UIRR
INTERNATIONAL UNION FOR ROAD-RAIL COMBINED TRANSPORT

RAIL CARGO - SPOORKONGRESS

INTERMODAL RAIL FREIGHT: POLICY, OWN-INITIATIVE PROGRESS, AND THE ROAD AHEAD

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UIRR: the Community of European Intermodal Freight Transport

New political majority in Europe: **the Clean Industrial Deal**

Competitiveness: productivity, efficiency

Resilience: reducing external exposures

Re-industrialisation: manufacturing in Europe

+ **the European Green Deal**: preserving greening results

The Efficiencies of Combined Transport: a study done for UIRR

How does Combined Transport measure up?

ENERGY / IMPORTED FOSSIL FUEL DEPENDENCY

Door-to-door Combined Transport uses **70% fewer kilowatt-hours of energy to produce a tonne-kilometre of transport performance** compared to the unimodal long-distance trucking alternative.

The energy used by Combined Transport is dominantly grid-electric, which means **a direct supply from Europe's increasingly carbon-neutral power generation**, thereby reducing the continent's dependence on imported fossil fuels.

INFRASTRUCTURE

The infrastructure of non-road means of transport is more suited to accommodate the heavy axles required by efficient freight transport than road.

The **per tonne-kilometre infrastructure degradation of door-to-door Combined Transport is thus a fraction of that of its unimodal road alternative.** Slower road degradation means less frequent roadworks resulting in reduced disruptions and works-related congestion.

EFFICIENCY AND COMPETITIVENESS

LABOUR PRODUCTIVITY, WORK/LIFE BALANCE

The number of **tonne-kilometres produced per worker employed in a door-to-door Combined Transport operation is multiple times higher** than that of workers active in the unimodal trucking alternative. At the same time, Combined Transport jobs offer a **superior work/life balance** to the workers, especially in comparison to truck drivers, promising to alleviate the looming truck driver shortage.

SAFETY: ACCIDENTS AND CONGESTION

More Combined Transport not only slows road degradation, but also contributes to a dramatic reduction in accidents due to the superior safety performance of non-road modes. This has a further **positive impact on the frequency and extent of road congestions** thus reducing the external costs of freight transport.

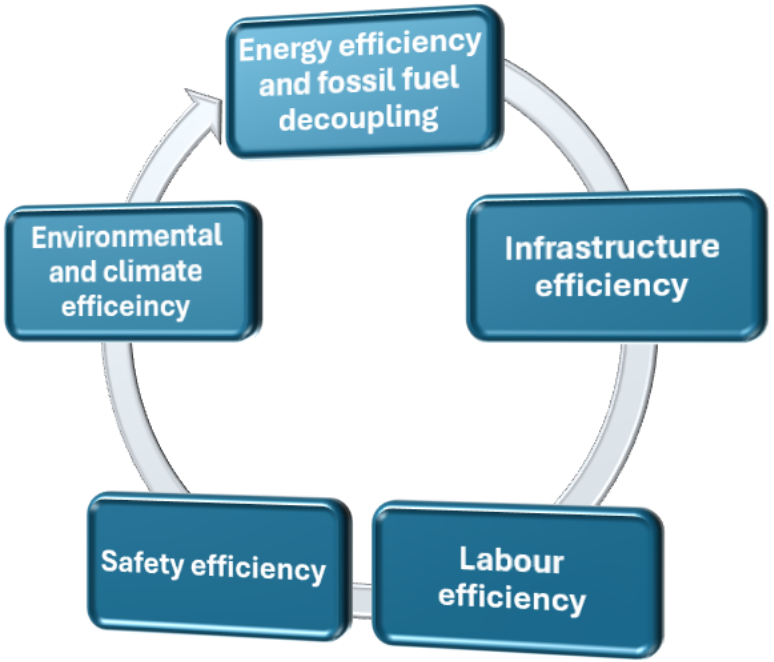
CLIMATE AND THE ENVIRONMENT

The harmful emissions of door-to-door Combined Transport, such as **PM10, PM2,5, NOx and ozone, are a fraction of those produced by unimodal trucking.** The greenhouse gas emissions of Combined Transport are up to **90% lower than that of the unimodal trucking alternative.** Zero-carbon door-to-door Combined Transport has been demonstrated to be viable with products and technologies already on the market today, making it **the most cost-effective solution for Europe.**

