Martela and the environmental impact of products

Martela products are mainly made of wood, metal and plastic

Martela uses wood from commercially grown forests. The most commonly used wood material particle board which can be produced from the sawdust created as a by-product at sawmills. The environmental effects of wood are caused by forestry, transportation, processing and the management of material efficiency in different production stages. Wood can be burned after use to utilize its energy content, however this also releases the carbon dioxide absorbed by the tree. Wood is a renewable resource, which means that for each tree that is cut, a new one is planted in its place and it will absorb carbon dioxide as it grows. However, in the Northern countries, it takes a lifetime for one tree to grow to full height.

The metal most commonly used in Martela products is steel in different forms. The environmental effects of steel are created by the land use of the mining industry, metal enrichment processes, transportation, and the management of material efficiency. Metal treatment processes require significantly more energy than those of wood, but metal can be recycled and melted for reused. Metal resources are not renewable, which means that the iron in the soil will not be replaced after it is mined.

Plastic is a commonly used material especially in task chair frames, castors, padding, fabrics, the edge strips of tables and cabinets and in the roller shutters of cabinets. Plastics are made from oil, which is a nonrenewable natural resource. The environmental impact of plastic results from the drilling and different treatment processes of oil and from the processing of plastic fibers. Processing plastics consumes great amounts of energy and chemicals. If well recycled, different plastics can be re-used. As sorting is expensive, the market for recycled materials is not yet well established and miscellaneous plastic materials are mainly used as source of energy.

Processes at Martela

New product manufacturing processes, managed by Martela group, include the component production at Kidex Oy and Martela's operations in Poland and the logistics center in Finland. The operations of Kidex Oy mainly involve cutting chip board and MDF board, applying edge strips, laminating and veneer processes and surface finishing processes for veneered components. Martela's operations in Poland produces assemblies of upholstered chair components. The logistics center is responsible for the storage of components for products with a short delivery time and final assembly. The operations are based on customer orders. The environmental effects of the logistics center and the factories are created mainly by property related energy use, transportation of incoming and outgoing wares and the energy use of machinery. Surface finishing processes also add to the environmental impact of Kidex Oy. This process uses the more environmentally friendly, water-based surface finishing agents. Martela's logistics center is also responsible for the refurbishment of second-hand products. The raw materials used at the remanufacturing mainly consist of used furniture, which is repaired and re-sold, prolonging the life of the products. Martela's Outlet-chain is responsible for finding new users for the repaired furniture.

Martela products

Martela products are designed to last over time and to answer customer needs. In the development phase, products are tested in various ways in Martela's own test laboratory to ensure a long and functioning product life.

The production process, however, is only a small factor affecting the environmental impact of a product. If the product is used only for a short period of time and then discarded, it will have a greater effect on the environment than if it is maintained and used for decades and its materials recycled. Most of

Martela's products do not consume energy, and even in electrically adjustable workstations energy consumption is minimal. Needed transportation, maintenance and repair can vary greatly from one product to another. For example, the upholstery of chairs will remain neat and intact significantly longer if they are vacuumed once a week and cleaned when dirty or at least once a year, as recommended. Dust and dirt will wear out the fabric. On the other hand, vacuuming and cleaning waste energy and chemicals, which also has an effect on the environment.

