

Environmental Product Declaration

in accordance with ISO 14025 for:

sodium salts

*natural soda ash and sodium bicarbonate
from*

ETİ SODA 

Programme:

The International EPD® System, www.environdec.com

EPD Turkey, www.epdturkey.org

Programme operator:

EPD International AB & EPD Turkey

EPD registration number:

S-P-01129

Date of publication (issue):

2017-11-27

Date of revision:

2020-08-07

Date of validity:

2025-08-06

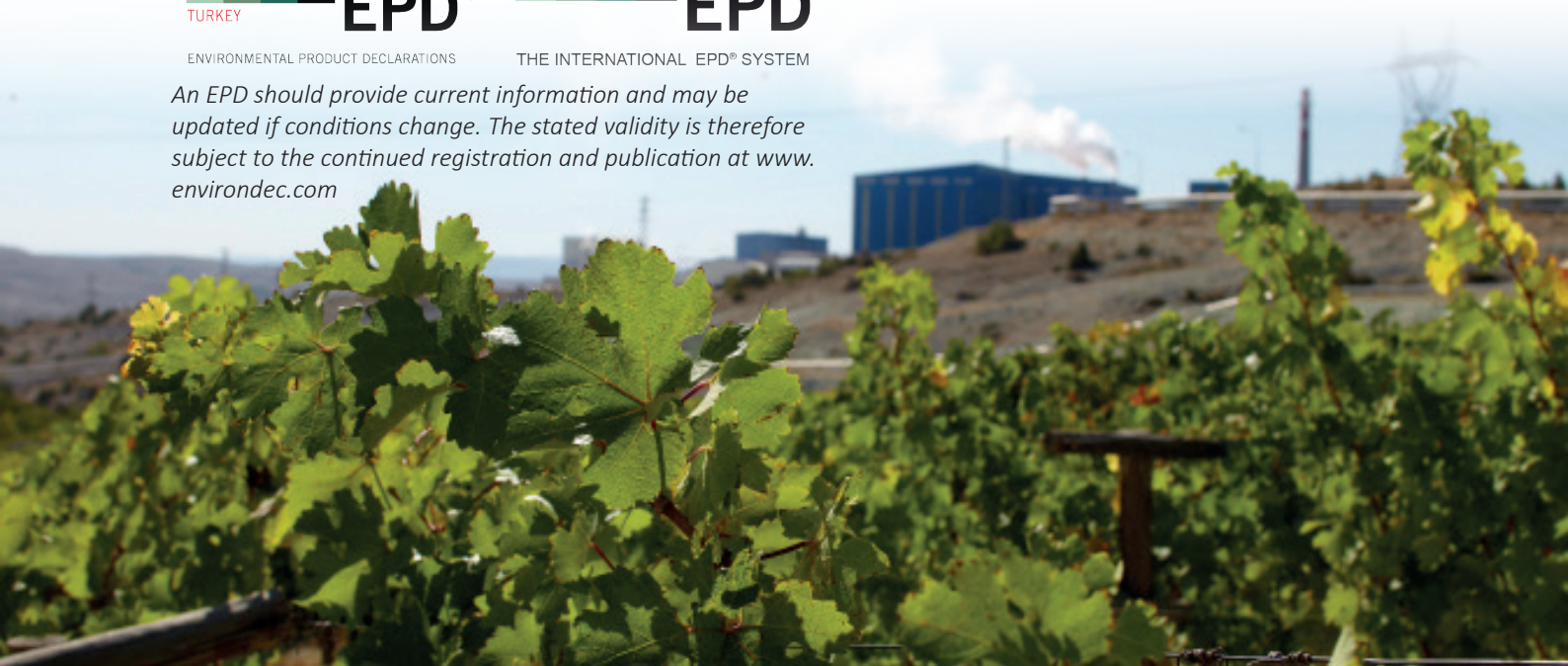


ENVIRONMENTAL PRODUCT DECLARATIONS



THE INTERNATIONAL EPD® SYSTEM

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



1 | Programme Information

Programme Operator

EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden
E-mail: info@envrondec.com

Regional Office: EPD Turkey, Nef 09 B Blok 7/15
Kağıthane/ Istanbul, Turkey
www.epdturkey.org

Product category rules (PCR):

Basic inorganic chemicals not elsewhere classified (n.e.c.), 2011:18, version 2.12

UN CPC Group: 342

PCR review was conducted by:

The Technical Committee of the International EPD® System. A full list of members available on www.envrondec.com. Chair of the PCR review: Lars-Gunnar Lindfors via: info@envrondec.com

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

☐ EPD process certification ☒ EPD verification

Third party verifier:

Ing. Luca Giacomello, PMP®
Via Leonardo Fea 35
10148 Torino- Italy

Approved by:

The International EPD® System Technical Committee,
supported by the Secretariat

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ YES ☒ NO

LCA Study & EPD Design Conducted By:

Semtrio Sustainability Consulting
BUDOTEK Teknopark, No 4/21, Umraniye / Istanbul Turkey
www.semtrio.com

Eti Soda has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable.

Owner of the EPD: ETİ SODA Üretim Pazarlama Nakliyat ve Elektrik Üretim Sanayi ve Ticaret A.Ş.

Yeşilağaç Mah. Gurağaç Kümeevler No:47/A 06730 Beypazarı / ANKARA / TURKEY

For further information about this EPD or its content please contact Mrs. Ahu S. Kilic at ahu.kilic@etisoda.com.

2 | Company Information

First established in 1998; Eti Soda is located in the same geographic region as Kazan Soda, and has been successfully producing for over 10 years. Following over US\$ 700 million of initial investment, commercial operations started in 2009. We further expanded our production facilities in 2017 and today Eti Soda produces over 1.65 million tonnes of Soda Ash and 200,000 tonnes of sodium bicarbonate every year.



Eti Soda was the first facility in the world to utilise innovative solution mining technology on a commercial scale and has almost 25 years of remaining mineable trona reserves. The production plant consists of three sub-units: mining, processing and a coal-powered cogen facility producing power and steam for use in the plant. The plant was designed and engineered by TCC and CMEC, and utilises Siemens and Goulds rotating equipment and control systems.

Trona mine, located in Beypazarı district of Ankara, is extracted from the ground by the solution mining method, which is a safe and environment friendly operating technique. The trona solution is taken into the monohydrate process and converted to the Sodium Carbonate and Sodium Bicarbonate products. The products of ETİ SODA, which are used in many sectors such as glass production and baking powder, are exported all over the world, especially to European countries.

3 | Product Information

Sodium Carbonate - Soda Ash

A simple, natural product used in products worldwide. Soda Ash is the 10th most consumed inorganic compound in the world, which has been used for over 5,000 years.

It is a safe, simple compound and a key component in a variety of industrial processes . Over half of all Soda Ash production is used in glass manufacturing, but it is also used in a wide range of other products, such as powdered detergents and soaps and rechargeable batteries, as well as being used extensively in metallurgical processes, and across the food, cosmetic and pharmaceutical industries.

Sodium Ash is classified under CPC Group: 342- Basic inorganic chemicals n.e.c., Class: 3424- Phosphates of triammonium; salts and peroxysalts of inorganic acids and metals n.e.c., 34240 Sodium carbonate. Eco-labelling, e.g. ISO Type I is not available for the product.

Sodium Bicarbonate

Like Soda Ash, Sodium Bicarbonate is a safe inorganic compound that is chemically closely related to Soda Ash. The main uses of Sodium Bicarbonate are as a raising agent in food manufacture, as an ingredient in pharmaceutical healthcare and animal feed products, and in waste water treatment.

More recently, Sodium Bicarbonate is increasingly being used in new environmental applications, including the desulphurisation or “scrubbing” of flue gas emissions, particularly in the shipping industry.

Sodium Bicarbonate also known as sodium hydrogen carbonate is a chemical substance white in colour and its aqueous solution is clear and colourless (chemical formula NaHCO₃).

Sodium Bicarbonate is classified under CPC Group: 342- Basic inorganic chemicals n.e.c., Class: 3424 - Phosphates of triammonium; salts and peroxysalts of inorganic acids and metals n.e.c., 34240 Sodium bicarbonate.

Eco-labelling, e.g. ISO Type I is not available for the product.

Geographical scope: Global

Name and location of production site: Eti Soda- Beypazari/Ankara/Turkey

The main export terminal is at Derince Port, 327 km from Eti Soda production facilities, where there are exclusive pier and storage facilities and can load bulk vessels at a rate of up to 2,200 tonnes per hour.

Almost 70% of the product soda ash is exported in bulk, also both products are exported in 25 kg small bags and 1.25 tonne big bags can be exported.

