Eco-friendly, safe and economically feasible energy concepts and technologies for European Inland Shipping

The Poettinger Case 2016

Case Study

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Table of Contents

Introduction

"Ouch!" Thomas[1] gave a wince of pain. Within the split of a second, his muscles relaxed again. He gently bit his tongue trying to relieve his pain and slowly put the cup of freshly brewed coffee back onto the table. "Damn, that is hot." His view focused on his desktop. Besides the portion of cream that he had already opened, there was another one, still unused. "As if I had known that I needed that one too", he mumbled. He reached for the portion, opened it and let the cream bubblingly flow into his cup. "That should cool it down. At least a little bit", he thought. While the saturated black of his damping black coffee was vanishing into more of a dark-brown colour, he took a glance at his very first office workplace. A short, satisfied smile appeared on his face.

Thomas was fascinated by tractors and agricultural machines since he had been a small boy. When the farmers were harvesting, he always had loved to watch them during their work on the fields, when they were operating their huge machines. Of course he had known the name Poettinger since then.

After high school Thomas had finally decided to study logistics and graduated three months before. He had done several internships at Poettinger during his studies and still was fascinated by the huge machines they produced. Thomas could perfectly identify with the company and - since the very first internship – got along very well with all of his colleagues. In secret, Thomas had hoped to work for Poettinger since his first internship at the company. When he was finally asked if he wanted to start working as a logistics engineer for Poettinger, his joy and pleasure was great.

> *With more than 1.600 employees and an annual turnover of more than 320 Mio. Euro in the year 2015, Poettinger belongs to the world's leading manufacturers of high-quality agricultural machines. The company, which is still a family-owned business, is based in Upper-Austria and aims to make work easier and more efficient for farmers. Besides its headquarters in Austria and two production sites in Germany and the Czech Republic, the company has sales offices in several countries in Europe, the United States, Canada, Russia, the Ukraine and Australia.*
>
> *The customers of Poettinger are located in the agricultural and farming industry. Accordingly are the products of the company: while one product-line is specialized in machines for tillage, so the cultivation of farmland with*

[1] All persons are fictional.

products like rakes, ploughs, disc harrows or stubble cultivators, the other product-line focuses on grassland like meadows and includes machines like different mowers, forage harvesters or loading wagons.

Poettinger is highly aware of its responsibility towards the environment and future generations. Therefore sustainability plays a very important role and all issues concerning environmental, economic and social issues are taken very seriously. This applies especially when it comes to developing and improving agricultural technology and new distribution strategies. Poettinger puts three values proudly on its banners: Innovation, dedication and authenticity.[2]

Figure 1: A typical agricultural machine of Poettinger: a centre-swath rake with four rotors[3]

The logistics department of Poettinger consisted out of three people: Franziska Hochbauer was the department manager, while Thomas and his colleague Heinz Buchbinder worked as logistics engineers. Their tasks included different responsibilities, such as the monitoring and the optimization of the company processes, the coordination of different departments working together or the planning and development of transport strategies.

Franziska Hochbauer was a tall, sportive woman in her late forties and well-known within the company – not only because of her calmness in times of stress and her structured way of thinking: Her husband was a farmer himself so she had gotten used to working with agricultural machines and had a lot of knowledge and practical experience. Her career with Poettinger had started as an assistant in the sales department. Due to her skills and knowledge, she had been able to evolve from an assistant into a business development

[2] URL: https://www.poettinger.at/en_uk/ [08.07.2016]
[3] URL: https://www.poettinger.at/en_us/Produkte/Kategorie/7/rakes [08.07.2016]