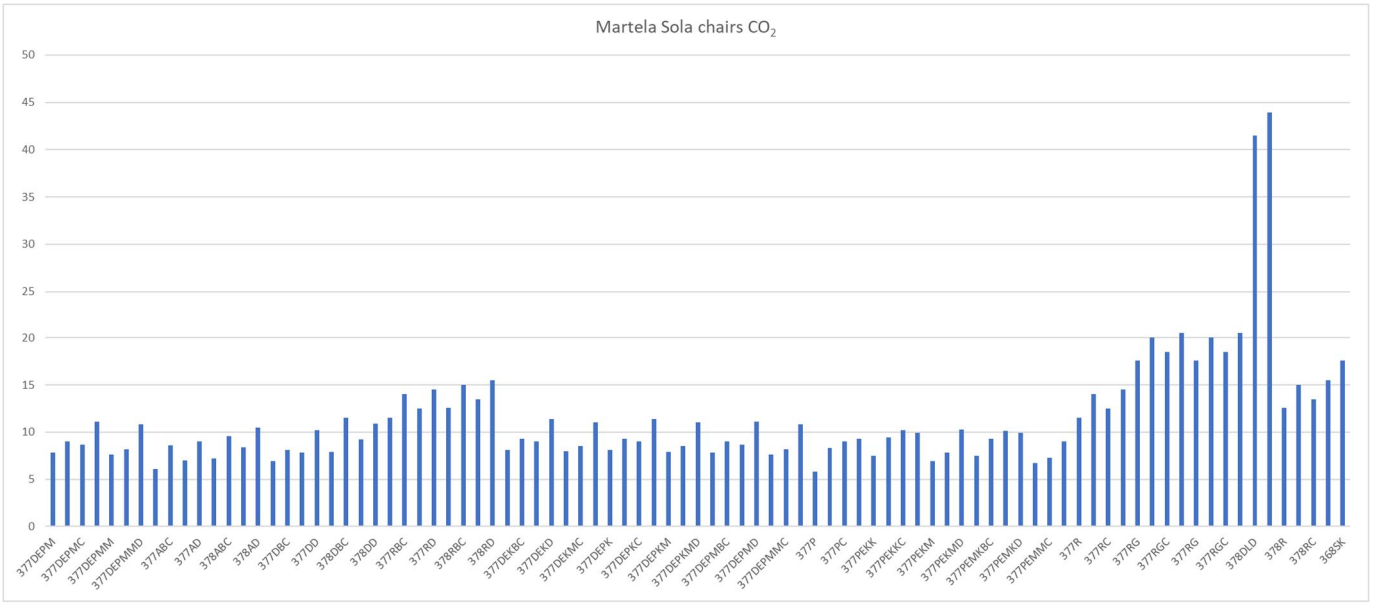
The history of product environmental impact assessment at Martela

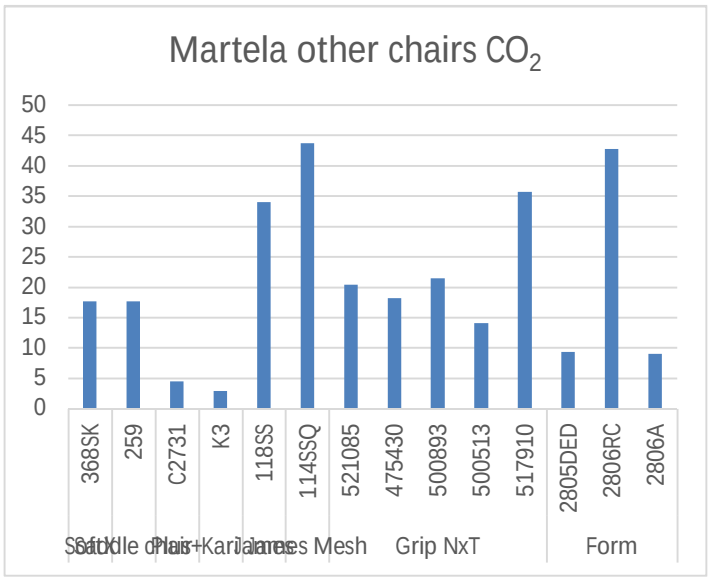
In 1995 Martela took part in the Environmental Declaration project coordinated by VTT Technical Research Centre of Finland. The aim of the project was to research and document the environmental effects of wood-based products over the their product lifecycle and to summarize this information in customer-focused environmental reports. Through the project Martela was able to produce environmental reports for products in its Tangent-collection, namely a table, a cabinet and shelving system with roller shutter. Over time, PVC-materials have been removed from the products for environmental reasons, product structures have been changed and the supply chain modified. Even though the Tangent products are no longer in Martela's product program, the documents still provide a good overview of the environmental impact of the product categories.

