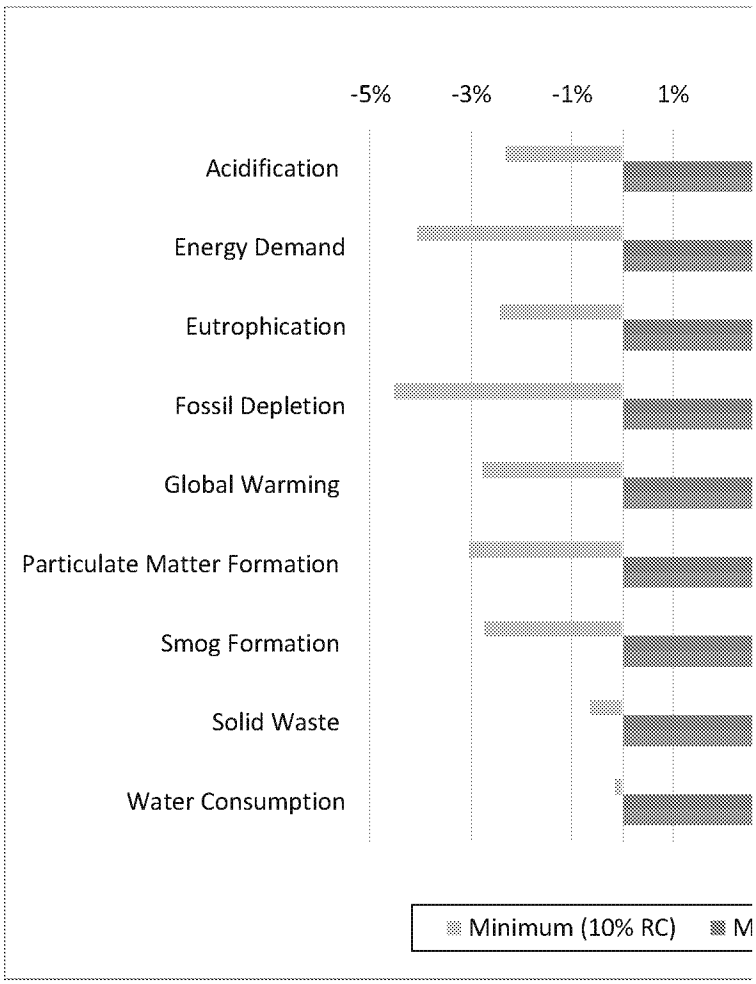
Weight and RC content

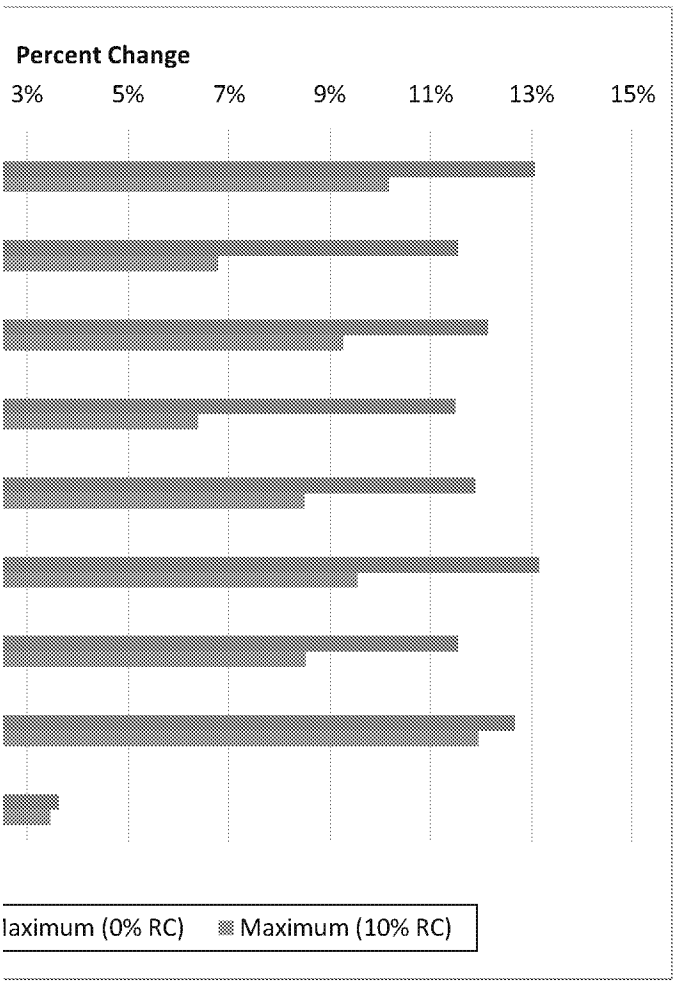
Category	Unit	Default (Minimum, 0% RC)
Acidification Potential	kg SO2 eq	0.000508057
Cumulative Energy Demand	MJ	2.535710784
Eutrophication Potential	kg N eq	1.82804E-05
Fossil Depletion	kg oil eq	0.053994881
Global Warming Potential	kg CO2 eq	0.118097757
Particulate Matter Formation Potential	kg PM2.5 eq	2.98266E-05
Smog Formation Potential	kg O3 eq	0.007874511
Solid Waste by Weight	kg SW eq	0.02177408
Water Consumption	liter H2O	1.622916725

	Minimum (10% RC)	Maximum (0% RC)
Acidification	-2%	13%
Energy Demand	-4%	12%
Eutrophication	-2%	12%
Fossil Depletion	-5%	11%
Global Warming	-3%	12%
Particulate Matter Formation	-3%	13%
Smog Formation	-3%	12%
Solid Waste	-1%	13%
Water Consumption	0%	4%

		Lightweight			
Minimum (10% RC)	**% Change**	**Maximum (0% RC)**	**% Change**	**Maximum (10% RC)**	**% Change**
0.000496197	-0.023343818	0.00057434	0.130462626	0.00055966	0.101568254
2.432510784	-0.040698648	2.827898673	0.115229186	2.707298673	0.067668557
1.78364E-05	-0.024288332	2.0497E-05	0.121255887	1.9971E-05	0.092481871
0.051546881	-0.045337632	0.060187984	0.114697977	0.057435984	0.063730182
0.114811757	-0.027824406	0.132107262	0.118626346	0.128107262	0.084756101
2.89206E-05	-0.030375615	3.37437E-05	0.131330369	3.26717E-05	0.095389244
0.007658511	-0.027430273	0.008781861	0.115226118	0.008543861	0.085002021
0.02163528	-0.006374552	0.024529815	0.126560334	0.024371815	0.119303999
1.620516725	-0.001478819	1.681557682	0.036133066	1.678897682	0.034494041

Maximum (10% RC)
10%
7%
9%
6%
8%
10%
9%
12%
3%




Percent Change
3%
5%
7%
9%
11%
13%
15%
laximum (0% RC)
Maximum (10% RC)

Comparison of AWG operation impacts using four eGrid subregions

		Average US	RFCW	La
Acidification Potential	*kg SO2 eq*	0.0015641	0.002487734	
Cumulative Energy Demand	*MJ*	4.149348969	4.615380269	
Eutrophication Potential	*kg N eq*	3.6151E-05	4.84882E-05	
Fossil Depletion	*kg oil eq*	0.078394348	0.095145498	
Global Warming Potential	*kg CO2 eq*	0.258721905	0.333006406	
Particulate Matter Formation Potential	*kg PM2.5 eq*	8.49848E-05	0.000129284	
Smog Formation Potential	*kg O3 eq*	0.014079873	0.020969931	
Solid Waste by Weight	*kg SW eq*	0.028714156	0.047631951	
Water Consumption	*liter H2O*	2.924709002	2.351654212	

Watergen

		Average US	RFCW	La
Cumulative Energy Demand	*MJ*	12448.04691	13846.14081	
Fossil Depletion	*kg oil eq*	235.1830427	285.4364942	
Global Warming Potential	*kg CO2 eq*	776.1657164	999.0192179	
Water Consumption	*liter H2O*	8774.127007	7054.962637	

		Average US	RFCW	La
Cumulative Energy Demand		0.866468836	0.963785693	
Fossil Depletion		0.663784465	0.805620628	
Global Warming Potential		0.657352976	0.846092841	
Water Consumption		0.854171174	0.686808581	

Impact category	Unit
Acidification Potentia	kg SO2 eq
Cumulative Energy De	MJ eq
Eutrophication Potent	kg N eq
Fossil resource scarcit	kg oil eq
Global Warming Pote	kg CO2 eq
Particulate Matter Fo	kg PM2.5 eq
Smog Formation Pote	kg O3 eq
Solid Waste by Weigh	kg SW
Water Consumption	liter H2O

Ecoloblue - Large scale

	Reusable container washing		
Impact Category	**Handwash**	**Dishwash**	**% Change**
Acidification Potential	1.35E-06	1.24E-04	9059%
Cumulative Energy Demand	3.41E-03	3.89E-01	11298%
Eutrophication Potential	3.08E-07	8.77E-06	2746%

Fossil Depletion	6.41E-05	7.70E-03	11907%
Global Warming Potential	2.16E-04	2.44E-02	11197%
Particulate Matter Formation Potential	7.49E-08	6.93E-06	9145%
Smog Formation Potential	1.17E-05	1.13E-03	9527%
Solid Waste by Weight	2.45E-05	2.17E-03	8744%
Water Consumption	5.97E-01	4.82E-01	-19%

Cut-off vs system expansion in bottled water systems

		Cut-off	**System Expansion**
Imapct Catgories	**Units**	*Single-serve bottle*	*Single-serve bottle*
Cumulative Energy Demand	**MJ**	*2.54E+00*	*2.19E+00*
Global Warming Potential	**kg CO2 eq**	*1.18E-01*	*1.09E-01*
Water Consumption	**liter H2O**	*1.62E+00*	*1.62E+00*

Spring water vs treated municipal water

	Spring water		Treated mur
	Single-serve bottle	Reusable Jug	Single-serve bottle
Cumulative Energy Demand (MJ)	2.535710784	1.00959809	2.543712363
Global Warming Potential (kg CO2 eq)	0.118097757	0.064775849	0.118603915
Water Consumption (liters H2O)	1.622916725	1.834656438	1.850303085

Impact catergory	**Single-serve bottle % change**	**Reusable Jug % change**
Cumulative Energy Demand (MJ)	0.32%	0.79%
Global Warming Potential (kg CO2 eq)	0.43%	0.78%
Water Consumption (liters H2O)	14.01%	12.40%

	cents	$
0.35	3.787	0.04
0.33	3.5706	0.04
0.3	3.246	0.03
0.42	4.5444	0.05
0.41	4.4362	0.04
0.3	3.246	0.03

