Environmental Product Declaration

BREG EN EPD No.: 000129 Issue: 01

ECO EPD Ref. No.: 000423

This is to certify that this verified Environmental Product Declaration provided by:

Diler Demir Celik Endustri ve Ticaret A.S.
(member of UK CARES)

Is in accordance with the requirements of:

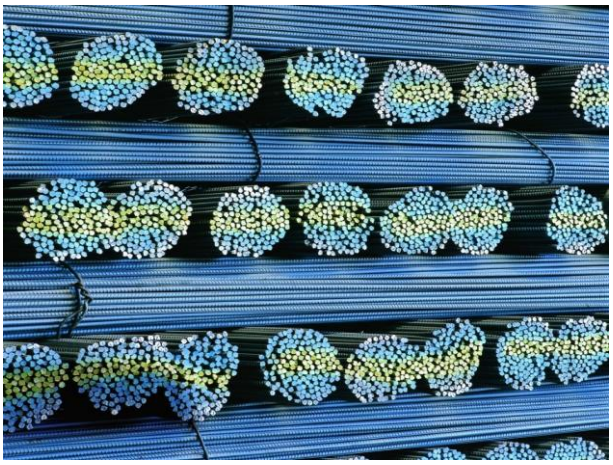
EN 15804:2012+A1:2013

This declaration is for:

Carbon Steel Reinforcing Bar (secondary production route – scrap)

Company Address

Dilovasi Organize Sanayi Bolgesi
1. Kisim Dicle Cad. No: 30
Dilovasi, Kocaeli
41455



Signed for BRE Global Ltd	Operator	Date of this Issue
22 September 2016		31 July 2019
Date of First Issue		Expiry Date

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EPD verification and LCA details

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR[a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐ Internal ☑ External
Third party verifier[b]: **Kim Allbury**
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

UK CARES EPD Tool thinkstep UK Ltd Euston Tower - Level 33, 286 Euston Road London NW1 3DP www.thinkstep.com	Kim Allbury BRE Global Bucknalls Lane Watford WD25 9XX www.bre.co.uk

UK CARES Pembroke House 21 Pembroke Road Sevenoaks, Kent TN13 1XR

General Information

Summary

This environmental product declaration is for 1 tonne of Carbon Steel Reinforcing Bar (secondary production route – scrap) produced by Diler Demir Celik Endustri ve Ticaret A.S. (member of UK CARES) at the following manufacturing facilities:

Diler Demir Celik Endustri ve Ticaret A.S.
(member of UK CARES)
Dilovasi Organize Sanayi Bolgesi
1. Kisim Dicle Cad. No: 30
Dilovasi, Kocaeli
41455
Turkey

This is a Cradle to gate with options EPD. The life cycle stages included are as shown below (X = included, MND = module not declared):

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction - Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water use	Deconstruction	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X

Programme Operator

BRE Global, Watford, Herts, WD25 9XX, United Kingdom.
This declaration is based on the BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013.

Comparability

Environmental declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the product category rules used and the source of the data, e.g. the database. See EN 15804:2012+A1:2013 for further guidance.

Construction Product

Product Description

Reinforcing steel bar (according to product standards listed in Sources of Additional Information) that is obtained from scrap, melted in an Electric Arc Furnace (EAF) followed by hot rolling.

The declared unit is 1 tonne of carbon steel reinforcing bars as used within concrete structures for a commercial building.

Technical Information

Property	Value	Unit
Production route	EAF	-
Density	7850	kg/m³
Modulus of elasticity	200000	N/mm²
Weldability (As per BS4449:2005)	max 0.5	Ceq
Yield strength (As per BS4449:2005)	min 500	N/mm²
Tensile strength (As per BS4449:2005)	min (Tensile strength / Yield strength >=1.08)	N/mm²
Surface geometry (As per BS4449:2005)	Bar size 6-12mm min 0.040 & Bar size >12mm min 0.056	fR
Elongation (Agt) (As per BS4449:2005)	min 5	%
Re-bend test (As per BS4449:2005)	Pass	-
Fatigue test (As per BS4449:2005)	Pass	-
Recycled content	98.9	%

Product Contents

Material/Chemical Input	%
Fe	97
C, Mn, Si, V, Ni, Cu, Cr, Mo and others	3

Manufacturing Process

Scrap metal is melted in an electric arc furnace to obtain liquid steel. This is then refined to remove impurities and alloying additions can be added to give the required properties.

Hot metal (molten steel) from the EAF is then cast into steel billets before being sent to the rolling mill where they are rolled and shaped to the required dimensions for the finished bars and coils of reinforcing steel.

The process flow diagram is shown below:

Construction Installation

Processing and proper use of reinforcing steel products depends on the application and should be made in accordance with generally accepted practices, standards and manufacturing recommendations.

During transport and storage of reinforcing steel products the usual requirements for securing loads is to be observed.

Use Information

The composition of the reinforcing steel products does not change during use.

Reinforcing steel products do not cause adverse health effects under normal conditions of use.

No risks to the environment and living organisms are known to result from the mechanical destruction of the reinforcing steel bar product itself.

Reference Service Life

Reinforcing steel products are used in the main building structure so the reference service life will equal the lifetime of the building.

End of Life

Reinforcing steel products are not reused at end of life but can be recycled to the same (or higher/lower) quality of steel depending upon the metallurgy and processing of the recycling route.

It is a high value resource so efforts are made to recycle steel scrap rather than disposing of it at EoL. A recycling rate of 92% is typical for reinforcing steel bar products.

Disposal results in minimal environmental impacts due to the inert nature of the material.

Life Cycle Assessment Calculation Rules

Declared / Functional unit

The declared unit is 1 tonne of carbon steel reinforcing bars manufactured by the secondary (scrap-based) production route as used within concrete structures for a commercial building (i.e. 1 tonne in use, accounting for losses during fabrication and installation, not 1 tonne as produced).

System boundary

The system boundary of the EPD follows the modular design defined by EN 15804. This is a cradle to gate – with all options EPD and thus covers all modules from A1 to C4 and includes module D as well.

Impacts and aspects related to losses/wastage (i.e. production, transport and waste processing and end-of-life stage of lost waste products and materials) are considered in the modules in which the losses/wastage occur.

Data sources, quality and allocation

Data Sources: Production data has been supplied by Diler Demir Celik Endustri ve Ticaret A.S (member of UK CARES).

Data Quality: Data quality can be described as good. Background data are consistently sourced from thinkstep databases. The primary data collection was thorough, considering all relevant flows and these data have been verified by UK CARES.

Allocation: EAF slag and mill scale are produced as a co-products from the steel manufacturing process. Impacts are allocated between the steel, the slag and the mill scale based on economic allocations.

Production losses of steel during the production process are recycled in a closed loop offsetting the requirement for external scrap.

Specific information on allocation within the background data is given in the GaBi datasets documentation (/GaBi 6 2014/).

Cut-off criteria

On the input side all flows entering the system and comprising more than 1% in total mass or contributing more than 1% to primary energy consumption are considered. All inputs used as well as all process-specific waste and process emissions were assessed. For this reason material streams which were below 1% (by mass) were captured as well. In this manner the cut-off criteria according to the BRE guidelines are fulfilled.

LCA Results

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
		Raw Material supply	Transport to factory	Manufacturing	Merged A1/A2/A3	Transport to site	Construction - installation	Use	Maintenance	Repair
Environmental impacts per declared/functional unit										
GWP	kg CO_2 eq.	AGG	AGG	AGG	1010	16.1	116	0.00	0.00	0.00
ODP	kg CFC 11 eq.	AGG	AGG	AGG	1.07E-06	7.39E-11	1.07E-07	0.00	0.00	0.00
AP	kg SO_2 eq.	AGG	AGG	AGG	3.33	0.0396	0.349	0.00	0.00	0.00
EP	kg $(PO_4)^{3-}$ eq.	AGG	AGG	AGG	0.324	0.00918	0.037	0.00	0.00	0.00
POCP	kg C_2H_4 eq.	AGG	AGG	AGG	0.271	-0.0111	0.0228	0.00	0.00	0.00
ADPE	kg Sb eq.	AGG	AGG	AGG	0.000108	1.07E-06	1.68E-05	0.00	0.00	0.00
ADPF	MJ eq.	AGG	AGG	AGG	12300	221	1410	0.00	0.00	0.00
GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels										
Resource use										
PERE	MJ	AGG	AGG	AGG	954	12.6	149	0.00	0.00	0.00
PERM	MJ	AGG	AGG	AGG	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	AGG	AGG	AGG	954	12.6	149	0.00	0.00	0.00
PENRE	MJ	AGG	AGG	AGG	12500	222	1440	0.00	0.00	0.00
PENRM	MJ	AGG	AGG	AGG	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	AGG	AGG	AGG	12500	222	1440	0.00	0.00	0.00
SM	kg	AGG	AGG	AGG	1150	0.00	115	0.00	0.00	0.00
RSF	MJ	AGG	AGG	AGG	-0.419	0.00	-0.0419	0.00	0.00	0.00
NRSF	MJ	AGG	AGG	AGG	-6.41	0.00	-0.641	0.00	0.00	0.00
FW	m^3	AGG	AGG	AGG	1400	31.5	181	0.00	0.00	0.00
PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water										
Waste to disposal										
HWD	kg	AGG	AGG	AGG	0.114	1.68E-05	0.0114	0.00	0.00	0.00
NHWD	kg	AGG	AGG	AGG	212	0.0187	31.00	0.00	0.00	0.00
TRWD	kg	AGG	AGG	AGG	0.104	0.000318	0.0112	0.00	0.00	0.00
RWDHL	kg	AGG	AGG	AGG	0.000138	4.65E-07	1.49E-05	0.00	0.00	0.00
HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste)										
Other output flows										
CRU	kg	AGG	AGG	AGG	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	AGG	AGG	AGG	0.00	0.00	120	0.00	0.00	0.00
MER	kg	AGG	AGG	AGG	0.00	0.00	0.00	0.00	0.00	0.00
EE	MJ	AGG	AGG	AGG	0.00	0.00	0.00	0.00	0.00	0.00
CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy										

LCA Results (continued)

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

Indicator	Unit	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Demolition	C2 Transport	C3 Waste Processing	C4 Disposal	D Reuse/ Recovery/ Recycling Potential
Environmental impacts per declared/functional unit										
GWP	kg CO_2 eq.	0.00	0.00	0.00	0.00	2.06	38.9	0.00	1.28	397
ODP	kg CFC 11 eq.	0.00	0.00	0.00	0.00	7.78E-12	1.77E-10	0.00	1.41E-11	-1.77E-09
AP	kg SO_2 eq.	0.00	0.00	0.00	0.00	0.00316	0.126	0.00	0.0077	1.52
EP	kg $(PO_4)^{3-}$ eq.	0.00	0.00	0.00	0.00	0.000428	0.0299	0.00	0.00105	0.12
POCP	kg C_2H_4 eq.	0.00	0.00	0.00	0.00	0.000381	-0.0324	0.00	0.000749	0.222
ADPE	kg Sb eq.	0.00	0.00	0.00	0.00	6.21E-08	2.51E-06	0.00	4.43E-07	-3.26E-05
ADPF	MJ eq.	0.00	0.00	0.00	0.00	28.6	535	0.00	16.7	3710
GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels										
Resource use										
PERE	MJ	0.00	0.00	0.00	0.00	0.0709	28.8	0.00	1.96	-194
PERM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	0.00	0.00	0.00	0.00	0.0709	28.8	0.00	1.96	-194
PENRE	MJ	0.00	0.00	0.00	0.00	28.6	537	0.00	17.3	3550
PENRM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	0.00	0.00	0.00	0.00	28.6	537	0.00	17.3	3550
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m^3	0.00	0.00	0.00	0.00	0.209	72.2	0.00	3.53	260
PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water										
Waste to disposal										
HWD	kg	0.00	0.00	0.00	0.00	4.78E-09	3.84E-05	0.00	3.95E-07	5.03E-06
NHWD	kg	0.00	0.00	0.00	0.00	0.00342	0.0428	0.00	80.1	5.63
TRWD	kg	0.00	0.00	0.00	0.00	3.41E-05	0.000759	0.00	0.000241	-0.064
RWDHL	kg	0.00	0.00	0.00	0.00	4.97E-08	1.11E-06	0.00	3.06E-07	-8.12E-05
HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste)										
Other output flows										
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	0.00	0.00	0.00	920	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy										

Scenarios and Additional Technical Information

Vehicle Type	Fuel Consumption (L/km)	Distance (km)	Capacity Utilisation (%)	Density Of Product (kg/m³)
Truck trailer	1.56	350	85	7850

Parameter	Description	Unit	Value
Ancillary materials for installation	Waste material from fabrication, losses per tonne of construction steel forms	%	2
Energy Use	Energy per tonne required to fabricate construction steel forms	kWh	15.34
Waste materials from installation wastage	Waste material from installation	%	10