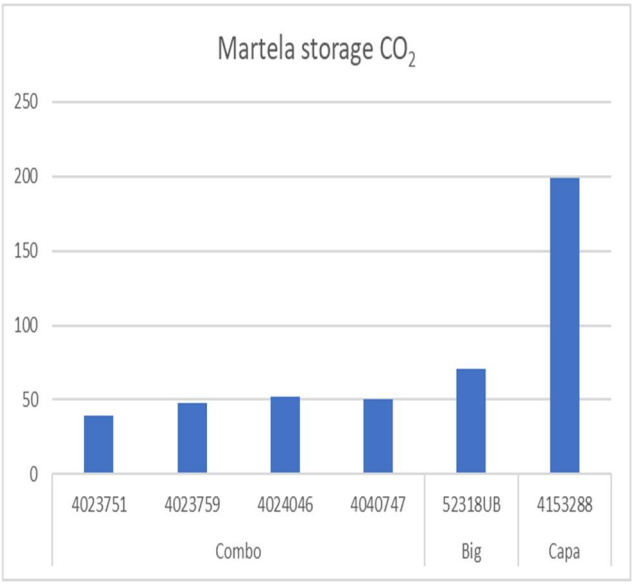
The environmental impact assessment of products has extensively developed in the 21st century and in 2010 Martela ordered a lifecycle analysis of its products from Aalto University with the aim of developing a carbon footprint study. The products chosen were two different chairs: one made almost entirely of wood and the other with metal legs. The study was done in the form of a Master's thesis and it examined the lifecycle of the products from the production of materials to final assembly. The lifecycle analysis was done over a six-month period and the result included the carbon footprint calculations of three product versions. According to the study, the carbon footprint of the Picco 316 chair with a powder coated base is 32,8 kgCO2-eq and 25,2 kgCO2-eq if the base is chromed. The carbon footprint of the wood-based Kari 3 chair is 6,3 kgCO2-eq. When evaluating the results one must take into consideration that study contains only the raw material and component manufacturing to finals assembly e.g. product until the factory gate. The information was collected on-site, using databases and literature and the carbon footprint calculation itself was conducted using the GaBi 4-program, the calculation method of which is based on the standards of the ISO 14040 series.

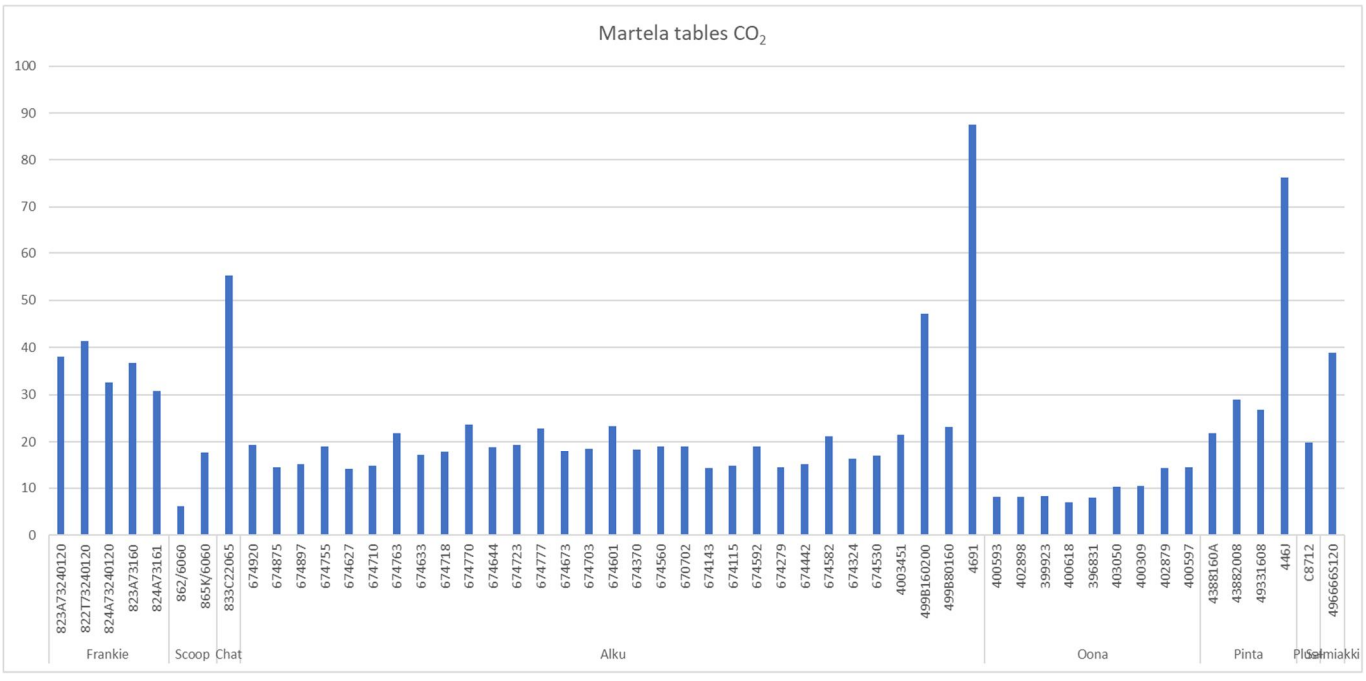
From product-specific detailed study to carbon footprint calculations