Cost per liter calculation

Product	Type	Unit cost ($)	Annual maintenance cost ($)
AWG - Watergen	Large	115,000	7866
AWG - Watergen	Medium	55,000	2500
AWG - Watergen	Home/Office	1250	-
AWG - Ecoloblue	Large	159,700	3767
AWG - Ecoloblue	Medium	30,750	870
AWG - Ecoloblue	Home/Office	799	-
Bottled water	Single-serve (per 24 pack, 12 L)	4.49	-
Bottle water	Multi-serve (per 5 gallon, 18.9 L)	7.49	6.95 (monthly delivery cost)

Watergen-per liter

rge			Medium		
FRCC	CAMX	Average US	RFCW	FRCC	CAMX
0.000947976	0.00038789	0.001490225	0.002361079	0.000909308	0.000381226
4.408679369	3.894343169	3.955816866	4.395217806	4.200328386	3.715382826
3.16117E-05	2.15385E-05	3.96924E-05	5.13247E-05	3.54125E-05	2.5915E-05
0.099849341	0.069302531	0.074728481	0.090522423	0.094957474	0.066156196
0.300221262	0.202250662	0.247269154	0.317308826	0.286397119	0.194024839
6.95497E-05	2.95835E-05	8.39123E-05	0.000125681	6.93593E-05	3.16768E-05
0.011508469	0.005982454	0.013450343	0.019946684	0.011025877	0.005815634
0.013185348	0.004046419	0.027197371	0.045034149	0.012555924	0.003939219
1.687855636	3.104411497	2.851644383	2.311335581	1.685468352	3.021078164

rge			Medium		
FRCC	CAMX	Average US	RFCW	FRCC	CAMX
13226.03811	11683.02951	1582.326746	1758.087122	1680.131354	1486.15313
299.5480217	207.9075917	29.89139241	36.20896917	37.98298977	26.46247857
900.6637859	606.7519859	98.90766157	126.9235303	114.5588474	77.60993545
5063.566909	9313.234492	1140.657753	924.5342324	674.1873409	1208.431266

Watergen

rge			Medium		
FRCC	CAMX	Average US	RFCW	FRCC	CAMX
0.920622322	0.813218415	0.110140717	0.122374836	0.116948584	0.103446379
0.845449234	0.586801786	0.084365955	0.102196787	0.107203811	0.074688132
0.762793315	0.513872508	0.083767222	0.107494519	0.097022579	0.065729677
0.492943957	0.906653896	0.111044321	0.090004452	0.065632899	0.117642148

US average	RFCW	FRCC	CAMX
0.0041	0.0067	0.0023	0.0007
10.6886	12.0201	11.4295	9.9600
0.0001	0.0001	0.0001	0.0000
0.2010	0.2488	0.2623	0.1750
0.6633	0.8756	0.7819	0.5020
0.0002	0.0003	0.0002	0.0001
0.0367	0.0564	0.0294	0.0136
0.0758	0.1299	0.0315	0.0054
4.0966	2.4593	0.5627	4.6100

Total life cycle

Handwash	Dishwash	% Change	Handwash	No wash	% Change
1.73E-03	1.85E-03	7.11%	1.73E-03	1.72E-03	-0.08%
4.51E+00	4.89E+00	8.55%	4.51E+00	4.50E+00	-0.08%
3.09E-05	3.93E-05	27.41%	3.09E-05	3.06E-05	-1.00%

8.47E-02	9.24E-02	9.01%	8.47E-02	8.47E-02	-0.08%
2.80E-01	3.04E-01	8.61%	2.80E-01	2.80E-01	-0.08%
9.22E-05	9.91E-05	7.43%	9.22E-05	9.21E-05	-0.08%
1.55E-02	1.66E-02	7.18%	1.55E-02	1.55E-02	-0.08%
3.19E-02	3.40E-02	6.73%	3.19E-02	3.19E-02	-0.08%
3.32E+00	3.21E+00	-3.45%	3.32E+00	2.73E+00	-17.96%

	Cut-off	**System Expansion**	
% change	*Reusable Jug*	*Reusable Jug*	*% change*
-1.36E-01	*1.01E+00*	*8.49E-01*	*-1.59E-01*
-7.55E-02	*6.48E-02*	*5.56E-02*	*-1.42E-01*
9.60E-04	*1.83E+00*	*1.83E+00*	*-5.20E-03*

nicipal water
Reusable Jug
1.017602988
0.065282217
2.062137073

	Energy cost per year
AWG - Watergen L	118479
AWG - Watergen M	15797.2
AWG - Watergen S	987.325
AWG - Ecoloblue L	118479
AWG - Ecoloblue M	23695.8
AWG - Ecoloblue S	1184.79

kWh/l	Electricity Cost per Liter*	Yearly unit cost AMG	Total annual cost (unit plus maintenance)	Liters produced per day	liters produced per year
0.35	0.04	11500	19366	3000	1095000
0.33	0.04	5500	8000	400	146000
0.3	0.03	125	125	25	9125
0.42	0.05	7985	11752	3000	1095000
0.41	0.04	1537.5	2407.5	600	219000
0.3	0.03	39.95	39.95	30	10950

-

-

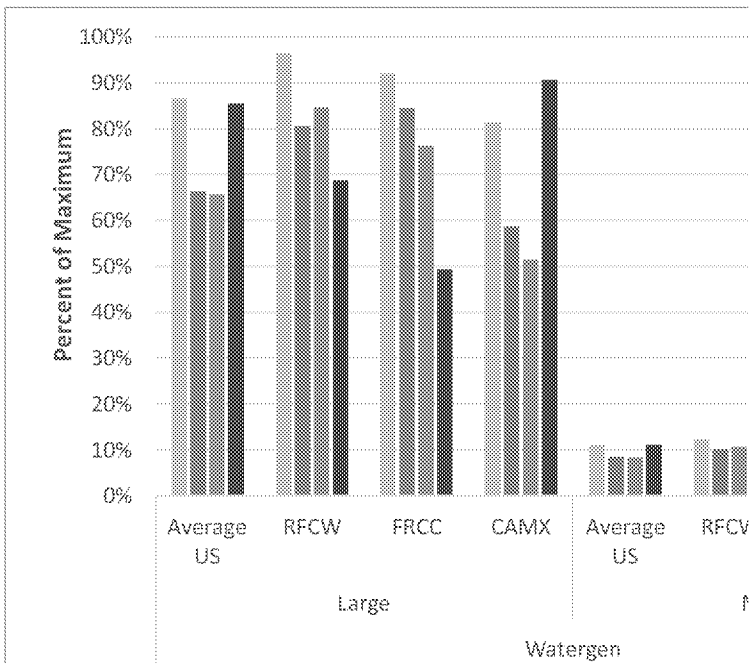
Home/Office				Large			
Average US	RFCW	FRCC	CAMX	Average US	RFCW	FRCC	CAMX
0.001368747	0.002160432	0.00084064	0.000361	0.001848083	0.002956442	0.001108734	0.00043663
3.640588401	4.040043801	3.862871601	3.422012	4.891435055	5.450672615	5.202631535	4.585428095
3.80949E-05	4.86697E-05	3.42041E-05	2.56E-05	3.93168E-05	0%	3.38696E-05	2.17819E-05
0.068808332	0.083166461	0.087198326	0.061015	0.092356121	0.112457502	0.118102113	0.081445941
0.228194362	0.291866791	0.263765239	0.17979	0.304440001	0.393581401	0.354239229	0.236674509
7.73686E-05	0.00011534	6.41386E-05	2.99E-05	9.90767E-05	0.000152236	8.05547E-05	3.25952E-05
0.012362539	0.018268303	0.010158478	0.005422	0.016620554	0.024888623	0.013534869	0.00690365
0.024922193	0.041137446	0.011611787	0.003778	0.034022903	0.056724257	0.015388334	0.004421619
2.733447454	2.242257634	1.673287426	2.887478	3.208388503	2.520722755	1.724164464	3.424031497

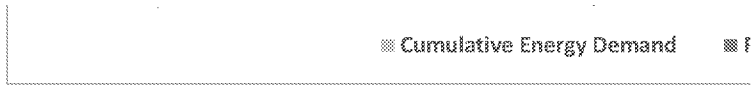
Ecoloblue

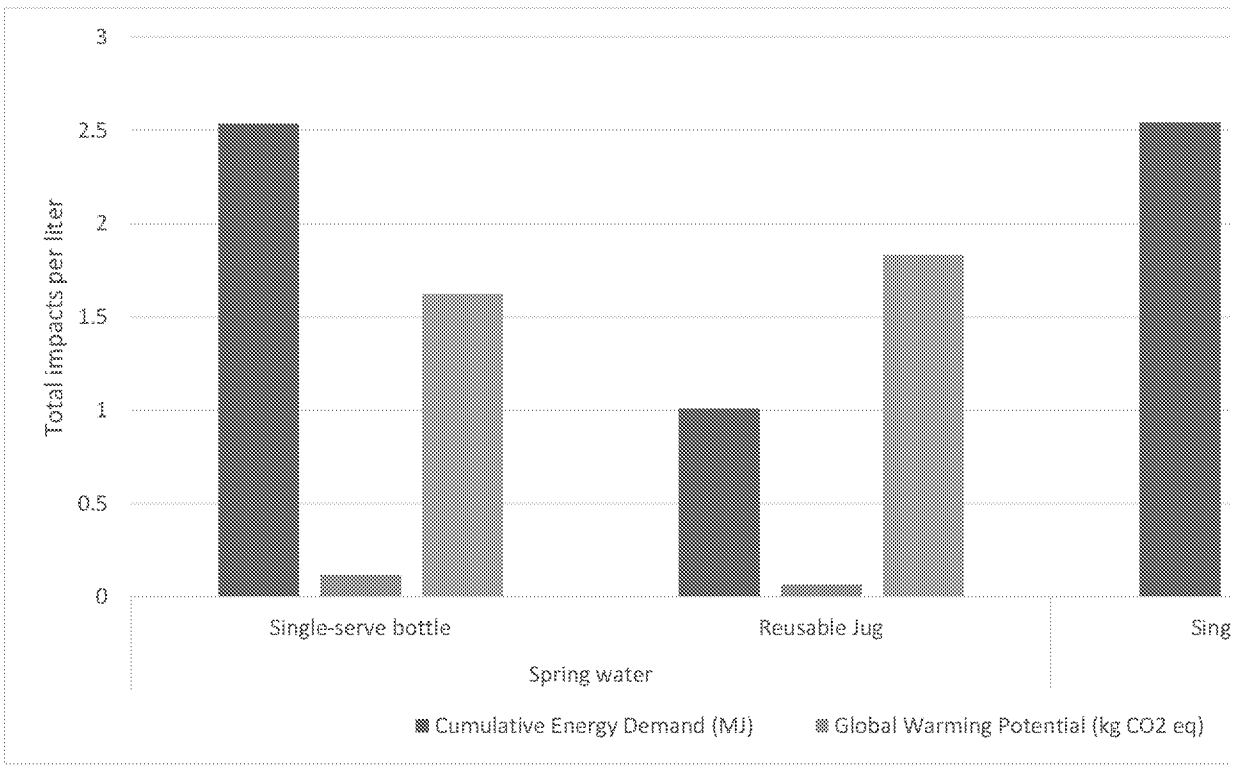
Large				Medium			
Average US	RFCW	FRCC	CAMX	Average US	RFCW	FRCC	CAMX
14674.30517	16352.01785	15607.89461	13756.28	2873.282082	3200.83551	3055.554306	2694.049434
277.0683629	337.3725047	354.3063377	244.3378	54.2489255	66.02259128	69.32872058	47.85867698
913.3200025	1180.744204	1062.717686	710.0235	178.83829	231.0496818	208.0064092	139.1470732
9625.16551	7562.168266	5172.493392	10272.09	1901.651716	1498.876064	1032.320493	2027.956898

