NexTrust

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NexTrust Pilot 3.1 Case Study:

Integrating intermodal structural freight flows from supply and demand side through trusted collaboration

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1. Introduction and Objective

Europe is considered as one of the leaders in logistics sector globally. Six EU Member States are ranked among the top 10 countries in terms of logistics performance for year 2014 (World Bank, 2014), while the market size of the logistics sector in Europe has been estimated equal to €878bn in 2012 (European Commission, 2015).

On the other side, the logistics cost remains a significant part of total cost in various sectors - 12% of total cost in manufacturing sector and more than 20% of total cost in retail sector (European Commission, 2007). Moreover, the freight supply chains across Europe account for 25% of the CO2 and particulate emissions.

Concurrently, the logistics' efficiency remains pretty low: 24% of goods vehicle-km in EU run empty while the average load factor for vehicles is equal to 57% (World Economic Forum, 2009) due to the lack of collaboration in the use of motive and warehousing assets.

Therefore, the enhancement of collaboration is considered as the solution towards the improvement of logistics sector. More efficient synchronized networks and decrease of operational costs are the main benefits for the companies involved in cooperation schemes (Lehoux et al., 2010), as cost savings and efficiency gains of 6-10%, according to Transport Intelligence (Graham, 2011), or a reduction of 9-30% in distribution costs (Vanovermeire and Sorensen, 2014) could be expected.

NexTrust, an EU grant funded Horizon 2020 project (Grant 635874), was setup to bring together like-minded actors in the supply chain to raise asset utilisation levels and reduce Green House Gas emissions through collaborative pilots.

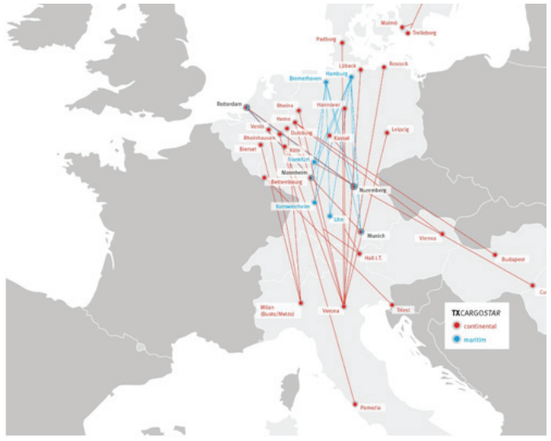
The innovative idea of NexTrust project is the development of interconnected, trusted networks that collaborate together along the entire supply chain towards the establishment of long-term solutions.

The main objective of the project is to establish a new way of working together, to solve real problems of inefficiency in the logistics sector on a sustainable basis. To this end, the project coordinates 20 different pilots which address actual problems across the length and breadth of European logistics.

Up to now, actors in the supply chain, such as manufacturers, importers, retailers, exporters and logistics companies are generally reluctant to pilot or utilise new methodologies or new routes to market as there are many examples of costly implementation failure.

In order to overcome actors' hesitation to participate, the most important aspects for successful collaboration were identified prior to the elaboration of the pilots:

- Careful planning of the project
- An agreement to, transparently, share the savings generated net of any additional costs
- Agreements on the planning and administrative processes to be used
- Routes to deal with any disagreements
- Importantly the use of a Trustee to receive data, analyse the best matched routes and distribute back the plans. This would be a daily (at least) dynamic process. The Trustee also covered the confidentiality and anti-trust concerns about the pooling of data.



Pilot 3.1 focused on the structural freight flows of the intermodal service provider TX Logistik across 10 European countries following the TX Intermodal Network that mirrors 5 of the TEN-T core networks corridors (North Sea to Baltic, Scandinavia to Mediterranean, Rhine to Alpine, Atlantic and Rhine-Danube corridors).

The challenge: how best to interlink them with current structural shipper road freight flows. By identifying these flows and matching to the train movements the pilot should find a sufficient volume base to be shifted off the road.

The main goals of the pilot case category 3.1 were:

- How to increase the quantity of freight flows for the TX Logistik rail network across 10 European countries?
- How to convert FTL road shipper flows to inter-modal rail service through trusted collaboration, matching up supply and demand?

