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Janne Silvonen

Developing the New Truck Sales Process for Battery Electric Trucks

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<p>This thesis is conducted for the case company to evaluate the new Truck Sales Process (TSP) for Battery Electric Vehicle (BEV) sales. Automotive industry in Finland, Nordic, Europe and worldwide is facing significant changes and challenges, when traditional internal combustion powered diesel trucks start to change to electric powered trucks. This change of the energy powered by the trucks may not sounds significant, but it brings many questions which need to solve. Therefore existing processes need to be re-evaluated, the organization need trainings, so that the company may offer answers to customers questions, which was done in this Thesis.</p> <p>The study was conducted by using qualitative research methods and mainly relied on unstructured or semi-structured interviews. Based on the results of the current state analysis, the current TSP was analyzed, and it was identified that the new BEV sales need only sub-processes to be added to the tradition TSP process.</p> <p>The theoretical framework focused on the topics of new technologies, business models and processes. The proposal for the case company was developed based on the results from the current state analysis, the theoretical framework, as well as a new round of data collection and co-development with the stakeholders. As a result of this thesis, new steps were proposed to be either added to the traditional TSP or the existing steps changed to adapt to the new product (BEV) sales.</p> <p>The outcome of this study is the proposal for the new sub-processes added for conducting BEV sales in the current TSP process, and the action plan was developed how the new ways of working will be put into action. These processes have been created only for BEV's and sales of BEV trucks for customers. It became obvious that new technology brings new element to sales processes which need special knowledge for the BEV's. These elements were important to describe on a detailed level, and plan how to train the sales personnel for these processes, so that the company can operate efficiently, and responsibilities are clear for everyone. As sales have just begun for the new BEV trucks, major changes will still happen in the upcoming years, and the processes will need to be re-evaluated again soon for the sales of BEV trucks to be adopted as part of the normal sales processes.</p>	
Keywords	Battery electric vehicles (BEV), new truck sales process (TSP)

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Glossary

GHG	Greenhouse Gas
TSP	New Truck Sales Process
Emob Manager	Commercial and Technical Manager Electromobility
e-truck	Fully electric truck
BEV	Battery Electric Vehicle
FCEV	Fuel Cell Electric Vehicle
ICEV	Internal Combustion Engine Vehicle
HEV	Hybrid Electric Vehicle
AC	Alternating Current
DC	Direct Current
KPI	Key Performance Indicator
TCO	Total Cost of Ownership
OEM	Original Equipment Manufacturer
GP	Gross Profit
VTC	Volvo Truck Center
CDD	Confirmed Delivery Date
PDI	Delivery Service
DP-TA	Dealerpoint -Truck Administration

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1 Introduction

Automotive industry in Finland, Nordic, Europe and worldwide is facing significant changes and challenges, when traditional internal combustion powered diesel trucks start to change to alternative fuels meaning renewable diesel, biogases, and especially to electrically powered trucks.

New battery electric vehicle (BEV) models have been launched massively especially starting from 2020, not only in passenger car segment, but also in heavy-duty trucks segment. The main reason for these new products and new technology to enter to market is EU regulations to achieve CO₂ target level, which are 15 % less CO₂ emission from new trucks from the reporting period 2025 to 2029 compared to the 2019 baseline CO₂ emission levels, and from 2030 onwards on average 30 % less CO₂ emissions (European Commission 2019). The Finland government have set target to be carbon neutral by 2035 and to be the first well-fare society in the world how have achieve this. Pollutions which are coming from traffic reach approximately 1/5 from all GHG in Finland. (Ministry of the environment 2019).

From the business perspective, change of the energy used by trucks, may not sounds significant, but it brings many questions which need to solve by companies. This change poses questions not only to customers, but also many internal questions, to companies. This is why existing TSP processes need to be re-evaluated, the organization salespersons need to be trained, so that sales teams can offer answers to these questions.

This thesis is conducted for the case company to evaluate the new truck sales process (TSP) suitability for battery electric vehicle (BEV) sales.

1.1 Business Context

This thesis is executed for the case company, Volvo Finland Ab, which operate in automotive industry as commercial trucks and buses importer in Finland. The case company offers new and used vehicle sales services, after sales services, rental services, and financing services for its customers and operates in 13 locations in Finland. The company revenue in 2020 was 191 M€, and the number of employees was 441 in

Finland. The case company is part of the global Volvo Group which headquarter is in Gothenburg. The group have almost 100 000 employees, has production in 18 countries and sales in more than 190 markets.

Volvo Group have committed to Science Based Targets to achieve net-zero targets and by 2030 reduce the scope 1 and 2 GHG by 50 percent compared to year 2019 baseline. Volvo Group also committed to reduce scope 3 GHG from use of heavy-duty trucks by 40 percent per vehicle per driven kilometer by 2030. (Science Based Targets 2021.)

1.2 Business Challenge, Objective and Outcome

This thesis is focusing on the case company's New Truck Sales Processes (TSP) and more specifically, the new TSP process of the battery electric vehicle (BEV). The purpose of this thesis is to define the key processes which are required to sell these new products (BEV) and clarify how these sub-processes differ from core process, and how these new sub-processes can be adopted to be part of the core process now and future.

The Thesis started with the assumption of the case company that the TSP core process itself will stay as it is, with only a few new sub-processes added for BEV truck sales and become part of the TSP when the sales are targeting BEV trucks. In the case company, the new BEV truck sales have just started, and sales process of these new products were observed to include several steps which deviate from the normal sales process.

The Objective on this thesis is *to define these new steps and processes which differs from normal TSP processes* and clarify the new sub-process in order to define all the new steps in TSP. So, the Outcome is a clear sub-process map which includes these new sales process steps.

In order to reach this Objective, future scenarios need to be thought about, how these new processes will blend to become part of the traditional TSP process, and how to measure the success of this new way of operating. This thesis will not create KPI's to measure the process success, but these KPI's will be set later to measure the success of the new business process implementation. Outcome of the thesis is clear sales subprocess for battery electric trucks.

1.3 Thesis Outline

This thesis is done by investigating the current TSP process and defining sub-processes which apply only to the sales of these new BEV trucks. Conversations with salespersons were the primary sources of data to get feedback and knowledge, and identify what are main differences between new BEV truck and current ICE truck sales.

The thesis is written in seven sections. Section 1 is the Introduction. Section 2 contains information about the research design and research approach. Section 3 describes the results of the current state analysis. Section 4 discusses existing knowledge and best practice related to the thesis topic. Section 5 opens up the key elements of the initial proposal. Section 6 reports on the results of the validation and presents the final proposal. Finally, Section 7 contains the conclusion.

2 Method and Material

This section describes the selected research methods used in this study. It describes the research approach, research design, and data collection and analysis methods used in this Thesis.

2.1 Research Approach

Research may be defined in many ways, but one simplified definition is that research is common language used to describe and gain knowledge. A little more specific way to define research may be proposed when relating to a specific problem or topic, as a scientific and systematic search for that. The purpose of research is to investigate a problem or a research question and get answers to it by finding out the facts from the matter studied. Based on these facts, the researcher gains knowledge and new insights on phenomenon. (Kothari 2004, 1-2.) While the purpose of a Fundamental, or basic, research is to gain knowledge, the purpose of the Applied research is to solve a hands-on problem by using different research methods (Kananen 2013, 27).

Main research types can be categorized into five different groups. *Descriptive vs. Analytical* where *Descriptive* research aims to describe the current situation. In business research, the term *Ex post facto research* is often used to describe this research type. *Ex post facto* is also used in social sciences. In this method, the researcher has no control over variables, and can only report based on the past, what has happened and future, what is going to happen. In *Analytical research*, the researcher must use information that is available now and based on the current information and build an analytical evaluation from the current situation. In *Applied vs. Fundamental* research, *applied* aims to found solution to a problem facing a society, industrial or business organization, when *Fundamental* is more for formulating a theory. *Quantitative vs. Qualitative* research makes another pair, where *Quantitative* method is to measure quantity or amount, and *Qualitative* is concerned with the phenomena related to quality. Finally, in *Conceptual vs. Empirical research*, *Conceptual* is focused on theory or new concept development, more like experimental research, when *Empirical* is evidence-based research. (Kothari 2004, 2-4.)

Based on previous classification of different types of research, there are two ways to gather and analyze data on the researched problem, *quantitative approach*, and *qualitative research methods*. (Kothari 2004, 5). When these both methods are brought together, this is called *mixed* approach. In *quantitative* research family, result can be measured in mathematical way. When other hand, in *qualitative* research family, data is analyzed using non-numerical methods like interviews and surveys, which is the method used on this thesis. Both, *Quantitative* and *qualitative* methods are used in the business world as both offer important insights and can be used for managing business and forecasting. (Kananen 2013, 32). When using *quantitative* research method and collecting numerical data, this raw data needs to be analyzed and processed to make it useful, turn it into information. Different analysis techniques to analyse *quantitative* data can be used and visualized using tables, graphs and statistics, which allows to demonstrate, present and explore trends and relationships from the data. (Saunders et al. 2016, 496-564.)

In this thesis, *qualitative* research methods are mainly used within the framework of the single case study research. In the single case study research, there is usually only one case where researched is aimed to get understanding in order to study the phenomenon in its natural setting and reach in-depth understanding of the case during study. Purpose in case research for the researcher is to achieve profound and holistic understanding of studied phenomenon. (Kananen 2013, 37-40.) In qualitative research, interviews may be executed via structured or qualitative (unstructured, open-end) interviews. In structured interviews, questions are asked in a structured way to get as precise results as possible and to get answers to specific questions. In qualitative interviews, interest is much more focused on the interviewee's point of view and what interviewee's sees important and relevant related to the topic of interview. (Bryman & Bell 2011, 466-467.)

In this Thesis, Case research is used to study the BEV truck sales phenomenon in the case company because no previous empirical studies from this subject. The research process was executed by using the 7-gate model which is used by the Master's programme in Business Informatics, at Metropolia University of Applied Sciences, as showed in Figure 1.

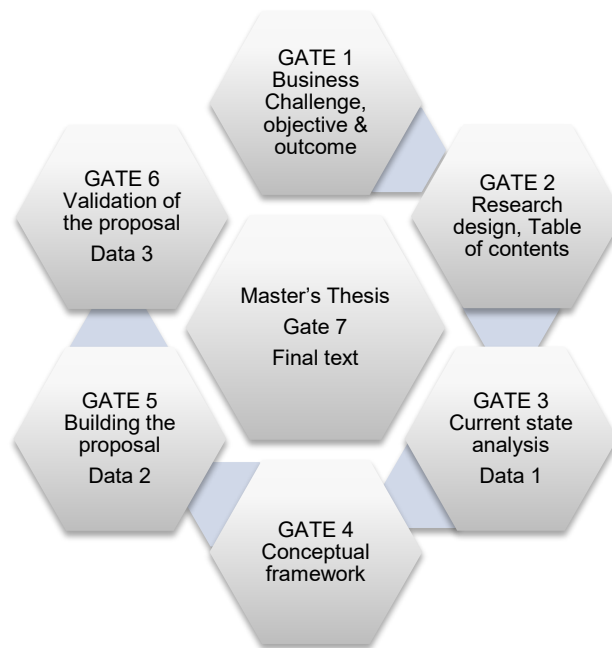


Figure 1. 7-gate model in Master's programme in Business Informatics, Metropolia University of Applied Sciences.

As seen in Figure 1, there are seven gates in the research process. Gate 1 consists of defining the business challenge, objective, and outcome. These are the key elements for defining what outline the study has and what outcome needs to be reached. Based on Gate 1, Gate 2 is defined which is the research design, research approach, data collection plan and the table of content. Gate 2 is mean to create an accurate plan how to conduct this thesis. After Gate 2, the study moves forward to Gate 3, the current state analysis. The current state analysis includes the analysis of the current situation where investigation is done how the current sales processes have described and how they work, but also, what special attention these new products need from the sales point of view. In Gate 4, the conceptual framework is created that selects the most relevant pieces of knowledge and best practice related to the topic at hand, so that to guide the next steps in the research, namely the proposal building. Gate 5 is focused on building a proposal which leads to Gate 6 where this proposal is validation. Gate 7 is the final step that focuses on validating and pulling together the “sales process development”.

2.2 Research Design

Figure 2 below shows the research design of this study.

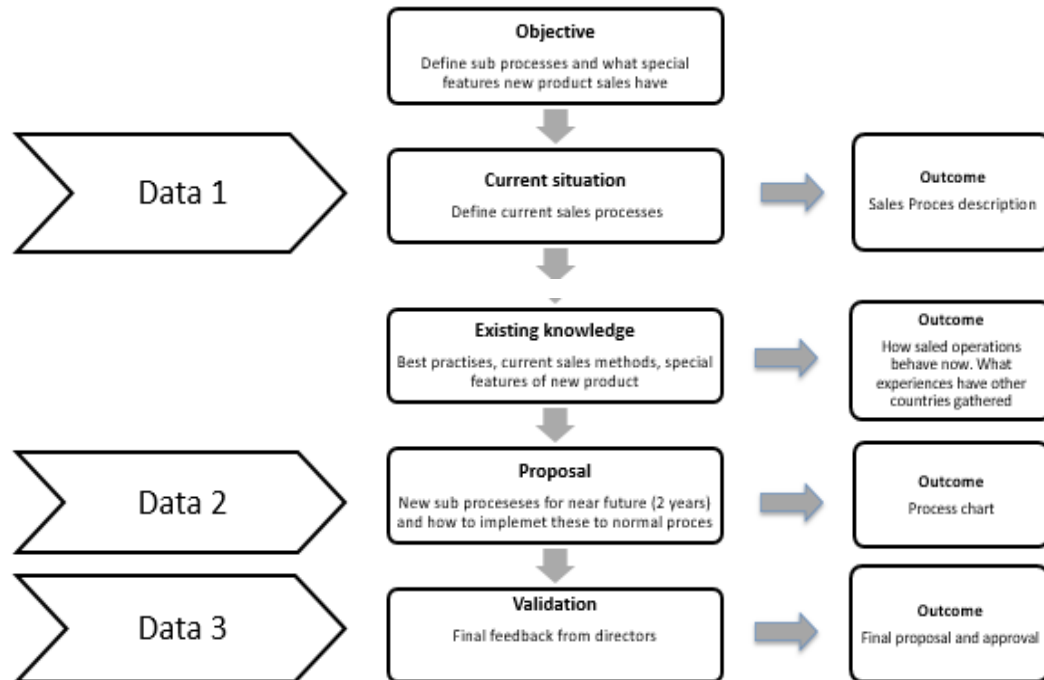


Figure 2. Research design of this thesis.

As shown in Figure 2, the research design of this thesis starts with setting the objective. In the next step, the current state analysis is conducted that is focused to investigate how current new truck sales process works. For conducting the current state analysis, the current situation needs are defined. Based on the interviews and the process investigation, the current situation is defined. At the end of this step, the current state analysis results are summarized. The findings will guide the building literature review and of the proposal building in the next step.

After that, the thesis concentrates on exploring the available knowledge and best practice related to BEV trucks and trends in market which guide the sales of new vehicles. Best practice experiences have been changed between different market companies to change ideas, experiences and what actions other colleagues from other countries are executing now.

In the next step, the proposal stage, the thesis evaluates what sub-processes are needed to support core sales process. After getting knowledge of the current situation, sales of

ICE trucks and BEV trucks, new sub-process chart was created. For developing this proposal, the previous results are considered, including the current state analysis results, the conceptual framework and the new round of co-creation with the stakeholders.

The final step on the thesis is validation. In this step, the proposal is discussed with the key stakeholders. Based on their feedback, the final corrections are done to the proposal, which becomes the final proposal and ready for implementation.

2.3 Data Collection and Analysis

This study draws from a variety of data sources, and the data was collected in three data collection rounds. Table 1 shows details of Data collections 1-3 used in this study.

Table 1. Details of Data collections 1-3 used in this study.

	1. Topic	2. Type of data?	3. Who/where? Source	4. Timing	5. Outcome
Data 1. CSA	Analyse current situation CSA	Current process chart Area sales director interview Sales person conversation	Process chart Southern area sales director Sales persons how have already sold new products	October 2021	Current state analysis sales process and needed sub process
Data 2. Proposal	New sales processes for new product sales	Interviews Meetings	Directors Colleagues from Sweden, Norway and Germany	October 2021	Conceptual Framework proposal
Data 3. Validation	Interviews and discussion with key stakeholders	Interview results	Sales director	November 2021	Validation

As seen from Table 1, data for this Thesis was collected in three rounds. The first round, collecting Data 1, was conducted for the current state analysis. This round included 3 unstructured interviews with the selected key stakeholders, the current process analysis, and special features of the new BEV truck sales process. In the first round, the process map of the new sub-processes were defined and created.

In the next round, Data 2 was collected to gather suggestions from the case company/unit for developing the vision. This data included 2 meetings with four different market companies and their managers responsible to these new products, to get understanding of the experience change and look into best practice how to handle it. Industry analysis

was also made to define how mature the Finnish market is for electric trucks, who are the competitors, what kind of products they have, and how may be the new entrants to this industry (in Appendix 3).

In the third round, Data 3 was collected when conducting validation of the initial vision with the key stakeholders. Data 3 included feedback for the initial vision based on which the final corrections were made, making proposal how sales subprocesses were planning to be implemented to be part of the TSP process in future.

Thus, in this study, the meetings and interviews made the primary method of data collection. The interviews were conducted as un-structured, face-to-face interviews, but also best practice and experience change meetings.

The textual data was analyzed using Thematic/ content analysis.

The findings from the current state analysis are discussed in Section 3 below.

3 Current State Analysis of the TSP Sales Process

This section discusses the results of the current state analysis of TSP.

3.1 Overview of the Current State Analysis

The goal of this current state analysis is to investigate, what steps the current sales process TSP includes, what sub-processes are already included for conducting the new BEV truck sales, and what material current sales process produce during the sales process. The current sales process also includes information from each step, who is responsible to produce it in each step, and which stakeholders are involved.

Firstly, it focuses on TSP process and secondly, special features of the new BEV truck sales. These two elements are selected since the ongoing changes cause significant deviations to the current working and sales methods, in the case of these new BEV trucks. For the purpose of the current state analysis, the sales sub-process for new BEV trucks are defined and after this, the sales organization may be trained to these new ways of working with these new products. Lastly, this section of CSA pulls all together and make the summary from all the previous points.

First, the current situation is defined. Thus, the first steps focuses on how new vehicles are sold now and what are the key steps in TSP process. Second, special features of selling new BEV trucks are defined to see, how these special features affect the current sales process. Third, a summary is drawn showing (a) how current sales process works, (b) special features of the new BEV trucks sales, and (c) how these special features of new product sales may be included into the current TSP processes.

3.2 Description of the Current TSP Process

The current new trucks sales process (TSP) contains 6 main topics, which are spared and more detailed to 55 steps totally, starting from customer conversations and defining the customer needs, all the way to the aftercare for customer. All the steps also include a responsible party, i.e. who and how is responsibility to execute the defined tasks. Different responsible parties are totally 15 different, starting from new vehicle sales, area directors and soft offer salesperson, all the way to end customer itself.

The process steps are described more precise on Excel file “*Visuaaliset Prosessistepit_TSP v. 1.3.*” and the six main topics are illustrated in Figure 3.

