



Figure 1: Savo S3 LN

**NEPD-nr: 145E**

Verified in accordance with ISO14025, § 8.1.4: February 16th, 2010  
Valid until: February 16th, 2015

*Svein Fossdal*

**Verification of data:**

Independent verification of LCA data and other environmental information in this declaration is performed by Professor Annik Magerholm Fet, Global & Local in accordance with ISO 14025 § 8.1.3.

**Verified by:**

*Annik Magerholm Fet*

**This declaration has been compiled by:**

Siv.Ing. Kjetil Wiig (Savo) and Christofer Skaar (NTNU)

**PCR:** Product category rules for seating (NPRC003, 2008)

**About the EPD:**

EPDs from other program operators than EPD-Norge are not necessarily comparable

**Key performance indicators**

From raw material extraction to use:

Global warming: 90,26 kg CO<sub>2</sub>-Eq.  
Energy consumption: 1411,95 MJ  
Guarantee period: 5 years

**Information about the producer:**

EFG European Furniture Group AB  
Trehörnavägen 2, Box 1017, 57328 Tranås  
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[www.efg.se](http://www.efg.se)

Org.no.: 556236-7259

Information about the product: Savo S3 LN (version with black base, headrest and armrests). The chair is also available with aluminium base and without headrest/armrest).

Functional unit: Seating produced and maintained for 15 years

Included life cycle stages: This declaration covers environmental impacts from raw material extraction to use and maintenance. The declaration does not cover product disassembly or disposal, and is therefore not comparable to declarations that cover the entire product life cycle (see Table 1 and Figure 6)

Performance year: 2009

Data development year: LCA-data is generated with the aid of GaBi 4 in the period 2008-2009

Assumed market: Europe

Contact person: Kjetil Wiig: (+47) 98 60 30 49

**Product specification:**

**Table 1: Product composition**

Materials	Mass (kg)	Share (%)	Share from contractors with certified EMS	Share of components with environmental declaration	System boundaries (See last page for specification)
Steel	4,51	21,9 %			A-G
Aluminium	4,16	20,2 %			A-G
Other metals					A-G
PUR	0,97	4,7 %			A-G
Plastic	10,74	52,1 %			A-G
Wood					A-G
Textile	0,25	1,2 %			A-G
Cardboard					A-G
<b>Total</b>	<b>20,63</b>	<b>100,0 %</b>			

## Resource consumption:

Table 2: Material resource consumption per life cycle stage

Category	Resource	Raw material production [kg]	Transport [kg]	Production [kg]	Use [kg]	Total [kg]
Renewable materials	Air	198,24	0,12	7,68	0,39	206,44
	Other biomass	0,11				0,11
	Water (fresh)	908,84	0,37	8,78	0,45	913,51
	Wood	0,02				0,02
Non-renewable materials	Aluminum	1,56				1,56
	Chromium	0,01				0,01
	Clay	0,01				0,01
	Colemanite	0,39				0,39
	Crude oil	5,13	0,44	0,03		5,61
	Dolomite	0,16				0,16
	Fluorspar	0,05				0,05
	Hard coal	10,25		0,20	0,01	10,46
	Heavy spar	0,03				0,03
	Inert rock	127,59	0,05	2,36	0,12	130,12
	Iron	4,20				4,20
	Kaolin	0,69				0,69
	Lignite	3,93		0,01		3,94
	Limestone	3,81		0,03		3,85
	Manganese	0,04				0,04
	Minerals and ore	60,64	0,02	0,44	0,02	61,12
	Natural gas	8,88	0,03	0,09	0,01	9,01
	Peat	0,04		0,09	0,01	0,13
	Phosphorus	0,03				0,03
	Potassium chloride	0,01				0,01
	Quartz sand	1,81				1,81
	Sodium chloride (rock salt)	2,05				2,05
	Soil	1,36		0,02		1,38
	Sulphur	0,95				0,95
Recycled renewable materials	Water	50,33				50,33
Recycled non-renewable materials	Aluminum	2,80				2,80
	Iron and steel	0,81				0,81
	Other unspecified	51,10				51,10
	Plastics	7,01				7,01
<b>Total</b>		1452,84	1,04	19,74	1,01	1469,71

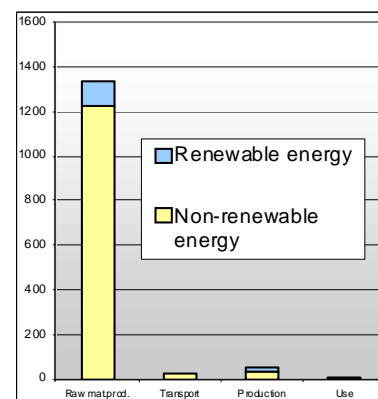
Land use has not been included. Water consumption is included in table 2.