The results in numbers: exceptional performance

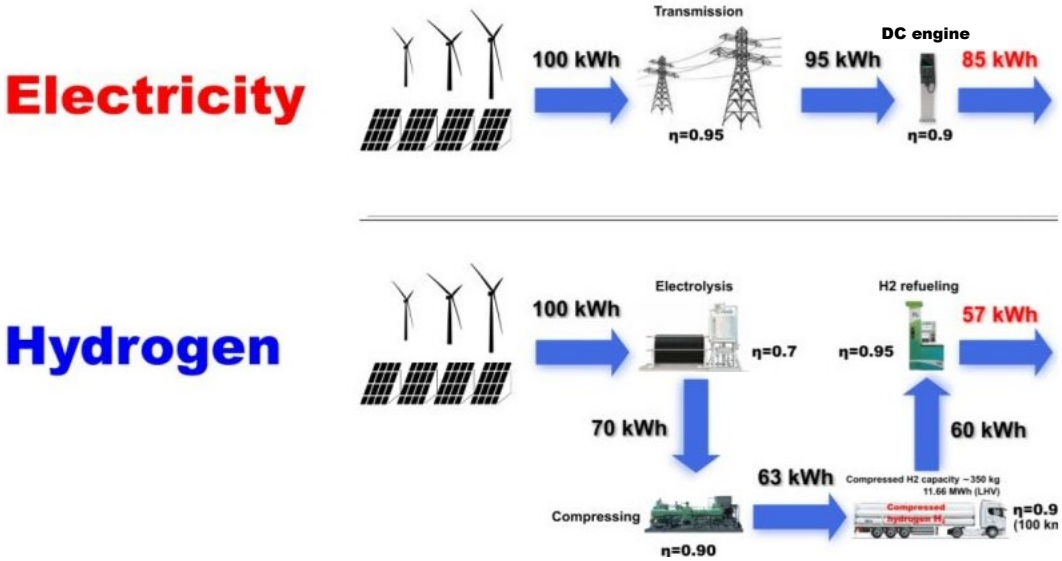
Combined transport – compared to unimodal truck transport – can deliver meaningful results in every examined dimension:

- **70%** better energy efficiency
- **Up to 50%** road infrastructure maintenance expense saving
- **60%** better labour productivity and improved work/life balance
- **95%** fewer accidents per tonne-kilometres
- **Up to 84%** fewer air pollutant and greenhoue gas emissions
- **50%** reduction of road congestion related to maintenance works and accidents



CT vs hydrogen fuel: energy-efficiency, distribution, fuel production

- ✓ **Energy efficiency**: of H2 powertrains is 34% while direct grid-powered electricity is 85%
- ✓ **Distribution**: TEN-E infrastructure requirements are modest compared to the challenges of developing a continent-wide hydrogen distribution network
- ✓ **Fuel production**: the production of hydrogen is costly and energy intensive, long distance transportation of hydrogen is also a big challenge



Comparison of an electric powertrain driven by electricity from the grid and a hydrogen-powered fuel-cell powertrain

MEGA TRUCK

CT vs EMS trucks: 50% reduction of road maintenance expenses

EMS truck 25m/32m[1]	Efficiency category	combined transport
10-15% / 15-20%[2]	energy efficiency	**45-72%**
0%	infrastructure (road maintenance)	**50%**
50-100%	labour productvity[3]	**42-80%**[4]
n/a[5]	safety / accidents	**95%** (fewer)
10-20%	environment/climate	**65-91%**
0%	road congestion	**50%**

NOTES:

[1] EMS truck circulation is restricted to those sections of the road network that are capable of handling these increased dimension (longer and heavier) vehicles.

[2] Source: International Energy Agency

[3] Not taking into account the slower acceleration and deceleration of EMS trucks and assuming that EMS truck drivers are paid the same as drivers of regular trucks

[4] Besides requiring fewer manhours per tonne-kilometre, combined transport jobs offer superior work/life balance compared to a long-distance truck driver's which has not been factored in the comparison; moreover, the potentially higher salaries of EMS truck drivers compared to their compatriots driving conventional 18,75m long trucks, has also not been factored in the comparison.