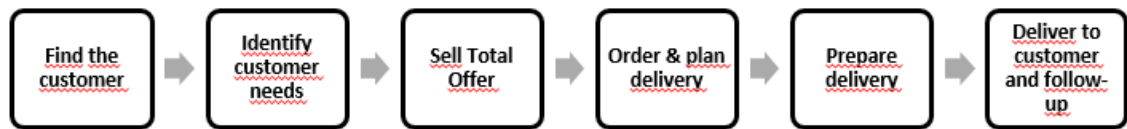


Figure 3. TSP and its six core process steps.

As seen from Figure 3, there are six main steps in the current TSP.

First, “Find the Customer”, this step includes process description and stages, how sales process will start. Here, the purpose of the salesperson is to outline potential customer needs, do the customer segmentation and draft a sales plan which is then converted to sales targets. When finding the customers (marketing) is also part of this step where marketing preparations start. All these actions start from leads and contacting the leads, to get more information from potential customers.

Second, “Identify the Customer Needs”, this step includes preparations to identify customer needs and meet the customer. Before meeting the customer, calculations must be done concerning the sales potential of the customer. Information needs to be updated regarding the customer’s business and transportation segment, and the salesperson prepares materials to meet the needs of the customer. This stage also includes review of the customer’s financial situation, which already define the sales potential to proceed to next step. After the financial situation has been confirmed, identification of customer needs may proceed to a deeper level to identify typical needs of this customer’s business segment and bring our solutions to customer awareness. When the first contact has been made to the customer and the solution offer have been presented, the next step is to make the decision if the sales process should continue to the next steps to make a tailored offer to the customer from the company’s product and service offering.

Third, “Sell the Total Offer”, this step includes the offer building itself. This stage requires earlier detailed customer conversations where the customer detailed needs are identified. The total offer building starts with the suggestion of the new product (truck) to the customer and tailoring it to the customer’s needs. In this point, it must be made clear that if the customer needs a new or used vehicle (and compare it to what is available

now), and if the customer wants to give replacement for the company's old vehicle and if so, the replacement vehicle price must be defined. After that, the calculations for the new vehicle need to be done, and the expected services must be defined to finalize the pricing for the new truck. After finalizing the pricing stage, the offer is made and showed to the customer who approves or rejects the offer. After the approval, the deal is closed, credit applications are made, and sales contracts are signed.

Fourth, "Order and Plan the Delivery", this step takes place when the sales contract have been signed. This stage includes finalizing and confirmation of the GP, discounts, and approval stage of the ordering. After the approval, the order is sent to VTC, and order is put into the system where the order confirmation is received which includes CDD. Salespersons must also follow up the CDD and, if some unplanned changes occur, the customer must be informed and the new CDD will be informed to the customer. If the customer wants to make changes to the delivery or vehicle features, these must be executed at this stage, before the new vehicle is put to the manufacturing stage. All changes must be confirmed, if pricing changes, this must be discussed with the customer also and the documents must be re-approved and signed.

Fifth, "Prepare delivery", this step includes the handover preparations, the new vehicle inspections, the replacement vehicle final checking, so that the new vehicle is prepared for a handover for the customer. This stage also includes billing activities where the invoice for the new vehicle is prepared for the customer after the handover. Also, transportation damages need to be checked and claimed if any such exist. PDI is also done at this stage, as the PDI should be fulfilled before the delivery of the new vehicles.

Sixth, "Deliver to Customer and Follow-up", this step includes the new vehicle handover to the customer where the customer and the salesperson make arrangements as for when and where the handover will happen. Warranty conditions will be given to the customer, the new vehicle will be presented to the customer including all the features and functions of the new vehicle. Also, the test drive is necessary to conduct in order secure right usage of the new vehicle. After getting familiar with the vehicle after test-driving, all documents must be signed, and the aftersales services presented. Signed document will be archived, reporting that the vehicle has been delivered to all should be done to change status of the vehicle to "Delivered" to DP-TA. Vehicle information will be updated and the status of the delivery will be updated so that a follow-up call may be executed latest 3 weeks after the delivery.

As seen from the description above, the core TSP process is formed from six main topics, where each topic includes several TSP steps. The current sales processes steps are well defined and, currently, the case company assumes that there is no need to make changes to the core sales process in relation to new BEV truck sales.

At the same time, the case company believes that these six TSP steps need sub-processes which are specially defined for the sales of these new BEV trucks to strengthen the core process.

3.3 Analysis of the Current New TSP Process, and Actions and Needs in Relation to BEV Sales

This section focuses on those sub-steps and elements when selling BEV trucks that are currently being added *impromptu* to the traditional TSP process (described above) by the salespersons of the case company, in the *ad hoc* manner (i.e. not yet officialized or documented). This section will also touch upon those needed additions that are not yet done, but the need for them is already either identified or clearly felt when selling BEV trucks.

Step 1, "Find the Customer"

In this 1st step, it is important to understand that the new BEV truck sales to the customer do not only include just the new product itself, but a feasibility analysis of the customer purpose planned for this new BEV truck, meaning that *support functions* must make simulations and create suggestions, what is needed so this new BEV truck will survive in the planned operations. Customer maturity toward these new BEV trucks must be defined, so the salesperson and support functions may offer relevant services and sort out, what is required that the customer may take this new product in usage as it is planned to be used. For this end, the salespersons need training regarding these new technologies, as well as the new tools to analyze the feasibility of the customer case and project what new elements and new technologies bring, and how these new elements will affect the sales.

Importantly, in the traditional TSP process, close and open communication between the salesperson and support functions is in key position. Therefore, there is a stirring expectation that in the new BEV truck sales, different departments inside of the company

must also work together in order to achieve strong market position and spread knowledge and expertise widely between different departments. This makes part of the successful sales process, starting from the very beginning, Step 1.

*“Selling an electric solution is complex and takes long time. There is different pre discussion with the customer in terms of range and scouting the range where customer s driving, not to forget the charging. In some cases company is addressing new customers that doesn't have transportation as their core, example transport buyers. Establishing a trustful relationship with a new customer takes time.”
(Internal Meeting, day 1, 14 April 2021).*

Step 2, “Identify the Customer Needs”

Based on the CSA results, many questions from customers have come where answers need to be found compared to the current products. Questions related to this new BEV truck technical solutions, usability and how this new truck suits to customers business. In the technical way, this new BEV truck launch to be sold on markets causes a massive need to change the current thinking how to use the BEV truck efficiently and where these trucks are suitable. Change from the current well know and familiar trucks with familiar energy source is massive, because it is not only the new truck gets couple of new features compared to old one, the whole idea of usage, where to use it, how to use it but also, where and when customer may charge the batteries of the truck.

“To identify customers need” step is similar between BEV trucks and ICE trucks, customer need to perform logistic operations and deliver goods. Specialties are coming in this stage to found perfect solution which response customer’s needs. Customers are extremely interested towards these new trucks and high number of contact requests are coming concerning our BEV trucks. Some questions are related straight to sales where customer wants to have offer and some of the contact requests concerning more needs of information, what is happening now, tomorrow and in future inside of this industry.

“Battery electric trucks are new and unknown inside of the truck industry. Customers asking frequently, which energy course is best for our truck fleet now and tomorrow. These questions have riced up in several customer meetings which have been executed online or in

face-to-face. These questions were also present in SKALL seminar held in 3.11.2021 in Mall of Tripla, Helsinki. One of the topics of the seminar were renewable diesel, gas as fuel for trucks and electricity as energy for trucks. Most of the questions were related to alternative energy sources, and which one will suit best for the truck industry.” (Seminar 3.11.2021 Emob Manager.)

“Medium duty electric segment has high penetration especially in city distributing and refuse. With heavy duty BEV trucks, regional distribution can be achieved which means large volumes. To have good dialogue with the customer, we may address the needs of the customer and these needs may be fulfilled with BEV trucks.” (Internal Meeting, 15 April 2021.)

The early experience of the case company in selling the new BEV trucks shows that the sales process for BEV truck takes longer in time compared to well know products. Because this new technology cause uncertainty in customers when they are thinking to take the leap to something new, the salesperson and the support functions need to gather lots of information related to this new product such as technical features, customer case feasibility, but also evaluate *the customer readiness to start operating with this new product*. To give answers to customer, support functions will make feasibility analysis of customer case and simulate wanted BEV truck in wanted route to see, how it may work in wanted environment. This way salesperson and support functions together may reduce customer suspicions and range anguish to show results and answers, how we may solve the case.

Step 3, “Sell the Total Offer”

First, the process step like *Vehicle specification* should be re-considered, as well as how to execute vehicle specification stage. Currently, Vehicle specification is created for these new BEV trucks centrally by Emob Manager or support functions. But it has caused some uncertainty feelings, and it was mentioned in the interviews and discussion that this is not a good situation. It is clear, based on the CSA and discussion with different salespersons and area managers, that Vehicle specification must be created by the salesperson and open communication with Emob Manager must be going on all the time during the offer building process. Based on these findings, the sub-process for these

new BEV products must include a sub-step where the salesperson creates a Vehicle specification and discusses it with Emob Manager.

“When vehicle specification has been made centrally, there is no possibility to increase salesperson competence and salesperson does not know all the details from vehicle specification. This lack of knowledge cause feeling that case is not in salesperson control.” (Salesperson, area West.)

“To avoid situation where central team have been overloaded and can’t response to customer in decent time, it is important that salesperson can create vehicle specification by them self. Salesperson and Emob Manager should have in contact when creating vehicle specification to get common understanding from the case and be enabled to have match between simulation and specification.” (Salesperson, area East.)

Second, to make the sales process as easy as possible for the salesperson, new sub-process must match to the current TSP process seamlessly, and the salesperson must feel confident when discussing with the customer regarding the new BEV trucks. Salesperson must take Emob Manager with him when making the offer to the customer and it is important in this early stage, that all parties communicate seamlessly between each other. Thus, more co-operation between salespersons and Emob Manager is needed. The new BEV truck sales process are tight up to three actors - the salespersons, the Emob Manager, and the customer together. All three parties must cooperate so that a consistent offer of the new BEV product may be given to the customer.

Step 4, “Order and Plan the Delivery”

As respondents informed, based on the needs for BEV sales, the Order process itself does not deviate from the normal process at all.

“Order stage may start to follow normal processes starting of 1.1.2022. Until then, we may order vehicles via these special channels and send separate email for logistic responsible.” (Sales Engineer.)

The only thing which must be taken consider is that the customer needs charging devices to charge up the vehicle, which must be ordered in same time while placing the vehicle order. Also, if customer need a charging consultation, this is the stage when charging consultation is also put to action, meetings where and when are ranged and charging solution definition starting latest.

Step 5, "Prepare delivery"

As respondents informed, based on the needs for BEV truck sales, Delivery of the BEV truck for the customer goes same as any other truck. Only driver training arrangements need to plan so customer drivers may use the truck efficient and safe way. This driver training arrangements needs driver trainer Product Manager to make arrangements with the driver trainer team. Driver trainings must be planned well in advance so customer may book schedules for the drivers, but also driver trainer team may also make necessary arrangements for the training.

Step 6, "Deliver to Customer and Follow-up"

As respondents informed, after delivering the truck to the customer, the follow-up will happen in a normal way. However, because these products are completely new, the follow up needs to happen on a bit more detailed level and best practice sharing should happen with the customer. Real life experiences show that the most effective ways to learn and make references is to try how these new products will survive in a real customer business environment.

In summary, the sub-processes and the new TSP process maps need to be created to make a clear vision of the TSP process for BEV trucks: what special actions the new BEV trucks sales will require. The summary of the findings in relation to selling the BEV trucks is described in Figure 4.

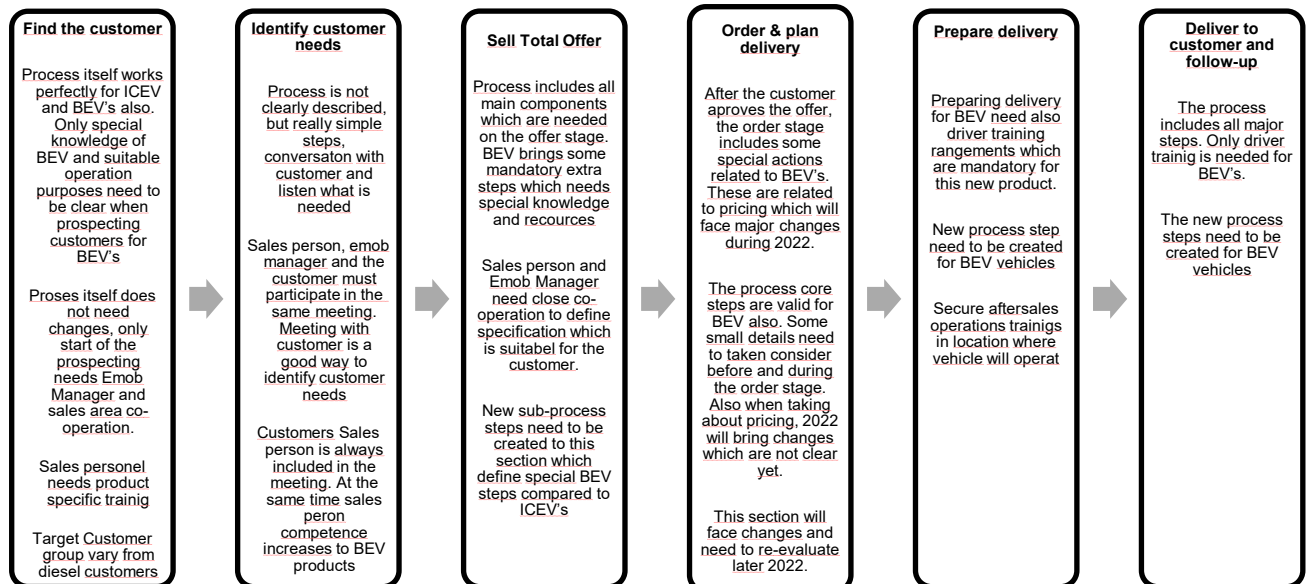


Figure 4. Summary of the current state analysis results based on core 6 TSP steps.

As the discussions with the salespersons showed, the new processes should include at least these elements added to the transitional TSP steps, and/or some of the steps may be integrated to be part of the core TBP process.

3.4 Key Findings from the Analysis of the Current New TSP Process, and Actions and Needs in Relation to BEV Sales

Based on the interviews and discussions, training sessions and experiences from real life cases, the sales process for BEV trucks have been coming clearer, but also further actions in relation to BEV trucks sales need to be clarified for further development.

3.4.1 Summary of CSA Results

Key findings from the current state analysis include the following:

First, the TSP process time is normally longer for BEV trucks, compared to well know ICE trucks which have been around since early 1990's. In the technical way, BEV truck launch to be sold on markets causes a massive need to change the current thinking how to use the product efficiently and where this product is suitable. Change from the current well know and familiar diesel truck massive, because it is not only the new truck gets a few new features compared to old one, the whole idea of usage, where to use it, how to use it but also, where and when customer may change up the BEV truck. Because this new technology cause uncertainty among the customers when they are thinking to take the leap to something new, the salesperson and the support functions need to gather lots of information related to this new product, such as technical features, customer case feasibility, but also customer readiness to start operating with BEV truck.

Second, it is critical to make the sales process as easy as possible to the salesperson. For this end, the new BEV-related sub-processes must match to the current TSP process seamlessly. When creating new sub-processes for BEV trucks, current TSP must be taken noticed to make sure that when BEV truck sales came business as usual, these new sub-processes do not make TSP unnecessary complex when selling BEV trucks.

Third, the salesperson must feel confident when discussing with the customer regarding the new BEV trucks. The most important thing is collaboration and open communication while creating the offer to the customer, so both, the salesperson and Emob Manager have the same information of Vehicle specification. Earlier, the sales processes for BEV truck sales were not specifically defined. After defining the actions specially needed to BEV truck sales, it became clear that salespersons need support functions to create material to support customer conversations. Support functions and Emob Manager responsible from new BEV truck commercial and technical matter must be in close and open communicating with salespersons when customer conversations are in actions. Only this way the new BEV trucks may be specified in the right way and the customer value proposition fulfilled. The key element what have been discovered is the need for close collaboration between the salesperson and responsible manager of these BEV trucks. Without seamless collaboration, it is impossible to produce a high-quality offer and offer materials, but also, customer need lots of information regarding usability and features of these new products and these information's must be accurate.

Fourth, the support function actions need to be defined. The new BEV truck sales process includes steps and information which are not previously needed when selling the current, normal and well known ICE trucks. These completely new steps and sub-processes are mostly taken care by the centralized support, but in near future, some of these sub-process steps must be part of TSP process and normal sales activities. Some process steps still need to be done centrally and support is still needed couple of years from now, because new BEV trucks brings with it completely new way of thinking, how customer execute business with these products and special, when offer to customer a turn-key solution.

Fifth, the sales organization needs training and knowledge regarding the new BEV trucks features and benefits, charging and TCO. Trainings and information shearing must increase significantly started beginning of January 2022. First training sessions are meant to give basic information for sales organization and next training session is deep dive to product itself. Moreover, the whole sales network needs training, support, and information regarding the product itself but also processes need to describe to all. Some sales areas are much more mature for these products that others, mostly because customer contact and real-life cases to sales of these new BEV trucks.

3.4.2 Selected Focus Area for Development

Based on the results of the CSA, the following developments need to be explored in this study:

- the sub-processes related to sales of BEV trucks to the current TSP process;
 - o in relation to *the Offer stage*, the new elements should mainly relate to this area. This because it requires lots of cooperation between the sales teams and support functions.
 - o in relation to *the Customer prospecting*, the new elements should also relate to this area. This stage is where everything is starting and it needs clear sub-processes for BEV trucks.

- in relation to *the Order stage*, the new elements should also relate to this area. This is the stage where vehicle is put to order book, driver training activities must also be thinks and discussed with driver training Product Manager.
- finally, there is a need to increase collaboration internally, and this topic should also be developed.

Additionally, as the automotive industry is facing a significant change now, especially transportation industry, due to electric trucks coming to market, it is important to analyze the automotive industry more closely, so that to help the company make sense of the competitive environment. The industry analysis can be found in Appendix 3. Next, the study moves to the search for best practice and available knowledge in relation to the identified challenges.

4 Existing Knowledge and Best Practice for Building the Sales Processes for New BEV Products

This section describes best available knowledge and best practice for building the sales processes for new BEV truck technologies. Previously, Section 3, the current state analysis, described the results of the current state sales process.

4.1 New Technologies

Automotive industry is under rapidly speeding change towards change where electric vehicles are being replaced by battery electric vehicles. This change specially in transportation and logistics sector is massive and can be considered biggest change in 20th century. Technical features are changing, customers need support and consultation about correct choices of technology what they are going to use in certain purpose. New technologies in fully electric trucks bring new services what are needed during sales process. Energy source and storage of the battery electric truck difference from ICEV's in way of fueling up the vehicle and amount of energy what vehicle can carry with during the driving.

Moreover, high powered public charging stations specially designed for heavy duty trucks are still rare, practically there is no such stations yet. Customers need own charging stations for overnight charging and for those trucks which are moving more, fast chargers are must to get vehicle charged between shifts. Charging up the battery electric truck takes from 0% of charge to 100% of charge from 2 to 12 hours, when fueling up ICE truck takes from empty to full tank of diesel only couple of minutes. Charging up and fueling up the vehicle and consumed time depends on size of the batteries and fuel tank, but in battery electric trucks, charging power and stability of the grid is also crucial. Large battery packs also gain significant weight to vehicle with expenses of payload. (Volvo 2021.)

