



Digital Automatic Coupler Game Changer for Europe's Rail Freight Sector

Constanze Bannholzer
„Neue Bahn – Sicher und Digital“
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The challenges for EU rail freight

Capacity

**+ 50% rail freight
- 55% GHG emissions
by 2030**

**from bottleneck
to green backbone**

Productivity



**from manual intervention
to automation**

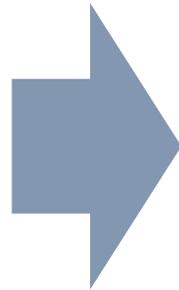
Quality



**from paper
to digital**

Processes today – and tomorrow

manual freight wagon coupling



automatic freight wagon coupling



DAC SA-3 type by Dellner Couplers AB



DAC Scharfenberg type by Dellner Couplers AB



DAC Scharfenberg type by J.M. Voith SE & Co. KG

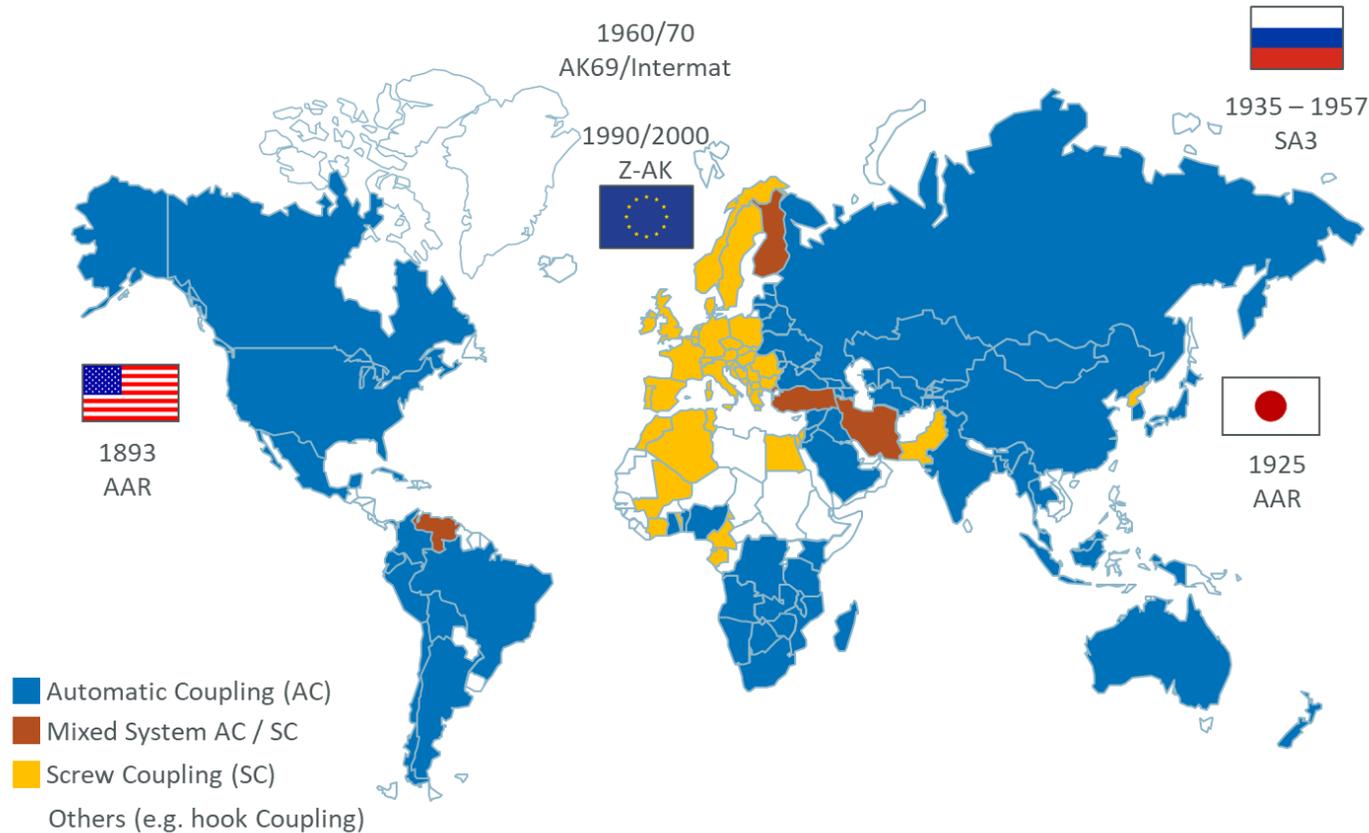


DAC Schwab type by Wabtec Corporation

Courtesy of ÖBB

Courtesy of DAC4EU consortium

Europe missed the AC revolution... ... but could lead the Digital-AC transformation



Source: hwh

Attempts were made:

- 1960/70s:
the “AK69”/“Intermat”, based on the Willison principle, was developed as a European AC (no compatibility with SC)
- 1990s:
“Z-AK” was developed (compatibility with SC)
- both failed due to the lack of common will and feasibility of the state railway administrations to bear the costs and take the full risks of these major transformation opportunity

DAC = Digital + Automation + Coupling

**this is a major
transformation
project**

- › push EU rail freight operations from heavily relying on human factor to 21st century world benchmark
- › rail freight automation with DAC is *the* chance for Europe and *the* offer to European policy makers

Key Benefits

- *Increasing infrastructure capacity*
- *Increasing rail freight efficiency*
- *Make modal shift possible:
+50% by 2030, +100% by 2050*
- *Delivering the European Green Deal*

Aim

- *Selection of an open, fully functional, operationally tested, safe, sustainable European DAC open model ready for industrialization and deployment (assessments of available solutions, testing and demos)*
- *Deliver final open design of the selected model by the end of 2021 of which interoperability and safety requirements to be incorporated to TSI, Green Deal & Digitalization Package 2022*
- *Identify necessary add-on automation components and integrate them*
- *Identify migration and business plans compatible across Europe as well as the necessary resources to match them*
- *communication and dissemination to facilitate DAC deployment in Europe*

