innofreight

# ANNUAL REVIEW 2016


Innofreight Technologies as a New European Standard for our Customers

*Published in December 2016*

# PREFACE

In 2016, we were able to further extend and strengthen our collaborations with end customers as well as European railways. Many railway transport companies use Innofreight's modular concept as an integral part of their future strategies. Highlights: We have signed a framework contract with the Czech railway company ČD Cargo about putting into service up to 500 InnoWaggons over the course of the next five years. The transition of brown coal transport to the Chvaletice power plant in the 2nd half of 2017 from Ea-wagons to Innofreight technology serves as a pilot project. Innofreight is a one-stop-shop system supplier delivering everything from InnoWaggons and containers to loading and conveying technology.

End customers need holistic logistics solutions, the railway freight transport organisations of the 21st century require modular and flexible wagon technology – for this purpose, Innofreight offers a perfectly tailored technology and logistics package.

The Slovenian rail transport company SŽ and the Finnish firm VR Cargo have also decided to sign contracts on future collaborations with Innofreight. InnoWaggon is particularly interesting for the Slovenian company since it yields high levels of optimisation possibilities when used at the Port of Koper. InnoWaggon as a carrying wagon for bulk material containers (e.g. for ores and coal) and as a universal carrying wagon for sea containers – that's the future vision on modernising fleets. In Finland, we are entering new territories: We will build the first wide-gauge wagon, our FinnoWaggon. Using our prototype wagon, we will pass TSI licensing in 2017. The first serial deliveries are scheduled to start in the 4th quarter of 2017.

We have further deepened our long-standing and excellent partnership with ÖBB Rail Cargo Austria. In late January 2017, we will put into service a new coal unloading station at voestalpine in Donawitz. Furthermore, our new liquid containers for slurry as well as the RockTainer SAND have proved well in test runs. Both container types will enter serial production in 2017.

For your benefit, we develop new logistics solutions and optimise our systems for purposes of increasing efficiency. Particularly worth mentioning in this context are our new log wood wagon for the Scandinavian market which allows us to increase payloads on block trains by some 25 % as well as our new inter-modal stainless steel bulk material container for the transport of corrosive cargo.

We hope that reading our end-of-the-year report will provide you with lots of new ideas on how to upgrade your logistics solutions. We are happy to assist you as your technology and logistics partner – now and in the future.


# WORDS OF THANKS FROM THE MANAGEMENT

On behalf of the entire international Innofreight team, we would like to take this opportunity to thank you for excellent collaborations in 2016.

Thereby, we would like to particularly emphasise our long-standing and successful collaborations with Mondi and Papierholz Austria. The first transport for Mondi Steti using Innofreight containers took place in 2004 and we have been contracted with building a stationary unloading station for woodchips in 2017. Rest assured that we will provide optimum logistics solutions in the coming 10 years and thank you very much! We would furthermore like to stress our collaborations with EP Cargo. Following the politically driven closure of the Mibrag power station Buschhaus, it became necessary to transfer technology to the EP power station of Opatovice. Together with EP Cargo and putting in great efforts, we managed – a mere 4 months after the scheduled full operation of Buschhaus power station – to put Opatovice power station into full operation in late February 2017. We would like to thank all those involved for their great dedication! Additionally, we would like to express a big thank you to all customers we were able to acquire in 2016. In this context, we would like to particularly mention Holzindustrie Ziegler and VTG Rail Logistics.

And last, but not least: our long-standing established customers, our partners, suppliers and service providers: Thank you very, very much for excellent collaborations in 2016! To account for our growth, we have further strengthened our team in 2016. This particularly applies to the wagon sector. In August 2016, we obtained our ECM certificate, which now allows us to optimally organise and take care of our wagons' maintenance for you.

For 2017, we have once again set ourselves a vast number of goals and will tackle promising and wide-ranging projects on the Scandinavian and French markets. This will make us ever more international and European – with our systems, there are no logistical borders. We thus strengthen European rail freight transport and reduce the impact on our environment, which makes us proud. On this path, the European Commission supports us with subsidies for our international business development in the framework of the programme line Horizon 2020 – thank you very much.

We wish you and your loved ones a Merry Christmas and a happy new year 2017.

DI Peter Wanek-Pusset & Bernhard Grentner

innofreight

Visit us at:
**www.innofreight.com**


# Company Profile



# Industry-specific logistics solutions

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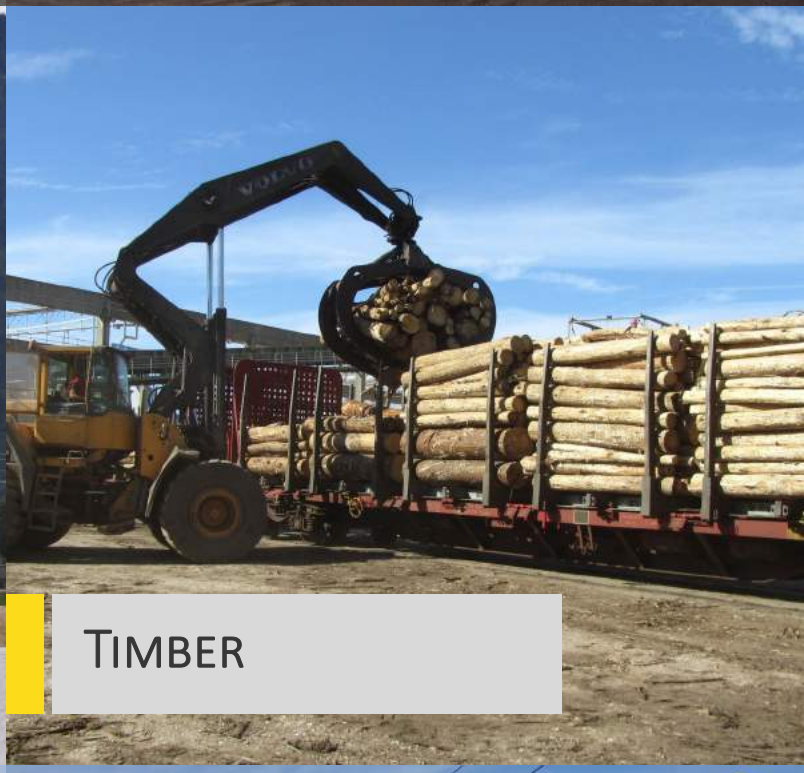
# Content


## Steel


## Energy


## Building Materials




## Timber


## Agriculture


## Liquids

# How everything started

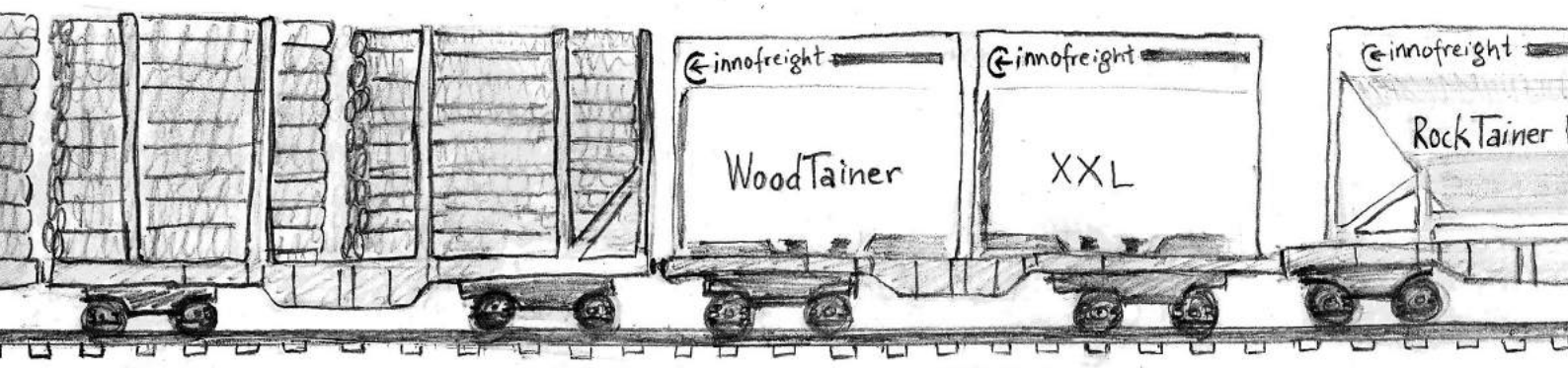
## Timber
2002-2010

In our first few years, our focus was on the timber industry. After extensive development, we brought our first container systems – WoodTainer XXL combined with a rotating fork lift unloading solution – onto the market in 2004. We managed to make this technology the European standard in the railway transport of wood-chips and biomass. We are particularly proud of the fact that we even managed this feat in Sweden and Finland, where we are also the market leader for this technology.

From the very beginning, we have developed logistics solutions in close collaboration with our customers and have learned from the customers. These positive experiences have shaped us and represent the secret of our success.


## Agriculture | Building Materials
2011-2015

In the following years, we started to develop logistics solutions for the transport of agricultural products and building materials. We were able to utilise our long-standing operating experience with our WoodTainer systems and adapted the containers and unloading technology to the altered requirements (higher specific weights). Thereby, we complemented our WoodTainer system with the inter-modal AgroTainer system. Extensive talks with our customers showed us that the only way to further increase the efficiency

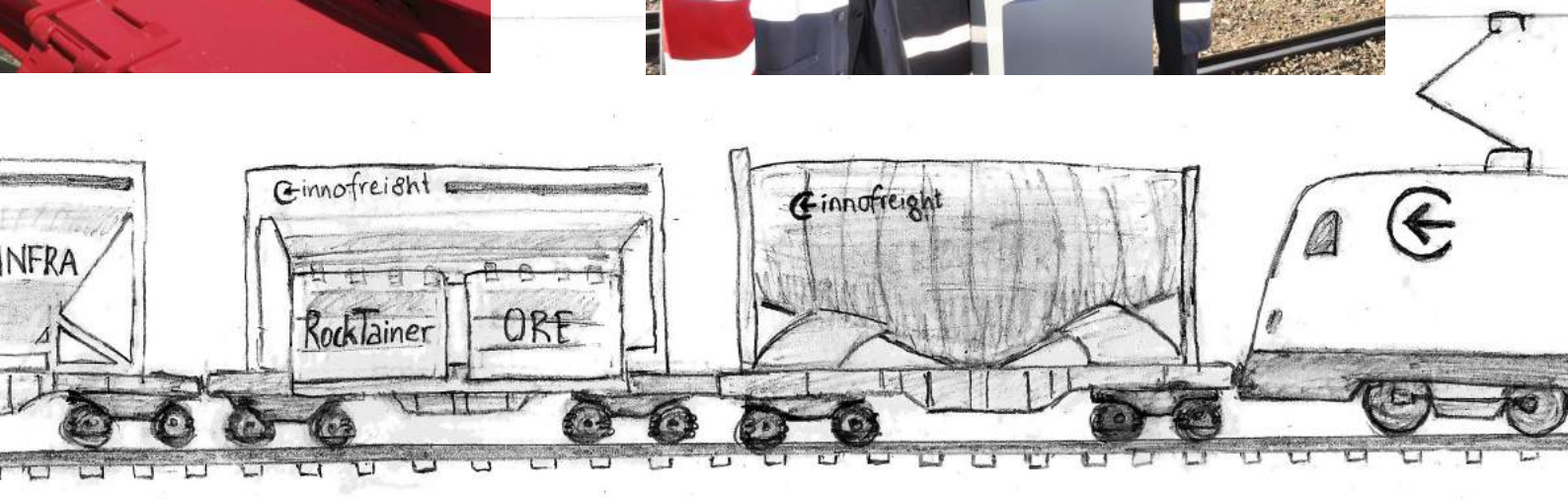


# The standard in European rail freight transport

## Steel | Energy | Liquids 2016...

of our products was to introduce to the market new, ultra-light and multi-functional container carrying wagons. This marked the birth of our InnoWaggons and 2013 saw the start of the test run using the first prototype wagon. We shift enormous quantities: every day, some 2,000 Innofreight containers are unloaded all over Europe.