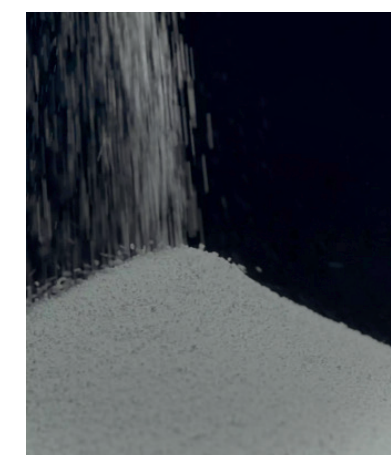
Container loaded with 1.25 tonne XL Big Bags



Palletised 25 kg small bags for container shipment



Products exported in bulk



Where is Natural Soda Ash (Trona Ore) found?

Natural Soda Ash has been found in lake brines or naturally occurring mineral deposits. Trona (a mix of water, sodium bicarbonate, sodium carbonate and sometimes sodium chloride or salt) is the most common and richest source of naturally occurring Soda Ash.

While Trona occurs naturally in a few locations worldwide, the largest and purest deposits are found near Green River, Wyoming, USA and near Ankara, Turkey. To date, these are the only commercially exploitable deposits that have been discovered globally.



LCA Information

Upstream module (from cradle-to-gate): The upstream process includes raw materials production and the manufacturing of the primary and secondary packaging.

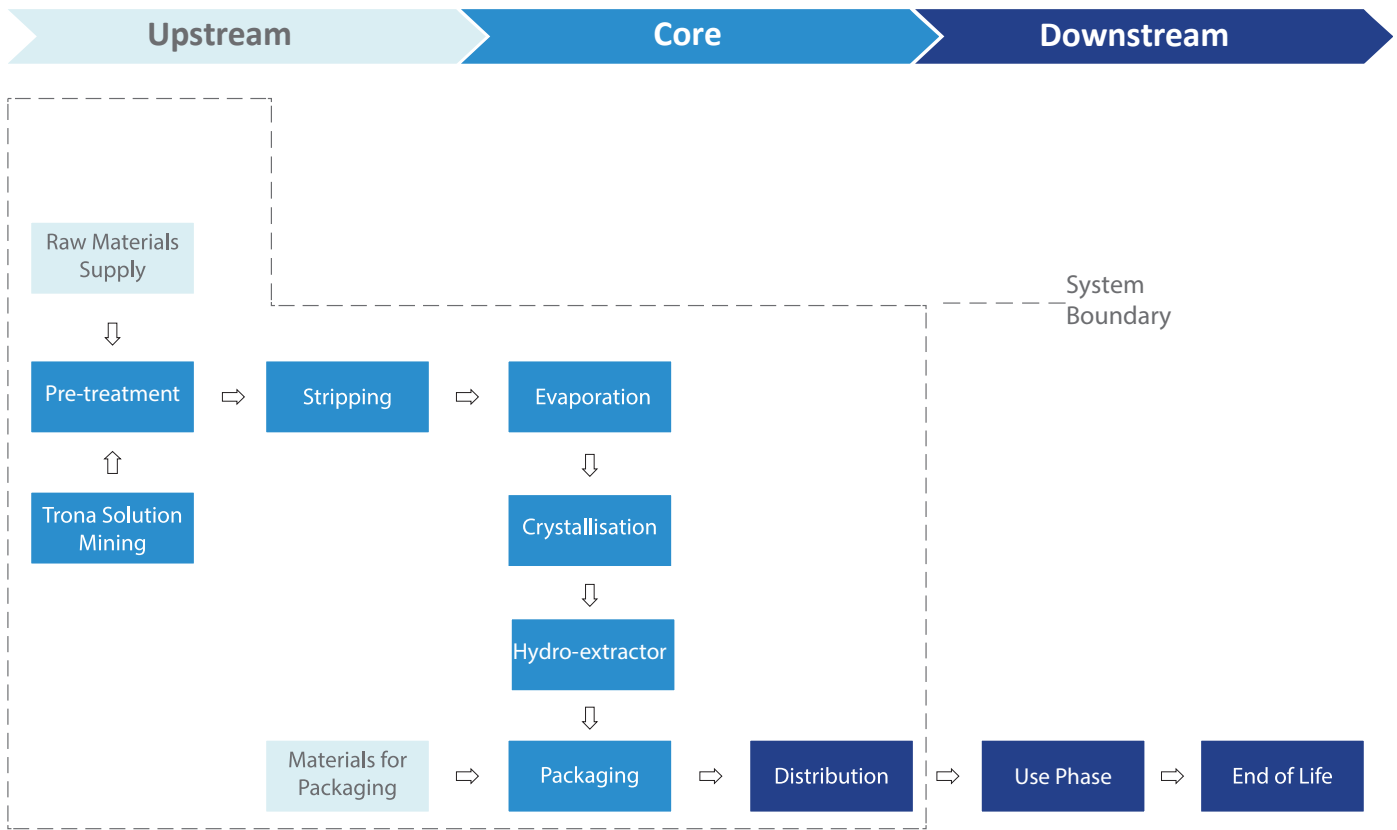
Core module, manufacturing processes (from gate-to-gate): The core process includes transportation of raw materials to production plant, impacts generated by the coal combusted in the cogeneration plant and impacts due to the electricity production according the country energy mix. Production of trona solution also operated by ETi Soda and considered under core processes. Energy consumption during the trona solution delivery to the manufacturing plant has been included into core processes.