Furthermore, in urban areas where routes are fixed or can be forecasted, battery electric trucks suits to these purposes already now. Fixed route means that company know their route stop and go point in advance, timing is also known so charging during the route can be happened. Heavy duty trucks which operate point-to-point routes, city-to-city purposes have well known route and time schedules. This means that charging can be well planned and will be possible to execute operators home location, which is most cost-

efficient way to charge the vehicle. Charging strategy is something customer must think when taking the leap from combustion engine powered truck to battery electric truck and choose between AC charging and DC charging. Charging may happen over-night when truck is not in use, but also mid-route charging can be taken consider if vehicle need charging during the day. (McKincey 2020.)

Also, route optimization for battery electric vehicles is important due to batteries can store limited amount of energy, which means also limited mileage with batteries only. Conventional route planning with ICE trucks normally takes consider time or mileage when consumed energy is not in that major meaning compared to BEV trucks. There are many things that affect to energy consumption kWh/km of the vehicle: rolling resistance, air resistance, road gradients, ambient temperature, weight and payload, accessories used in the vehicle, and driver behavior. Route topographies have major impact to energy consumption and range, meaning that on downhill, battery electric vehicle may generate energy back to batteries and in uphill energy consumption is higher. When air-condition or heating is needed, these accessories use also high amount of energy. In cities, traffic light stops and accelerations consumer energy. Driving behavior is in crucial position when evaluating the energy consumption. In urban areas traffic situation and traffic light affect to energy consumption and driving time, when driving in non-urban areas driving speed is making the difference. Higher the speed, higher the energy consumption due to air resistance. Due to battery electric vehicle energy storage capacity is limited, route planning is essential part of the battery electric vehicles. (Perger & Auer 2020.)

Importantly, new technology cause longer selling process time because electric trucks drivetrain is completely different compared to well know diesel trucks and need some additional and complex actions compared to diesel truck sales process. Electric truck may carry only limited amount of energy with it, stored to large traction battery system which meant that customer case needs to evaluate closely, wanted operation environment need to be simulated and charging solution think through in advance. Range anxiety is normal phenomenon with battery electric vehicles, especially when moving first time from ICEV to BEV. To reduce this anxiety, route simulations are must to investigate the possibilities, how the BEV truck survive from wanted route and under what conditions. Route simulations and analysing the results takes time, like also charging solution consultation. After analysed results are presented to the customer, the customer must also think, how the company business and operations suits to electric

solution and if the operations must adjust, how it is possible. Six different variables of consumers can be considered in this respect, which affect heavily to BEV range. These variables are listed on Table 4 below. (Volvo 2021.)

Ambient temperature	Approximately 10% affect to range when temperature goes from +10C to -20C (mostly because cabin heating)
Payload and GCW	Impact approximately 2% per ton
Average speed	Impact 1,3% per 1km/h
Tyres	Approximately 5% per class of tyre
Battery age	Approximately 20% from new to end of life.
Driver behaviour	At least 20% which makes this most considerable consumer.

Table 2. Energy consumers for BEV. (Volvo 2021.)

Thus, at least these different options are needed to be looked carefully into, how this new technology fits to customers operations, takes time, which means longer sales process to BEV trucks compared to ICE trucks. (Volvo 2021.) The key options relevant to the topic of this thesis are discussed in more detail below.

Table 5 illustrates different charging options for BEV's. Charging strategy is essential to think in early stage and evaluate, which strategy suits best for the case. Different strategies are listed on table five below.

Characteristics of charging strategies					
	Overnight only	Overnight and mid-route¹	Mid-route¹ only	Battery swapping	Overhead catenary
Location	Operator's hub	Operator's hub and private or public mid-route charging station	Private or public mid-route charging station	Operator's hub or public swapping station	While driving, using catenary
Cost	Low Capital expenditures if only AC charging; operating expenditures can be lower if charging when electricity cost is lowest at night	Potentially lower capex for chargers and smaller battery; higher opex if using public mid-route charging	Potentially lower capex for chargers and smaller battery; higher opex if using public mid-route charging	High capex for swapping infrastructure and battery storage; high opex for swapping labor	Considerable cost for building catenary infrastructure
Feasibility	Viable today	Limited availability of mid-route charging infrastructure	Limited availability of mid-route charging infrastructure	No pilots for commercial sector	Some pilot projects announced
Flexibility	No flexibility for externalities or total route length	Option to extend stops if needed	Needs predictable routes	Possible only where swapping station available	Possible only where catenary available
¹ Mid-route charger owned by operator or public/third party.					

Table 3. Charging potential options for battery electric truck (McKinsey 2020).

Table 5 shows different charging strategies and their feasibility, cost efficiency and flexibility related to location. As can be concluded from this summary, the most cost-efficient way of charging is to charge up the BEV in operators' hub or depot where they are parked overnight and charge with low power. Overnight-only charging strategy assume that BEV truck drives only one shift a day and have batteries large enough to drive planned daily route. Overnight-only charging strategy is possible already with today's infrastructure and technology. Second strategy is the overnight and midroute charging when the operators charge the BEV during night with low power chargers and during the day with high power fast charger. Midroute chargers can be located to rest stops, destination warehouses, public retail locations or truck rest stops. Overnight and midroute charging strategy is for purposes where battery pack is not large enough to cover full day operations. In midroute-only charging, operator use and rely only public and private charging during the route. This will only be possible when charging stations are available in route where operator is driving. This charging strategy is suitable for operators which do not have own depot parking or parking space is limited. Fourth strategy is battery swapping. On this, discharged batteries are replaced with fully charged batteries, at the hub or depot location or midroute as dedicated battery swapping stations. Battery swapping is extremely time efficient way compared to normal charging,

but cost of this strategy could be significant, especially if operator have multiple different BEV trucks and all these have different batteries. Even if batteries would be similar, battery stock need to massive to serve all of the BEV trucks. Overhead catenary charging is for the truck with no batteries at all or the batteries are quite small. This strategy truck drive fixed route while getting power from overhead catenary which directly provide electricity to truck. This strategy make sense only for extremely limited and short routes, for example inside of the mining applications. This because extremely high capital expenses needed to build up large catenary network, where fixed routs will make high limitations of usage of these kings of trucks. (McKinsey 2020.)

Finally, wireless charging is possible also and in these, there is used inductive charging technology. On Gotland, there is pilot test ongoing where 1,6 km of electric road, where copper coils are placed under the asphalt and electricity is generated to vehicle while vehicle is driving on this road. This require inductive technology from vehicle also to be enabled to use this inductive charging road and when vehicle may use this technology, it may reduce the need of standstill charging. Smartroad Gotland project in Gotland is not one of its kind, because similar projects are ongoing in other parts of the Sweden also to seek solutions for net-zero transportation. (Smart Road of Gotland 2022.)

Summing up, new technology brings also demand about training of salespersons so they can offer high sales experience to customers how are interested to BEV trucks. Knowledge about BEV truck benefits, TCO comparison and what models are available is essential. Knowledge regarding batteries and how batteries affect to range and payload is one major thing which need to take consider when selling BEV trucks. Charging knowledge regarding vehicle range, charging setup in home and public charging opportunities need to be trained to sales staff. Charging is most important considered topic after the BEV truck which need to solve when customer takes BEV truck to use. (McKinsey 2020).

4.2 Business Model

Business models are not strategies. Every business model is based on customer value proposition and company must create value proposition so that customer choose our company instead of competitors. Business model should not be mixed to strategy, because business model comes first, and strategy is much more wider concepts. When competition comes along, company start to create strategy, how to serve customer better than competitors. When creating basic business model, purpose is to bring recourses and processes together to generate value to customer and revenue to company. Business model can be put to four main element that when putting together create and deliver value: (Spencer 2013.)

1. **Key resources** to build business model
2. **Key processes** are routines where recourses are turned to value which is offered to customer
3. **The profit formula** to evaluate how the company makes profit while performing value to customer
4. **Customer value** proposition explains what benefits your products and service offering are attended to provide to customer. (Spencer 2013.)

Other element beside of these four mentioned are company leaders' visions and experiences, customer will also affect and relationships between company and its customers. Customer relationship between company and customer must be cared and maintained for if it's to be sustained. (Spencer 2013.)

When business model purpose is to create value to customer, business models need to be simple enough so everybody can understand it but not too simple to identify all needed actions around the business model and most important, business model must be relevant. In the end, business model purpose is to identify key activities and logic, how company have planned to create revenue and profit. Business model can be described through nine different building blocks by using Business Model Canvas, which are presented to chapter 5.2.1. (Osterwalder, Clark & Pigneur 2010.)

4.2.1 Business model canvas

One way to identify and describe business model is to use Business Model Canvas and its nine building blocks. Business model canvas includes four key building blocks: Customer, offer, infrastructure and financial viability. These blocks are illustrated in Figure 6 below.

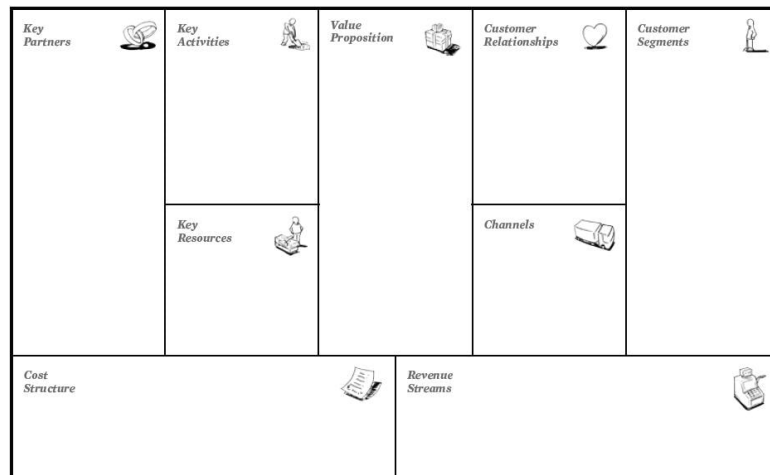


Figure 5. Business Model Canvas, Customer Segment (Osterwalder et al. 2010.)

The elements are explained below starting from the revenue and cost elements.

Revenue block is based on successfully executed and offered value proposition to customer. Company can get different type of revenue streams like transaction revenues from one-time payment, or repeatable payments from delivering the value proposition to customer or provide post-purchase customer support. To generate revenue streams, there is many options like asset sale, usage fee, subscription fees, leasing, licensing, brokerage fees, advertising etc. (Osterwalder et al. 2010.)

Other side of business model canvas is cost block which illustrate all necessary costs to run business. Costs are generated from operations to creating and generating the value, maintaining customer relationships, and generating revenue. Cost can be calculated when we know company key activities, key recourses, and key partnerships. Different cost structures are fixed- costs, variable costs, economies of scale and economies of scope. (Osterwalder et al. 2010.)

4.2.2 Business model canvas revenue stream blocks

First block, Customer Segment describe those customers and companies what organization want to reach to offer services and products. Customer is central and most important piece of business model because no company may survive without profitable customer relationship. Company must make careful and precise customer analysis, what kind of customer segment company want to serve. After this definition and decision, company may start building precise business model around these chosen customer segments and needs of these customers. Second block is Value Proposition which purpose is to offer services and products to specified customer segment and, on that way, create value to customer. Company value offer is only reason why customer use this company services. This value offers solutions for customer problems or needs so customer may perform its own business and “get the job done”. Third block of business model canvas is channel, which purpose is to reach and communicate with customer to make possible delivery of value proposition. This part of business model is most important to gain high level customer satisfaction because this is the touch point between customer and the company. In customer relationship block is described the type of relationship that the company create to customers and customer segments. Customer relationship can be personal or automated and these relationships can be driven by the type of wanted customer relationship. These wanted relationships can be like *customer acquisition* and *retention*, but also *boosting sales*. (Osterwalder et al. 2010.)

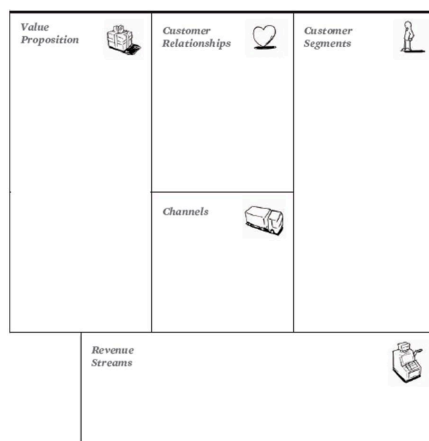


Figure 6. Business Model Canvas, Revenue streams (Osterwalder, Clark & Pigneur 2010).

After these four blocks of Customer Segment, company generate cash flows and this block is called Revenue Streams. Revenue stream blocks are illustrated on figure 7. (Osterwalder et al. 2010.)

4.2.3 Business model canvas cost structure blocks

When customer segment is defined, it's time to look business model Key Resources which is next building block of Business Model Canvas. This block describes most important assets of the company to make business model work. Key recourses can be owned or leased by the company, physical, financial, human, or intellectual. Next block is called Key Activities which describe the company key activities what is needed to be performed to make business model work. Key activates can be like Production, Problem solving, Platform/network. Key Partnerships block describes supplier and partnership network what is needed to make company business model work. Key partners are important to companies in many reasons, like reduce risks or get resources to perform needed operations. There can be identifyee four different kind of partnership: "*Strategic alliances between non-competitors, Coopetition: strategic partnerships between competitors, Joint ventures to develop new businesses and Buyer-supplier relationships to assure reliable supplies*". Final block Cost Structure descript most important cost structure from operations which are forms to keep business running. (Osterwalder et al. 2010.)

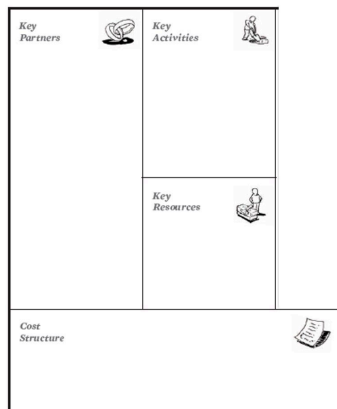


Figure 7. Business Model Canvas, Cost structure (Osterwalder, Clark & Pigneur 2010).

Cost from value delivered to customer segments, maintaining customer relationships, and creating revenue can be defined from needed Key Recourses, Key Activities and Key Partnership. When these Key blocks of Business Model Canvas is well known, company cost structure can be defined. Different type of costs can be fixed costs which do not vary no matter volume of delivered goods or service, variable costs which vary depending on volume of delivered goods and service. Cost structure blocks are illustrated in Figure 8. (Osterwalder et al. 2010.)

4.2.4 Value Proposition

Value proposition means value which company offer deliver to customer, or in other words, proposed benefits delivered to customer. Value proposition can be divided to three categories: *all benefits*, *favorable points of difference*, and *resonating focus*. Main differences between these three categories are needed knowledge of customer and competitors or industry competition forces. (Anderson et al. 2006.)

In first method, *all benefits* value proposition, company list all the points they think prigs value to customer. On this method, volume matters meaning that more company may list benefits, the better. This method does not require deep level knowledge of the customer or competitors and it is some way easy to build. However, this rather simplified value proposition and lack of knowledge of customer may lead to position, where company's offered benefits not bring any value to customer. (Anderson et al. 2006.)

Second method, *favorable points of difference* value proposition, require more efforts from company compared to first method *all benefits*. In this method, company recognize that customer have other options to choose, meaning that company need to have deep knowledge from the customer and competitors. This value proposition has always competition position towards company competitors and company need to convince the customer that our product and value proposition brings more benefits to you compared to our competitors. Due to competition setup with other suppliers, company must know the customer so company may point out meaningful points of benefits which have real value to customer. Without deep knowledge of the customer needs, company may point out completely wrong features from the product or service whin does not bring any value to customer and this way loose the deal to competitors. (Anderson et al. 2006.)

Third value proposition way *resonating focus* require most effort and knowledge from the customer, due this method purpose is to deliver high quality and superior value proposition which may answer only few points of customers need but bring most value to customer. This method purpose is to convince the target customer by demonstrating the benefits of the value proposition and documenting the benefits in way that clearly shows company understand customers business needs. This value proposition method differs in two significant ways from *favorable points of difference*. Firstly, less is more. Meaning that company focus only one or two points which deliver most value to customer and where company resources may focus to improve the value proposition in future. Secondly, this value proposition includes high level of competition where competitor may

try to convince customer that their product or service offer more value and benefits to customer. On this situation, deep knowledge of target customer and competitors put company favorable position when company must ground their offer. (Anderson et al. 2006.)

4.2.5 Value proposition canvas

Value proposition canvas is a tool for business model canvas to help evaluate value proposition through customer segment more precisely. This tool helps the company evaluate their value proposition for customer more accurate, test their value proposition and see more accurate what certain customer segment want. Value Proposition canvas is presented in Figure 9. (Strategyzer 2020.)

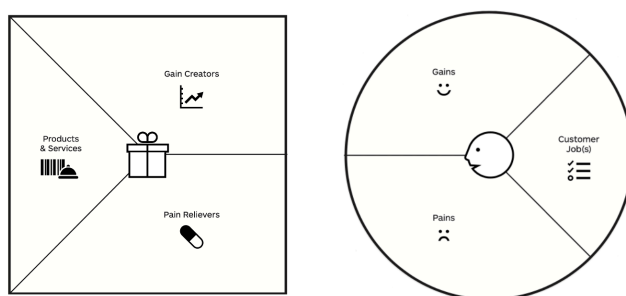


Figure 8. Value Proposition Canvas (Strategyzer 2020).

For this tool, customer jobs are meant to be defined and pains which may occur before, during or after customer perform their job. Gain section to define gains what customer expect to get from performed job. After customer segment have defined, it's time to define company products and services what are meant to reach customer demand and create value to customer. The purpose of these products and services is to help create customer benefits or alleviate customer pains. (Strategyzer 2020.)

Summing up, Value proposition is most important thing when company executing its business. Value propositions define, what company are offering to customer, what are the customer jobs customer is performing. When value proposition and needed actions are clear, company may identify needed resources. To make company business running efficient way, company need processes to address needed resources to make people work efficient way. Due to this thesis is focusing to sales processes, next Section 5.3 purpose is to bring knowledge around processes.

4.3 Business and Selling Processes

Processes and proves improvements, where processes have been re-engineered, purposes of these actions are to improve company performance when company is working as goal-oriented way. Process management key focusing areas *customer focus, system thinking, goal orientation, value adding activities, feedback used to modify operations and performance improvement*. Processes are value adding chains where process purpose is to use resources to utilize value for customer. Process get input from customer which may be internal or external, but this input from customer always set expectations, needs and requirements towards the process. Process add value to customer needs and expectations, when form of output can be product, service, or other kind of solution. To perform activities what processes need, process needs recourse which can be like raw materials, tools, capacity, capital, knowledge, or workforce. Source of the recourse can be internal or external, common between these is that resources is that they cots money and are always limited. Different type of processes can be split between process and business process, where business process purpose is to generate revenue and profits for the company. Other type of processes can be considered core and support process, where core process always has customer contact where support process purpose is to serve core process from inside the company. When talking main and sub-processes, main process can be divided to several sub-processes which can be split to multiple different levels using hierarchy. When improving processes, there is always current processes and target processes, where target processes are the processes where current processes should be. (Martinsuo & Blomqvist 2010.)