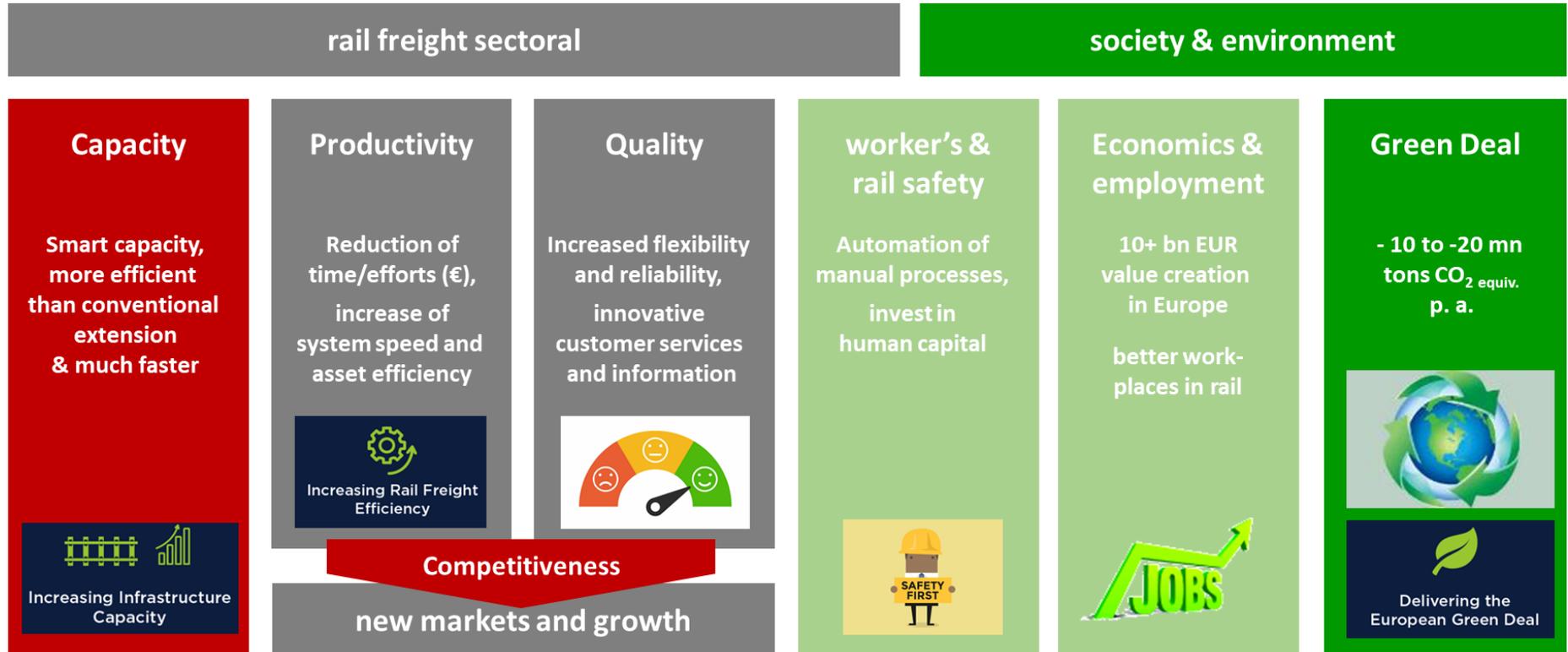
Enabler

- This work is enabled by **Shift2Rail** to ensure technology and oversight independence, with a major role for the railway operating community as major future customer of the operational changes introduced, **to meet final logistic customer expectations.**

ÖBB DAK Konzernprogramm

- ÖBB has **installed a dedicated programme**, which is “mirroring” the European DAC Delivery Programme. The “ÖBB DAK Konzernprogramm” is **contributing** heavily to and assuring **aligned expert views** to the European Programme.