[5] There is no data available; however in case EMS trucks reduce the number of HGV circulations (i.e. there are fewer trucks due to their introduction) then there may be somewhat fewer HGV-related accident occurrences, but the impact of a single accident will potentially be greater due to the increased size of the vehicle

The efficiency advantage, and therefore the contribution to Europe's competitiveness, is significantly better in case of a door-to-door combined transport operation than if using even a the longer 32-meter-long EMS truck combination weighing 60 or 70 tonnes.

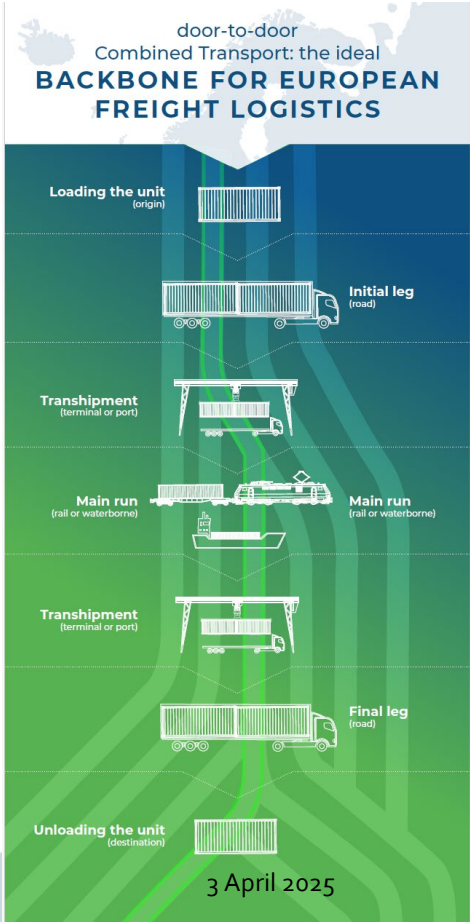
Baseline: the "backbone of land freight transport over 300km"

THREE QUESTIONS:

1. How does Combined Transport compare to unimodal trucking if performing in the capacity of "backbone of land freight transport over distances of 300km"?
   – efficiency + productivity performance

2. How much modal shift would be needed until 2050 to qualify Combined Transport as "the backbone"?
   – 1000 billion tonne kilometres

3. Are the preconditions of Combined Transport to becoming "the backbone" realistic and affordable?



Modal shift of 1000bn tkm: what are the preconditions?

No need for unaffordable public or private investments

- The estimated annual public investment need into the TEN-T transport infrastructure is about **€15 billion**.
- The estimated annual private investment into intermodal assets like terminals, rolling stock and digitalisation amounts to **€1,5 billion**.

Philosophical changes to freight transport choices

- **Critical mass**: regular cargo flows should be carried by Combined Transport (non-road modes), while unimodal trucking should only carry the irregular, last minute shipments.
- **Mixed cargo**: heavy (high density) and light (**low density**) cargo should both be entrusted to Combined Transport as this will be needed to fill 740m long trains.

Legislative and regulatory steps

- Adoption of the **new Rail Infrastructure Capacity Management Regulation** with the right content to ensure that cross-border intermodal freight trains are granted **more and better quality train paths**, as well as that the **hierarchy of these trains is elevated** in the eye of rail traffic managers.
- Revision of the **Combined Transport Directive** with a **broader, enhanced definition** of a *combined transport operation*, and the required compensatory and promotional **state aid measures**
- The correct and timely implementation of the **TEN-T Guidelines Regulation**.
- **Standardisation and digitalisation** in the field of railway transport would need to be advanced throughout Europe. The correct and timely implementation of the **Electronic Freight Transport Information Regulation** and the **TSI Telematics** are needed.

What does this mean for the European economy in monetary terms?

ANNUAL SAVINGS FROM 2050

- ✓ 70% better energy efficiency = **€70 billion**
- ✓ 50% road infrastructure maintenance expense reduction = **€20 billion**
- ✓ 60% better labour productivity + improved work/life balance = **€47 billion**
- ✓ 95% fewer accidents per tonne-kilometres = **€70 billion**
- ✓ Up to 90% fewer air pollutant and greenhouse gas emissions = **€17 billion**
- ✓ 50% estimated reduction of road congestion = **€90 billion**

The annual contribution to the public budgets and to European economic actors would amount to €314 billion, which is equal to €222 billion net of present day internalisation charges (paid through taxes and charges).