Ecoloblue

Large				Medium			
Average US	RFCW	FRCC	CAMX	Average US	RFCW	FRCC	CAMX
1.021431572	1.1382118	1.086415755	0.957531	0.2	0.222799949	0.212687388	0.187524187
0.782002277	0.952205673	1	0.689623	0.153113054	0.186343241	0.195674514	0.135077112
0.773512162	1	0.900040569	0.601336	0.151462348	0.195681402	0.176165514	0.117846925
0.937020733	0.736185621	0.503548074	1	0.185127942	0.145917278	0.100497566	0.197423894







Milage reimbursement for Poland Spring Bottle

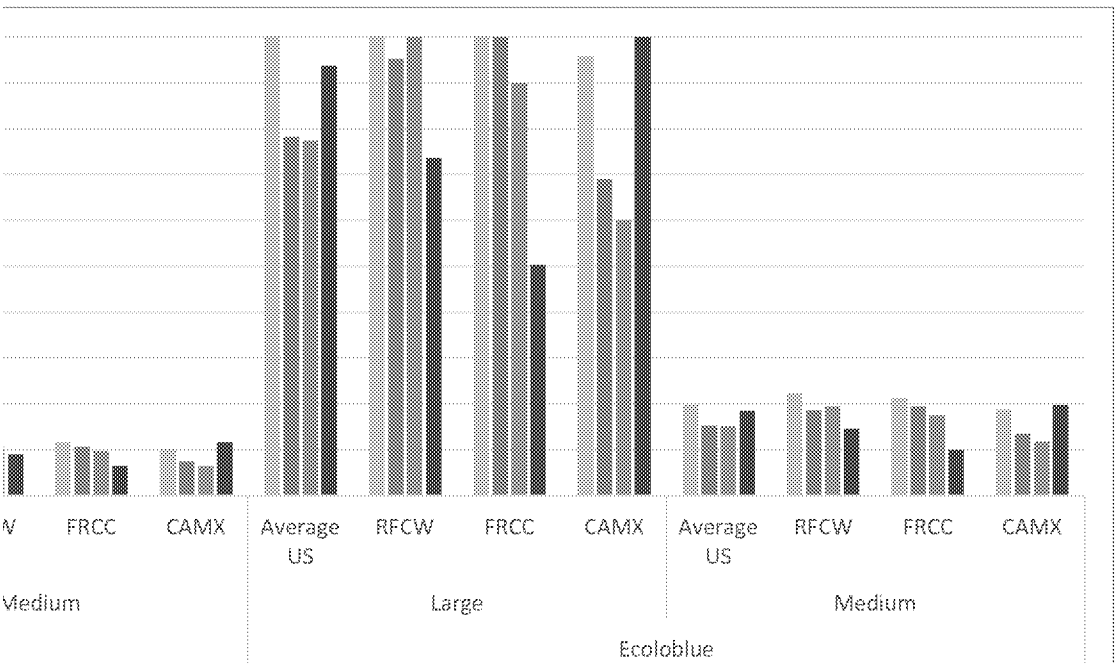
0.0564	tmi	From	SimaPro	model	
56.4L	1 mile				

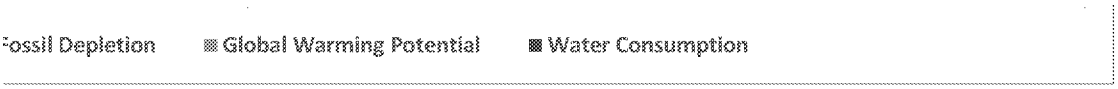
Unit and Maintenance Cost per liter ($)	Total cost per liter ($)				
		56.4L	54.5 cents (IRS)		
0.017685845	0.06	1L	0.96 cents	$0.01	
0.054794521	0.09				
0.01369863	0.04				
0.01073242	0.06				
0.010993151	0.05				
0.003648402	0.03				
	0.38				
	0.40				

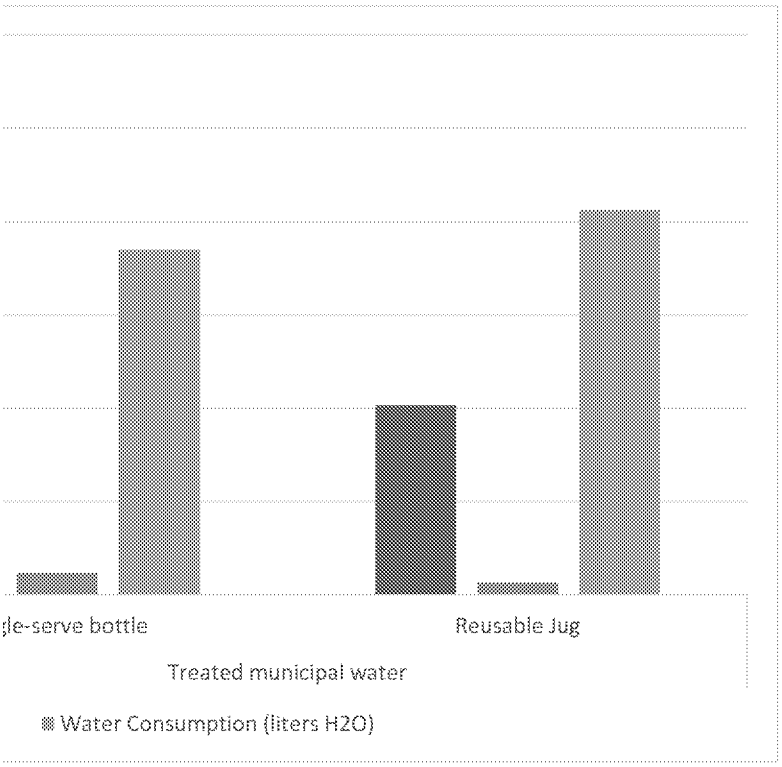
Ecoloblue

Medium				Home/Office			
Average US	RFCW	FRCC	CAMX	Average US	RFCW	FRCC	CAMX
0.001808888	0.002890859	0.001087143	0.000431041	0.001360902	0.002152588	0.000832796	0.000352721
4.788803469	5.334725849	5.092590509	4.490082389	3.626940206	4.026395606	3.849223406	3.408363806
3.98413E-05	0%	3.45238E-05	2.27239E-05	3.38255E-05	0%	2.99347E-05	2.13005E-05
0.090414876	0.110037652	0.115547868	0.079764462	0.068570798	0.082928927	0.086960792	0.060777812
0.298063817	0.385082803	0.346677349	0.231911789	0.22654165	0.290214079	0.262112527	0.178137727
9.76602E-05	0.000149554	7.95791E-05	3.27616E-05	7.41588E-05	0.00011213	6.09288E-05	2.6672E-05
0.016275682	0.024346893	0.013263466	0.006790134	0.012269654	0.018175418	0.010065593	0.005329009
0.033264511	0.055425356	0.015073622	0.004368019	0.024922193	0.041137446	0.011611787	0.003778419
3.169419527	2.498126773	1.720534155	3.379928164	2.722714121	2.231524301	1.662554093	2.876744831

max
14366.41041
354.3063377
1180.744204
10272.09449




Fossil Depletion
Global Warming Potential
Water Consumption


gle-serve bottle
Reusable Jug
Treated municipal water
Water Consumption (liters H2O)

0.4	0	62.5	0.8

9	8.4	3.4	6.5	4.3	4.4

0.3

		Minimum Water		
Category	**Unit**	Watergen LS	Watergen MS	Watergen H/O
Acidification Potential	*kg SO2 eq*	1.44E-03	1.52E-03	1.26E-03
Cumulative Energy Demand	*MJ*	3.76E+00	3.95E+00	3.29E+00
Eutrophication Potential	*kg N eq*	2.77E-05	1.19E-04	3.60E-05
Fossil Depletion	*kg oil eq*	7.08E-02	7.38E-02	6.17E-02
Global Warming Potential	*kg CO2 eq*	2.35E-01	2.61E-01	2.07E-01
Particulate Matter Formation Potential	*kg PM2.5 eq*	7.81E-05	1.35E-04	7.45E-05
Smog Formation Potential	*kg O3 eq*	1.30E-02	1.43E-02	1.14E-02
Solid Waste by Weight	*kg SW eq*	2.66E-02	2.51E-02	2.28E-02
Water Consumption	*liter H2O*	3.04E+00	3.14E+00	2.86E+00

	Percent of Maximum Min/Max Error			
	Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS
Acidification Potential	1.52E-06	7.66E-05	5.63E-06	3.80E-05
Cumulative Energy Demand	3.95E-03	1.97E-01	1.51E-02	1.02E-01
Eutrophication Potential	8.75E-07	4.54E-05	3.20E-06	2.19E-05
Fossil Depletion	7.05E-05	3.47E-03	2.72E-04	1.83E-03
Global Warming Potential	4.38E-04	1.97E-02	1.61E-03	1.10E-02
Particulate Matter Formation Potential	5.76E-07	3.00E-05	2.00E-06	1.44E-05
Smog Formation Potential	1.94E-05	9.95E-04	7.22E-05	4.95E-04
Solid Waste by Weight	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water Consumption	1.77E-03	8.70E-02	7.47E-03	4.29E-02