Parameter	Description	Unit	Value
Maintenance process description or source of information	No maintenance required	-	-

Parameter	Description	Unit	Value
Repair process description or source of information	No repair process required	-	-

Module B4 - Replacement			
Parameter	**Description**	**Unit**	**Value**
Replacement cycle	No replacement considerations required	-	-

Parameter	Description	Unit	Value
Refurbishment process description or source of information	No refurbishment process required	-	-

Parameter	Description	Unit	Value
Other assumptions for scenario development, e.g., frequence of use, number of occupants	No use phase requirements of either water or energy required	-	-

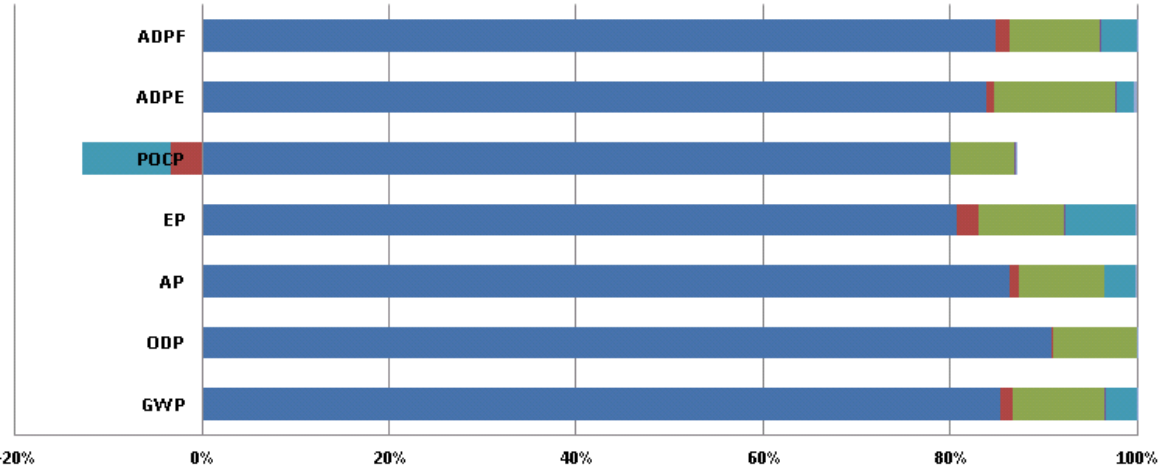
Parameter	Description	Unit	Value
Waste for recycling	Recovered steel from crushed concrete	%	92
Waste for energy recovery	Energy recovery is not considered for this study as most end of life steel scrap is recycled, while the remainder is landfilled	-	-
Waste for final disposal	Unrecoverable steel lost in crushed concrete and sent to landfill	%	8
Other assumptions for scenario development, e.g, transportation	Portion of energy assigned to rebar from energy required to demolish building, per tonne	MJ	24

Vehicle Type	Fuel Consumption (L/km)	Distance (km)	Capacity Utilisation (%)	Density Of Product (kg/m³)
Truck	1.56	463	85	7850
Container ship	0.00401	158	50	7850

It is assumed that 92% of the steel used in the structure is recovered for recycling, while the remainder is landfilled. “Benefits and loads beyond the system boundary” (module D) accounts for the environmental benefits and loads resulting from net steel scrap that is used as raw material in the EAF and that is collected for recycling at end of life. The resulting scrap credit/burden is calculated based on the global “value of scrap” approach (/worldsteel 2011).

Interpretation

Scrap-based carbon steel rebar of Diler Demir Celik Endustri ve Ticaret A.S (member of UK CARES) is made via the EAF route. The bulk of the environmental impacts and primary energy demand is attributed to the manufacturing phase, covered by information modules A1-A3 of EN 15804. For GWP for instance, A1-A3 impacts account for 85.28% overall life cycle impacts for this category.



	GWP	ODP	AP	EP	POCP	ADPE	ADPF
A1-3	85.28%	90.89%	86.37%	80.69%	107.78%	83.80%	84.76%
A4	1.36%	0.01%	1.03%	2.29%	-4.41%	0.83%	1.52%
A5	9.79%	9.09%	9.05%	9.21%	9.07%	13.03%	9.72%
C1	0.17%	0.00%	0.08%	0.11%	0.15%	0.05%	0.20%
C2	3.28%	0.02%	3.27%	7.45%	-12.89%	1.95%	3.69%
C3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
C4	0.11%	0.00%	0.20%	0.26%	0.30%	0.34%	0.12%

Figure 1

Sources of additional information

BRE Global. BRE Environmental Profiles 2013: Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013. PN 514. Watford, BRE, 2014.

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

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Kreißig, J. und J. Kuemmel (1999): Baustoff-Oekobilanzen. Wirkungsabschaftzung und Auswertung in der Steine-Erden-Industrie. Hrsg. Bundesverband Baustoffe Steine + Erden e.V.

London Metal Exchange, Steel Billet Prices, March 2014. https://www.lme.com/en-gb/metals/ferrous/

U.S. Geological Survey, Mineral Commodity Summaries, Iron and Steel Slag, January 2006

Sustainability of construction works – Environmental product declarations – Methodology for selection and use of generic data; German version CEN/TR 15941

REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

CARES SCS Sustainable Constructional Steel Scheme. Appendix 1 - Operational assessment schedule for the sustainable production of steel billets, steel bars/coils and wire rod for further processing into carbon steel bar, coil or rod for the reinforcement of concrete

CARES SRC Steel for the Reinforcement of Concrete Scheme. Appendix 1 – Quality and operations assessment schedule for carbon steel bars for the reinforcement of concrete including inspection and testing requirements - http://www.ukcares.com/approved-companies - Certificate number of conformance to BS4449 at the time of LCA study – 011001

BS 4449:2005+A3:2016 Steel for the reinforcement of concrete. Weldable reinforcing steel. Bar, coil and decoiled product. Specification.

BS 4449:1997+A1 Carbon Steel Bars for the reinforcement of concrete – Specification.

ASTM A615/A615M – 16 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

ASTM A706/A706M – 16 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

EN 10080:2005 Steel for the reinforcement of concrete. Weldable reinforcing steel. General

ISO 6935-2:2007 - Steel for the reinforcement of concrete - Part 2: Ribbed bars.

NF A35-080-1 Décembre 2013 - Aciers pour béton armé - Aciers soudables - Partie 1 : barres et couronnes.

CAN/CSA G30.18-09:2009 Carbon steel bars for concrete reinforcement.

UNE 36068:2011 - Ribbed bars of weldable steel for the reinforcement of concrete.

NBN A 24-301&304:1986 - Steel for reinforcement.

NBN A 24-301&304:1986 - Steel for reinforcement.

TS 708:2010 - Steel for the reinforcement of concrete - Reinforcing steel.

BDS 9252:2007 - Steel for the reinforcement of concrete - Weldable reinforcing steel B500.

AS/NZS 4671:2001 - Steel reinforcing materials

MS 146:2006 - Hot rolled steel bars for the reinforcement of concrete – Specification.

NBR 7480:2007 - Steel For The Reinforcement Of Concrete Structures – Specification.

SI 4466-3:2013 - Steel for the reinforcement of concrete: Ribbed Bars.

GOST R 52544:2006 - Weldable deformed reinforcing rolled products of A500C and B500C classes for reinforcement of concrete constructions. Specifications.

BDS 4758:2008 - Steel for the reinforcement of concrete - Weldable reinforcing steel (B420)

NCH 204-2006 - Hot Rolled Bars for Reinforced Concrete

NT 26-05:2004 - Production Details of Rebars For Tunisia

NA 8634:1997 - Steel for the Reinforcement of Concrete:Ribbed Bars

D.M:2008 - Steel for the Reinforcement of Concrete Bars of Grade (B450C)

DİLER DEMİR ÇELİK END VE TİC. A.Ş.

Maturity Matrix Worksheet - Olgunluk Matris Çalışması

Data Collection/Reporting Period Veri Toplama / Raporlama Periyodu		2019			
Sustainability Principles Sürdürülebilirlik Prensipleri	**Practices Uygulamalar**	**Characteristics of the approach to sustainability in developing organizations Organizasyonun Gelişiminde Sürdürülebilirlik yaklaşımının karekteristikleri**			**Objectives & Plan(s) / Programme(s) Hedefler & Plan(lar) / Program(lar)**
		Maturity Olgunluk			
		Ad-hoc engagement, an informal approach to stakeholders in relation to these Practices. Limited understanding of the implications of the Practices on business priorities and decision making. Geçici katılım, bu uygulamalarla ilişkili olarak paydaşlara resmi olmayan bir yaklaşım. İş öncelikleri ve karar verme üzerindeki uygulamaların etkilerinin sınırlı bir şekilde anlaşılması	Policies and approach documented and well understood. Accountable party identified and responsible implementing roles/tasks resourced, trained and operational. Certified or uncertified management systems in place to manage the Practices. Politika ve Yaklaşım belgelenmiş ve iyi anlaşılmış. Hesap verebilir taraf belirlendi ve sorumlu uygulayıcı rolleri/görevleri belirlendi, eğitildi ve uygulamada. İşletmede sertifikalandırılmış veya sertifikalandırılmamış yönetim sistemi, uygulamaları yönetiyor	Engaged' plus: Proactively using sustainability to drive innovation into the organisation at every level to deliver improved performance. Company success is viewed in broader terms than foundation financials only. Positive and negative impacts on our natural capital, wellbeing, local communities and economic contribution should be considered and built into all decision making. Artı "Katılım" Geliştirilmiş performans sunmak için yenilikleri her seviyedekuruluşa yönlendirebilecek sürdürülebilirliği proaktif olarak kullanma. Şirketin başarısıkuruluş finansmanlarından daha geniş kapsamlı olarak görülüyor. Doğal sermayemiz, Refahımız, Yerel Topluluklarımız ve Ekonomik katkımız üzerindeki olumlu ve olumsuz etkiler dikkate alınmalı ve tüm karar alma süreçlerine dahil edilmelidir.	
		Immature Olgunlaşmamış	**Engaged Katılım Sağlanmış**	**Proactive and Learning Proaktif ve Öğrenme**	
Inclusivity Kapsam	Stakeholder identification and mapping **Paydaş Tanımlama Ve Haritalama**		X		1-The policy, procedures and manual. 2-Factory information given by Internet, meetings, etc. be
	Open engagement in various formats for various stakeholders **Çeşitli Paydaşlar için çeşitli formatlarda açık katılım**		X		evaluations. *Communication INSTRUCTION-IT.06.09.05 *Records of correspondence.
	Stakeholder issue identification **Paydaşlar ile ilgili konuların tanımlanması**		X		*Stakeholder surveys evaluations. Communication INSTRUCTION-IT.06.09.05
	Communication of organization response to issues raised **Yükselen sorunlara organizasyonun cevabının iletilmesi**		X		evaluations. *Communication INSTRUCTION-IT.06.09.05 *Records of correspondence.
	Stakeholder participation in the system **Paydaşların sisteme katkısı**		X		
Integrity Bütünlük	Leadership shown - clear Accountabilities documented **Liderlik gösterilmiş-Açık hesap verme kayıtlı**			X	18001 certifications 2-SRS Cert. of Sustainable Reinforcing Steel 3-Target management
	Code of Conduct adopted **Davranış Kuralları adaptasyonu sağlanmış**			X	Policy ETHICS WORK INSTRUCTION-IT.06.09.13 *Performance evaluation
	Integrity risks identified and managed **Bütünlük riskleri tanımlandı ve yönetiliyor**		X		*Sustainability procedure *Sustainability Certificate *Risk assessment *Management Review Meeting
Stewardship Yöneticilik	Sustainable development culture **Sürdürülebilir kalkınma kültürü**			X	Feedback forms The implementation of the reward system
	Responsible/Sustainable Supply chain approach adopted **Sorumlu/Sürdürülebilir tedarik zinciri yaklaşımı adaptasyonu sağlanmış**		X		*Supplier evaluation form *Purchasing procedure *Certification (ISO, G etc.) *Objectives
	Systematic Environmental Management **Sistematik Çevre Yönetimi**			X	*ISO 14001 certification. *Environmental Aspects table procedures. *Environmental permission
	Systematic Social Management **Sistematik Sosyal Yönetim**		X		*Food aid *clothing aids
	Systematic Economic Management **Sistematik Ekonomik Yönetim**		X		*Policy *(IT.06.09.13-INSTRUCTIONS)-ETİGH RULES *İnnavation/investment prices
	Skills and training **Beceriler ve Eğitim**			X	*Human resources Procedure *Trainig records. *Targets.
	Career development **Kariyer geliştirme**		X		*Dosis(Diler Enquiry system) works and awarding records.
Transparency Şeffaflık	Identify appropriate metrics/KPIs **Uygun Ölçümlerin/KPI'ların belirlenmesi**			X	Instructions (İnspection,experiment,work etc.) *Objectives
	Monitor performance **Performansların İzlenmesi**		X		Meeting of quality productivity records. *Management review meeting records.
	Publicly report management practices and performance **Yönetim uygulamalarını ve performansını kamuya açıklamak**		X		records. *Management review meeting records. *Used Computer Programs.
	Review performance **Performansı gözden geçirme**			X	Meeting of quality productivity records. *Management review meeting records.

