SophSys client boarding procedures.

This document outlines the way SophSys interacts with it's clients and what steps are taken to reach a successful project start.

-Please note that SophSys will reveal their contacts and expertise. As such, SophSys will require the client to sign a mutual NDA/Non-Circumvent between SophSys and the client, based on Dutch law.

-Before the first call, SophSys will send a basic questionnaire to the client.
This questionnaire is designed to reveal basic but necessary information to SophSys in relation to the situation at hand.

1. SophSys is contacted by client.

The client contacts SophSys to obtain information on potential solutions.

The initial talks include (but are not limited to):

- The nature/background of the client,
- discussing what the client wants and/or needs,
- what waste and environmental legislation is applicable at clients location/country of origin,
- what previous steps the client has undertaken before reaching out to SophSys,
- what funding methods the client foresees for the project,
- political situations in clients area/country,
- who they currently work with in regards to waste management and other partnerships that can influence the work/project,
- if the clients has a waste management protocol for their site/area,
- what type(s) of waste the client has (in tons),
- what the client thinks or knows the waste consists of (morphological and chemical analysis is requested)
- how the waste is collected and by whom,
- location of a landfill site (if any)
- size and conditions of the landfill site(s) (if any),
- potential left capacity of the landfill (if any),
- what the cost of waste collecting and processing is at this moment in time,
- if they execute any sorting and recovery,
- explanation by SophSys on available technologies, based on provided information by/from the client,
- explanation by SophSys on procedures and steps SophSys intends to take with the client.

2. Questions by SophSys

based on the above discussions, SophSys will provide a list of questions and will request documents SophSys will need to be able to provide an offer or give indications on the viability of the intended project.
To enable an insight into possible solutions and results, the client will be requested to provide a morphological and chemical waste analysis and to explain how the initial waste sample on which the analysis are performed are obtained to ensure the data provided by the client is accurate.

-If a client does not have a morphological and chemical waste analysis, SophSys is unable to perform any calculations or estimations on solutions and/or potential revenues.

-An example of a morphological and chemical analysis is added to this boarding process overview as a reference point. (attachment 1: Morphological and chemical analysis example Opcina Davor)

If a client does not have a valid morphological and chemical waste analysis, SophSys is unable to provide any valid proposals on technologies and/or potential revenues. If the client wishes to obtain

valid proposals for technologies and revenues for the intended project, the client will have to perform a valid waste analysis and provide SophSys with all requested data.

2.A Offer for performing validated waste analysis.
SophSys can provide an offer for obtaining this information for the client, based on the situation and settings at the client and includes the development of a sampling protocol, the actual taking of the waste samples needed for an analysis, performing the waste analysis and providing the client with a valid report.
The obtained information will be owned by the client and the client can utilize the data from that work independently from SophSys, meaning the client is not bound to working with SophSys after this point and can use the obtained information to attract other solution providers if they wish to do so.

3. Proposed technologies and estimated results.

If the client is able to provide a valid waste analysis, SophSys will make an initial preliminary and basic calculation on potential volumes/quantities of recoverable items from the waste (if needed) and provide an initial idea on the proposed technology for processing waste that cannot be recovered.
Based on the provided data from the analysis, SophSys will also provide a basic and estimated result for the chemical recycling technology that SophSys has proposed as a solution, including estimated calculations on caloric value of the remaining waste, potential residues (if any) and estimated data on produced electricity/hydrogen or oils.
This is an **estimated calculation** of CapEx and OpEx cost and **estimated revenue calculations**. These calculations are NOT an offer but simply a basic cost indication for the client to obtain a first understanding of the cost a for a project and revenues of a project. Actual CapEx, OpEx and revenue calculations will only appear during a feasibility study or a development study.

SophSys will bring this information together in a basic project proposal and presents it towards the client, showing what systems and technologies SophSys foresees to deploy and potential revenues from the proposed technologies for the client.

4. Presenting the project proposal.

Based on the provided morphological and chemical analysis, SophSys has produced a basic and preliminary project proposal.
The project proposal can be presented to the client via digital presentation via ZOOM or, if the client requires a physical presentation at the clients location, SophSys will visit the client to present their intended solutions and indicated results.
Please note that a visit by SophSys to a clients location is subject to an invoice by SophSys to the client and will be based on travel expenses, food and drinks during the travel and hotel costs.
SophSys will not calculate any hours in this initial phase of the project.

