EARTHCHECK

BENCHMARKING ASSESSMENT REPORT

COMMUNITY BENCHMARKING

SNAEFELLSNES PENINSULA
STYKKISHOLMI, ICELAND

REPORT DATE: 12 November 2014

Benchmarking Data Collection Period: 1 January 2013 – 31 December 2013

The planet deserves more than half measures

OVERVIEW

This annual assessment of the **Snaefellsnes Peninsula** was undertaken against EarthCheck benchmarking indicators and checklists developed for EarthCheck and listed below[1]. They have been carefully selected to track performance in key areas of environmental and social performance impact. The lead agency responsible for collection, collation and authorisation of the information required by the indicators was the **Snaefellsnes Council of Executives**.

		Indicator Measure (Benchmark)
1	Policy	Policy is produced and in place[2]
2	Energy	Energy Consumption (GJ / Person Year)[3] Green Power (%)[3] Greenhouse Gas Emissions (Scope 1 and Scope 2) (t CO_2-e / Person Year)[3] Indirect Emissions (Scope 3) (t CO_2-e / Person Year)[3]
3	Water	Potable Water Consumption (kL / Person Year)[3] Recycled / Captured Water (%)[4]
4	Waste	Waste Sent to Landfill (m^3 / Person Year)[3] Recycled / Reused / Composted Waste (%)[4]
5	Sector Specific	Nitrous Oxides Produced (kg / Person Year / Hectare)[5] Sulphur Dioxide Produced (kg / Person Year / Hectare)[5] Particulate Matter Produced (kg / Person Year / Hectare)[5] Water Samples Passed (%)[2] Habitat Conservation Area (%)[2] Green Space (%)[2] Accredited Operations (%)[2]
		Lead Agency Performance
6		Water Savings Rating (Points)[6] Waste Recycling Rating (Points)[6] Paper Products Rating (Points)[6] Cleaning Products Rating (Points)[6] Pesticide Products Rating (Points)[6]

1 Please refer to the relevant EarthCheck Sector Benchmarking Indicator (SBI) document for more details. For frequently asked questions (FAQs) about benchmarking or specific help, please log on to 'My EarthCheck'
2 Produced by the lead agency after consultation with the community and consensus
3. Person year is equivalent to 365 person days. EarthCheck Communities must also allow for both resident and transient (tourist) populations in indicators assessed on a per person year basis. Tourist activity is classified into an "overnight stay" or "day tripper". An overnight stay is counted the same as a permanent resident, that is, 1 person day. A day tripper is counted as 0.333 person day
4. These indicators are for guidance only and do not affect the overall benchmarking evaluation
5. Primary assessed impacts on air quality are emissions due to electricity consumption, vehicular transport, industrial processes and mining. The levels are calculated on a per unit area basis using total emissions and total bounded area of the Community, including waterways. The data is then normalized against the average number of person years per area of the country
6. Assessed for the lead agency only

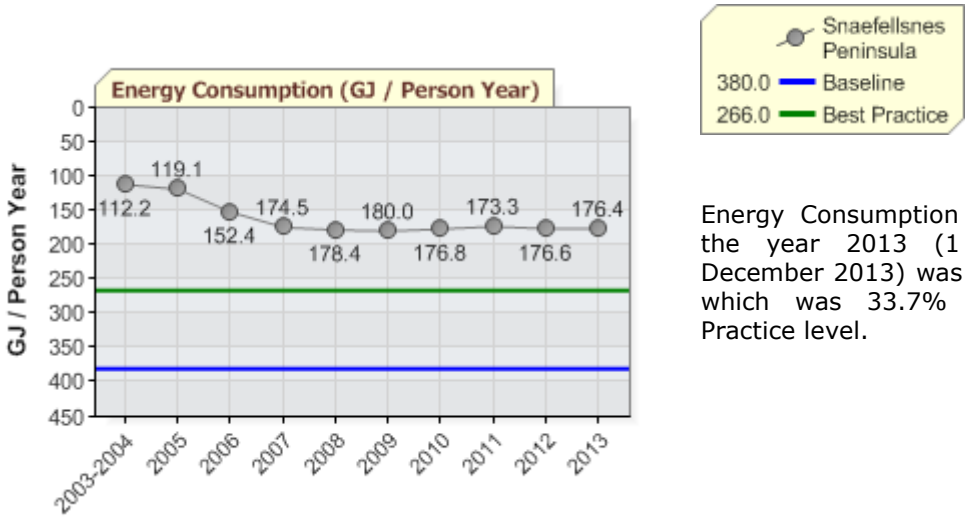
COMMUNITY PERFORMANCE BENCHMARKS

Current performance: *Below Baseline* ✖ *At or above Baseline* ✓ *At or above Best Practice* ★

1. Policy ★

2. Energy

Energy Consumption (GJ / Person Year) ★

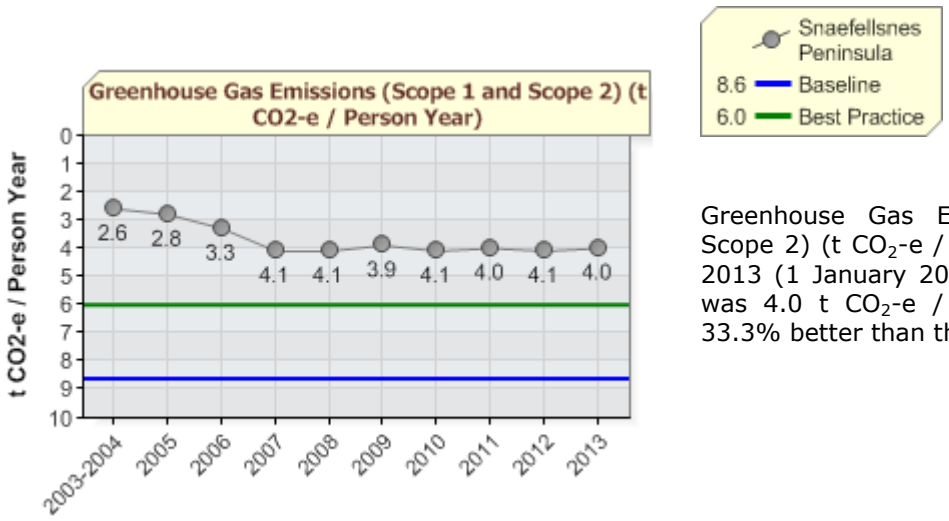


Energy Consumption (GJ / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 176.4 GJ / Person Year, which was 33.7% better than the Best Practice level.

Green Power (%)

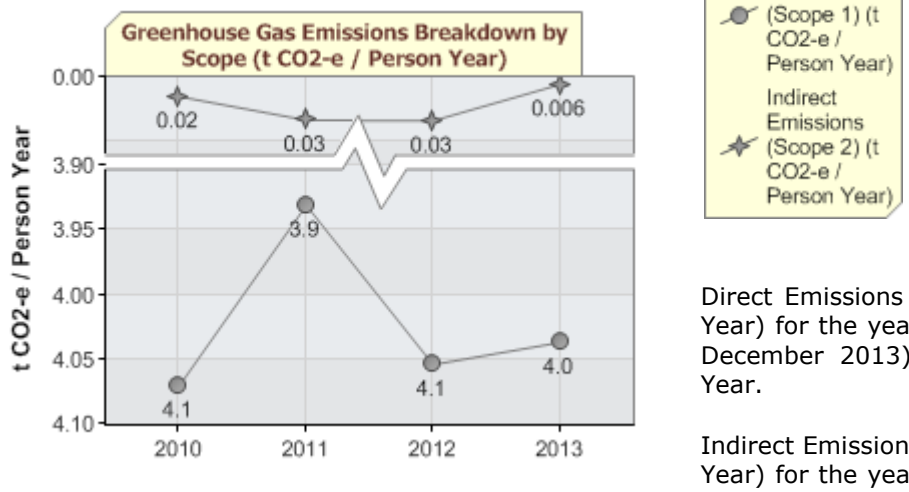
N/A

Greenhouse Gas Emissions (Scope 1 and Scope 2) (t CO_2-e / Person Year) ★



Greenhouse Gas Emissions (Scope 1 and Scope 2) (t CO_2-e / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 4.0 t CO_2-e / Person Year, which was 33.3% better than the Best Practice level.

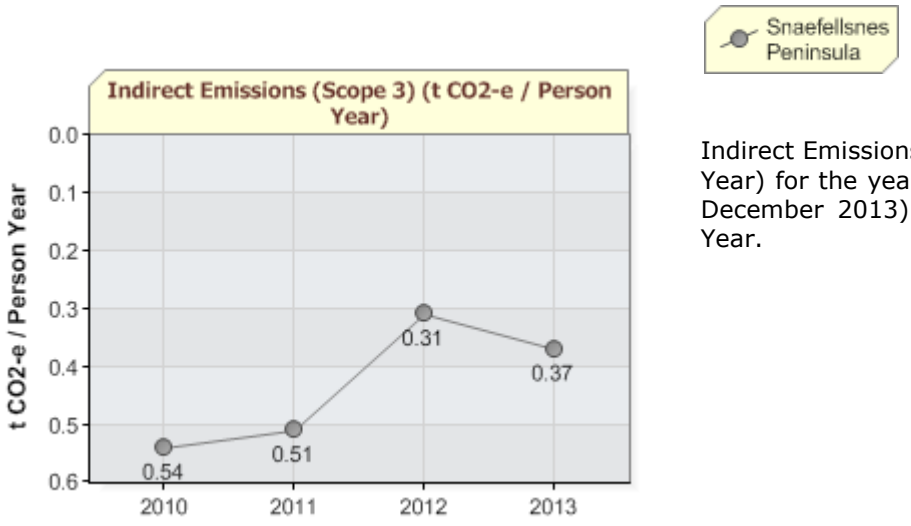
Greenhouse Gas Emissions Breakdown by Scope (t CO_2-e / Person Year)



Direct Emissions (Scope 1) (t CO_2-e / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 4.0 t CO_2-e / Person Year.