manager. During her time as a business development manager she had successfully completed a business executive programme and had gotten her MBA. After that she had been ordered to establish and develop a new logistics management department as a corporate function - which was a novelty.
Thomas and Heinz Buchbinder shared one office. Heinz was in his early thirties and was specialised in process optimization. He had worked for an IT-company before and was known for his analytical approaches to problem-solving. Thomas and Heinz got along very well. But since Heinz was on vacation, Thomas had the office for himself.
Thomas stood next to the window. He was casting a glance downwards and overlooking the area, where the outgoing machines were being prepared for the transport. He glanced at a truck driver, who was closing his trailer. Wooden crates were shortly visible before they vanished behind a curtain of blue tarpaulin. "Where will this truck be going now", Thomas asked himself. He took a small dram of his coffee, when, out of the blue, one single hard knock on the office door ended his little daydream. It was his superior, Franziska Hochbauer, who rushed into the room and stared at him with a broad smile in her face. "Be careful with the coffee", she advised Thomas, "Since they had the machine maintained yesterday, it is twice as hot as before." A slightly embarrassed smile vanished across Thomas' face: "Thank you. I already noticed that", he replied. "Would you mind coming into my office", Franziska asked, "I want you to have a look at something."

Actual situation

Minutes later they were both sitting in the office of Franziska. With a slow motion, she picked up a map (see Figure 2), which was lying on the desk directly in front of her, and slipped it to Thomas. "Thomas, you have done several internships while you were studying, so you know our company quite well", she started, "and you also know how important the Ukrainian market is, since agriculture is very important for this country. The Ukraine is to be considered to be one of the most fertile places on earth. The so-called black earth, or "Chernozem", is a very dark soil that contains a lot of humus – and thus is perfectly usable for agriculture. The Ukraine has one third of the world's Chernozem stocks; 68 percent of the land that can be used for agriculture in this country is black earth."[4] – "That is interesting", countered Thomas, "I didn't know that. I have heard that we already have a lot of customers there, but that there still is a lot of market potential for us."

[4] Cf. URL: http://www.worldbank.org/en/news/feature/2014/12/05/ukraine-soil, [08.07.2016].

"Yes, that is true", continued Franziska, "The thing is, by now, we supply all of our Ukrainian customers via our subsidiary in Boryspil, which is close to Kiev. But there are several problems that we have to face, as we currently transport all of our machines by truck. Due to their size, some of our machines require special equipment like flat-bed trailers, so transport costs are very high. Not just because of the equipment itself, but also because the capacity of the trucks is limited. Additionally there is little to no cargo that the drivers can take with them on their way back. Therefore the forwarding agencies charge us more than just the distance that they transport our cargo in order to cover the costs that they have when they drive back with empty trailers. It is a matter of money on one side, but also highly inefficient and unsustainable on the other side. A lot of carbon-dioxide is being produced unnecessarily, just because trucks need to drive back without cargo. And trucks simply produce a lot more pollution than the other modes of transport. Wait a second, I'll show you something!" Franziska turned towards her laptop. She typed something on the keyboard that Thomas was not able to capture, and clicked several times with the computer mouse.