Downstream module (from gate-to-grave):Transportation from preparation to shipping port (Derince Port) platform have been allocated as 327 km of transport by roadway per functional unit.

Sodium Carbonate and Sodium Bicarbonate have many different applications and are often used as input materials to other production processes. It is difficult to allocate an environmental burden from the use phase to the chemical input. Also, the end-of-life management depends on the application and location of the use and disposal of the chemical. No relevant data is available for the use and end of life phases of the products manufactured by Eti Soda.

Functional Unit	1 000 kg of product, considered as cumulated/total amount of both natural soda ash and sodium bicarbonate, delivered to an average retailer platform.
EPD Type (System Boundary)	Cradle-to-gate with options
	Upstream data, raw materials production, transportation, and electricity mix data have been obtained from Ecoinvent v3.6 as secondary data. All manufacturing data in core processes have been gathered from Eti Soda production plant. The manufacturing data are monitored and recorded in Eti Soda data collection system. The production data in this LCA study represents the period from 1 st January 2018 to 31 th December 2018.
Data Collection	An on-site third-party verification has been proceeded for all manufacturing data, electricity, water and coal consumption according to ISO 14064-1:2006 by Rina Denizcilik ve Belgelendirme Ltd.Şti.
	Mass allocation between natural soda ash & sodium bicarbonate and by-product-calcium carbonate. Mass allocation between sodium carbonate and sodium bicarbonate is not possible by process.
Allocation	An Alternative Generation Method has been conducted for cogeneration plant and environmental indicator (global warming potentials) has been allocated for 1 kWh electricity and 1 kWh steam.
	All resource use values are calculated from Cumulative Energy Demand V1.11; net use of fresh water has been calculated from SimaPro Inventory result outputs.
Calculation Methods	Potential environmental impacts are calculated with the CML-IA baseline V 3.06, ReCiPe 2016 Midpoint (H) v 1.04, Formation potential of tropospheric ozone (POCP) from LOTOS-EUROS as applied in ReCiPe Midpoint (H) v 1.13, 2008, IPCC 2013 GWP 100a V1.03 for GWP, USEtox 2 (recommended + interim) v.1.0 methods in SimaPro software.

System Diagram



4 | Content Declaration

Eti Soda production and products are in line with the Regulation (EC) No 1907/2006 of the European parliament and of the council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

NATURAL SODA ASH is declared to be above %99 in the product.

Chemical name: Sodium carbonate; REACH registration number:01-2119485498-19-0012; CAS number:497-19-8;

Physical hazards: Not Classified

Environmental hazards: Not Classified

Hazard statements: H319 Causes serious eye irritation.

This substance is not classified as PBT or vPvB according to current EU criteria.

SODIUM BICARBONATE is declared to be above %99 in the product.

Chemical name: Sodium bicarbonate; REACH registration number:01-2119485498-19-0012; CAS number:144-55-8;

Physical hazards: Not Classified

Environmental hazards: Not Classified

Hazard statements: H320 Causes eye irritation

This substance is not classified as PBT or vPvB according to current EU criteria.

Information about packaging

Distribution Packaging: packaging designed for the purposes of transport, handling and/or distribution. Polyethylene and polypropylene packaging materials are used. Flat pallets are used for handling of packaged products. No recycled materials have been used for packaging.