The requirement for the establishment of these collaborative intermodal shipments is that the train operators need to accept, supported by the trustee, a shift of the transport capacity risk from the shippers and the integrators to the carriers. This entails using "smart visibility" and a change in internal operational behaviour to synchronise flows at the execution level.

The situation today is that the FTLs in scope are transported mainly via road causing high emissions of greenhouse gases (GHG). Eurostat data from November 2014 reveals that, among the inland transport modes in EU for freight, road transportation continues to account for the biggest share with about 75%. Railway's share of the freight transport market is steady and low with around 18%. While freight will probably continue to be transported by truck when it comes to short distances, freight transportation over medium and long distances can be shifted to the rail mode to increase the environmental sustainability of the European Transport System.

Today there is no trusted environment in place to share transport flows between shipper and LSPs in order to analyse a potential shift to intermodal. The role of the Intermodal Operator to provide this independent trustee was explored.

2. Application of Pilot

The pilot was a research analysis to show what might be possible if collaborative planning of the TX Freight Network and the known road freight networks were performed.

Looking into the current 'as-is' business model, it emerges that the market players have already undertaken a lot of efforts in bundling cargo flows and shifting them off the road. The key business model currently in place is the so called "intermodal operator", who acts as independent intermediary or kind of broker between intermodal companies and potential customer groups. The intermodal operator purchases transport capacity from rail or shipping companies and sells the capacity to several other competing carriers. Some European intermodal operators have also established a legal entity where the shareholders are mainly the carriers or other intermodal undertakings to be able to bundle cargo and share the risk with a common joint-venture.

However, the intermodal operator is organised between the door-to-door carrier and with the intermodal suppliers, and there is no direct involvement with the end-customers, i.e. the shippers.

With this role as intermediary at the supply level, there is no direct control about freight flows to be transported and with each shipper tender a new

carrier could be assigned, - who is often not using the intermodal service capacity from the previous carrier or is technically not able to continue to transport in an environment-friendly way. This 'as-is' situation feature will be addressed further when discussing the 'to-be' situation.
In the railway sector, the intermodal operator is sharing the risk in three different scenarios:

- Carrier takes fix commitment for rail slots
  → Risk is with carrier.
- Operator sells rail capacity on demand
  → Risk is with operator.
- Carriers takes partial commitment (e.g.1/3 of the train), Operator sells free rail capacity on demand
  → shared risk between carrier and operator

In Figure 2 below, we visualise the current general business model of the 'as-is' situation.

To illustrate these evolutions, the International Union of Railways (UIC) has summarised the development of the CT / intermodal operator business model and shows that nowadays, shipper, carrier and railway undertaking are taking the risk of the train utilisation. This is illustrated in Figure overleaf:

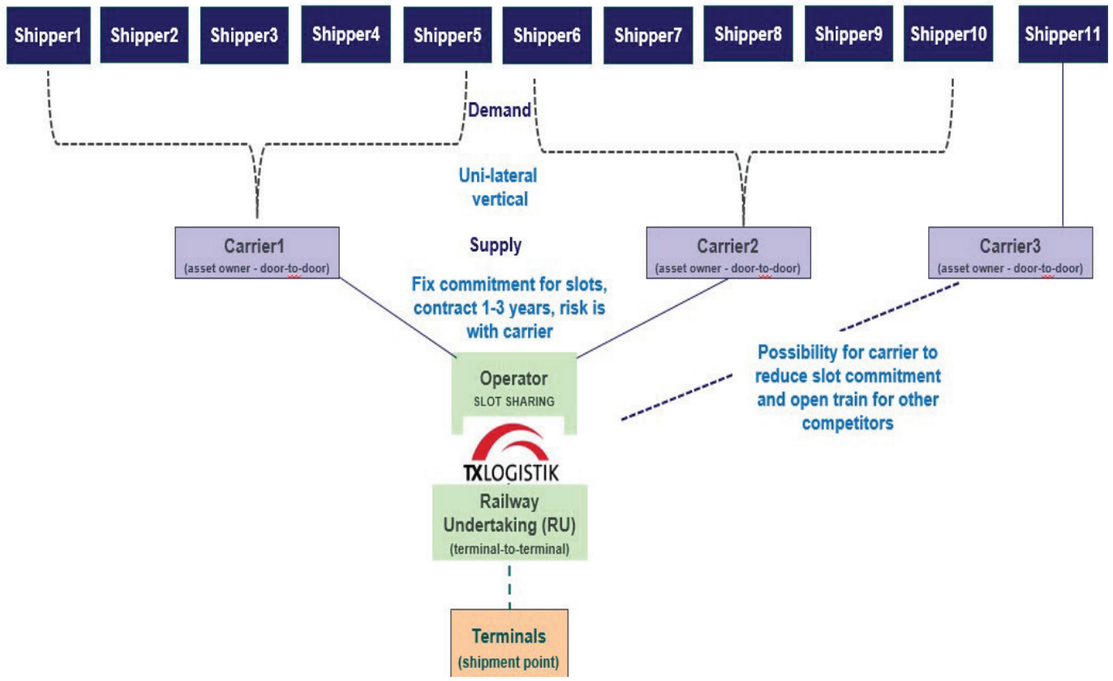


Figure 2: 'As-is-model'

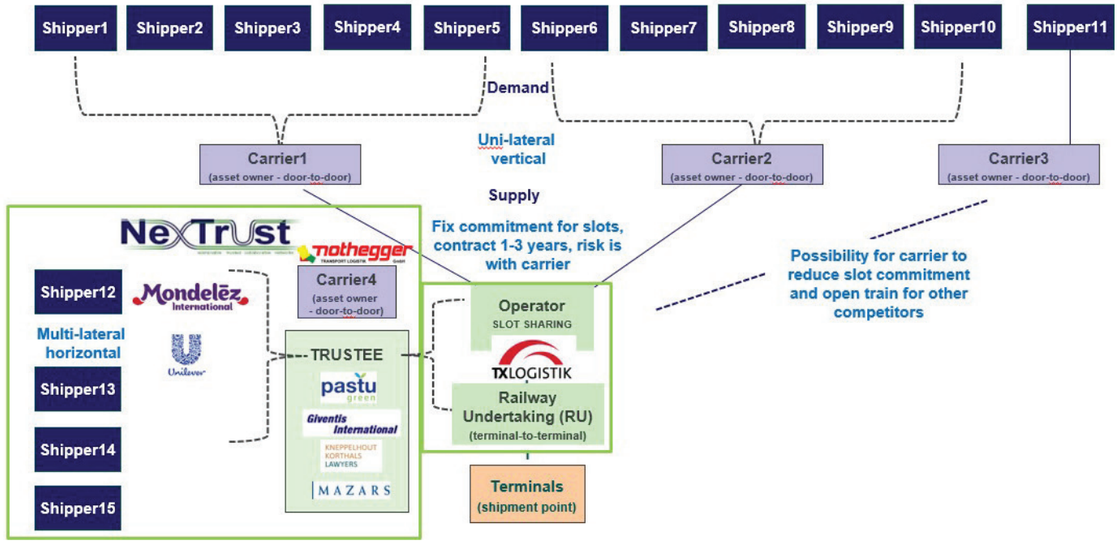


Figure 3: 'To-be-model'

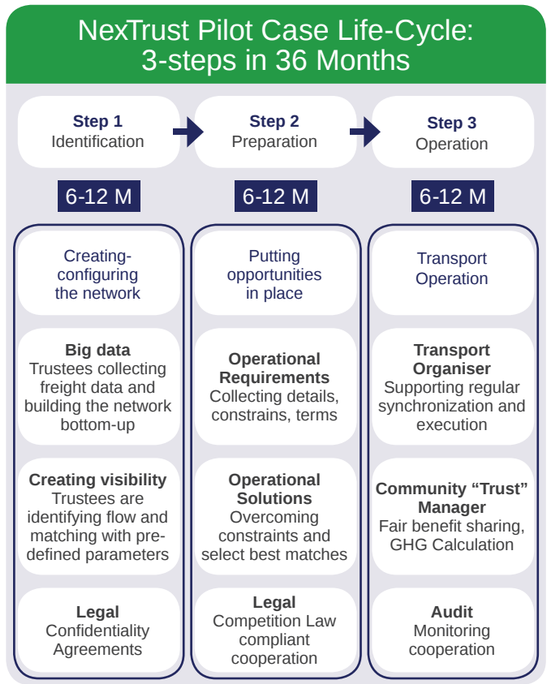
2.1 Methodology

The methodology used across all the pilots was based on a 3 Step process which was an operationally enhanced version of the CO3 methodology.