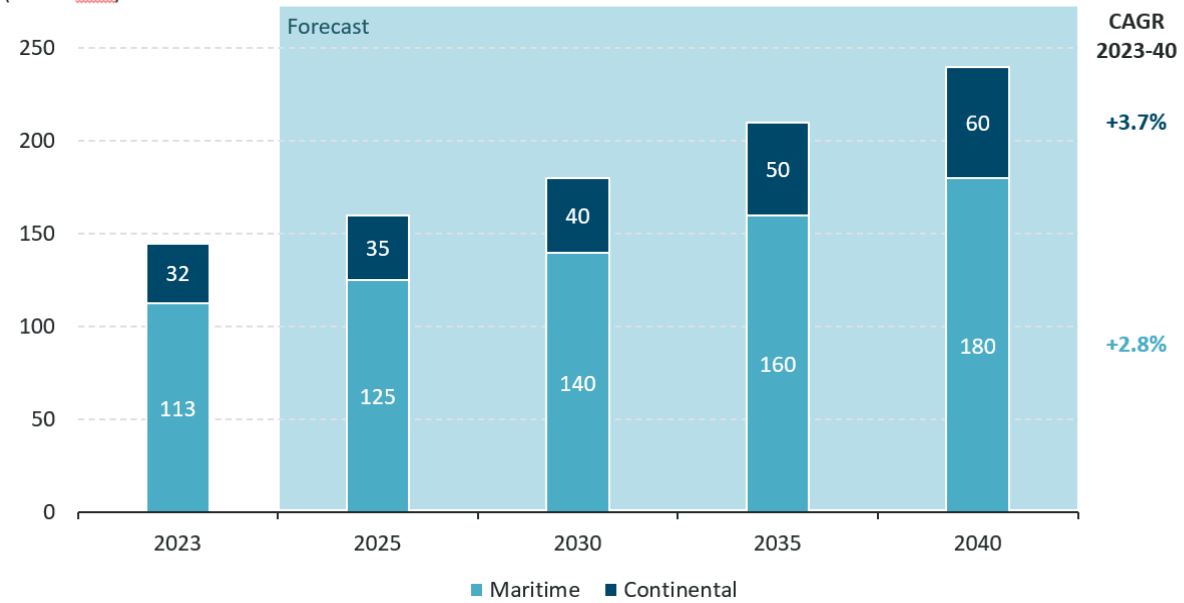
Challenge of the day: **tariffs, trade war, deglobalisation**

Combined Transport has the answer

Maritime hinterland		Continental
Port to inland and back	**Points connected**	Any two points within Europe
ISO containers, tank containers	**Loading units**	PWHQ containers and swap bodies, semi-trailers
Long standing practice	**Know how**	Learning phase
Port access capacities, lack of train paths, water levels	**Bottlenecks**	Shortage of inland terminals, lack of train paths, water levels
Modest	**Growth potential**	**Large**

The market for Combined Transport by rail is forecast to grow by 3% p.a. until 2040

