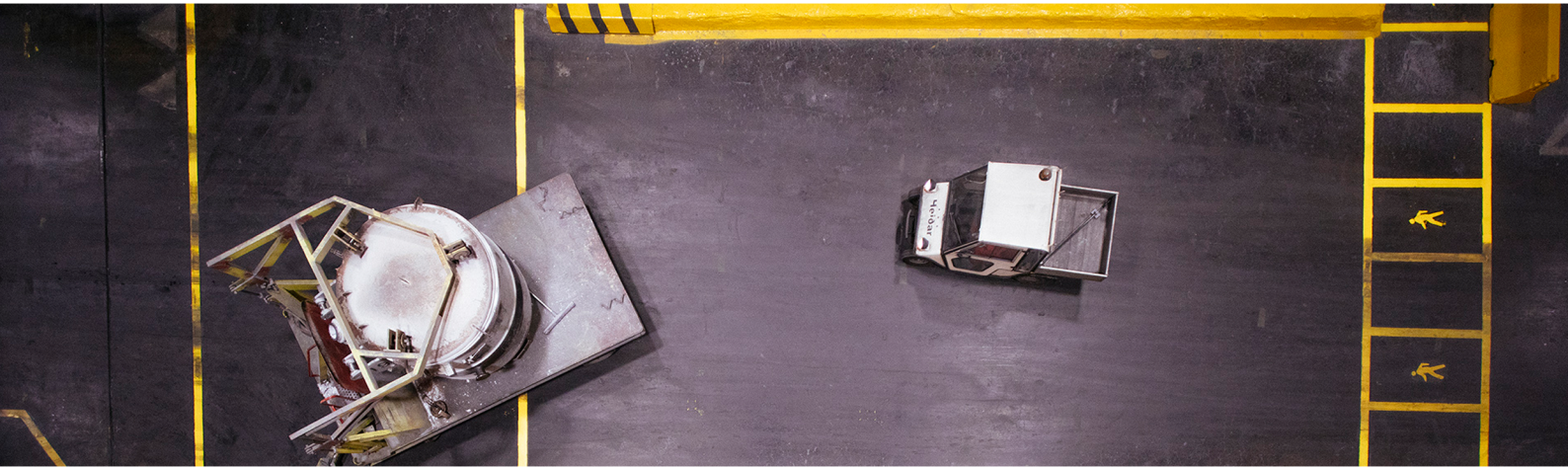


2019

Green Accounting



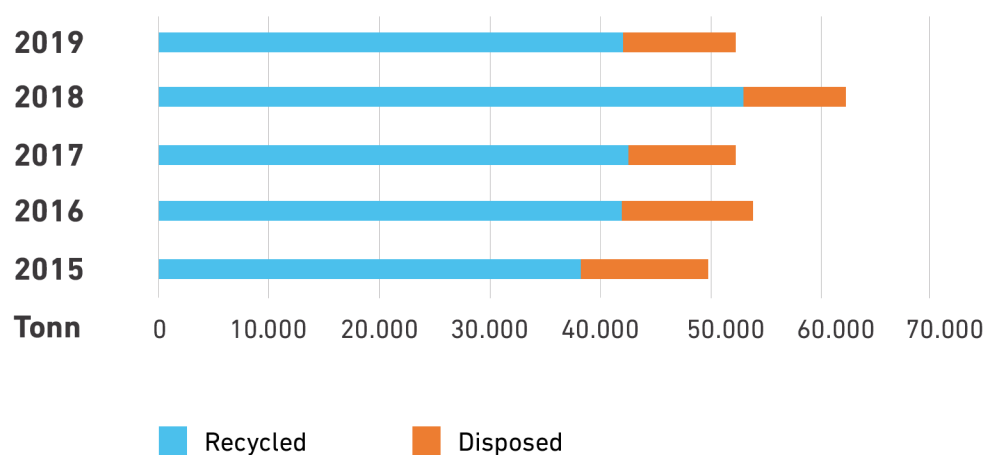
Green Accounting



Green accounting is a thorough register of all materials brought to the aluminum plant and delivered from it. Our aim is to maximize the efficient use of materials and provide a precise account of how undesirable materials are disposed of. Green accounting has various direct and indirect positive effects on company culture. It increases care in the use and disposal of all materials.

At the same time, green accounting provides a valuable tool for identifying opportunities and improvements, minimizing waste and improving health and safety. The year 2019 passed without a single major environmental incident. Filtration systems ran smoothly and all monitoring measurements were well within operational license limits.