In process developing, it is important to specify the scope of the development project and choose which process steps are affected to this development project. When started developing current processes, it is important to get data out from the current process to see how the process working now and illustrate these functionalities. This data can be collected by using interviews, group work, data mining from performance, observations of the process and simulate the process. After analyzing the process and identify the target areas, the target process is illustrated and modeled in that way so target process may reach its objectives and set targets. After modeling, target process is tested by using simulation or piloting in real business environment. This way target process can be

followed, observed and bugs can be corrected before final process can be put in action. Piloting and testing are extremely important before putting new designed target process in action so bugs and mistakes can be fixed, so costly mistakes are not happened in later stage when target process is put in action. When evaluating target process needs, process can be evaluated from end to star to see, how company may fulfill customer values proposition. In this way, all needed actions can be identified as needed tools and software's also. (Martinsuo & Blomqvist 2010.)

Companies that aim to continuous process improvement use Lean or Six Sigma methods which are methods for process change and improvement. Difference between Lean and Six Sigma is that Lean is name for subset of ideas which coming from Toyota Production System, where Six Sigma meant to make employees to be aware of value the improvement and make support continuous improvement. Company processes should be mapped, measured, and understood by them how managing these processes. To get acceptance of process development, involving workers to be part of process analysis and chare the success with them, workers get satisfaction to be part of the changing process and approve change more easily. (Harmon & Davenport 2014. p,293 - 300.)

The selling process includes seven steps starting prospecting and qualifying the potential customer, to planning the sales call and to approach the prospect. When contact have been made, sales presentation and product demonstration will be held to go in negotiation phase which led to closing the deal. After closing the deal, follow up phase start and aftercare begin. After these seven steps illustrated in Figure 10 have been walked through, process starts all over again from prospecting and qualifying. (Hair et al 2020 p, 96-116.)

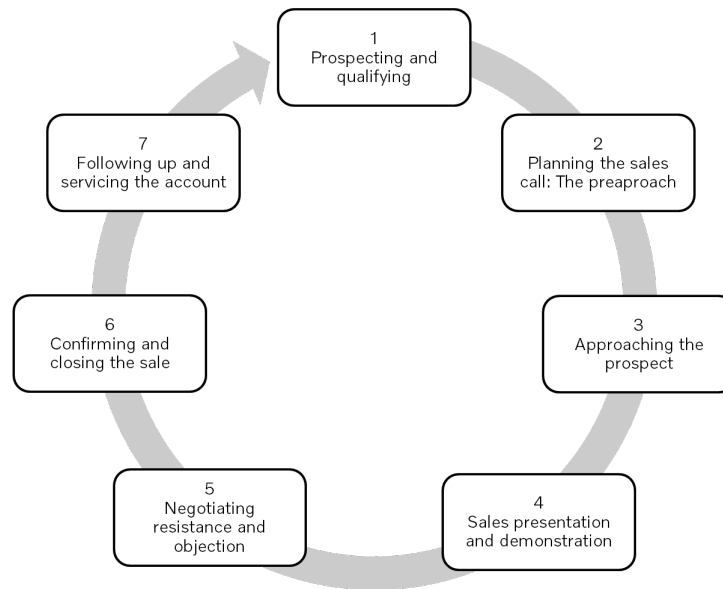


Figure 9. Selling process (Hair et al. 2020, p 100).

When sales process and all seven steps have been walked through, process starts all over again from prospecting and qualifying. Normal purpose of prospecting is to seek new potential customer to maintain or increase sales volumes and is done via leads. Lead is normally a phone number, address or name of the company which needs company's services or products. Before considering the lead be valid prospect, salesperson must qualify the lead *need or want*, *authority to buy*, *money to buy (financial situation)* and *eligibility to buy* (e.g., salesperson who contact wholesales can't bypass the to sell retailer without effecting to channel relationships). Different methods of prospecting customers are shown in Figure 11. (Hair et al. 2020 p, 96-116.)

Looking for New Prospects	
Random-Lead Searching Methods	
Door-to-Door of organizations	Advertising (print, broadcast, or online)
Territory blitz of organizations	Websites, social media
Cold calls on organizations	Electronic mail (e-mail)
Selective-Lead Searching Methods	
Direct sources	Indirect sources
Networking through friends, neighbors, colleagues and acquaintances	Postal or electronic sales letters, oftentimes with attachments
Personal observations	Trade shows, fairs and exhibitions
Spotter, or "big dogs"	Professional seminars and conferences
Current satisfied customers and former customers	Contests or lotteries for prospects to enter for a chance to win a product or service
Endless chain (obtaining referrals from prospects and customers)	Free gift offers that entice prospects to listen to sales presentation
Centers of influence (joining social or business groups to meet potential prospects)	Unsolicited inquiries sent to prospects
Surveys	Telemarketing
Internet	
Sales associates and professional sales organizations	
Company records, directories, mailing lists, news letters	

Figure 10. Looking for new prospects (Hair et al. 2020, p 101).

After successful prospecting and qualification, salesperson prepare presales approach by investigating and gathering detailed information about the prospect, what prospect needs and what kind of problem prospect needs a solution. (Hair et al. 2020 p, 96-116.)

To summing up, the processes main purpose is to add value and key focusing areas are *customer focus, system thinking, goal orientation, value adding activities, feedback used to modify operations and performance improvement*. Executing processes require always recurses and these recurred must be addressed in early stage and pointed out into the process maps. When developing the processes, current situation must be evaluated before process development may go to developing phase. Companies that

are focusing to process developing, use Lean or Six Sigma methods. Common thing to getting company employees onboard is to involving employees to be part of the process analysis and share the results with them. When employees are involved in development, change is easier to embrace among employees. What's coming to selling process, selling process can be considered as a loop, which is starting from prospecting the customer, to planning and approaching the customer to sales presentation, negotiation and closing the deal. When "loop" coming to last stage, follow up, it's time to start sell process again from prospecting.

4.4 Conceptual Framework of This Thesis

This section describes conceptual framework of the thesis. Figure 12 below illustrate key elements of the conceptual framework.

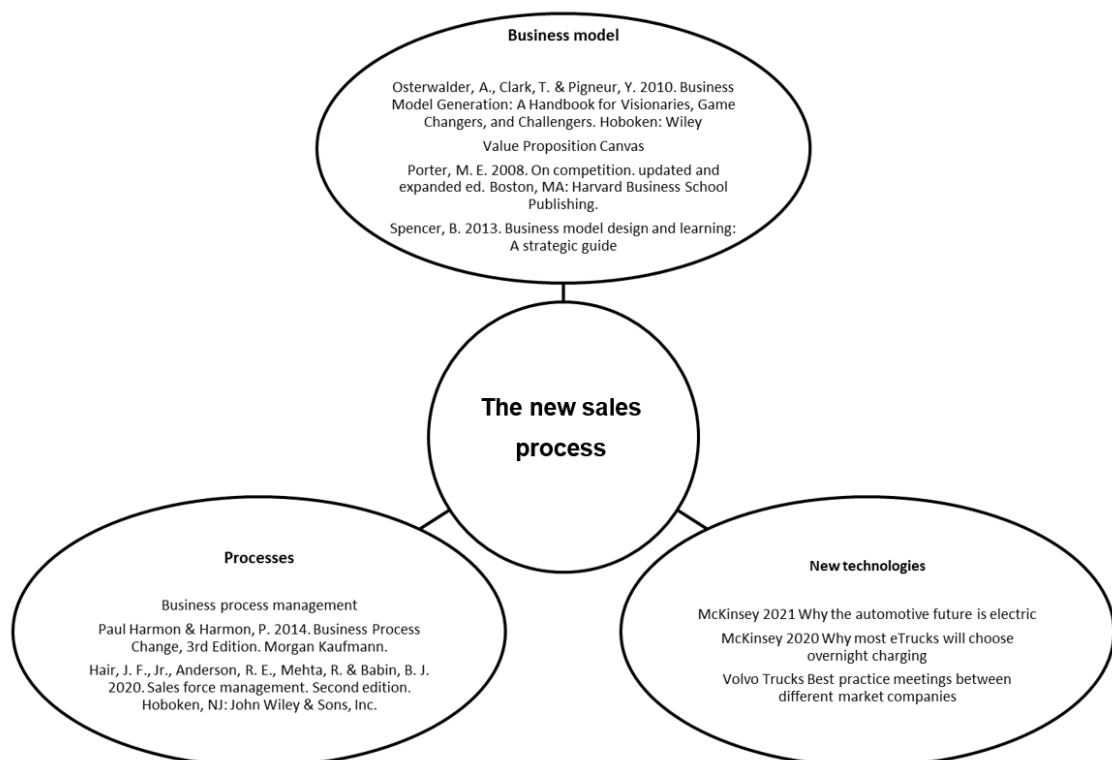


Figure 11. Conceptual Framework of this study.

The first part of the conceptual framework draws best practice for building the new sales from the specifics of the *New technology* for usage in BEV trucks. This technology will bring new knowledge of battery electric vehicles and how this new type of vehicles will influence the industry and the sales process. Charging solutions are in major role in

battery electric trucks and different type of charging strategies must be considered when taking battery electric trucks in use. Thus, these specifics need to be reflected in the new steps of the traditional sales process.

The second part of the conceptual framework draws best practice for building the new sales from *the Business model*. Purpose of this part is to identify value proposition to customer, what channels and relationships are used. Recourses are also defined by creating process maps to support new product sales. Five forces analysis to industry is also created to identify powers which are affecting to truck industry now.

The last part of the conceptual framework draws best practice for building the new sales from *Processes and process improvement*. Due to BEV trucks and something new in trucks industry and not much research material available, best practice meetings are extremely important to share knowledge and experiences between different markets. This way un mature markets may learn from more mature markets which already have some years of experience to build strong worldwide market position in this early stage.

5 Building Proposal for a New Sales Process for the Company

This section merges the results of the current state analysis and the conceptual framework towards the building of the Proposal using Data 2.

5.1 Overview of the Proposal Building Stage

First, the building of the proposal comes from specifying the sub-processes in the current TSP process. In this Proposal, the three key elements from new TSP process are selected to take under development in order to support sales strategies now and future. In addition, also the need for increased collaboration is proposed as the fourth element of the proposal.

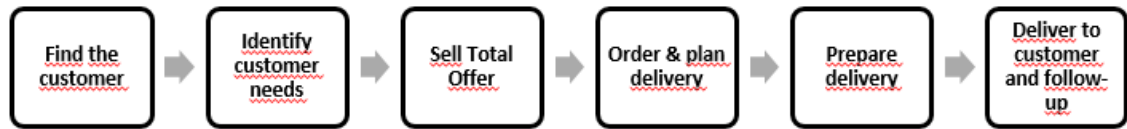
In order to build a future-oriented sales process, in this Proposal it was also necessary (before building the actual elements of the Proposal) to also look into the Customer Value Proposition, so that to make sure what is offered to the customer and find agreement to this topic in the sales team. Thus, the Customer Value proposal made part of the input into the Proposal building, as part of preparation for building the actual sub-processes for the current TSP process. The results for this preparation are reported as part of Section 6.2 below.

Thus, the Proposal was built from the inputs of (a) the current state analysis results and the industry analysis results (in Appendix 3); (b) suggestions from literature and best practice as for building the sales process, (c) inputs from the stakeholders, mostly from the sales team of the case company, and (d) the inputs from brainstorming the Customer Value Proposition of the new BV products with the sales team.

The three elements of the Proposal are reported last, in Section 6.3 below.

5.2 Findings from Data 2

First, based on the findings from the current state analysis, the special features of the new BEV product affect strongly to the current TSP process and actions by the sales personnel. The current TSP process contains 6 key steps, as shown below, that were further expanded to include the needs related to selling the BEV products.



The current TSP process was somewhat adapted to the needs when selling BEV products via adding additional sub-processes. Some on them have already been in use by the case company (as *ad hoc* additions), and some were co-developed with the stakeholders during the Proposal building, in Data collection 2. (This part is presented below in Section 6.3).

Table 6 pulls together the results from CSA, input from CF, and stakeholder suggestions for Element 1 of the Proposal.

Table 4. Key focus areas from CSA, input from CF and suggestions.

	Key focus area from CSA (From data 1)	Input from literature (CF)	Suggestion from stakeholders (summary of Data 2)	Description of their suggestions (in detail)
1	New Truck Sales Process considering the special features of selling new BEV products	The ideas for the sales processes, based on (a) hopes and uncertainty around the new technology and the inputs from (b) the Industry analysis and the Customer Value Proposition from the new products (done earlier in the CSA stage).	a) Bring vehicle specification close to salespersons to increase self-confidence in customer conversation situations b) Make SC calculation possible to service product salesperson to increase knowledge and make process faster	Both processes must be executed in close co-operation between support functions and salespersons. Several points are still under development, some crucial software's does not open for market companies yet, so not everything must be released in once, but step by step. Sales trainings for sales organizations must be done immediately to increase competence and to make process steps as clear as it can be.
2	Offer element	When creating offer to customer, we must know what customer is needing and how our value proposition will fill	Specification and route and range simulation must match between each other. For the customer, ready solution where can be clearly seen what is possible	Offer to customer should include "turnkey" solution, concerning the vehicle and route. When specification is tailored to customers' needs and route simulation give confidence to customer that

		up the need of the customer.	and what is not. Give overview of services available, which create value to customer and relieve doubts towards ne BEV truck technology.	with this tailored BEV truck customer may execute its business, its make possible to proceed to close the deal. Other services like Driver Training, Charging Consultation, Dynafleet and Volvo Connect, Aftersales Services like workshop readiness, Smart Tire Service and one of the important one, service contract tailored to customer needs. All of these services are for customer, so customer may concentrate to its core business.
3	Customer prospecting	Customer prospecting can be happened in many ways, from random-lead to selective-lead method.	We must address current customers first, contact them and offer our value proposition of BEV truck for them. Also, new customers how are not yet our customer must be seek also.	Early adopter customers how are the first ones should not be price sensitive. We must seek from current customers the potential ones, but also seek new customers, who are not yet Volvo customer.
4	Order element	One of the selling process last stages are ordering the vehicle, which leads to last, follow up stage and servicing the account stage	Ordering the BEV truck have been executed before 21.12.2021 via email which were send to Sales Engineer and Logistic Manager email address. Copy of the mail were send to Emob Manager and Product Manager. Starting from 1.1.2022, ordering the BEV truck is executed in by using TSP process	Precious way of ordering the vehicle were only temporary solution. Correct way of ordering the BEV truck from factory is to follow TSP process. Only to secure that information of ordering the BEV truck reach correct stakeholders, it is essential to add these stakeholders to be copy of the email message.
5	Collaboration	Collaboration between different parties is kay to successfully executed business model and make processes to work. Key processes are routines where recourses are turned to value which is offered to customer	Whole sales organization collaboration is only way to succeed in BEV truck sales and achieving the targets.	Whole sales network must be onboard with sales of BEV trucks, meaning private dealers and own sales areas also.

As seen from Table 6, some of salespersons feel insecure when operating in the way what were planned originally to start sales of the BEV new products, but at the same time, other salesperson approached the new methods with more open mind. Because of these mixed feelings, the sales processes specially meant for the BEV trucks sales, need to follow closely current TSP process and be part of it as sub-process.

Table 7 pulls together the results from CSA, input from CF, and stakeholder suggestions for Elements 2 and 3 of the Proposal.

Table 5. Key focus areas from CSA, input from CF and suggestions.

	Prospecting	Evaluation of suitability for BEV	Quote	Pricing	Handover
Salesperson	Salespersons have best knowledge from the customer. Salesperson and customer relationships is always personal in some level and customer trust salesperson.	Most of the evaluation after prospecting have done by support functions by using simulation tools. Results will be analysed and after analysis, results have been given to salesperson. In some cases, customer meeting is mandatory to	Offer stage includes two main parts: Vehicle specification and ERS simulation. Both must be match and ERS mostly based on evaluation stage simulations.	Pricing processes do not include any changes compared to standard TSP. Other parts of the pricing model are confidential.	Handover stage includes driver trainer where driver trainers range the training session with customer.
Communication		This phase requires clear communication between salesperson and support functions. Especially in this early stage when BEV are really new in truck industry. This stage will give answers for customer, is the case feasible for electric truck and in what conditions.	Vehicle technical features and simulations must match 1:1. Without close cooperation and communication, there is high risk that simulation and analysis are incorrect.	Pricing stages require close and precise communication between salesperson, price manager and support functions. Other parts of the pricing model are confidential.	
Support Function		Create simulations and analyse feasibility of the case. Create materials for the deal from simulation results which show clearly, can wanted operation be electrified.	Help salesperson to built quote. Produce support materials to support vehicle technical specification so company may create comprehensive offer.	Pricing processes do not include any changes compared to standard TSP. Other parts of the pricing model are confidential.	Support salespersons in handover and if needed, introduce the vehicle for customer

Second, the inputs for the sales process building were also considered from brainstorming the Customer Value Proposition of the new BEV products features. The summary of the brainstorming with the stakeholders of the Customer Value Proposition can be seen on Business Model Canvas below, as shown in Figure 13.

Value Proposition We can provide an electric transport solution with zero exhaust emissions.	Customer Relationships Salesperson knows their customer, close contact where customer need to trust sales person	Customer Segments Transport and logistic companies: Short radius distribution in urban areas Waste collection companies in urban areas Construction companies delivering e.g gravel, concrete, hardware equipments Transport buyers: Wood industry, steel industry, energy industry, food industry, municipalities,
	Channels Sales teams to deliver the product Marketing materials (News papers and digital) Events, fairs and exhibitions	
Revenue Streams Product BEV Service Contract Leasing		

Figure 12. Business Model Canvas, customer segment.

For building a future-oriented sales process, it was necessary to clarify and evaluate the customer value proposition of the new BEV products. The customer is in the key position in the TSP process and the customer value proposition is key to successfully business model. The elements of the Customer Value Proposition were discussed; their summary can be found in Appendix 2.

Value proposition canvas can be seen in Figure 14.