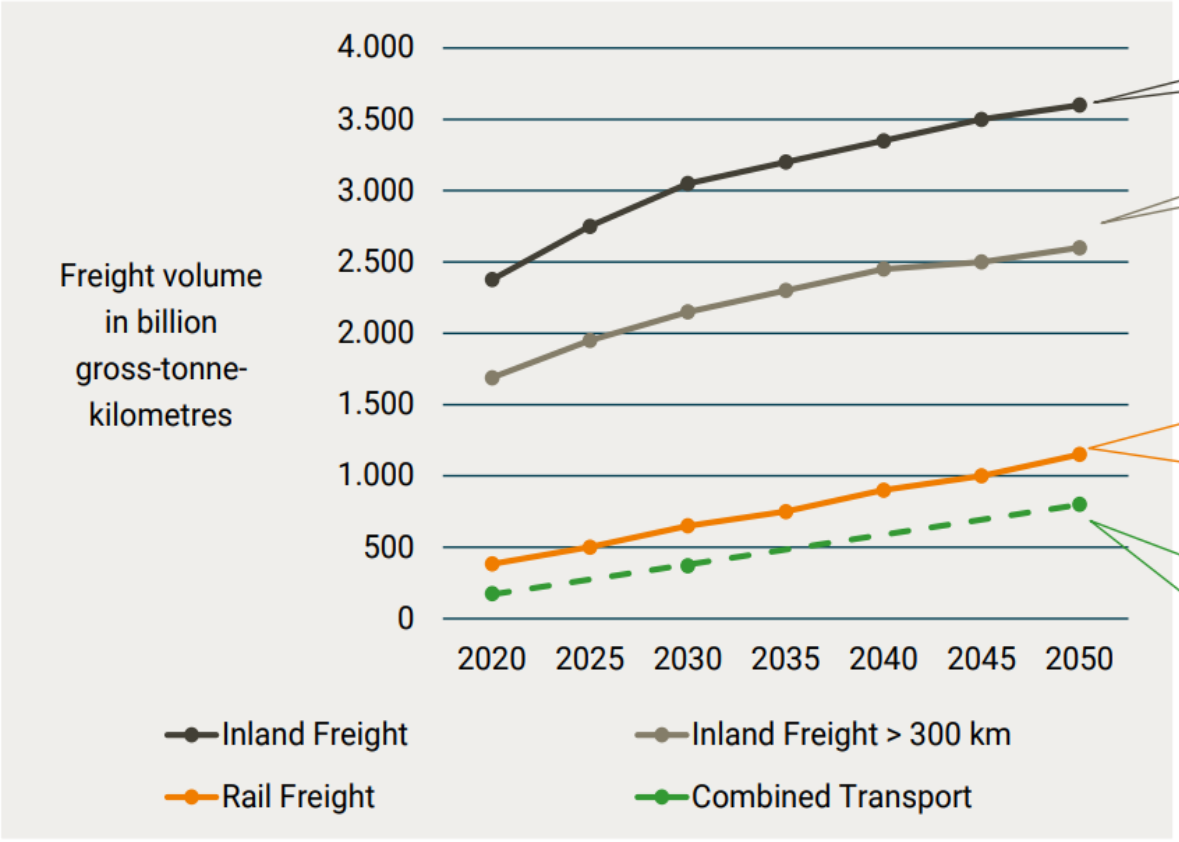
Development of unaccompanied CT rail transport performance by transportation type
(billion tkm)



Source: SCI Verkehr Rail Freight Market Forecast

- SCI Verkehr expects further growth of unaccompanied Combined Transport by rail until 2040. **In 2040, the market will be around two thirds bigger than in 2023.**
- With a compound annual growth rate of 3.7% between 2023 and 2040, **continental transport should grow at a higher rate than the overall market** and almost double by 2040. This development should be mainly driven by the currently planned and further expected expansion of the continental network, especially in markets like Spain, France and Poland. In 2040, continental transport's share of the Combined Transport market will be 25% compared to 22% in 2023.

Development of freight volumes: overall demand evolution, rail freight and combined transport



+ 51% total inland freight transport demand[01]

+ 54% long-distance inland freight transport demand[01]

× 3 rail freight (in tkm)

× 2 trains per day

44 % rail share in long-distance transport (> 300 km)

× 4 combined transport (in tkm)

5 % Annual growth rate of CT

70% share of CT in rail transport

The demand for freight transport, especially by rail, will increase continuously in the coming years.

SUMMARY

1. **Transport is a policy-driven market**: publicly owned and operated infratructure, heavy regulation due to externalities + need for safety → **policymakers play a key role**

2. **The EU's new political direction**: whether greening or competitiveness and resilience, the Clean Industrial Deal → **plays into the hand of Combined Transport**

3. **The efficiencies of Combined Transport**: robust performance that can play a significant role if Combined Transport can become the backbone of long distance land transport → **must have a vision**

4. **An annual growth rate of 5% can get us there**: Combined Transport average 6-7% annual growth from 1992-2008 → **proven doable**

5. **What is needed to make it happen?** → **collaboration, confidence, unity**

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THANK YOU

For your attention

Energy efficiency: 70% less energy needed per tonne-kilometre

- ✓ **SOURCE OF PRESENT DAY EFFICIENCY** :
  - low friction of steel-on-steel or steel-in-water (compared to rubber-on-asphalt)
  - large sizes (trains: a 'platoon' of 40-50 truckloads, waterway vessels: 50-2000 truckloads)
  - high degree of electrification of railways (grid power, regenerative braking)
  - dedicated infrastructure (reduced need to brake, reduced need for start-and-stop)

- ✓ **OUTLOOK for Combined Transport** :
  - Uniform 740m train length and electrification (TEN-T)
  - Better traffic controlling (further reduction of graking action)
  - Further electrification of transhipment and road last mile (BEV trucks)
  - Increased share of locally generated renewable electricity (reduced transmission loss)