5. First go/no-go decision.

Upon presenting the proposed solutions and revenues, the client will be requested to make a decision if the project is feasible for the client, based on cost and revenues/results.

6. Show-and tell visits to technology providers.

Upon reaching a positive outcome of the decision, the client can request a show-and-tell visit to the technology suppliers that SophSys has selected for the project.
If the locations for the technologies are in the Netherlands, the clients only pays for it's own travel cost and expenses, including food/drinks and hotel and SophSys will not invoice hours from their end.

If a visit includes locations outside the Netherlands, the client is expected to cover any and all costs associated with the travel by SophSys to a location outside the Netherlands. again, SophSys will not charge any hourly rate for performing/executing these visit(s).
The client is expected to cover it's own cost for traveling.

7. Second go/no-go decision.

After executing the visits to potential technology suppliers, the client knows what to expect, knows the estimated indicated cost for the technologies and knows the estimated indicated revenues for the project. SophSys has presented it's vision on the solutions for the client and the client has a basic understanding of the project and all is clear to all parties within the project.
The client will now be requested to make a decision on the next steps for the project and the collaboration with SophSys.
If the client decides that they don't want to proceed with the project, the participation of SophSys ends here.

8. Feasibility study.

Upon reaching a positive outcome of the previous request for decision, the client is entering the next phase of the project, a feasibility study. This is a paid study, executed by SophSys, and is intended to show the viability of the project in relation to the situation and settings at the client's location.
The obtained information within this study is usable for obtaining funding for the project.
The feasibility study will reveal actual cost and revenues for the project, backed by actual offers from technology suppliers.

In an alternative model, the client can opt for a basic pre-feasibility study.
This is a much smaller and more basic study and is often used to obtain funding for the full feasibility study.

9. Conclusion and next steps.

After the feasibility study, the client has a full understanding of the selected technologies, the viability od the selected technologies, the cost of the selected technologies and the revenues from the selected technologies and knows what steps and actions are required for executing the next phase of the project, the development study.

Contact details:

If you require additional clarification or explanation related to our boarding procedures, please contact SophSys at 0031-6-288-47-131 or via mail at Martijn@sophsys.nl

Attachment 1: example of morphological and chemical analysis Opcina Davor.

	Total collected waste	no of people	kg resident
Davor	544.65	3015	180
Nova Gradiska	2652.60	14229	186

	Davor %	Nova Gradiska %
Paper cardboard	10.1	7.3
Paper cardboard packaging	2.0	4.0
Metal packaging waste	1.0	1.4
Metal dispensers	0.1	0.2
Metal others	1.4	0.4
Wood untreated	2.5	0.2
Wood treated	2.0	0.3
Wood packaging	0.0	0.0
Glas plain (window)	0.0	0.0
Glas packaging	2.4	1.3
Clothes and shoes	4.8	7.8
Fabrics (textile)	1.6	3.8
Textile packaging	0.1	0.4
Plastic	1.4	0.8
Plastic packaging	15	13.6
Rubber	0.3	0.7
Skin and bones	1.2	0.1
Kitchen waste	32.2	37.1
Garden waste	2.5	9.4
Eatable oils and fats	0.0	0.0
Diapers	11.1	1.2
Multi layer packaging	5.3	4.3
Mixed packaging	0.4	0.9
Medicine	0.0	0.0
Batteries and accumulators (storage)	0.0	0.0
Electric waste (radio's etc)	0.1	0.3
Earth dust sand	2.7	4.6
Total 100%	100	100

Fraction

	Davor combined	Nova Gradiska combined
paper and cardboard	12.0	11.3
metal	2.5	1.9
wood	4.4	0.4
glass	2.4	1.3
textile cloths	6.5	12.0
plastics	16.4	14.4
rubber	0.3	0.7