The 3 Steps are:

- **Identification:** freight flows and potential partners
- **Preparation:** Selecting best matches, benefit sharing agreement, administration, contracts
- **Operation:** supporting execution, monitoring agreed KPIs

Figure 4: 3-step methodology



General Schema by Dr. Patrick Stumm, Mike Bogen

Figure 5: 3-step in 36 months

Each step takes between 6 and 12 months. To ensure that collection and analysis of the result data was consistent and verifiable, the results were audited and confirmed by Vlerick University before any publication.

2.2 The introduction of the neutral trustee to support collaboration

The NexTrust intermodal FTL demonstrator has hereby two main service functions of the trustee, as also visualized in the figure below:

- First, the service is categorized as a “Transport optimizer”, which includes transport flow match-making to identify synergies between partners.
- Second, the service function is providing “trust”, where the trustee is acting as independent, neutral and confidential provider for several shippers. The trustee enables the collaboration journey, from identification of freight flows through preparation of the collaboration, supporting the actual execution.

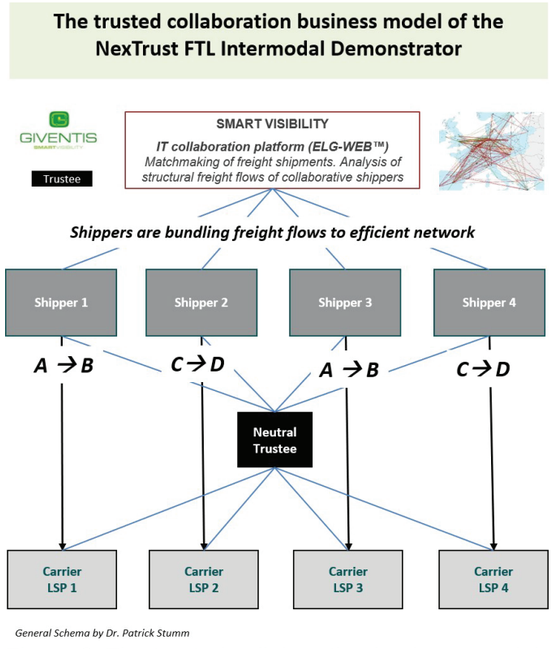


Figure 6: The trusted collaboration business model

The trustee for the FTL demonstrator worked as a team, in particular the NexTrust partners, Giventis and Pastu. The role of Giventis was particularly important to identify and match transport flow data of shippers. Giventis has a dedicated IT collaboration platform ‘ELG-Web’ offering a unique on-demand web-based service that helps clients to re-engineer and optimize their transport networks. The tool gives visibility to intermodal FTL bundling opportunities.

The legal support for the FTL demonstrator was provided by NexTrust partner Kneppelhout.

Table 1:
Overview of the neutral trustees for the FTL intermodal Demonstrator.

Neutral Trustees	Short Description	3-step involvement
pastu green	Pastu Green is the division responsible for innovative sustainable business solutions with special expertise in the transportation and logistics sector, such as, full-truck-loads and intermodal sector.	Involved in the entire life-cycle of setting up intermodal collaborative pilot cases
GIVENTIS SMARTVISIBILITY	Giventis is an information services company, offering a unique on-demand web-based service that helps clients to re- engineer and optimize their transport networks by providing actionable business intelligence.	Involved in the entire life-cycle of setting up collaborative pilot cases IT optimization platform ELG
KNEPPELHOUT KORTHALS LAWYERS	Kneppelhout is a law firm with broad expertise in inter-national business law, among others in corporate and commercial law, IP and privacy law, competition law and transport law.	Support for any legal questions which may arise

The NexTrust FTL demonstrator very much follows the business philosophy of “think globally, act locally” with regards to building trusted collaborative networks.

Step 1: Identification phase of the FTL demonstrator

The trustee will help the participants in a collaboration to identify, set up and organize the pilot cases by first collecting individually from the proposed participants some transport data for the express purpose of matching this data with the similar data of other collaboration candidates. The focus is on identifying if there are any potential ‘collaborative matches’ for freight flow bundling on identical or compatible lanes to develop more sustainable solutions. It is as if an impartial observer would take a helicopter view to look for bundling chances across the millions of structural freight flows and transport asset movements that exist everywhere in the European transport market. The first trust step is an important building block. The identification process is designed to identify potential partners and thus initiate first trusted relationships that can be scaled up to demonstration pilots.