	Average Water Production			
	Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS
Acidification Potential	1.44E-03	1.37E-03	1.25E-03	1.73E-03
Cumulative Energy Demand	3.76E+00	3.57E+00	3.26E+00	4.51E+00
Eutrophication Potential	2.77E-05	3.12E-05	2.96E-05	3.09E-05
Fossil Depletion	7.08E-02	6.71E-02	6.12E-02	8.47E-02
Global Warming Potential	2.35E-01	2.23E-01	2.04E-01	2.80E-01
Particulate Matter Formation Potential	7.81E-05	7.71E-05	7.05E-05	9.22E-05
Smog Formation Potential	1.30E-02	1.23E-02	1.12E-02	1.55E-02
Solid Waste by Weight	2.66E-02	2.51E-02	2.28E-02	3.19E-02
Water Consumption	3.04E+00	2.97E+00	2.85E+00	3.32E+00

	Average as Percent of Maximum Impact:			
	Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS
Acidification Potential	77.99%	74.00%	67.42%	93.36%
Cumulative Energy Demand	76.95%	73.00%	66.55%	92.13%
Eutrophication Potential	69.51%	78.40%	74.39%	77.46%
Fossil Depletion	76.61%	72.65%	66.24%	91.73%

Global Warming Potential	77.05%	73.29%	67.02%	92.07%
Particulate Matter Formation Potential	78.86%	77.78%	71.17%	93.08%
Smog Formation Potential	78.01%	74.23%	67.68%	93.30%
Solid Waste by Weight	78.09%	73.63%	66.94%	93.69%
Water Consumption	94.74%	92.46%	88.78%	103.58%

Net present Value

Watergen Large

Year	Discount	Nominal Cash Flows		
	Factor	Capital	Maintenance	Energy
0	1	-115000		
1	0.95		-7866	-118479
2	0.9		-7866	-118479
3	0.85		-7866	-118479
4	0.8		-7866	-118479
5	0.75		-7866	-118479
6	0.7		-7866	-118479
7	0.65		-7866	-118479
8	0.6		-7866	-118479
9	0.55		-7866	-118479
10	0.5		-7866	-118479
Total				

Watergen Medium

Year	Discount	Nominal Cash Flows		
	Factor	Capital	Maintenance	Energy
0	1	-55000		
1	0.95		-2500	-15797.2
2	0.9		-2500	-15797.2
3	0.85		-2500	-15797.2
4	0.8		-2500	-15797.2
5	0.75		-2500	-15797.2
6	0.7		-2500	-15797.2
7	0.65		-2500	-15797.2
8	0.6		-2500	-15797.2
9	0.55		-2500	-15797.2
10	0.5		-2500	-15797.2
Total				

Watergen home/office

Year	Discount	Nominal Cash Flows		
	Factor	Capital	Maintenance	Energy
0	1	-1,250		
1	0.95		-228	-987.325
2	0.9		-228	-987.325
3	0.85		-228	-987.325
4	0.8		-228	-987.325

5	0.75		-228	-987.325
6	0.7		-228	-987.325
7	0.65		-228	-987.325
8	0.6		-228	-987.325
9	0.55		-228	-987.325
10	0.5		-228	-987.325
Total				

Ecoloblue Large

Year	Discount Factor	Nominal Cash Flows		
		Capital	Maintenance	Energy
0	1	-159,700		
1	0.95		-3767	-118479
2	0.9		-3767	-118479
3	0.85		-3767	-118479
4	0.8		-3767	-118479
5	0.75		-3767	-118479
6	0.7		-3767	-118479
7	0.65		-3767	-118479
8	0.6		-3767	-118479
9	0.55		-3767	-118479
10	0.5		-3767	-118479
11	0.45		-3767	-118479
12	0.4		-3767	-118479
13	0.35		-3767	-118479
14	0.3		-3767	-118479
15	0.25		-3767	-118479
16	0.2		-3767	-118479
17	0.15		-3767	-118479
18	0.1		-3767	-118479
19	0.05		-3767	-118479
20	-3.19189E-16		-3767	-118479
Total				

Ecoloblue Medium

Year	Discount Factor	Nominal Cash Flows		
		Capital	Maintenance	Energy
0	1	-30,750		
1	0.95		-870	-23695.8
2	0.9		-870	-23695.8
3	0.85		-870	-23695.8
4	0.8		-870	-23695.8
5	0.75		-870	-23695.8
6	0.7		-870	-23695.8
7	0.65		-870	-23695.8
8	0.6		-870	-23695.8

9	0.55		-870	-23695.8
10	0.5		-870	-23695.8
11	0.45		-870	-23695.8
12	0.4		-870	-23695.8
13	0.35		-870	-23695.8
14	0.3		-870	-23695.8
15	0.25		-870	-23695.8
16	0.2		-870	-23695.8
17	0.15		-870	-23695.8
18	0.1		-870	-23695.8
19	0.05		-870	-23695.8
20	-3.19189E-16		-870	-23695.8
Total				

Ecoloblue Small

Year	Discount	Nominal Cash Flows		
	Factor	Capital	Maintenance	Energy
0	1	-799		
1	0.95		-288	-1184.79
2	0.9		-288	-1184.79
3	0.85		-288	-1184.79
4	0.8		-288	-1184.79
5	0.75		-288	-1184.79
6	0.7		-288	-1184.79
7	0.65		-288	-1184.79
8	0.6		-288	-1184.79
9	0.55		-288	-1184.79
10	0.5		-288	-1184.79
11	0.45		-288	-1184.79
12	0.4		-288	-1184.79
13	0.35		-288	-1184.79
14	0.3		-288	-1184.79
15	0.25		-288	-1184.79
16	0.2		-288	-1184.79
17	0.15		-288	-1184.79
18	0.1		-288	-1184.79
19	0.05		-288	-1184.79
20	-3.19189E-16		-288	-1184.79
Total				

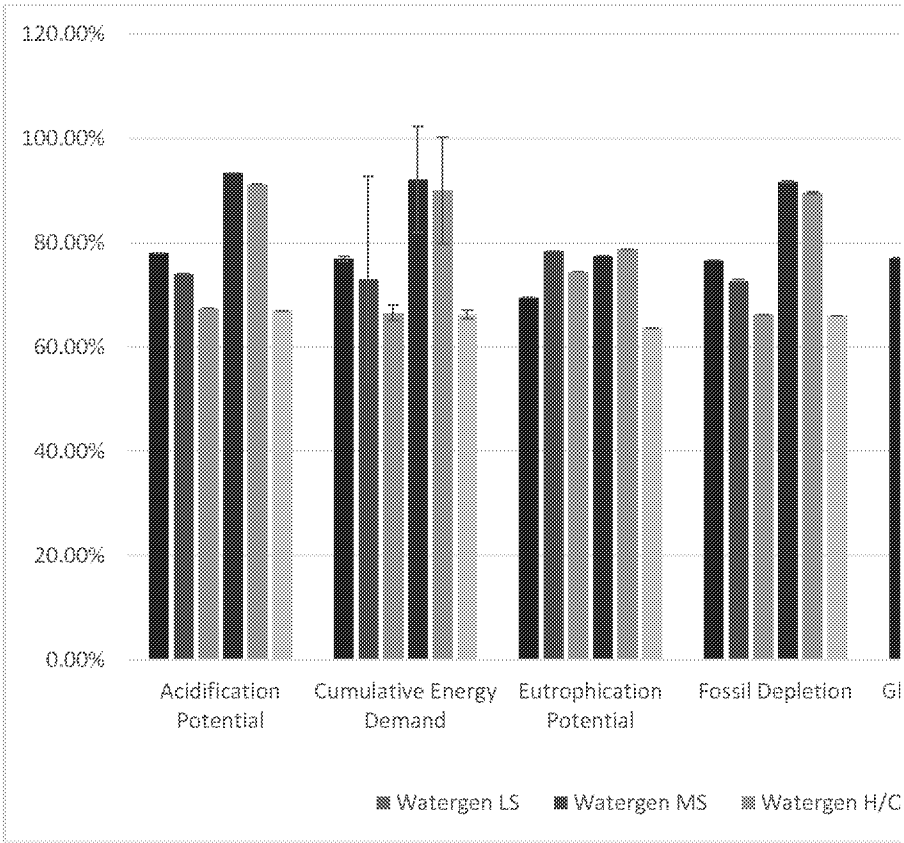
Total Impacts Per Liter

Production					Maximum Water Production	
Ecoloblue LS	Ecoloblue MS	Ecoloblue H/O	Watergen LS	Watergen MS	Watergen H/O	Ecoloblue LS
1.80E-03	1.76E-03	1.24E-03	1.44E-03	1.36E-03	1.25E-03	1.72E-03
4.70E+00	4.60E+00	3.26E+00	3.76E+00	3.56E+00	3.26E+00	4.50E+00
7.36E-05	7.67E-05	2.80E-05	2.59E-05	2.84E-05	2.96E-05	2.98E-05
8.83E-02	8.62E-02	6.12E-02	7.06E-02	6.69E-02	6.12E-02	8.46E-02
3.02E-01	2.93E-01	2.04E-01	2.34E-01	2.22E-01	2.04E-01	2.80E-01
1.20E-04	1.20E-04	6.87E-05	7.70E-05	7.52E-05	7.05E-05	9.15E-05
1.65E-02	1.61E-02	1.12E-02	1.29E-02	1.23E-02	1.12E-02	1.55E-02
3.19E-02	3.11E-02	2.28E-02	2.66E-02	2.51E-02	2.28E-02	3.19E-02
3.41E+00	3.37E+00	2.84E+00	3.04E+00	2.96E+00	2.85E+00	3.32E+00

Ecoloblue MS	Ecoloblue H/O
3.89E-05	2.26E-06
1.02E-01	7.94E-03
2.34E-05	1.33E-06
1.79E-03	1.44E-04
9.84E-03	7.94E-04
1.52E-05	6.98E-07
5.06E-04	3.09E-05
0.00E+00	0.00E+00
4.41E-02	2.92E-03

Ecoloblue MS	Ecoloblue H/O
1.69E-03	1.24E-03
4.40E+00	3.24E+00
3.14E-05	2.54E-05
8.28E-02	6.09E-02
2.74E-01	2.02E-01
9.08E-05	6.73E-05
1.52E-02	1.12E-02
3.11E-02	2.28E-02
3.28E+00	2.84E+00

s	
Ecoloblue MS	Ecoloblue H/O
91.24%	67.00%
90.03%	66.27%
78.77%	63.67%
89.63%	65.98%



89.97%	66.48%
91.65%	67.93%
91.23%	67.12%
91.46%	66.94%
102.36%	88.44%

	Discounted Cash Flows			
Total	Capital	Maintenance	Energy	Total
-115000	-115000			-115000
-126345		-7472.7	-112555.05	-120027.75
-126345		-7079.4	-106631.1	-113710.5
-126345		-6686.1	-100707.15	-107393.25
-126345		-6292.8	-94783.2	-101076
-126345		-5899.5	-88859.25	-94758.75
-126345		-5506.2	-82935.3	-88441.5
-126345		-5112.9	-77011.35	-82124.25
-126345		-4719.6	-71087.4	-75807
-126345		-4326.3	-65163.45	-69489.75
-126345		-3933	-59239.5	-63172.5
-1378450				-1031001.25