With our InnoWaggon, we managed to revolutionise raw material logistics for the steel industry as well as thermal power stations. Combining significantly higher payloads in railway transport due to reduced dead weight, optimised and reliable unloading technology, paired with highest levels of occupational safety (stationary systems operated by a single worker) makes us a one-stop-shop. We provide tailored solutions for our customers without deviating from container standards. Thus, we create highest levels of flexibility yielding maximum benefits for our customers. Together with our customers, we constantly develop our products further or introduce new ones to the market: For us, there are no technical or logistical boundaries. Our first tank containers weighing a total of 76 tonnes are already in use. European railway businesses increasingly rely on Innofreight technology – we are part of their future strategies. Our mission is to make rail freight transport able to compete in the 21st century.

# European Standard


Over the course of almost two centuries of railway history, special wagons have dominated rail freight transport. Investing in one's wagon fleet always involved many years of lead time taken up by planning, development, testing and licensing. Once delivered, conventional wagons were used for 40 or more years. At that time, the possibilities of technically adapting wagons to changing market or customer requirements as well as infrastructure conditions were very limited indeed. High operating efforts during loading and unloading the freight wagons as well as technology increasingly prone to malfunctions and damage brought about economic disadvantages for both owners and operators. The immense variety of wagons, for instance resulting from different unloading methods for bulk materials such as coal, ore, gypsum, lime, gravel, sand, woodchips etc. significantly restricted the universal utilisation of special wagons. Back-up wagons of every type needed to be kept to be able to react to changes in demand or perform maintenance work. Many a fleet's kilometric performance lagged well behind than that of the lorry, a close competitor.

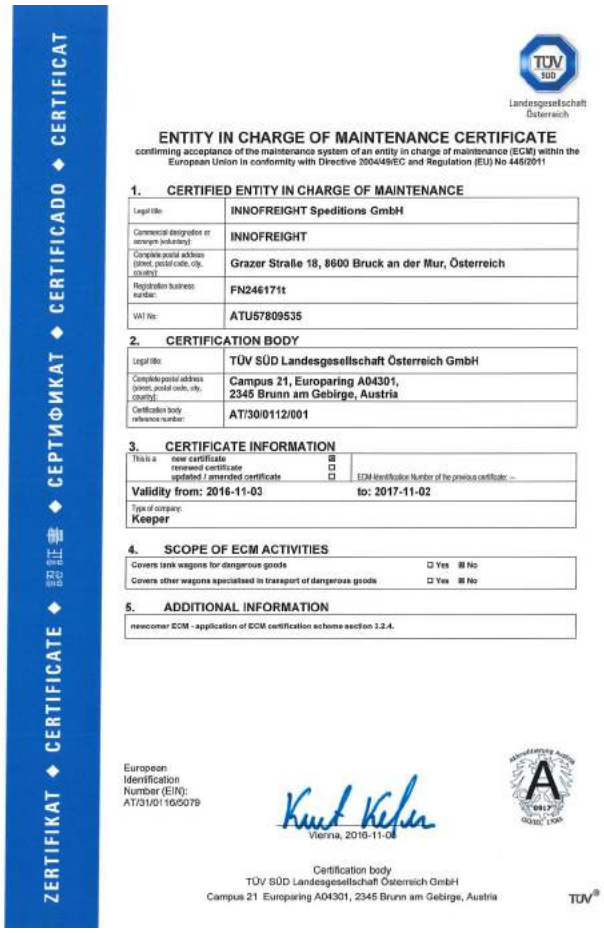

The demand for (re-)investment in the European rail freight transport sector is on the rise and is estimated to amount to approximately 100,000 wagons over the course of the next ten years. At the same time, the effect on freight structures (reduction of railway-based bulk goods, simultaneous increase in general cargo) requires fleets to be adapted. Additionally, the containerisation of logistics processes increasingly applies to industries previously dominated by conventional wagons. Political targets such as Germany's fossil-fuel phase-out agenda add insecurity to long-term investment.

Innofreight faces these challenges with a modular equipment concept consisting of the modern and light-weight InnoWaggon, standard containers optimised on the basis of cargo and infrastructure alike as well as innovative freight handling and unloading technology. Through higher net train weights, reduced shunting work for shorter trains, shorter wagon cycle times due to quicker unloading and optimised maintenance concepts or its containers' manifold areas of application: Innofreight's technology gives customers obvious economic advantages. High levels of flexibility mark the new standard in railway logistics in the 21st century. In 2017, Innofreight will further extend its position as the innovation leader in the field of European railway logistics.

The European Commission has launched a research and development subsidy programme called Horizon 2020 worth a total of 80 billion Euros. It forms a part of the Europe 2020 economic programme. The latter's objective is to produce "intelligent, sustainable and inclusive growth" while improving coordination between national and European economies. It particularly supports small and medium sized companies with growing faster and, in turn, successfully establishing their innovations globally. The EU subsidy initiative furthermore aims at minimising the risk involved in large-scale, complex projects to make sure that good ideas don't fail in the implementation phase due to overly long run-up periods or costly projects starts. Innofreight is expecting a multiplying factor in its aim to become the European market leader for technologies for railway-based bulk cargo transport.

Innofreight's ITECCO project was awarded for creating novel railway-logistics system solutions for the European steel industry. Through consistent standardisation, Innofreight is able to universally apply its technology all across Europe. Our platform concept, combined with containers optimised on the basis of cargo, increases the competitive advantage of railway companies and lowers their logistics costs. Thus, we significantly contribute to securing the future of Europe's steel industry. The project's implementation period was set at 24 months, started in October 2016 and will last until September 2018.

Horizon 2020 supports Innofreight's internationalisation, the development of a business structure with local sales organisations. Thus, it will be able to meet your requirements even more efficiently.



ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Landesgesellschaft Österreich

**ENTITY IN CHARGE OF MAINTENANCE CERTIFICATE**

confirming acceptance of the maintenance system of an entity in charge of maintenance (EGM) within the European Union in conformity with Directive 2004/49/EC and Regulation (EU) No 445/2011

**1. CERTIFIED ENTITY IN CHARGE OF MAINTENANCE**

| | |
|---|---|
| Legal title: | INNOFREIGHT Speditions GmbH |
| Commercial designation or acronym (voluntary): | INNOFREIGHT |
| Complete postal address (street, postal code, city, country): | Grazer Straße 18, 8600 Bruck an der Mur, Österreich |
| Registration business number: | FN246171t |
| VAT No: | ATU57809535 |

**2. CERTIFICATION BODY**

| | |
|---|---|
| Legal title: | TÜV SÜD Landesgesellschaft Österreich GmbH |
| Complete postal address (street, postal code, city, country): | Campus 21, Europaring A04301, 2345 Brunn am Gebirge, Austria |
| Certification body reference number: | AT/30/0112/001 |

**3. CERTIFICATE INFORMATION**

This is a: new certificate ☒ / renewed certificate ☐ / updated / amended certificate ☐ — ECM Identification Number of the previous certificate: –

Validity from: 2016-11-03 to: 2017-11-02

Type of company: Keeper

**4. SCOPE OF ECM ACTIVITIES**

| | |
|---|---|
| Covers tank wagons for dangerous goods | ☐ Yes ☒ No |
| Covers other wagons specialised in transport of dangerous goods | ☐ Yes ☒ No |

**5. ADDITIONAL INFORMATION**

newcomer ECM - application of ECM certification scheme section 1.2.4.

European Identification Number (EIN): AT/31/0116/5079

Vienna, 2016-11-03

Certification body
TÜV SÜD Landesgesellschaft Österreich GmbH
Campus 21 Europaring A04301, 2345 Brunn am Gebirge, Austria

TÜV®

The project has two phases. The first phase consists of a feasibility study, which is supposed to underline the innovation's market-readiness. Following the successful completion of phase 1 in 2015, we were able to submit phase 2 under the name of ITECCO Demo. Its acceptance proves how highly respected our innovative efforts are at European level for only 6 % of a total of 26,000 applications submitted in phase 2 – the implementation phase – all across Europe receive subsidies in the end. The second part involves a large-scale demonstration project in cooperation with voestalpine and ÖBB. Spanning all industries, we are one of only eight companies in Austria that was accepted in the framework of the Horizon 2020 EU project.

**EU-PROJECT HORIZON 2020**

Overall: 26.050 submissions | 1935 funded

Phase 1: 18.500 | 1.506 (8,2 %) - AUT 192|24

Phase 2: 7.550 | 429 (5,7 %) - AUT 108|8

Co-funded by the Horizon 2020 programme of the European Union

# Railway Collaborations



European railway companies are important partners and customers of Innofreight. Collaborations with Rail Cargo Austria Group started in 2004 and have been successful ever since. The WoodTainer system combined with rotating unloading fork lifts was established as a new standard for woodchip transports for the Austrian pulp/paper/sawmill industry. Innofreight's cooperation with RCA was gradually extended to other market segments such as agricultural products, steel, building materials and liquids. By now, RCA Group is also using Innofreight's equipment in Hungary and Italy.