INTEGRATED MANAGEMENT SYSTEM POLICY

Release Date: 04/01/2010
Revision No: 4
Revision Date 05/01/2018

We as Diler Demir Çelik End. And Tic. Inc aim to comply with
the requirements of the relevant parties applicable within the scope of Integrated Management Systems and Nuclear Safety Culture that we have established with our contexts, principles and values in the national and international markets we operate in, and to increase customer satisfaction, to protect employees from potential hazards, to control negative environmental effects and use energy resources efficiently.
For this purpose, we hereby commit;

- Our policy to provide a framework for the creation of our Goals; To be publicized, understood and implemented within our organization, and accessible and sustainable by the interested parties,
- To support the strategic direction of Diler,
- To develop business health and safety in our activities, to develop systems so as to prevent work accidents and occupational diseases,
- Respecting people and the environment by focusing on preventing pollution and protecting the natural environment in relation to the Diler's context,
- The suitability of our activities for the purpose and context of the Diler, including the environmental impact, nature and scale of our products and services,
- To reduce waste, increase recycling rate, use raw and natural resources efficiently and effectively, to reduce greenhouse gas effect, transportation effect and energy consumption,
- Ensuring that the necessary information and resources are provided in the realization of activities and targets for increasing energy efficiency,
- To increase cooperation with neighboring facilities, authorities and local administrations on health, safety and environment issues,
- In order to increase the performance of Quality - Environment - Occupational Health and Safety, Energy efficiency in line with continuous improvement approach for our management systems and our Nuclear Safety Culture, to improve the life cycle and the efficiency of all our processes to a level that can compete internationally
- To take precautions for sustainable resource use, mitigation of climate change, protection of ecosystem and biodiversity,
- To ensure effective communication arrangement so as to ensure that our employees and other shareholders understand the responsibilities of Quality - Environment - Occupational Health and Safety, Energy efficiency. To be organized so as to intervene in emergencies,
- Establishing connections with shareholders to understand and control risks and opportunities (based on control hierarchy), taking into account their anticipation and local economic effects,
- Developing awareness of responsibility in Local Community and other shareholders, meeting social, economic and human rights, complying with ethical business rules (in line with ILO and ETI basic terms and conditions)
- To be transparent to our stakeholders in our applications, to raise awareness of them, to implement the requirements of Quality - Environment - Occupational Health and Safety Standards, Energy efficiency, Sustainability and Nuclear Safety Culture with the participation of all our shareholders,
- To act within the framework of responsible supply principles. Considering energy efficiency in the supply of products and services.

ENVIRONMENT

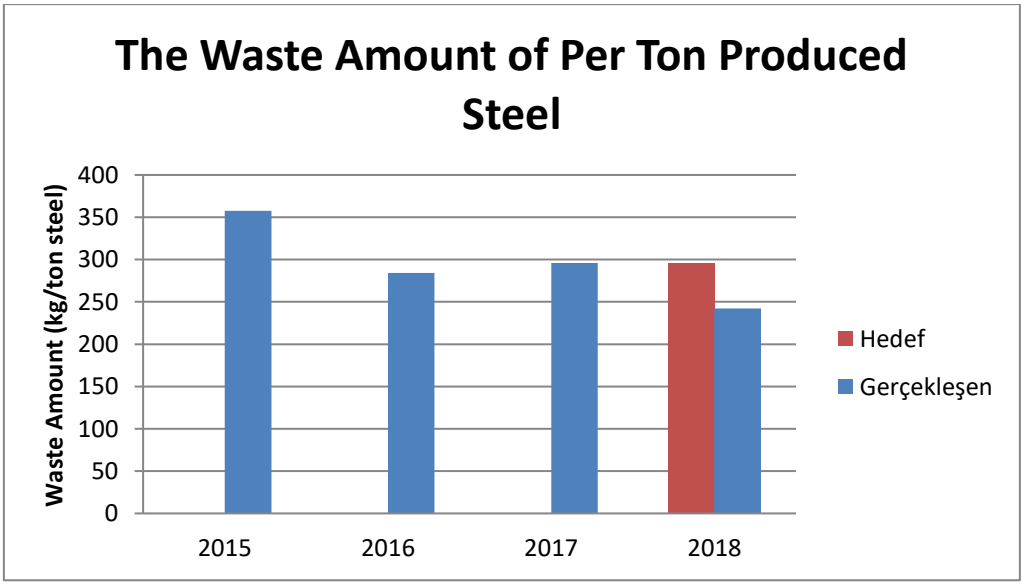
DILER IRON & STEEL IND. TRADE. INC. continues its production by adopting a sustainable environmental policy, following the new technologies required in this regard and making investments within its own structure and supporting them with quality certificates.

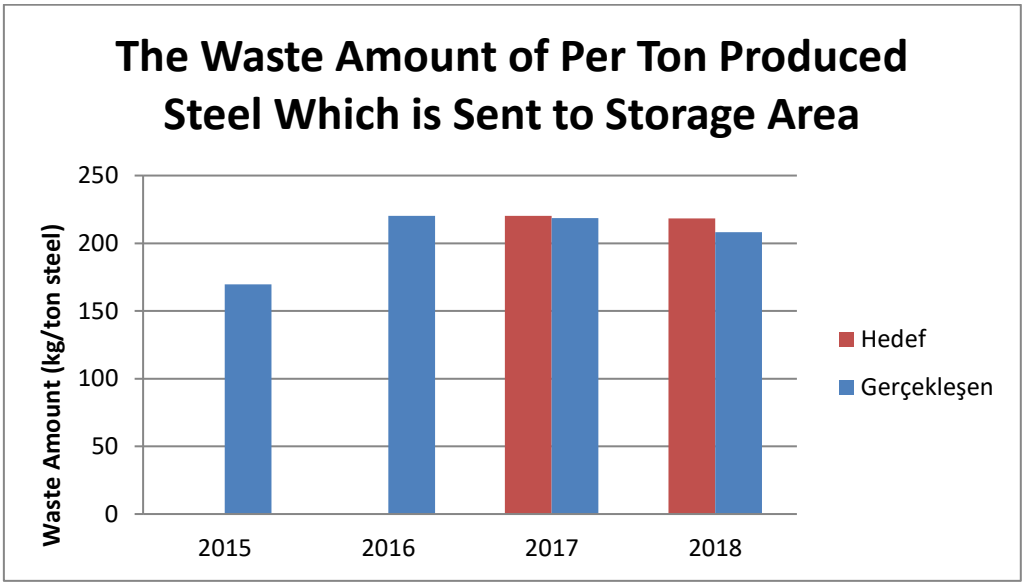
All kinds of solid, liquid and gas wastes that may arise during or after the production, repairs, maintenance of the facilities are disposed or recycled in the legal obligations, with priority in recycling.

In order to maintain the sustainable structure of the environment, DILER IRON & STEEL IND. TRADE. INC. carries out its investments.

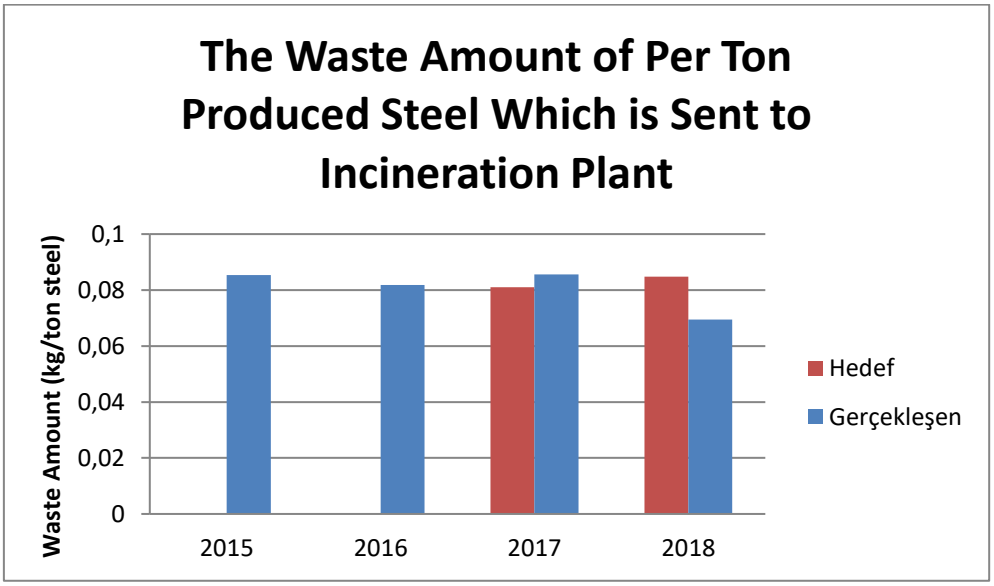
The presence of the combustion chamber for controlling air emissions, the combustion of gases such as CO and by arising energy, heating of scraps reduce the use of natural gas. Reducing of gas emissions are ensured by combusted gases. In addition, the emission of dioxin-furan gases can be prevented by the water cooled line. The emission comes from the steelshop can be reduced to minimum levels by passing through the filters before being released from the chimney.

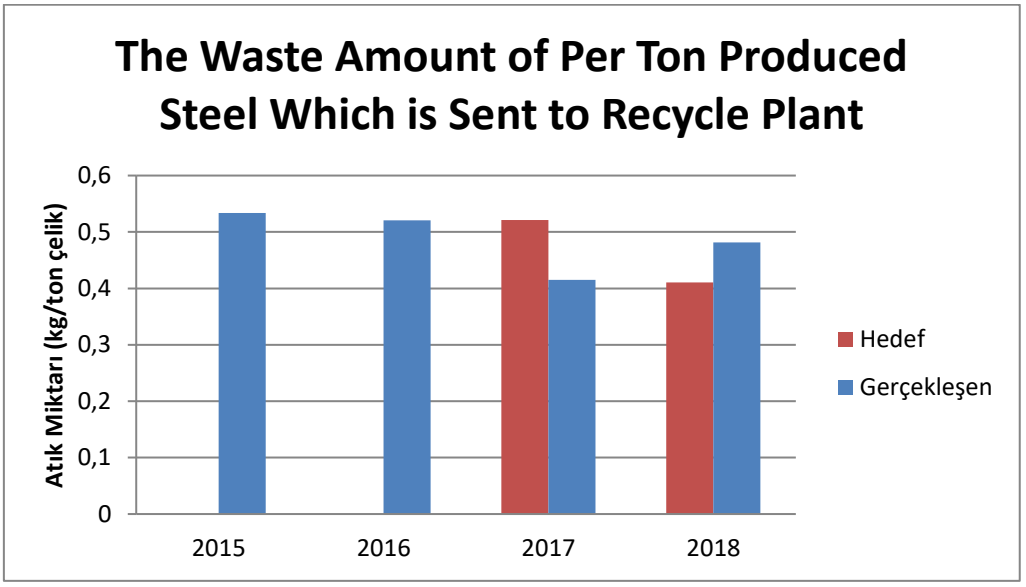
The dusts retained in the filters are evaluated by the contracted recovery companies. The high concentration of zinc in the flue dust is separated and reused. Continuous Emission Measurement System is installed in steelshop chimneys. Instant data received via the system is shared online with the Ministry of Environment and Urbanization and the Provincial Directorate of Environment. Slag separation is provided in different sizes with the recovery and storage facility established for slag waste formed in the steelshop. It can be re-melted by providing separation of excess steel. Recycled slag contributes to recycling by using various sectors (construction, cement, road construction etc.). In this context, by-product certificate from Ministry of Environment and Urbanization for Turkish synthetic Slag Aggregate, Turkish Standards Institute (TSE) and Turkish standards compliance certificate for the road construction, concrete aggregates and civil engineering works, the necessary CE certificates are taken and the slag waste is reused and recovered, thus contributing to the country's economy.

