Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

Steel pipes

UAB Scandia Steel Baltic

Programme:	The International EPD® System www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD, S-P-00903
Approval date:	2016-06-20
Valid until:	2021-06-20
Revision date:	2016-06-20
Geographical scope:	Europe

Company

Scandia Steel is a leading supplier of steel piling pipes. Our piles are supplied to the Scandinavian building industry and used by well-known construction companies.

SCANDIA STEEL

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Product

Steel pipes are made from cooled or hot rolled steel sections. The tube piles are either drilled or rammed into place, either with a driving shoe or a ring set. After ramming tubes are normally emptied and reinforces using steel and concrete. Typical applications are foundations for (houses) dwellings, offices and commercial buildings as well as refurbishing existing foundations and for infrastructure. The steel pipes is offered at sizes from 139,7mm to 323,9mm.

The steel tube pipes consist of 100% steel.

Product Life Cycle

This study goes from cradle-to-gate. According to the PCR the life cycle should be divided into t different life cycle stages:

- **Upstream processes** (from cradle-to-gate). Includes life cycle stage referred to as A1 Raw Material Supply. In this case extraction and processing of steel raw material.

- **Core processes** (from gate-to-gate). Includes life cycle stages referred to as A2 Transport and A3 Manufacturing. In this case there is no transport from the raw material processing and manufacturing as the manufacturing is also done at the steel work.

  In manufacturing the pipes are formed by cold rolling steel sheet raw material to a circular form and then welded together and cut to the preferred sizes. At the end of the pipe a thin chamfering is done to ease welding when used at construction site.
  The electricity mix used for manufacturing in Italy is based on the market average 2015 and have a GWP 516g CO2 eq. per kWh.

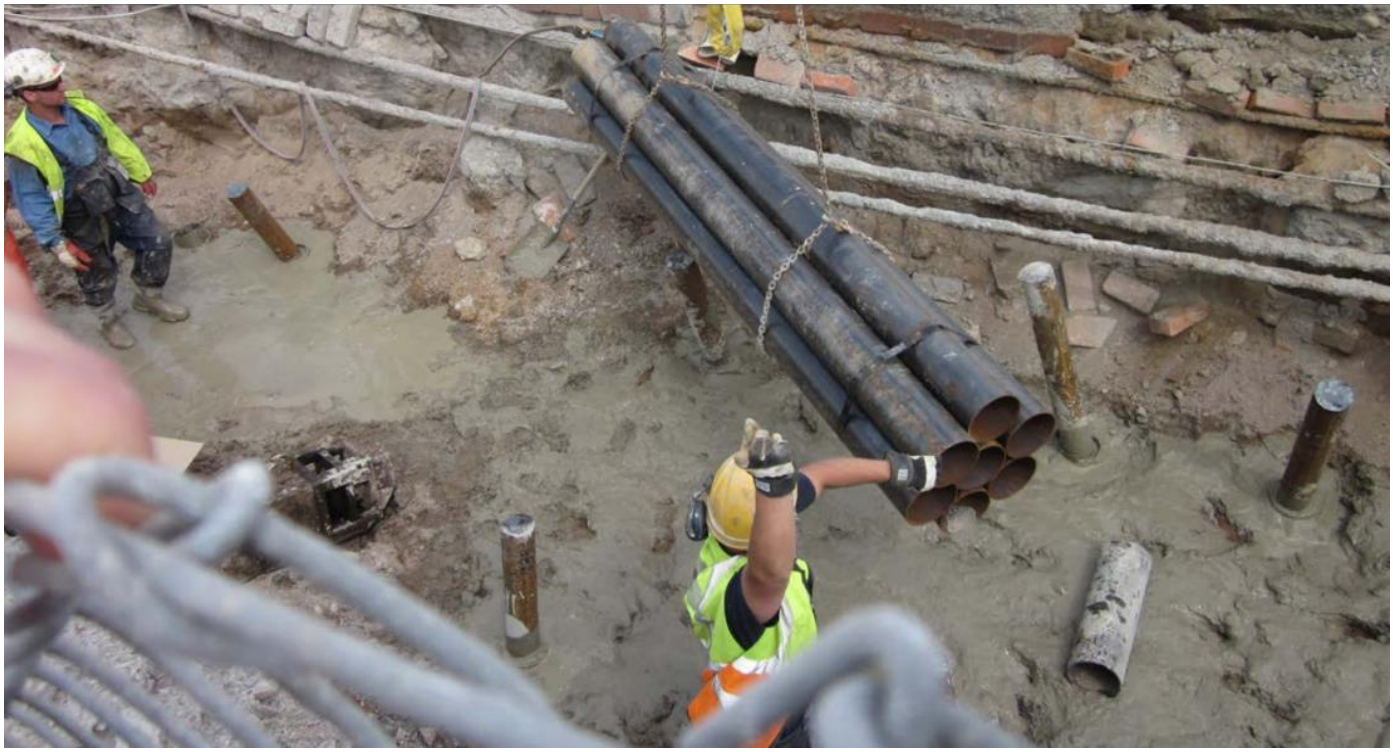
- **Downstream processes.** Includes only the transport to the construction site, module A4. The transport is done with lorry and the distance from Italy and Poland to Oslo, Norway is 1642km and 1238km.
  This module will be added to be valid with the specific rules set by EPD Norway and sector practice in Norway. For other markets the downstream part of the result can be withdrawn.