Liters produced i
Net prese

	Discounted Cash Flows			
Total	Capital	Maintenance	Energy	Total
-55000	-55000			-55000
-18297.2		-2375	-17382.34	-19757.34
-18297.2		-2250	-16467.48	-18717.48
-18297.2		-2125	-15552.62	-17677.62
-18297.2		-2000	-14637.76	-16637.76
-18297.2		-1875	-13722.9	-15597.9
-18297.2		-1750	-12808.04	-14558.04
-18297.2		-1625	-11893.18	-13518.18
-18297.2		-1500	-10978.32	-12478.32
-18297.2		-1375	-10063.46	-11438.46
-18297.2		-1250	-9148.6	-10398.6
-237972				-205779.7

Liters produced i
Net prese

	Discounted Cash Flows			
Total	Capital	Maintenance	Energy	Total
-1250	-1250			-1250
-1215.325		-216.6	-1154.55875	-1371.15875
-1215.325		-205.2	-1093.7925	-1298.9925
-1215.325		-193.8	-1033.02625	-1226.82625
-1215.325		-182.4	-972.26	-1154.66

Liters produced i
Net prese

-1215.325		-171	-911.49375	-1082.49375
-1215.325		-159.6	-850.7275	-1010.3275
-1215.325		-148.2	-789.96125	-938.16125
-1215.325		-136.8	-729.195	-865.995
-1215.325		-125.4	-668.42875	-793.82875
-1215.325		-114	-607.6625	-721.6625
-13403.25				-11714.10625

	Discounted Cash Flows			
Total	Capital	Maintenance	Energy	Total
-159700	-159700			-159700
-122246		-3578.65	-112555.05	-116133.7
-122246		-3390.3	-106631.1	-110021.4
-122246		-3201.95	-100707.15	-103909.1
-122246		-3013.6	-94783.2	-97796.8
-122246		-2825.25	-88859.25	-91684.5
-122246		-2636.9	-82935.3	-85572.2
-122246		-2448.55	-77011.35	-79459.9
-122246		-2260.2	-71087.4	-73347.6
-122246		-2071.85	-65163.45	-67235.3
-122246		-1883.5	-59239.5	-61123
-122246		-1695.15	-53315.55	-55010.7
-122246		-1506.8	-47391.6	-48898.4
-122246		-1318.45	-41467.65	-42786.1
-122246		-1130.1	-35543.7	-36673.8
-122246		-941.75	-29619.75	-30561.5
-122246		-753.4	-23695.8	-24449.2
-122246		-565.05	-17771.85	-18336.9
-122246		-376.7	-11847.9	-12224.6
-122246		-188.35	-5923.95	-6112.3
-122246		1.20239E-12	3.78172E-11	3.90196E-11
-2604620				-1321037

Liters produced i
Net preser

	Discounted Cash Flows			
Total	Capital	Maintenance	Energy	Total
-30750	-30,750			-30750
-24565.8		-826.5	-22511.01	-23337.51
-24565.8		-783	-21326.22	-22109.22
-24565.8		-739.5	-20141.43	-20880.93
-24565.8		-696	-18956.64	-19652.64
-24565.8		-652.5	-17771.85	-18424.35
-24565.8		-609	-16587.06	-17196.06
-24565.8		-565.5	-15402.27	-15967.77
-24565.8		-522	-14217.48	-14739.48

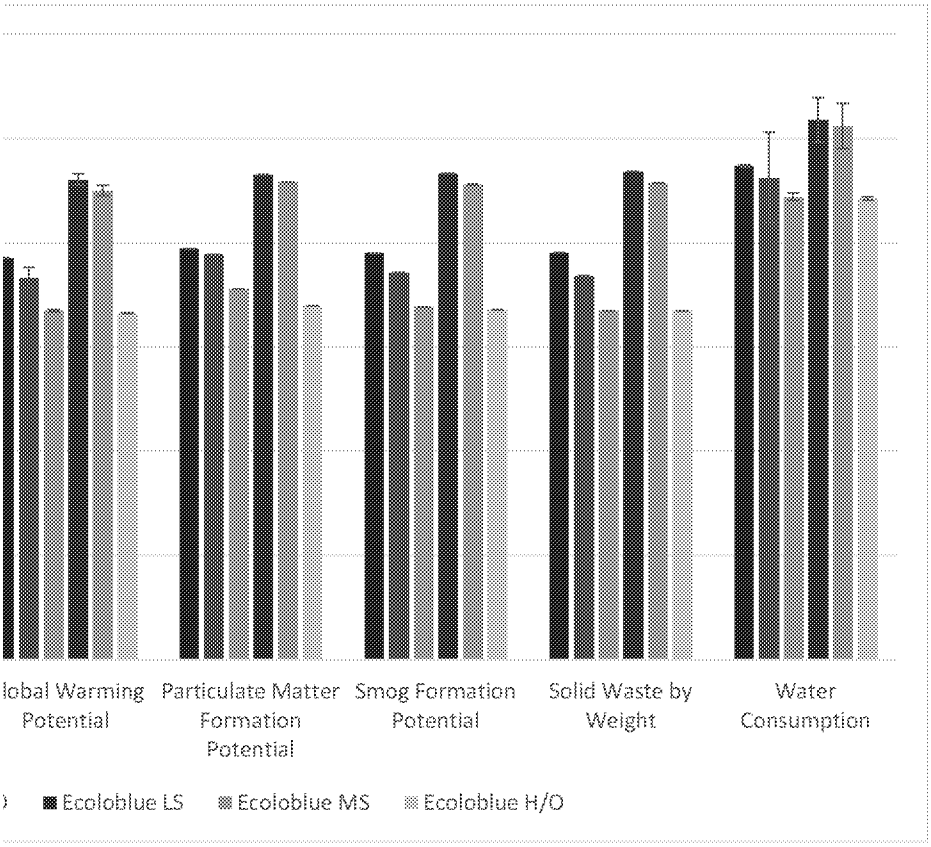
Liters produced i
Net preser

-24565.8	-478.5	-13032.69	-13511.19
-24565.8	-435	-11847.9	-12282.9
-24565.8	-391.5	-10663.11	-11054.61
-24565.8	-348	-9478.32	-9826.32
-24565.8	-304.5	-8293.53	-8598.03
-24565.8	-261	-7108.74	-7369.74
-24565.8	-217.5	-5923.95	-6141.45
-24565.8	-174	-4739.16	-4913.16
-24565.8	-130.5	-3554.37	-3684.87
-24565.8	-87	-2369.58	-2456.58
-24565.8	-43.5	-1184.79	-1228.29
-24565.8	2.77695E-13	7.56344E-12	7.84114E-12
-522066			-264125.1

	Discounted Cash Flows			
Total	Capital	Maintenance	Energy	Total
-799	-799			-799
-1472.79		-273.6	-1125.5505	-1399.1505
-1472.79		-259.2	-1066.311	-1325.511
-1472.79		-244.8	-1007.0715	-1251.8715
-1472.79		-230.4	-947.832	-1178.232
-1472.79		-216	-888.5925	-1104.5925
-1472.79		-201.6	-829.353	-1030.953
-1472.79		-187.2	-770.1135	-957.3135
-1472.79		-172.8	-710.874	-883.674
-1472.79		-158.4	-651.6345	-810.0345
-1472.79		-144	-592.395	-736.395
-1472.79		-129.6	-533.1555	-662.7555
-1472.79		-115.2	-473.916	-589.116
-1472.79		-100.8	-414.6765	-515.4765
-1472.79		-86.4	-355.437	-441.837
-1472.79		-72	-296.1975	-368.1975
-1472.79		-57.6	-236.958	-294.558
-1472.79		-43.2	-177.7185	-220.9185
-1472.79		-28.8	-118.479	-147.279
-1472.79		-14.4	-59.2395	-73.6395
-1472.79		9.19265E-14	3.78172E-13	4.70099E-13
-30254.8				-14790.505

Liters produced i
Net prese

Ecoloblue MS	Ecoloblue H/O	Max
1.68E-03	1.24E-03	1.85E-03
4.40E+00	3.24E+00	4.89E+00
2.98E-05	2.54E-05	3.98E-05
8.27E-02	6.09E-02	9.24E-02
2.73E-01	2.02E-01	3.04E-01
8.98E-05	6.73E-05	9.91E-05
1.51E-02	1.12E-02	1.66E-02
3.11E-02	2.28E-02	3.40E-02
3.28E+00	2.84E+00	3.21E+00



n 10 years	10950000
nt cost/L	0.094155365

n 10 years	1460000
nt cost/L	0.140945

n 10 years	91250
nt cost/L	0.128373767

n 10 years	21900000
nt cost/L	**0.060321324**

n 10 years	4380000
nt cost/L	**0.060302534**

n 10 years	219000
nt cost/L	**0.067536553**

AWG Results DRAFT

Calculation

Model Output

		LARGE SCALE		
				Per Da
Category	**Unit**	Capital Equipment	Transport to Point of Use	Operation
Acidification Potential	*kg SO2 eq*	1.5E-02	3.3E-05	5.2E+00
Cumulative Energy Demand	*MJ*	4.1E+01	8.9E-05	1.3E+04
Eutrophication Potential	*kg N eq*	8.8E-03	2.0E-06	8.3E-02
Fossil Depletion	*kg oil eq*	7.4E-01	2.4E-06	2.5E+02
Global Warming Potential	*kg CO2 eq*	4.4E+00	6.7E-03	8.4E+02
Particulate Matter Formation Potential	*kg PM2.5 eq*	5.8E-03	5.9E-07	2.7E-01
Smog Formation Potential	*kg O3 eq*	2.0E-01	1.1E-03	4.6E+01
Solid Waste by Weight	*kg SW eq*	0.0E+00	0.0E+00	9.6E+01
Water Consumption	*liter H2O*	1.7E+01	0.0E+00	8.2E+03

		LARGE SCALE		
				Per Lite
Category	**Unit**	Capital Equipment	Transport to Point of Use	Operation
Acidification Potential	*kg SO2 eq*	3.2E-06	6.8E-09	1.7E-03
Cumulative Energy Demand	*MJ*	8.6E-03	1.9E-08	4.5E+00
Eutrophication Potential	*kg N eq*	1.8E-06	4.1E-10	2.8E-05
Fossil Depletion	*kg oil eq*	1.5E-04	5.0E-10	8.4E-02
Global Warming Potential	*kg CO2 eq*	9.2E-04	1.4E-06	2.8E-01
Particulate Matter Formation Potential	*kg PM2.5 eq*	1.2E-06	1.2E-10	9.0E-05
Smog Formation Potential	*kg O3 eq*	4.1E-05	2.3E-07	1.5E-02
Solid Waste by Weight	*kg SW eq*	0.0E+00	0.0E+00	3.2E-02
Water Consumption	*liter H2O*	3.6E-03	0.0E+00	2.7E+00