organic waste	35.9	46.6
rest/other	19.5	11.3
total	100	100

Idem for 2020

	Davor %	Nova Gradiska %
Paper cardboard	9.8	14.6
Paper cardboard packaging	2.6	1.3
Metal packaging waste	1.2	2.2
Metal dispensers	0.1	0.0
Metal others	1.1	0.3
Wood untreated	0.0	0.0
Wood treated	0.3	0.3
Wood packaging	0.0	0.0
Glas plain (window)	0.0	0.3
Glas packaging	3.0	2.3
Clothes and shoes	9.6	1.6
Fabrics (textile)	4.3	5.0
Textile packaging	1.1	0.0
Plastic	1.2	0.7
Plastic packaging	11.8	20.7
Rubber	0.3	0.5
Skin and bones	2.1	0.4
Kitchen waste	35.3	29.8
Garden waste	7.4	0.0
Eatable oils and fats	0.0	0.0
Diapers	2.9	14.5
Multi layer packaging	3.5	2.8
Mixed packaging	0.7	1.4
Medicine	0.0	0.0
Batteries and accumulators (storage)	0.2	0.0
Electric waste (radio's etc)	0.3	0.0
Earth dust sand	1.4	1.2
Total 100%	100	100

Fraction

	Davor combined	Nova Gradiska combined
paper and cardboard	12	16.0
metal	2.4	2.5
wood	0.3	0.3
glass	3.0	2.6
textile cloths	14.9	6.6
plastics	13.0	21.4
rubber	0.3	0.5
organic waste	44.7	30.2
rest/other	8.9	20.0
total	100	100

Prilog 3 physical chemical analysis waste autumn 2019
Davor and Nova Gradisk
Autumn 2019

Product	Davor	Nova Gradisk	measuring	method
Upper caloric value	16.853	16.212	kj/kg st	hrn en 15400:2011
Upper cal value in delivered form (moisture etc)	8.989	7.912	kj/kg st	hrn en 15400:2011
Lower caloric value	15.382	15.322	kj/kg	hrn en 15400:2011
Lower caloric value in delivered form (moisture)	7.448	6.286	kj/kg	hrn en 15400:2011
% of moisture	45.67	51.2	%	hrs cen/ts 154141:2010
% of solid matter	54.33	48.8	%	hrs cen/ts 154141:2010
Loss on ignition (burning)	86.48	82.88	%st	hrn en 15169:2008
Ash	13.52	17.12	%st	hrn en 15403:2011
% biomass	43.0	41.9	%st	hrn en 15403:2011
% Non biomass	43.5	41.0	%st	hrn en 15440:2011
% of biomass as part of total carbon (bio carbon)	60.0	59.5	%st	hrn en 15440:2011
% of NON biomass as part of total Carbon	40.0	40.5	%st	hrn en 15440:2011
Anorganic parameters:				
Chlorides dry matter (Cl)	8.395	7.512	mg/kg st	hrn en 15408:2011
Chlorides delivered sample (Cl)	4.561	3.666	mg/kg	hrn en15408:2011
Sulphur dry matter (S)	2.316	2.635	mg/kg	hrn en 15408:2011
Sulphur delivered sample (S)	1.258	1.286	mg/kg	hrn en 15408:2011
Antimony dry matter (sb)	5.70	5.02	mg/.kg	hrn en 15411:2011
Antimony delivered sample (Sb)	3.10	2.45	mg/kg	hrn en 15411:2011
Arsenic dry matter (As)	0.156	0.158	mg/kg	hrn en 15411:2011
Arsenic delivered sample (As)	0.085	0.077	mg/kg	hrn en 15411:2011
Cadmium dry matter (Cd)	0.014	0.002	mg/kg	hrn en 15411:2011
Cadmium delivered sample (Cd)	0.008	0.001	mg/kg	hrn en 15411:2011
Cobalt dry matter (Co)	<0.100	<0.100	mg/kg	hrn en 15411:2011
Cobalt delivered sample (Co)	<0.100	<0.100	mg/kh	hrn en 15411:2011
Chromium dry matter (Cr)	2.91	2.87	mg/kg	hrn en 15411:2011
Chromium delivered sample (Cr)	1.58	1.40	mg/kg	hrn en 15411:2011
Lead dry matter (Pb)	1.42	1.29	mg/kg	hrn en 15411:2011
Lead delivered sample (Pb)	0.774	0.631	mg/kg	hrn en 15411:2011
Nickel dry matter (Ni)	<0.025	<0.025	mgkg	hrn en 15411:2011
Nickel delivered sample (Ni)	<0.025	<0.025	mg/kg	hrn en 15411:2011
Mercury dry matter (Hg)	<0.001	<0.001	mgkg	hrn en 15411:2011
Mercury delivered sample (Hg)	<0.001	<0.001	mg/kg	hrn en 15411:2011
Organic Parameters…..				
Carbon dry matter (C)	50.3	48.5	%st	hrn en 15407:2011
Carbon delivered sample (c)	27.3	23.7	%st	hrn en 15407:2011
Total Carbon dry matter 41.0	40.8	%st	hrn en 13137:2005	
Total carbon delivered sample	22.3	19.9	%st	hrn en 13137:2005
Total organic carbon dry matter 23.4	28.5	%st	hrn en 13137:2005	