Innofreight also enjoys long-standing and fruitful collaborations with the freight divisions of ČD, DB, SBB, PKP, SNCF, SŽ, ZSSK as well as Green Cargo. From the transport of coal, timber and steel products in the Czech Republic and Slovakia, recycling materials and woodchips in Germany, biomass in Poland and Sweden and ores in Slovenia to building materials in France and more – former national railways increasingly rely on Innofreight technology. Together with Europe's private railway operations, Innofreight also develops novel railway concepts for shippers. In cooperation with Sweden's Hector Rail and Takargo in Portugal, it has created innovative solutions for the timber industry as well as energy producers. In the Czech Republic, Innofreight – together with EP Cargo – supplies power stations with brown coal. In Germany and Austria, LogServ, LTE, SETG, SLB and Stuttgarter Bahnservice, among others, use trains equipped with Innofreight containers.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green cargo


PKP cargo
LOGISTICS
SM42-1242


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# Focussing on the Customer



Heavily reliant on commodities, Europe's industry needs efficient logistics systems to secure its international competitiveness. Railway logistics is Innofreight's core competence. With our international sales team, which is extended by specialists from our Development Department when needed, we are capable of developing and implementing new logistics solutions. Assuring failure-free operations is our strength!

Our international employees speak the language of your country, are highly qualified and capable of optimally solving complex logistics tasks.

Innofreight's modular systems offer you many advantages when compared with special wagons: By separating the superstructure from the wagon (while maintaining container standards), we can offer you maximum levels of flexibility. You can perfectly tailor your wagons to your needs. Once requirements change, we change the superstructure for you.

Capitalise on a strong, international sales team and flexible, efficient technologies!


VISITOR

# Added Value for our Customers


Innofreight is dedicated to sustainable innovation in rail freight transport, which is also why the word innovation is part of our company's name. We guarantee our customers an ongoing improvement process. Thanks to the constant further development of our technologies, you can fully concentrate on your core competences.


A continuous optimisation process that, however, only works well thanks to collaborations with our customers and partners. We need their experience and know-how to design innovations that meet market requirements. We need their support and feedback to make our technologies ready to compete on the market.

Together with our customers and partners, we have set ourselves the goal to shift boundaries, following the motto "let's move the limits". Becoming ever larger, faster, leaner and more efficient: Those are the challenges that accompany our daily business – a less than easy target, but essential to secure economic competitiveness.

As a railway logistics company, we thereby don't stop at the equipment itself, but investigate in the entire logistics chain – from loading to transport, handling and unloading. Reviewing the logistics chain holistically guarantees optimum integration into the production process and makes sub-optimisation redundant. "Let's move the limits" – when it comes to our innovations, this is a motto we regard as a challenge and as an incentive alike.


RockTainer ORE
RockTainer ORE
ÖBB

# Increasing Customer Benefits Through Flexibility


Together with our customers, we face their logistic challenges. Thereby, we develop individual concepts and offer overall logistics solutions. Whether it comes to unloading technology, special containers or freight wagons: we make your logistics maximally efficient. Our principle is based on our InnoWaggon, combined with containers optimised to meet your needs.

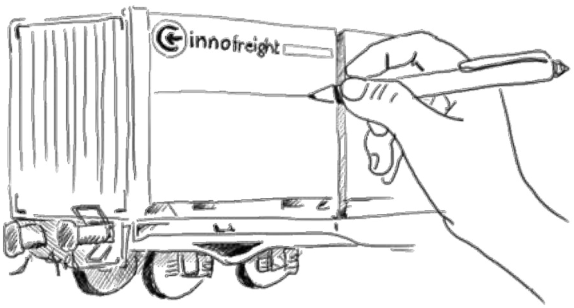
Thanks to uniform and thus interchangeable wagons, our customers furthermore benefit from flexible handling in the event of fluctuations in usage rates. Our modular separation model is unique. Our wagon optimised for payloads thereby serves as the basis. Our InnoWaggon was developed in accordance with the latest state of technology and is already perfectly prepared for future market requirements.

Since the start of the InnoWaggon project, more than 500 wagons with twelve different configuration options have been put into service. This means that one wagon type offers twelve different modes of application. From pallets for the transport of log wood and blooms to large volume containers for biomass/agricultural/mining products to superstructures for the handling of liquids and coils.

All these transport containers work perfectly with our dedicated unloading concepts, which are also individually tailored to customer needs. These include flexible fork lift unloading and stationary unloading installations.


Our own, highly qualified and experienced engineering team gives us the development competence for all our products. Wagon, container, unloading installation and conveyor belt design – everything from a single source!

We are a one-stop-shop, which allows us to optimally adapt to your individual needs.




# Service and Maintenance

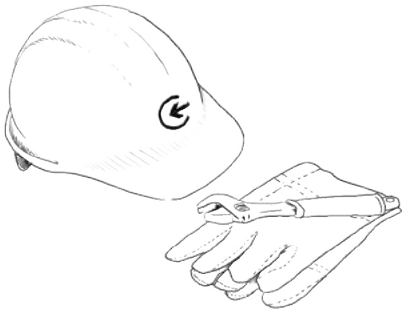

Every day, some 90 Innofreight trains roll through Europe. With its technology, Innofreight plays an important role in supplying the industry and energy producers with commodities.

Apart from its rolling equipment (wagons and containers), the operation of unloading machines and unloading installations which are directly located at the customers' premises is another one of its core areas of activity. In this context, service is a key factor and involves high degrees of responsibility. The effects of supply chain problems on production can be severe and include everything up to downtimes. High levels of availability and quick reaction times must be guaranteed in this field.

Apart from service tasks performed directly at the customers' premises, regularly inspecting, maintaining and repairing equipment is part of our service portfolio. Many of these tasks have been performed at our location at St. Michael (Styria) terminal for several years.

Due to the increasing scope of these tasks, we have signed a long-term cooperation agreement with ÖBB INFRA in early 2016, which will secure and further extend collaborations at the location. The agreement's centre piece is the construction of a new repair and maintenance hall which is scheduled to be put into service in March 2017. Thus, we will be able to perform all kinds of repair tasks regardless of the weather.

Innofreight's service team consists of experts from all product categories. As early as during the development of new products, these specialists are part of the respective project teams. Their experiences are fed into the development process. This allows for a clean transition into serial production and optimises future application by the customer. Furthermore, the team is internationally positioned and has its own service employees for every market (country) who support the respective sales organisation in its day-to-day work. This ranges from commissioning to operating. These employees are trained for their tasks in regular training courses.



# Service and Maintenance


## TERMINAL St. Michael
## GROUND-BREAKING CEREMONY

On the 22nd of June 2016, the construction of a repair competence centre at the St. Michael Container Terminal was officially begun with the initial ground-breaking ceremony. Some 200 guests followed the invitation to our event, which was staged together with ÖBB INFRA.

First to break ground and thus marking the start into a future of optimised working conditions and secure additional jobs were Area Manager Andreas Fuchs, Project Manager PNA Dr. Klaus Schneider, Terminal Director Werner Lödl, Deputy Mayor Martin Schuchaneg and the managing directors of Innofreight, DI Peter Wanek-Pusset and Bernhard Grentner.

The ground-breaking ceremony and the signing of the cooperation agreement with St. Michael Container Terminal by Andreas Fuchs and DI Peter Wanek-Pusset simultaneously sealed our continued excellent collaborations with the terminal. St. Michael Terminal thus establishes itself as an optimal future service location for Upper Styrian industrial operations.

Following the initial ground breaking, Innofreight's total modular logistics concept, consisting of the InnoWaggon and superstructures individually tailored to customer needs, were presented in the course of a "Rail Show". As a special feature, a RockTainer ORE with "Steiermark" (German for "Styria") branding was showcased as the "Rail Show's" highlight.

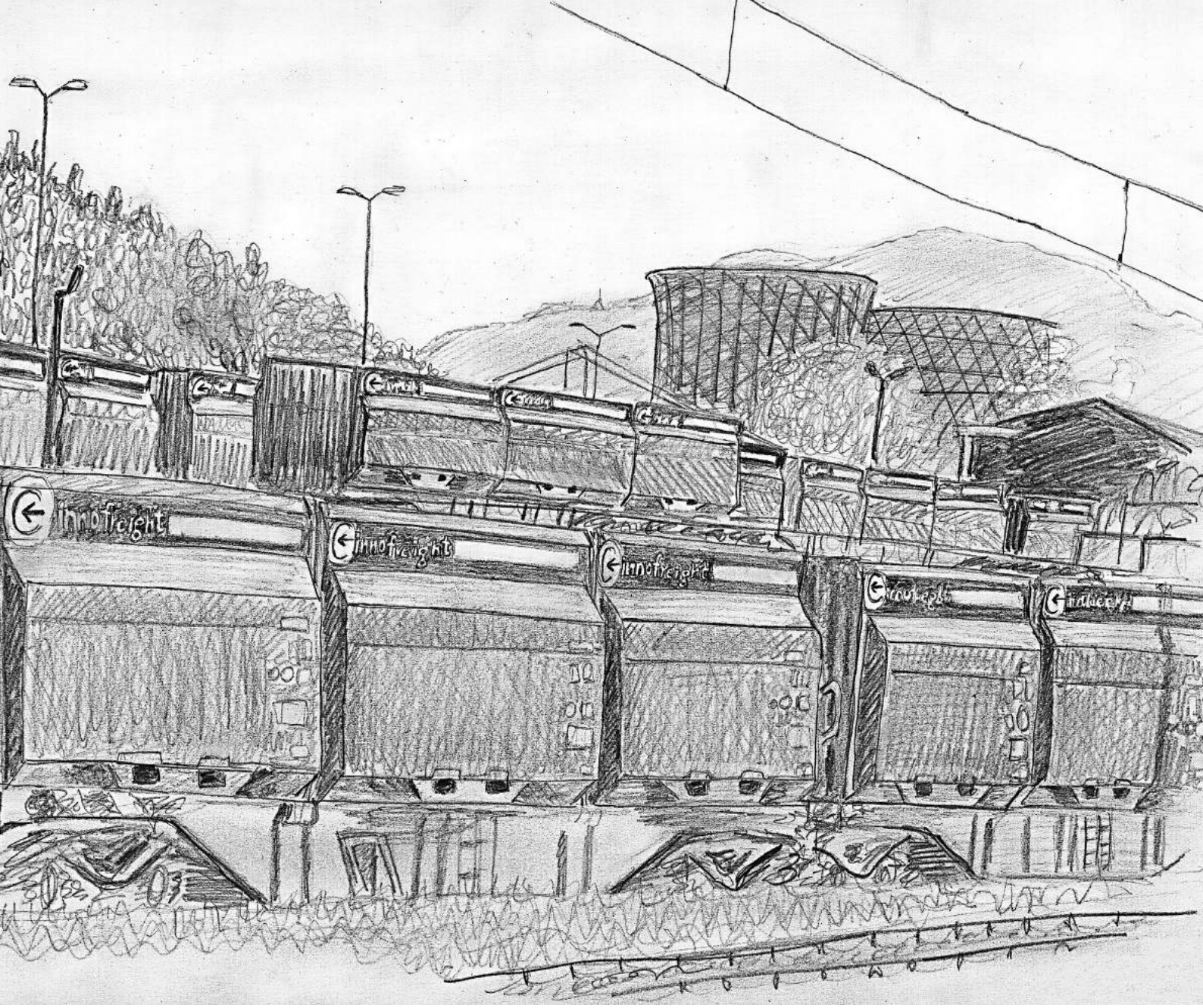
The event was rounded off with a cosy get-together and interesting talks.