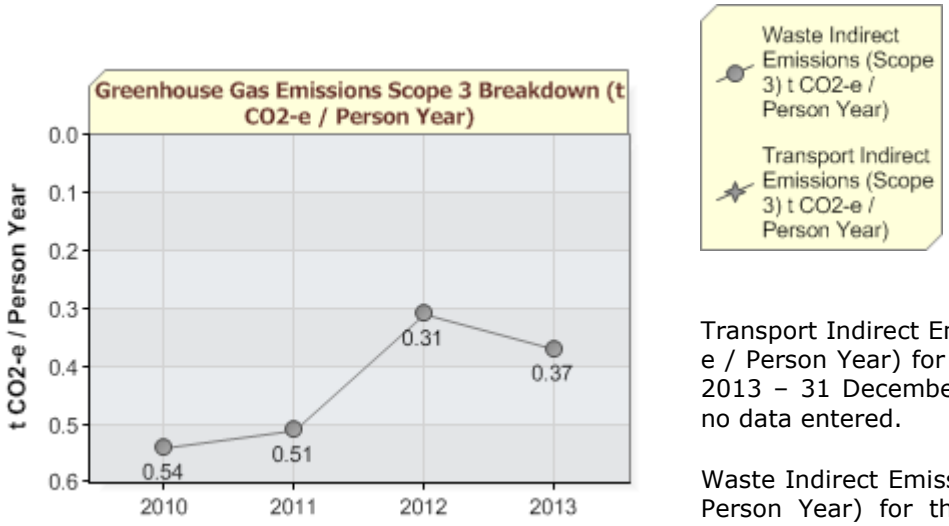
Indirect Emissions (Scope 2) (t CO_2-e / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 0.006 t CO_2-e / Person Year.

Indirect Emissions (Scope 3) (t CO_2-e / Person Year)



Indirect Emissions (Scope 3) (t CO_2-e / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 0.37 t CO_2-e / Person Year.

Greenhouse Gas Emissions Scope 3 Breakdown (t CO_2-e / Person Year)



Transport Indirect Emissions (Scope 3) (t CO_2-e / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) not measured as no data entered.

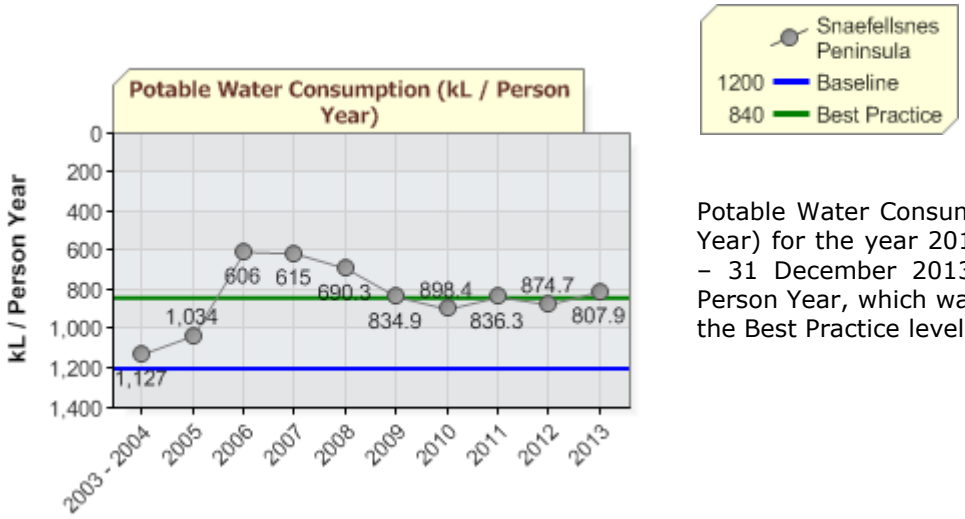
Waste Indirect Emissions (Scope 3) (t CO_2-e / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 0.37 t CO_2-e / Person Year.

Direct Emissions (Scope 1)							
Stationary Fuel Combustion							
2013							
Type	**Quantity**	**Unit**	**Energy Consumption (MJ)**	**CO_2 Emission Estimate (t CO_2-e)**	**CH_4 Emission Estimate (t CO_2-e)**	**N_2O Emission Estimate (t CO_2-e)**	**Total Emission Estimate (t CO_2-e)**
Heavy fuel oil	76817	litres (L)	2935652.1	215.9	0.6	0.5	217.0
		subtotal	2935652.1	215.9	0.6	0.5	217.0
Mobile Fuel Combustion (road)							
2013							
Type	**Quantity**	**Unit**	**Energy Consumption (MJ)**	**CO_2 Emission Estimate (t CO_2-e)**	**CH_4 Emission Estimate (t CO_2-e)**	**N_2O Emission Estimate (t CO_2-e)**	**Total Emission Estimate (t CO_2-e)**
Motor gasoline	2192839	litres (L)	75000530.9	4937.7	37.4	176.7	5151.8
Diesel	3584730	litres (L)	136925573.3	9638.9	10.7	157.3	9806.8
		subtotal	211926104.3	14576.5	48.1	334.0	14958.6
Mobile Fuel Combustion (water)							
2013							
Type	**Quantity**	**Unit**	**Energy Consumption (MJ)**	**CO_2 Emission Estimate (t CO_2-e)**	**CH_4 Emission Estimate (t CO_2-e)**	**N_2O Emission Estimate (t CO_2-e)**	**Total Emission Estimate (t CO_2-e)**
Heavy fuel oil	790006	litres (L)	30191009.9	2219.9	4.2	17.8	2241.9
		subtotal	30191009.9	2219.9	4.2	17.8	2241.9
		TOTAL	**245052766.3**	**17012.3**	**52.9**	**352.3**	**17417.5**
Indirect Emissions (Scope 2)							
Purchased Electricity							
2013							
Quantity	**Unit**	**% Green Power**	**Provider**	**Energy Consumption (MJ)**	**CO_2 Emission Estimate (t CO_2-e)**	**CH_4 Emission Estimate (t CO_2-e)**	**N_2O Emission Estimate (t CO_2-e)**	**Total Emission Estimate (t CO_2-e)**
92146654	Kilowatt hour (kWh)	N/A*	Iceland	331727954.4	16.9	0.06	0.3	17.2
127745	Kilowatt hour (kWh)	N/A*	Iceland	459882.0	0.02	0.00008	0.0004	0.02
51131390	Kilowatt hour (kWh)	N/A*	Iceland	184073004.0	9.4	0.03	0.2	9.5
			subtotal	516260840.4	26.2	0.09	0.4	26.8
			TOTAL	**516260840.4**	**26.2**	**0.09**	**0.4**	**26.8**
Greenhouse Gas Emissions (Scope 1 and Scope 2)							
			GRAND TOTAL	**761313606.7**	**17038.6**	**53.0**	**352.7**	**17444.2**
Indirect Emissions (Scope 3)							
Waste Sent to Landfill							
2013							
Quantity	**Unit**	**Type of Landfill**	**Type of Waste**	**Type of Operation**	**Source**	**CO_2 Emission Estimate (t CO_2-e)**	**CH_4 Emission Estimate (t CO_2-e)**	**N_2O Emission Estimate (t CO_2-e)**	**Total Emission Estimate (t CO_2-e)**
1343831	kilograms (uncompacted)	Covered and/or managed waste treatment facility	Unknown (mixed waste types)	Other Operation	International	0.0	1612.6	0.0	1612.6
					subtotal	0.0	1612.6	0.0	1612.6
					TOTAL	**0.0**	**1612.6**	**0.0**	**1612.6**

**A Green Power Agreement is unavailable for purchase as the standard grid electricity supply is from close to 100% renewable energy sources.*

3. Water

Potable Water Consumption (kL / Person Year)

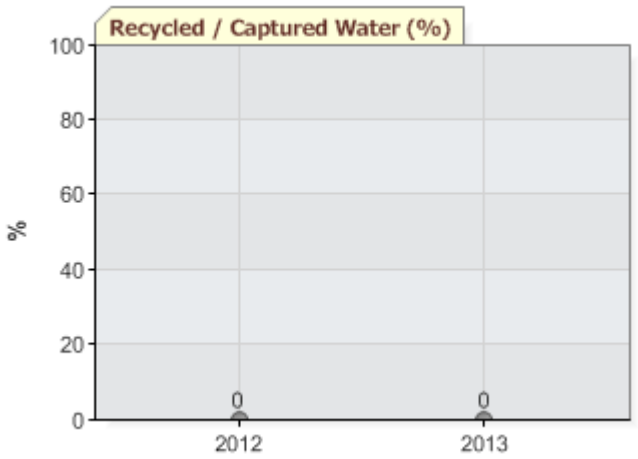


Potable Water Consumption (kL / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 807.9 kL / Person Year, which was 3.8% better than the Best Practice level.

2013

Quantity	Unit	Potable Water Consumption (kL)
3486037	kilolitres (kL)	3486037.0 kL
	TOTAL	**3486037.0 kL**

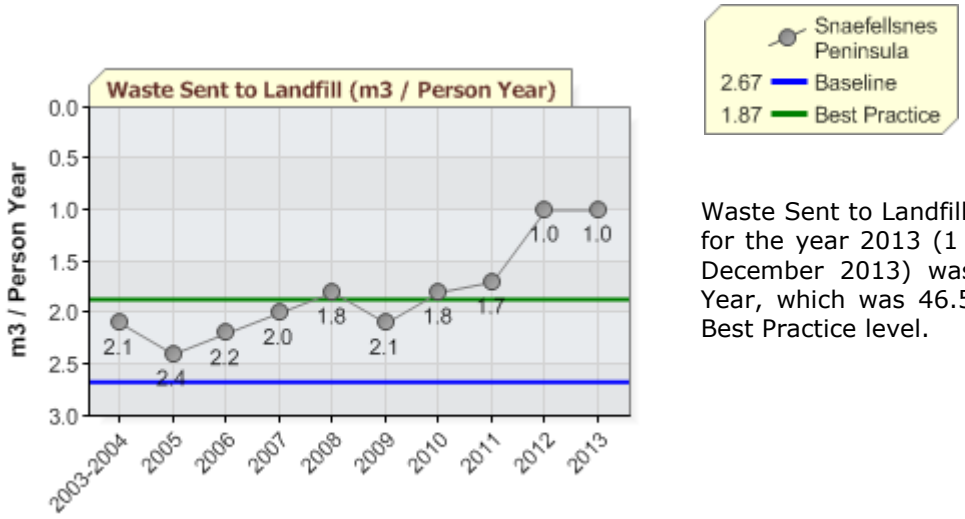
Recycled / Captured Water (%)



Recycled / Captured Water (%) for the year 2013 (1 January 2013 – 31 December 2013) was 0%.

4. Waste

Waste Sent to Landfill (m^3 / Person Year)



Waste Sent to Landfill (m^3 / Person Year) for the year 2013 (1 January 2013 – 31 December 2013) was 1.0 m^3 / Person Year, which was 46.5% better than the Best Practice level.

