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# Viabale Wagonload Production Schemes (ViWaS)







**COORDINATED BY HACON**, the Viable Wagonload Production Schemes (ViWaS) is a 39-month research programme seeking to strengthen the infrastructure and competitiveness of Europe's single wagonload (SWL) and wagon group transport systems.

Changing framework conditions across Europe coupled with increasingly demanding market requirements have had considerable impact on the transport industry. SWL systems remain a key component in many countries' transport systems, particularly for the steel and automotive sectors. As such, there is a pressing need to improve the sustainability and efficiency of SWL transport.

The ViWaS project was created to help identify key areas for improvement. Here, as the project nears its end, HaCon's Executive Director Lars Deiterding and ViWaS' Project Manager Niklas Galonske speak to International Innovation about the importance of developing cost-effective solutions and the greatest innovations born from the initiative.///

[www.viwas.eu](http://www.viwas.eu)

# Fragile freight

Initiated by HaCon, a European project seeking to identify and correct the many challenges facing the single wagonload transport system, **Lars Deiterding** and **Niklas Galonske** are designing and building rail transport systems of the future

## To begin, could you introduce the work of the HaCon consulting team?

**LD:** The HaCon consulting team specialises in rail freight transport and intermodal transport chains. Using our broad competencies and experience we're able to provide a wide spectrum of consulting services, including the development and coordination of research projects; advising on policy matters; preparation of funding applications; market analyses; and the development of transport concepts. We are often involved as a project coordinator, so our job starts at the very beginning of the process, ie. forming a general project idea and project consortium. Essentially, we're responsible for providing our partners with an optimal framework for their research activities. This involves taking care of the main administrative duties while our partners concentrate on the research. Wherever appropriate, we provide advice and technical expertise.

## What was the main motivation for creating the Viable Wagonload Production Schemes (ViWaS)?

**LD:** Although intermodal transport has developed into a dynamic rail freight product that competes with road transport, we still see a demand for high-quality and efficient conventional rail freight services below the block train level. In particular, the classical single wagonload (SWL) transport system has shown considerable loss of transport volumes and market shares due to unfavourable cost structures and low-quality standards. We are confident that our expertise and ideas will generate important improvements for this rail product.

## Could you describe your role within the initiative?

**NG:** ViWaS is the first EU-level research project exclusively dedicated to SWL. As Project Manager, I have been responsible for setting it up, coordinating the work and all of the administrative duties, and promoting the project's results. We are happy that the EC has acknowledged the importance of this type of transport and has provided the necessary funding. This enables our project partners to conduct necessary analyses and improvements they would not otherwise be able to do under current economic pressures.

## Why is ViWaS so important to the European economy?

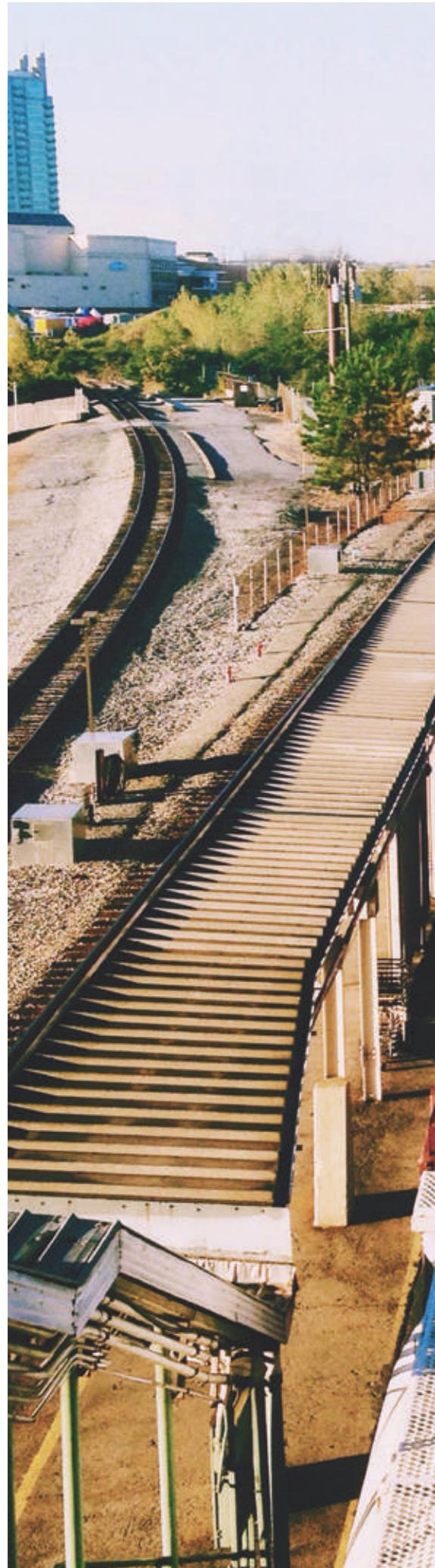
**LD:** The European economy is largely dependent on high-functioning logistics and transport systems, with all available modes being used. In this context, it is worth mentioning that some important industries such as steel, chemicals, automotive and timber rely on SWL transport. SWL still makes up roughly 30 per cent of rail transport volumes in Europe. When stabilising these volumes, other modes will increase their capacity to better cope with rising transport demands. We therefore urgently need improvements to SWL.