5 | Environmental Performance

Environmental indicators for Soda Ash - Bulk

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
POTENTIAL ENVIRONMENTAL IMPACTS						
Global warming (GWP100a)	Fossil	kg CO ₂ eq	2.37	316	55.4	374
	Biogenic	kg CO ₂ eq	0.162	2.10	0.287	2.55
	Land use and land transformation	kg CO ₂ eq	0.004	1.35	0.024	1.37
	TOTAL	kg CO ₂ eq	2.53	320	55.7	378
Acidification potential (AP)		kg SO ₂ eq	0.013	1.73	0.142	1.89
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	0.006	0.660	0.031	0.697
Formation potential of tropospheric ozone (POCP)		kg NMVOC	0.010	0.735	0.136	0.881
Abiotic depletion potential – Elements		kg Sb eq	3.93E-05	0.001	0.001	0.002
Abiotic depletion potential – Fossil fuels		MJ	34.7	2969	809	3813
Water scarcity potential		m³	2.20	153	2.92	158
Freshwater ecotoxicity*		PAF.m³.day	1.57E-07	1.36E-05	1.64E-06	1.54E-05
Human toxicity, cancer*		cases	5.34E-07	4.73E-05	7.79E-06	5.56E-05
Human toxicity, non-cancer*		cases	43633	1530952	291155	1865739
USE OF RESOURCES						
Primary energy resources – Re-newable	Use as energy carrier	MJ, net calorific value	4.15	371	9.89	385
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	4.15	371.2	9.89	385
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	44.3	3351	871	4267
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	44.3	3351	871	4267
Secondary material		kg	0	0	0	0
Renewable secondary fuels		MJ, net calorific value	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0
Net use of fresh water		m³	0.076	3.43	0.10	3.60
WASTE PRODUCTION and OUTPUT FLOWS						
Hazardous waste disposed		kg	INA	4.28E-05	0.00	4.28E-05
Non-hazardous waste disposed		kg	INA	0.063	0.00	0.063
Radioactive waste disposed		kg	INA	0.00	0.00	0.00
Components for reuse		kg	INA	0.00	0.00	0.00
Material for recycling		kg	INA	0.00	0.00	0.00
Materials for energy recovery		kg	INA	0.00	0.00	0.00
Exported energy, electricity		MJ	INA	0.00	0.00	0.00
Exported energy, thermal		MJ	INA	0.00	0.00	0.00

INA: Indicator Not Assessed

* Additional environmental indicators

Environmental indicators for Soda Ash - Big Bag

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
POTENTIAL ENVIRONMENTAL IMPACTS						
Global warming (GWP100a)	Fossil	kg CO ₂ eq	13.98	316	55.4	386
	Biogenic	kg CO ₂ eq	3.493	2.10	0.287	5.88
	Land use and land transformation	kg CO ₂ eq	0.035	1.35	0.024	1.40
	TOTAL	kg CO ₂ eq	17.51	320	55.7	393
Acidification potential (AP)		kg SO ₂ eq	0.067	1.73	0.142	1.94
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	0.022	0.660	0.031	0.713
Formation potential of tropospheric ozone (POCP)		kg NMVOC	0.080	0.735	0.136	0.951
Abiotic depletion potential – Elements		kg Sb eq	2.57E-04	0.001	0.001	0.002
Abiotic depletion potential – Fossil fuels		MJ	274.9	2969	809	4053
Water scarcity potential		m³	7.35	153	2.92	163
Freshwater ecotoxicity*		PAF.m³.day	1.02E-06	1.36E-05	1.64E-06	1.63E-05
Human toxicity, cancer*		cases	2.61E-06	4.73E-05	7.79E-06	5.77E-05
Human toxicity, non-cancer*		cases	174469	1530952	291155	1996576
USE OF RESOURCES						
Primary energy resources – Re-newable	Use as energy carrier	MJ, net calorific value	587.55	371	9.89	969
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	587.55	371.2	9.89	969
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	324.3	3351	871	4547
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	324.3	3351	871	4547
Secondary material		kg	0	0	0	0
Renewable secondary fuels		MJ, net calorific value	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0
Net use of fresh water		m³	0.224	3.43	0.10	3.75
WASTE PRODUCTION and OUTPUT FLOWS						
Hazardous waste disposed		kg	INA	4.28E-05	0.00	4.28E-05
Non-hazardous waste disposed		kg	INA	0.063	0.00	0.063
Radioactive waste disposed		kg	INA	0.00	0.00	0.00
Components for reuse		kg	INA	0.00	0.00	0.00
Material for recycling		kg	INA	0.00	0.00	0.00
Materials for energy recovery		kg	INA	0.00	0.00	0.00
Exported energy, electricity		MJ	INA	0.00	0.00	0.00
Exported energy, thermal		MJ	INA	0.00	0.00	0.00