We would like to thank all attending guests from Austria and abroad for coming and St. Michael Container Terminal for successful past and future collaboration.



innofreight
Rail Cargo Group
voestalpine
RockTainer ORE
Made with the
by voestalpine

# Steel




For the steel industry, Innofreight has developed novel rail logistics solutions. Weight-optimised 40-ft and 60-ft container carrying wagons serve as basic wagons and feature low-noise brake systems. The carrying wagons can be equipped with the most diverse superstructures – tailored to cargo and infrastructural requirements at the loading and unloading points. This yields logistic flexibility previously thought impossible in the rail freight transport sector.

Ores and industrial minerals can be transported using our self-unloading RockTainer ORE container or our MonTainer – the carrying wagon remains the same, you make the choice.

Our MonTainer system combined with rotating unloading system or stationary unloading installation is our standard for coke and coal transport.

We now have all commodities supply technologies at our disposal and have started to further develop our superstructures to be used for the transport of semi-finished (e.g. slabs) and finished products (e.g. pipes).

Thus, we are able to offer the European steel industry total modular logistics solutions.

The next step is to combine commodities with return loads to reduce unladen journeys. This is one of the key points of our Horizon 2020 project titled ITECCO.


## RockTainer ORE

In cooperation with Rail Cargo Waggon and the voestalpine corporation, we have created a self-unloading unit for the 21st century. InnoWaggon serves as the wagon as it provides the perfect basis due to its low dead weight. Its superstructure, made from voestalpine's high-strength steel, was executed as a self-unloading container, which meant that no changes had to be made to the existing infrastructure, a deep unloading bunker. The length of the individual clamp pairs was adapted to the length of the bunker units. Significantly easier operation when compared to the old self-unloading wagons furthermore yields work facilitation for the operating personnel. At the moment, RockTainer ORE containers are available in three different colour schemes. These three colour schemes reflect the three companies involved: Rail Cargo Group, the voesalpine corporation and Innofreight. The separation of wagon and superstructure makes this system perfectly prepared for the future and thus offers significant competitive advantages when compared with other systems.

## SŽ Cargo

Via the Port of Koper, Cinkarna, which has its headquarters in Celje, imports large quantities of titanium ore for its production. The Slovenian railway company's self-unloading wagons have become a little long in the tooth. Innofreight has further developed its RockTainer ORE and equipped it with a roller tarpaulin. This makes it possible to transport cargo sensitive to moisture using the RockTainer ORE. Due to the fact that Innofreight's technology represents a major element in the future modernisation process of the freight wagon fleet, this marks the beginning of extensive collaborations with SŽ Cargo. The Slovenian railway company's main transport volume is processed at the Port of Koper. Innofreight's modular container technology fits in extremely well with the logistic processes at the port, whereby InnoWaggon serves as the perfect carrying wagon.

## VR Cargo

VR Cargo has been a partner of Innofreight for more than 8 years. Using our containers, it transports some 2 million tons of industrial minerals annually. VR Cargo, too, will start a modernisation programme to overhaul its freight wagon fleet. Innofreight was contracted with developing a wide-gauge wagon – the so-called FinnoWaggon – on the basis of its InnoWaggon. VR Cargo will thus be able to utilise all advantages and elements of the modular Innofreight system. The first 50 production wagons are scheduled to be dispatched by the end of 2017. Using the new wide-gauge wagon, we will be able to tailor to additional markets. Thereby, the focus will be on Russia since many commodity export transports out of Russia are processed at Finland's ports.


## voestalpine Coal Donawitz

The next upgrade stage following the successful commissioning of our new coke logistics line for voestalpine Donawitz will be the integration of the coal logistics. Thereby, we will upgrade the stationary unloading installation with an additional conveyor belt system to allow the system to be used for the unloading of both coke and coal in the future. The new coal logistics line will be taken into service in February 2017. Once this construction scheme has been completed, all scheduled building measures in connection with Innofreight's transport technology at voestalpine Donawitz will be complete.


## Semi-Finished Products

The efficient transport of semi-finished products such as slabs, blooms and billets is essential to utilise steel works and rolling mills to their full capacity and high payloads significantly contribute to that. InnoWaggon, equipped with pallets, has a payload of up to 146.5 tonnes on D3. Thanks to the maximum route class of D3, the wagons can be used flexibly and are not restricted to calculated routes.

A cargo area 2 x 12.37 m in length guarantees ample space for all conventional formats. We can transport semi-finished products at room temperature or, if needed, at up to 500 °C by adapting the wagons' and pallets' equipment. We furthermore offer solutions to further increase efficiency by providing return transport solutions. Thus – using adapted pallets – one can, for instance, transport scrap containers in one and wide plates in the other transport direction. Production scrap can thus be fed back into the steel production process directly.

## Pipes

Often, transport campaigns of project character are to be implemented when it comes to pipeline construction or the export of large pipes. The pipes are manufactured to customer specifications and vary in length, diameter and weight. Special wagons in quite large numbers whose type may, for purposes of more efficient transport, be chosen on the basis of the pipes' dimensions, need to be organised for the duration of the project. Innofreight has refined its pallet system for the transport of large pipes. The system uses pallets on standard container wagons. This yields advantages in the following areas: Container carrying wagons – also in larger quantities – are more easily available than special wagons. Additionally, container carrying wagons are available in various dimensions regarding loading length and payload, whereby one can adjust to the cargo very well. This allows for highly efficient pipe transport. Furthermore, one can opt to remove the loading racks from the container wagons upon return transport and to transport them separately. The container carrying wagons can be used for other purposes at the destination.

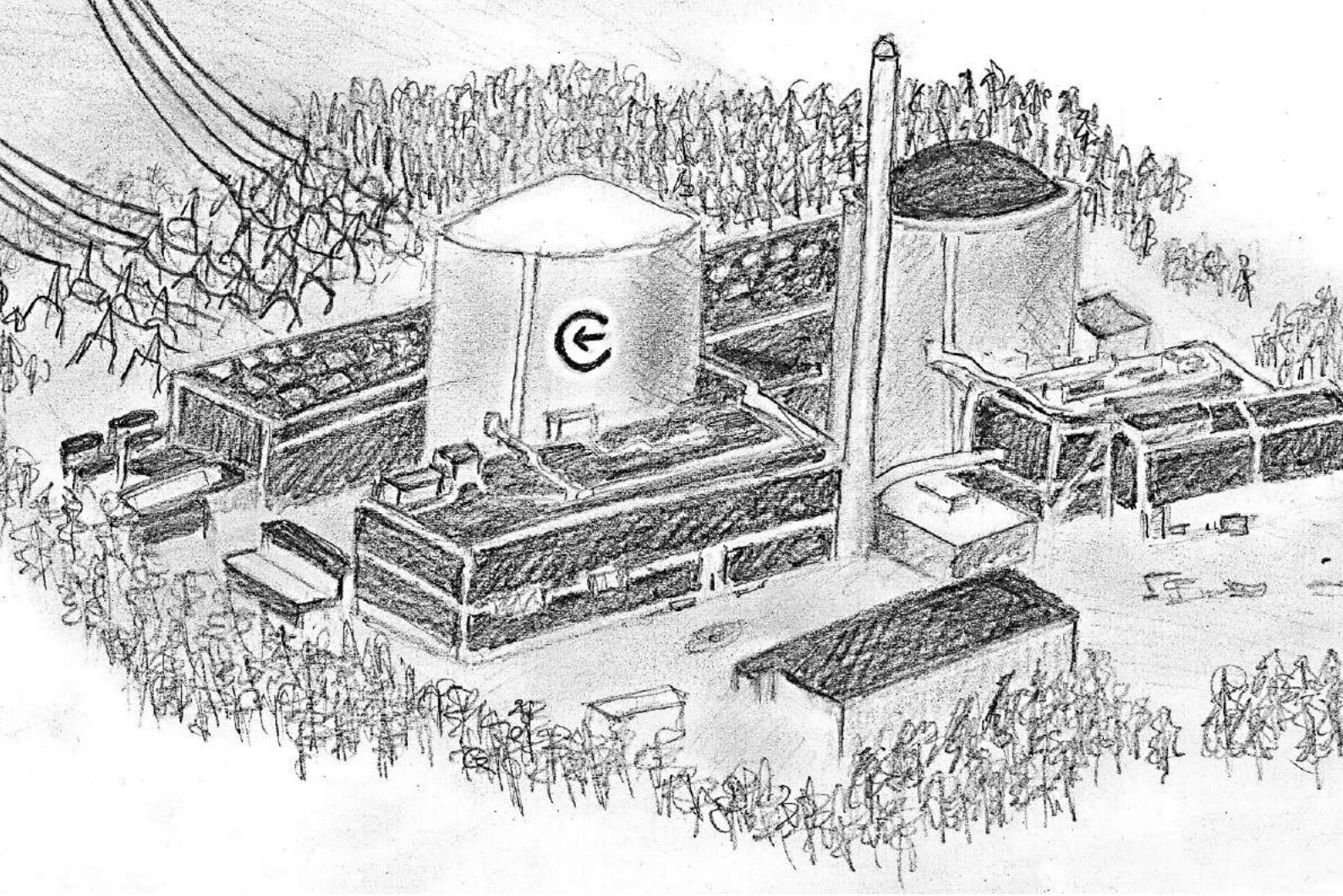

## Innovations

One of Innofreight's overarching goals is to increase the performance capabilities and appeal of rail freight transport and to make it as efficient as possible. The focus is thereby on preventing costly empty runnings and the parking of container wagons due to reasons of fluctuations in usage rates. Innofreight's modular concept addresses precisely those needs for specific containers, can be lifted off and changed at will. This allows for costly container wagons to remain in service permanently while at the same time guaranteeing flexibility in the loading of customer-specific goods. Fluctuations in usage rates can thus be compensated in an optimum manner. To optimise this system even further, Innofreight is currently developing a box-in-the-box system. This system allows for the transport of bulk materials from the loading to the unloading point as well as finished and semi-finished goods on the way back.