2013

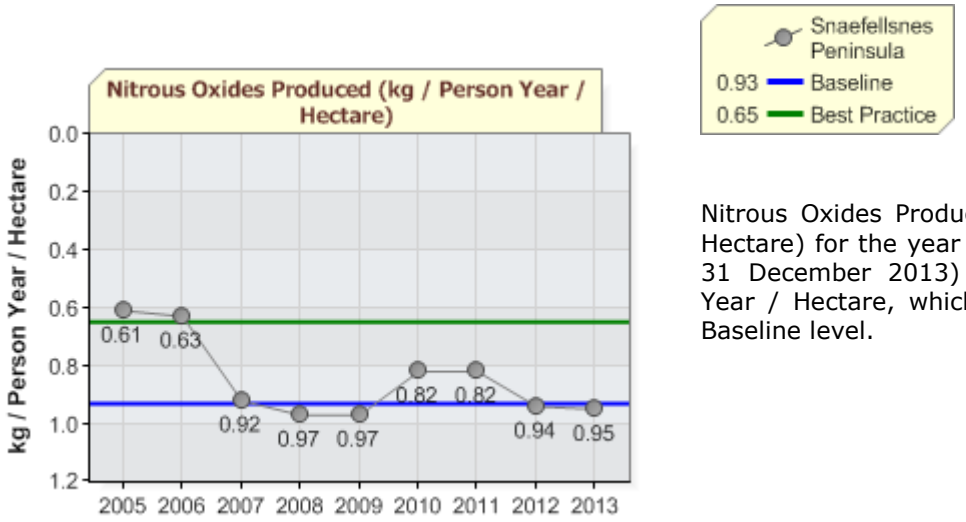
Quantity	Unit	Type of Landfill	Type of Waste	Type of Operation	Waste Sent to Landfill (m^3)
1343831	kilograms (uncompacted)	Covered and/or managed waste treatment facility	Unknown (mixed waste types)	Other Operation	4479.4 m^3
				TOTAL	**4479.4 m^3**

Recycled / Reused / Composted Waste (%)

Recycled / Reused / Composted Waste (%) for the year 2013 (1 January 2013 – 31 December 2013) was 54.4%.

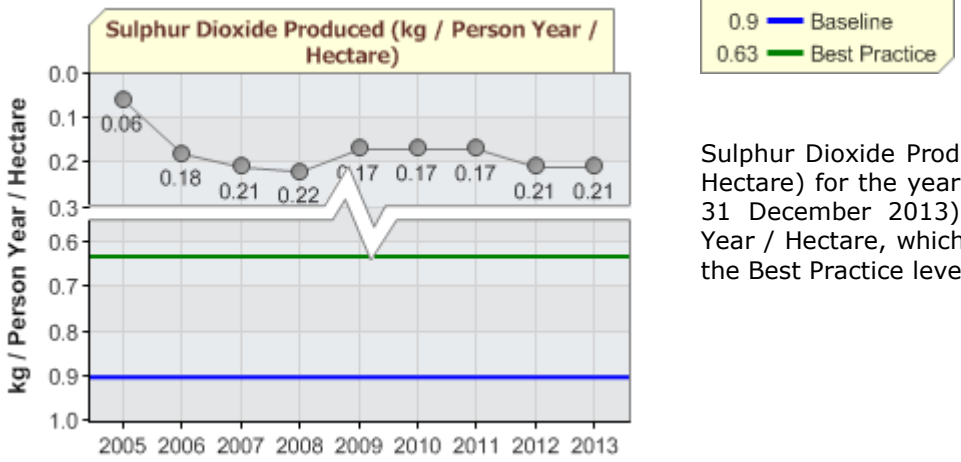
5. Sector Specific

Nitrous Oxides Produced (kg / Person Year / Hectare)



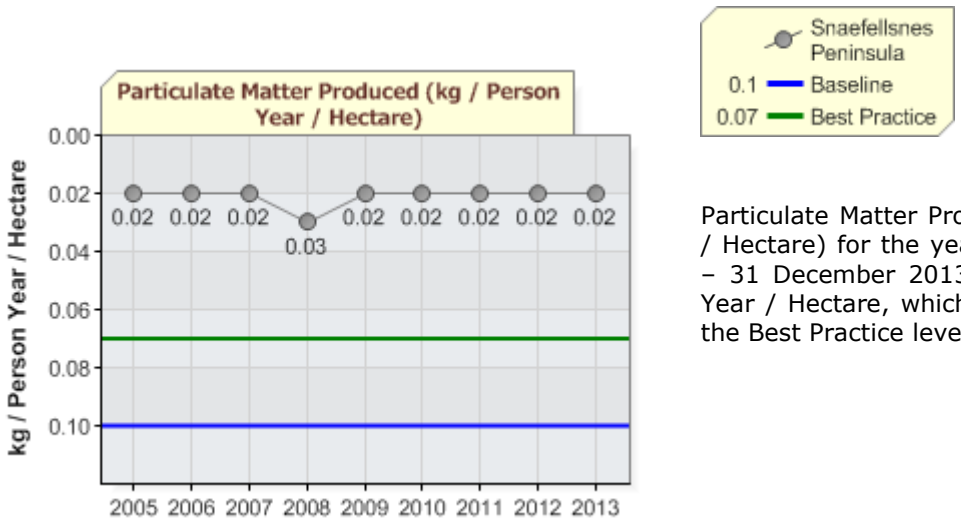
Nitrous Oxides Produced (kg / Person Year / Hectare) for the year 2013 (1 January 2013 – 31 December 2013) was 0.95 kg / Person Year / Hectare, which was 2.2 % below the Baseline level.

Sulphur Dioxide Produced (kg / Person Year / Hectare)



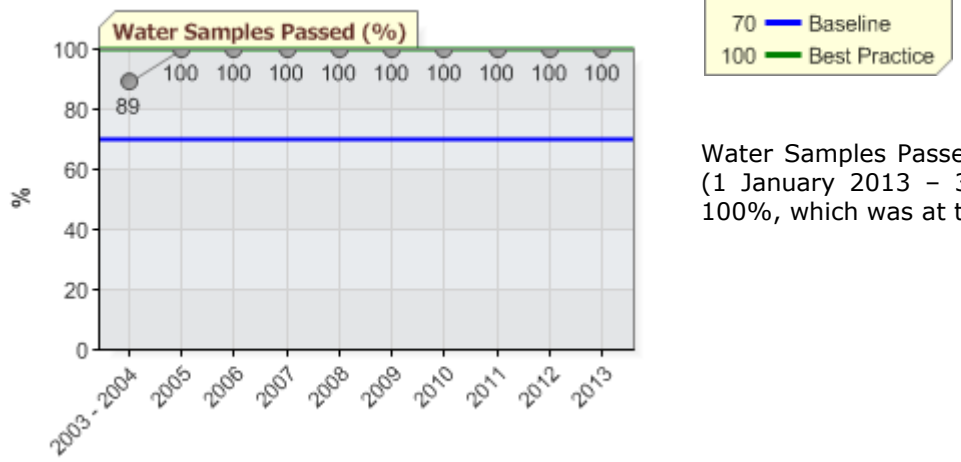
Sulphur Dioxide Produced (kg / Person Year / Hectare) for the year 2013 (1 January 2013 – 31 December 2013) was 0.21 kg / Person Year / Hectare, which was 66.7 % better than the Best Practice level.

Particulate Matter Produced (kg / Person Year / Hectare) ★



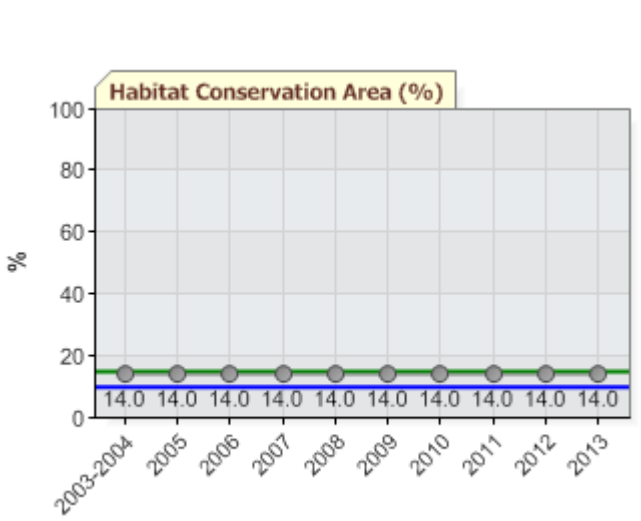
Particulate Matter Produced (kg / Person Year / Hectare) for the year 2013 (1 January 2013 – 31 December 2013) was 0.02 kg / Person Year / Hectare, which was 71.4% better than the Best Practice level.

Water Samples Passed (%) ★



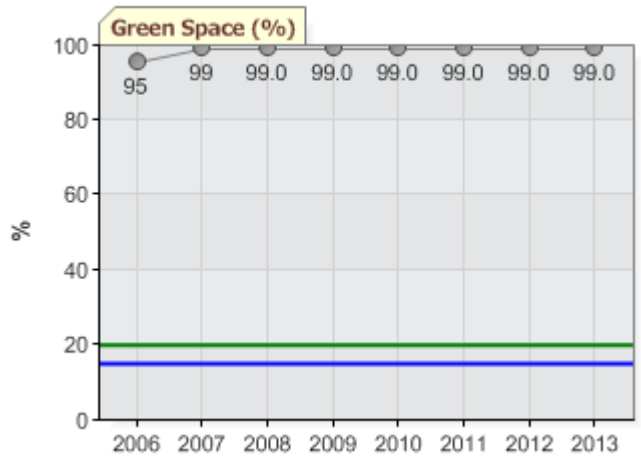
Water Samples Passed (%) for the year 2013 (1 January 2013 – 31 December 2013) was 100%, which was at the Best Practice level.

Habitat Conservation Area (%)



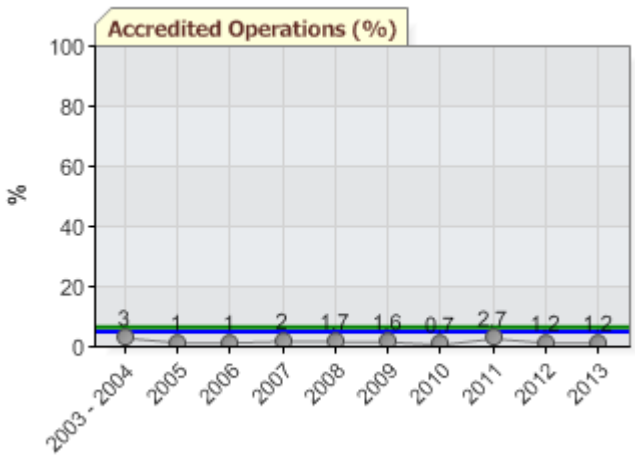
Habitat Conservation Area (%) for the year 2013 (1 January 2013 – 31 December 2013) was 14.0%, which was 4.0% better than the Baseline level.