## Energy resources:

Table 3: Energy resource consumption (in MJ) per life cycle stage

Category	Resource (MJ)	Raw material production	Transport	Production	Use	Total
Fossil energy	Coal	355,29	0,08	5,85	0,30	361,51
	Fossil oil	245,98	20,74	1,56	0,08	268,36
	Natural gas	447,51	1,72	4,98	0,26	454,46
Nuclear energy	Nuclear energy	158,55	0,10	19,56	1,00	179,21
Renewable energy	Biomass	1,95				1,95
	Hydro	90,00	0,02	15,81	0,81	106,64
	Wind and solar	16,89		2,72	0,14	19,76
Misc. energy	Miscellaneous	20,06		1,13		20,06
<b>Total</b>		1336,22	22,66	51,61	2,58	1411,95

Figure 2: Energy carriers specified in total MJ used per life cycle stage.

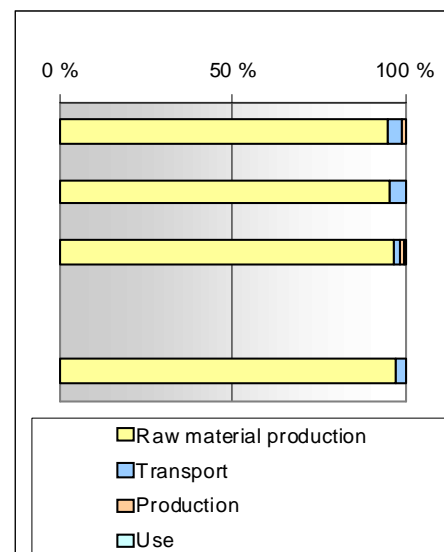


## Output and environmental impacts:

**Table 4: Environmental impact categories**

	Environmental impact	Unit	Raw material production	Transport	Production	Use
1	Acidification Potential	kg SO2-Eq	0,41	0,02	0,00	0,00
2	Eutrophication Potential	kg PO4-Eq	0,04	0,00	0,00	0,00
3	Global Warming Potential (100 years)	kg CO2-Eq	87,21	1,53	1,45	0,07
4	Ozone Layer Depletion Potential	kg R11-Eq	0,00	0,00	0,00	0,00
5	Photochem. Ozone Creation Potential	kg C2H4-Eq	0,04	0,00	0,00	0,00

Figure 3: Percent distribution of environmental impact for each cycle phase



**Table 5: Wastes and emissions**

	Wastes and emissions	Raw material production [kg]	Transport [kg]	Production [kg]	Use [kg]	Total [kg]
<b>Wastes</b>	Energy recovery	0,06				0,06
	Material recovery	23,28				23,28
	Hazardous waste	2,33		0,01		2,34
	Landfill	131,48	0,05	2,38	0,12	134,03
<b>Emissions to air</b>	Carbon dioxide	70,24	1,49	1,37	0,07	73,17
	Carbon monoxide	0,25				0,25
	Methane	0,27				0,27
	Nitrogen oxides	0,11	0,02			0,13
	Nitrous oxide	0,03				0,03
	NMVOC	0,03				0,03
	Steam	96,91	0,04	4,21	0,22	101,37
	Sulphur oxides	0,29	0,01			0,30
<b>Emissions to water</b>	BOD	0,01				0,01
	COD	0,05				0,05
	Nitrates	0,02				0,02
	Particles	0,11				0,11
	Waste water	21,03				21,03

## Additional information

This environmental product declaration has been created according to the product category rules for seating.

The lifetime of an average piece of furniture is estimated to be 15 years according to the PCR. This is the average lifetime in the possession of the first consumer. The furniture will usually have longer technical lifetime.

Environmental issues are included from the start in the development of new Savo chairs. Savo S3 has been designed to use a high percentage of recycled materials in its components. More than 50% of the plastic in Savo S3 is recycled material. All parts can be separated, and the plastic parts are also marked according to ISO 11469 for easy recycling. Aluminium parts are made of 100% recycled material.

Savo S3 is approved according to EN-1335  
(Dimensional, performance and safety requirements for office work chairs used 8 hours a day)

EFG is ISO-14001 certified.

## Treatment of wastes from the final product

Figure 4 and 5 shows the assumed waste management based on the material composition from Table 1. The waste management are based on Norwegian statistics for waste management. This statistics shows an average recycling percentage, while the share of recyclable material in the product is more than 90%.