This makes empty runnings a thing of the past. One concrete example is the steel industry, for which Innofreight offers the possibility of transporting bulk materials such as ore, coke or coal from the harbour to the steel works. There, a stationary unloading station assures a safe and smooth unloading process by tilting the container. Subsequently, a container fork lift is used to place an ISO container in the Innofreight container. The ISO container does not need to be secured separately. This box in a box can be, for instance, laden with steel coils and goes back to the harbour. Using this development, Innofreight takes another step towards optimum flexibility, high usage rates and increasing efficiency in the processing of railway transports. The development of this system is part of the Horizon 2020 project and marks a new milestone in the transport processes of the steel industry.


innofreight
INNOFREIGHT
IHR PARTNER IN DER KOHLELOGISTIK
10ft
Sgns
Cargo

# ENERGY



Europe's average annual brown and black coal consumption amounts to approximately 400 million tonnes. Despite the fact that the European Commission expects energy consumption to be halved by 2050, the transport of coal remains a lucrative segment in the field of rail freight transport. Being highly dependent on rail freight transport, coal producers and processors alike are constantly looking for optimisation potential along the transport chain – both for brown and black coal as well as many other products related to energy generation such as coke, limestone, gypsum, ashes, wood briquettes, biomass or waste. We see it as our mission to introduce to the market customer-specific technology and to optimise rail freight transport in the energy field. For the delivery of products from the energy sector, Innofreight has developed its MonTainer, the most innovative container on the European market. MonTainer is a robust and reliable open-top container type. Combined with the new 80-ft InnoWaggon, the lightest short-coupled container wagon on the market, this technology allows for the maximum utilisation of load capacities and volumes. It is the perfect combination for the transport of heavy bulk materials. Unloading is taken care of by a highly automated container tilting system or a mobile fork lift equipped with a rotating device. This technology allows all those involved to achieve marked cost savings. The importance of biomass as a source of energy is on the rise, especially in Scandinavia and Poland. For these raw materials, too, Innofreight offers optimised rail logistics solutions. Due to their low specific weight when compared to coal, we are using 60-ft container wagons. The containers have a capacity of up to 175 m³ per wagon. Unloading takes place either with a stationary unloading installation or a rotating unloading fork lift. In the coming years, we expect to see an increase in demand for rail logistics solutions in the field of waste transport. Particularly in the Eastern European countries, waste will largely replace coal as a source of energy.


## Brown Coal Transport

Carbosped has been using InnoWaggons for some 1.5 years now. When compared with the self-unloading wagons they used previously, ČD Cargo is able to transport 350 tonnes of brown coal more to the Pilsen power station with every block train. This year will see the implementation of the next upgrade stage, in which Innofreight will build a feeding bunker and a conveyor belt system allowing the brown coal to be fed directly into the power station or into an intermediate storage facility. Our rotating unloading fork lift guarantees safe and quick unloading.

For EP Cargo, we are building a stationary container unloading installation at Opatovice power station. By means of a total of 70 InnoWaggons, we are capable of transporting more than 2 million tonnes of brown coal annually via rail. Furthermore, Innofreight has signed a maintenance contract for the entire technology with EP Cargo. This exemplifies Innofreight's competence – for our customers, we solve all internal logistics requirements.

Collaborations with ČD Cargo began as early as 2005. Over the course of our long-standing cooperation with ČD Cargo, we have been able to successfully implement many reference projects for the most diverse industries. We value ČD Cargo as a capable, flexible and reliable partner and one of the top railway operators in Europe. The next step in our intensive collaboration will be the renewal of ČD Cargo's old wagon fleet using Innofreight's high-performance technology. For us, the future of collaborations in this field lies in flexibility and transport speeds as well as the ecological aspect.

The first large reference projects will be coal transport to Chvaletice power station which is owned by Seven EG A.Ş. The annual transport volume amounts to some two million tonnes of brown coal. For this purpose, ČD Cargo will operate a total of 5 sets of 80-foot InnoWaggons consisting of 14 InnoWaggons and 56 MonTainer XXL. Unloading at Chvaletice will be taken care of by a stationary tilting system. Innofreight will start full operation in autumn 2017.

## Coke Transport

Considering that foundry coke is an exceedingly lightweight material, AgroTainer OT has established itself as the only means of distribution for the western European coke transport of shipping company NYYLO with headquarters in Usti nad Labem. NYYLO's fleet consists of some 500 Innofreight containers named NYYLCON. NYYLO benefits from a highly advanced system of block trains, last-mile transport via lorries as well as a network of reloading points in Germany. Its logistics chain originates at Metalimex foundry in Ostrava in the east of the Czech Republic. The block trains run between the reloading terminals in Germany (e.g. Regensburg, Glauchau, Singen, Nieder-Ofleiden) at regular intervals. Additionally, some wagons also run to Scandinavia (Volvo Skövde) via ferry (Sassnitz – Trelleborg line).


## Biomass Transport

The construction of a new boiler for thermal biomass utilisation is a scheme with wide-ranging ramifications. In the field of biomass rail logistics, Innofreight's WoodTainers as a transport system, combined with its stationary unloading installations as unloading systems, marks the system standard for the 21st century. A stationary unloading installation as an unloading system allows for cost-efficient operation. It additionally provides work safety, process reliability and supply reliability at highest levels and latest state of technology. This applies especially to operating such systems during Scandinavian winters. Without additional personnel and machines, unloading in the cold season can take place safely and efficiently without interruption. The boiler, which had been built over the course of the past few years, was officially opened on 9 May 2016. A total of 2 block trains permanently deliver biomass, predominantly from Sweden and Norway. Once arrived at the unloading point, the train operator leaves his traction unit and sits down in the operator's cabin of the stationary unloading installation. From the operator's cabin, he unloads the block train by means of a semi-automated mode. A battery-operated shunting vehicle shunts the containers forward one by one during unloading. This vehicle is, likewise, operated from the operator's cabin.

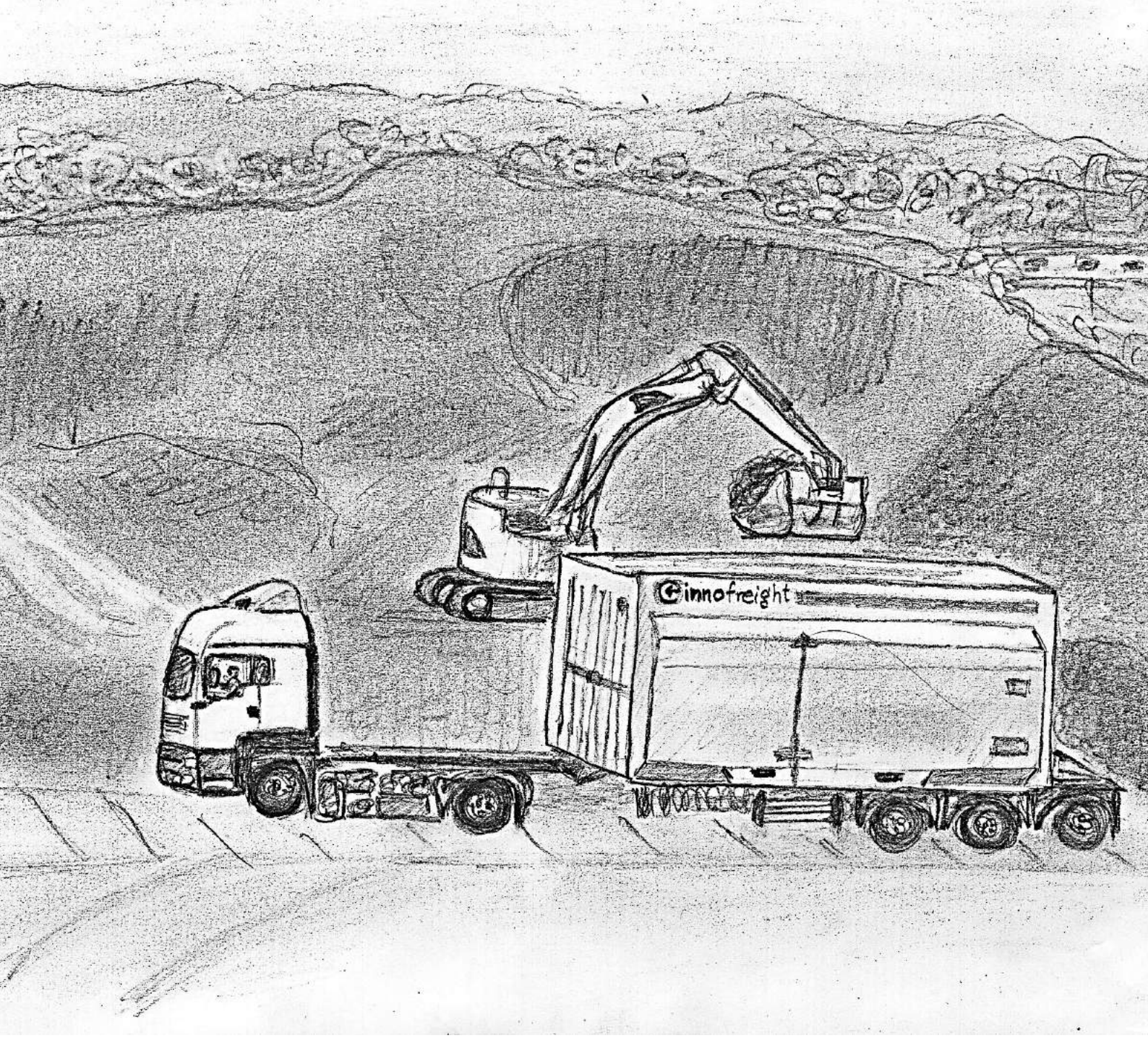
Over the course of the past few years, we have managed to become the leading provider of logistics solutions for the energy industry in Poland. Among others, our customers include PGNiG Termika, Enea, Tauron and Engie.