## What have been the biggest innovations to come out of this initiative?

**NG:** It would not best serve the ViWaS project to highlight one or two innovations; most developments show their full effectiveness in combination with other improvement measures. However, it's possible to highlight some concrete results that are connected with technological developments. For instance, various prototypes have made it possible to make freight wagons modular. The Flex Freight Car is a light container wagon equipped with a drive-on floor. This wagon serves as the base for different types of superstructures and can be flattened. Another example is the Container Loading Adapter, a superstructure that can be added to a conventional container wagon to facilitate the loading and unloading of containers in sidings.

Major improvements have also been achieved in the field of wagon telematics. The new telematics devices generate larger amounts of better data, and for less money, compared to previous devices. A high-accuracy load sensor, which is part of the telematics system, is currently in the final development stage.

Having reached the final phase of the ViWaS project, we're pleased to see it has succeeded in producing important tools for improving the flexibility, visibility and thereby efficiency and quality of SWL transport.





# Haulage systems overhaul

The single wagonload transport market may be on the precipice, but that does not mean it has outlived its potential. **HaCon** is leading an international development project to bring some much needed improvements to Europe's transportation networks

**IN EUROPE TODAY**, the landscape of rail freight transportation is undergoing significant changes. In 2005, single wagonload (SWL) transport accounted for 39 per cent of Europe's rail freight transportation market share, but only five years later this number dropped to just 30 per cent. With a near to nonexistent level of competition within the SWL market itself, low-quality standards and unfavourable cost structures have become widespread. While it may be lacking in internal competitiveness, it faces strong competition from conventional block trains, intermodal transport and road transport services.

Despite the current state of SWL transport, it still provides a vital service to industries wanting to shift freight below the block train level. In a bid to halt its deterioration, the Viable Wagonload Production Schemes (ViWaS) project has been undertaken to breathe new life into the SWL market through improvements in cost efficiency, transport quality and sustainability.

Co-financed by the EU Seventh Framework Programme (FP7), ViWaS is a 39-month R&D project aimed at identifying weaknesses in the European SWL transport network and searching for solutions. Heading the project is HaCon, a company with a track record that puts it among the top European players in the field of traffic, transport and logistics. At its helm are Lars Deiterding, Executive Director and head of the consulting team for freight transport and logistics, and Niklas Galonske, the company's Project Manager and consulting team leader for ViWaS. Together, they bring over 30 years combined experience in research and analysis of the international railway industry, as well as in coordinating, consulting, managing and providing technical guidance for numerous international projects.

## UP TO SPEED

Together with the project partners, the HaCon team has pinpointed a vicious cycle eating away at the SWL market. As demand has dropped, the response among many European countries has been to save money by cutting the least cost-effective tracks, yards and sidings, and generally scaling back their networks. Reduced connectivity has made it harder to send or receive goods, so it is little wonder that customers are looking to take their money elsewhere. In order to combat this, Deiterding



and Galonske have identified several key areas where improvements could radically bring down costs and boost SWL efficiency.

To ensure the viability of SWL systems, the team first identified the importance of trunk lines being used to their full potential by operating trains. In partnership with the Swiss Institute for Transport Planning and Systems (IVT), a simulation tool has been developed for the optimisation of SWL production schemes. The group hopes the tool, wagonSim, will help overcome challenges in network usage and cost efficiency. Based on an existing public transport model, wagonSim is able to infer the current status of the network by modelling the physical infrastructure (a network's capacities and available train routes) and the production network. Successfully simulating the basic model of a current SWL network, the wagonSim tests have already provided one of the project's partners with a baseline from which they can develop new ideas for network improvements.

Further aiding the implementation of these improvements is the introduction of onboard communication technology – telematics – for load tracking and tracing. This helps operators to optimise the wagon dispatch and rescheduling processes and inform their customers instantly about any changes to the transport schedule. They can also play an invaluable role in determining a wagon's lifecycle by giving accurate data on their actual

mileage. By addressing these problem areas, new telematics devices of ViWaS partner Eureka can help vastly improve the dispatching processes, resulting in shorter stand-still times and increased efficiency.