Due to the wide interest on carbon footprint of products, Martela began searching for opportunities for conducting similar calculations for a broader selection of products. The goal was to conduct a carbon footprint assessment for vide selection of products using less extensive resources needed for one lifecycle analysis. The chosen method focused on product groups. The method utilized the process information of repeated operations commonly used in manufacturing, which were then allocated to several products. The method enables the rapid calculation many products. The first part of the carbon footprint calculation was to take into account materials, production, assembly, packaging materials and logistics. The environmental effects of material, component and final product transportation on average as well as packaging materials have also been considered in the calculations. The enormous amount of data was grouped into components and the information entered into the Footprinter-program. As all products have been calculated using the same method, the environmental impacts of Martela products can be compared with each other.


Martela Sola chairs CO_2
50
45
40
35
30
25
20
15
10
5
0
377DEPM
377DEPMC
377DEPMM
377DEPMMD
377ABC
377AD
378ABC
378AD
377DBC
377DD
378DBC
378DD
377RBC
377RD
378RBC
378RD
377DEKBC
377DEKD
377DEKMC
377DEPK
377DEPKC
377DEPKM
377DEPKMD
377DEPMBC
377DEPMD
377DEPMMC
377P
377PC
377PEKK
377PEKKC
377PEKM
377PEKMD
377PEMKBC
377PEMKD
377PEMMC
377R
377RC
377RG
377RGC
377RG
377RGC
378DLD
378R
378RC
368SK

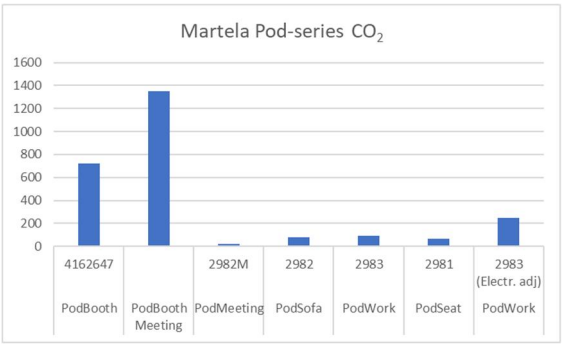

Martela other chairs CO_2
50
45
40
35
30
25
20
15
10
5
0
368SK
259
C2731
K3
118SS
114SSQ
521085
475430
500893
500513
517910
2805DED
2806RC
2806A
Saddle chairs
Plair+Karuselles
Mesh
Grip NxT
Form

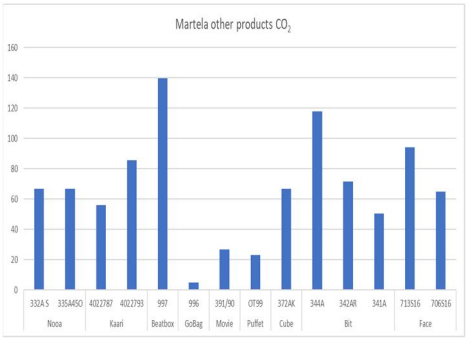

Martela storage CO_2
250
200
150
100
50
0
4023751
4023759
4024046
4040747
52318UB
4153288
Combo
Big
Capa


Martela tables CO_2
100
90
80
70
60
50
40
30
20
10
0
823A73240120
822T73240120
824A73240120
823A73160
824A73161
862/6060
865K/6060
833C22065
674920
674875
674897
674755
674627
674710
674763
674633
674718
674770
674644
674723
674777
674673
674703
674601
674370
674560
670702
674143
674115
674592
674279
674442
674582
674324
674530
4003451
499B160200
499B80160
4691
400593
402898
399923
400618
396831
403050
400309
402879
400597
43881604
43882008
49331608
446J
C8712
4966665120
Frankie
Scoop
Chat
Alku
Oona
Pinta
Ploom
Salmiakki