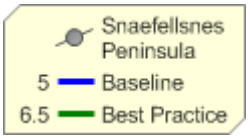
Green Space (%)



Green Space (%) for the year 2013 (1 January 2013 – 31 December 2013) was 99.0%, which was 79.0% better than the Best Practice level.

Accredited Operations (%) ✘





Accredited Operations (%) for the year 2013 (1 January 2013 – 31 December 2013) was 1.2%, which was 3.8% below the Baseline level.

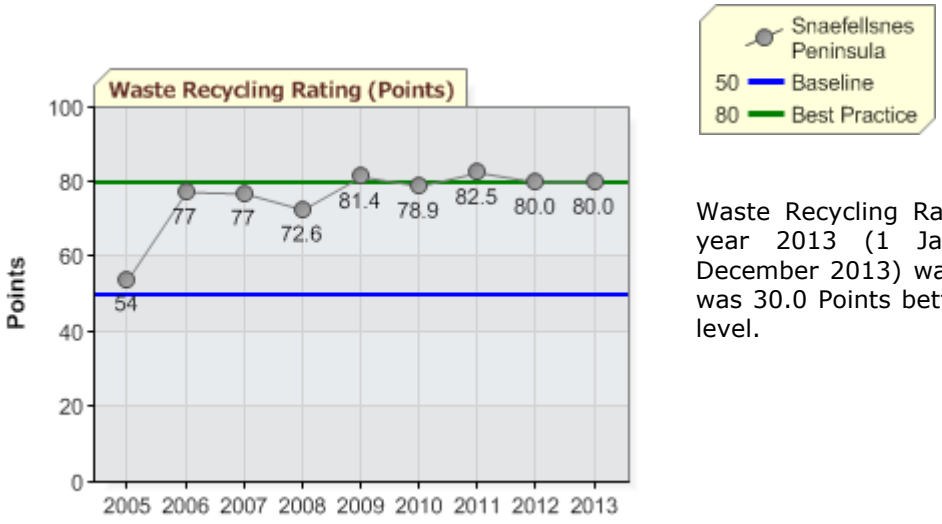
6. Lead Agency Performance

Water Savings Rating (Points)

Water Savings Rating (Points) for the year 2013 (1 January 2013 – 31 December 2013) was 50.0 Points, which was at the Baseline level.

Water Savings Measures	Frequency / Percentage Rating	Water Savings Rating (Points)
Check for leaks	Relevant / Not Available	50.0 Points
Low/dual flush toilets	Relevant / Not Available	50.0 Points
Low flow tap fittings	Relevant / Not Available	50.0 Points
Low flow shower fittings	Relevant / Not Available	50.0 Points
Water sprinklers used after dark	Relevant / Not Available	50.0 Points
Minimal irrigation landscaping	Relevant / Not Available	50.0 Points
Use of recycle/grey/rain water	Relevant / Not Available	50.0 Points
	Overall Rating:	**50.0 Points**

Waste Recycling Rating (Points) ✓



Waste Recycling Rating (Points) for the year 2013 (1 January 2013 – 31 December 2013) was 80.0 Points, which was 30.0 Points better than the Baseline level.

Waste Recycling Measures	Frequency / Percentage Rating	Waste Recycling Rating (Points)
Glass	80-99%	88.9 Points
Paper/card	40-59%	65.1 Points
Iron & steel (ferrous metals)	80-99%	88.9 Points
Other metals (non-ferrous)	80-99%	88.9 Points
Plastics	80-99%	88.9 Points
Rubber	40-59%	65.1 Points
Green waste	60-79%	73.9 Points
	Overall Rating:	**80.0 Points**

Paper Products Rating (Points) ★

Paper Products Rating (Points) for the year 2013 (1 January 2013 – 31 December 2013) was 100.0 Points, which was 20.0 Points better than the Best Practice level.

Paper Products Measures	Frequency / Percentage Rating	Paper Products Rating (Points)
Office paper	100%	100.0 Points
Serviettes	100%	100.0 Points
Tissues	100%	100.0 Points
Toilet tissue	100%	100.0 Points
Paper towels	100%	100.0 Points
	Overall Rating:	**100.0 Points**

Cleaning Products Rating (Points)

Cleaning Products Rating (Points) for the year 2013 (1 January 2013 – 31 December 2013) was 62.4 Points, which was 12.4 Points better than the Baseline level.

Cleaning Products Measures	Frequency / Percentage Rating	Cleaning Products Rating (Points)
Hard floor cleaners	20-39%	58.8 Points
Carpet cleaners	20-39%	58.8 Points
Interior surface cleaners	40-59%	65.1 Points
External surface cleaners	Not Relevant / Available	100.0 Points
Glass cleaners	Not Relevant / Available	100.0 Points
Detergents	0%	0.0 Points
Personal hygiene	1-19%	54.0 Points
	Overall Rating:	**62.4 Points**

Pesticide Products Rating (Points) ★

Pesticide Products Rating (Points) for the year 2013 (1 January 2013 – 31 December 2013) was 100.0 Points, which was 20.0 Points better than the Best Practice level.

Pesticide Products Measures	Frequency / Percentage Rating	Pesticide Products Rating (Points)
Weed killers	Not Relevant / Not Available	100.0 Points
Fungal killers	Not Relevant / Not Available	100.0 Points
Rodent killers	Not Relevant / Not Available	100.0 Points
Insect killers	Not Relevant / Not Available	100.0 Points
	Overall Rating:	**100.0 Points**

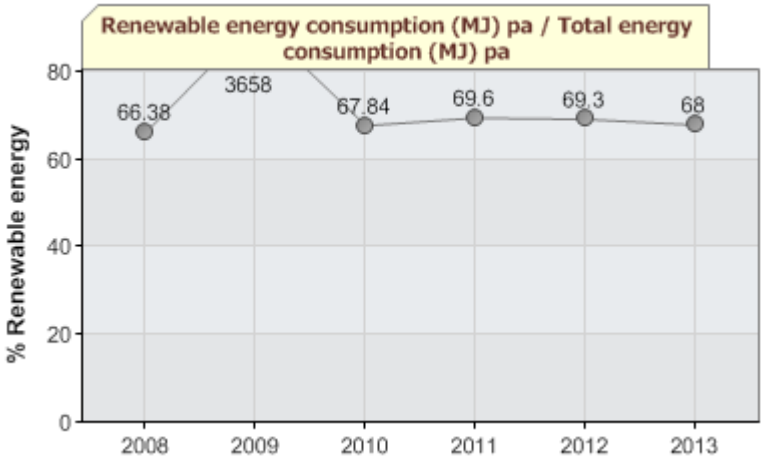
Optional Benchmarking Indicators

The **Snaefellsnes Peninsula** has also nominated optional Operation Selected and Specified Indicators that they consider relevant to their specific operation and locality. The Operation Selected and Specified Indicators do not form part of the formal annual benchmarking exercise.

1. Selected Indicators

Selected Indicators are from a supplied list of EarthCheck indicators.

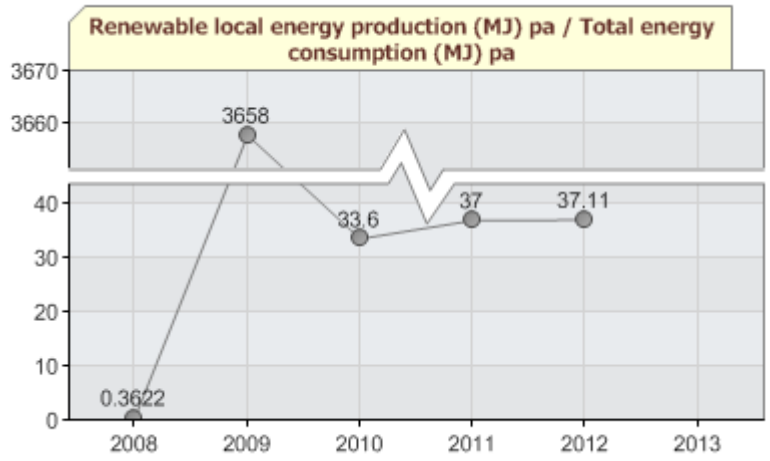
Renewable energy consumption (MJ) pa / Total energy consumption (MJ) pa



2. Specified Indicators

Specified Indicators are devised by the operator for local and/or internal performance assessment.

Renewable local energy production (MJ) pa / Total energy consumption (MJ) pa

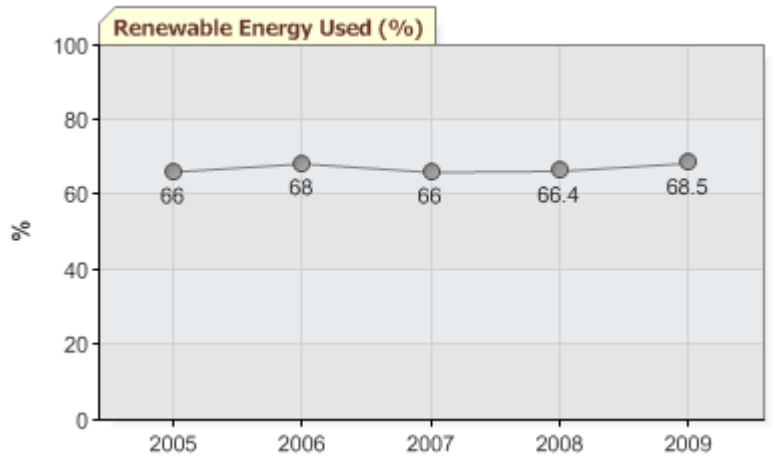


HISTORIC BENCHMARKING INDICATORS

1. Renewable Energy

Renewable Energy % is no longer a supplementary indicator; it is included here for historical reference.

Renewable Energy Used (%)



*The supplied data has been compiled by the **Snaefellsnes Peninsula** in the prescribed manner, authorised by a senior executive of the company and submitted for an annual assessment.*

CONCLUSION AND RECOMMENDATIONS

Congratulations, the **Snaefellsnes Peninsula** has met the requirements to be recognised as an EarthCheck Benchmarked Community.

In addition to having a Sustainability Policy in place, fourteen of the assessed EarthCheck indicators are at or above the Baseline level. From the benchmarking data provided, ten indicators, *Energy Consumption, Greenhouse Gas Emissions (Scope 1 and Scope 2), Potable Water Consumption, Waste Sent to Landfill, Sulphur Dioxide Produced, Particulate Matter Produced, Water Samples Passed, Green Space, Paper Products Rating,* and *Pesticide Products Rating* are at or above the Best Practice level, which is an achievement to be highly commended.