INA: Indicator Not Assessed

* Additional environmental indicators

Environmental indicators for Soda Ash - Small Bag

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
POTENTIAL ENVIRONMENTAL IMPACTS						
Global warming (GWP100a)	Fossil	kg CO ₂ eq	25.48	316	55.4	397
	Biogenic	kg CO ₂ eq	3.860	2.10	0.287	6.25
	Land use and land transformation	kg CO ₂ eq	0.047	1.35	0.024	1.42
	TOTAL	kg CO ₂ eq	29.38	320	55.7	405
Acidification potential (AP)		kg SO ₂ eq	0.113	1.73	0.142	1.99
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	0.040	0.660	0.031	0.731
Formation potential of tropospheric ozone (POCP)		kg NMVOC	0.128	0.735	0.136	0.999
Abiotic depletion potential – Elements		kg Sb eq	6.64E-04	0.001	0.001	0.003
Abiotic depletion potential – Fossil fuels		MJ	577.7	2969	809	4356
Water scarcity potential		m³	16.72	153	2.92	173
Freshwater ecotoxicity*		PAF.m³.day	1.64E-06	1.36E-05	1.64E-06	1.69E-05
Human toxicity, cancer*		cases	4.40E-06	4.73E-05	7.79E-06	5.95E-05
Human toxicity, non-cancer*		cases	333449	1530952	291155	2155556
USE OF RESOURCES						
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	603.04	371	9.89	984
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	603.04	371.2	9.89	984
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	674.4	3351	871	4897
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	674.4	3351	871	4897
Secondary material		kg	0	0	0	0
Renewable secondary fuels		MJ, net calorific value	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0
Net use of fresh water		m³	0.459	3.43	0.10	3.99
WASTE PRODUCTION and OUTPUT FLOWS						
Hazardous waste disposed		kg	INA	4.28E-05	0.00	4.28E-05
Non-hazardous waste disposed		kg	INA	0.063	0.00	0.063
Radioactive waste disposed		kg	INA	0.00	0.00	0.00
Components for reuse		kg	INA	0.00	0.00	0.00
Material for recycling		kg	INA	0.00	0.00	0.00
Materials for energy recovery		kg	INA	0.00	0.00	0.00
Exported energy, electricity		MJ	INA	0.00	0.00	0.00
Exported energy, thermal		MJ	INA	0.00	0.00	0.00

INA: Indicator Not Assessed
* Additional environmental indicators

Environmental indicators for Sodium Bicarbonate - Bulk

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
POTENTIAL ENVIRONMENTAL IMPACTS						
Global warming (GWP100a)	Fossil	kg CO ₂ eq	0.95	316	55.4	373
	Biogenic	kg CO ₂ eq	0.133	2.10	0.287	2.52
	Land use and land transformation	kg CO ₂ eq	0.002	1.35	0.024	1.37
	TOTAL	kg CO ₂ eq	1.09	320	55.7	377
Acidification potential (AP)		kg SO ₂ eq	0.007	1.73	0.142	1.88
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	0.003	0.660	0.031	0.694
Formation potential of tropospheric ozone (POCP)		kg NMVOC	0.005	0.735	0.136	0.876
Abiotic depletion potential – Elements		kg Sb eq	8.88E-06	0.001	0.001	0.002
Abiotic depletion potential – Fossil fuels		MJ	10.9	2969	809	3789
Water scarcity potential		m³	0.95	153	2.92	157
Freshwater ecotoxicity*		PAF.m³.day	7.83E-08	1.36E-05	1.64E-06	1.54E-05
Human toxicity, cancer*		cases	2.18E-07	4.73E-05	7.79E-06	5.53E-05
Human toxicity, non-cancer*		cases	12993	1530952	291155	1835100
USE OF RESOURCES						
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	2.68	371	9.89	384
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	2.68	371.2	9.89	384
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	16.7	3351	871	4239
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	16.7	3351	871	4239
Secondary material		kg	0	0	0	0
Renewable secondary fuels		MJ, net calorific value	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0
Net use of fresh water		m³	0.045	3.43	0.10	3.57
WASTE PRODUCTION and OUTPUT FLOWS						
Hazardous waste disposed		kg	INA	4.28E-05	0.00	4.28E-05
Non-hazardous waste disposed		kg	INA	0.063	0.00	0.063
Radioactive waste disposed		kg	INA	0.00	0.00	0.00
Components for reuse		kg	INA	0.00	0.00	0.00
Material for recycling		kg	INA	0.00	0.00	0.00
Materials for energy recovery		kg	INA	0.00	0.00	0.00
Exported energy, electricity		MJ	INA	0.00	0.00	0.00
Exported energy, thermal		MJ	INA	0.00	0.00	0.00