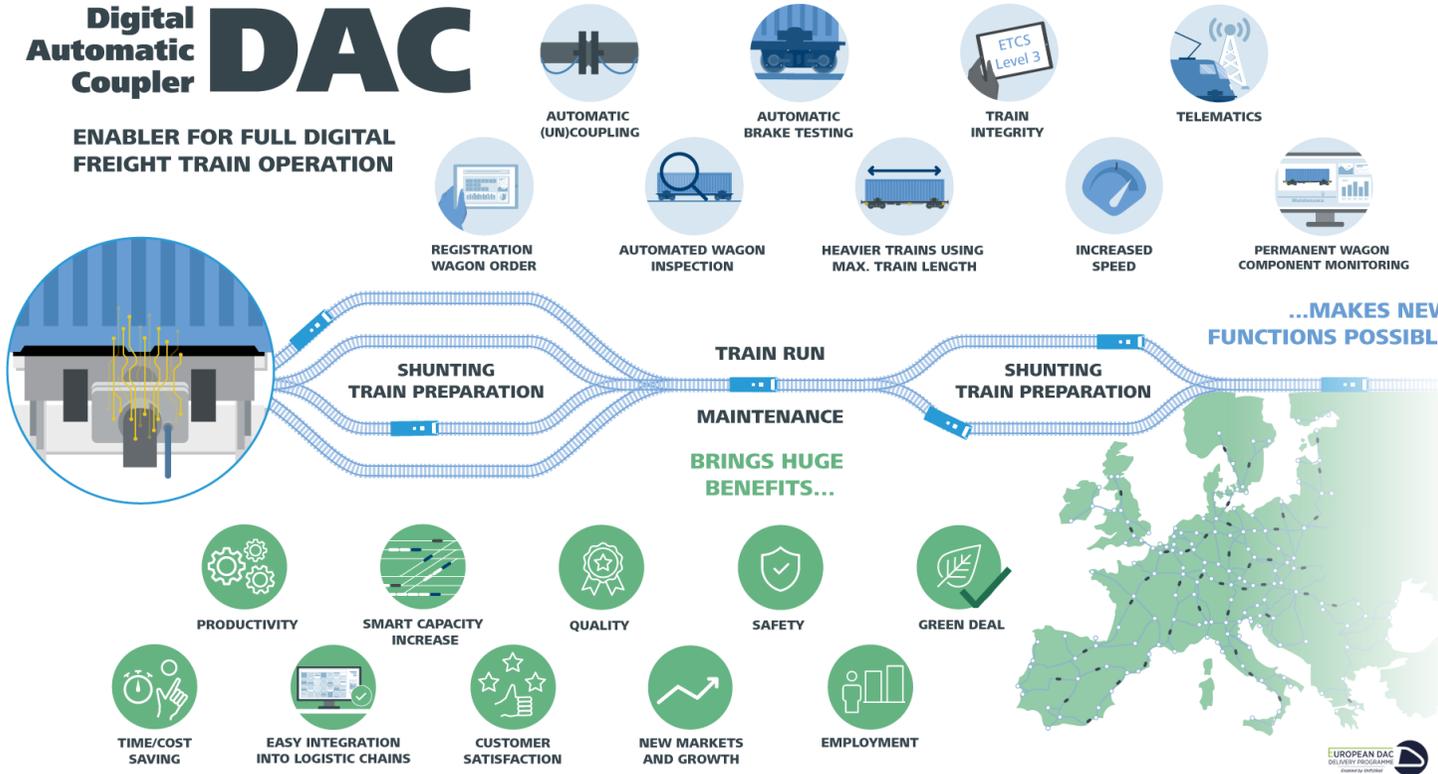
The DAC and automation benefits for EU



DAC for Full Digital Freight Train Operations

Digital Automatic Coupler DAC

ENABLER FOR FULL DIGITAL FREIGHT TRAIN OPERATION

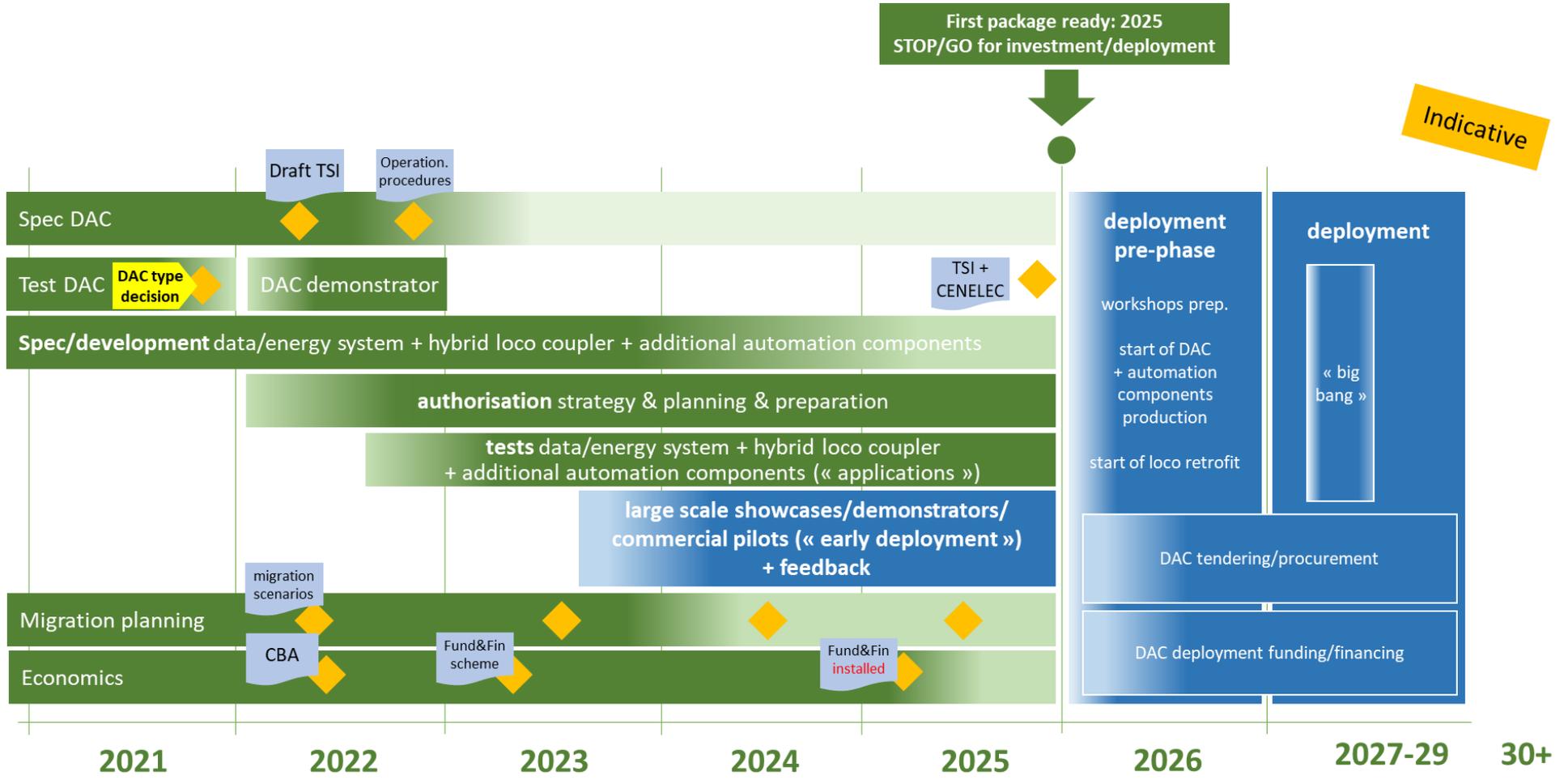


- DAC is **more than just a coupler**
- DAC is an **enabler**
- DAC is not a stand-alone technology but the **basis for “full digital freight train operations”** to achieve the ambitious transformation in European rail freight
- Further components (applications) and technology to be developed
- This will allow the DAC to enable even more **use cases** and to **generate a max. possible benefit**

DACcelerate

This project has received funding from the Shift2Rail Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement no. 101046657.

Indicative overall time plan



First major milestones for the selection of the future Europe-wide DAC standard coupler head design for European rail freight transport reached

EDDP assessment July – September 2021

- Prototypes for two **Scharfenberg** type designs and one **Schwab** type design from participating manufacturers **Dellner Couplers AB**, J.M. **Voith SE & Co. KG** and **Wabtec Corporation** were completely tested (One SA 3 design withdrawn earlier from the process)
- Different coupler head concepts were compared and checked in a **broader testing** campaign until **June 2021**
- Objective of the process: select a design **ensuring interoperability** and **operational performance** free of **royalties/licenses**, not a manufacturer
- Around 100 EDDP **experts** from 36 companies **assessed** the **results** of two test consortia (DAC4EU and Trafikverket/ Swedish Winter Tests) as of previous S2R works for each coupler
- **September 2021**: based on clear assessment results from this process, the EDDP Programme Board selected **in consensus a latch type (Scharfenberg) as the European DAC coupler head type** (confirmed by EDDP Supervisory Board)



Next steps

- Scharfenberg design will be further developed (jointly by all manufacturers) to meet the **remaining** other **DAC requirements**; optimisation of DAC Life Cycle costs
- Through this, EDDP will develop further the DAC specification and compatibility/safety interfaces (stepwise m/p+d/e), later resulting in product **pilots** and **TSI requirements**, and follow-up of open points relevant for **serial production**
- All three **manufacturers** from current test programme are **competent** in **latch type** couplers and can boost further development
- **More manufacturers can join** the process in the upcoming stages, all aiming at **establishing** the Europe-wide DAC standard and enabling the DAC introduction in Europe

Demonstrator train of the DAC4EU consortium will be tested for 4 weeks in Austria **led by RCA**

Rankweil (+ Langen am Arlberg)