Infrastructure efficiency: 50% reduction of road maintenance expenses

- ✓ **SOURCE OF PRESENT DAY EFFICIENCY** :
  - railway infrastructure is built for 22,5t axles – the axle range on railways is 18-22,5 tonnes (there are no „light" and „heavy" axles on rail)
  - heavy axles on roads cause exponentially greater wear-and-tear: 98% of road vehicles roll on axles of 5 tonnes or less (passenger cars: 1t axle), only 2% of road vehicles have 10t or heavier axles (presently 11,5t)
  - roads and bridges have historically not been built for 11,5 tonne axles, but much lower – the legislation increased maximum permissible axle load over the years
  - the ratio of overloaded heavy trucks was estimated at 10% -- these cause even greater degradation

- ✓ **OUTLOOK for Combined Transport** :
  - 22,5-tonne axles are adequate for Combined Transport – no increase is sought
  - alternative fuelled road vehicle drive axles need to be 12,5 tonnes

Labour productivity: 60% fewer manhours per tonne-kilometre

- ✓ **SOURCE OF PRESENT DAY EFFICIENCY** :
  - rail: 40-50 truckloads per driver, waterborne: 50+ truckloads per crew member
  - trucks: 1 driver per truckload
  - resting time: enforcement gaps in road haulage; no issues in rail or waterborne

- ✓ **OUTLOOK for Combined Transport** :
  - average speed of freight trains and trucks performing Combined Transport road legs can increase considerably
  - self-drive technologies in all modes and in transhipment are under development

Safety efficiency: 95% fewer accidents, fatalities and injuries

- ✓ **SOURCE OF PRESENT DAY EFFICIENCY** :
  - rail and waterborne: accidents/fatalities/injuries per tonne-kilometre are very low due to built-in safety systems (active train control systems)
  - trucks: the role of the human factor in accidents is very high + severity of accidents by heavy goods vehicles is exponentially higher

- ✓ **OUTLOOK for Combined Transport** :
  - ERTMS deployment will further boost safety performance

Pollution: 90% lower emissions per tonne-kilometre

- ✓ **SOURCE OF PRESENT DAY EFFICIENCY**:
  - rail and waterborne: energy efficiency + use of electric propulsion in rail freight
  - trucks: internal combustion and rubber-on-asphalt causes most harmful emissions

- ✓ **OUTLOOK for Combined Transport**:
  - longer trains
  - regenerative braking – electric brakes to replace pressure air braking

Congestion: 50% reduction of road congestion

- ✓ **SOURCE OF PRESENT DAY EFFICIENCY** :
  - rail and waterborne: active route- and traffic management
  - trucks: free driving on motorways causes traffic overloads + frequent accidents and infrastructure works cause congestion

- ✓ **OUTLOOK for Combined Transport** :
  - improved rail traffic management – better bypass planning for infrastructure works

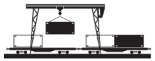
New TEN-T Regulation: important changes

Infrastructure parameters: 100km/h for freight trains (instead of 160km/h)

KPIs for freight trains

- ✓ **75% of border-crossing freight trains should be on time** (within the 30 minutes standard)
- ✓ **90% of freight trains should complete the border crossing process on internal EU borders within 25 minutes** (both technical and administrative)

Rail Freight Corridors will merge into the European Transport Corridors



Terminal development:
country specific study until July 2027, action-plan for terminal capacity development within a year thereafter

Rail Capacity regulation under preparation: the trialogue begins

TTR (Timetabling Reform) – digital European timetabling

Capacity allocation (train path allocation) principles - socio-economic and environmental cost-benefit analysis

Capacity allocation along TCRs - temporary capacity restrictions

New self-regulating organisation and supervisory functions - RU supervisory platform

Numerous question marks to be settled during the trialogue negotiations!

Combined Transport Directive amendment: main issues

1. **Definition of combined transport operation**: which types of intermodal transport should qualify for special support?

2. **European benefits**: Article 4 equivalence, 44-tonne gross vehicle weight for CT road legs, drive-ban exemption

3. **Member State benefits**: in line with a national study, at least for a reduction of 10% of operating expenses

4. **Support of daily operations + digitalisation**: central EU portal to disseminate Member State derogations and programmes, ILU-Code for every semi-trailer carried in an unaccompanied combined transport operation