#### REINVENTING THE WAGON

A major factor hampering the efficiency of SWL transport is the organisation of costly and complex 'last-mile' services. Here, a multiplicity of necessary and time-consuming tasks conspire to put the brakes on SWL networks. The project partners have identified a range of solutions to simplify last-mile procedures, reducing overall workloads and saving time and money.

The most notable among these is the development of modular freight wagon technologies. The Swiss Split operating system SBB Cargo has been able to bring maritime containers on shuttle trains or barges to Switzerland, using the domestic SWL network for further distribution. In the Swiss gateway terminals, containers are currently placed onto conventional wooden-floored wagons and secured in place. To do this, terminal employees have to nail wooden blocks around the container into the wooden floor of the wagon. In addition to being slow, wooden-floored wagons have high maintenance costs compared to their steel counterparts. ViWaS has developed two technical solutions for container transport on

the SWL part. Both solutions make existing container wagons accessible, allowing unloading and loading by fork lifts. The 'Container Loading Adapter' of SBB Cargo is a mobile platform that is set on a container wagon. Wascosa's 'Flex Freight Car' already integrates an accessible floor and, moreover, is extremely light weight. This means that it can carry one of the highest payload of its class in Europe.

### The project's partners have pinpointed a vicious cycle eating away at the single wagonload transport market

The Wascosa wagon also addresses challenges posed by non-containerised freight. Often, different commodities call for specific types of wagon, such as timber. In these instances, many wagons end up running a lot of mileage when empty in SWL production schemes. However, the Wascosa wagon comes with rearrangeable stacking bodies that accommodate an array of cargo types. Such flexibility allows for instant response to changes in demand with real benefits in productivity and overall operating efficiency.

## IN SMART COMPANY: LEADERS IN EUROPEAN TRANSPORT LOGISTICS

In 2015, HaCon was named among the '50 Smartest Companies' in the world as ranked by Massachusetts Institute of Technology. With 30 years of transport consulting and software development expertise behind them, the group is now responsible for designing the European transport system of the future

Based in Hannover, Germany, HaCon was founded in 1984 on the expertise of three engineers specialising in public transport, freight traffic and railway operation research. Now, with over 30 years' experience and a dedicated team of more than 250 specialists in transport planning and IT, HaCon has firmly established itself as one of Europe's lead players in developing high-quality traffic software planning, scheduling and information solutions.

HaCon is also home to a dedicated team of consultants specialising in rail freight and combined transport projects. Using a highly integrated and results-orientated approach, the group aims to assist customers through the combined skills of transport engineers, geographers, lawyers and IT specialists. Working with project sponsors, including the EC, HaCon has amassed a considerable amount of project management experience. Among its service portfolio are successes in requisition and subsidies, the completion of financial and administrative formalities and the overall coordination of all parties involved such as railway companies, shipping agents, institutions and associations.

[www.hacon.de](http://www.hacon.de)

## VIABLE WAGONLOAD PRODUCTION SCHEMES (ViWaS)

### OBJECTIVE

To strengthen the competitiveness of single wagonload and wagongroup transport in Europe.

### PARTNERS

Bentheimer Eisenbahn AG; HaCon Ing. GmbH; Eureka Navigation Solutions AG; Technische Universität Berlin, Germany

Federal Institute of Technology in Zurich, Institute for Transport Planning and Systems (ETH Zurich IVT); SBB Cargo AG; Wascosa AG, Switzerland

Société Nationale des Chemins de Fer, Fret (Fret SNCF), France

Consorzio IB Innovation, Italy

NEWOPERA Aisbl, Belgium

### FUNDING

EU Seventh Framework Programme (FP7)

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**LARS DEITERDING** is Executive

Director of HaCon and head of HaCon's consulting team for freight transport and logistics. He has more than 15 years of experience

in research and expert analysis in all areas of the international railway industry, including the planning and design of railway systems, infrastructure capacity analyses and rail operational studies.



**NIKLAS GALONSKA** holds a diploma degree in Civil Engineering from the University of Hannover, Germany.

After acting as a consultant, with a focus on infrastructure assessment and railway operations, he joined HaCon in 2005. He supports the consulting team as a project manager and team leader.