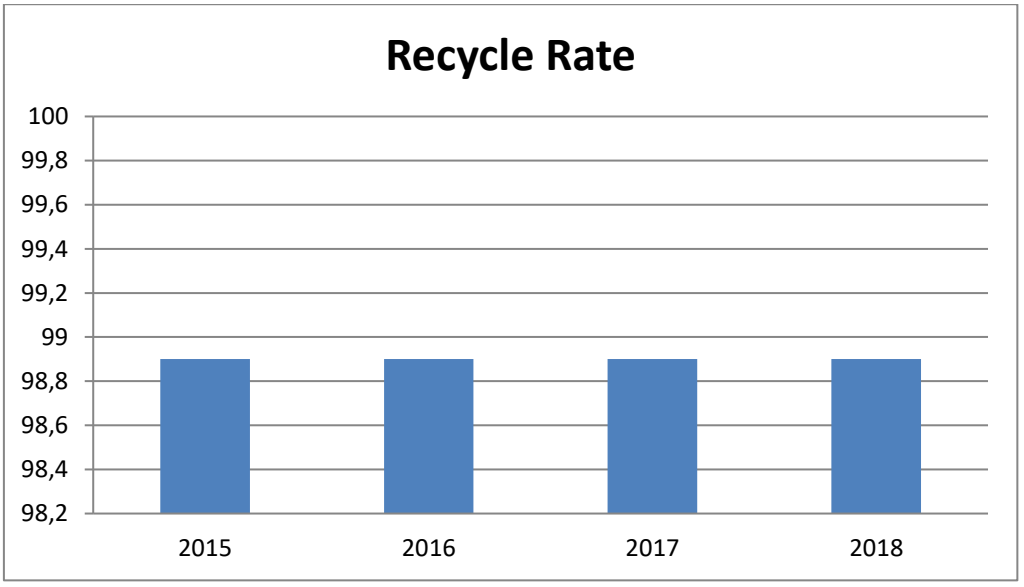




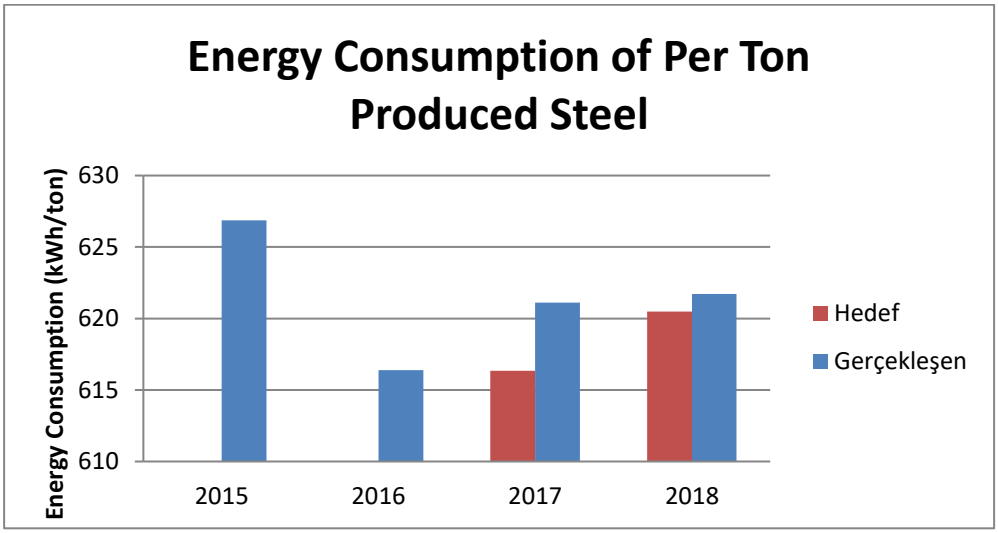
Scale waste which is formed from the processes of steelshop and rolling mill sections has an important place in terms of waste management. The scale waste is recovered by selling it to the blast furnace plants in domestic market, white goods manufacturers and also exporting abroad. Apart from these, there are chemical contaminated waste, end-of-life tire, waste oil, packaging waste, electronic waste and medical wastes that may occur in every process. Waste is sent to licensed companies according to its type and recycled if possible, in other cases they are disposed.

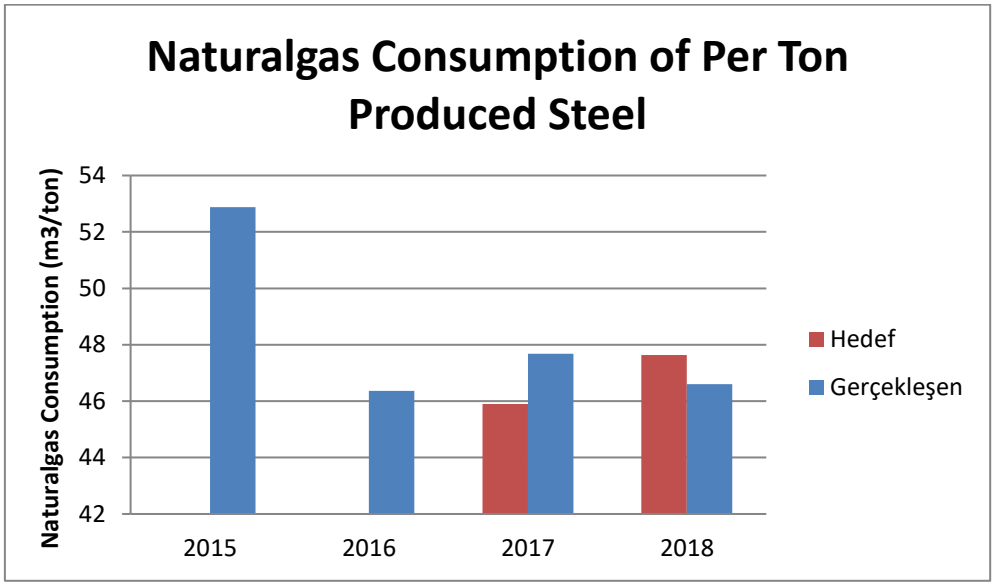


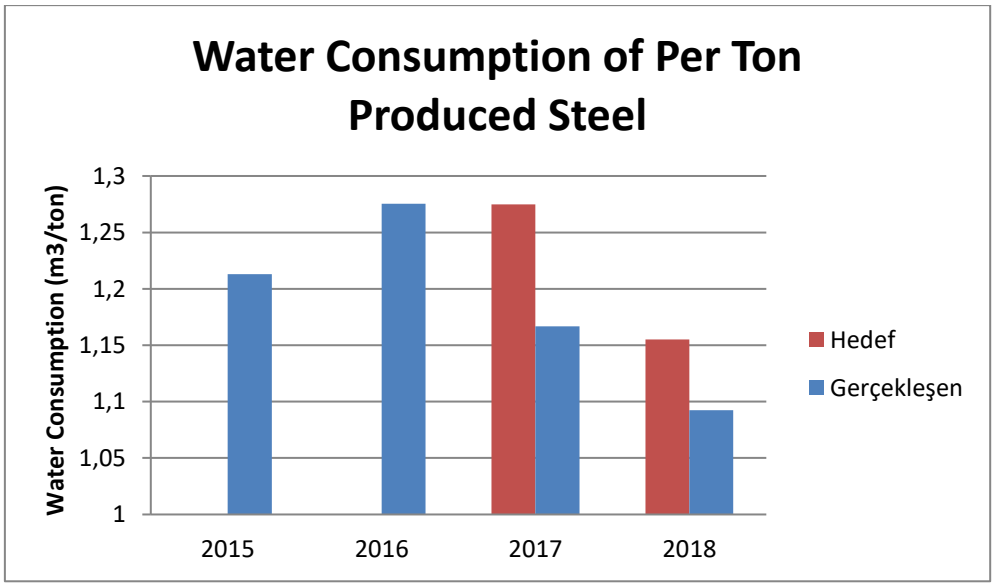




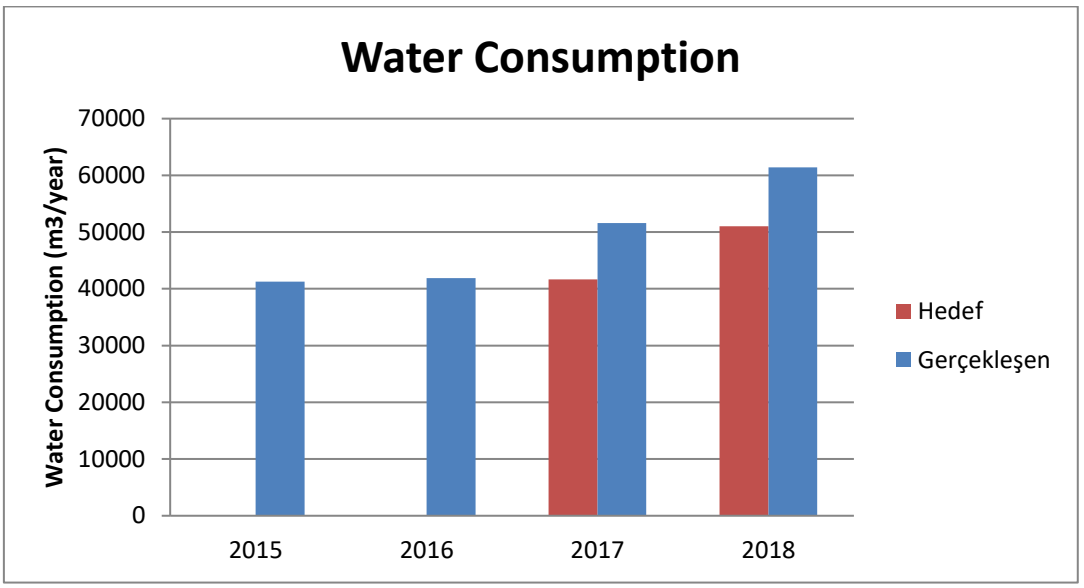
Cooling water is extensively used throughout the steelshop and rolling mill lines. The water used as a closed system is cooled by the help of cooling towers and re-used after the sedimentation process. There is a constant need for reinforcing water due to the high evaporation during the process.


Energy Consumption of Per Ton Produced Steel
Energy Consumption (kWh/ton)
630
625
620
615
610
2015
2016
2017
2018
Hedef
Gerçekleşen


Naturalgas Consumption of Per Ton Produced Steel
Naturalgas Consumption (m3/ton)
54
52
50
48
46
44
42
2015
2016
2017
2018
Hedef
Gerçekleşen


Water Consumption of Per Ton Produced Steel
Water Consumption (m3/ton)
1,3
1,25
1,2
1,15
1,1
1,05
1
2015
2016
2017
2018
Hedef
Gerçekleşen

In sea water treatment plant, membrane filters designed with new and high environmental technologies are used. It prevents the supply of high amounts water used in the facility from the tap water.



The water arising from domestic needs such as bathrooms and kitchens is discharged to the wastewater lines of the OSB (Organized Industrial Zone) to be sent to the Dilovası Organized Industrial Zone (DOSB) waste water treatment plant.

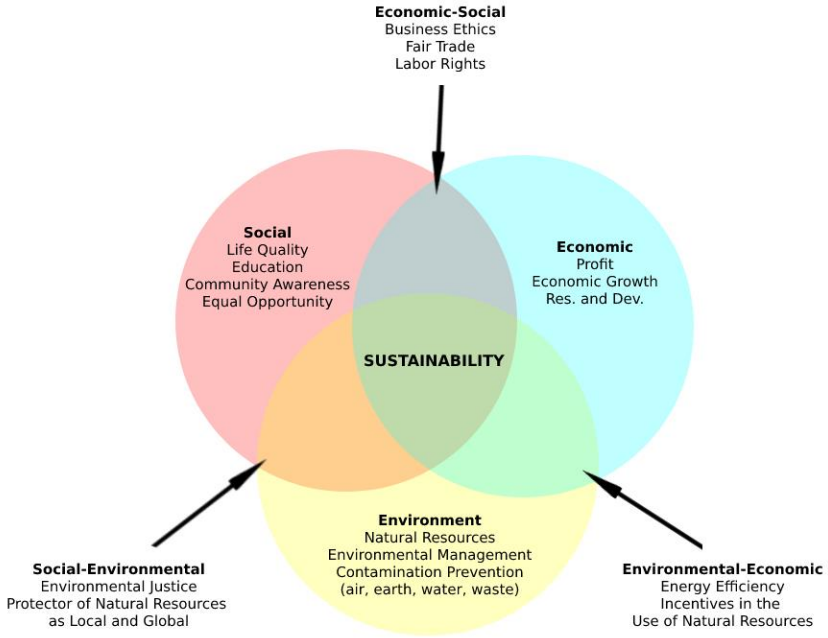
SUSTAINABILITY

As DILER IRON & STEEL IND. TRADE. INC, in the context of a holistic sustainable development approach, a more livable environment with its economic, environmental and social dimensions and its transfer to next generations;