The two indicators that fell below the Baseline level were *Nitrous Oxides Produced* and *Accredited Operations*.

The value for *Nitrous Oxides Produced* was 2.2% below the Baseline Level. The **Snaefellsnes Peninsula** is encouraged to make improvements to ensure that Air Quality (NO_x) will meet the Baseline level for the next Benchmarking Period.

The value for *Accredited Operations* was 3.8% below the Baseline Level. The **Snaefellsnes Peninsula** is encouraged to promote environmental accreditation to hotels, restaurants and other business within the community.

Improvements in all the EarthCheck indicators will not only help the environment, but can also help reduce operational costs. Due to the positive commitment that the **Snaefellsnes Peninsula** has demonstrated to the environment, the assessors are confident that they can maintain or improve performance, where appropriate and practical, in all indicators. In particular over the next 12 months, the **Snaefellsnes Peninsula** is encouraged to ensure that *Nitrous Oxides Produced* and *Accredited Operations* are at Baseline performance or better. In line with EarthCheck Policy this would enable the **Snaefellsnes Peninsula** to continue to meet the benchmarking requirements of the EarthCheck program.

APPENDIX

SUBMISSION COMMENTS

The following comments were provided at time of submission:

> *"Benchmarking comments report will be sent to my relationship manager, Helene Pacalin. There these results are explained."*

Activity Measure

2.1 Person Years

The following table shows calculation of person years for the Snaefellsnes Community 2013.[1]

	Number	Days	Total (person years)	%
Residents	3.859	365	3.859	90,76
Overnight	109.611	1	300	7,06
Day Tripper	102.486	0,33	93	2,18
Total			**4.315**	**100,00**

Table 1. Calculation of Person Years in Snaefellsnes 2013

Number of residents, 1 January 2013, in the Snaefellsnes Community is gotten from Statistics Iceland (www.hagstofa.is) and can be divided between the five communities participating in the EarthCheck certification project. According to these numbers Stykkisholmsbær has 1095 residents, Helgafellssveit 53, Eyja- og Miklaholtshreppur 148, Grundarfjarðarbær 872 and Snæfellsbær 1691.

Statistics Iceland collects and compiles data on overnight stays in Iceland. In 2013 the total number for the Snaefellsnes Community was 109,611. No accurate data is available for day trippers. For the purpose of benchmarking for the last couple of years, the number of day-trippers has been estimated to be 93.5% of overnight stays, approximated to the next thousand. The same estimate is used this time.

2.2 Total Community Area

The total area of the Snaefellsnes community is 1,479 km^2 = 147,900 hectares (ha).

Numbers gotten in 2014 from the National Land Survey of Iceland (www.lmi.is).

Energy Consumption

3.2 *Energy*

Conversion factors used for the energy calculation are presented in table 2.

Conversion factors:		
1 kWh	=	3,6 MJ
1 L gasoline	=	34,2 MJ
1 L diesel	=	38,1 MJ
1 L oil (fuel)	=	38,2 MJ
1 m^3 geothermal water	=	50 kWh

Table 2. Conversion Factors.

The input data to EarthCheck Energy Calculator is presented in table 3. The formulas for the CO_2 emissions were derived directly from Earth Check's Energy Calculator.

Energy Consumption in Snæfellsnes 2013

Energy Source	Units Energy Supplied in	Quantity of Energy used	% Renewable	Energy (MJ)	CO2 (tonnes)
Power Station Provided Grid Electricity					
Hydro	kWh	92.146.654	100	331.727.954	0
	Sub Total - Power Grid Sources			**331.727.954**	**0**
Other Sector Energy Sources Used					
Hydro	kWh	127.745	100	459.882	0
Gasoline (automotive)	L (litre)	2.192.839	0	75.000.000	5.050
Diesel	L (litre)	3.584.730	0	136.925.000	9.816
Hydro	kWh	51.131.390	100	184.073.004	0
Oil (fuel) (for ships)	L (litre)	790.006	0	30.191.000	2.220
Oil (stationary)	L (litre)	76.817	0	2.934	207
	Sub Total - Other Sources			**426.651.820**	**17.293**
	Grand Total - All Sources			**758.379.774**	**17.293**
Renewable Energy Consumption/Total Energy Consumption				0,6807	

Table 3. Energy Consumption in Snaefellsnes 2013. The calculation of CO2 emissions is received from the EarthCheck benchmarking software.

As shown in table 3 "Other Sector Energy Sources Used" consists of 5 sources:

1. Hydropower, 127,745 kWh. This refers to locally produced and consumed electricity at four farms in the Snaefellsnes area (Sydri-Knarrartunga, Thvera (two farms) and Hjardarfell) (see also explanations on Local Energy Production in the section on optional indicators at the bottom of this document). However for the years 2012 and 2013 the electricity production at Sydri-Knarrartunga has been non-existent due to landslides that ruined the power station.
2. Gasoline (automotive), 2,192,839 L. This is based on data from The Road Traffic Directorate (RTD (Umferðarstofa) in Reykjavik, (see Table 4). Same numbers have been

used for average mileage or fuel efficiency since this information is no longer easy to get. This goes for diesel driven passenger cars as well.

3. Diesel, 3,584,730 L. (See also Table 4).
4. Hydropower, 51,131,390 kWh. This refers to geothermal water used for heating and other purposes. Geothermal water is harnessed at three points within the community, i.e. at Town Stykkisholmur, in Eyja- and Miklaholtshreppur municipality and at Dalsmynni farm. Details for this are provided in the section on optional indicators. As the Energy Calculator does not account for geothermal water, the consumption, originally measured in cubic meters, was converted to kWh of hydropower, (conversion factor 50, see table 2). Some CO_2 is released from geothermal wells when harnessed, but this is ignored here as this is only a minor part of the total CO_2 emissions and not accounted for in the Earth Check software.
5. Oil, water (heavy fuel oil), 790,006 L. This number includes the fuel for the ferry Baldur, who runs between Snaefellsnes and another community. Included in these numbers is also fuel for a smaller passenger boat, Særún, which is operated by the same company as Baldur as well as two other passenger boats (rib boats) operated by Iceland Ocean Tours.
6. Oil, stationary (heavy fuel oil), 76,817 L. The swimming pools and to some extent the elementary schools at Grundarfjordur and Olafsvik are heated by oil. One of the two swimming pools (Olafsvik) and both the schools are primarily heated by so-called unsecured electricity at low prices, which demands them to have a second heating source in place, in these cases oil, as the power will be shut down in cases of high demand from other buyers linked to the national grid.

In 2008 fuel consumption of cars registered within the Snaefellsnes community was estimated. According to Icelandic law, all cars are brought to a mandatory vehicle inspection once a year with the exemption of 0-2 years old cars and 4 year old ones. Mileage is documented for each car at the point of inspection, which makes it possible to calculate the average annual mileage for each vehicle category, yet with some uncertainties due to the absence of new cars. In 2008 mileage data was available for 42.3% of all cars in the Snaefellsnes community.

In addition to this, importers of passenger cars are requested to submit standardised data type approval documents showing the fuel consumption for each model. This has been in place in Iceland for most car models since 1999, yet to some extent missing for cars imported from The USA. In 2008 consumption data was available for 46.7% of all passenger cars in the Snaefellsnes community.

The Road Traffic Directorate (RTD) has developed a database including both the above mentioned data on annual mileage and fuel consumption. Information can be derived from this database for each postal code of registration, making it possible to get a fair estimate for the purpose of this benchmarking.

For the year 2013 the same numbers were used for average mileage and fuel efficiency of the cars since these data are now extremely hard to come by. Hence the only parameters that changed in the vehicle data table was the number of vehicles registered in the area in 2011.

It has to be mentioned in this context that the RTD-data for 2008, 2009 and 2010, 2011, 2012 and 2013 is categorized by postal code of car owners, while data for the years before was based on postal code of car users. This reduces the comparability of data. However, there are no major differences when comparing number of vehicles between these years, which gives a reason to believe that the consequent inaccuracy is minimal.

Table 4 shows vehicle data for the Snaefellsnes community 2013, based on information from The RTD, completed with assumptions were actual data was missing. Details for these assumptions are not given in this report but can easily be provided upon request.

Community:	*Snæfellsnes*				Year:		*2013*
Vehicle Type	**Definition**	**Category in IRTD-database**	**Number registred by fuel type 2012**		**Average Vehicle Km Travelled per annum**	**Average Fuel Consumpt (l/100 km)**	**Fuel Usage (litres) per annum**
Passenger	Vehicle mainly for personal transport, max 8 pers.	BI1 Fólksbifr.	Petrol	1.750	12.909	8,49	1.917.555
			Diesel	624	18.325	8,88	1.015.221
			LPG	6	12.909	4,50	3.485
Light Commercial A	Vehicle mainly for goods transport, max 3,500 kg.	BI4 Sendibifr.	Petrol	112	11.231	8,14	102.353
			Diesel	235	13.992	8,51	279.848
			LPG				0
Light Commercial B	Vehicle mainly for personal transport, min 8 pers., max 5,000 kg.	BI2 Hópbifr. 1	Petrol	4	8.500	15,00	5.100
			Diesel	15	25.059	11,25	42.286
			LPG				0
Heavy Duty A	Vehicle mainly for personal transport, min 8 pers., min 5,001 kg.	BI3 Hópbifr. 2	Petrol	0			0
			Diesel	14	16.069	40,00	89.986
			LPG				0
Heavy Duty B	Vehicle mainly for goods transport, 3,501-12,000 kg.	BI5 Vörubifr. 1	Petrol	4	18.504	25,00	18.504
			Diesel	74	16.543	25,00	306.045
			LPG				0
Heavy Duty C	Vehicle mainly for goods transport, min 12,001 kg.	BI6 Vörubifr. 2	Petrol				0
			Diesel	104	35.330	45,00	1.653.433
			LPG				0
Motorcycles A	Max 50 ccm	HJ2 - létt	Petrol	39	8.375	1,50	4.899
			Diesel				0
			LPG				0
Motorcycles B	Other	HJ3 - þung	Petrol	73	4.060	2,50	7.410
			Diesel				0
			LPG				0
Motorcycle C	Off road vehicle	Tofæruhjól og vélsleðar	Petrol	166	n/a	n/a	132.800
			Diesel				
			LPG				
Tractors		Dráttar-vélar	Petrol	1	n/a	n/a	733
			Diesel	270	n/a	n/a	197.910
			LPG				0
Total fuel usage in litres			**Petrol**				**2.189.354**
			Diesel				**3.584.730**
			LPG				**3.485**
Total vehicle fuel usage in litres (Grand Total)							5.777.570

Table 4. Vehicle data for Snaefellsnes 2013

The total energy consumption in the Snaefellsnes community was estimated to be 758,379,774 MJ in 2013, which equals 175,754 MJ pr. person year.