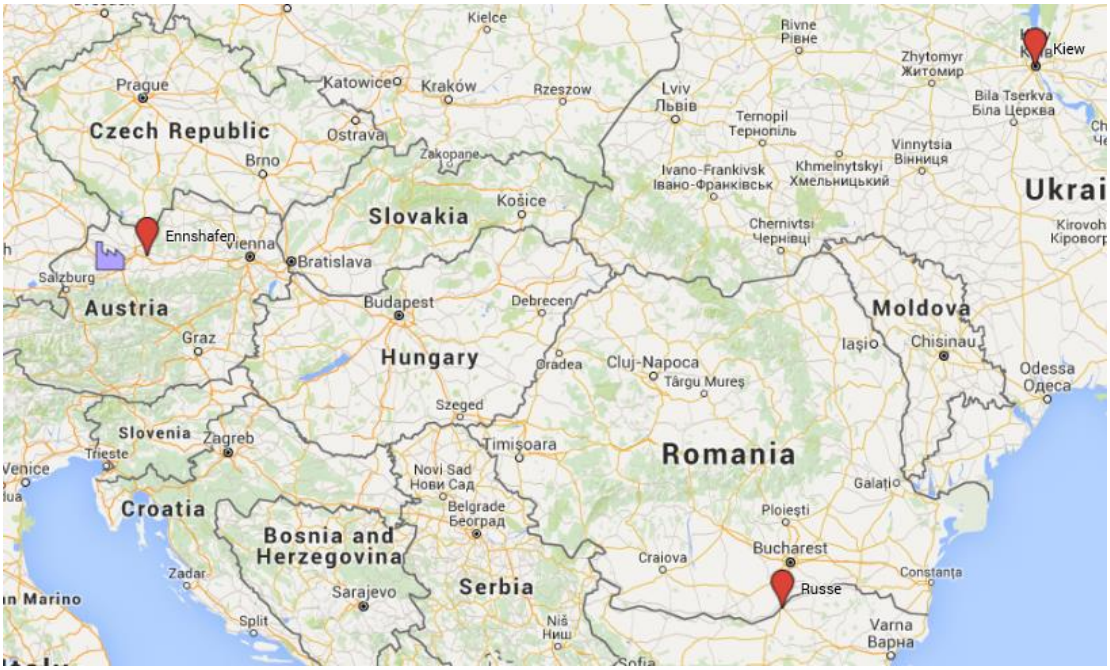

Figure 2: Geographical map with relevant places.[5]

"There we go", Franziska mumbled. She turned the monitor that Thomas could view the screen. "Look at that figure (see Figure 3)! That is really impressive: A comparison of

[5] Source: Google Maps.

truck, train and inland vessel in regard of their external costs. Mind the level climate gases and the level of air pollutants. The truck is highly inefficient per ton-kilometre." – "And by far cannot load as much cargo as a train or a ship may", Thomas added, "Still the truck is more flexible." – "Which may be relevant for shorter distances", Franziska said, "but this does lowly affect us when we are delivering to Kiev." Thomas nodded in agreement. "One of the advantages of shipments by truck for us", Franziska continued, "is that these shipments are direct shipments. They are being loaded here, and unloaded at their destination. There is no risk of damage due to further manipulation of the machines. On the other side, to be honest, it also happens that machines get damaged just because the drivers apply too much pressure when they are securing the cargo on their trucks." – "So, we should overthink the way we supply our machines to the Ukraine, shouldn't we", interfered Thomas. – "Yes", answered Franziska promptly, "but not only because of high costs, inefficiency and pollution. According to the European Commission, shipments that are to be transported at distances that exceed 300 km should be transported by rail or by vessel."

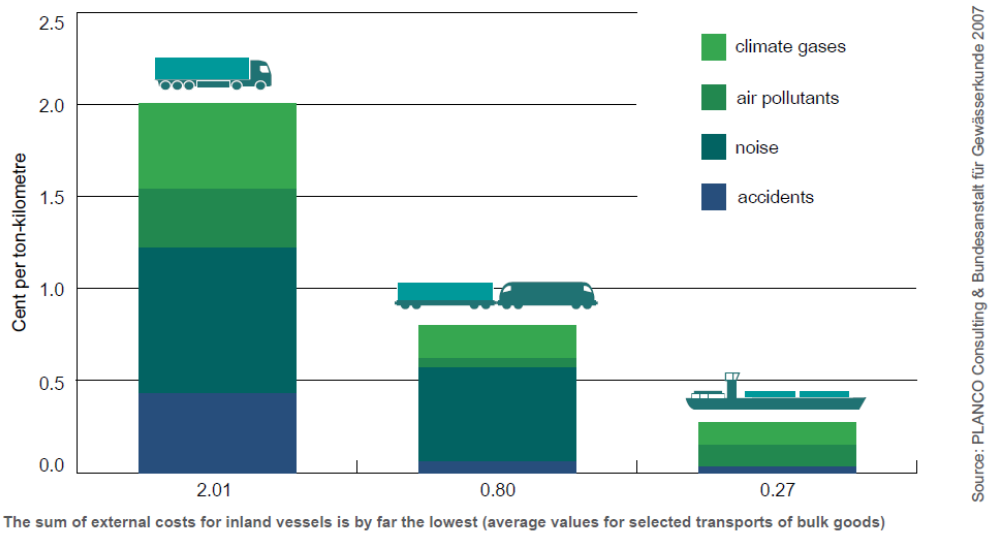

Figure 3: External costs of different modes of transport.[6]

