



# Rolling stock financing - Locomotive leasing in Europe

CAREC Railway Working Group

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Beratungs- und Beteiligungsgesellschaft mbH

Over the past 25 years the European Rail industry has attracted significant private sector investment into locomotive leasing

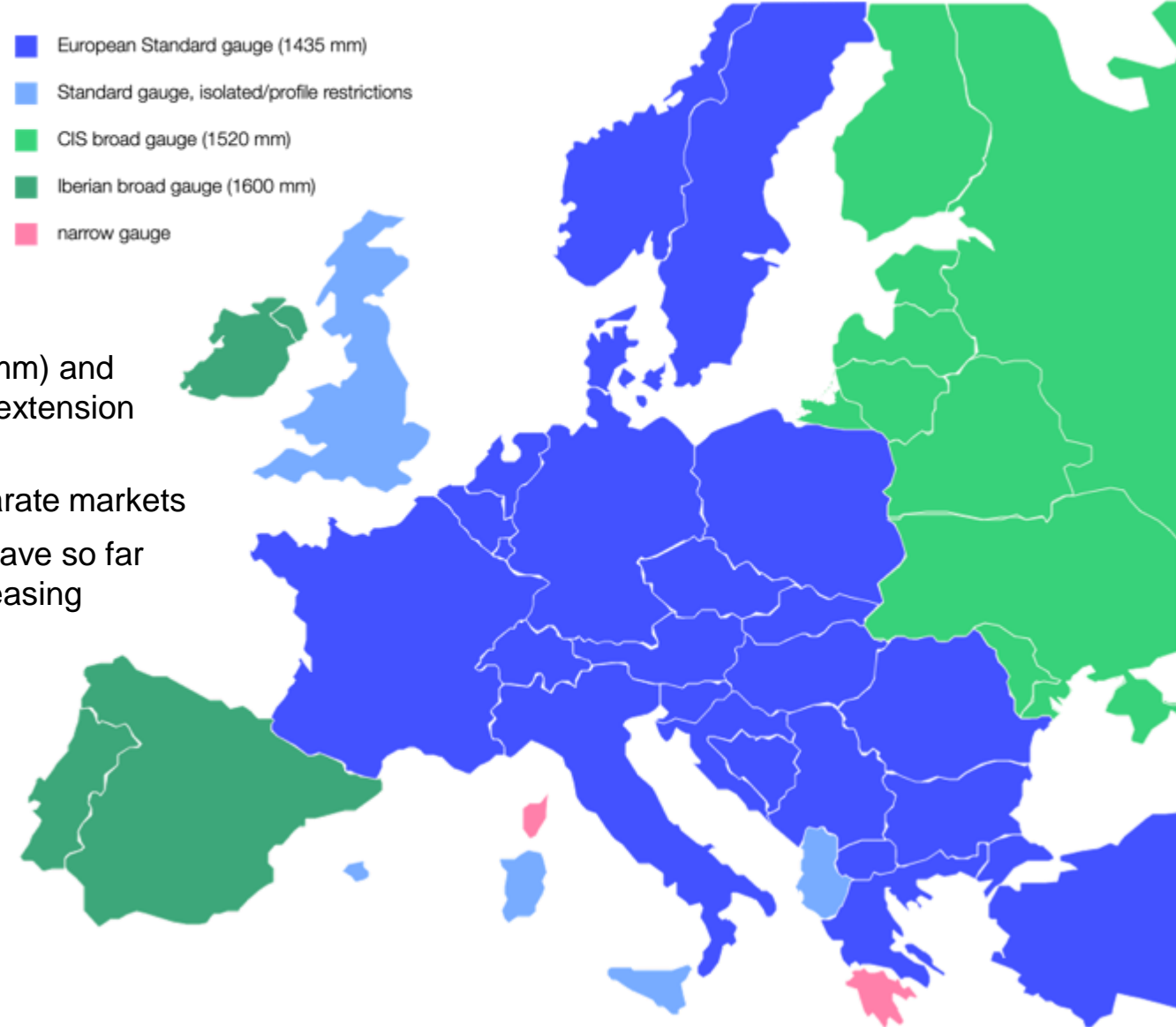
### **European Locomotive lessors offer „operating“ leases**

- Balancing a long-term asset (locomotive) against a short(er) term market
- Typical lease duration << useful locomotive life
- Lessors take significant commercial and technical risks
- Locomotive capex is off the Lessee's balance sheet