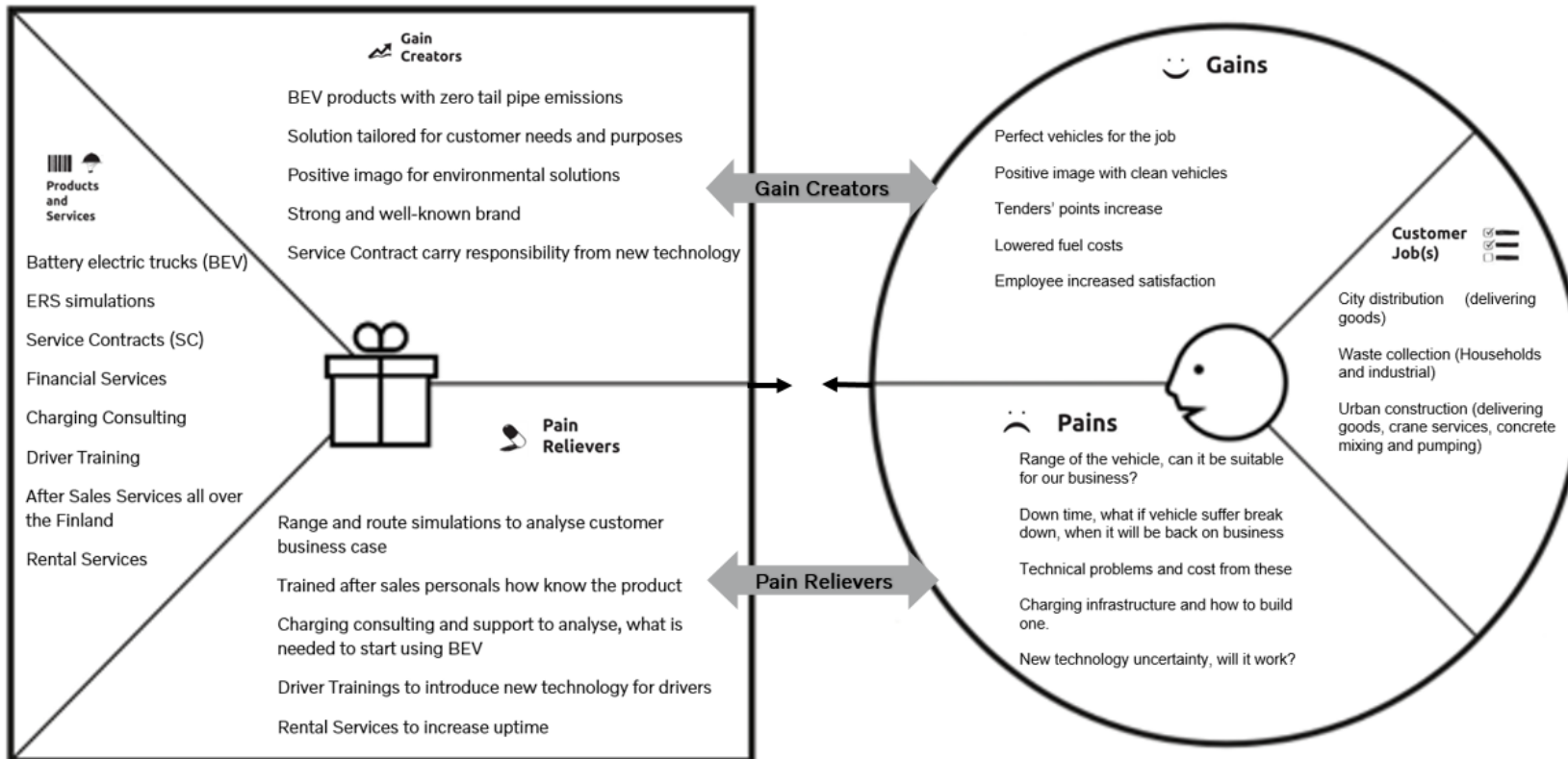


Figure 13. Value Proposition Canvas for the new BEV products.

Summing up, the following inputs were used for building the Proposal for the new sub-processes for the current TSP process: (a) the current state analysis results and the industry analysis results (in Appendix 3); (b) suggestions from literature and best practice as for building the sales process, (c) inputs from the stakeholders, mostly from the sales team of the case company, and (d) the inputs from brainstorming the Customer Value Proposition of the new BV products with the sales team.

The three elements of the Proposal are reported last, in Section 6.3 below.

5.3 Element 1 of the Initial Proposal: Sub-processes for the Current TSP Process, in Relation to “Offer”

The new BEV-related sub-process maps in relation to the “Offer” was created that is shown in Figures 15 below. As seen from Figure 15, the new TSP process maps includes (in relation to BEV sales, in part of the Offer):

Addition to Process step 1: customer prospecting, contacting, and defining customer needs, pricing models and special actions needed for the new BEV product sales process.

Customer prospecting is first step in this sales process. Customers who are already familiar to our company need to define again, who are the potential ones and how to evaluate the customers. When making customer prospecting, customer needs and environmental goals must be defined, but also, the customer must be financial stable to be able to purchase these new products. Prospecting steps have described on the process chart in Appendix 1.

Process step one includes specifically for BEV trucks made sub-process which includes wide range of special actions compared to normal ICE truck. BEV truck need route and range simulations based on customer wanted route or task. This stage includes also defining needed charging setup in high level, charging strategy, time, and place where charging needs to be happen so wanted route or task is suitable for BEV truck. All these results are analyzed and given to salesperson in writing and go through verbally if needed.

Addition to Process step 4: In process step 4, when vehicle superstructure is defined with subcontractor, products which are available today not need major specific actions. Subcontractor must be aware of special features of these new products and subcontractor need training, pointed to these new BEV trucks. These subcontractor trainings are not included to this thesis. Process steps require same recourses from sales organization to be executed in step 4, and subcontractor training need recourses from support function.

Superstructure is important element of commercial vehicles, especially trucks. In BEV trucks, superstructure energy consumption must be defined and be known on process step one, where range and route have been evaluated for customer. Energy consumption of the body depends on the type of body, usage intervals and time of operation. These important points are got through on step one also while range and route analysis.

Addition to Process step 10: Process step 10 includes instructions to build the offer and defining pricing. Perspective of building the offer, require actions from Emob Manager and salesperson, to gather all necessary information like: Vehicle specification, superstructure, range and route simulation, possible charging setup and charging consultation. Salesperson responsibility is to create BEV truck specification with collaboration Emob Manager, and Emob Manager responsible is to create range and route simulations. These two elements will be synchronized between salesperson and Emob manager to ensure that offer will be valid from BEV truck technical perspective and is suitable for customers wanted operation in range and route perspective.

Price definition is executed like described on TSP, meaning that salesperson make contact to Price Manager who define price for the BEV truck and add needed accessories, like charger if needed to truck pricing. Special feature for the BEV truck is that Emob Manger is always included to price discussion, and Price Manager must add charger prices to IM so vehicle pricing is valid. Process step 10 will be executed eventually as described on TSP, when sale of BEV trucks starts to increase and be more common among sales teams.

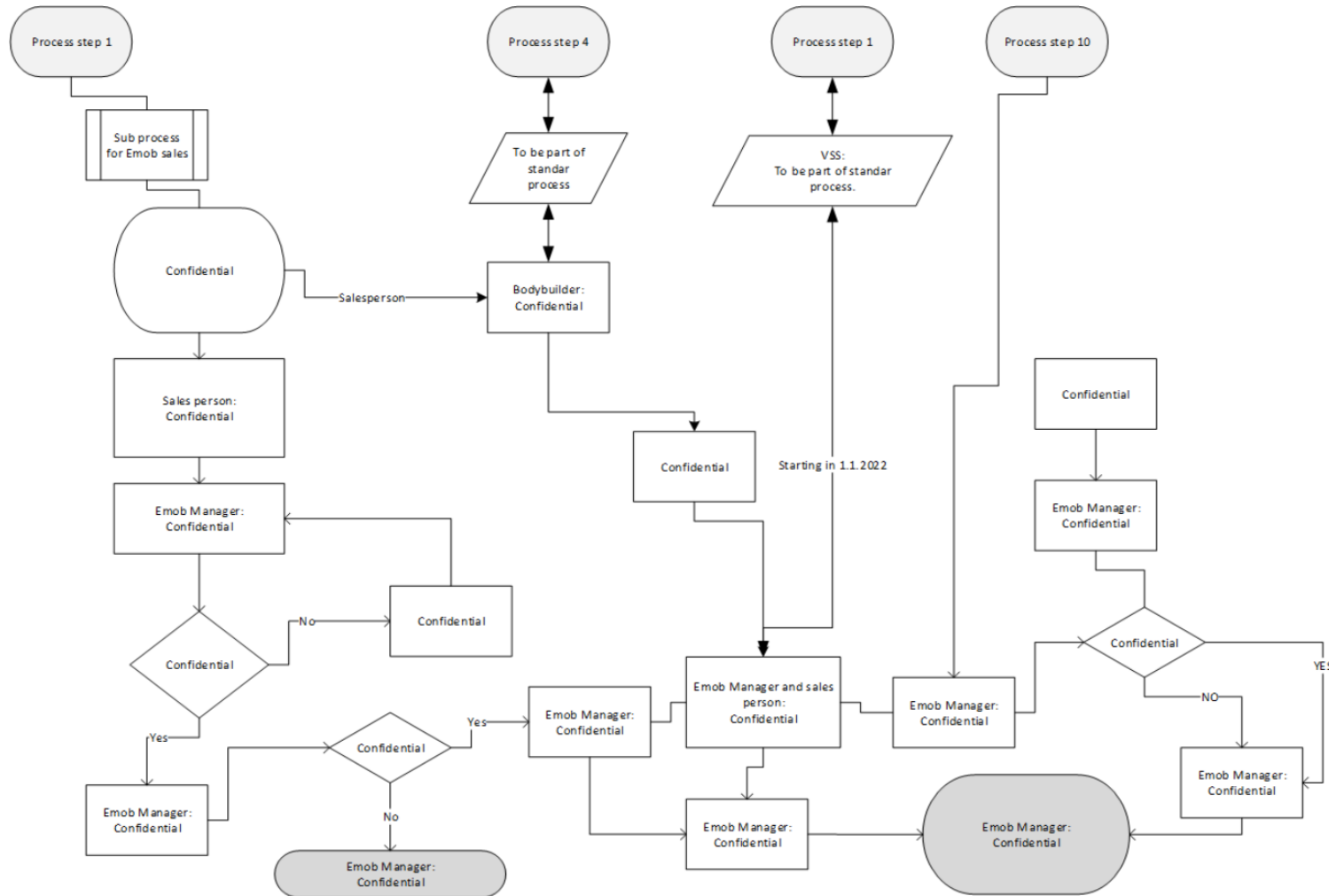


Figure 14. New BEV-related sub-processes to the current TBP process: The Offer.

5.4 Element 2 of the Initial Proposal: Sub-processes for the Current TBP Process, in Relation to “Order”

As seen from Figure 16, the new TBP process maps includes (in relation to BEV sales, in part of the Order):

Addition to Process step 11: In process step 11, offer will be gone through between customer and salesperson. This stage is executed by salesperson who gives the offer to customer. If needed, Emob Manager can be present in this stage and need of the presence will be evaluated case by case. Usually, Emob Manager have already been contacting to the customer earlier in prospecting stage, where feasibility analysis is made. Emob Manager presence is only necessary when offer presentation needs specific knowledge from BEV truck features, range and route or from charging. All these have been given to salesperson and gone through by verbally or in writing in process step one. This stage could also be first contact between Emob Manger and customer, where meeting with the customer is ranged. Naturally, customer and salesperson have already discussed and perhaps met before this meeting to have enough knowledge from customer, which is necessary to create specification, select superstructure and create range and route simulations.

Addition to Process step 14: Order processes have moved to follow standard TSP processes started from 1.1.2022, process step 14 not need any subprocesses. Only to follow up, when order have been placed is important to keep in track, when customer case have been closed, order placed and which building slot is filled up. Process step 14 need recourses from sales organization, logistic and from support functions also.

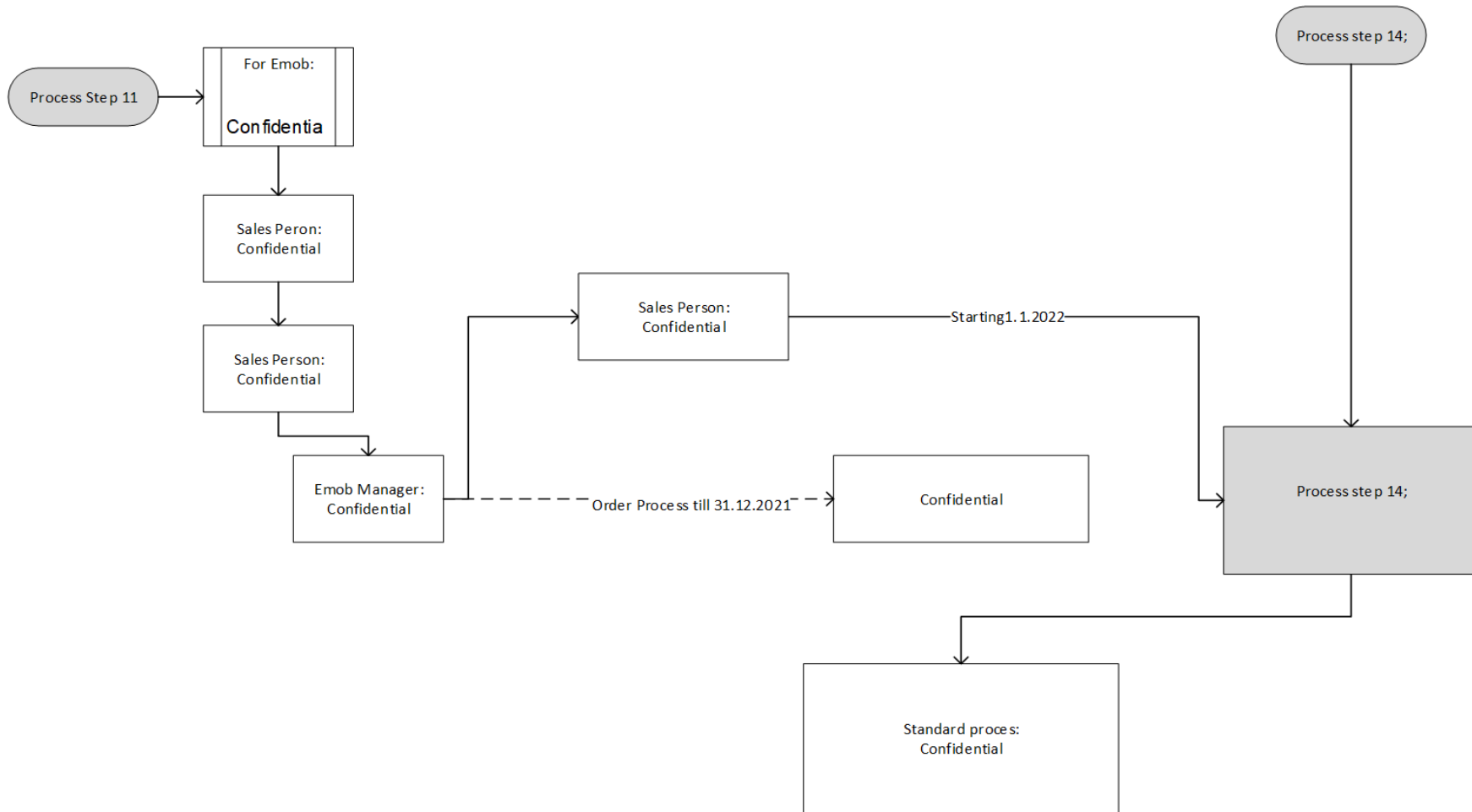


Figure 15. New BEV-related sub-processes to the current TBP process: The Order.

5.5 Element 3 of the Initial Proposal: Sub-process for the Current TSP Process, in Relation to “Customer Prospecting”

Customer prospecting is where TSP starting, and BEV truck sub processes start also. Customer prospecting can be happened in two ways:

- a) Salesperson make contact to customer to offer value proposition “*We can provide and electric transport solution with zero exhaust emissions*”

- b) Customer makes contact to the company to get information about our BEV trucks when salesperson presents value proposition “*We can provide and electric transport solution with zero exhaust emissions*”

It does not matter which way this first contacting is happening, salespersons need special knowledge from BEV trucks. To get special knowledge, sales staff need training for product, services, tools/software’s, charging and most important, sales processes towards BEV trucks. This process stage needs recourses from sales organization and from support functions to be executed, meaning salesperson and Emob Manager. Both works together towards to give customer information from our value proposition. This stage requires deep level knowledge from customer core business so our value proposition may hit the point, meaning knowledge what salesperson have from the customer and special knowledge from the BEV product what Emob Manager have. Process map can be seen from figure 17 concentrated specially to customer prospecting stages.

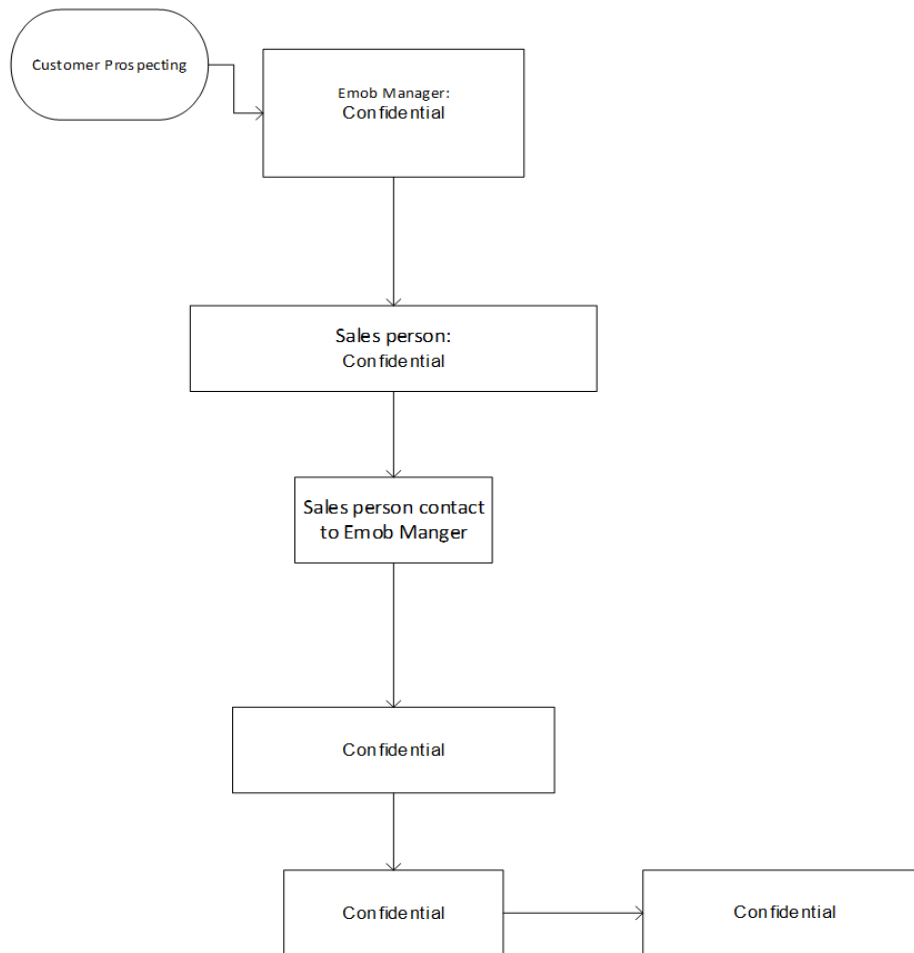


Figure 16. Customer prospecting.

As seen from Figure 18, the new sub process maps include (in relation to BEV sales, in part of the “Customer Prospecting”):

Prospecting starts from task, where sales teams seek potential customers to BEV trucks using the company current customers and also potential new, entrepreneur customers. When seeking potential customers, salesperson and Emob Manager have close conversations when starting to approach selected customer. Prospecting may end to customer meeting where participate commonly salesperson and Emob Manager, or to deliver product specific materials to customer, or to create offer from the BEV truck to customer when customer may see concrete offer and product details.

In other way, customer may approach the company and ask more information from BEV trucks than what is presented in company's website or in commercial materials. This contact may be pointed to salesperson like normal customer approach, or straight to support functions and to Emob Manager. Both contacting ways will be treated similar way, customer will receive information from BEV trucks and both, salesperson, and Emob Manger area aware of the contacting.

Final goal of prospecting the customer is to have meeting and present the information to the customer. This requires efforts from salesperson and Emob Manger to have customer interest waken up towards BEV truck, so customer want to have meeting to hear sales pitch and more information. Possibility to meeting depends on customer profile and how mature customer is for BEV trucks, which is tightly related to customer core business. When core business is placed to urban areas, derived route is placed to city center or customer have clear environmental program under usage, these will affect in positive way to have range the meeting with the customer. When customer core business is not really mature for BEV trucks yet, it may need extra effort to have meeting with the customer, due to salesperson and Emob Manager must present concrete value proposition to customer which will suits for customers core business.

Table 6. Customer prospecting; evaluation and questions.