Reusable Container Washing	Disposal	*Total*
	0.0E+00	*5.2E+00*
	0.0E+00	*1.4E+04*
	0.0E+00	*9.2E-02*
	0.0E+00	*2.5E+02*
	0.0E+00	*8.4E+02*
	0.0E+00	*2.8E-01*
	0.0E+00	*4.6E+01*
	0.0E+00	*9.6E+01*
	0.0E+00	*8.2E+03*

MEDIU

Category	**Unit**
Acidification Potential	*kg SO2 eq*
Cumulative Energy Demand	*MJ*
Eutrophication Potential	*kg N eq*
Fossil Depletion	*kg oil eq*
Global Warming Potential	*kg CO2 eq*
Particulate Matter Formation Potential	*kg PM2.5 eq*
Smog Formation Potential	*kg O3 eq*
Solid Waste by Weight	*kg SW eq*
Water Consumption	*liter H2O*

Reusable Container Washing	Disposal	*Total*
1.4E-06	0.0E+00	1.7E-03
3.4E-03	0.0E+00	4.5E+00
3.1E-07	0.0E+00	3.0E-05
6.4E-05	0.0E+00	8.5E-02
2.2E-04	0.0E+00	2.8E-01
7.5E-08	0.0E+00	9.2E-05
1.2E-05	0.0E+00	1.5E-02
2.5E-05	0.0E+00	3.2E-02
6.0E-01	0.0E+00	3.3E+00

MEDIU

Category	**Unit**
Acidification Potential	*kg SO2 eq*
Cumulative Energy Demand	*MJ*
Eutrophication Potential	*kg N eq*
Fossil Depletion	*kg oil eq*
Global Warming Potential	*kg CO2 eq*
Particulate Matter Formation Potential	*kg PM2.5 eq*
Smog Formation Potential	*kg O3 eq*
Solid Waste by Weight	*kg SW eq*
Water Consumption	*liter H2O*

M SCALE					
Per Day					
Capital Equipment	Transport to Point of Use	Operation	Reusable Container Washing	Disposal	*Total*
4.1E-03	8.6E-06	1.0E+00		1.9E-05	*1.0E+00*
1.1E+01	2.3E-05	2.6E+03		2.6E-05	*2.6E+03*
2.5E-03	5.2E-07	1.6E-02		1.2E-06	*1.9E-02*
1.9E-01	5.6E-07	4.9E+01		6.3E-07	*5.0E+01*
1.0E+00	1.8E-03	1.6E+02		1.8E-03	*1.6E+02*
1.6E-03	1.5E-07	5.3E-02		8.2E-07	*5.4E-02*
5.2E-02	2.9E-04	9.0E+00		6.7E-04	*9.1E+00*
0.0E+00	0.0E+00	1.9E+01		0.0E+00	*1.9E+01*
4.7E+00	0.0E+00	1.6E+03		0.0E+00	*1.6E+03*

M SCALE					
Per Liter					
Capital Equipment	Transport to Point of Use	Operation	Reusable Container Washing	Disposal	*Total*
4.2E-06	8.9E-09	1.7E-03	1.4E-06	2.0E-08	1.7E-03
1.1E-02	2.4E-08	4.4E+00	3.4E-03	2.7E-08	4.4E+00
2.6E-06	5.4E-10	2.7E-05	3.1E-07	1.2E-09	3.0E-05
2.0E-04	5.8E-10	8.2E-02	6.4E-05	6.5E-10	8.3E-02
1.1E-03	1.8E-06	2.7E-01	2.2E-04	1.8E-06	2.7E-01
1.7E-06	1.6E-10	8.8E-05	7.5E-08	8.5E-10	9.0E-05
5.4E-05	3.0E-07	1.5E-02	1.2E-05	7.0E-07	1.5E-02
0.0E+00	0.0E+00	3.1E-02	2.5E-05	0.0E+00	3.1E-02
4.8E-03	0.0E+00	2.7E+00	6.0E-01	0.0E+00	3.3E+00

		Small Scale			
		Per Day			
Category	**Unit**	Capital Equipment	Transport to Point of Use	Operation	Reusable Container Washing
Acidification Potential	*kg SO2 eq*	2.7E-04	4.3E-07	3.7E-02	
Cumulative Energy Demand	*MJ*	9.5E-01	1.2E-06	9.6E+01	
Eutrophication Potential	*kg N eq*	1.6E-04	2.6E-08	5.9E-04	
Fossil Depletion	*kg oil eq*	1.7E-02	2.8E-08	1.8E+00	
Global Warming Potential	*kg CO2 eq*	9.5E-02	8.8E-05	6.0E+00	
Particulate Matter Formation Potential	*kg PM2.5 eq*	8.4E-05	7.7E-09	1.9E-03	
Smog Formation Potential	*kg O3 eq*	3.7E-03	1.5E-05	3.3E-01	
Solid Waste by Weight	*kg SW eq*	0.0E+00	0.0E+00	6.8E-01	
Water Consumption	*liter H2O*	3.5E-01	0.0E+00	6.7E+01	

		Small Scale			
		Per Liter			
Category	**Unit**	Capital Equipment	Transport to Point of Use	Operation	Reusable Container Washing
Acidification Potential	*kg SO2 eq*	9.0E-06	1.4E-08	1.2E-03	1.4E-06
Cumulative Energy Demand	*MJ*	3.2E-02	3.9E-08	3.2E+00	3.4E-03
Eutrophication Potential	*kg N eq*	5.3E-06	8.6E-10	2.0E-05	3.1E-07
Fossil Depletion	*kg oil eq*	5.8E-04	9.3E-10	6.0E-02	6.4E-05
Global Warming Potential	*kg CO2 eq*	3.2E-03	2.9E-06	2.0E-01	2.2E-04
Particulate Matter Formation Potential	*kg PM2.5 eq*	2.8E-06	2.6E-10	6.4E-05	7.5E-08
Smog Formation Potential	*kg O3 eq*	1.2E-04	4.9E-07	1.1E-02	1.2E-05
Solid Waste by Weight	*kg SW eq*	0.0E+00	0.0E+00	2.3E-02	2.5E-05
Water Consumption	*liter H2O*	1.2E-02	0.0E+00	2.2E+00	6.0E-01

Disposal	*Total*
9.5E-07	*3.7E-02*
1.3E-06	*9.7E+01*
6.0E-08	*7.5E-04*
3.1E-08	*1.8E+00*
8.9E-05	*6.1E+00*
4.1E-08	*2.0E-03*
3.3E-05	*3.3E-01*
0.0E+00	*6.8E-01*
0.0E+00	*6.7E+01*

Disposal	*Total*
3.2E-08	1.2E-03
4.4E-08	3.2E+00
2.0E-09	2.5E-05
1.0E-09	6.1E-02
3.0E-06	2.0E-01
1.4E-09	6.7E-05
1.1E-06	1.1E-02
0.0E+00	2.3E-02
0.0E+00	2.8E+00

Large Scale - WaterGen

Per Day			
Capital Equipment	Transport to Point of Use	Operation	Disposal
2.3E-02	4.9E-05	4.3E+00	1.1E-04
59.25	0.00	11223.02	0.00
1.3E-02	3.0E-06	6.9E-02	6.9E-06
1.057	0.000	211.025	0.000
6.555	0.010	696.514	0.010
8.6E-03	8.9E-07	2.3E-01	4.7E-06
0.2900	0.0017	38.5723	0.0038
0.0000	0.0000	79.6312	0.0000
26.5000	0.0000	7301.3925	0.0000

Medium Scale - WaterGen

Per Day			
Capital Equipment	Transport to Point of Use	Operation	Disposal
6.2E-03	1.4E-05	5.4E-01	3.1E-05
16.00	0.00	1410.89	0.00
3.7E-03	8.3E-07	8.7E-03	1.9E-06
2.8E-01	0.000	26.529	1.00E-06
1.595	0.003	87.562	0.003
2.4E-03	2.5E-07	2.8E-02	1.3E-06
0.0794	0.0005	4.8491	0.0011
0.0000	0.0000	10.0108	0.0000
7.0800	0.0000	940.75	0.0000

Small Scale - WaterGen

Capital Equipment
4.2E-04
1.14
2.4E-04
0.020
0.120
1.5E-04
0.0053
0.0000
0.5600

Electricity Impacts per kW

Impact category	Unit	US average	RFCW
Acidification Potential (AP)	kg SO2 eq	4.09E-03	6.73E-03
Cumulative Energy Demand	MJ eq	1.07E+01	1.20E+01
Eutrophication Potential (EP)	kg N eq	6.57E-05	1.01E-04
Fossil resource scarcity	kg oil eq	2.01E-01	2.49E-01
Global Warming Potential (GWP)	kg CO2 eq	6.63E-01	8.76E-01
Particulate Matter Formation Potential	kg PM2.5 eq	2.15E-04	3.41E-04
Smog Formation Potential	kg O3 eq	3.67E-02	5.64E-02
Solid Waste by Weight	kg SW	7.58E-02	1.30E-01
Water Consumption	liter H2O	4.10E+00	2.46E+00

Per Day		
Transport to Point of Use	Operation	Disposal
8.6E-07	3.1E-02	1.9E-06
0.00	80.16	0.00
5.2E-08	4.9E-04	1.2E-07
0.000	1.507	0.000
0.000	4.975	0.000
1.5E-08	1.6E-03	8.2E-08
0.0000	0.2755	0.0001
0.0000	0.5688	0.0000
0.0000	55.7242	0.0000

Large Scale - EB

Per Day			
Capital Equipment	Transport to Point of Use	Operation	Disposal
1.5E-02	3.3E-05	5.2E+00	7.3E-05
40.90	0.00	1.3E+04	0.00
8.8E-03	2.0E-06	8.3E-02	4.6E-06
0.737	0.000	2.5E+02	0.000
4.410	0.007	8.4E+02	0.007
5.8E-03	5.9E-07	2.7E-01	3.1E-06
0.1981	0.0011	4.6E+01	0.0025
0.0000	0.0000	9.6E+01	0.0000
17.2600	0.0000	8.2E+03	0.0000

'h

FRCC	CAMX
2.33E-03	7.32E-04
1.14E+01	9.96E+00
5.28E-05	2.40E-05
2.62E-01	1.75E-01
7.82E-01	5.02E-01
1.71E-04	5.65E-05
2.94E-02	1.36E-02
3.15E-02	5.36E-03
5.63E-01	4.61E+00