## RALLYING FOR THE RAILWAY

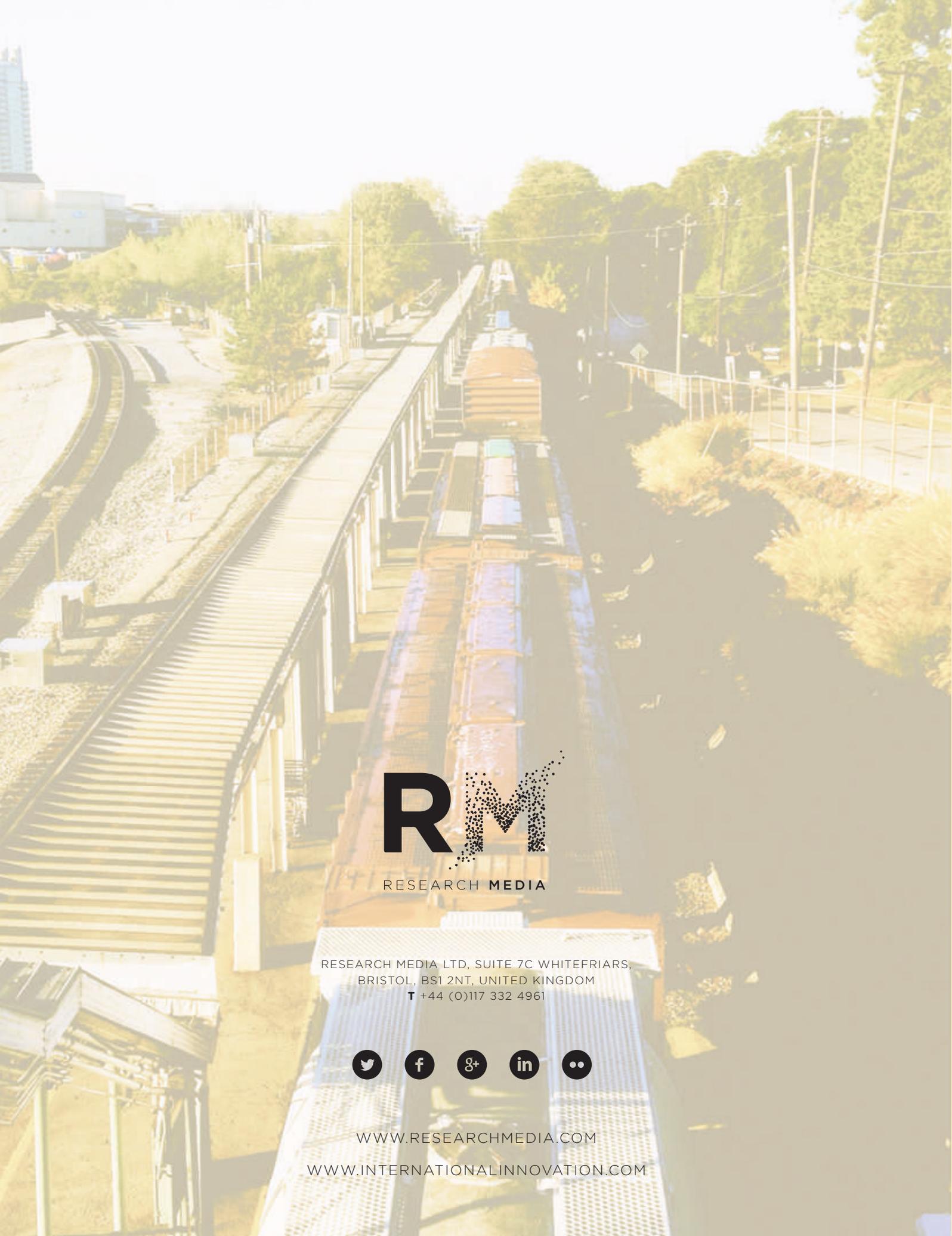
Considering the rail transport system as a whole, Deiterding and Galonske know that there are a great many aspects that need addressing, but not all can be tackled at once. Equally important to the implementation of new technologies is the development of market-driven business models, ICT in an administrative context and advanced management procedures. One area they are particularly concerned with is the improvement of the rail transport sector's carbon footprint.

While rail freight is regarded as an ecological mode of transport, current calculation tools are not designed to take into account the emissions from intermodal transshipment processes. The HaCon consultants, therefore, have sought to fill this technology gap with a calculation tool to cover the entire transport chain. Based on the detailed infrastructure, equipment and processes of intermodal terminals, the Intermodal Terminal Eco-Efficiency Calculator (ITEC) computes their energy use (including greenhouse gases contributions), identifies the main energy consumers and helpfully shows the impacts of implemented and planned greening measures.



Deiterding and Galonske have overseen the development of a range of products up to prototype status and given their proven application within the scope of ViWaS; many are only a hair's breadth from being marketable products. The project leaders, however, are not under any illusion that the SWL market can be saved overnight, as remarkable though its achievements may be, it cannot rejuvenate the system on its own. Where it does succeed is in showing exactly where and how improvements can be made. Gearing up along with its partners to present the project's findings, the word might begin to spread and bring about what SWL really needs: an environmentally friendly, Europe-wide approach to strong logistics solutions.





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