Step 2: Preparation phase of the FTL demonstrator

In the preparation phase, it is the trustee’s responsibility to facilitate the development of business cases of several shippers to support specific collaboration scenarios and in this role act as an arbitrator to overcome any barriers or constraints to the collaboration. Just as in the identification step, this requires a “tool kit” of processes, methodologies and ICT tools covering all aspects of trusted collaboration, including but not limited to legal agreements providing for applicable rules of engagement that cover partner gain sharing, entry/exit terms, supplier selection and expected behaviour between the partners. In many situations, the trustee may also facilitate market discovery in an anti-trust compliant environment through various means.

Step 3: Operation phase of the FTL demonstrator

In the operation phase, the trustee implements the collaborative agreement (rules of engagement) and supports the actual operations of the collaboration scenario on an on-going basis. For this purpose, appropriate ICT tools are needed for an efficient and streamlined management process. The trustee also audits the actual operations to ensure that the rules of engagement are followed and that gains delineated in the collaboration agreement are actually accrued.

2.3 Target Groups

This pilot could be valuable for: 1) Food manufacturing participants and industry peers, and 2) Supply chain and logistics researchers /policy groups/NGO’s as it establishes the viability of 4PL consolidation (Control Tower) while determining the scope for consolidation, indicating the factors and barriers towards its adoption.

Based on the above, three main target groups were identified in this pilot:

- Temperature controlled product manufacturers
- Food wholesalers, Pharma and retailers
- Automotive
- Interested academic institutions and policy groups/NGO’s

3. Resources needed for the pilot/ application

In order to create the interface for freight flows of shippers with the existing TX intermodal rail network we used the ELG-interface of Giventis (See NexTrust public deliverable 2.1 “Network Identification”) and enriched this with the intermodal specific parameters. The interface has been tested and validated, adjustments have been made based upon feedback collected during this testing period.

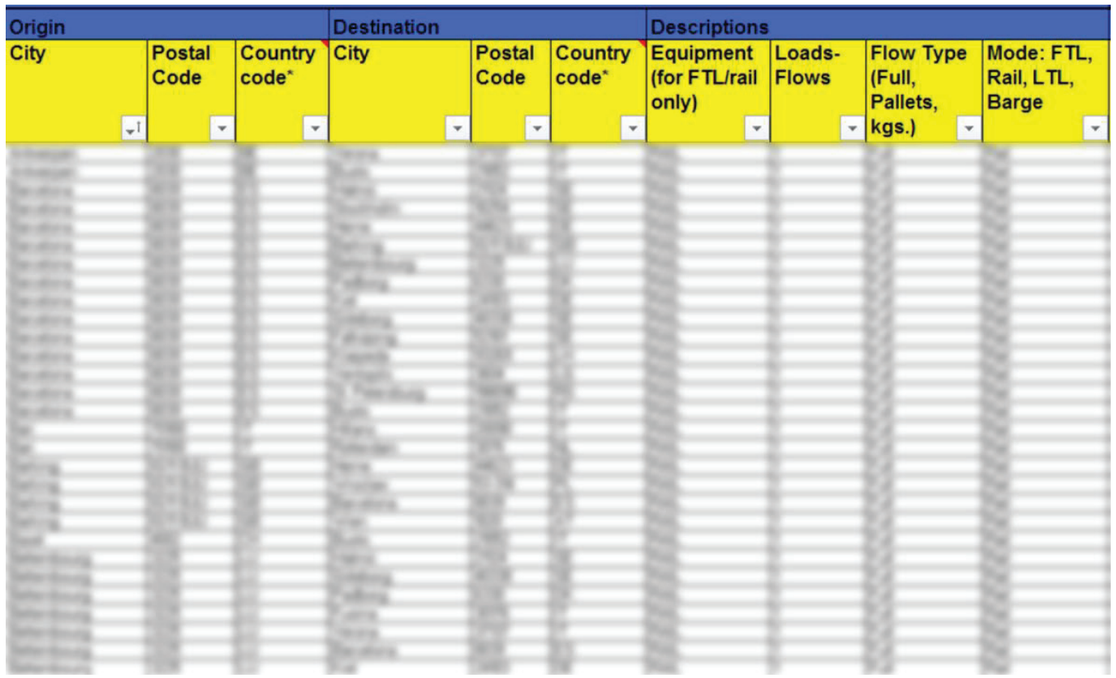


Figure 7: ELG Interface

4. Results/Impacts

The flows provided by shippers were matched in the course of a first analysis in 04/2016 against the current TX network. Overall 17 flows (incl. 3 backload flows) matched against the current TX network. In total we have identified 5756 FTL, see Table 1.