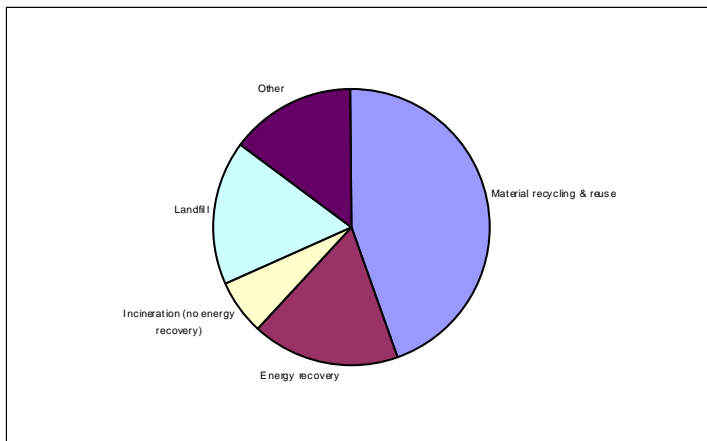


Figure 4: Waste management for Savo S3.

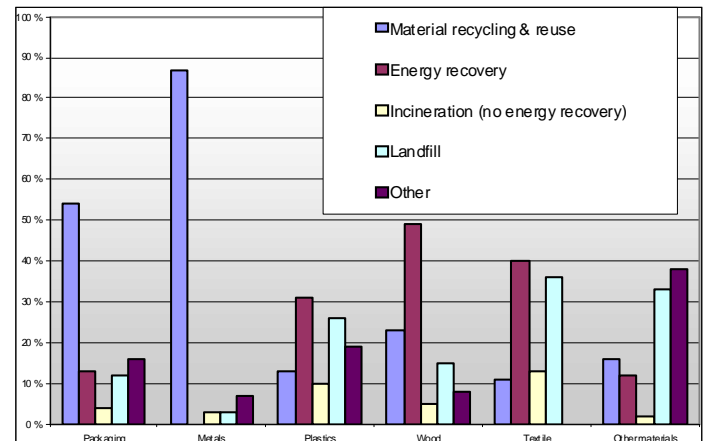


Figure 5: Statistical waste management for different materials [SSB].

## Methodological decisions

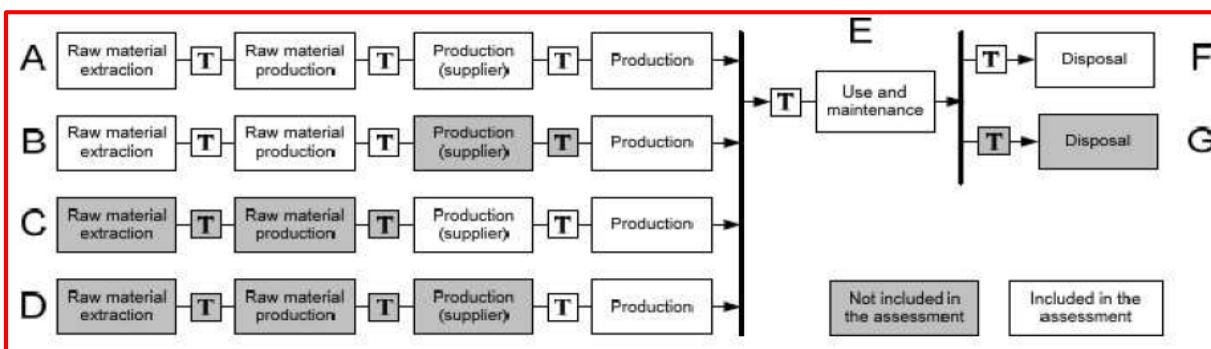


Figure 6: System boundaries. See table 1 for specification of system boundaries for this declaration.

- Cut-off criteria:** Processes and activities that contribute to less than 1 % of the total environmental impact for any impact category can be omitted.
- Use phase:** The use phase are based on vacuum cleaning every second year for 15 years. (A total of 1,125 MJ)  
The transport to the market/customer (before the use phase) is also included in this declaration, and is set to an average of 500km
- Disposal phase:** Not included (see previous page and above for waste management)
- Allocation rules:** For virgin resources are raw materials and production processes included. The recycling process is included for input of recycled resources. Where economic allocation has not been possible, the allocation has been based on production volume. Detailed information on allocation is available in the documentation for the Norwegian Furniture Database.

## References

EFG LCA Report v1 - Global & Local Report #1 - 2010 (January 2010)  
NPCR003 Product Category Rules for Seating solution, 2008