The largest part of the biomass transported with the Innofreight system is imported from Belarus. At first, this was mainly restricted to shuttle services from the loading points to the power stations and the trains were assigned to the customers. Thanks to a larger number of customers and the increased transport volume, we are now able to run a logistics network together with our logistics partner Skarna. Thus, we can compensate fluctuations in customer demand and offer a flexible and cost-efficient rail logistics solution.


At the moment, we are running some 700 biomass transport containers in Poland. Our rotating fork lifts guarantee fast and reliable unloading – especially during the winter months.

We expect to see Innofreight's technology – which will serve as the future backbone of coal transports in the Czech Republic – assuming the same status in Poland in the years to come.


# Building Materials




Based on the InnoWaggon, various container types that have emerged from many years of product portfolio development are used for supplying the building material industry with raw materials. These diverse raw materials include grits, sands, gypsum, granulated slag, feldspar and many more. The main distinguishing feature when it comes to choosing the container type is the unloading technology which, in turn, depends on the requirements of the respective unloading point.

The RockTainer line generally uses deep bunker systems for purposes of unloading and utilises the cargo's gravity. These special containers feature a saddle-shaped floor and two unloading flaps on either long side. Additionally, RockTainer INFRA's special feature is the possibility of dosed unloading through unloading ramps, a feature predominantly used for track ballast.

The WoodTainer line uses the mobile rotating unloading system including flexible hopper feed-in or direct loading into lorries.





## Sand- and Gravel Transport

In the course of the Stuttgart 21 construction project, the Innofreight container system is used to transport sand and grit from the quarries and gravel pits to Mertz's reloading site at Stuttgard Port from where they are distributed by means of lorries. Grit is either driven to the feeding point by means of the rotating unloading device and loaded into the silo using a gripper or can be loaded directly into a waiting lorry.

## RockTainer INFRA

The RockTainer INFRA system is a modular container system consisting of container, adjustable unloading ramps as well as work platforms equipped with hydraulics. ÖBB INFRA uses InnoWaggons and RockTainer INFRA systems to perform track ballast work. The unloading flaps can be opened and adjusted hydraulically which guarantees high levels of work safety and operating comfort.


## RockTainer SAND

The self-unloading wagons used by the building material industry have reached the end of their life cycles. We have extended our product range by the newly developed RockTainer SAND by Innofreight. Using the proven construction elements of the RockTainer ORE as well as voestalpine's high-strength steels, the container was extended to a length of 40 ft.

At a loading capacity of 70 m³ per container and a dead weight of 8.2 tonnes, InnoWaggon's payload on route class D amounts to 67 tonnes.

Thanks to its extremely high payload, RockTainer SAND is the perfect container for the building material industry to transport sand and gravel, limestone or granulated slag. Its payload advantage resulting from its optimised load capacity as well as its pneumatically operated flaps ensure cost-efficient and reliable rail transport. Another advantage is its generous loading width of 2.1 m for crane loading.

Following an extensive trial and testing period, we will start delivering the first production containers in 2017.

We now offer you two sizes of self-unloading containers: RockTainer ORE (optionally with roller tarpaulin) for extremely heavy bulk materials and RockTainer SAND for lighter products.





## Transport of Contaminated Soil

In the Czech Republic, Innofreight technology has been used in the transport of contaminated soil for many years now and over time has become the new standard in this field. In most cases, Mydlovary in the south of the Czech Republic, is being used as a collection point for transported material. Mydlovary is an area of former radium mines that now need to be filled up.

With the help of Innofreight technology, more than 500,000 tonnes of contaminated material were already transported to Mydlovary. Several projects could be executed in collaboration with ČD Cargo as the haulage operator: CKD Vysocany Praha (haulage operator: Purum), Ashes (CEZ), Karlovary Vary (Purum), Bubenec (Carbosped), Nyrsko (Interport), Ostrava (Purum) and Stare Mesto (Purum).

The logistics solution consists of WoodTainer XXL containers, conventional 60-ft wagons belonging to the railway transport company as well as fork lifts provided by us. Several factors contributed to this project's success and boosted the technology's popularity. For instance, it makes smooth material unloading into a dump truck possible – even in wintry conditions.

As a last-mile technology, lorry transport in collaboration with other companies has turned out to be the optimum solution. The unloading platform is located only a few kilometres from the mine, which means lorry transport is highly efficient and perfectly suited. Furthermore, the local city administration sees ecological advantages in lorry transport since it reduces the number of lorries crossing adjacent towns and villages.

## Gypsum Transport

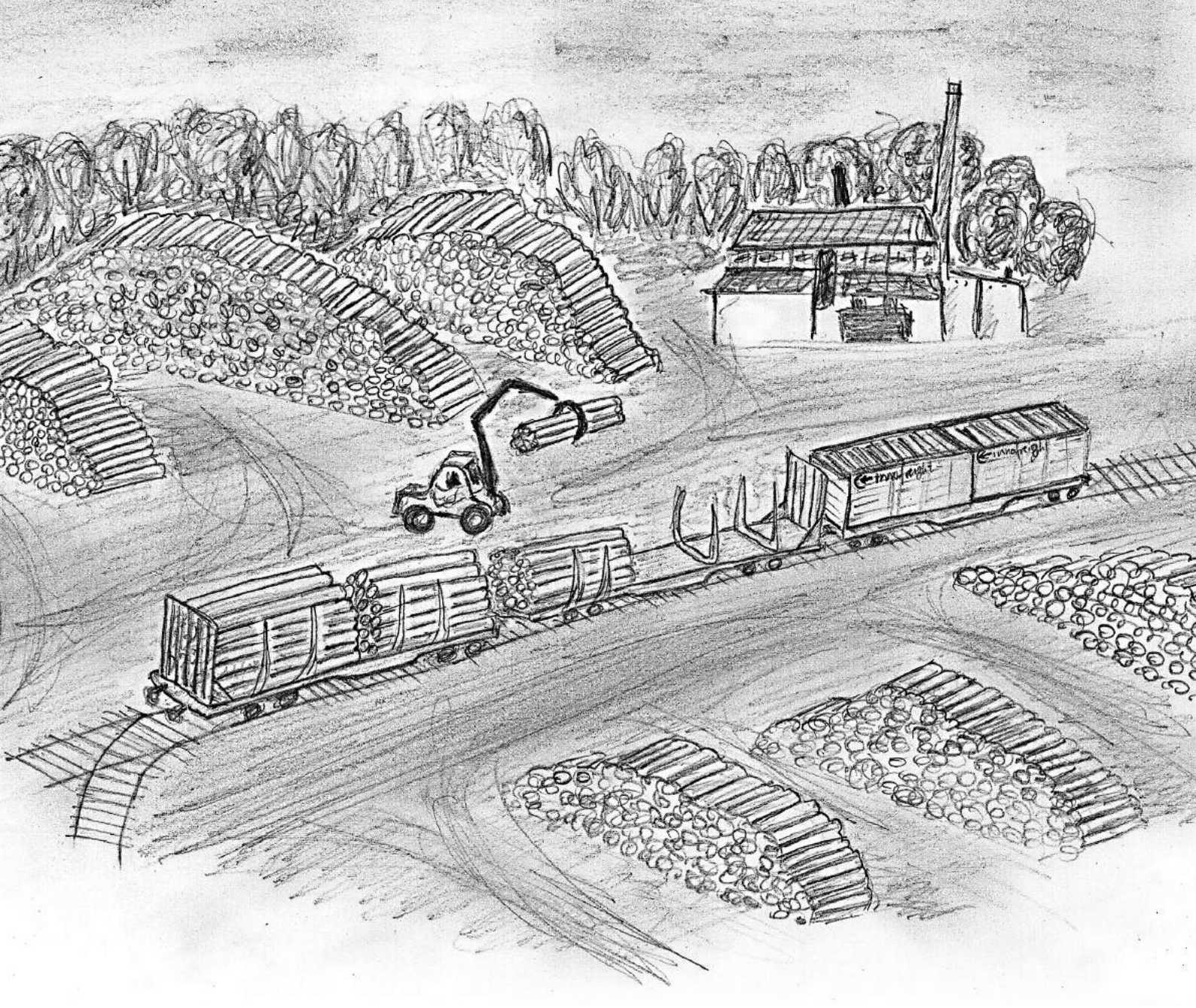
REA gypsum is produced from the exhaust gases collected in the flue gas desulfurisation systems of brown coal power stations. The sulphur dioxide in the exhaust gases thereby reacts with additionally added limestone and turns into gypsum. The gypsum thus produced is chemically identical to naturally occurring gypsum (natural gypsum) and has a specific weight of some 1,100 kg per m³. Like natural gypsum, it is mainly used in the cement industry and to manufacture building materials such as gypsum plaster, drywall or gypsum screed.

Due to residual moisture of some 10 %, REA gypsum tends to compress during transport and thus, the material tends to stick to the railway wagon which makes gravity unloading virtually impossible, especially during the winter months. The winter suitability of the Innofreight transport system can eradicate this problem!

The appropriate WoodTainer XXM with its 29-m³ capacity, combined with the InnoWaggon allows for a payload of up to 138 tonnes per 80-ft InnoWaggon on route class D. If needed, the transport system can be covered using a dust cover. Sealing lips between the containers prevent the container carrying wagons' contamination during loading. For our customer and haulage operator VTG Rail Logistics, the containers are unloaded by means of the rotating unloading fork lift at Hamburg Port. Rotating unloading by means of vibration technology ensures smooth unloading, as our long-term experience with our customer Knauf in Weißenbach bei Liezen has shown. In a subsequent step, we will implement a direct feed into the overseas ship going to England to our end customer Knauf.



# Timber



Our company started in the timber industry, for which it optimised woodchip transport logistics systems. For this purpose, we invented our WoodTainer system in 2002, which represents a combination of volume-optimised special containers and efficient, dependable unloading systems. Due to its high levels of efficiency, the WoodTainer system soon became our customers' first choice for logistic challenges – not just in Austria, but also in countries such as the Czech Republic, Germany Sweden, Poland, Switzerland and Italy.

The timber industry remains an important pillar of our business even though our services now extend far beyond woodchip transport solutions. Additionally, we offer solutions for the transport of log wood (from 2 to 6 m in length), waste wood and waste paper. Compared to woodchip transports, the transport of log wood is becoming more and more popular with customers. Innofreight's log wood pallet system works as a modular concept – a combination of pallet superstructures and container carrying wagons (or InnoWaggons on the Swedish market) allows for the maximum utilisation of the permissible payload weight in rail transport while it guarantees impressive flexibility in the field of container transport. As you will see on the following pages, Innofreight is always one step ahead of its competition when it comes to the development of customer-focussed logistics solutions, especially in the timber industry. Our total solutions allow our customers to capitalise on working safely, efficiently and at low costs.