Customer prospecting: evaluation and questions	
Where this customer operates?	
What is this customer's core business?	
Fleet size	
Financial situation	
Environmental targets and plans	
Maturity towards electric vehicles	
Charging	

Table 8 shows high-level topics which need to be taken into consideration when starting to prospect the customer towards BEV trucks. Customer location and core business is most important thing and need to be consider first. Location gives hints, what type of

vehicle we are talking about, size of the vehicle and is there possible to offer charging and aftersales services. Customer core business gives same information as location, type of the vehicle, charging strategy and where the BEV trucks is planned to operate. Fleet size and financial situation both goes hand by hand. Environmental targets are values which customers company is following and executing, not only to achieve targets to stop global warming, but to keep their business running in future. Consumers and companies are more environmental aware than ever and require from their suppliers and partners environmentally friendly actions, but also that goods area purchased along a sustainable supply chains.

5.6 Element 4 of the Initial Proposal: Collaboration in the Current TSP Process

Importantly, collaboration between salesperson and Emob Manager is in the key position when new process steps are implemented to the current TSP process. It is clear that new technologies have major impact on the sales processes, and new technologies are the only reason for the development of sales processes and creating new sub-processes for the new BEV products. New technology cause uncertainty in customers and questions, how new product will suite for customers business. To get answers to these question, salesperson and Emob Manager need close co-operation to solve these raised questions, make estimations and feasibility analysis for suitability of customer business.

Figure 18 illustrates communication and specified tasks between Salesperson and Emob Manager.

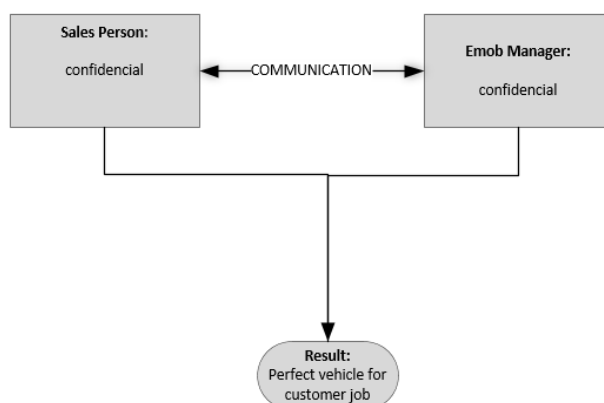


Figure 17. Collaboration process chart.

Thus, the current sales process needs key partners to support our value proposition to customer when selling these new BEV products. When the customer needs support to start operating with these new products, we must be ready to offer support to this early stage.

This stage must be defined in very early process stage where the customer prospecting has been made and evaluation is ongoing of customer maturity towards BEV trucks. The customer gain benefits when entering to use these new products so the company offer as gain creator new product and all support to purchase these. These offers are going to be done in future close collaboration between customer, salesperson, and Emob Manager. Also, brand image and gained benefits is essential and significant especially on this early stage.

Summing up, the new sub-process were drafted to extend the current TSP process.

Process steps, such as *Vehicle specification*, were re-considered, as well as the contents of this specification. The most important thing is collaboration and open communication while creating the offer to customer, so both, salesperson and Emob Manager have same information what specification offer includes. To make the sales process as easy as possible for the salesperson, new sub-process must match to current TSP process seamlessly, and the salesperson must feel confident when discussing with the customer regarding these new BEV trucks. Salesperson must take Emob Manager with him when making the offer to customer and it is important in this early stage that all parties communicate seamlessly between each other. Currently, the vehicle specification has been created for these new products centrally by Emob Manager. It has caused some uncertainty feelings, and this is not a good situation. It is clear, based on CSA and discussion with different salesperson and area managers, that vehicle specification must be created by the salesperson and open communication with Emob Manager must be happening all the time during offer building process. Based on these findings, sub-process of these new BEV trucks must include the step where the salesperson creates the vehicle specifications and discusses it with Emob Manager.

Other elements like *Customer prospecting* may follow TSP but need to be taken consider special features of the BEV trucks. Increasing competence is essential on this stage so salesperson may answer customers questions, even the sales teams need support and special knowledge to seek perfect solution for the customer.

Third element, *Ordering the vehicle* may follow standard TSP and no special actions are needed. This stage for BEV have been taken under usage started from 1.1.2022.

Last but not least, handover the BEV truck to the customer need now and future driver training as standard. This to ensure high level customer satisfaction and right usage of the vehicle. These new products may also bring some pains and negative emotions to some customers, mostly because new product technical features are so different compared to the current ICE trucks. These have been solved via offering a comprehensive package including the product, range and route simulations, service contract, and the driver training for the vehicle before the customer starts operating the new BEV truck.

6 Validation of the Proposal

This section reports on the results of the validation stage and points to further developments to the initial Proposal. At the end of this section, the final proposal and action plan are presented.

6.1 Overview of the Validation Stage

Validation stage includes discussion with Sales Director related to the proposed sub-processes, and a cross-function team session where Sales support, Technical support, Service offer sales and Development manager discussed the sub-process entities to discover the steps which need to have risk evaluations before they are going to be part of the normal daily business.

6.2 Developments to the Proposal (based on Data Collection 3)

The new process steps were decided to be developed further and continue developing support sales strategies in future. Purpose of these selected process steps is to make process as standard as it can be for salesperson.

It was also decided that not all sub-process steps are going to be implemented to be part of the standard TSP, mainly because business is changing, and market is still not yet mature. Other things like considerably longer sales process which includes step's which require deep analyzing, which is time consuming, must be handled by support functions.

6.3 Final Proposal

Presently, best practices around of the new BEV trucks are still quite limited. Best practice meetings have been held via Teams between different market companies in larger and smaller groups, but also private one-to-one teams' meetings were also be held to share experiences. Meetings have considered BEV trucks itself, sales activities, sales strategies and planning's, but also real-life cases and what challenges different markets have faced and how they have solved these challenges.

Most of the experiences from different markets have come have been rather similar with Finnish market. Customers have showed great interest towards battery electric trucks

but are still uncertain to purchase the BEV truck, which cause long selling time. It is also clear that customer who purchase these new products and are first to show the way for others and gets lots of positive publicity. Customers who are early adopters have also gathered really good practical experience about usage of the BEV trucks and positive feedback from drivers. Driver feedback have been encouraging, meaning that drivers feel less tired after full day of driving and do not want to go back to old ICE trucks. (Best practice meeting 2021.)

Incentives between different countries boost the sales, for example Germany how have massive incentives from governments to support transition towards CO2 free trucks. These generous incentives have encouraged customers to contact sales departments to get more knowledge from these vehicles and really want to buy these new battery electric trucks. Thus, because huge interest, salespersons and support functions have been heavily employed due to strong demand in Germany. (Best practice meeting 2021.)

Due to these factors, BEV trucks are extremely new and some way unknown products in heavy truck segment, it is also essential to see, how business model should be built around these new BEV products. It is also essential to understand the customer's needs, pains and gains when talking about BEV's inside of the truck industry (therefore, Osterwalder's Business model canvas was used as input for the Proposal building).

In short, the Final proposal integrates the current *New product specification step* to be part of the normal TSP core process. These specially created sub-process maps for these new products are not going to be implemented to part of the core process but will be a sub-processes so when sales process faces this step when this sub-process is needed. It is easier to check the needed steps from this sub-process chart that try to force these new processes be part of core TSP process.

The final view of the Proposal is shown below in Figure 19 below.

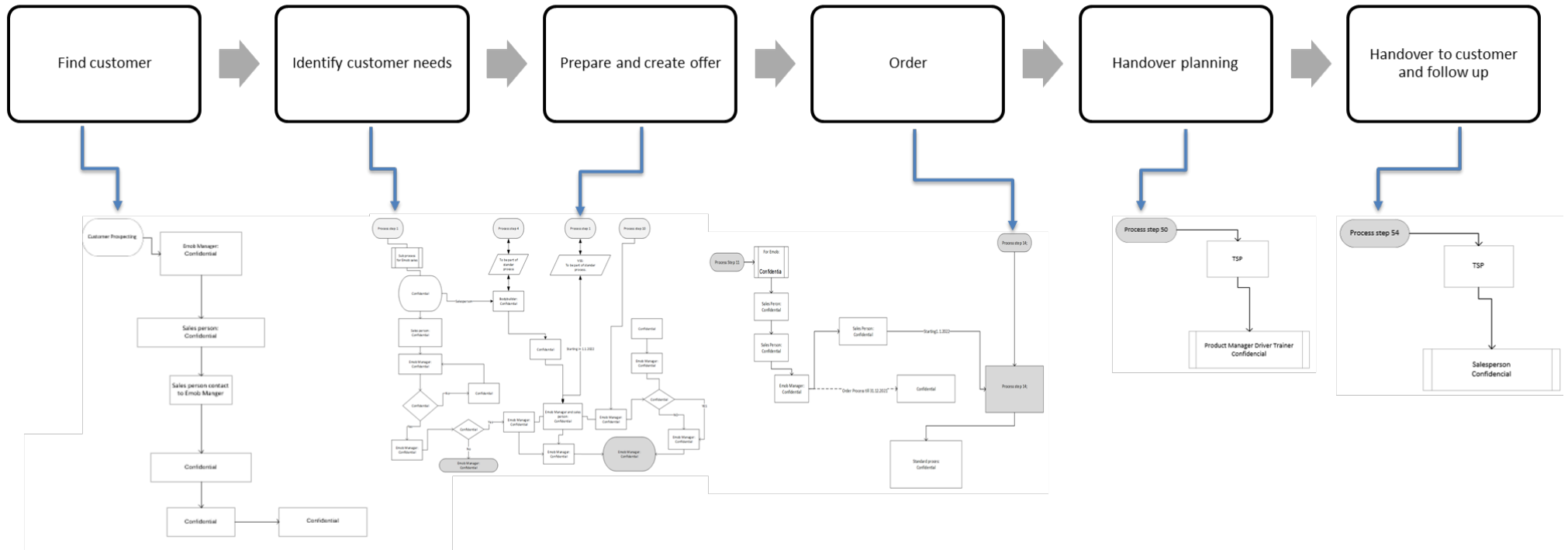


Figure 18. The Final proposal for the sub-processes for the BEV sales process (in addition to the traditional TSP process).

6.4 Action Plan and Further Recommendations

The Action plan for implementing the Offer stage is presented below in Table 9 to be part of the normal TSP and salespersons may create vehicle specification by themselves.

Table 7. Action Plan for implementing the Offer stage of the TSP process.

Action description	Responsible	Status	Finished or target timeline	Notes
Sales processes and subprocess maps for BEV	Emob Manager	Step 1 finished. Step 2 started	Step one finished 12/2021	Subprocess maps for BEV truck sales finished in step one. Re-evaluate in end of Q2/2022. Feedback from sales teams.
Sales teams trainings towards processes and products. Phase 1	Emob Manager	Training 1 finished. Training 2 under planning	Training 1 finished in January 2022	Training 1 focused to processes and products. Training 2 to deep dive to product and gather feedback from processes.
Sales teams trainings. Phase 2	Emob Manager	Under planning. Train the Trainer in W14. Sales teams invitations to training under planning.	Target to be finished in Q2/Q3 2022	For deep dive to product. Gather feedback from processes and ways to work. Get improvement successions what is working and what is not.
Sales teams trainings. Phase 3	Emob Manager	No actions. Will be clarified in Q4/2022	Target to be finished in Q1/2023	Deep dive to product and feedback session 2. Process development phase 3 to make it normal business.
New KPI's to measure success of BEV Truck sales	Emob Manager	KPI's discussed in high level. Numerical levels not agreed.	Follow up in Q4/2022. Re-evaluation in Q4/2022	KPI's to measure successfully executed processes, sales strategy, sales targets, and competence increasing.
Strategy to sales to increase sales of BEV trucks	Sales Director Emob Manager	Not yet actions decided	Q4/2023	Implementation stage towards business as usual. ERS for sales teams.

When implementing the Action Plan and after that, special attention should be paid to:

First, most importantly, *the new KPI's* need to be agreed and set up to follow the updated sales process and for evaluation how successful this new strategy is. The KPI's are not included in this Thesis and thus they were not discussed as part of the Thesis. It was decided in the course of the session and confirmed in the validation discussions that KPI's would be set separately.

Second, *close communication* must be established between the salesperson and Emob Manager, so that the specifications and simulation results will match, and the vehicle is suitable for customers operations. This way of working would also increase the sales teams' competence and knowledge of the new BEV products.

Third, *the steps in the process* described in Figure 20 need to be followed closely so that the needed changes can be identified if necessary. This process can be considered as a loop, so after customer feedback, the salesperson may do changes to the specifications and feedback from that is also given to Emob Manager. At this Thesis demonstrated, this is the only way the company may be sure that vehicle is suitable on customer operations.

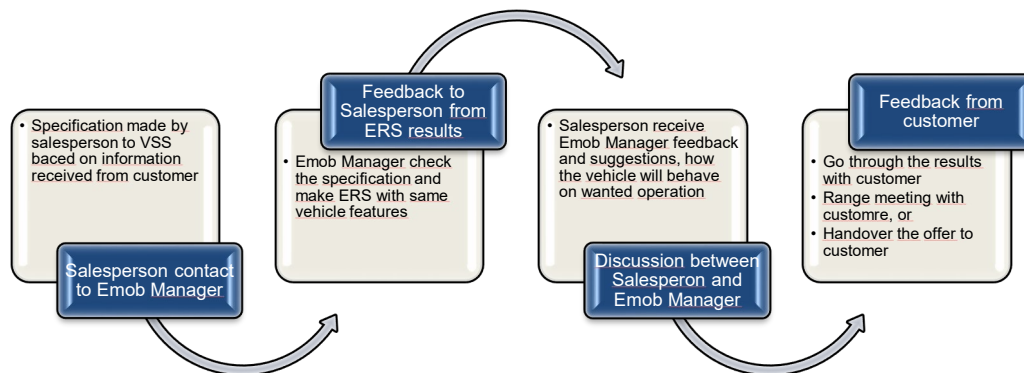


Figure 19. Offer stage and vehicle specification.

To measure success of the new process, in Offer stage and the Order stage, KPI's must be set which need to be followed closely during the year and followed by the needed actions when changes are needed. As mentioned earlier, these KPI's will still need to be defined as they were not included in this thesis.

Fourth, *Training* for all parties how work with BEV trucks is planned to be held to get people more familiar regarding new products, how to deal with BEV trucks, what is needed to be taken consider and how to contact when questions are rising from customers. Trainings were scheduled for the first half of 2022, including own sales organization but private dealers also. Charging solutions and correct terminology is essential when communication with customer so also basic knowledge regarding different charging methods needs to be trained. Thus, the sales organization will need training and knowledge regarding product features and benefits, charging and TCO. The first training session are meant to give basic information for sales organization and next training session is deep dive to product itself.

Fifth, *Customer prospecting* need to be done in close relationship between support functions, salesperson and sales areas to reach right customers and use sales area knowledge. This also gives opportunity to spread knowledge and information to customers also. Customers need information, what BEV truck models are available now, which operations are suitable for BEV trucks and how availability of BEV trucks will increase upcoming months and years.

Sixth, *New process implementation* will start from a pilot. While gathering experiences, sales areas will be trained at the same time. After the pilot and experiences are gathered, discussions should happen and development successions analyzed, based on which the process can be put into a wider use in order to make this business as usual. The steps are illustrated in Figure 21.

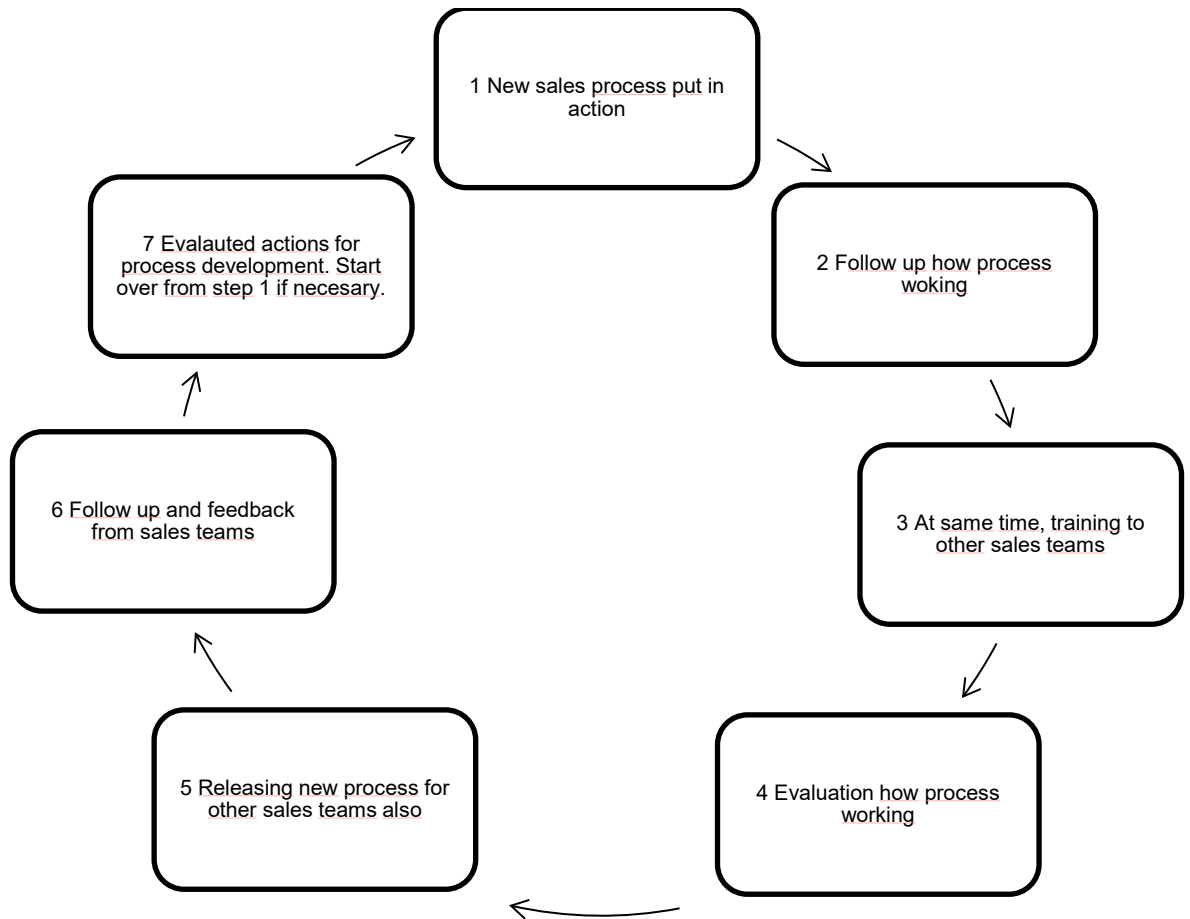


Figure 20. Follow-up of the sales process implementation.

Figure 21 illustrates how follow up and process development need to be executed. As can be seen, there is seven steps and after go through the loop, process starts again from the beginning. This way process development may be evaluated over and over again. In step one, new subprocesses were put into action in smaller group and step two is follow up, how process works. After good experience, trainings may be executed for wider audience, sales teams, to put processes to proper actions. After processes are put to wider use, results can be evaluated which have come from higher volumes and when number of actions start to increase. After step by step, new subprocesses have been put on action, all sales teams have got trainings for way of working and experiences may be evaluated when subprocesses are in full action. When subprocesses need correcting actions or fine tuning, process start from evaluate, how this change in subprocess affect to way of working and can it work.