INA: Indicator Not Assessed
* Additional environmental indicators

Environmental indicators for Sodium Bicarbonate - Big Bag

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
POTENTIAL ENVIRONMENTAL IMPACTS						
Global warming (GWP100a)	Fossil	kg CO ₂ eq	12.57	316	55.4	384
	Biogenic	kg CO ₂ eq	3.463	2.10	0.287	5.85
	Land use and land transformation	kg CO ₂ eq	0.033	1.35	0.024	1.40
	TOTAL	kg CO ₂ eq	16.06	320	55.7	392
Acidification potential (AP)		kg SO ₂ eq	0.061	1.73	0.142	1.93
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	0.018	0.660	0.031	0.710
Formation potential of tropospheric ozone (POCP)		kg NMVOC	0.075	0.735	0.136	0.946
Abiotic depletion potential – Elements		kg Sb eq	2.26E-04	0.001	0.001	0.002
Abiotic depletion potential – Fossil fuels		MJ	251.1	2969	809	4029
Water scarcity potential		m³	6.10	153	2.92	162
Freshwater ecotoxicity*		PAF.m³.day	9.40E-07	1.36E-05	1.64E-06	1.62E-05
Human toxicity, cancer*		cases	2.30E-06	4.73E-05	7.79E-06	5.74E-05
Human toxicity, non-cancer*		cases	143830	1530952	291155	1965937
USE OF RESOURCES						
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	586.07	371	9.89	967
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	586.07	371.2	9.89	967
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	296.6	3351	871	4519
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	296.6	3351	871	4519
Secondary material		kg	0	0	0	0
Renewable secondary fuels		MJ, net calorific value	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0
Net use of fresh water		m³	0.193	3.43	0.10	3.72
WASTE PRODUCTION and OUTPUT FLOWS						
Hazardous waste disposed		kg	INA	4.28E-05	0.00	4.28E-05
Non-hazardous waste disposed		kg	INA	0.063	0.00	0.063
Radioactive waste disposed		kg	INA	0.00	0.00	0.00
Components for reuse		kg	INA	0.00	0.00	0.00
Material for recycling		kg	INA	0.00	0.00	0.00
Materials for energy recovery		kg	INA	0.00	0.00	0.00
Exported energy, electricity		MJ	INA	0.00	0.00	0.00
Exported energy, thermal		MJ	INA	0.00	0.00	0.00