As before energy consumed by the local fishing fleet is excluded from the benchmarking data.

Potable Water Consumption

3.3 Water

In 2013 the Snaefellsnes community consumed an estimated total of 3,206,389 kL (m^3) of potable cold water. Water meters are installed at the wells supplying the towns of Grundarfjordur and Stykkisholmur with water, but actual monitoring is missing for the other towns. The water consumption of these is estimated to be the same per capita as for Grundarfjordur (2,790 l/person/day), while the usage in the countryside is estimated to be the same as average figures for similar communities in Iceland, (700 l/person/day (farms included)).

In addition to potable cold water, the water consumption data should include geothermal water used for cleaning purposes, as well as geothermal water used by the local swimming pools. Geothermal water for heating should however not be included, to maintain comparability with other communities using other energy sources and circulated water for heating.

As can be derived from table 3 and related comments, the total consumption of geothermal water in Snaefellsnes 2013 was 1,022,628 kL (m^3). The available data does not distinguish between water for different purposes, (swimming pool, cleaning, heating, etc.). According to a report from The National Energy Authority, (Orkustofnun: *Jarðvarmaspá 2003–2030. Spá um beina nýtingu jarðvarma*. OS-2003/060, Reykjavík, December 2003), swimming pools might on average use 241 m^3 geothermal water annually pr. m^2 of pool surface. The swimming pool in Stykkisholmur has an surface area of approximately 396 m^2 according to the same report, which gives an estimated annual water usage of 95,436 kL of geothermal water pr. annum. Approximately 6,132 kL are used for barley drying at Dalsmynni farm, leaving 1,022,628-95,436-6,132 = 921,060 kL for other purposes, including heating. Swedish research (Source: Ívar, Orkustofnun) indicates that approximately 80% of geothermal water for households would be used for heating and 20% for cleaning and other purposes. The same does not necessarily apply to Iceland, but the Swedish assumption will be used here since no Icelandic estimate is available. According to this, some 20% of 921,042 kL might have been used for other purposes than heating, giving an estimate of 184,212 kL.

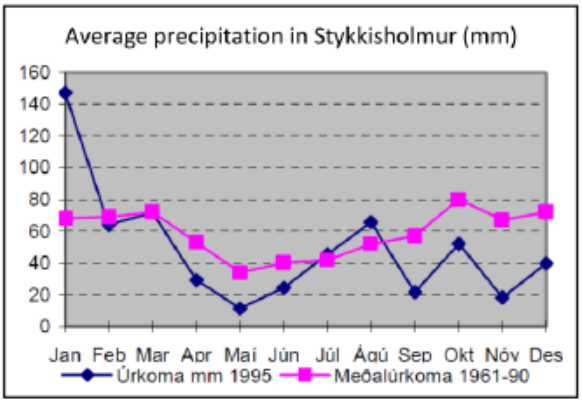
The above assumptions are summarized in table 5.

Purpose	kL
Potable cold water	3.206.389
Geothermal water for swimming pool	95.436
Geothermal water for other purposes, excl. heating	184.212
Total	**3.486.037**

Table 5. Estimated total water consumption in Snaefellsnes 2013

According to table 5, the total cold water consumption 2013 was 3,486,037 kL or 807.8 kL per person year.

Measurements or estimations for recycled/captured water are not relevant for Icelandic circumstances where clean water is an abundant resource in nearly all communities. Picture 1 shows average precipitation in Iceland.



Picture 1. The pink line shows average precipitation in Stykkisholmur in 1961-1990 (data from the Icelandic Met Office.

The EarthCheck water saving checklist is only to a limited extent applicable to communities, and thus left out at this time by defining it as "Not Relevant / Not Available".

Table 6 explains more thoroughly why these factors are "Not Relevant/ Not Available".

Water Savings Measures	Relevant / Not Relevant
Check for leaks	The municipalities have not yet had the finances to start checking for leaks
Low/dual flush toilets	Since the water usage for the Snaefellsnes Peninsula is the total amount of water used by every inhabitant, municipal institutions, state run institution and privately run organizations this information is not relevant. The community cannot directly affect these factors but in its own institutions.
Low flow tap fittings	Since the water usage for the Snaefellsnes Peninsula is the total amount of water used by every inhabitant, municipal institutions, state run institution and privately run organizations this information is not relevant. The community cannot directly affect these factors but in its own institutions.
Low flow shower fittings	Since the water usage for the Snaefellsnes Peninsula is the total amount of water used by every inhabitant, municipal institutions, state run institution and privately run organizations this information is not relevant. The community cannot directly affect these factors but in its own institutions.
Water sprinklers used after dark	Water sprinklers are rarely used in the municipalities as rain is frequent in Snaefellsnes Peninsula. Sprinklers are never used after dark – so the information is not relevant.
Minimal irrigation landscaping	Not relevant in Iceland where clean water is an abundant resource in nearly all communities.
Use of recycle/grey/rain water	Not relevant in Iceland where clean water is an abundant resource in nearly all communities.

Table 6. Explanations regarding water savings in EarthCheck benchmarking software.

Waste Sent to Landfill

3.4 Waste

Waste (uncompact) landfilled by the community in 2013 was 1,344 tonnes. The landfilled waste was 54,4% of the total waste production, leaving 45,6% for recycling/reusing.

Measurements or estimations for recycled/reused waste have been put into the checklist section of the online benchmarking software to some extent. The listing of material types in the checklist is however not appropriate for Iceland, as each of the categories is in real life normally divided into several subcategories with extremely different amounts and recycling

opportunities. An example of this is glass, which should include e.g. the glass part of construction waste, which can be a huge amount but poorly registered. This category also includes drinking bottles, which are a part of the Icelandic refund system with a recycling degree of some 90%. Plastics are even more complicated due to the huge diversity of materials and recycling schemes available. For Icelandic purposes it would have been much better to have the list more product oriented, such as "glass bottles", "beverage cartridges", "newspapers and magazines", "scrapped cars", tyres, WEEE, etc. As the list is, it invites some extremely rough and inaccurate estimates to be done. Further explanation of the input data for the benchmarking of Snaefellsnes is given below.

There is no data available for glass recycling in Snaefellsnes, but assuming that glass means drinking bottles, its recycling rate can be assumed to be over 80% as in all other Icelandic communities.

The waste category "paper/card" as defined in the EarthCheck benchmarking software most likely includes three major waste categories, i.e.

- Newspapers and magazines
- Light cardboard and paper beverage
- Cardboard (corrugated)

The total amount of newspapers and magazines wasted annually in Icelandic homes was estimated some years ago by FENÚR, an Icelandic national waste association, to be 176 kg pr. household. However, the economic downturn that hit Iceland especially hard in late 2008 has caused considerable changes in this respect. No new estimates have been published, but a 50% decrease would not be unrealistic, taking into account the disappearance of one of the two former existing free newspapers, less distribution of the other, reduced sizes and most likely a significant reduction in ads. A fair guess for 2013 would be some 90 kg pr. household. Approximately 2.82 persons are living in each household on average, which means that the total paper waste in these categories would be close to 32 kg pr. person.

The numbers above apply to the capital area of Iceland. The amount is lower in the rural areas because of less distribution of ads and free newspapers. There is no estimation available, but here it is assumed that the amount pr. person in rural areas is some 80% of the amount in the capital area. According to this, the amount in Snaefellsnes might be around 26 kg pr. person pr. year, i.e. some 100 tons for the entire population. The recycling rate cannot be derived from data from the municipalities, but here it is assumed to be ca. 52%.

Light cardboard and paper beverage is estimated to be some 15 kg pr person pr year in the capital area. In that case the amount pr. person should be similar in the rural areas, giving a total estimate of 58 tons for Snaefellsnes. The recycling rate cannot be derived from data from the municipalities, but here it is assumed to be similar as 2008 or ca. 10%.

Some 20,000 tons of corrugated cardboard is annually wasted in the capital area of Iceland, where the number of inhabitants is close to 202,000. This is close to 100 kg pr. capita. Assuming the same applies to other regions in Iceland, the amount for Snaefellsnes should be close to 386 tons. The recycling rate cannot be derived from data from the municipalities, but here it is assumed to be similar as 2008 or ca. 20%.

Adding all these assumptions for the three different sub-categories gives the following results:

Paper waste: Category	Total (tons)	Recycled (tons)	%

8

		(gestimate)	
Newspapers and magazines	100	52	52
Light cardboard and paper beverage	58	6	10
Corrugated cardboard	386	77	20
Total	544	135	25

Table 7. Estimated recycling rates for paper waste in Snaefellsnes 2013

The waste category Iron & steel (ferrous metals) consists to a major extent of scrapped cars and other vehicle (ELV's). Almost all ELV's are handed in for recycling since a premium was introduced in Iceland some years ago. Thus it can be stated that the recycling rates for metals (ferrous and non-ferrous) in general lies between 80 and 99%, even though no accurate data is available.

The recycling rates for plastics (80%) and green waste (70%) are pure gestimates, as there is no reliable data available. However it is known that the recycling rate for green waste in Stykkisholmur and Grundarfjordur is close to 100%.

For the purpose of benchmarking tyres are used here as a synonym for rubber, as data on other potential rubber wastes is not easily available. Wasted tyres in Iceland are estimated to be some 5,000 tons pr. year. Some 1.25% of the Icelandic population is living in Snaefellsnes, and as there are no major differences in car ownership by regions, this gives a reason to estimate that some 62.5 tons of tyres are wasted in the area each year. Available data shows that 28.5 tons of tyres from this area were handed in for recycling in year 2012 or 45,6% of the estimated total amount, which seems to be a rational recycling rate, bearing in mind that the Icelandic Processing Charge Act, No. 162/2002 assures funding for the collection, transportation and recycling of wasted tyres in Iceland. However, there might be substantial fluctuations in the amounts of tyres handed in from year to year, as some actors might collect and hand in tyres on a biannual basis.

Paper Products

3.5 Paper

The percentage of eco-labelled purchased paper is entered into the benchmarking software according to data from the individual municipalities. These numbers are collected from forms that all purchasers are obliged to fill in for every single purchase. The data does however not come from all institutions run by the municipalities but is well comparable with the years before. From the institutions that hand in the data the purchase of eco-labelled paper is 100%.