Medium Scale - EB

Per Day			
Capital Equipment	Transport to Point of Use	Operation	Disposal
4.1E-03	8.6E-06	1.0E+00	1.9E-05
10.73	0.00	2.6E+03	0.00
2.5E-03	5.2E-07	1.6E-02	1.2E-06
0.189	0.000	4.9E+01	0.000
1.034	0.002	1.6E+02	0.002
1.6E-03	1.5E-07	5.3E-02	8.2E-07
0.0524	0.0003	9.0E+00	0.0007
0.0000	0.0000	1.9E+01	0.0000
4.6500	0.0000	1.6E+03	0.0000

Small Scale - EB

Per Day		
Capital Equipment	Transport to Point of Use	Operation
2.7E-04	4.3E-07	3.7E-02
0.95	0.00	9.6E+01
1.6E-04	2.6E-08	5.9E-04
0.017	0.000	1.8E+00
0.095	0.000	6.0E+00
8.4E-05	7.7E-09	1.9E-03
0.0037	0.0000	3.3E-01
0.0000	0.0000	6.8E-01
0.3500	0.0000	6.7E+01

	Operation Large Scale WG (per day)			Operation Medium Scale WG (per day)
Disposal	RFCW	FRCC	CAMX	RFCW
9.5E-07	7.1E+00	2.4E+00	0.77	8.9E-01
0.00	12621.11	12001.01	10458.00	1586.65
6.0E-08	1.1E-01	5.5E-02	0.03	1.3E-02
0.000	261.279	275.390	183.75	32.846
0.000	919.367	821.012	527.10	115.578
4.1E-08	3.6E-01	1.8E-01	0.06	4.5E-02
0.0000	59.2424	30.8580	14.28	7.4476
0.0000	136.3846	33.0448	5.63	17.1455
0.0000	5582.2281	3590.8324	7840.50	724.6230

FRCC	CAMX
3.1E-01	9.7E-02
1508.70	1.3E+03
7.0E-03	3.2E-03
34.621	2.3E+01
103.213	6.6E+01
2.3E-02	7.5E-03
3.8793	1.8E+00
4.1542	7.1E-01
474.2761	1.0E+03

Operation
Small Scale WG (per day)

RFCW	FRCC	CAMX
5.0E-02	1.7E-02	5.5E-03
90.15	85.72	7.5E+01
7.6E-04	4.0E-04	1.8E-04
1.866	1.967	1.3E+00
6.567	5.864	3.8E+00
2.6E-03	1.3E-03	4.2E-04
0.4232	0.2204	1.0E-01
0.9742	0.2360	4.0E-02
43.4445	29.2202	6.0E+01

Operation
Large Scale EB (per day)

RFCW	FRCC	CAMX
8.5E+00	2.9E+00	9.2E-01
1.5E+04	1.4E+04	1.3E+04
1.3E-01	6.7E-02	3.0E-02
3.1E+02	3.3E+02	2.2E+02
1.1E+03	9.9E+02	6.3E+02
4.3E-01	2.2E-01	7.1E-02
7.1E+01	3.7E+01	1.7E+01
1.6E+02	4.0E+01	6.8E+00
6.1E+03	3.7E+03	8.8E+03

Operation
Medium Scale EB (per day)

RFCW	FRCC	CAMX
1.7E+00	5.7E-01	1.8E-01
3.0E+03	2.8E+03	2.5E+03
2.5E-02	1.3E-02	5.9E-03
6.1E+01	6.5E+01	4.3E+01
2.2E+02	1.9E+02	1.2E+02
8.4E-02	4.2E-02	1.4E-02
1.4E+01	7.2E+00	3.3E+00
3.2E+01	7.7E+00	1.3E+00
1.2E+03	7.4E+02	1.7E+03

Operation
Small Scale EB (per day)

RFCW	FRCC	CAMX
6.1E-02	2.1E-02	6.6E-03
1.1E+02	1.0E+02	9.0E+01
9.1E-04	4.8E-04	2.2E-04
2.2E+00	2.4E+00	1.6E+00
7.9E+00	7.0E+00	4.5E+00
3.1E-03	1.5E-03	5.1E-04
5.1E-01	2.6E-01	1.2E-01
1.2E+00	2.8E-01	4.8E-02
5.2E+01	3.5E+01	7.1E+01

Cell: F20

Comment: Citizen Name / Ex. 6
Electricity holds steady per L water produced

Cell: O20

Comment: Citizen Name / Ex. 6
Electricity holds steady per L water produced

Cell: X20

Comment: Citizen Name / Ex. 6
Electricity holds steady per L water produced

Single-serve bottle results DRAFT

Calculation

Model Output

Category	Unit	Raw Material Production	Conversion
Acidification Potential	*kg SO2 eq*	9.9E-05	9.1E-05
Cumulative Energy Demand	*MJ*	6.5E-01	2.1E-01
Eutrophication Potential	*kg N eq*	4.5E-06	1.8E-06
Fossil Depletion	*kg oil eq*	1.4E-02	4.0E-03
Global Warming Potential	*kg CO2 eq*	2.5E-02	1.3E-02
Particulate Matter Formation Potential	*kg PM2.5 eq*	6.8E-06	4.6E-06
Smog Formation Potential	*kg O3 eq*	1.6E-03	1.0E-03
Solid Waste by Weight	*kg SW eq*	1.3E-03	1.5E-03
Water Consumption	*liter H2O*	9.2E-02	8.0E-02

Category	Unit	Raw Material Production	Conversion
Acidification Potential	*kg SO2 eq*	2.0E-04	1.8E-04
Cumulative Energy Demand	*MJ*	1.30	0.42
Eutrophication Potential	*kg N eq*	9.0E-06	3.7E-06
Fossil Depletion	*kg oil eq*	0.029	0.0079
Global Warming Potential	*kg CO2 eq*	0.050	0.026
Particulate Matter Formation Potential	*kg PM2.5 eq*	1.4E-05	9.1E-06
Smog Formation Potential	*kg O3 eq*	0.0031	0.0020
Solid Waste by Weight	*kg SW eq*	0.0025	0.0029
Water Consumption	*liter H2O*	0.18	0.16

Per 16.9 oz Spring Water Bottle							
Water Treatment	Filling	Transportation to Retail	Closure Life Cycle	Label Life Cycle	Secondary Packaging Life Cycle	Bottle End-of-Life	*Total*
4.8E-07	1.5E-06	2.9E-05	1.6E-05	6.7E-06	1.0E-05	-2.9E-07	2.5E-04
1.3E-03	3.8E-03	1.0E-01	1.1E-01	5.3E-02	1.4E-01	-1.3E-03	1.3E+00
3.0E-07	2.3E-08	1.6E-06	3.9E-07	1.4E-07	2.5E-07	8.3E-08	9.1E-06
2.4E-05	7.2E-05	2.3E-03	2.3E-03	1.1E-03	2.8E-03	-4.3E-06	2.7E-02
7.9E-05	2.4E-04	7.2E-03	3.9E-03	2.0E-03	5.0E-03	2.6E-03	5.9E-02
2.5E-08	7.7E-08	1.3E-06	9.3E-07	3.9E-07	7.1E-07	1.4E-07	1.5E-05
4.3E-06	1.3E-05	8.8E-04	2.0E-04	7.7E-05	1.4E-04	4.6E-05	3.9E-03
8.9E-06	2.7E-05	9.9E-05	9.0E-04	6.1E-04	1.2E-03	5.3E-03	1.1E-02
5.9E-01	1.5E-03	1.2E-02	1.9E-02	8.2E-03	1.2E-02	-1.9E-03	8.1E-01

Per Liter of 16.9 oz Spring Water Bottle							
Water Treatment	Filling	Transportation to Retail	Closure Life Cycle	Label Life Cycle	Secondary Packaging Life Cycle	Bottle End-of-Life	*Total*
9.6E-07	2.9E-06	5.9E-05	3.3E-05	1.3E-05	2.0E-05	-5.9E-07	5.1E-04
0.0025	0.0076	0.21	0.22	0.11	0.28	-0.0026	2.54
6.0E-07	4.7E-08	3.2E-06	7.7E-07	2.9E-07	5.1E-07	1.7E-07	1.8E-05
4.7E-05	1.4E-04	0.0047	0.0046	0.0023	0.0056	-8.7E-06	0.054
1.6E-04	4.7E-04	0.014	0.0078	0.0039	0.010	0.0051	0.12
5.0E-08	1.5E-07	2.7E-06	1.9E-06	7.9E-07	1.4E-06	2.8E-07	3.0E-05
8.6E-06	2.6E-05	0.0018	4.0E-04	1.5E-04	2.8E-04	9.2E-05	0.0079
1.8E-05	5.4E-05	2.0E-04	0.0018	0.0012	0.0025	0.011	0.022
1.17	0.0029	0.025	0.038	0.016	0.025	-0.0037	1.62

Per 16.9 oz Spring Water Bottle, bottle weight = 9.3 grams (Cutoff, 0% PCR)								
Raw Material Production	Conversion	Water Treatment (Spring)	Filling	Transportation to Retail	Closure Life Cycle	Label Life Cycle	Secondary Packaging Life Cycle	Bottle End-of-Life
9.9E-05	9.1E-05	4.8E-07	1.5E-06	2.9E-05	1.6E-05	6.7E-06	1.0E-05	-2.9E-07
0.65	0.21	0.0013	0.0038	0.10	0.110	0.053	0.14	-0.0013
4.5E-06	1.8E-06	3.0E-07	2.3E-08	1.6E-06	3.9E-07	1.4E-07	2.5E-07	8.3E-08
0.014	0.0040	2.4E-05	7.2E-05	0.0023	0.0023	0.0011	0.0028	-4.3E-06
0.025	0.013	7.9E-05	2.4E-04	0.0072	0.0039	0.0020	0.0050	0.0026
6.8E-06	4.6E-06	2.5E-08	7.7E-08	1.3E-06	9.3E-07	3.9E-07	7.1E-07	1.4E-07
0.0016	0.0010	4.3E-06	1.3E-05	8.8E-04	2.0E-04	7.7E-05	1.4E-04	4.6E-05
0.0013	0.0015	8.9E-06	2.7E-05	9.9E-05	9.0E-04	6.1E-04	0.0012	0.0053
0.092	0.080	0.59	0.0015	0.012	0.019	0.0082	0.012	-0.0019