The figure below show an overview of the included and accounted modules and life cycle phases.

Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
Raw materials	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X = Module is accounted for
MND = Module Not Declared

After the completeness check all materials and processes are found to be included and represented in a full life cycle Cradle to Grave perspective.



Functional Unit	The functional unit is 1 tone of finished product
Product group classification	UN CPC 41244
Goal and Scope	The result will be used to understand where the environmental burden for the products occurs during the life cycle and aims to lay a road map for development to decrease this burden. The intended use is also to optimize the choice of steel pipes and steel cores during a construction from an environmental perspective. The audience is in first hand construction companies and contractors but also producers of similar steel products.
Manufacturing Site	Arvedi Tubi Acciaio S.p.A. Via Acquaviva 3 - Zona Porto Canale I-26100 Cremona Stalprodukt Kraków ul. Nad Drwiną 10 30-741 Kraków
Geographical Area	Europe
Compliant with	This EPD follow the "Book-keeping" LCA approach which is defined as attributional LCA in the ISO 14040 standard. In accordance with ISO 14025 and EN 15804 This EPD follow the PCR 2012:01 version 2.01 Construction products and construction services
Cut-Off Rules	For this LCA study a 1 % cut off rule was applied.
Background Data	Every generic LCI data comes from ecoinvent 3.2
Reference year for data	For specific data 2015 is the reference year. The background data from ecoinvent are from 2012-2015
Allocations	Polluter Pays / Allocation by Classification There are no co-products in the production and therefore no need for co-product allocation.
Impact Assessment methods	Total use of renewable and non-renewable resources was calculated with Cumulative Energy Demand 1.09 method. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100 year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method.
Software	SimaPro 8.2

EPDs within the same product category but from different programmes may not be comparable.
EPDs of construction products may not be comparable if they do not comply with EN 15804.

Product contain no substances in the REACH Candidate list. Product contain no substances in the Norwegian priority list.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Environmental performance

The tables below show the renewable and non-renewable resources, the quantities of waste generated, the amount of secondary material used and the consumption of net fresh water in the production of 1 FU i.e. 1000kg of Steel pipes.