Kuppeltests mit Abstoßbetrieb
Kuppeln bei winterlichen Bedingungen

Wien

Kuppeltests am Ablaufberg

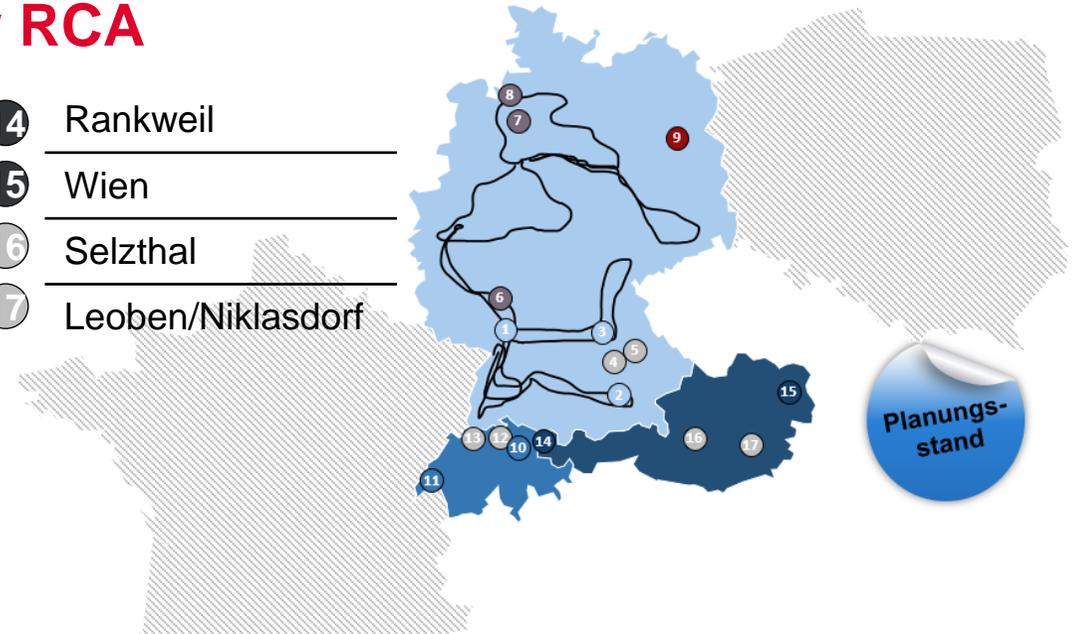
Selzthal

Streckenfahrten auf anspruchsvollen Streckengeometrien
Kuppeln bei winterlichen Bedingungen

Leoben/Niklasdorf

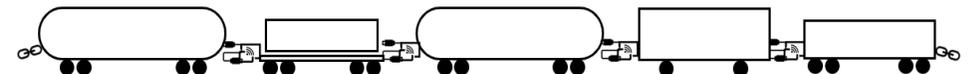
Kundengleise
Enge Gleisradien

- 14 Rankweil
- 15 Wien
- 16 Selzthal
- 17 Leoben/Niklasdorf



	Zags 119	Sgmnms 40	Zags 119	Hbbins 306	Eanos x-059
Länge über Puffer	18,8m	13,61m	18,8m	15,5m	15,74m
Drehzapfenabstand	12,1m	9,87m	12,1m	9m	10,7m
Eigengewicht	32,5t	17,5t	32,5t	14,9t	24t
Max. Gewicht	90t	90t	90t	45t	90t
Beladungszustand	Leer	2x leere 20' ISO Container bzw. Wechselbehälter	Beladen	Leer	Beladen

Detailplanung findet gerade statt!