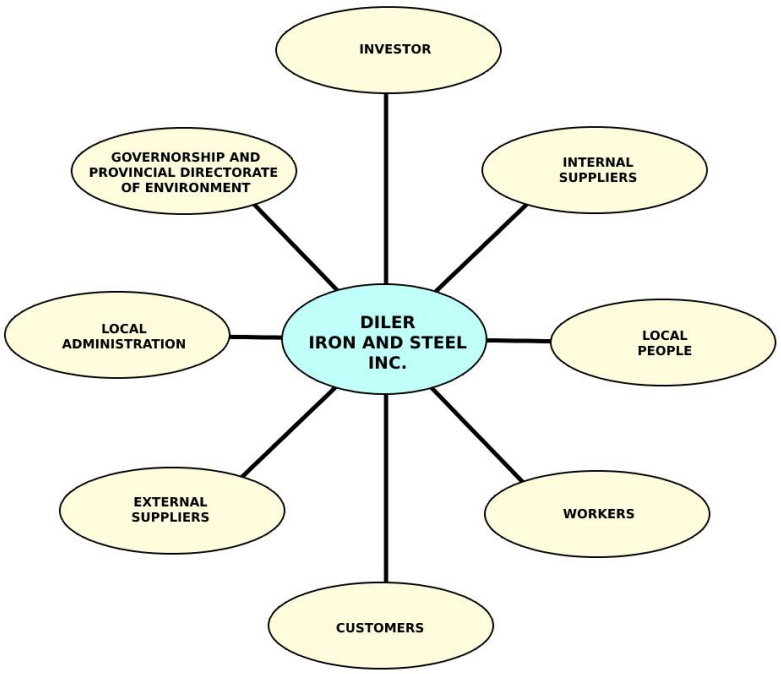
We are committed that,

- Respecting people and environment by focusing on preventing pollution and protecting our natural environment,
- Reducing waste, increasing recycling rate, using raw materials and natural resources effectively and efficiently, reducing greenhouse gas impact, transport impact and energy consumption,
- Aim to increase the life cycle and the efficiency of all our processes to the level that can compete at international level, in line with the continuous improvement approach to our management systems to improve Quality - Environment - Occupational Health and Safety performance,

Sustainable resource utilization, mitigation of climate change, taking measures to protect ecosystem and biodiversity,



STAKEHOLDERS



Our Strategic Matters According to Our Stakeholders

Stakeholder Mapping

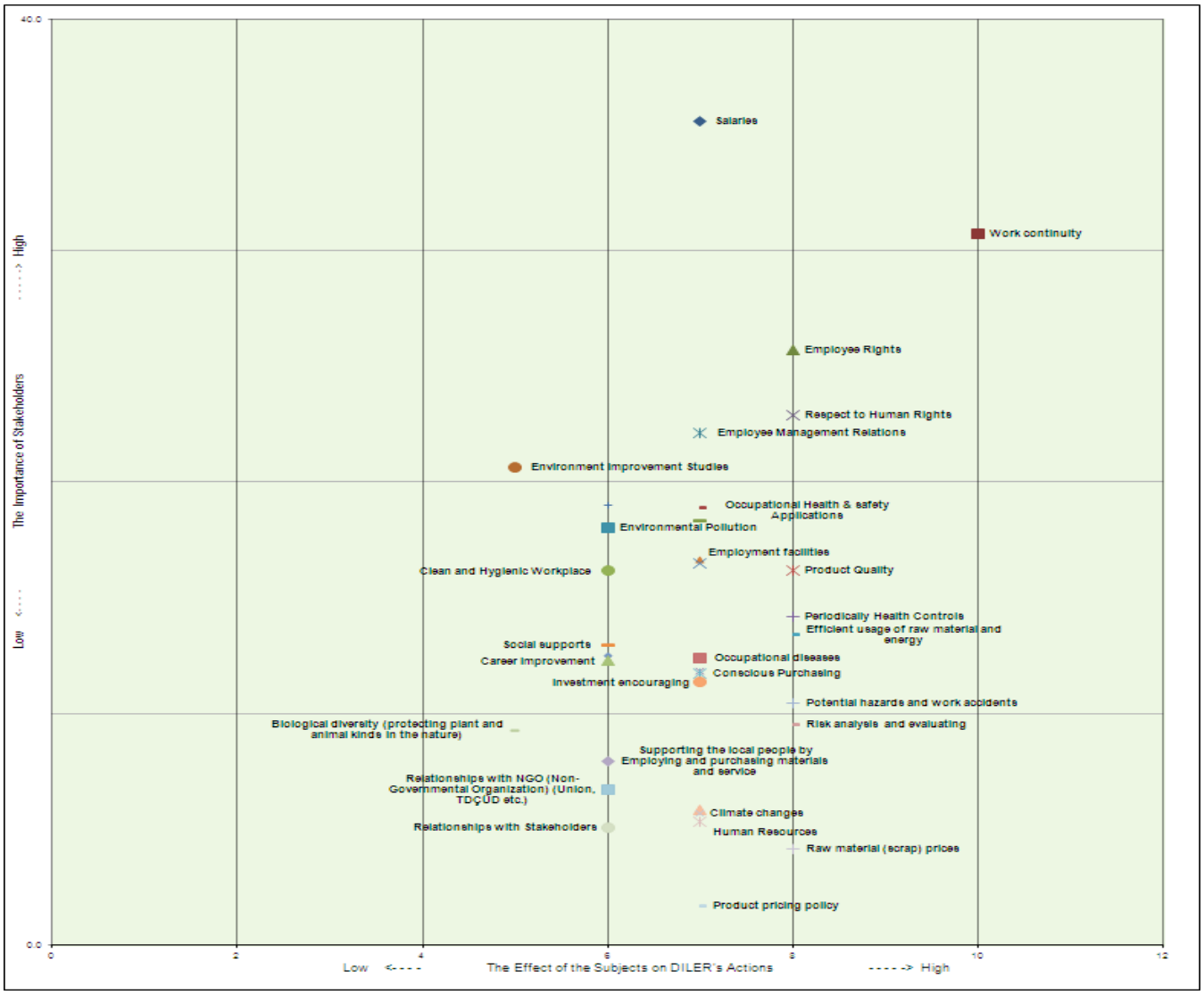
TOPICS	Workes and Union	Customers	Local People	Suppliers	Inversters	Local Government
Economic Performance	*****	***	****	****	*****	****
Employment	*****	****	*****	***	****	***
Occupational Health & Safety	*****	***	****	**	*****	****
Education & Training	*****	***	**	**	****	**
Emissions	*****	**	*****	**	****	****
Social Facilities	*****	****	****	***	****	***
Communication	***	*****	***	****	****	****
Quality	****	*****	**	*****	*****	**
Biodiversity	****	**	*****	*	**	*****

*****= Very Important, **** = Important, *** = Moderately Important, ** = Slightly Important, * = Non-Important

Importance Test and Comparison of Determined Subjects and Issues:

	2017	2018
1	Salary	Salary
2	Work persistance	Work persistance
3	Employee Rights	Employee Rights
4	Respect to Human Rights	Employee Managing Relations
5	Employee Managing Relations	Respect to Human Rights
6	Environment Improvement Studies	Environment Improvement Studies
7	Code of Ethics	Employment facilities
8	Occupational Health & safety Applications	Code of Ethics
9	Safe Workplace	Research & Development Studies
10	Environment Protection	Environmental Pollution
11	Environmental Pollution	Environment Protection
12	Employment facilities	Safe Workplace
13	Recycle (paper, plastic, glass and etc.)	Recycle (paper, plastic, glass and etc.)
14	Product Quality	Efficient usage of raw material and energy
15	Clean and Hygienic Workplace	Product Quality
16	Periodically Health Controls	Occupational Health & safety Applications
17	Efficient usage of raw material and energy	Clean and Hygienic Workplace
18	Social supports	Career improvement
19	Research & Development Studies	Periodically Health Controls
20	Occupational diseases	Occupational diseases
21	Career improvement	Social supports
22	Natural resources consumption (water, air, underground etc.)	Potential hazards and work accidents
23	Conscious Purchasing	Natural resources consumption (water, air, underground etc.)
24	Investment encouraging	Conscious Purchasing
25	Potential hazards and work accidents	Risk analysis and evaluating
26	Risk analysis and evaluating	Investment encouraging
27	Biological diversity (protecting plant and animal kinds in the nature)	Supporting the local people by Employing and purchasing materials and service

DILER IRON STEEL STRATEGIC PRIORITY MATRIX

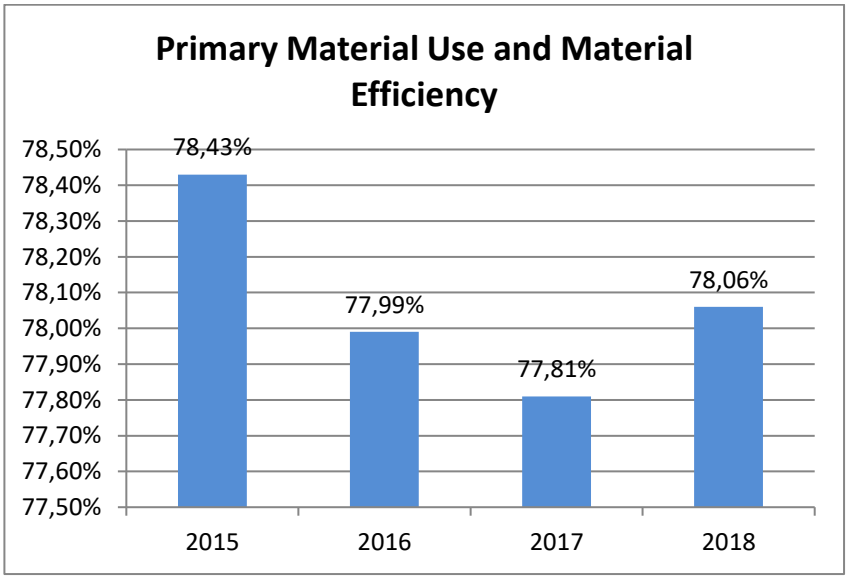


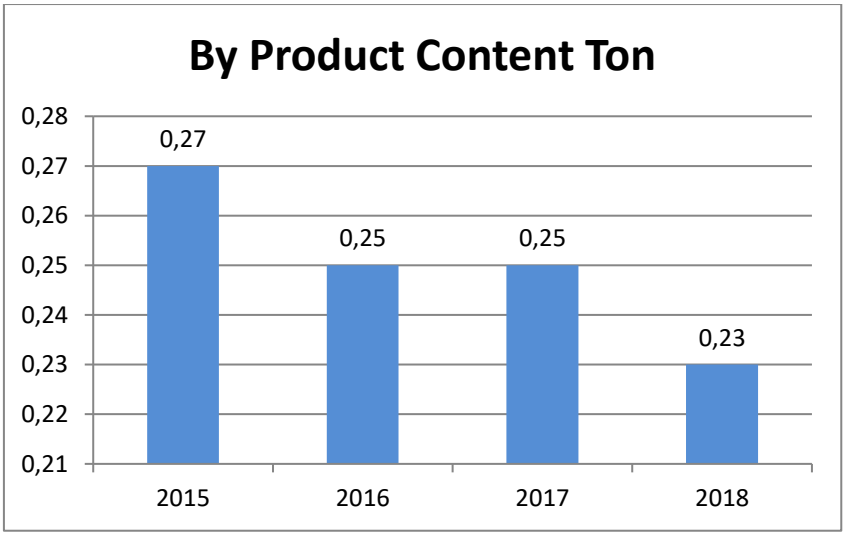
Relationship management with stakeholders and determining communicator department

Stakeholders	Communication actions with stakeholders	Frequency	Responsible
Employees	• Intranet, Announcements ve publications, • Seminar ve Training Programmes, • Near-miss reports • Social activities, Stakeholder surveys, One-on-one meetings	• Stakeholder survey (once in a year) • And more, If needed	• General Administration Management
Customers	• Foreign Trade Meetings • Customer satisfaction survey • On-Location Visits, Social activities, Stakeholder surveys • One-on-one meetings	• Stakeholder survey (once in a year) • Customer satisfaction survey (once in a year) • And more, If needed	• Sales Department (Foreign Trade and Domestic Trade)
Shareholder	• Yearly performance reports • On-Location Visits, One-on-one meetings	• Yearly performance reports (once in a year) • And more, If needed	• Plant Management
Suppliers	• Yearly Supplier Evaluation, On-Location Visits • Social activities, Stakeholder surveys, One-on-one meetings	• Stakeholder survey (once in a year) • Yearly Supplier Evaluation (once in a year) • And more, If needed	• Sales Department and General Administration Management
Stakeholders	• On-Location Visits, Social activities • Stakeholder surveys, One-on-one meetings	• Stakeholder survey (once in a year) • And more, If needed	• Sales Department and General Administration Management
Local people and neighbour plants	• Diler web site, Media, Plant Visits • Stakeholder surveys, One-on-one meetings, Social activities	• Stakeholder survey (once in a year) • And more, If needed	• Plant Management and General Administration Management
Public Institutions	• Social activities, One-on-one official dialogs • Law and Rules	• If needed	• Environment&OHS Management • General Administration Management
NGO (Non-Governmental Organization)	• Social activities, Collective agreement • One-on-one meetings, Bulletin, Statics • Stakeholder surveys	• Stakeholder survey (once in a year) • Collective agreement (once in three years) • And more, If needed	• General Administration Management