Non-renewable resources

		UNIT	A1 UPSTREAM	A2, A3 CORE	A4 DOWNSTREAM	TOTAL
Non-Renewable primary resources: energy						
Total		MJ	13 697	2 169	6 247	24 913
Energy	Hard Coal	MJ	8 840	187	308	8 840
	Crude Oil	MJ	2 580	142	5 440	8 160
	Natural Gas	MJ	2 660	1 690	341	4 690
Non-Renewable primary resources: raw material						
Total		MJ	2 800			
Total use of non-renewable primary energy						
		MJ	16 497	2 169	6 247	24 913

Renewable resources

		UNIT	A1 UPSTREAM	A2, A3 CORE	A4 DOWNSTREAM	TOTAL
Renewable primary resources: energy						
Total		MJ	1 507	91	76	1 674
Renewable primary resources: raw material						
Total		MJ	0	0	0	0
Total use of renewable primary energy						
		MJ	1 507	91	76	1 674

Waste

	UNIT	A1 UPSTREAM	A2, A3 CORE	A4 DOWNSTREAM	TOTAL
Hazardous Waste disposed					
Total	kg	0,1	0,1	0,01	0,21
Non-Hazardous Waste disposed					
Total	kg	36	15	29	80
Radioactive Waste disposed					
	kg	0,2	0,1	0,01	0,31

Secondary Material

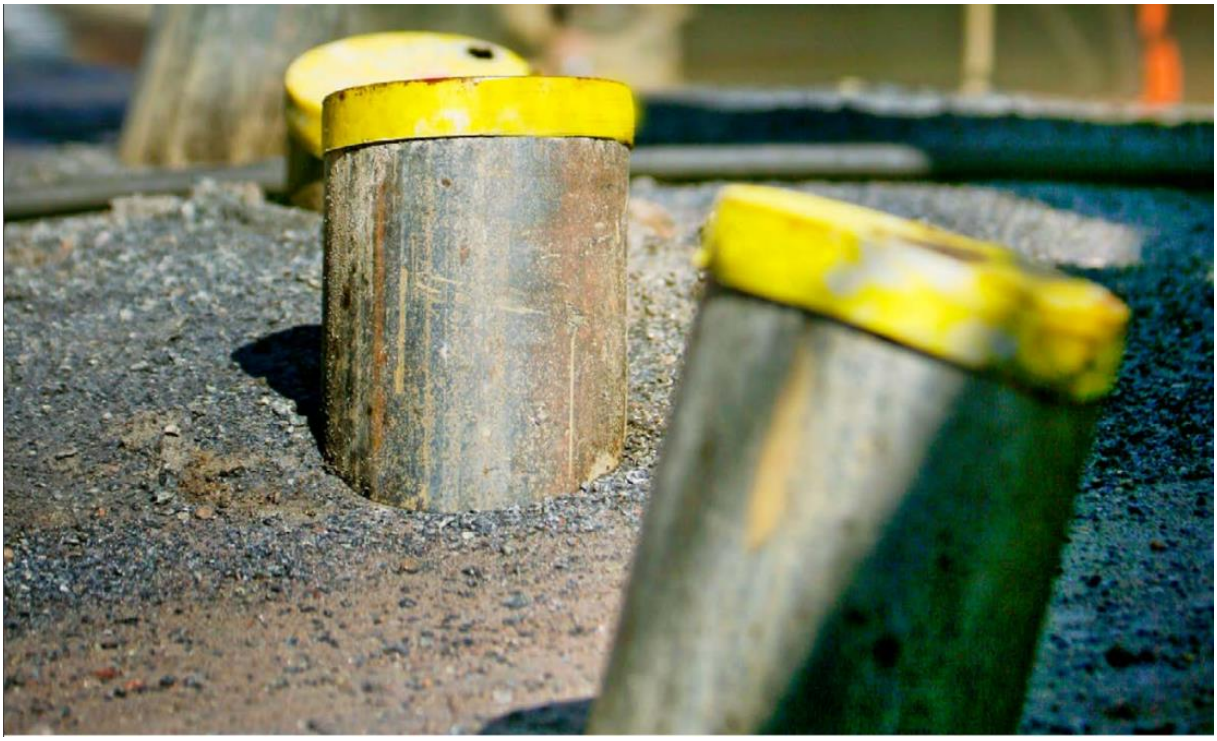
	UNIT	A1 UPSTREAM	A2, A3 CORE	A4 DOWNSTREAM	TOTAL
Secondary material used: Scrap metal					
Total	kg	469	0	0	469