Inclusion of unions from the beginning on



Unions

Early involvement of experts in practical tests takes place because

- ÖBB/EDDP sees the **importance** of involving practitioners as timely as possible in the **ongoing developments** on the DAC, so that **feedback** on the introduction of the DAC can be considered.
- **Delegation** of practitioners (5-6 persons consisting of the European Transport Workers' Union (ETF), trade union vida and EVG) was able to **test manipulation on prototypes** (09/06-10/06 at the test site Görlitz)
- **Next steps: DAC4EU test train**, which will be **in AT** in February 2022, will also be organized with the **involvement of unions**



ETF Dialogue Plattform

Joint development of a platform EDDP & trade unions was conceptualized

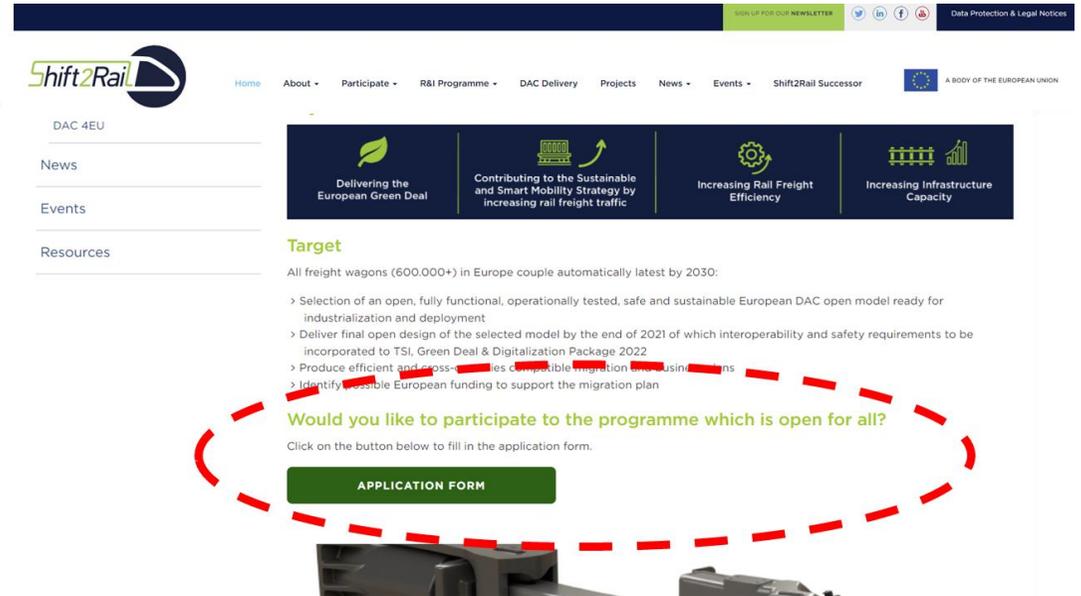
- The **goal** is the **successful implementation** of **DAC** in **transparent cooperation** with a strong focus on **employees, operational safety, health & safety** and creation of a **dialogue** to ensure that the **expectations** are articulated and **understood** by the respective parties
- The **solution** is to set up an EDDP & Trade Unions **platform** as an opportunity for the sector with participants from S2R, EDDP Programme Management, respective Work Package Leaders and ETF
- In terms of content, trade unions will gain insight into relevant milestones in this efficiently designed structure in order to be able to use their own resources in a targeted manner.
- The first **dialogue platform** took place in November 2021 and will be continued twice a year.



[Digital Automatic Coupling - YouTube](#)

Thank you!

A single entry point for all Europe and beyond



The screenshot shows the Shift2Rail website interface. At the top, there is a navigation bar with the Shift2Rail logo and a menu with items: Home, About, Participate, R&I Programme, DAC Delivery, Projects, News, Events, and Shift2Rail Successor. Below the navigation bar, there are four main content blocks with icons: 'Delivering the European Green Deal', 'Contributing to the Sustainable and Smart Mobility Strategy by increasing rail freight traffic', 'Increasing Rail Freight Efficiency', and 'Increasing Infrastructure Capacity'. A 'Target' section follows, stating 'All freight wagons (600.000+) in Europe couple automatically latest by 2030:' and listing four bullet points. A red dashed oval highlights the text 'Would you like to participate to the programme which is open for all?' and a green 'APPLICATION FORM' button below it.

Thank you for your attention!

For more information please contact: Constanze.Bannholzer@oebb.at



Thank you!