## Woodchips Transport

In the field of chopped wood logistics for the paper and pulp industry, but also for biomass consumers, Innofreight can draw on more than 10 years of experience. Almost all well-established industrial companies and renowned energy producers in Europe are part of Innofreight's customer portfolio. Innofreight has managed to create a flexible and comprehensive European logistics network and convince its customers of the technological advantages of the WoodTainer system. The optimum integration of deliveries into their internal processes in the factories is thereby an essential factor. Using mobile and stationary unloading systems (e.g. Pöls), our customers are able to unload their raw materials safely, flexibly and, of course, at low costs. Using Innofreight's equipment pool, we can also integrate a new transport relation or a new unloading location into the system in an astonishingly short amount of time. This ensures highest levels of flexibility and optimum supply reliability.

The continuous development of our technology is key to our success. We try to address our logistics know-how in talks and benefit from our customers' experience. Thus, we manage to keep our optimisation process going and to meet our customer's requirements. New InnoWaggons, additional innovative container concepts and ever faster and simpler unloading concepts will make sure that our customers will be able to remain the leaders in their segments.


The containerisation of raw material supply for the paper, pulp and panel industry is where Innofreight's innovative history of development originates. Low payloads, complex manipulation of conventional equipment such as push-through wagons, high maintenance costs and, not least, the increasingly important topic of labour safety put on the table by work accidents were the driving factors behind the fact that Austria's raw material purchasing industry started paying attention to this field.

Based on a 60-ft container wagon, a bulk material transport system, the 20-ft WoodTainer XXL – equipped with a rotating unloading system – was developed. The 20-ft open-top container thus allows for the optimisation of transport volumes of very light bulk materials amounting to 45.2 m³ per container or 135.6 m³ per wagon. WoodTainers are loaded with chopped wood or waste wood by means of wheeled loaders directly at the wagon using high-tipping shovels or grippers. The forks of a high-capacity fork lift pick the container up via the fork channels installed in the container's floor. After that, the container is rotated by means of an attached 360-degree rotating unloading unit and, in case material sticks to the container, fully unloaded by means of a vibration system. Furthermore, the rotating unloading unit allows material to be fed directly into the feed hopper or, if needed, unloaded onto an intermediate storage site.

The patented container system for bulk material transport revolutionised railway logistics. Quick and flexible unloading of material allows for an optimisation of reloading times and yields higher payloads per block train. The transport system's process reliability and, above all, winter suitability are extremely important to customers. Elaborate and often dangerous tasks performed by unloading personnel at the wood yard are now significantly reduced since no mechanical parts on the transport system need to be operated which, in turn, contributes to an increase in labour safety. The fact that the open-top containers contain no mechanical parts is reflected in low maintenance costs.

## Log Wood Transport

Working with the Portuguese railway company Takargo, we address the needs of the timber industry. Every day, more than 600 log wood pallets are used for this purpose between Portugal and Spain. In 2015, we transported some 480,000 tonnes of Eucalyptus timber and in 2016, these quantities have even been exceeded.

Since entering the pallet transport business, we have developed three different product types. This significantly increases the quality of our offered services. A fourth type is constantly being developed to optimally serve all market needs.

Six log wood pallets on a single standard container wagon provide a cargo capacity of 65 tonnes of 4-m log wood. Thanks to stoppers and holes for the wagon pins, the equipment combination offers maximum levels of flexibility. These components support quick, efficient assembly and disassembly at highest standards of safety. Furthermore, they allow for the pallet types to be individually tailored to customer needs in a short amount of time and thus for the transport of log wood of various lengths.

A belt between the stanchions, attached on the other side of the pallet ensures that the goods are perfectly secured for transport. If needed, the belts and stanchions can be removed which allows for the quicker and cheaper implementation of service work. Another important advantage is a result of the fact that the pallets can be stacked which offers manifold storage and transport possibilities.


For log wood transport in Sweden, Innofreight has developed the InnoWaggon. The use of extra-wide (approx. 3.6 m) and high (approx. 3.5 m) stanchion systems makes it possible to increase the payload on block trains by approx. 25 % when compared to previously used 60-ft wagons. Volume optimisation combined with the InnoWaggon's light weight allows for this high gain in payload.

The majority of this country is covered in woods, which is particularly true for the north of Sweden. This means long transport routes to the timber-processing companies. SCA will invest some 800 million Euros in the Östrand pulp mill to double its capacity. This will also double the demand for timber. As a technology provider, Innofreight has participated in a tender procedure for the transport of 4 million tonnes of log wood.

The forest industry is immensely important for Sweden. 22 % of all goods transported by rail are products of the forest industry. Innofreight offers SCA a system solution: Log wood transport using InnoWaggons and woodchip transport using our WoodTainer system. It is already being discussed whether to use our InnoWaggon with its volume-optimising stanchion systems in other countries. Respective profile checks with infrastructure operators have been initiated.

## Short Timber Transport

2-m log wood has been transported using Innofreight AgroTainers for 2 years. The containers were originally designed for bulk materials. They were able to prove their sturdiness in the transport of log wood. The required transport capacity to reach optimum payloads on the wagon was achieved by means of an attachment frame. A weekly shuttle train has been operating between Hungary and Austria ever since.

Utilising the experiences gathered in these transport projects and in collaboration with Papierholz Austria, we have built further containers specially optimised for 2-m log wood. The floor assembly and front walls were reinforced, and the containers' inside surface is smooth. Their volume is identical to that of AgroTainers with attachment frame. The first cycles in Austria, Hungary and the Czech Republic were already completed and all participants from RCA, ČD and Papierholz Austria were pleased with the results.

On the one hand, AgroTainer's advantages lie in its quick and safe loading and unloading and, on the other hand, in its smooth and safe operation. The fact that loads do not need to be secured, saves lots of time while maintenance costs are reduced, too (no belts). The container allows for safe handling and can be cleaned easily.

Following the example of chopped wood transports using WoodTainer containers, Innofreight and the paper and pulp industry have a common goal: to establish a uniform, modern standard for the transport of 2-m log wood. The optimised AgroTainer has everything it needs to achieve this goal.


## Waste Paper Transport

Our WoodTainer system makes us one of the key players in the waste paper transport sector in Switzerland: Perlen and Utzendorf are already using two Innofreight containers each for their railway logistics. The WoodTainer XXL (20-ft OT container, 2.9 m in width and 2.9 m in height, doorless) and the WoodTainer XL (20-ft OT container, 2.9 m in width and 2.6 m in height, doorless). Combing the containers and a standard SBB Cargo Sgns wagon, WoodTainers achieve a payload of up to 21 tonnes.

A net serves as a container cover, it is attached to the container's corner posts and can be easily installed and removed at ground level. The containers can also be used without covers. The two unloading fork lifts used are equipped with a weighing system that records the container's exact payload.

The advantages of our container system in the transport of waste paper include a high payload for loose waste paper thanks to high load capacity, a quick and reliable unloading by means of rotating unloading fork lift and the optimal adaptation to different unloading infrastructure requirements thanks to the combined use of container sizes.


# Agriculture


The transport of sugar beets via rail is still highly important in Austria and its neighbouring countries (Switzerland, Hungary, Slovakia and the Czech Republic). Huge quantities need to be transported within short amounts of time. This seasonal business is a great challenge for all those involved. Currently upgrading and in the future replacing Ea-wagons used in sugar beet transport, Innofreight offers open-top containers that can be unloaded by means of water canons or through turning and making use of the cargo's gravity. This allows for highly flexible types of use and railway logistics can be processed in accordance with the infrastructural requirements of the respective sugar plant using uniform, standardised and optimised container systems. Through combining different seasonal operations, for instance track ballast transports with self-unloading containers, one can use container wagons for multiple applications by simply switching from sugar beet containers and thus significantly reduce equipment costs.

Our second container type is the inter-modal 30-ft AgroTainer. For purposes of silo loading, this container features four dome covers as well as an additional flap to be unloaded by tipping. Inlays can be attached for the transport of e.g. sugar in which case unloading is carried out by means of a rotary valve and the cargo being injected into the silo. This container type's vast advantage is the fact that these containers can be loaded with pallets or general cargo for the return journey. One side of the container can be opened fully and double doors at the rear allow for unloading via a rear-mounted loading ramp.

In recent years, European wagon rental companies have invested heavily in conventional grain wagons – in one direction, these wagons always travel unladen. This is a significant logistic disadvantage. Using Innofreight's AgroTainers, one can now reach even those customers that don't have rail connection and logistics processes can be optimised by means of laden return journeys. This reduces transport costs and preserves resources.


## Sugar Beet Transport

For sugar beet transport in Austria, Innofreight developed a new container. For this purpose, our WoodTainer XXL was equipped with diagonally offset side doors to allow for a new method of unloading.

Thereby, the container is filled by means of water canons before the side doors are opened and the sugar beets fall into a water channel, from where they are transported to be further processed. Thanks to the smooth steel floor and by tilting the tracks, the water can easily flow off, whereby the sweet cargo is carried along.

Another important advantage of this method of unloading is the fact that the container is simultaneously cleaned by the water. The loading process is performed by means of wheeled loaders for which an additional loading ramp, some 1.5 m in height, is used. This is necessary since the container is longer than conventional types. Thanks to the altered dimensions, the possible payload rises to 30 tonnes per container. Counting an entire InnoWaggon, this means that one can transport 120 tonnes of sugar beets.

Also in other areas of bulk material transport, the new WoodTainer XXL with side doors is used to meet peaks, whereby the additional fork pockets increase the unloading technology's flexibility. Thus, even a stationary unloading installation or a rotating unloading fork lift can unload a container.


A new sugar beet campaign in Sered started in early September. Over the course of the last five years, Innofreight's logistics solution has become the technological standard for the local sugar refinery AGRANA - Slovenské Cukrovary, s.r.o. Among others, what has motivated the customer to switch from the previously used ACTS containers to Innofreight's solution, was the level of reliability required, the significant reduction in manpower needed, the system's effectiveness in terms of transport volume, the possibility of a continuous unloading process and, last but not least, the fact that it reduces the number of lorry journeys rolling through the inner city by some 5,000 per sugar beet campaign.