Use of net fresh water

	UNIT	A1 UPSTREAM	A2, A3 CORE	A4 DOWNSTREAM	TOTAL
Net fresh Water					
Total	m^3	33,3	7,69	1,26	42,2

Potential Environmental impact Cradle to Gate life cycle 1000kg of Steel pipes

	UNIT	TOTAL	A1 UPSTREAM	A2, A3 CORE	A4 DOWNSTREAM
Global warming potential	kg CO2-e	1 825	1 309	129	387
Acidification potential	kg SO2-e	8,00	6,29	0,31	1,40
Eutrophication potential	kg PO43-e	4,97	4,59	0,09	0,29
Photochemical oxidant creation potential	kg C2H4-e	0,84	0,75	0,02	0,07
Ozone depletion,	kg CFC 11-e	0,00	0,00	0,00	0,00
depletion of abiotic resources (elements),	kg Sb-e	0,02	0,02	0,00	0,00
depletion of abiotic resources (fossil),	MJ	16 497	2 169	6 247	24 913



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References

Ambrazaitis, N. (2016, 05). Production Manager, UAB Scandia Steel, Tel: +370 62 08 22 74, E-post: nerijus@scandiasteel.se. (P. Lindman, Interviewer)

Bauer, C., Althaus, H.-J., Weidema , B., & Hirschier, R. (2009). *Code of practice. Ecoinvent report No. 2.* St. Gallen: Swiss Centre for Life Cycle Inventories.

Baumann, H., & Tillman, A. (2004). *Liftarens guide till LCA.* Lund, Sweden: Studentlitteratur ISBN: 91-44-02364-2.

Carlsson, R., & Pålsson, A.-C. (2011). *Livscykelanalys – ringar på vattnet. .* SIS Förlag 978-91-7162-652-3.

ecoinvent, Hirschier, R., Weidema , B., Althaus , H.-J., Bauer , C., Doka , G., . . . Wernet , G. (2009). *Code of practice. ecoinvent report No. 2.* St. Gallen: Swiss Centre for Life Cycle Inventories.

EPD®, T. I. (2016-03-09). *PCR 2012:01 v. 2.01 Construction products and construction services.* The International EPD® System.

Goedkoop, M., Heijungs, R., Huijbregts, M., Schryver, A., Struijs, J., & Zelm, R. v. (2009). *ReCiPe 2008-A life cycle impact assessment method which comprises harmonised category indicators at the midpoint and the endpoint level.* Holland.

Guinée, J., Gorrée, M., Heijungs, R., Huppes, G., Kleijn, R., Koning, A. d., . . . Sleeswijk, A. (2004). *Handbook on Life Cycle Assessment - Operational Guide to the ISO Standards.* Kluwer Academic Publications.

ISO 14040. (2006). *Environmental Management – Life cycle assessment – Principles and framework (SS-EN ISO 14040:2006).* Stockholm, Sweden.: Swedish Standards Institute (SIS förlag AB).

ISO 14044. (n.d.). *Environmental Management – Life cycle assessment – Requirements and guidelines (SS-EN ISO 14044:2006).* Stockholm, Sweden: Swedish Standards Institute (SIS förlag AB).

Lindman, P. (2016-06-08). *Life Cycle Assessment Steel pipe piles and Steel core piles Miljögiraff Report 78.* Kalmar: Miljögiraff AB.

Łyczak, Ł. (2016, May). Sales Department Stalprodukt AS.

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Programme-related information and verification

This EPD follow the PCR 2012:01 v. 2.01 Construction products and construction services.
Product Category Rules review was conducted by: The Technical Committee of the International EPD® System. Contact via info@environdec.com
Independent verification of the declaration and data, according to ISO 14025:2006: ☐ EPD Process Certification (internal) ☑ EPD Verification (external)
Third party verifier: Göran Brohammer, Extracon AB Approved by the International EPD System