Total organic carbon delivered sample	12.7	13.9	%st	hrn en 13137:2005

3 physical chemical analysis waste Winter 2020

Product	Davor	Nova Gradisk	measuring	method
Upper caloric value	16.308	17.481	kj/kg st	hrn en 15400:2011
Upper cal value in delivered form (moisture etc)	8.271	9.282	kj/kg st	hrn en 15400:2011
Lower caloric value	15.721	16.328	kj/kg	hrn en 15400:2011
Lower caloric value in delivered form (moisture)	7.428	8.743	kj/kg	hrn en 15400:2011
% of moisture	49.28	46.91	%	hrs cen/ts 154141:2010
% of solid matter `	50.72	53.09	%	hrs cen/ts 154141:2010
Loss on ignition (burning)	86.66	88.01	%st	hrn en 15169:2008
Ash	16.34	11.99	%st	hrn en 15403:2011
% biomass	40.9	40.7	%st	hrn en 15403:2011
% Non biomass	42.7	47.3	%st	hrn en 15440:2011
% of biomass as part of total carbon (bio carbon)	61.0	60.7	%st	hrn en 15440:2011
% of NON biomass as part of total Carbon	39.0	39.3	%st	hrn en 15440:2011
Anorganic parameters:				
Chlorides dry matter (Cl)	9.054	6.782	mg/kg st	hrn en 15408:2011
Chlorides delivered sample (Cl)	4.593	3.601	mg/kg	hrn en15408:2011
Sulphur dry matter (S)	2.515	2.380	mg/kg	hrn en 15408:2011
Sulphur delivered sample (S)	1.276	1.263	mg/kg	hrn en 15408:2011
Antimony dry matter (sb)	4.57	7.39	mg/.kg	hrn en 15411:2011
Antimony delivered sample (Sb)	2.32	3.93	mg/kg	hrn en 15411:2011
Arsenic dry matter (As)	0.167	0.164	mg/kg	hrn en 15411:2011
Arsenic delivered sample (As)	0.084	0.087	mg/kg	hrn en 15411:2011
Cadmium dry matter (Cd)	0.004	0.015	mg/kg	hrn en 15411:2011
Cadmium delivered sample (Cd)	0.002	0.008	mg/kg	hrn en 15411:2011
Cobalt dry matter (Co)	<0.100	<0.100	mg/kg	hrn en 15411:2011
Cobalt delivered sample (Co)	<0.100	<0.100	mg/kh	hrn en 15411:2011
Chromium dry matter (Cr)	2.31	2.64	mg/kg	hrn en 15411:2011
Chromium delivered sample (Cr)	1.17	1.40	mg/kg	hrn en 15411:2011
Lead dry matter (Pb)	1.41	1.86	mg/kg	hrn en 15411:2011
Lead delivered sample (Pb)	0.713	0.985	mg/kg	hrn en 15411:2011
Nickel dry matter (Ni)	<0.025	<0.025	mgkg	hrn en 15411:2011
Nickel delivered sample (Ni)	<0.025	<0.025	mg/kg	hrn en 15411:2011
Mercury dry matter (Hg)	<0.001	<0.001	mgkg	hrn en 15411:2011
Mercury delivered sample (Hg)	<0.001	<0.001	mg/kg	hrn en 15411:2011
Organic Parameters…..				
Carbon dry matter (C)	48.4	52.8	%st	hrn en 15407:2011
Carbon delivered sample (c)	24.6	28.0	%st	hrn en 15407:2011
Total Carbon dry matter 41.3	43.5	%st	hrn en 13137:2005	
Total carbon delivered sample	21.0	23.1	%st	hrn en 13137:2005

Total organic carbon dry matter	28.4	23.4		%st	hrn en 13137:2005
Total organic carbon delivered sample	14.4	12.4		%st	hrn en 13137:2005

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