Finally, the new technology effect to the new sales process still needs to be monitored in the future. Here, the main focus of attention should be placed on monitoring and

evaluating how to create value to customers with these new products and how to give answers to customer questions and doubts. Customer Value Proposition will keep being at the centric position in this part.

7 Discussion and Conclusions

This final section includes conclusions to this thesis. It also includes summary, thesis evaluation and recommendations to the way forward.

7.1 Executive Summary

The objective of this thesis was to define sub-processes for selling battery electric vehicles (BEVs) along the traditional sales process (TSP), and define what special features new BEV trucks sales should have. Main business challenge to start the BEV truck sales is that well know diesel powered ICE trucks have been in use from beginning of 1900's and BEV brings several special features with it to sales processes. Mostly these special features are related BEV truck technical features, like used energy is changing from diesel to electricity. Amount of carried energy in batteries with the truck is extremely limited compared to diesel tank, which cause typical BEV range anxiety. This matter needs to tackle and customer doubts concerning the range need to be answered.

This thesis is conducted for the case company to evaluate the new Truck Sales Process (TSP) for Battery Electric Vehicle (BEV) sales. Automotive industry in Finland, Nordic, Europe and worldwide is facing significant changes and challenges, when traditional internal combustion powered diesel trucks start to change to electric powered trucks. This change of the energy powered by the trucks may not sounds significant, but it brings many questions which need to solve. Therefore existing processes need to be re-evaluated, the organization need trainings, so that the company may offer answers to customers questions, which was done in this Thesis.

The study was conducted by using qualitative research methods and mainly relied on unstructured or semi-structured interviews. Based on the results of the current state analysis, the current TSP was analyzed, and it was identified that the new BEV sales need only sub-processes to be added to the tradition TSP process.

The theoretical framework focused on the topics of new technologies, business models and processes. The proposal for the case company was developed based on the results from the current state analysis, the theoretical framework, as well as a new round of data collection and co-development with the stakeholders. As a result of this thesis, new steps

were proposed to be either added to the traditional TSP or the existing steps changed to adapt to the new product (BEV) sales.

The outcome of this study is the proposal for the new sub-processes added for conducting BEV sales in the current TSP process, and the action plan was developed how the new ways of working will be put into action. These processes have been created only for BEV's and sales of BEV trucks for customers. It became obvious that new technology brings new element to sales processes which need special knowledge for the BEV's. These elements were important to describe on a detailed level, and plan how to train the sales personnel for these processes, so that the company can operate efficiently, and responsibilities are clear for everyone. As sales have just begun for the new BEV trucks, major changes will still happen in the upcoming years, and the processes will need to be re-evaluated again soon for the sales of BEV trucks to be adopted as part of the normal sales processes.

Currently TSP processes is well defined, detailed and working for ICE trucks and in many parts BEV trucks also. Discussion and interviews with sales teams and area director have given overall understanding, which actions were working on BEV sales and which ones needed re-engineering and subprocesses. New technical features of the BEV truck are in driveline, usage of the truck and charging. Charging can be executed by using overnight charging, overnight and midroute charging, midroute only charging, battery swapping or overhead catenary, but also, inductive charging can be done. As can be seen, several different options are available, some more feasible than others currently. Now, overnight and midroute charging options are the ones which are in use on BEV truck and are technically but also commercially way feasible.

Based on feedback from sales teams, experiences of real-life cases and what have been learned from these earlier cases, it was came to clear that centralized offer creation was not an option to execute successfully, long lasting and competence increasing sales processes. Vehicle specifications were needed to bring close to salesperson and to be salesperson responsibility to create specification, where same time Emob Manager and salesperson cooperation were in centric position to ensure compatibility between technical specification and range analysis of the customers operation. This not only increase salesperson competence towards BEV trucks, but give salesperson to be control of the sales case, which is important. Sales processes and subprocesses for BEV trucks will be under developing in upcoming year to found effective way to execute BEV

truck sales. Several parts on BEV truck sales are facing changes during upcoming years, mostly because new BEV truck models' serial production will start, and customer expectations are evolving when BEV trucks are coming more common among customers. Charging is essential part of the BEV trucks sales process, so charging offer to customer and also best way to execute charging offer is under development now.

7.2 Thesis Evaluation

The objective of this thesis was to develop the current sales processes for battery electric vehicle (BEV) sales. In this thesis, the new sub-processes were created especially for battery electric trucks. These new subprocesses will be part of the TSP, knowledge of these process steps will be given to sales organization via sales trainings.

First, to adjust the current TSP process to selling BEVs, this Thesis looked closely into the needs of the sales and developed new sub-processes useful to the company now and in future.

Secondly, The Thesis also explored the need for open communication inside of the company around the new BEV truck products. Specially communication and collaboration between sales teams, support functions, technical after sales support and workshop services was important to develop.

Thirdly, sales team trainings were proposed for the next couple of years to bring all the knowledge available for salespersons. This way the sales team will achieve strong market position when salespersons are familiar with the new BEV trucks, and we may offer deep knowledge to the customers and help them to choose perfect trucks for their business purposes.

Thus, the thesis created the basis for launch of the new sales process for BEV trucks. Battery electric trucks will bring opportunities with them to offer customer wide range of services which need to be evaluate closely.

This thesis was executed by conducting unstructured interviews while meeting the sales teams and exacting the process and product trainings. Other part, TSP investigations includes one meeting with our company consultant of processes and Development

Manager, who has created and developing TSP. Other meeting was cross function team meeting where in totally four to five different teams were present from sales support, technical support, soft offer team and from development team was present. Important meetings were also held with Sales Director to present results of new sub-processes and get feedback. The views of many stakeholders were taken consider, listened, and evaluated. When thinking what could be done in different way, more data collection would be needed to bring in more development and ideas.

One of the best and highly educational experience were best practice meeting with few different market companies. These meetings were held three times between Finland, Germany, Switzerland, and Great Britain. Due to all markets are in starting point of the BEV trucks sales journey, it was good to hear what other counters had done and what strategies they are developing to execute sales start of BEV trucks. This way all may learn from another's and chare experiences, what has working and what clearly hasn't. Best practice meetings were good channel of information from other colleges because some of colleges have been working with BEV couple of years and had really good information to be shared. When evaluating this thesis, the literature part had high potential which should have made more use of, and the sales process topics could have been dealt in more deeply.

7.3 Closing Words

This decade in automotive industry will bring historical changes to automotive industry core business when energy sources of truck are changing from diesel fuels to alternative fuels. Electricity brings totally new effect and put whole industry to totally new position when well-known ICEV's will change to BEV's through time. It is important to realize that processes what have been created now, are coming to be common in future. Timeline for these changes can't be clearly defined, but this decade will bring many new elements to this industry which most surety change our sales processes. Processes need to adaptive so we may react the change more easily, and mindset must those things are going to be change.

Next, new KPI's need to be set to follow successful sales strategies and for evaluation how successful this new strategy is. These KPI's can be use as tool to guide Emob operations to achieve set targets. This thesis will not include these new KPI's.

Deeper knowledge will be also need to collected from customers of the case company. Feedback and aftercare of the customers who have taken BEV trucks under usage are in important position, when gathering experiences from real life cases. Only this way company may learn and develop the services, processes and way of working to even better.

This thesis was a great opportunity to deep dive to case company new truck sales processes (TSP) and learn from colleagues, how sales processes working in practice, and what practices are in common use. This especially made a great opportunity for the thesis researcher who started as a new employee in the company to speed up the learning of the company's ways of working. The thesis researcher wants to deeply thank all the stakeholders for their excellent inputs and unconditional support during the course of this study. Thank you for your help!

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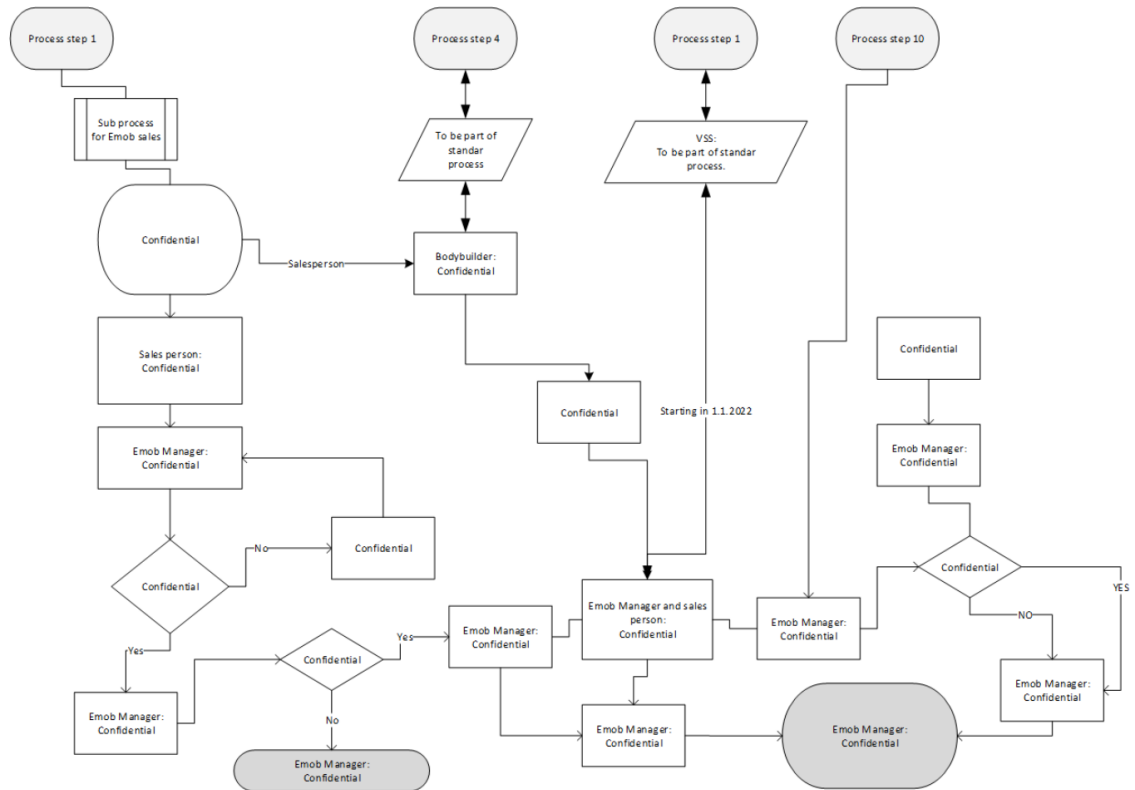
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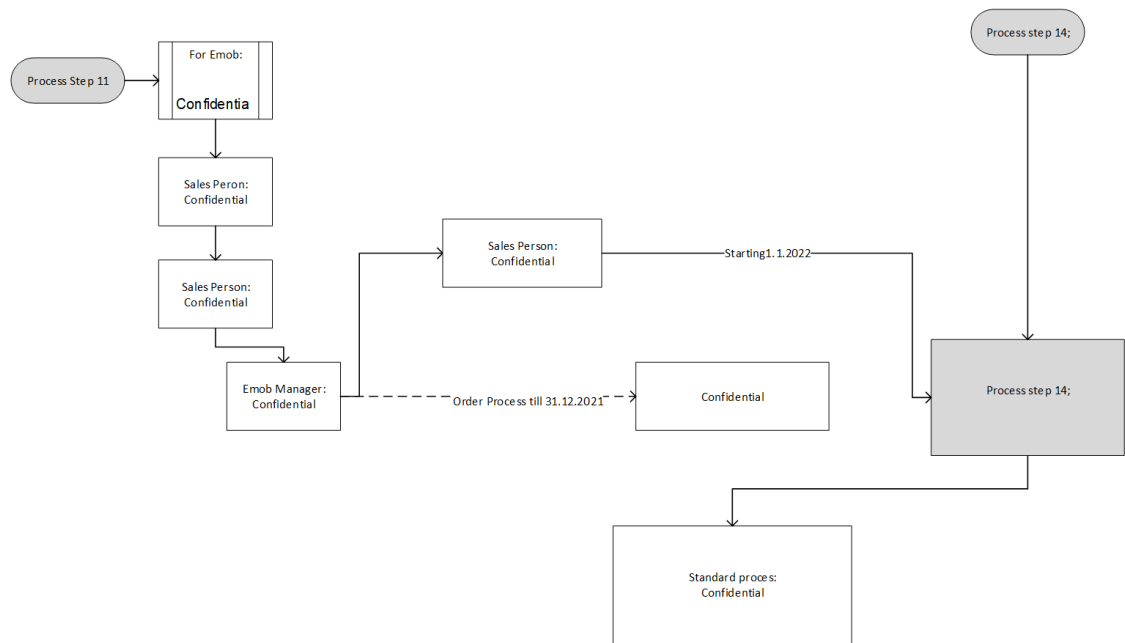
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Appendix 1. Sub-process maps

Offer

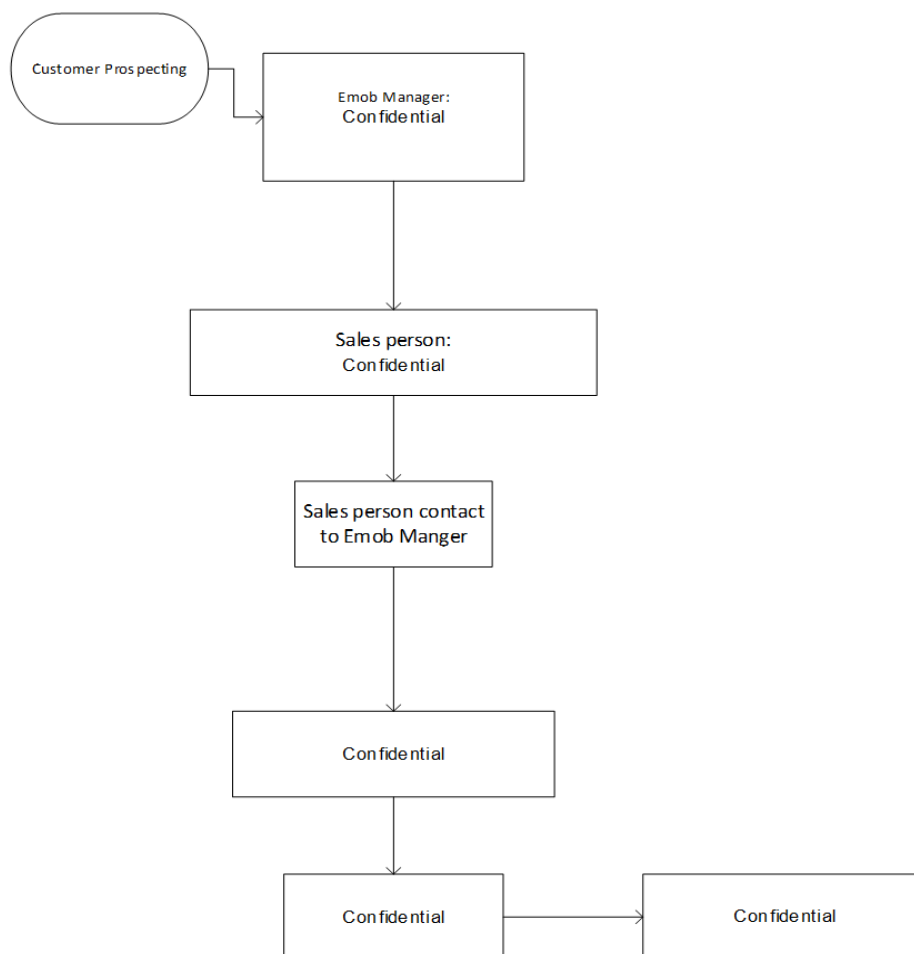


Order



Customer Prospecting

Customer prospecting evaluation and questions	
Where this customer operates?	
What is this customer's core business?	
Fleet size	
Financial situation	
Environmental targets and plans	
Maturity towards electric vehicles	
Charging	



Appendix 2. Industry Analysis in Relation to BEV Products

This section focuses on automotive industry analysis with Porter's Five Forces analysis method. The purpose is to identify forces affecting to industry to see how competitors are competing among each other, will there be threat of new entrants, but also how supplier, substitutes and customer will affect to attractiveness and profitability of the automotive industry.

1. Introduction to the Industry Analysis

In 2021, the estimation was that in year 2030, the number of e-truck in traffic in Finland could raise up to 4600 units. (Jääskeläinen 2021. s.22). It is highly likely to expect that the numbers of electric heavy-duty vehicles on traffic will increase significantly during this decade. Mostly because the climate regulations and the need to meet the Paris Agreement objectives will be observed even more strictly. As said in Article 1 on Regulation (EU) 2019/1242 of the European Parliament and of the Council:

In order to contribute to achieving the Union's target of reducing its greenhouse gas emissions by 30 % below 2005 levels in 2030 in the sectors covered by Article 2 of Regulation (EU) 2018/842 and to achieving the objectives of the Paris Agreement, and to ensure the proper functioning of the internal market, this Regulation sets CO₂ emission performance requirements for new heavy-duty vehicles whereby the specific CO₂ emissions of the Union fleet of new heavy-duty vehicles shall be reduced compared to the reference CO₂ emissions as follows:

(a) for the reporting periods of the year 2025 onwards by 15 %.

(b) for the reporting periods of the year 2030 onwards by 30 %, unless decided otherwise pursuant to the review referred to in Article 15.

The reference CO₂ emissions shall be based on the monitoring data reported pursuant to Regulation (EU) 2018/956 for the period from 1 July 2019 to 30 June 2020 ('the reference period'), excluding vocational vehicles, and shall be calculated in accordance with point 3 of Annex I to this Regulation.

Based on these regulations and stricter targets to reduce CO2 emission from 2030 onwards, can be assumed that fully electric heavy-duty vehicles will be come more common. (European Commission 2019.)

2. Porters Five Forces

Michael Porters five forces tool includes five different forces which affect to the industry. Forces are *Rivalry Among Existing Competitors*, *Threat of New Entrants*, *Bargaining Power of Buyer*, *Threat of Substitute Products or Services*, and *Bargaining Power of Supplier*. These forces are illustrated in Figure 5 and discussed for BEVs below.

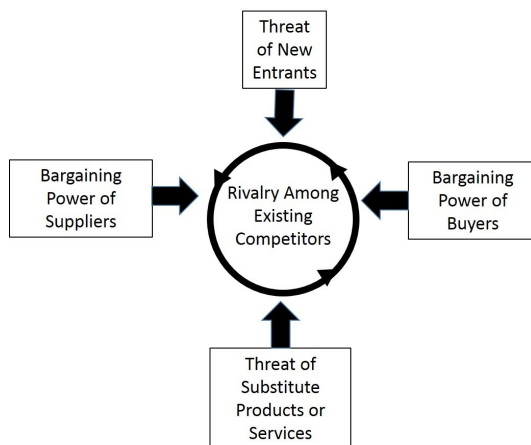


Figure 21. The Five Forces That Shape Industry Competition (Porter 2008).

First, the power of threat of new entrants, “put pressure on prices, costs and rate of investment necessary to compete”. When barriers to enter the industry or to the market is low for net entrants, this will keep industry profit level low. Different barriers against new entrants can be considered be seven. Supply-side economies of scale where producer of large volumes may keep price per unit low. When production volumes are high, fixed cost can be spread over large amount of units. Demand-side benefits of scale, in other words wide network who are willing to buy products from this producer. Increase of fixed costs when change supplier, for example changing from software to another which require trainings for employees. Capital requirements if large investments are needed to be enabled to enter the industry. Incumbents who have cost, quality, or other advantages which new entrants may not have, increase barriers of new entrants. Unequal access to distribution channels is big challenge to new entrant. If costs to

participate already known distribution channel is high, new entrant must find another one channel or create completely new one. Finally, restrictive government policy may turn barrier for new entrants higher or lower. All depends regulations on the industry, if there is needed licensing or business is somehow strictly regulated, barrier could be high. (Porter, M. E. 2008. p. 3-21.)