To further strengthen the European transport sector for the future and to be resilient in times of global competition and dependency on oil, the European Union aims to strategically develop one single European transport area with identical standards. In its White Paper on Transport 2011, the European Union

[6] Source: PLANCO Consulting & Bundesanstalt für Gewässerkunde, 2007

defines ten challenging goals as part of a strategic development of the European transport sector. One of the goals is that thirty percent of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50 percent by 2050.[7]

"I know", countered Thomas, "We have discussed the current and future European transport strategy during my studies. At the moment the modal split of road-based transports is too high. In 2014 it was nearly 75 percent, whereas inland waterway was below 7 percent and rail at a little more than 18 percent within the EU-28.[8] A shift towards more efficient and eco-friendly transport modes would have a significant impact on pollution." Franziska looked at him. "The White Paper is an important step towards an eco-friendly transportation of goods within the European Union", she continued, "although it is definitely something that will affect us." She paused. "Besides that, we want to be one of those companies, who belong to the first when it comes to planning and implementing innovative strategies or products." Thomas took a sip of his already cold coffee: "On the map here, you marked our location in Austria and the capital city of the Ukraine, Kiev. But you also marked the port of Enns and Russe in Bulgaria. Why that", he asked. "This", Franziska replied, "is because we already were doing a trial shipment using a Roll-on/Roll-off-vessel on the Danube River."

In 2015, Poettinger decided to test a new transport mode to ship their agricultural machines from Austria to Russe, to supply customers within Bulgaria and southern Romania. The machines were transported by truck to the trimodal port of Enns, where they were loaded onto a Ro/Ro-vessel and shipped to Russe.

"I remember that someone was mentioning that during my last internship", started Thomas, "That sounds like a good idea. Did we follow up with that?" – "Well, not really", answered Franziska, "The thing is that we didn't have the personal resources to do that, which is also one of the reasons why we wanted you in our team."
"We want to focus on how we can transport our machines to our customers more efficiently and eco-friendly", she carried on, "and I want you to work out a new, innovative and eco-

[7] Cf. European Union: White Paper on transport, 2011.
[8] URL: http://ec.europa.eu/eurostat/statistics-explained/index.php/Freight_transport_statistics_-_modal_split [08.07.2016]

friendly transport strategy for the Ukraine. Maybe you can use the idea of the inland waterway transport and combine the volume from Bulgaria, Romania and the Ukraine. Try to be innovative – but realistic! For further information on inland waterway transport you may use the Danube Logistics Portal at www.danube-logistics.info for example. The information provided there may be helpful." – "I will", Thomas answered quickly. This was his chance to proof what he had learned during the past years as a student. "What I am also going to do is, I will consider the main corridors of the trans-European transport network TEN-T", he said raringly. "Yes, you really should do that", retorted Franziska, "and not only the European transport network itself, but try to find suitable gateways, especially when we are talking about the Ukraine. It is a third country, so we are talking about transportation to a non-EU country." – "By the way", Thomas started asking, "The current political situation, does it affect us?" – "No", Franziska explained, "At the moment not. We are in the fortunate position that all of our customers are located in safe areas." – "Ok", answered Thomas, "Then, where do I get some information about the shipping volumes, sizes and weight of the machines from?" – "I will provide you with our shipment statistics of the last season for the Ukraine and for Romania and Bulgaria", Franziska answered deliberately, "In the sales department they don't have the forecast for the upcoming season completed yet, so actually we depend on the data of the past year. The important thing is: as you know, our volumes are schedulable, so in the majority of cases, we don't need to ship that urgent. You will notice that when you work on the data. You can clearly see how machines are consolidated to form one single shipment. Sometimes it is even more than just one trailer."

> *The shipment statistics (see 03_Poettinger Case_Shipment Data.xlsx) provides information on a 12-months period in regard of the individual shipment date, the origin and the category of the machine as well as its weight in kilograms and its dimensions in meters. Since some of the machines can be folded in order to establish a smaller size for transportation, the dimensions are to be understood as the size of each product when it is ready for shipment. Machines that have the same shipment date and destination can be supposed to be transported by one truck, as long as the size and weight allow that. Each destination is defined by a 2-digit country code, the zip-code and the name of the city.*
>
> *The machines can either be transported unpacked or on pallets. The way the machines can be manipulated is indicated in the shipment statistics. Machines*

that are being transported on pallets are usually manipulated by fork lift truck, whereas those that are being transported loose need to be wheeled by a tractor, a fork lift truck or another suitable vehicle.