Total
2.5E-04
1.3E+00
9.1E-06
2.7E-02
5.9E-02
1.5E-05
3.9E-03
1.1E-02
8.1E-01

Per 16.9 oz Spring Water Bottle, bottle weight = 10.9 grams (Cutoff, 0% PCR)									
Raw Material Production	Conversion	Water Treatment (Spring)	Filling	Transportation to Retail	Closure Life Cycle	Label Life Cycle	Secondary Packaging Life Cycle	Bottle End-of-Life	*Total*
1.2E-04	1.1E-04	4.8E-07	1.5E-06	3.0E-05	1.6E-05	6.7E-06	1.0E-05	-3.5E-07	*2.9E-04*
0.76	0.24	0.0013	0.0038	0.10	1.1E-01	0.053	0.14	-0.0015	*1.4E+00*
5.3E-06	2.2E-06	3.0E-07	2.3E-08	1.6E-06	3.9E-07	1.4E-07	2.5E-07	9.7E-08	*1.0E-05*
0.017	0.0046	2.4E-05	7.2E-05	0.0023	2.3E-03	0.0011	0.0028	-5.1E-06	*3.0E-02*
0.029	0.015	7.9E-05	2.4E-04	0.0072	3.9E-03	0.0020	0.0050	0.0030	*6.6E-02*
7.9E-06	5.3E-06	2.5E-08	7.7E-08	1.3E-06	9.3E-07	3.9E-07	7.1E-07	1.7E-07	*1.7E-05*
0.0018	0.0012	4.3E-06	1.3E-05	8.8E-04	2.0E-04	7.7E-05	1.4E-04	5.4E-05	*4.4E-03*
0.0015	0.0017	8.9E-06	2.7E-05	9.9E-05	9.0E-04	6.1E-04	0.0012	0.0062	*1.2E-02*
0.108	0.094	0.59	0.0015	0.013	1.9E-02	0.0082	0.012	-0.0022	*8.4E-01*

Bottle End-of-Life (System Expansion), 0% PCR		Bottle End-of-Life (System Expansion), 10% PCR		Raw Material Production, 10% PCR	
9.3 g bottle	10.9 g bottle	9.3 g bottle	10.9 g bottle	9.3 g bottle	10.9 g bottle
-9.9E-06	-1.2E-05	-6.8E-06	-8.0E-06	9.3E-05	1.1E-04
-0.1499	-0.1757	-0.1024	-0.1200	0.5964	0.6987
-9.7E-08	-1.1E-07	-3.9E-08	-4.6E-08	4.3E-06	5.0E-06
-3.4E-03	-4.0E-03	-2.3E-03	-2.7E-03	1.3E-02	1.5E-02
-1.4E-03	-1.7E-03	-1.4E-04	-1.7E-04	2.3E-02	2.7E-02
-6.4E-07	-7.5E-07	-3.9E-07	-4.6E-07	6.3E-06	7.4E-06
-1.5E-04	-1.8E-04	-9.0E-05	-1.0E-04	1.5E-03	1.7E-03
5.2E-03	6.1E-03	5.2E-03	6.1E-03	1.2E-03	1.4E-03
-0.0003	-0.0003	-0.0008	-0.0009	0.0910	0.1067

System Expansion (Cap)	Municipal Water
1.51629E-05	2.0703E-06
0.086747911	0.005255806
3.61951E-07	6.59747E-07
0.001760497	9.88483E-05
0.00345561	0.000332277
8.61342E-07	1.13169E-07
0.000186218	1.80286E-05
0.000886385	3.76978E-05
0.01837842	0.70093301

Multi-serve reusable jug results DRAFT

Calculation

Model Output

Category	Unit	Raw Material Production
Acidification Potential	*kg SO2 eq*	4.9E-04
Cumulative Energy Demand	*MJ*	2.13
Eutrophication Potential	*kg N eq*	2.7E-05
Fossil Depletion	*kg oil eq*	0.044
Global Warming Potential	*kg CO2 eq*	0.16
Particulate Matter Formation Potential	*kg PM2.5 eq*	7.8E-05
Smog Formation Potential	*kg O3 eq*	0.0063
Solid Waste by Weight	*kg SW eq*	3.8E-06
Water Consumption	*liter H2O*	0.27

Category	Unit	Raw Material Production
Acidification Potential	*kg SO2 eq*	2.6E-05
Cumulative Energy Demand	*MJ*	0.11
Eutrophication Potential	*kg N eq*	1.4E-06
Fossil Depletion	*kg oil eq*	0.0023
Global Warming Potential	*kg CO2 eq*	0.0084
Particulate Matter Formation Potential	*kg PM2.5 eq*	4.1E-06
Smog Formation Potential	*kg O3 eq*	3.3E-04
Solid Waste by Weight	*kg SW eq*	2.0E-07
Water Consumption	*liter H2O*	0.014

Per 5 gallon Spring Water Jug								
Conversion	Water Treatment	Filling	Transportation to and from User	Closure Life Cycle	Reusable Container Washing	Jug Washing	Jug Recycling	*Total*
1.8E-04	1.8E-05	5.5E-05	0.0016	2.2E-04	0.0000	3.0E-04	0.0E+00	*0.0029*
0.47	4.7E-02	0.14	6.6059	1.6E+00	0.0644	0.80	0.0E+00	*11.8*
3.1E-06	1.1E-05	8.9E-07	0.0001	4.8E-06	0.0000	1.7E-05	0.0E+00	*1.6E-04*
0.0088	8.9E-04	0.0027	0.1503	3.2E-02	0.0012	0.015	0.0E+00	*0.25*
0.029	3.0E-03	0.0089	0.4629	5.2E-02	0.0041	0.049	0.0E+00	*0.77*
9.2E-06	9.5E-07	2.9E-06	0.0001	1.2E-05	0.0000	1.6E-05	0.0E+00	*2.1E-04*
0.0017	1.6E-04	5.0E-04	0.0480	2.5E-03	0.0002	0.0027	0.0E+00	*0.062*
0.0033	3.4E-04	0.0010	0.0064	3.3E-03	0.0005	0.0055	0.0E+00	*0.020*
0.17	2.2E+01	0.055	0.8027	2.7E-01	11.2811	1.79	0.0E+00	*36.8*

Per Liter Spring Water Jug								
Conversion	Water Treatment	Filling	Transportation to and from User	Closure Life Cycle	Reusable Container Washing	Jug Washing	Jug Recycling	*Total*
9.3E-06	9.6E-07	2.9E-06	8.7E-05	1.1E-05	1.4E-06	1.6E-05	0	1.5E-04
0.025	0.0025	0.0076	0.35	0.082	0.00	0.042	0	0.62
1.6E-07	6.0E-07	4.7E-08	4.7E-06	2.5E-07	3.1E-07	9.2E-07	0	8.4E-06
4.7E-04	4.7E-05	1.4E-04	0.0080	0.0017	0.0001	7.8E-04	0	0.013
0.0015	1.6E-04	4.7E-04	0.024	0.0027	0.000	0.0026	0	0.041
4.9E-07	5.0E-08	1.5E-07	4.6E-06	6.6E-07	7.5E-08	8.4E-07	0	1.1E-05
9.0E-05	8.6E-06	2.6E-05	0.0025	1.3E-04	0.0000	1.4E-04	0	0.0033
1.8E-04	1.8E-05	5.4E-05	3.4E-04	1.8E-04	0.0000	2.9E-04	0	0.0011
0.0092	1.17	0.0029	0.042	0.014	0.60	0.095	0	1.95

Reusable Container	
Dishwasher	Handwash
0.002345292	2.56056E-05
7.3444095	0.064434722
0.000165662	5.82073E-06
0.14553272	0.00121202
0.46045009	0.004075962
0.00013095	1.41638E-06
0.021266915	0.000220906
0.041020924	0.000463839
9.1112773	11.281096

Jug Transport		
25 Miles	75 Miles	125 Miles
0.000548446	0.001646701	0.002742228
2.200153304	6.60593301	11.00076652
2.93716E-05	8.81878E-05	0.000146858
0.050050842	0.150277034	0.250254209
0.154173757	0.46290477	0.770868765
2.90277E-05	8.71554E-05	0.000145139
0.015991509	0.048014307	0.079957546
0.002118316	0.006360217	0.010591579
0.26733726	0.802676798	1.3366863

Jug
Cutoff
0
0
0
0
0
0
0
0
0

Recycling	Closure Life Cycle		Water Treatment	
System Expansion	Cutoff	System Expansion	Spring Water	Municipal Water
-0.000430623	0.000216197	0.00017085	1.8E-05	7.82898E-05
-1.9619968	1.5519641	0.47105235	0.047	0.19875189
-2.59141E-05	4.75295E-06	3.95412E-06	1.1E-05	2.49488E-05
-0.040415573	0.032054949	0.008431537	8.9E-04	0.003738015
-0.14865107	0.051692882	0.026794458	0.0030	0.012565265
-7.42867E-05	1.24891E-05	9.38393E-06	9.5E-07	4.27955E-06
-0.005527187	0.002473794	0.002039394	1.6E-04	0.000681763
0.000817148	0.003333892	0.002842502	3.4E-04	0.001425568
-0.13918529	0.26563364	0.22460515	22.2	26.506258

	oz	ml	L	L/day
Single serve volume	16.9	500	0.5	
Multi-serve volume			18.9	
Large-scale AWG water production, WaterGen (Average)				3000
Large-scale AWG water production, WaterGen (Minimum)				3000
Large-scale AWG water production, WaterGen (Maximum)				4000
Medium-scale AWG water production, WaterGen (Average)				400
Medium-scale AWG water production, WaterGen (Minimum)				38
Medium-scale AWG water production, WaterGen (Maximum)				578
Small-scale AWG water production, WaterGen (Average)				25
Small-scale AWG water production, WaterGen (Minimum)				15
Small-scale AWG water production, WaterGen (Maximum)				25
Large-scale AWG water production, Ecoloblue (Average)				3000
Medium-scale AWG water production, Ecoloblue (Average)				600
Small-scale AWG water production, Ecoloblue (Average)				30
Large-scale AWG water production, Ecoloblue (Minimum)				193
Medium-scale AWG water production, Ecoloblue (Minimum)				50
Small-scale AWG water production, Ecoloblue (Minimum)				20
Large-scale AWG water production, Ecoloblue (Maximum)				4781
Medium-scale AWG water production, Ecoloblue (Maximum)				962
Small-scale AWG water production, Ecoloblue (Maximum)				30

Reusable Container Washing Method
Dishwash
Handwash

Jug Transport Distance
Average
Minimum
Maximum

Single-serve Bottle Weight
Minimum
Maximum

Recycling Allocation
Cutoff
System Expansion

AWG Vendor
WaterGen
Ecoloblue

AWG Electrical Grid
Average US
RFCW
FRCC
CAMX

Bottled Water Source
Treated Municipal Water
Spring Water

Single-serve Bottle Recycled Content
None
Ten Percent

AWG Water Production
Average
Minimum
Maximum