Match #	FTL	Country Origin	Country Destination	Backload (FTL)	Temperature Requirements
1	838	DE	NL	0	ambient
2	85	DE	BE	0	ambient
3	31	DE	SE	0	temperature controlled
4	504	NL	SE	0	temperature controlled
5	100	NL	DE	0	ambient
6	342	HU	NL	0	temperature controlled
7	600	IT	BE	0	temperature controlled
8	437	DE	IT	486	temperature controlled
9	1178	BE	IT	0	temperature controlled
10	54	DE	CZ	0	ambient
11	43	IT	NL	0	ambient
12	543	IT	BE	161	temperature controlled
13	69	IT	DE	0	ambient
14	144	AT	BE	141	temperature controlled
TOTAL	**4968**			**788**	

Table 2: FTL flows matched with current TX network (1st round)

Transport flows are designed to be transferred from the road to intermodal, facilitated by the NexTrust 3-step- methodology. The trusted environment has been setup (supported by KKL) by signing NDAs between partners involved as well as introducing trustees. After that, transport flows have been shared with trustees GIV and PAS in order to match and identify synergies. The results have been shared with parties concerned and opportunities have been discussed.

Out of these matches, we could start a pilot case in operational phase, involving SHIPPER1- CARRIER1-TX on the lane Hannover area (Germany) and Milano (Italy) with a matching backload from Hall greater area (Austria) to Hannover greater area (match no. 8). The first and last mile on road is transported by freight forwarder SHIPPER 1, which has been invited as pilot participant. As SHIPPER 1 has liftable reefer containers available, we found a perfect match. Operational and contractual questions have been solved and go decision for operation was taken in July 2016.

Overall, the pilot category 3.1 applied successfully the 3-step methodology and achieved success with two Pilot Cases in advanced stage:

- TX – CARRIER 1– SHIPPER 1 (operation phase)
- TX - SHIPPER 2 (preparation phase)

Within the joint WP2/WP3 activities (T2.2.2 / 2.3.1 and 3.1.4) we have analysed to setup new intermodal lanes, provided the critical mass therefore is given. Here we consider all available and planned flows (NexTrust shippers, pilot members, TX customers) and identify main routes that are feasible to setup a new intermodal lane.

At this stage the analysis showed high volumes between Poland and UK, which would allow to set up a new intermodal lane. However, we once again were facing the challenge of missing backloads from UK to Poland. In this respect we have been looking into various scenarios to identify needed backloads (e.g. stop in Rotterdam or Ruhr area, Germany).

As further shippers have provided freight flows during the course of the project, an additional analysis has been made in November 2017. Table 3 shows an excerpt of the most relevant matches.

Match #	FTL	Country Origin	Country Destination	Backload (FTL)	Temperature Requirements
1	1364	Hungary	Germany		
2	128	Denmark	Italy		
3	1641	Austria	Netherlands		
4	1652	Italy	Netherlands	1308	
5	2880	Germany	Italy		
6	1226	Germany	Austria	656	
TOTAL	**8891**			**1964**	

Table 3: FTL flows matched with current TX network (2nd round, excerpt)

5. Lessons Learnt

The factors that contributed to the successful implementation of the pilot, as well as the main obstacles faced were identified as they are considered as valuable, towards the expansion of the pilot to additional companies and markets as well as for the elaboration of similar pilots in the future.