Second, the power of supplier inside of the industry may be extremely high if company have only one supplier. This may end to situation where powerful supplier may decrease profitability of the company. Supplier is powerful if its:

- Concentrated to its products more than the industry it sells to
- Supplier serving many industries and not just one
- Switching supplier cause significant costs
- Suppliers products that are differentiated like pharmaceutical companies which have patented their goods which have clear medical benefits
- There is no substitute available

These five points sets supplied to powerful positions, but the power of buyer or customer for the supplier must be taken consider also, if buyer purchase with high volumes, it may force prices down which cause low profits for supplier. (Porter 2008, p. 3-21.)

Third, buyers have high power especially if there are only few buyers, products are standardized and are replaceable with low costs. Also, if buyers are extremely price sensitive or buyers earn low profit, there will be a need for prices negotiations. Buyer is price sensitive if:

- Products represent significant portion of costs structure or budget
- Buyers earn low profit or have limited purchasing budget
- Buyers' product or service have low effect to industry
- Industry products have low effect to buyers' costs

Buyers who area as intermediate customers, who purchase the products but are not the end users, have high power when they can affect to downstream customers buying decision. (Porter, M. E. 2008. p. 3-21.)

Finally, the fifth element of Porters Five Forces, threat of substitutes products. If substitute products are performing same function as original products, this can be considering increasing the power of substitute products. When switching costs are low or there is none, will put substitute product to strong position. This force will also be affected to industry profitability. (Porter 2008, p. 3-21.)

Thus, understanding these five competitive forces reveals routs on profitability and give understanding on industry structure. Industry structure and understanding of it is crucial for effective strategy positioning. (Porter 2008.)

The power of each force varies depending on the industry. Most powerful force is most relevant for the company when company is creating business or sales strategy. All industries face rivalry among existing competitors, but power ratio between other forces may vary significantly. (Porter 2008, p. 3-21.)

a. Threat of New Entrants

If applied to the automotive industry in Finland, a larger change inside of the industry globally have started towards fossil free vehicles and fossil free transportation. New entrants from different industries or from different continent markets have already showed interest to penetrate to European market. Especially electric vehicle manufacturers from China and Japan, but also from Northern America. Chinese fully electric products in busses have already penetrate to Finland and manage to take large part from electric buss segment. These new Chinese buses are cheaper, and range measured on driven kilometers at one charge is much longer that European manufacturers could offer in 2021. These two elements, range and price often go hand-by-hand because long range need large energy storage system and in electric buses, energy is stored to batteries which are costly and effect vehicle total price significantly. Same could happen in truck segment, so new arrivals should be taken seriously and followed closely, when new entrants start to show signs to penetrate to Finland market.

New Chinese vehicle manufacturer have already penetrated to Finland, but still on lighter segment of commercial vehicles.

Summing up, threat of new entrants today and near future can be considered to increase its potential not only in Europe, but in Finland also. Good example how rapidly company may grow and take significant market shares, is Tesla. Elon Musk founded Tesla in 2003, and in just eighteen years, it has grown into the world's largest OEM in 2021. (Companiesmarketcap 2022). News has come from Germany that startups like VOLTA have received a large pre-order, delivering nearly 1,500 all-electric trucks in the near future. Initially, DB Schenker will test the first prototypes in the spring and summer of 2022. (DB Schenker 2021.)

Similar news from truck manufacturer Hyundai have also released when this manufacturer, which have been considered to be emerging market manufacturer, have come to Europe and release FCEV trucks on test purposes. This is clear sign that these manufacturers which are not so popular in Europe must be taken seriously also, because these are inventing new technologies which may be popular near future in Europe too. (Hyundai 2021.)

b. Bargaining Power of Buyers

Customers that are early adopters of BEV trucks have significant bargaining power towards supplier. This because companies that offer new BEV trucks need to build up the market and built trust to logistic companies how are considering investing to this new technology of trucks. In other hand, there are still only few manufacturers who import BEV trucks to Finland, and especially when taking consider Finland market and offering of OEM aftersales services. Contract period of the truck depends on type of the truck and yearly mileage of the truck. For example, city distribution truck which have low annual mileage, contract period may be rather long, from five to even ten years. During this period, customer will need aftersales services like maintenance, repair, and spare parts to keep the truck on the road and uptime level high. Only when truck is in productive usage, transport operator may earn and get profit. So, when thinking current well known European manufacturers like Volvo, Scania, Mercedes-Benz, MAN, Renault, and DAF,

only few have launch wide range of BEV truck models to be serial produced and to be offered to Finnish market and customers.

Summing up, the buyer always has bargaining powers in sales negotiation situations. How high this power is, depends on customer profile, size, and which product customer is buying. Negotiation is always part of the sales process, especially when purchased object price is significant. In the near future, the buyer's bargaining power will increase when considering only the OEM suppliers of BEV trucks, due to the significant increase in the product range of BEV trucks from all the major truck manufacturers mentioned earlier. In short, bargaining power of buyer is always present and can be medium or high now and future.

c. Threat of Substitute Products and Services

Threat of substitute products and services is strong mainly because market is not perfectly mature yet for BEV trucks. Main reason is that current well know ICE trucks have been around almost 100 years and will be around during next decades. Current ICE trucks will be superseded with these new BEV trucks when operating task of the truck suits to BEV truck, but it will take couple decade before BEV trucks will be came mainstream. Other substitute products are much lighter BEV vans, which are already available from every main European manufacturer, but purpose and technical features are so different between van and trucks, so van will not be straight substitute product for the truck. New Chinese van brand Maxus have already entered to Finland in 2021 and need to be followed closely, even it would not be straight substitute for BEV truck.

To summing up, a replacement product for a truck can be a van or a bus but with significant restrictions, mainly because trucks cannot be fully replaced because the purpose of the trucks is not only necessary to deliver the goods from point A to point B. Trucks could be used for crane applications, concrete mixers, construction and dump applications, and many other more specialized ICE truck or BEV truck applications. When it comes to the efficiency of transportation and delivery of goods, if we use a van instead, the reduction in the amount of goods transported affects productivity and earnings. The conclusion about the replacement product for BEV trucks is that there are

high limits and certain basic needs that need to be met and then truck cannot be substituted easily.

d. Bargaining Power of Suppliers

Common goals, ambition to achieve these set targets and a common understanding of the goals set is the first and most important step towards a successful partnership. The bargaining power of the supplier is always present, especially if the characteristics of the market are special compared to other markets in which the supplier operates. The Finnish transport market is extremely special compared to Europe, mainly because Finland is a long and sparsely populated country, which means that Finnish truck combinations are long and heavy. The Finnish truck combination can be 34.5 meters long and weigh a maximum of 76 tons, while the European truck combination can be 18.75 meters long and have a maximum weight of 44 tons. Special truck combinations can be considered a bargaining advantage, as the truck is in heavy use and an increase in maintenance services is possible. But at the manufacturing level, it is clear that the current global situation and the COVID-19 pandemic have had a significant impact on production and the shortage of materials needed for manufacturing. When look deeper into the supply chain and the global COVID-19 situation, the supplier has a huge impact on the delays in the factory and manufacturing processes when the necessary materials cannot be delivered to the assembly line on time. The COVID-19 pandemic has forced factories around the world to shut down production due to a major infection, affecting the supply chain's ability to supply goods to truck manufacturers. As these plant outages occurred over and over again, it is clear that this had a significant impact on supply chains.

To summing up, when we think only of Finland and the supplier, the truck manufacturer, it can be said that the supplier side always has bargaining power, but due to the joint effort to build a better market for electric trucks, this power may be medium. Common goals and vision make collaboration effortless in most cases.

e. Rivalry among Existing Competitors

Inside of the industry rivalry between existing competitors is tough. Most established European truck manufacturers have ongoing test with BEV trucks, manufacturers have launch BEV truck models or piloting these with specific customers. All manufacturers have in common the ambition to have BEV trucks in serial production before 2025.

Table 8. Truck manufacturers with electric trucks.

Competitors	
Established truck OEMs	
High end / premium (Western trucks)	Volvo, Scania, Mercedes-Benz, Renault, MAN, Iveco, DAF, Mitsubishi
Low end emerging market trucks	Isuzu, Hyundai
Converters	Futuricum, Emoss
New entrants	Nikola, Tesla, BYD, Volta

As seen from Table 2, several manufacturers have start production of BEV trucks. Many of these manufacturers are well known also in Finland and specially all which have been categorize as High end / Premium manufacturer, have BEV truck models in Europe and can be rivalling between each other's in BEV truck segment. Some of these manufacturers, for example Futuricum, produce BEV trucks for specific European marker with specific features and are not sold in every country. All BEV trucks purchase prices are still higher compared to combustion engine trucks, mostly because technology is new and serial productions have run only few years. Some manufacturers have not yet started series production and are running small series production other than serial

production. As production capacity and sales volumes start to increase significantly, the price will start to fall. This is reflected in the trend in battery prices when comparing the \$/kWh trend that began in 2010, when the price of lithium-ion batteries was \$ 1,200/kWh compared to 2021 and \$ 132/kWh, a decrease of 89% in battery prices. (BloombergNEF 2021).

In conclusion, the competition between existing competitors can be considered fierce given the current well-known ICE truck dealers. New BEV truck models are coming to market and all well-known truck manufacturers have released the first BEV models. Manufacturers have already started serial production of several BEV truck models, and production will increase in 2022 when new models enter serial production. Ambitious CO2 emission targets are so stringent, increasing the need for BEV production in the truck industry. The Finnish truck market in the truck segment over 16 tons is divided between three main brands, which account for about 90% of the market share and the remaining 5 brands for the remaining 10%. These 8 main brackets and their market shares are illustrated in the chart below. In 2020, there were a total of 16 brands in Finland that were trucks over 16 tons, as shown in Table 3.

Table 9. New truck registrations statistics over 16tn. from 2010 to 2020 (Autoalan Tilastokeskus 2021).

Merkki / Make	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Market share 2020
SCANIA	734	777	737	865	672	794	949	968	926	1 049	888	39 %
VOLVO	588	825	805	1 056	728	766	840	940	932	973	729	32 %
MERCEDES-BENZ	283	409	456	434	358	329	417	538	582	463	416	18 %
DAF	63	65	93	93	47	44	78	66	75	80	74	3 %
MAN	85	105	91	58	28	61	113	92	106	78	61	3 %
IVECO	36	41	43	27	28	45	64	79	62	55	46	2 %
RENAULT	32	30	57	54	19	29	51	48	59	74	46	2 %
SISU	35	64	82	92	47	38	65	108	122	115	32	1 %
LIEBHERR	0	1	0	1	2	0	1	0	2	1	3	0 %
DEMAG	2	6	0	2	1	0	0	2	2	0	1	0 %
JETI	0	0	0	0	0	0	0	0	0	0	1	0 %
PROTOLAB	0	0	0	0	0	0	0	0	1	0	1	0 %
SCHWING	0	0	0	0	0	0	0	0	3	4	1	0 %
STETTER / SCHWIN	0	0	0	0	0	0	0	0	0	0	1	0 %
STX	0	0	0	0	0	0	0	1	0	0	1	0 %
TADANO FAUN	0	0	0	1	1	1	5	2	3	1	1	0 %
BRONTO SKYLIFT	0	0	0	0	0	0	1	0	0	0	0	0 %
FAUN-TADANO	1	3	1	1	0	0	1	0	0	0	0	0 %
GROVE	0	2	1	2	2	1	2	1	0	0	0	0 %
TADANO	0	0	1	1	1	4	5	0	0	0	0	0 %
TEREX	0	0	2	2	2	0	2	2	1	1	0	0 %
TEREX DEMAG	1	1	0	0	0	0	0	0	0	0	0	0 %
Other	0	0	2	0	0	0	1	0	0	0	0	0 %
Total	1 860	2 329	2 371	2 689	1 936	2 112	2 595	2 847	2 876	2 894	2 302	100 %

These three main brands in Finland, Scania, Volvo, and Mercedes-Benz will compete also from BEV customers, but brands with smaller market shares also have BEV trucks

in their product portfolio, so these other brands are considerable competitors. Product portfolio between different truck manufacturers vary significantly today, like Volvo have wide range of BEV, Mercedes-Benz have started serial production with one model and next one is coming in 2022. Scania also have released one BEV model but offer also HEV model over 26-ton truck segment. Other brands like Renault have also wide range of electric trucks on its product portfolio, when MAN have launched one small series produced BEV which is also included to over 26-ton segment and released news of production start of heavy-duty BEV trucks in 2024. DAF also released news of two different fully electric truck models when Iveco and Nikola have formed joint venture to start to production in Germany for fully electric trucks. As can be seen, a lot is happening inside of the truck industry now, which means that new fully electric truck models will be launched in near future, during 2022 and 2023.

f. Conclusions from Five Forces Analysis

Automotive industry is facing major changes in 2030 when the goals of the Paris Climate Agreement must be met. Customer expectations are changing, digitalization is opening new opportunities and new entrants are entering the industry. The industry is also facing major changes and new entrants need to be closely monitored. All European manufacturers will launch BEV trucks in the near future, and this also applies to Finland. Although the products are not yet mass-produced today, it will not take many years for certain transports to be carried out only by BEV trucks, especially in urban areas. New entrants to the automotive industry have entered into massive agreements with major logistics operators in Europe. News has already arrived in Finland that makes current competitors in the industry evaluate these new entrants and how big a threat they will be in the future. It is not so simple to get into this industry just for selling new products. These products will be used in professional logistics operations with tight uptime, so new entrants need a well-organized service network, skilled workers, and secure spare parts supply chains. Barriers to the production of these new products have decreased compared to previous years and high environmental targets are encouraging new entrants to enter the industry and market with BEV truck models.

The decade of 2030 will be a time of great change for the automotive industry, so the ratio between the five competitive forces could change dramatically over the decade. The automotive industry, and the truck industry in particular, is likely to face the biggest change in decades as BEV trucks enter the market and serial production also begins. Well-known ICE trucks have been on the market for so long that it is only natural that customers will have doubts and the change may be difficult to accept. The industry is not yet fully mature when it comes to BEV trucks. The public charging infrastructure is not yet suitable for BEV trucks, mainly because it was originally designed for passenger cars only. The biggest problem with the charging infrastructure for electric trucks is that the charging stations are located next to the parking garages or the parking space for the electric car is so small that it is not possible to park a large truck there. The technical requirements must also be met between the charging station and the BEV truck. The electric truck market will grow significantly in the coming years as the product range grows, manufacturers begin to manufacture BEV trucks, and customers see these new products in a real operating environment. The charging infrastructure is also evolving and serving BEV trucks as cities plan charging areas where BEV trucks can be parked and charged.

Appendix 3. Elements of the Business Model

Value proposition: The company can provide an electric transport solution with zero exhaust emissions

To these Customer Segments: Transport and logistic companies whose business is to offer distribution services in urban areas, waste collection where people are living and also urban construction. Common to all of these is that trucks which are used to perform business are operating in urban areas where normally there are lots of people.

Via these Channels: To reach our customers and offer these products, we are using our normal sales channels meaning sales personnel, but also marketing materials to spread and offer information for customers. Events and fairs are important to reach large masses of customers, influencers which may make decisions and to make our products, services and people familiar to customers.

Using these Customer Relationships: Customer relationships are in some level personal due to trust must be achieved between salesperson and customer. Without trust and these customer relationships where customer and salesperson know each other, it is extremely difficult to make business between each other.

For creating these Revenue Streams: In the end, purpose of the company is to create positive revenue streams from the products, services and experience which we may offer to our customers. Revenue streams are starting from sold new trucks where salesperson and customer sign binding sales agreement, and after truck has been on use, customer needs aftersales services to keep the truck running in most efficient way. Financial operations is for offer customer full package of service where customer may purchase the trucks, services, and get financing for the trucks from same place. To create full turn key solution for the customer where customer only pay monthly fee, purpose is to make business little bit easier.

These key elements of the new BEV products business model were brainstormed and specified further into the following Customer value proposition. On the customer side:

Customer Jobs-to-be-done: When customer is making business in transportation, main purpose is to deliver goods from location A to Z, meaning that customer may have multiple places during the day where it needs to stop. When customer business is waste collection, purpose is to pick up waste from location A to Z and deliver this waste-to-waste handling plant. And in business, which is related to construction in urban areas, purpose is to deliver goods to construction site.

Customer Pains: Customer normally feel pains when executing the business when vehicle is not working as it should, unplanned downtime happened because breakdown of the vehicle, or vehicle can't be restored back to operation in short time. Unplanned downtime may cause financial lost when goods are not delivered just in time, but also reputation losses can be happen which may cause significant harm to company core business in future.

Customer Gains: To enjoy positive image and gain positive publicity, right, clean and environmentally friendly trucks are perfect to that. Early adopter customers gain positive imago from positive publicity when taking environmentally friendly trucks to use in their business of delivering goods. These new trucks can open new business possibilities when competing tenders where logistic cities need to have logistic services. Last but definitely not least is employee satisfaction. These new fully electric trucks are user friendly because no exhaust gasses, extremely quiet and vibration free driving experience. These may end to results that employee feel better, they are not that tired after long day of driving and working and most important, healthy benefits when toxic exhaust gases are missing completely when working around the truck.

These identified elements were then brainstormed, and the following offerings were identified how to address them from the Company's side:

The product/service: To meet our value proposition of we can provide and electric transport solution with zero exhaust emissions means that our product are BEV trucks, services related straight to product are range simulations to reduce range anxiety and get feasibility analysis regarding suitability of BEV to customers business. Charging consultation is one of the major services what we may offer to customers because charging is much more that to install device to wall and plug it to truck. Other more normal services we offer to customer is financial services, service contract, after sales services

and also rental services. Trucks are used to execute business so all of previously mentioned services are highly important to secure highest possible uptime for the customers trucks.

Pain Relievers: Customer must perform the job efficient as possible to offer he's customers best possible service. There for pain revealers can be considered to be range simulations to reduce doubts, how this BEV truck may survive in customers business environment. Aftersales services are trained for these new products to offer high level service to customer to secure that customers BEV truck is ready on time from the service. Driver training services give customers drivers knowledge how to use this new BEV truck right and efficient way. Rental services offer rental vehicles when customers own BEV trucks is under maintenance so customer may execute business with rental truck. Last but not leas charging consultation where customers business case is evaluated via charging and usability of the BEV truck.

Gain Creators: To offer customer clean, environmentally friendly trucks will give customer possibilities to enter to new business and operation areas. With specialist and trained salespersons, customer get best possible truck for the job and also gain positive imago when starting operate with vehicle which not produce any tail pipe emissions. Service contract purpose is to make customers business easy and take responsibilities from risks of new technologies. When service contract taking the risk from expensive repairing operations, customer may focus the core business and execute efficient transportation with the BEV vehicle. Also brand image of Volvo Trucks is strong and well known all over the world.

Appendix 4. Validation: Interview meeting with Director Area South.

Field notes from interview	22.9.2021
Director Area South	
Question	Answer
How is responsible of the offer?	Confidential
How pricing is done currently with ICE?	Confidential
How is order stage going after offer accepted?	Confidential
How is BB offer asked?	Confidential
How financial offer is asked? Business model: Cash or leasing?	Confidential
What do you expect from my side?	Confidential