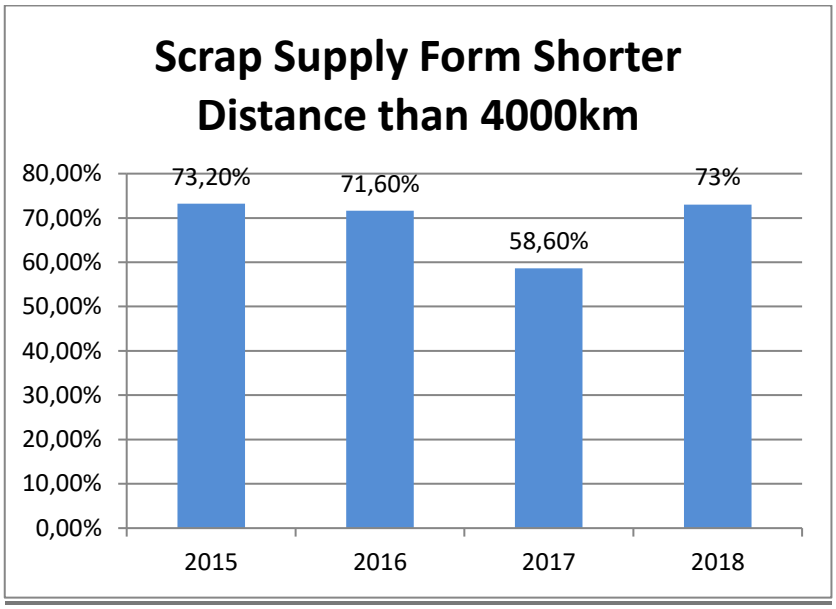
DILER IRON & STEEL IND. TRADE. INC. with NUMBERS

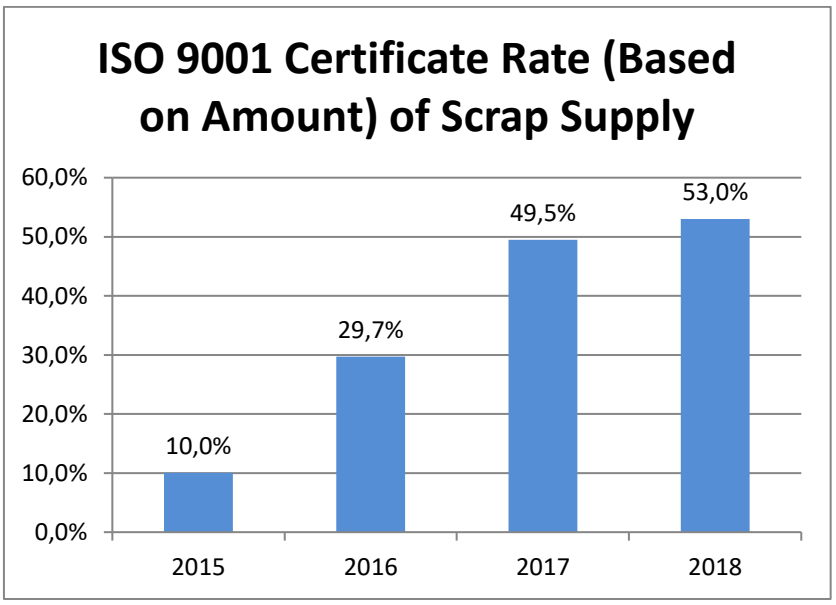
SUSTAINABILITY PERFORMANCE:

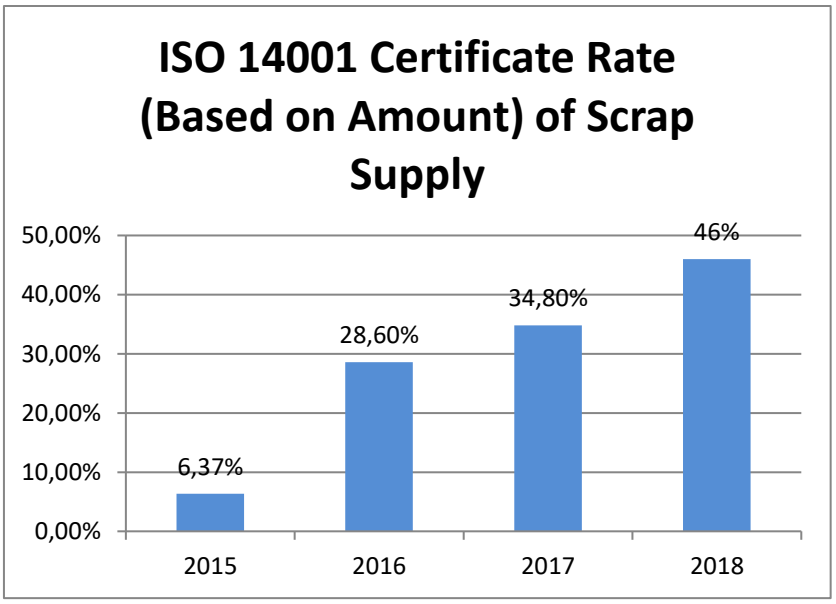


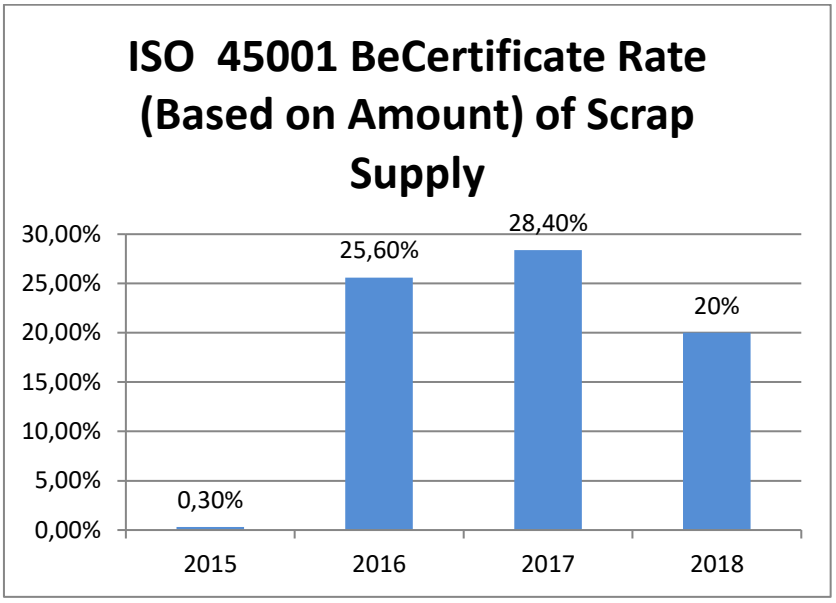


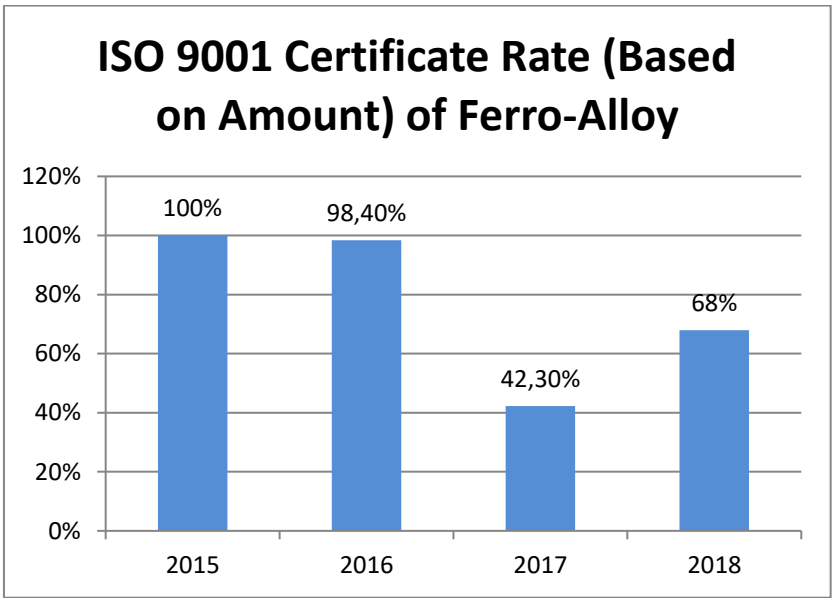
Raw Material Supply

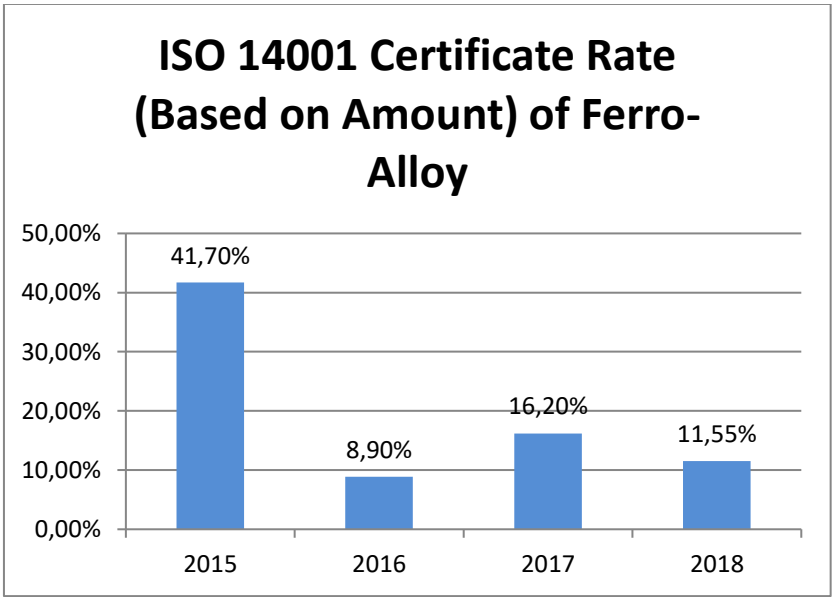


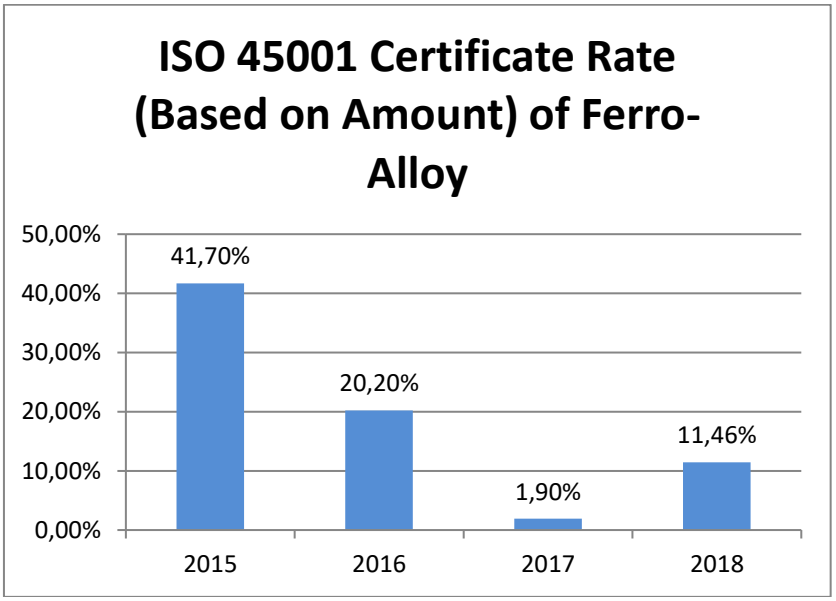


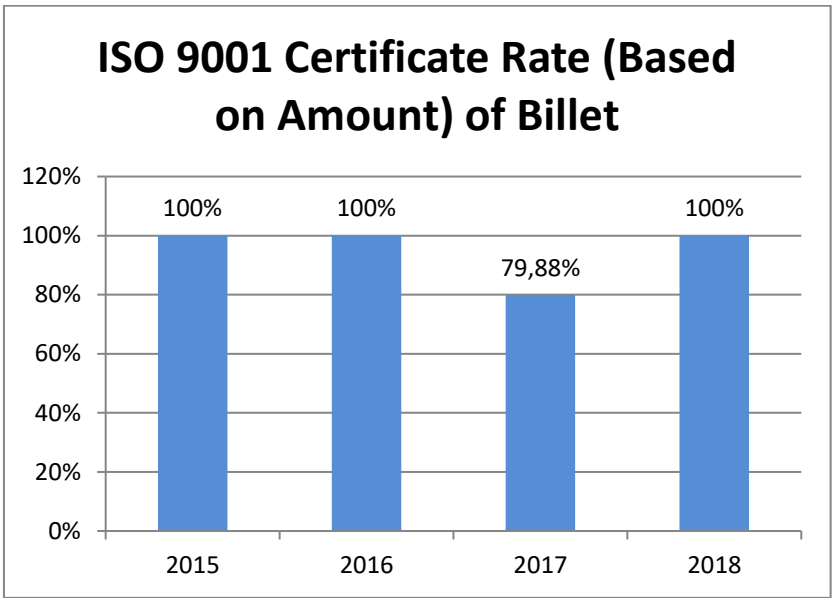


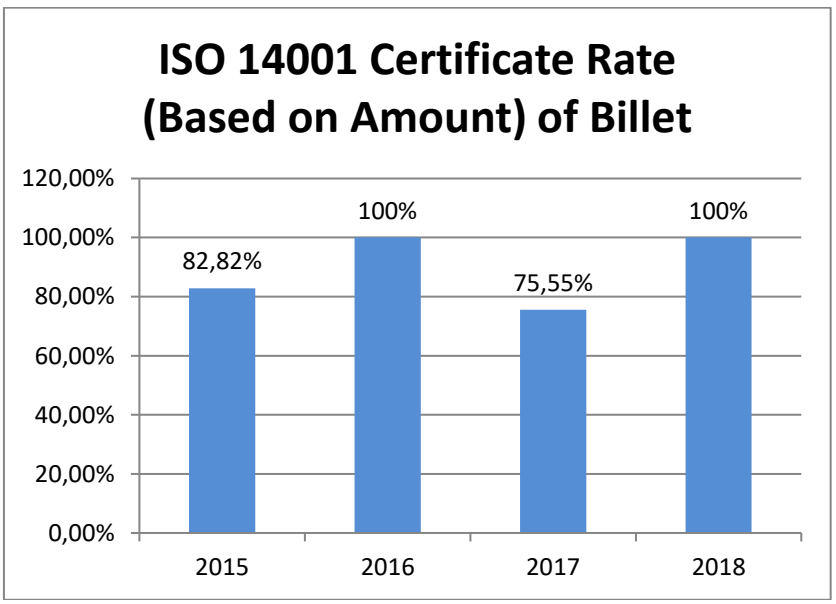

ISO 45001 BeCertificate Rate (Based on Amount) of Scrap Supply
30,00%
25,00%
20,00%
15,00%
10,00%
5,00%
0,00%
0,30%
25,60%
28,40%
20%
2015
2016
2017
2018

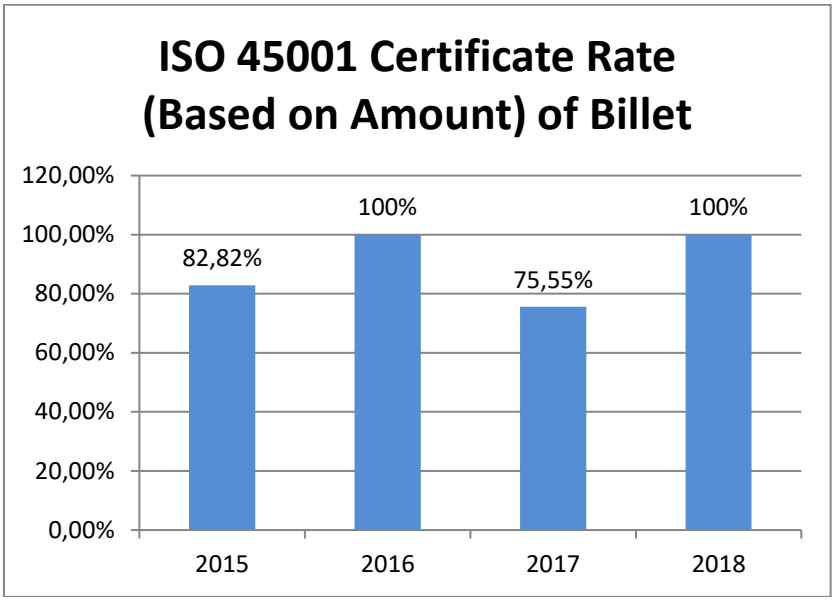

ISO 9001 Certificate Rate (Based on Amount) of Ferro-Alloy
120%
100%
80%
60%
40%
20%
0%
100%
98,40%
42,30%
68%
2015
2016
2017
2018


ISO 14001 Certificate Rate (Based on Amount) of Ferro-Alloy
50,00%
40,00%
30,00%
20,00%
10,00%
0,00%
41,70%
8,90%
16,20%
11,55%
2015
2016
2017
2018


ISO 45001 Certificate Rate (Based on Amount) of Ferro-Alloy
50,00%
40,00%
30,00%
20,00%
10,00%
0,00%
41,70%
20,20%
1,90%
11,46%
2015
2016
2017
2018

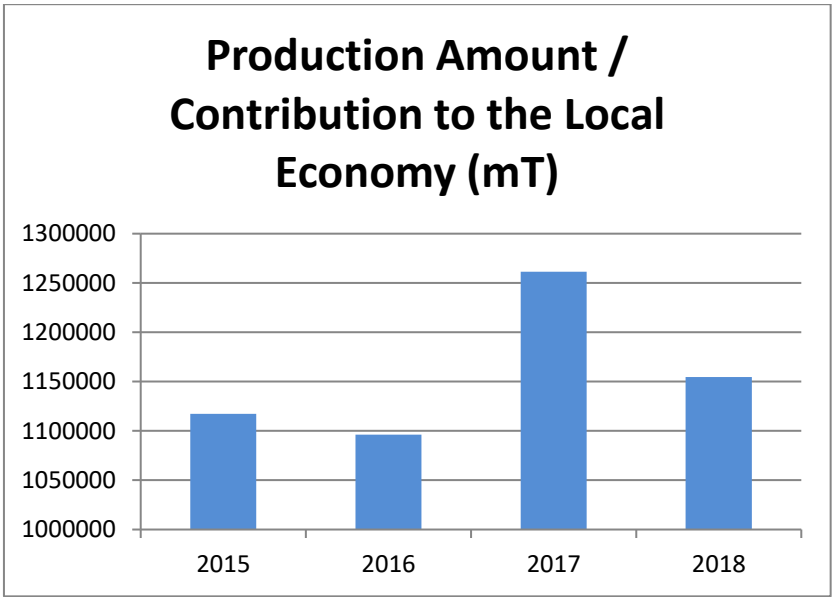

ISO 9001 Certificate Rate (Based on Amount) of Billet
120%
100%
80%
60%
40%
20%
0%
100%
100%
79,88%
100%
2015
2016
2017
2018

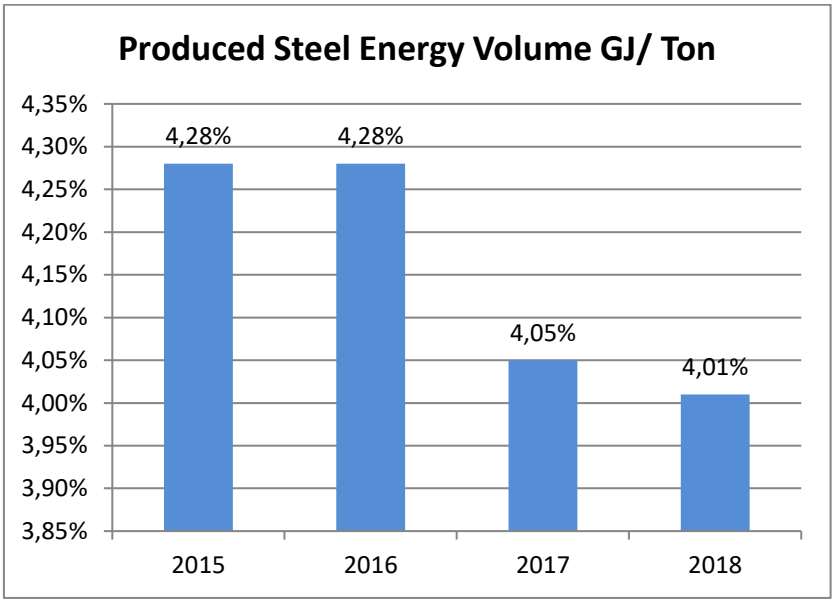

ISO 14001 Certificate Rate (Based on Amount) of Billet
120,00%
100,00%
80,00%
60,00%
40,00%
20,00%
0,00%
82,82%
100%
75,55%
100%
2015
2016
2017
2018

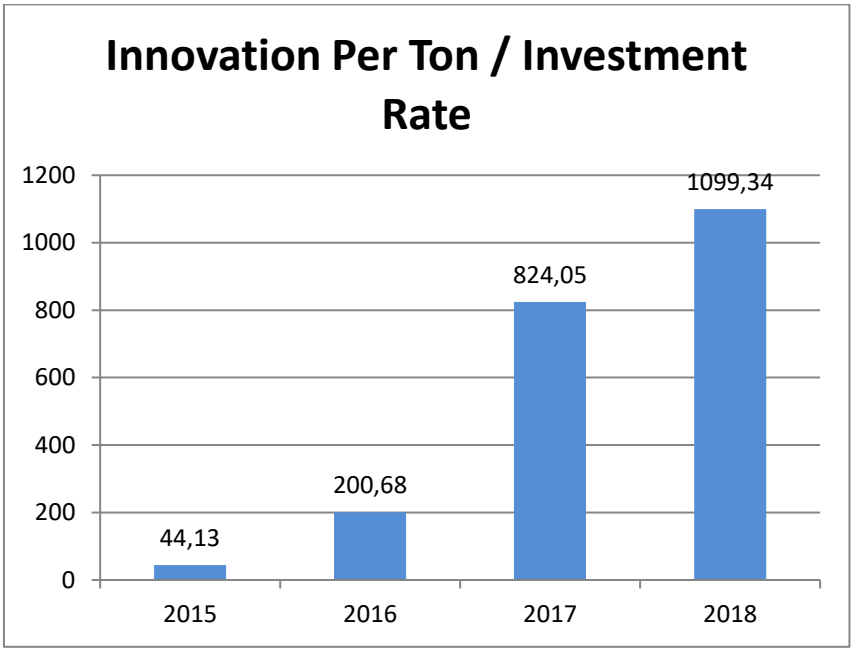


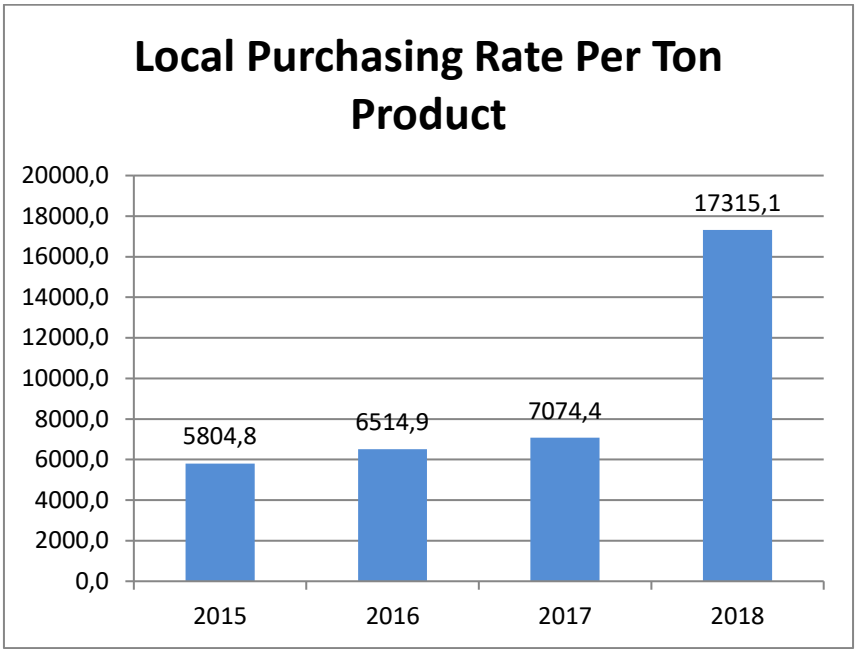
DILER IRON & STEEL IND. TRADE. INC. with NUMBERS

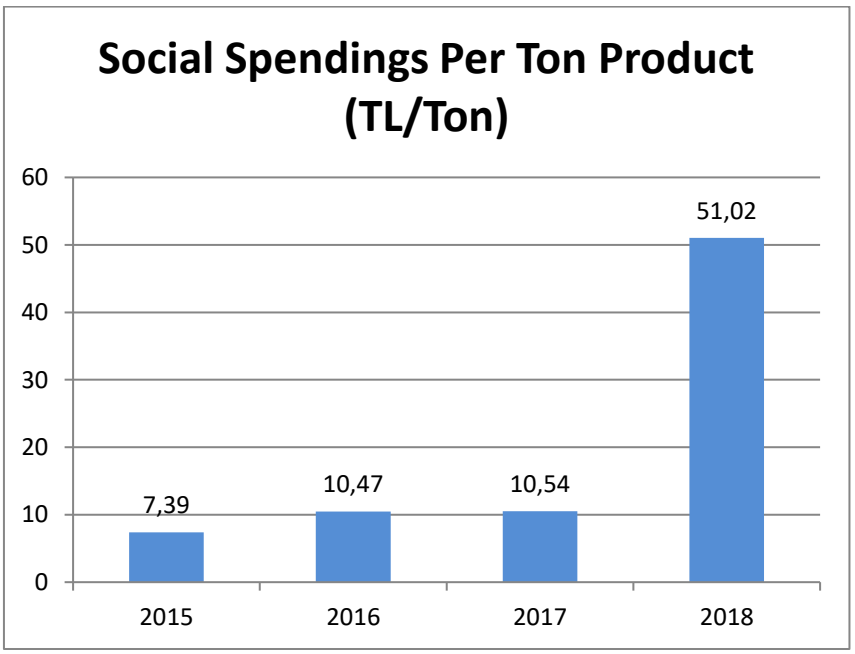
ECONOMIC PERFORMANCE:



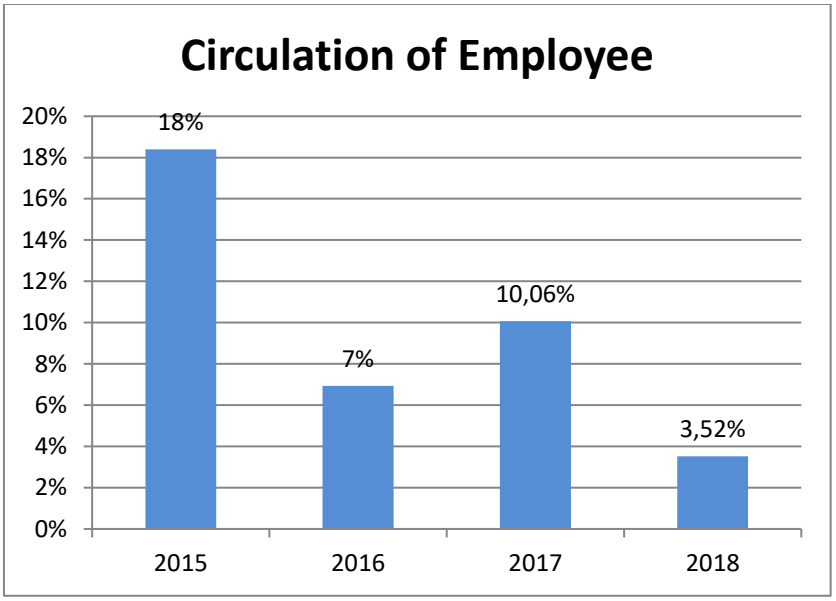

Produced Steel Energy Volume GJ/ Ton
4,35%
4,30%
4,25%
4,20%
4,15%
4,10%
4,05%
4,00%
3,95%
3,90%
3,85%
4,28%
4,28%
4,05%
4,01%
2015
2016
2017
2018

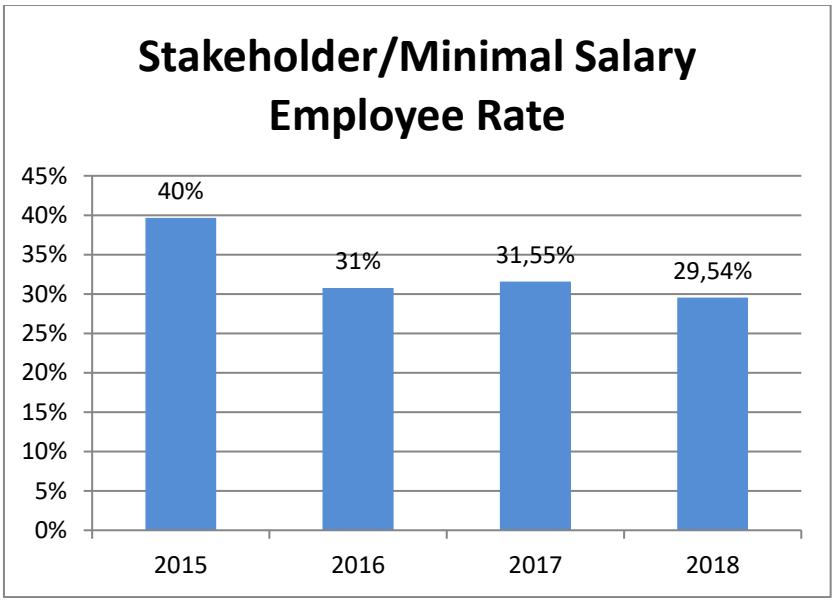

Innovation Per Ton / Investment Rate
1200
1000
800
600
400
200
0
44,13
200,68
824,05
1099,34
2015
2016
2017
2018

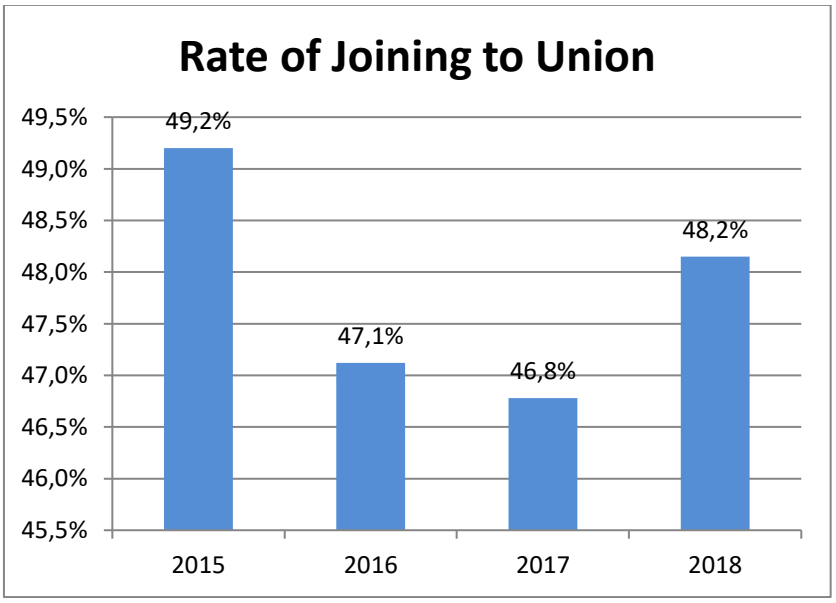

Local Purchasing Rate Per Ton Product
20000,0
18000,0
16000,0
14000,0
12000,0
10000,0
8000,0
6000,0
4000,0
2000,0
0,0
5804,8
6514,9
7074,4
17315,1
2015
2016
2017
2018

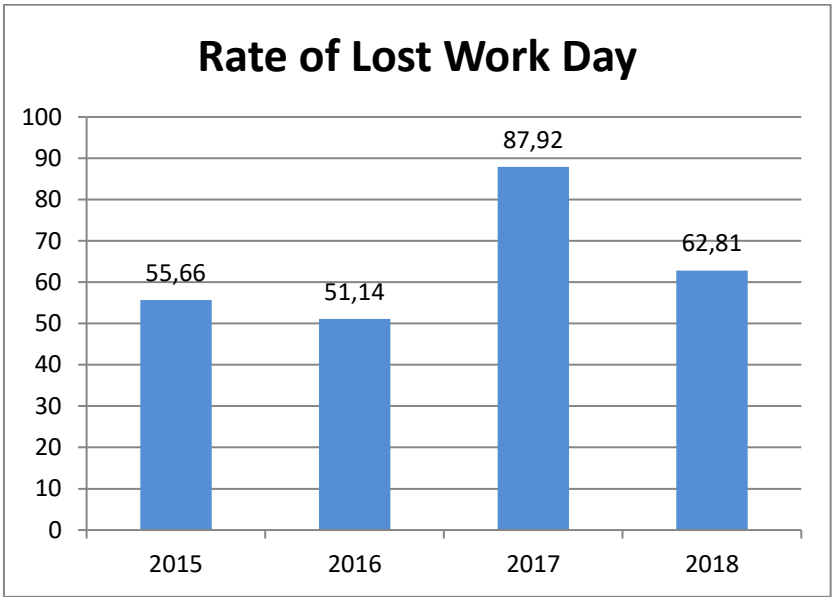

Social Spendings Per Ton Product (TL/Ton)
60
50
40
30
20
10
0
7,39
10,47
10,54
51,02
2015
2016
2017
2018

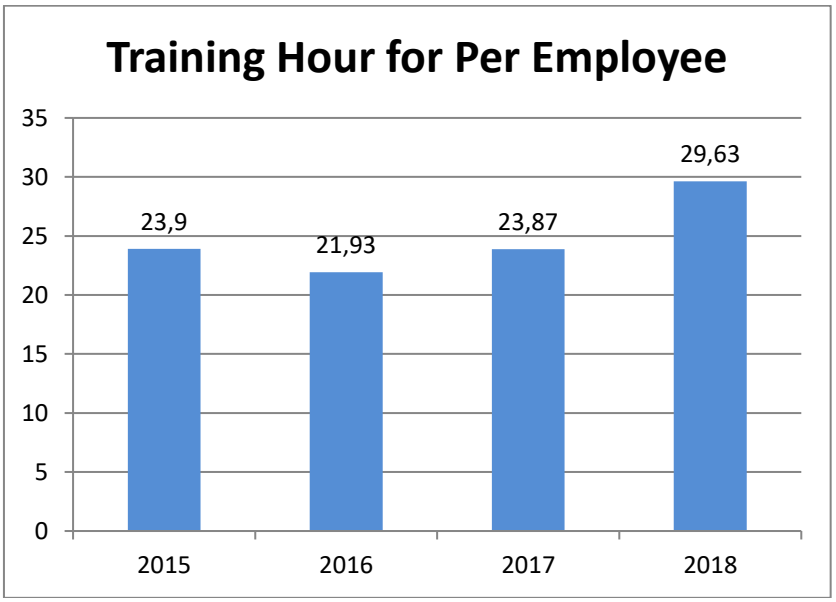
SOCIAL PERFORMANCE:

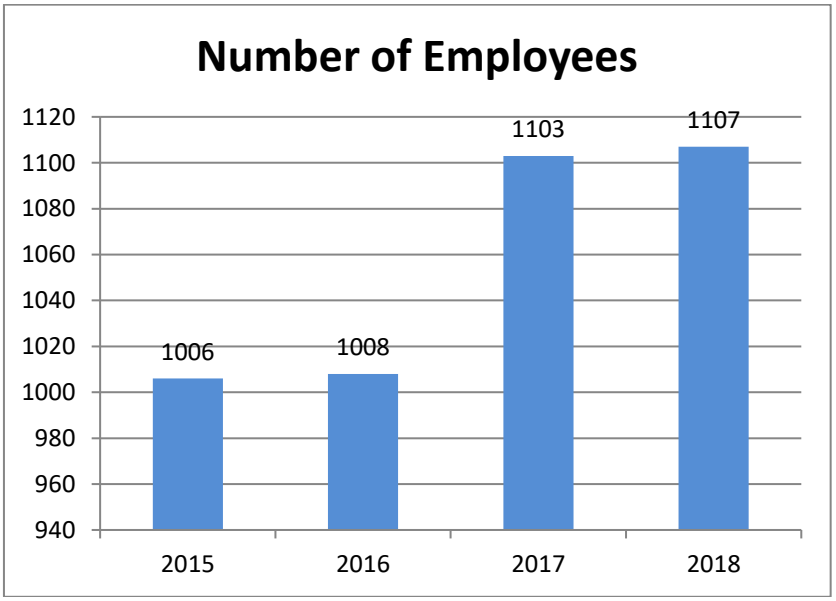







Rate of Lost Work Day
100
90
80
70
60
50
40
30
20
10
0
55,66
51,14
87,92
62,81
2015
2016
2017
2018


Training Hour for Per Employee
35
30
25
20
15
10
5
0
23,9
21,93
23,87
29,63
2015
2016
2017
2018


Number of Employees
1120
1100
1080
1060
1040
1020
1000
980
960
940
1006
1008
1103
1107
2015
2016
2017
2018

Diler Suggestion System (Diler Öneri Sistemi (DÖSİS)), is activated to achieve the high productivity and performance of the employees' to share their experience and knowledge.
The evaluated suggestion subjects in DÖSİS are written below,

- Production Increasing
- Quality Improvement
- Time and Material Save
- Energy Save
- Work Methodology Improvement
- Expense Decreasing
- Work-flow Improvement
- Connection between Processes
- Stock Decreasing

Employees, can inform their ideas by the papers are placed in the plant or DÖSİS software. The informed suggestions are being collected weekly to be presented to Suggestion Evaluation Committee. By taking comments of Suggestion Evaluation Committee, Committee Moderator presents the suggestion to related department. The related department's manager appoints a responsible to make the suggestion happen. After the suggestion is applied, the profit is calculated and the person has given the suggestion is rewarded. There are 326 suggestion applied between 2008-2017.