5.1 Factors of Success

Initially, the main factors and ways that ensured the successful implementation of the pilot were identified and are presented below.

a) Build trust early: Confidentiality and anti-trust rules need to be established and agreed at the initial phase of the pilot to gain participants' trust & commitment. This was a Trustee priority throughout the pilot.

b) Prospectus: Providing a balanced, succinct project overview can help to put potential partners at ease, as well as demonstrating the commitment of other parties without providing names.

c) Credibility: In order to enhance the credibility of the pilot, it is important to bring knowledgeable, experienced people when presenting opportunities for a collaboration project. Within this pilot, the larger shippers involved provided expertise and guidance that encouraged the smaller shippers to participate.

d) Cultural differences: Cultural differences, in terms of geographical area or business sector could act as an obstacle in collaboration. The fact that during this pilot, the participants were from the same region and acting in similar businesses eliminated any cultural differences and helped significantly in communication and logistics

e) Data Collection: Cost-elements in the data: Data collection should be conducted through the use of pre-agreed standard templates, designed to match the participants internal systems capabilities. Within this pilot, normalisation was minimized to data standard differences and differences in nomenclature and text formatting.

f) Pre-calculation model: When setting up a more complex collaborative network, a robust pre-calculation model is a prerequisite to get companies to participate. Using appropriate tools and a structured methodology, the Pilot volume came within 6% of the initial model – once adjusted for time and the withdrawal of some lanes through operational change. Cost performance was also forecasted, subject to operational variations on the volumes over the planned lanes.

5.2 Main obstacles/difficulties

As mentioned above, the identification of main obstacles and difficulties faced during the elaboration of this pilot action is also valuable in case of conducting similar pilots in the future. The main obstacles faced during the elaboration of this pilot are presented below.

Unlike matching FTL flows, we were facing specific challenges in converting transport flows for intermodal transportation. This relates to the fact that different parameters and specific constraints apply than shippers used to know from road transportation. Thus, we experienced the following challenges when setting up pilots:

a) Shippers expect door-to-door transportation and preferably a single business partner when sourcing transportation. Being a railway operator, TX usually offers terminal-to-terminal connections. We learned that a door-to-door solution is mandatory for shippers and we had to work out a feasible setup. It turned out that involving freight forwarders currently working for the respective shippers had little or none intermodal experience (specific planning and organization) and not the resources available with regards to intermodal transportation (esp. liftable equipment).

b) We also faced reluctance by some freight forwarders, when being approached by TX in order to offer first/last mile transportation. Some feared it was a risk to their business, as they claim to be the sole contact for shippers. This shows that more needs to be done to highlight the benefits when participating in NexTrust and to pay attention to the benefit sharing model within NexTrust.

c.) Another challenge has been that predominantly temperature-controlled flows were matched with the TX network, which made things more complicated as freight forwarders specialised in temperature-controlled transport are limited in general and usually do not have liftable reefer equipment.

d) Finally, we concluded it would be better to work with freight forwarders having experience with intermodal transportation, and thus having the required equipment available.

e) Timeline: Critical for the successful elaboration of the pilot. It took a lot longer to set up the pilot than planned.

f) Difficulty in getting first companies on board: Getting the first ones on board can be hard as the trustee has to be strict to not mention any names of potentially interested other companies.

g) Participant pipeline: The final number of companies that submitted data was limited compared to the total number of companies that were interested in joining. Trustees should already have a second and third wave of companies to be contacted ready before going to the first wave to prevent losing too much time, and as a result lose the first wave of companies' buy-in and patience.

h) Need both small and large companies: Combining smaller shippers with larger ones can lead to unexpected synergies. The opportunity to involve smaller shipper was lost early on in this Pilot due to operational circumstances, which compromised the expected result in some areas.

i) Focus on economic benefits: Cost savings remain the main goal for participants in order to join a collaboration project, regardless of potential savings in GHG. As such, the goal of the collaboration should be clear from the start, and participating companies should be on the same page in order to keep the end-goal in sight. At the same time, trustees and pilot leaders need to keep in mind that companies may not engage in a pilot if the economic benefits are too small. This has been shown to be true in this pilot, where significant consolidation opportunities were already available to the larger shippers. This collaboration required the involvement of smaller shippers to generate increased savings.

j) Current processes and risks. The larger and smaller shippers had different priorities driving current and future participation in this type of collaboration.

5.3 Other findings

Shippers are providing predominately one-way flows, which was another challenge we were facing. In intermodal transportation it is crucial to have a backload available, as – in opposite to road transportation – usually only A-B-A connections allow an efficient operation. In the identification phase we found only two flows with an adequate backload. In addition to find suitable freight forwarders for the first/last mile transportation, we could not offer a competitive pricing to shippers, as (mostly) no backload was available.