Cleaning Products

3.6 Cleaning

The percentage of eco-labelled purchased cleaning chemicals is entered into the benchmarking software according to data from the individual municipalities. These are collected from forms that all purchasers are obliged to fill in for every single purchase. The data does however not come from all institutions run by the municipalities but is well comparable with the years before.

Pesticide Products

3.7 Pesticides

Pesticides were not used in large amount in 2013. Detailed data is not available but the municipalities are working on implementing a registration system for the use of pesticides in the area.

Sector Specific

3.8 Sector Specific

3.8.1 CO2 – Equivalents

Estimation of the CO_2 production was derived from Earth Check's Energy Calculator. The total CO_2 production due to the community's energy consumption was estimated to be 17,408 tonnes, which equals 4 tonnes pr. person year. The total CO_2 production due to waste indirect emissions was estimated to be 1,613 tonnes, which equals 0.4 tonnes pr. person year. Thus the total estimate is 18,843 tonnes.

3.8.2 Air Quality – Nitrous Oxides

No monitoring of air quality, i.e. of NO_x, SO_2 and PM10, is done in Snaefellsnes. The calculation of air quality should therefore preferably be done by EarthCheck. The input for this calculation can be taken directly from Table 3. Land based industry in Snaefellsnes does not consume fossil fuels, except from agriculture which is included in Table 3.

In spite of all efforts to provide data for calculation of air quality, it has to be mentioned as before that the relevance of any such measurements or estimations for the Snaefellsnes community is questionable from a sustainability point of view. The total area of the Snaefellsnes community is 1,479 km^2 and the number of inhabitants 3,859 or 4,315 if tourists are included. This gives a population density of less than 3 pr. km^2. The highest density is to be found in the town Stykkisholmur with its 1,100 inhabitants. In addition to this the Snaefellsnes peninsula is known to be one of the windiest places in Iceland, as explained in the benchmarking comments for Snaefellsnes in spring 2006.

In the online benchmarking software the digit "1" has been filled in for "Air Quality – Nitrous Oxides" to allow submitting.

3.8.3 Air Quality – Sulphur Dioxide

See above. In the online benchmarking software the digit "1" has been filled in for "Air Quality – Sulphur Dioxide" to allow submitting.

3.8.4 Air Quality – Particulate Matter

See above. In the online benchmarking software the digit "1" has been filled in for "Air Quality – Particulate Matter" to allow submitting.

3.8.5 Waterways Quality

In 2013, all tested waterways samples passed quality standards according to information from the regional health surveillance authority.

3.8.6 Habitat Conservation

The total area of the Snaefellsnes community is 1,479 km^2 according to data from The National Land Survey of Iceland (Landmælingar). Snaefellsjokull National Park covers 170 km^2 thereof. In addition to that, the following areas are designated for conservation:

- The nature reserve in Budahraun (lava field)
- The nature reserve from Arnarstapi to Hellnar and the natural monument Bardarlaug. This area and Budahraun is in total approximately 30 km^2.
- The nature reserve Melrakkaey off Grundarfjordur, approximately 0.15 km^2.
- Other islands off Grundarfjordur and Stykkisholmur, in total approximately 5 km^2.
- The Coastline from Vallabjarg to Alftafjordur (on the north side of the peninsula), total length estimated 200 km, average width estimated 10 m, thus in total approximately 2 km^2.

10

The total area designated for conservation is, according to the above measurements and assumptions, approximately 207 km^2, which is 14% of the total area of the community. This might however be underestimated, which inter alia relies on the accuracy of the estimated width of the coastline area. To ensure comparability same approach is used as before.

3.8.7 Green Space

The online benchmarking software has a cell for "Green Space area of community" as a proportion of the total community area. It is questionable if this parameter is based on the EarthCheck Community Standard at all. The definition of "Green Space" also seems to be missing from the available guidance material. Furthermore this emphasis on "Green Space" might be questioned from biodiversity/sustainability point of view, especially in sparsely populated areas, depending though on the missing definition. In the case of Snaefellsnes it should be kept in mind, as mentioned in the section on air quality, that the area is sparsely populated with its 1,479 km^2 and 3,933 inhabitants, giving less than 3 people/km^2. Furthermore more than 3,700 of the 3,933 inhabitants are living in the three towns of Stykkisholmur, Grundarfjordur and Olafsvik and the two smaller villages of Hellissandur and Rif. This implies that the vast majority of the total area, most likely some 1,400 km^2 is hosting only around 200 inhabitants. In that sense almost the whole area is an open space and any efforts to develop "Green Spaces" would imply interference with nature, practically untouched for centuries.

In the online benchmarking software "99%" has been filled in for 'Green Space' to allow submitting.

3.8.8 Travel & Tourism Accreditation

By the end of year 2013, 1 of 81 Travel and Tourism operators in Snaefellsnes (1.23%) was environmentally accredited.

Optional Indicators

4. Optional Indicators

The Snaefellsnes community has selected two optional indicators as being accessible and relevant for the community. These are *Renewable energy consumption* (Operation Selected) and *Renewable energy production within community* (Operation Specified).

4.1 Renewable Energy Consumption

As shown in table 3, 68% of the total energy consumption in Snaefellsnes 2013 came from renewable energy sources (hydro and geothermal)

4.2 Renewable Energy Production

At the end of year 2013 seven relatively small hydropower plants were operated within the Snaefellsnes community. The energy production of these is shown in table 8. The plants at Olafsvik, Mulavirkjun and Grisholl produce power to the national grid, while the energy from the four smaller farm-owned plants is consumed locally. By Stykkisholmur there is a geothermal well, providing the town with water for heating as well as for the local swimming pool. Two smaller geothermal wells are being harnessed for heating and drying of barley in the countryside at the southern part of the peninsula.

The renewable energy production within the community in 2013 was 35% of the total energy consumption.

Local Energy Production in Snaefellsnes 2013		
	kWh/year	MJ/year
Olafsvik (hydropower)	2.046.573	7367662,8
Mulavirkjun (hydropower)	15.607.866	56188317,6
Knarrartunga (hydropower)	0	0
Thvera both stations (hydropower)	60.000	216000
Hjardarfell (hydropower)	67.745	243882
Grisholl (hydropower)	4.213.004	15166814,4
Stykkisholmur (geothermal)	42.000.750	151202700
Eyja- og Miklaholtshr, (geothermal)	6.064.640	21832704
Dalsmynni (geothermal)	3.066.000	11037600
Total	73.126.578	263.255.681
Total Energy Consumption	(Table 3)	758.379.774
Renewable Local Energy Production/ Total Energy Consumption		0,34712909

Table 8. Local Renewable Energy Production in Snaefellsnes 2013

ENERGY CONSUMPTION

The Benchmarking Assessors sought clarification with regards to the *Energy Consumption* as *Diesel* was submitted for *'Stationary Fuel Combustion'*, however in the previous assessment *Heavy Fuel Oil* was used.

The **Snaefellsnes Peninsula** advised;

> *„Energy consumption – Stationary Fuel Combustion:*
> *Thank you for pointing this out. I seem to have entered the wrong data – that is this should be Heavy fuel oil as in 2012."*

The Benchmarking Assessors have also revised the % Green Power from 100% to Not Available, as 'Green Power Agreements' are unavailable for purchase in Iceland due to the standard grid electricity supply is from close to 100% renewable energy sources. Please note that the mix of energy sources which make up the grid electricity relevant to the Iceland (eg. hydropower) have already been taken into consideration by EarthCheck's greenhouse gas emission calculator. Therefore, the Benchmarking Assessors updated the *Energy Consumption* as per below;

Stationary Fuel Combustion

Type	Quantity	Unit	Energy Consumption (GJ)
Heavy fuel oil	76817	litres (L)	2935.65

Mobile Fuel Combustion (road)

Type	Quantity	Unit	Energy Consumption (GJ)
Motor gasoline	2192839	litres (L)	75000.53
Diesel	3584730	litres (L)	136925.57

Mobile Fuel Combustion (water)

Type	Quantity	Unit	Energy Consumption (GJ)
Heavy fuel oil	790006	litres (L)	30191.00

Purchased Electricity

Quantity	Unit	% Green Power	Provider	Energy Consumption (GJ)
92146654	Kilowatt hour (kWh)	N/A*	Iceland	331727.95
127745	Kilowatt hour (kWh)	N/A*	Iceland	459.88
51131390	Kilowatt hour (kWh)	N/A*	Iceland	184073.00

These sources produced a total of 761 313.61 GJ which equates to 176.43 GJ per *Person Year*. Total *Greenhouse Gas Emissions (Scope 1 and Scope 2)* was 17 444.2 t CO_2-e which equates to 4.0 t CO_2-e per *Person Year*.

AIR QUALITY

The Benchmarking Assessors have calculated Air Quality based on the submitted energy sources;

2013

Nitrous Oxides Produced: 131497 kg
Sulphur Dioxide Produced: 10442 kg
Particulate Matter Produced: 482236 kg

WASTE SENT TO LANDFILL

The *Waste Sent to Landfill* data has been converted and assessed as a volume due to the direct impact of *Waste Sent to Landfill* relates to the space of landfill that is used to contain waste. The common measure used to measure this indicator is volume. The figures for 2003 - 2012 benchmarking periods have also been recalculated to volume values which are reflected in the current assessment report. This update provides **Snaefellsnes Peninsula** a more accurate reflection of its performance in solid waste management.

Based on the raw data provided, the Benchmarking Assessors have calculated the volume values, "m^3 / Person Year" figures, for the 2003 - 2012 Benchmarking Periods as per below;

2003-2004

- Raw *Waste Sent to Landfill* Data:2 581 tonnes (assumed as 'uncompacted')
- Activity Measure: 4 021 *Person Years*

The submitted value of 2 581 tonnes (2 581 000 kg) of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 2 581 000 kg x 0.00333333 = 8603.32 m^3 or 8 603 324.73 L). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 2.1 m^3 per *Person Year*.

2005

- Raw *Waste Sent to Landfill* Data: 3 038.90 tonnes (assumed as 'uncompacted')
- Activity Measure: 4 288 *Person Years*

The submitted value of 3 038.90 tonnes (3 038 900 kg) of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 3 038 900 kg x 0.00333333 =

10 129.66 m^3 or 10 129 656.54 L). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 2.4 m^3 per *Person Year*.

2006

- Raw *Waste Sent to Landfill* Data: 2 780.60 tonnes (assumed as 'uncompacted')
- Activity Measure: 4 271 *Person Years*

The submitted value of 2 780.60 tonnes (2 780 600 kg) of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 2 780 600 kg x 0.00333333 = 9268.66 m^3 or 9 268 657.40 L). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 2.2 m^3 per *Person Year*.