Although a manipulation by crane is basically possible with all types of machines, experience shows that the risk of damage is extremely high. For that reason, it is highly recommended to avoid manipulation, loading or unloading by crane.

What Thomas is now expected to do

Thomas nodded slowly. "Okay", he continued, "So I will get started as soon as I get the statistics from you." "Perfect. Once again, Thomas, what I want you to do is to develop an eco-friendly transport strategy for our Ukrainian market", Franziska took the map and handed it over to Thomas. "Create a draft of your transport strategy, defining which modes of transport we should use by comparing which ones are the most suitable for us. Afterwards go into details and work out the whole strategy. You know the location of our plant and the destinations; you have the shipment data of the past 12 months and the specific information of the machines. Be aware that some of the machines cannot be transported by standard trailers and require special equipment for transportation. Manipulation of the machines is crucial too. Try to consider all these factors when you work out the strategy. I guess you have all the relevant information I can provide you with. What I want in the end is a presentation that enables our management board to decide on how we are going to ship our machines to the Ukraine in the future. That means not only a brief description of your proposal, but a founded conception of how to supply the Ukraine. You should be able to give reason for your decisions. Do you have any questions?"

Thomas thought for a second. "No, not at the moment", he replied. "Okay", Franziska stood up. And so did Thomas. "I will send you the file with the shipment statistics in a minute, so that you can start working." – "Thank you." Thomas left and went back into his office. He sat down and looked at the notes he had taken during the conversation with Franziska.

Tasks

Imagine you are Thomas, when working on the following tasks. Use the online blog provided on the learning management system "ILIAS" to document the progress of your work and share information with your colleagues and other users of the blog.

Date	Tasks
1st Lecture	• Case will be handed out.
Self-study	• Analyse the case and the information provided within it. • Identify the advantages and disadvantages of different transport modes and compare the transport modes in regard of the transportation of high and heavy agricultural machines. In addition, consider possible ways of transportation based on the trans-European transport network TEN-T. • Evaluate and decide for at least one eco-friendly transport strategy draft, which you present during the next lecture. • Eco-friendly strategy draft(s) should at least include the following information: costs; strengths and weaknesses of transport strategy; necessary “make or buy”-decisions; location and function of possible new distribution centers/transshipment points; required strategic alliances.
2nd Lecture	• 10 minutes presentation of transport strategy draft • Feedback from lecturer and students
Self-study	• Based on the transport strategy draft and on the feedback you get, elaborate the most eco-friendly transport strategy for Poettinger in detail, as required in the case. • Create a well-structured management presentation of 20 minutes and prepare for a following 5-10 minutes discussion to discuss your final transport strategy. • The final presentation should at least include the following information: costs; strengths and weaknesses; implementation plan of strategy; resource planning; necessary investments and profitability of strategy and environmental impact of strategy.
3rd Lecture	• Presentation of the strategy (20 min.) and discussion (5-10 min.).

Recommended Links:

Homepage of company (Poettinger):

http://www.poettinger.at/en_in

European Commission: Mobility and Transport

http://ec.europa.eu/transport/index_en.htm

TEN-T and European Traffic Geography

http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html
https://www.bmvit.gv.at/service/faktenblaetter/tent.pdf
http://www.inlandnavigation.eu/media/33990/Map_Europe_VIA_2014.pdf
http://www.unece.org/fileadmin/DAM/trans/doc/finaldocs/sc3/ECE-TRANS-SC3-144r1e.pdf
http://www.european-waterways.eu/e/index.php

The River Danube and Inland Waterway Transport

http://www.rewway.at
http://www.viadonau.org/
http://www.danube-logistics.info/
http://www.doris.bmvit.gv.at/en/