product	code	CO_2
Sola	377DEPM	7,8
	377DEPMBC	9
	377DEPMC	8,7
	377DEPMD	11,1
	377DEPMM	7,6
	377DEPMMC	8,2
	377DEPMMD	10,8
	377A	6,1
	377ABC	8,6
	377AC	7
	377AD	9
	378A	7,2
	378ABC	9,6
	378AC	8,4
	378AD	10,5
	377D	6,9
	377DBC	8,1
	377DC	7,8
	377DD	10,2
	378D	7,9
	378DBC	11,5
	378DC	9,2
	378DD	10,9
	377R	11,5
	377RBC	14
	377RC	12,5
	377RD	14,5
	378R	12,6
	378RBC	15
	378RC	13,5
	378RD	15,5
	377DEK	8,1
	377DEKBC	9,3
	377DEKC	9
	377DEKD	11,4
	377DEKM	8
	377DEKMC	8,5
	377DEKMD	11
	377DEPK	8,1
	377DEPKBC	9,3
	377DEPKC	9
	377DEPKD	11,4
	377DEPKM	7,9
	377DEPKMC	8,5
	377DEPKMD	11
	377DEPM	7,8
	377DEPMBC	9
	377DEPMC	8,7
	377DEPMD	11,1
	377DEPMM	7,6
	377DEPMMC	8,2
	377DEPMMD	10,8
	377P	5,8
	377PBC	8,3
	377PC	9
	377PD	9,3
	377PEKK	7,5
	377PEKKBC	9,4
	377PEKKC	10,2
	377PEKKD	9,9
	377PEKM	6,9
	377PEKMC	7,8
	377PEKMD	10,3
	377PEMK	7,5
	377PEMKBC	9,3
	377PEMKC	10,1
	377PEMKD	9,9
	377PEMM	6,7
	377PEMMC	7,3
	377PEMMD	9
	377R	11,5
	377RBC	14
	377RC	12,5
	377RD	14,5
	377RG	17,6
	377RGBC	20
	377RGC	18,5
	377RGD	20,5
	377RG	17,6
	377RGBC	20
	377RGC	18,5
	377RGD	20,5
	378DLD	41,5
	378DLDK	43,9
	378R	12,6
	378RBC	15
	378RC	13,5
	378RD	15,5
	368SK	17,6
Combo	4023751	39,7
	4023759	47,6
	4024046	52,5
	4040747	50,6

product	code	CO_2
Big	52318UB	71,1
Capa	4153288	199,1
SoftX	368SK	17,6
Saddle chair	259	17,6
Plus+	C2731	4,4
Kari	K3	2,9
James	118SS	34
James Mesh	114SSQ	43,7
Grip NxT	521085	20,4
	475430	18,2
	500893	21,4
	500513	14
	517910	35,7
Form	2805DED	9,3
	2806RC	42,7
	2806A	9
Frankie	823A73240120	38,1
	822T73240120	41,4
	824A73240120	32,6
	823A73160	36,7
	824A73161	30,8
Scoop	862/6060	6,2
	865K/6060	17,6
Chat	833C22065	55,3
Alku	674920	19,3
	674875	14,4
	674897	15
	674755	19,1
	674627	14,1
	674710	14,8
	674763	21,9
	674633	17
	674718	17,7
	674770	23,7
	674644	18,8
	674723	19,4
	674777	22,8
	674673	17,9
	674703	18,5
	674601	23,3
	674370	18,4
	674560	19
	670702	19,1
	674143	14,2
	674115	14,8
	674592	19,1
	674279	14,4
	674442	15
	674582	21,2
	674324	16,2
	674530	16,9
	4003451	21,5
	499B160200	47,2
	499B80160	23,1
	4691	87,5
Oona	400593	8,1
	402898	8,1
	399923	8,3
	400618	7
	396831	8
	403050	10,3
	400309	10,4
	402879	14,3
	400597	14,4
Pinta	4388160A	21,9
	43882008	28,9
	49331608	26,8
	446J	76,3
Plus+	C8712	19,8
Salmiakki	496666S120	38,9
Nooa	332A S	66,7
	335A45O	66,7
Kaari	4022787	56
	4022793	85,8
Beatbox	997	139,7
GoBag	996	4,8
Movie	391/90	26,9
Puffet	OT99	23,1
Cube	372AK	66,7
Bit	344A	118
	342AR	71,4
	341A	50,3
Face	713S16	94
	706S16	64,9
PodBooth	4162647	720,1
PodBooth Meeting		1350,1
PodMeeting	2982M	23,5
PodSofa	2982	77,7
PodWork	2983	89,5
PodSeat	2981	63,1
PodWork	2983 (Electr. adj)	248,9





15.4.2021/A-MP