A network of distribution centres from where the sugar beets are transported to the sugar refineries via rail (route class D) exists. For this purpose, AGRANA is renting two sets of WoodTainer XXL on 60-ft wagons. At a 48-hour-cycle, this makes it possible to unload an entire block train every day. The material is loaded into the containers at the distribution point by means of wheeled loaders. For one year now, PSZ (a private railway transport company) has served as the haulage operator for AGRANA. The unloading fork lift is equipped with a calibrated scale and a printer which provides the customer with high levels of service quality.



## Grain Transport

In inter-modal transport, the lorry and not the wagon determines the container's maximum load limit – provided the wagon can run on route class D. The maximum permissible total lorry loads in inter-modal bulk material transport in Europe are not standardised. In Austria, for instance, they amount to 42 tonnes + a tolerance of 5% = 44.1 tonnes, in Italy it's 44 tonnes + a tolerance of 5% = 46.2 tonnes.

For the road journey in the export of grain from Austria to Italy, Innofreight has built extra-light semi-trailers called AgroTrailer with a dead weight of less than 3 tonnes. Combined with the 4-tonne AgroTainers, this yields a net payload of 29.5 tonnes per container per tank (when using a 7.5-tonne traction unit). For deliveries in Italy, a tip-type container chassis is needed, the dead weight of these tip-type semi-trailers amounts to approximately 5 tonnes. Thus, one stays below the permissible limit of 46.2 tonnes. Innofreight not only builds containers: Unloading installations and wagons but also semi-trailers for optimised road transport are also part of our technological competence.

Of course, these advantages in payload can also be used in the transport of sugar. The unloading vehicles are equipped with compressors and rotary valves that make it possible to inject the sugar into the silos. When using this method of unloading, the container itself remains de-pressurized.

The 30-ft AgroTainers feature a load capacity of some 50 m³ and can be stacked. At terminals, they are handled by means of reach stackers or container cranes. Using this technology, it is possible to switch from wide to normal gauge. The grain containers loaded in Ukraine, for instance, switch from wide to normal gauge tracks at the border.

## Pallet Transport

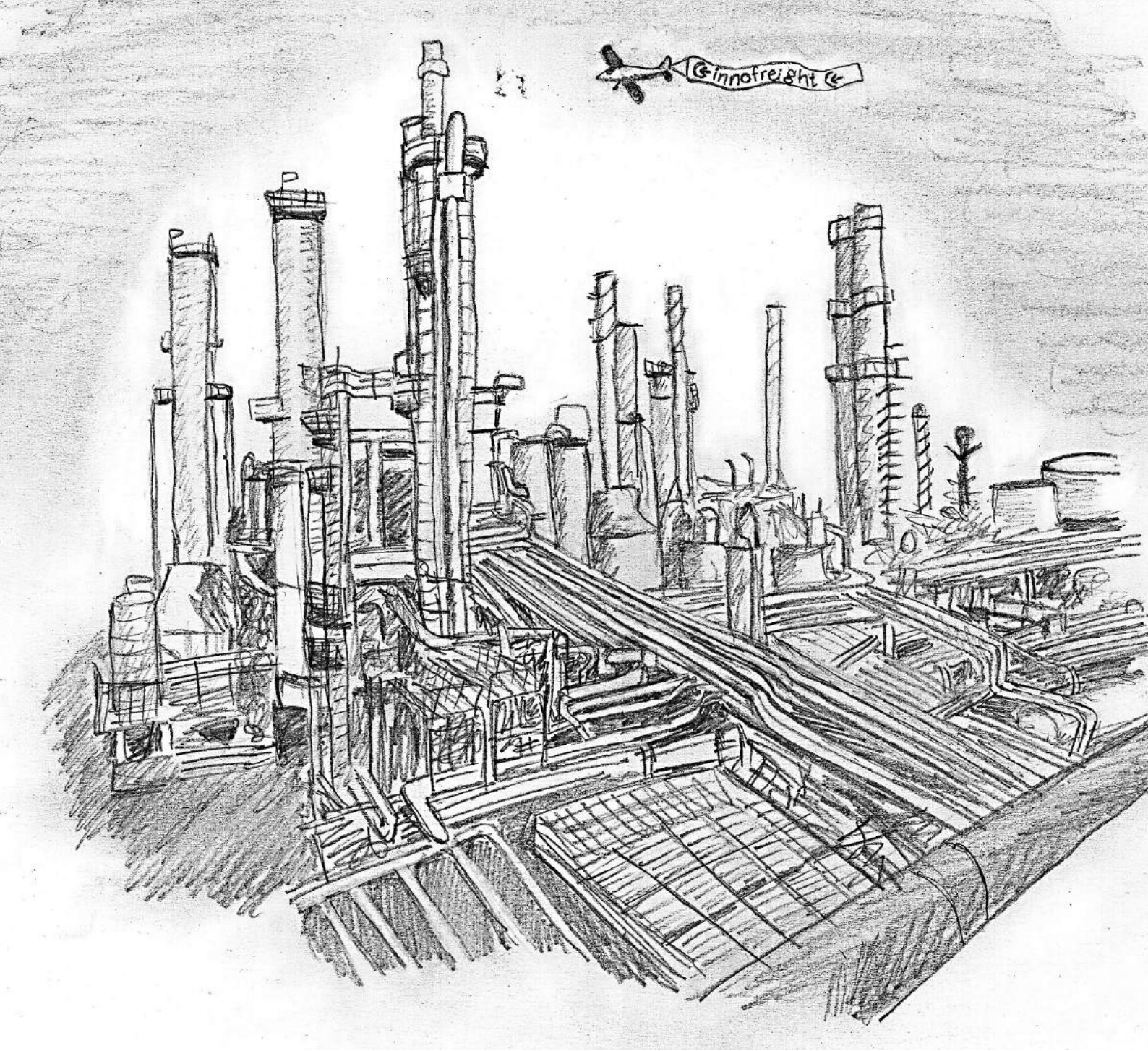
The containers are built in such a way that every type of good and general cargo on pallets can be loaded for the return journey. Loading and unloading takes place from the side; the container can be fully opened for this purpose, which makes it possible to load even long products such as pipes, rolls of paper or chipboards. One of the rear sides features a double door for loading and unloading.

Thanks to being shorter than conventional semi-trailers with tarpaulins (AgroTainer measures approx. 9 m in length whereas semi-trailers are 13.6 m long) these containers are particularly suitable for the transport of heavy pallets (e.g. loaded with tiles). They can also be double-stacked.

However, the use of AgroTainers is not limited to the agriculture sector – other moisture-sensitive bulk materials with a specific weight of > 0.6t/$m^3$ are also perfectly suited for transport which includes, among others, wood pellets or industrial minerals such as magnesite.

AgroTainer is the ideal, multi-functional supplement for standard grain wagons and lorries. It capitalises on the advantages of both transport systems and creates the prerequisites for additional transfer of transports from the road to rail. Your bulk material and pallet transports will become more environmentally friendly and your logistics will be optimised into the bargain.

# Liquids




Innofreight has become involved in another freight transport sector – the transport of liquids, more precisely the transport of calcium carbonate. Calcium carbonate, also referred to as lime carbonate, is refined to particle sizes only a few thousandths of a millimetre wide and held in suspense in a liquid.

This method is called suspension and yields a so-called slurry, a lime milk of uniform quality with a specific density of 1,700 to 2,000 kg per $m^3$. Slurry is predominantly used as a filler in the paper industry.

In a further logical step, Innofreight will turn its attention to further development in the field of special transports of liquid mineral oil products as hazardous goods.

For both the transport of hazardous and non-hazardous liquids, the proven Innofreight concept of separating bed and superstructure will be continued.

## Slurry Transport

The newly developed, inter-modal 30-ft Slurry container together with the 80-ft InnoWaggon, offers many advantages when compared with conventional Z-class rail tank wagons. With two Slurry containers each, the InnoWaggon features a higher load capacity in relation to its dead weight when compared with rail tank wagons. With a volume of 43 m³ per container, 138 tonnes of net payload can be achieved per InnoWaggon. The slurry container, which can be used universally in the European railway network, from Italy and France to England, furthermore offers immense cost benefits in terms of maintenance due to its separation of bed and superstructure. At an average annual kilometric performance of 180,000, operators can get the best out of this piece of special equipment and simultaneously optimise their railway logistics. In short: lots of competitive benefits for our customers!

Containers are loaded with slurry directly from the silo via a dome cover. Prior to loading, every container is cleaned from above in an automated cleaning facility using 200 bars of water pressure and a 180 °C swivel head. After unloading, a hose is attached to the discharge pipe and once the central valve is opened, the liquid is directly pumped into the silo.

Currently, the prototypes built in the first quarter of 2016 are subjected to a rigorous testing procedure. Customer-focussed development, prototype construction, accompaniment during testing and evaluation including logistics concept and serial production characterises Innofreight in development and introduction of new technologies to the market. The market launch of the first block train equipped with Slurry containers is scheduled for 2018.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# Social Commitment


Innofreight is a logistics company and deals with cargo mobility. We have made it our mission to support persons with impaired mobility.

Werner Boberger is the chairman of the Austrian *Zivilinvalidenverband* Bruck-Kapfenberg. Severely handicapped himself following a stroke, he has made it his goal to stand up for and support handicapped people. This year, supported by his friend, the ultra-runner Andreas Ropin, he has conquered Großglockner-Hochalpenstraße, which winds its way up Austria's tallest mountain all the way to Fuscherthörl on his bicycle. Actively supported by Böhler Schmiedetechnik, the proceeds from this challenge went to the Sportbündel association. Sportbündel supports mentally impaired people in the exercise of competitive sports.


Kalmar, too, has supported these social activities for many years. As a manufacturer of fork lifts and terminal installations, Kalmar works in the freight mobility sector, just like Innofreight. The employees of the two companies are linked in friendship by joint sporting activities with a social purpose.

For Special Olympics in particular, Innofreight supports the basketball team. In 2015, it were the World Games in Los Angeles, and currently, it's the handicapped team of ECE Bulls from Kapfenberg.

Economically successful companies are responsible for supporting socially underprivileged and deprived people.

We are very proud to be able to make a small contribution in this direction.



Innofreight's logistics solutions are now also available as H0-scale models!

B-models exclusively produce for Innofreight. The InnoWaggons with their different superstructures are available in your model railway shop.

Details at **www.b-models.be**

# Thank you very much for excellent collaborations!

**LATEST NEWS FROM THE INNOVATION DEPARTMENT:**

2017 we will start with new 20-ft intermodal bulk containers for the transport of cargo in need of water protection.

Usability: chemical industry (especially corrosive goods such as salt) or high-quality sand, etc.

Payload up to 34 t in combination with our InnoWaggon possible


innofreight