Responsible waste management



Auditor's Statement



I have reviewed and audited the information presented in Norðurál's green accounting for the year 2019. The books have been reviewed with regard to whether the information stipulated in articles 6, 7 and 8 of Regulation No. 851/2002 is available for scrutiny and whether the numerical information presented complies with data from the financial records and the company's monitoring of key figures in environmental matters. After having conducted a review of the data, my opinion is that the green accounting meets the conditions of Regulation No. 851/2002 and gives a thorough account of the company's environmental impact in the year of 2019.

Reykjavík, march 31, 2020

Elin Vignisdóttir

Elin Vignisdóttir

Geographer



Fluoride, dust SO₂ emission

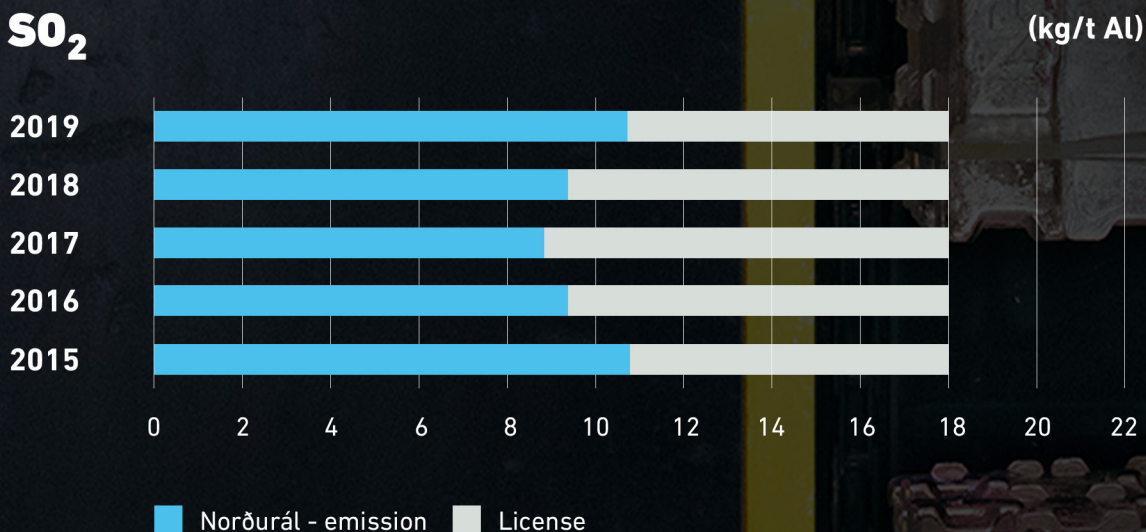
Fluoride



Dust



SO₂



Fluoride, dust and SO₂ emissions remain well within limits set in operating license.



Statement of the CEO

All information presented in our green accounting for the year 2019 is provided in good faith. We use state-of-the-art emissions control technologies that are regularly and thoroughly maintained. The results of our internal measurements are used for improvement in order to minimise the environmental impact of our operations. Operating in harmony with the environment is a key factor in what we do and we reach our goals by constantly monitoring environmental factors. The environmental protection aspect of our operations went well this year and active monitoring was conducted in accordance with our monitoring plan and the conditions stipulated in our operating license.

Gunnar Guðlaugsson

CEO

Materials and Resources 2019	Qty	Unit
Members of staff	570	♂ ♀
Ratio male/female	442/128	♂/♀
Electricity	4.654.000	MWst
Oil	479.456	litr
Gas	62	tonn
Fresh water	185.277	m ³
Sea water	7.884.000	m ³
Total raw materials used	2,37	t/t Al
Imported raw materials	2,37	t/t Al
Hazardous substances (solid)	611.646	tonn
Hazardous substances (liquid)	503.839	litr
Misc. packaging	< 400	tonn

Emissions and Waste	Qty	Unit
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Atmospheric emissions

Fluoride (gaseous and particles)	0,38	kg/t Al
Sulphur dioxide SO ₂	10,83	kg/t Al
Dust	0,74	kg/t Al
Carbon Dioxide CO ₂	1,49	t/t Al
Fluorocarbons, PFC CO ₂ equivalents	0,14	t CO ₂ íg./t Al
Polyaromatic hydrocarbons PAH ₁₆	0,14	t CO ₂ íg./t Al

Release into surface water/groundwater/sea

Sludge	0,04	kg/t Al
Oils/fats in cooling agents	< 0,5	ppm

Release into municipal sewage system

From septic tanks	7,5	tonn
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Release into municipal sewage system