INA: Indicator Not Assessed
* Additional environmental indicators

Environmental indicators for Sodium Bicarbonate - Small Bag

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
POTENTIAL ENVIRONMENTAL IMPACTS						
Global warming (GWP100a)	Fossil	kg CO ₂ eq	24.06	316	55.4	396
	Biogenic	kg CO ₂ eq	3.830	2.10	0.287	6.22
	Land use and land transformation	kg CO ₂ eq	0.045	1.35	0.024	1.41
	TOTAL	kg CO ₂ eq	27.94	320	55.7	404
Acidification potential (AP)		kg SO ₂ eq	0.107	1.73	0.142	1.98
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	0.036	0.660	0.031	0.727
Formation potential of tropospheric ozone (POCP)		kg NMVOC	0.123	0.735	0.136	0.994
Abiotic depletion potential – Elements		kg Sb eq	6.34E-04	0.001	0.001	0.003
Abiotic depletion potential – Fossil fuels		MJ	554.0	2969	809	4332
Water scarcity potential		m³	15.47	153	2.92	171
Freshwater ecotoxicity*		PAF.m³.day	1.56E-06	1.36E-05	1.64E-06	1.69E-05
Human toxicity, cancer*		cases	4.08E-06	4.73E-05	7.79E-06	5.92E-05
Human toxicity, non-cancer*		cases	302810	1530952	291155	2124917
USE OF RESOURCES						
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	601.57	371	9.89	983
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	601.57	371.2	9.89	983
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	646.8	3351	871	4869
	Used as raw materials	MJ, net calorific value	0	0	0	0
	TOTAL	MJ, net calorific value	646.8	3351	871	4869
Secondary material		kg	0	0	0	0
Renewable secondary fuels		MJ, net calorific value	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0
Net use of fresh water		m³	0.427	3.43	0.10	3.95
WASTE PRODUCTION and OUTPUT FLOWS						
Hazardous waste disposed		kg	INA	4.28E-05	0.00	4.28E-05
Non-hazardous waste disposed		kg	INA	0.063	0.00	0.063
Radioactive waste disposed		kg	INA	0.00	0.00	0.00
Components for reuse		kg	INA	0.00	0.00	0.00
Material for recycling		kg	INA	0.00	0.00	0.00
Materials for energy recovery		kg	INA	0.00	0.00	0.00
Exported energy, electricity		MJ	INA	0.00	0.00	0.00
Exported energy, thermal		MJ	INA	0.00	0.00	0.00

INA: Indicator Not Assessed
* Additional environmental indicators

Other environmental indicators

According to the PCR following environmental indicators have been included in the LCA study and presented in this EPD in the potential environmental impact tables:

- Freshwater ecotoxicity, PAF.m³.day; Human Toxicity cancer and non-cancer, cases.
- Ref: USEtox 2 (recommended + interim) v1.00

According to the “Life Cycle Metrics for Chemical Products” (WBCSD Chemicals, 2014) document, USEtox method is used for other environmental indicators calculation.

Eti Soda can be contacted for other emissions and environmental aspects.

6 | ADDITIONAL INFORMATION

Biotic matter is not used as feedstock.

To provide the safety of the chemical products exported upon the human health and environment, ETİ SODA has completed the regulations determined in the REACH Legislation, which is effective in the European Union Countries.

According to the GHS Hazard statement, for Natural Soda Ash reported as H319: Causes serious eye irritation; for Sodium Bicarbonate not classified under GHS.

Material Safety Data Sheet (MSDS) information may be reached via ahu.kilic@etisoda.com.



Differences Versus Previous Versions

In the first version of the EPD, some part of the data regarding to cogeneration plant was miscalculated. In this version all data has been on-site verified by Rina Denizcilik ve Belgelendirme Ltd.Şti.; externally. Also, in this version different packaged products are calculated separately.

REFERENCES

- ETI SODA / <http://www.etisoda.com/>
- ISO 14040: 2006 Environmental management-- Life cycle assessment-- Principles and framework
- ISO 14044: 2006 Environmental management-- Life cycle assessment-- Requirements and guidelines
- ISO 14025: 2006 Environmental labels and declarations-- Type III environmental declarations-- Principles and procedures
- The International EPD® System / www.environdec.com
- The International EPD® System / The General Programme Instructions / <http://www.environdec.com/tr/The-International-EPD-System/General-Programme-Instructions/>
- Ecoinvent 3.6 database / <http://www.ecoinvent.org/>
- SimaPro LCA Software / <https://simapro.com/>
- The International EPD® System / PCR Basic inorganic chemicals not elsewhere classified (n.e.c.) v2.12 / <https://www.environdec.com/PCR/Detail/?Pcr=8313>
- Life Cycle Metrics for Chemical Products (WBCSD Chemicals, 2014). / <http://www.wbcd.org/Projects/Chemicals/Resources/Life-Cycle-Metrics-for-Chemical-Products>

CONTACT INFORMATION

Third party verifier:

Ing. Luca Giacomello, PMP®

Via Leonardo Fea 35
10148 Torino- Italy



Owner of the Declaration:

**ETİ SODA Üretim Pazarlama Nakliyat ve Elektrik
Üretim Sanayi ve Ticaret A.Ş.**

Yeşilağaç Mah. Gurağaç Kümeevler No:47/A 06730
Beypazarı / ANKARA
www.etisoda.com



LCA Practitioner & EPD Design:

Semtrio Sustainability Consulting

BUDOTEK Teknopark, No 4/21, Umraniye Istanbul Turkey
www.semtrio.com



ETİ SODA



www.etisoda.com

info@etisoda.com

ciner