Besides we experienced that - even if all above mentioned operational challenges could be solved - we finally failed to start a pilot due to pricing. We learned that some shippers are very price sensitive and do not accept to pay (significantly) more than they pay for road transportation.

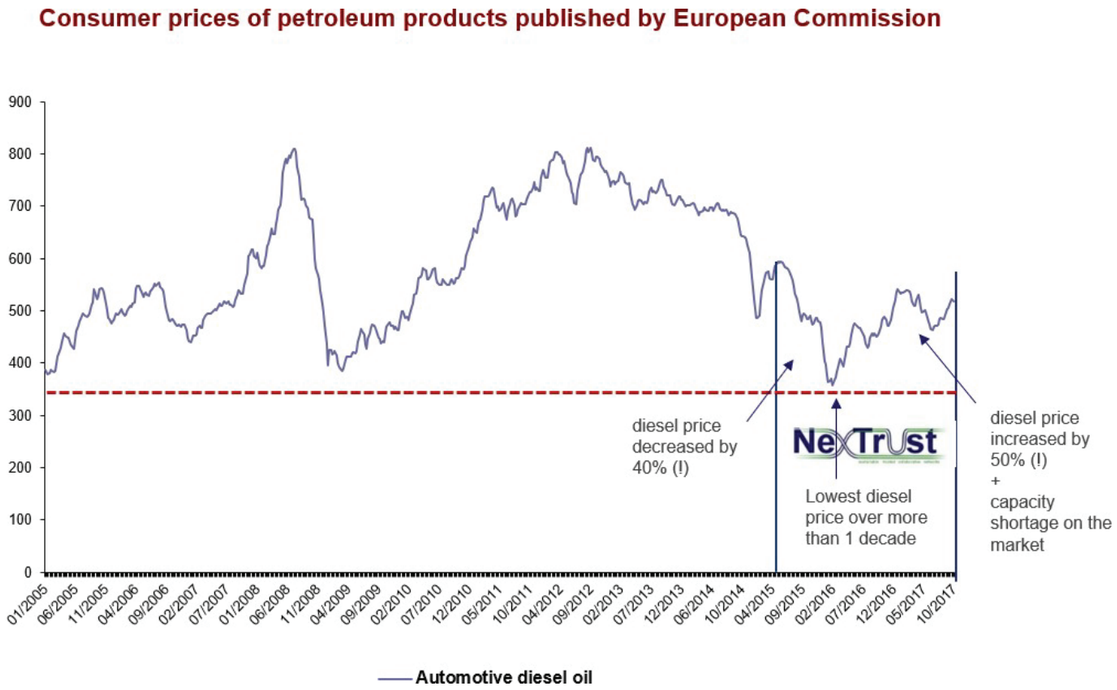


Figure 8: Diesel oil price 2005-2017

This effect has been intensified by the diesel price from 2015 to 2016, which was at the lowest level for more than a decade (see Figure 8).

6. Conclusions

With regards to matching FTL flows with the current TX intermodal network, we will continue discussions with shippers and pilot members and keep the database up-to-date. On a regular basis we will update and match shipper's flows with our network.

We will further contact freight forwarders (esp. specialised in temperature-controlled transportation) in order to overcome the challenge of having suitable carriers for first/last mile transportation. In this respect we will underline the NexTrust business model and benefits involved for all partners.

In order to address the fact that freight forwarders are lacking liftable (reefer) equipment, we will focus on promoting our NIKRASA system. NIKRASA is an innovative technology which allows to lift any non-liftable (standard like box, taut-, tank-, bulk-) trailers on a wagon with the help of a special lifting device (see Figure 9).

Figure 9: NIKRASA system

Webpage: https://www.txlogistik.eu/en/services/nikrasa/
Video: https://vimeo.com/289841848

The benefit is that freight forwarders do not need to invest in liftable equipment or any modification and can avoid the complexity of planning the needed (liftable) trailer at the right place.

The NIKRASA system is in particular interesting for the intermodal pilot cases as many flows provided from shippers are temperature-controlled. Bearing in mind that freight forwarders with liftable reefer equipment are very rare, there is a good opportunity to broaden the potential scope of freight forwarders for first/last mile transportation.

7. References

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