Waste for compacting	0,5	kg/t Al
Dumping to seashore repository	32	kg/t Al

Recyclable waste

Anode waste and coal dust	108	kg/t Al
Aluminum slag	8,1	kg/t Al
Wood	1,1	kg/t Al
Scrap metal	2,3	kg/t Al
Cardboard	0,12	kg/t Al
Plastic	0,03	kg/t Al

Waste material for disposal

Total waste	0,01	kg/t Al
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Waste	2019	2018	2017
Material from the sewer (tonnes)			
Sludge	13,3	20	21,3
Other waste (from septic tanks)	7,5	7,3	8,1
Recyclable waste			
Anode butts	32.670	41.978	34.311
Carbon dust	1.300	1.352	1.436
Bath material	2.648	2.220	3.150
Aluminum dross	2.568	2.846	3.402
Busbars	1.928	3.050	–
Anode stub metal	98	637	–
Scrap iron	721	700	843
Timber	333	284	290
Paper	38	30	39
Plastic	11	7	5
Waste oil	16	17	13
Rubber tires	4,9	3,8	8,6
Batteries and electronics	4,2	4,7	1,7
Textile	1,1	1,2	–
Light bulbs	0,19	0,02	0,1
Oil contaminated waste	7	7	7
Asphalt	217	5	106
Toxic waste			
Electronics – toxic waste	0,04	0,4	0
Toxic waste	4	7	4
Paint	0,5	0,7	0,4
Material in flood pits			
Spent potlining	7.449	5.522	6.652
Carbon from rodding shop	1.156	1.277	1.088
Carbon from pot rooms	1.110	1.480	722
Dust from sweeper	–	6	–
Residual refractory material	412	537	469
Spent refractory material	58	41	39
Earth materials	43	161	90
Solid waste			
Waste for compacting	158	144	146
Organic waste	7	6	7
Emissions to the air			
Carbon Dioxide CO ₂ (tonnes)	469.201	473.303	479.065
Fluorocarbons, PFC (tonnes CO ₂ equivalents)	45.530	39.101	30.079
Sulphur dioxide SO ₂ (tonnes)	3.421	2.973	2.819
Polyaromatic hydrocarbons PAH ₁₆ (kg)	7,5	7,6	7,6
Fluoride (gaseous and particles) F (tonnes)	121	120	93
Dust (tonnes)	235	233	202

Hazardous substances

DAG 554/20 (litres)	16.875	19.384	15.325
Plicast strong mix (tonnes)	128	115	130
Ramming paste (tonnes)	708	576	618
Flange paste (tonnes)	1.616	1.643	1.625
Propane (tonnes)	62	89	110
Diesel oil (litres)	479.456	565.413	503.410
Hydraulic oil (litres)	7.508	6.797	–
Sodium hydroxide (tonnes)	196	159	167
Aluminum fluoride (tonnes)	5.104	4.573	4.337
Aluminum oxide (tonnes)	603.805	609.380	608.984
Ferromanganese (tonnes)	11	10	12
Ferrophosphorus (tonnes)	16	8	12

Production and raw materials	2019	2018	2017
Primary aluminum production (tonnes)	315.867	317.386	317.179
Alluminum oxide (tonnes)	603.805	609.380	608.984
Aluminum fluoride (tonnes)	5.104	4.573	4.337
Prebaked anodes (net weight, tonnes)	132.142	132.434	133.544
Propane (tonnes)	62	89	110
Diesel oil (litres)	479.456	565.413	503.410
Sodium hydroxide (tonnes)	196	159	167
Ramming paste (tonnes)	1.616	1.643	1.625
Cast iron (tonnes)	979	1 278	976
Anode rods (tonnes)	747	782	580
Electricity (MWh)	4.654.000	4.639.000	4.649.000
Industrial water (m^3)	111.166	104.375	102.645
Drinking water (m^3)	74.111	69.583	68.430
Sea (m^3)	7 884.000	7 884.000	7 884.000
Silicon (tonnes)	3.771	5.113	4.286
Magnesium (tonnes)	151	204	169
Titanium (tonnes)	56	76	63
Strontium (tonnes)	19	25	19
Hydraulic oil (litres)	7.5086	797	1 684
Oil for cooling (litres)	5.0245	327	4 101
Oil removing chemicals (tonnes)	1.720	892	940
Lubricating oil (litres)	6.231	5.327	4.547
Ferrosilicon (tonnes)	23	23	25
Ferromanganese (tonnes)	11	10	12
Ferrophosphorus (tonnes)	16	8	12
Carbon (tonnes)	52	65	60
Steel hail (tonnes)	81	71	56
Wood sticks (pcs.)	13.600	9.900	10.900
Batteries (pcs.)	60	67	87