2007

- Raw *Waste Sent to Landfill* Data: 2 502 tonnes (assumed as 'uncompacted')
- Activity Measure: 4 196 *Person Years*

The submitted value of 2 502 tonnes (2 502 000 kg) of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 2 502 000 kg x 0.00333333 = 8339.99 m^3 or 8 339 991.66 L). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 2.0 m^3 per *Person Year*.

2008

The submitted value of 2 259 650 kg of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of: 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 2 259 650 kg x 0.00333333 = 7 532.2 m^3). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 1.8 m^3 per *Person Year*.

2009

The submitted value of 2 654.75 tonnes (2 654 750 kg) of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 2 654 750 kg x 0.00333333 = 8849.2 m^3). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 2.1 m^3 per *Person Year*.

2010

The submitted value of 2 262 tonnes (2 262 000 kg) of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 2 262 000 kg x 0.00333333 = 7 540 m^3). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 1.8 m^3 per *Person Year*.

2011
The submitted value of 2 169 373.00 kg of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of: 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 2 169 373.00 kg x 0.00333333 = 7 231.2 m^3). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 1.7 m^3 per *Person Year*.

2012
The submitted value of 1 352 tonnes (1 352 000 kg) of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 1 352 000 kg x 0.00333333 = 4506.7 m^3). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 1.0 m^3 per *Person Year*.

2013
The submitted value of 1 343 831.00 kg of waste (specified by the operator as uncompacted waste) has been converted into a volume by using the standard conversion of: 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L (i.e. 1 343 831.00 kg x 0.00333333 = 4479.4 m^3). (If the waste is compacted, then the standard conversion is: 1 kg = 0.00153846 m^3 or 1.53846 L).

This equates to 1.0 m^3 per *Person Year*.

These updated figures have been reflected in this Benchmarking Report.

PESTICIDE PRODUCT RATING

The Benchmarking Assessors sought clarification with regards to the *Pesticide Product Rating* as all measured had been submitted as "Relevant / Not Available".

The **Snaefellsnes Peninsula** advised;

> *„Pesticide products rating*
> *Pesticides are rarely used in the operation of the municipalities here in Iceland, so these last years we have not measured the use of them at all. However we have been designing a system that keeps track of the use of pesticides if there is any, that is. And we will hopefully start using that system in the spring so hopefully we can say something more accurate about pesticide use in the area next*"

Therefore, the Benchmarking Assessors updated the *Pesticide Product Rating* for all measures to "Not Relevant / Not Available" to remain consistent with previous Benchmarking Reports.

This gives an overall *Pesticide Product Rating* of 100.0 Points.

Benchmarks Assessed by EarthCheck

Summary Of Supplied Benchmarking Data

Activity Measures

Person Years	4315
Total Community Area	147900

Supplied Benchmarking Data

Energy

Energy Consumption (GJ / Person Year)

Supplied	761313.61 GJ
Calculated	176.43 GJ / Person Year
Baseline	380 GJ / Person Year
Best Practice	266 GJ / Person Year
Difference	33.7% better than the Best Practice level

Green Power (%)

Supplied	N/A
Calculated	N/A

Greenhouse Gas Emissions (Scope 1 and Scope 2) (t CO_2-e / Person Year)

Supplied	17444.2 t CO_2-e
Calculated	4.0 t CO_2-e / Person Year
Baseline	8.6 t CO_2-e / Person Year
Best Practice	6.0 t CO_2-e / Person Year
Difference	33.3% better than the Best Practice level

Direct Emissions (Scope 1) (t CO_2-e / Person Year)

Supplied	17417.5 t CO_2-e
Calculated	4.0 t CO_2-e / Person Year

Indirect Emissions (Scope 2) (kg CO_2-e / Person Year)

Supplied	26778.2 kg CO_2-e
Calculated	6.2 kg CO_2-e / Person Year

Indirect Emissions (Scope 3) (kg CO_2-e / Person Year)

Supplied	1612597.2 kg CO_2-e
Calculated	373.7 kg CO_2-e / Person Year

Transport Indirect Emissions (Scope 3) (t CO_2-e / Person Year)

Supplied	0.0 t CO_2-e
Calculated	0.0 t CO_2-e / Person Year

Waste Indirect Emissions (Scope 3) (kg CO_2-e / Person Year)

Supplied	1612597.2 kg CO_2-e
Calculated	373.7 kg CO_2-e / Person Year

Water

Potable Water Consumption (kL / Person Year)

Supplied	3486037.0 kL
Calculated	807.9 kL / Person Year
Baseline	1200 kL / Person Year
Best Practice	840 kL / Person Year
Difference	3.8% better than the Best Practice level

Recycled / Captured Water (%)

Supplied	0%
Calculated	0%

Water Savings Rating (Points)

Supplied	50.0 Points
Calculated	50.0 Points
Baseline	50 Points
Best Practice	80 Points
Difference	at the Baseline level

Waste

Waste Sent to Landfill (m^3 / Person Year)

Supplied	4479.4 m^3
Calculated	1.0 m^3 / Person Year
Baseline	2.67 m^3 / Person Year
Best Practice	1.87 m^3 / Person Year
Difference	46.5% better than the Best Practice level

Recycled / Reused / Composted Waste (%)

Supplied	54.4%
Calculated	54.4%

Waste Recycling Rating (Points)

Supplied	80.0 Points

Calculated	80.0 Points
Baseline	50 Points
Best Practice	80 Points
Difference	30.0 Points better than the Baseline level

Paper

Paper Products Rating (Points)

Supplied	100.0 Points
Calculated	100.0 Points
Baseline	50 Points
Best Practice	80 Points
Difference	20.0 Points better than the Best Practice level

Cleaning

Cleaning Products Rating (Points)

Supplied	62.4 Points
Calculated	62.4 Points
Baseline	50 Points
Best Practice	80 Points
Difference	12.4 Points better than the Baseline level

Pesticides

Pesticide Products Rating (Points)

Supplied	100.0 Points
Calculated	100.0 Points
Baseline	50 Points
Best Practice	80 Points
Difference	20.0 Points better than the Best Practice level

Sector Specific

Nitrous Oxides Produced (kg / Person Year / Hectare)

Supplied	131497 kg
Calculated	0.95 kg / Person Year / Hectare
Baseline	0.93 kg / Person Year / Hectare
Best Practice	0.65 kg / Person Year / Hectare
Difference	2.2 %below the Baseline level

Sulphur Dioxide Produced (kg / Person Year / Hectare)

Supplied	10442 kg
Calculated	0.21 kg / Person Year / Hectare
Baseline	0.90 kg / Person Year / Hectare
Best Practice	0.63 kg / Person Year / Hectare
Difference	66.7% better than the Best Practice level

Particulate Matter Produced (kg / Person Year / Hectare)

Supplied	482236 kg
Calculated	0.02 kg / Person Year / Hectare
Baseline	0.10 kg / Person Year / Hectare
Best Practice	0.07 kg / Person Year / Hectare
Difference	71.4% better than the Best Practice level

Water Samples Passed (%)

Supplied	100%
Calculated	100%
Baseline	70 %
Best Practice	100 %
Difference	at the Best Practice level

Habitat Conservation Area (%)

Supplied	14.0%
Calculated	10.0%
Baseline	15 %
Best Practice	26 %
Difference	4.0% better than the Baseline level

Green Space (%)

Supplied	99.0%
Calculated	99.0%
Baseline	15 %
Best Practice	20 %
Difference	79.0% better than the Best Practice level

Accredited Operations (%)

Supplied	1.2%
Calculated	1.2%
Baseline	5 %
Best Practice	6.5 %
Difference	3.8% below the Baseline level

DETERMINATION OF BASELINE AND BEST PRACTICE LEVELS

General
The values for the Baseline and Best Practice levels for each indicator are derived from extensive worldwide research into available and appropriate case studies, industry surveys, engineering design handbooks, energy, water and waste audits, and climatic and geographic conditions.

National and regional data for per capita energy use, greenhouse gas and other emissions, wastes to landfill and water consumption, where available provide background data for normalisation of the expected performance values for per customer or employee, and/or overall performance of an enterprise being benchmarked. They are used to gauge the regional or national situation and environmental performances that an enterprise is based in, and hence what are reasonable levels to expect the enterprise to achieve.

A benchmarking result at, or above, the Baseline level demonstrates to all stakeholders that the enterprise is achieving above average performance. A result below the Baseline level indicates that an enterprise can and should carry out actions that will make beneficial improvements in performance.

Consideration of Climate
A major determinant of energy consumption in some sectors, primarily those centred on buildings such as accommodation, visitor centres and administration offices will be the dominant climatic conditions in which the enterprise is located. In general, to maintain the same level of indoor comfort, enterprises operating in hot or cold climates will consume more energy than those in temperate climates.

Similarly, it is recognised that in certain sectors a major determinant of potable water consumption will be the climate in which an enterprise is located, in particular those with large grounds and/or significant water-based facilities or activities. That is, enterprises located in hot climates are more likely to consume more potable water than equivalent ones located in cooler climates. Factors that are likely to lead to a higher level of potable water consumption, for example in the accommodation sector, include increased evaporation rates of swimming pools, personal bathing and irrigation demands of grounds. In consideration of this factor, Baseline and Best Practice levels can vary in relation to country location.

Waste Sent to Landfill
The benchmark indicator used for Waste Sent to Landfill is given in litres as waste bins are usually calibrated by volume, and it has been found that the majority of operations do not have access to the weight of material disposed of. However, if a weight is supplied, standard factors are used to convert from weight (e.g., kilograms (kg)) to volume (e.g., cubic metres (m^3) or litres (L)). These are: 1 kg (uncompacted waste) = 0.00333333 m^3 or 3.33333 L and 1 kg (compacted waste) = 0.00153846 m^3 or 1.53846 L.

Operations should make note of the level of compaction when submitting data for assessment by EarthCheck.

Review of Performance Levels
The Baseline and Best Practice performance levels for EarthCheck indicators are continuously reviewed and are likely to change over time. This review by a team of international experts, takes into account "business-as-usual" changes in practices, equipment and facilities, as well as regulations and general improvement trends in performance and procedures. This review is used to update the levels of Baseline and Best Practice, and provides useful feedback to the user of the indicators.

The list below summarises the basic generic rules used to determine Baseline and Best Practice levels for EarthCheck indicators.

- If relevant enterprise sector specific case studies are not available for a type of activity in a designated region, then national averages will be used to ascertain the Baseline level. In this case, the Best Practice level will be set at a minimum of 30% better performance than the Baseline.

- If case study or national data are not available for a specific indicator, then the first enterprise that benchmarks will have its results set as 15% better than Baseline (i.e., half way between Baseline and Best Practice).