### **Locomotive leasing companies are backed by institutional equity investors and commercial banks**

- Typical equity investors are infrastructure funds, pension funds, insurance corporations ...
- Investment horizon 10 years +
- ROI expectations hover around 5 ... 8 %
- Commercial banks provide significant portion of debt finance

# Track gauge and gabarit determine the core European locomotive market

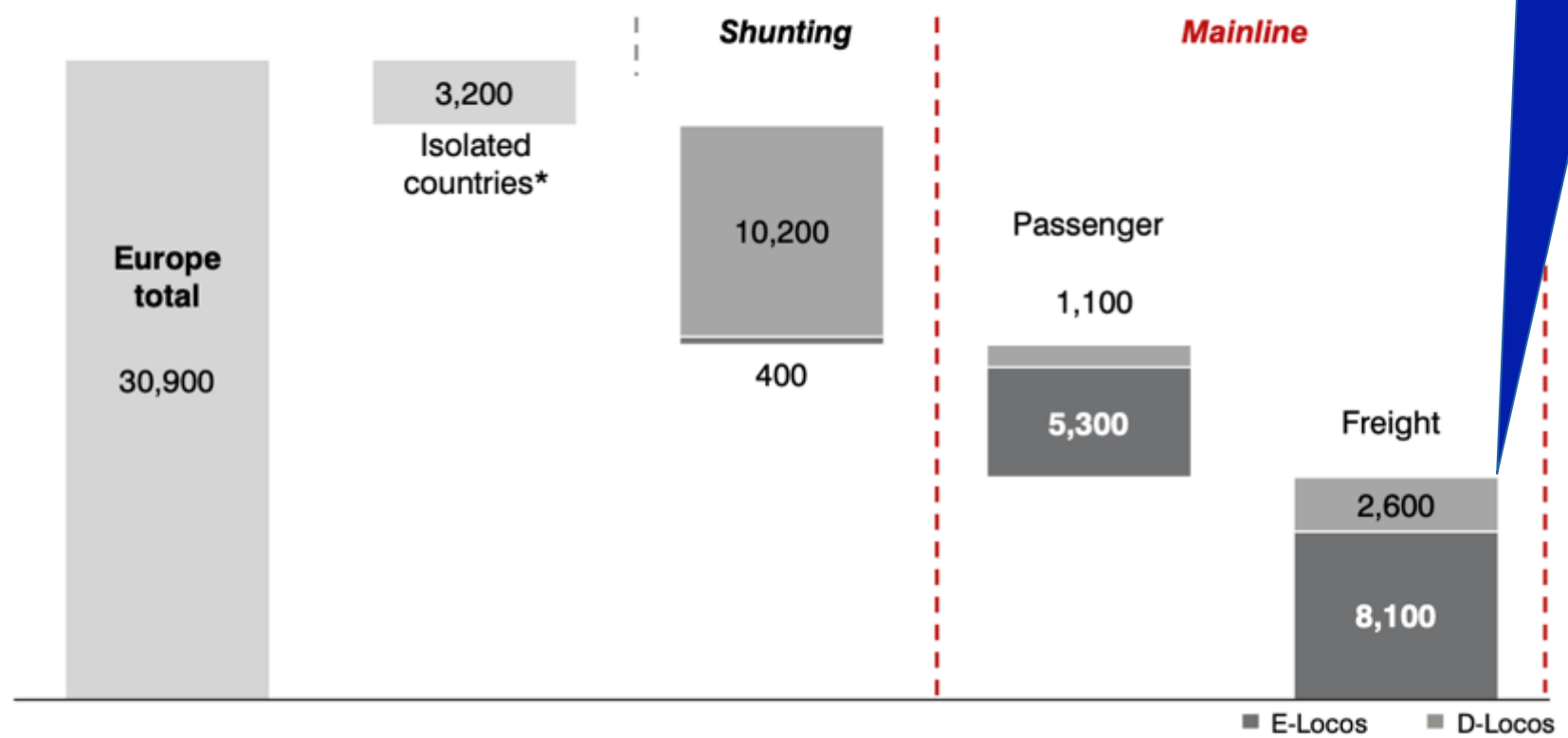


- European standard gauge (1435 mm) and gabarit determine the geographic extension of the leasing market
- Therefore, Spain and UK are separate markets
- The Baltic countries and Finland have so far only had very limited locomotive leasing

There are approximately 27,700 locomotives in operation in continental Europe

Today we will focus on freight mainline locomotives

**Locomotives in Europe in 2019** [~30,900 units]  
**of which electric freight mainline locomotives** [~8,100 units] **in Continental Europe**



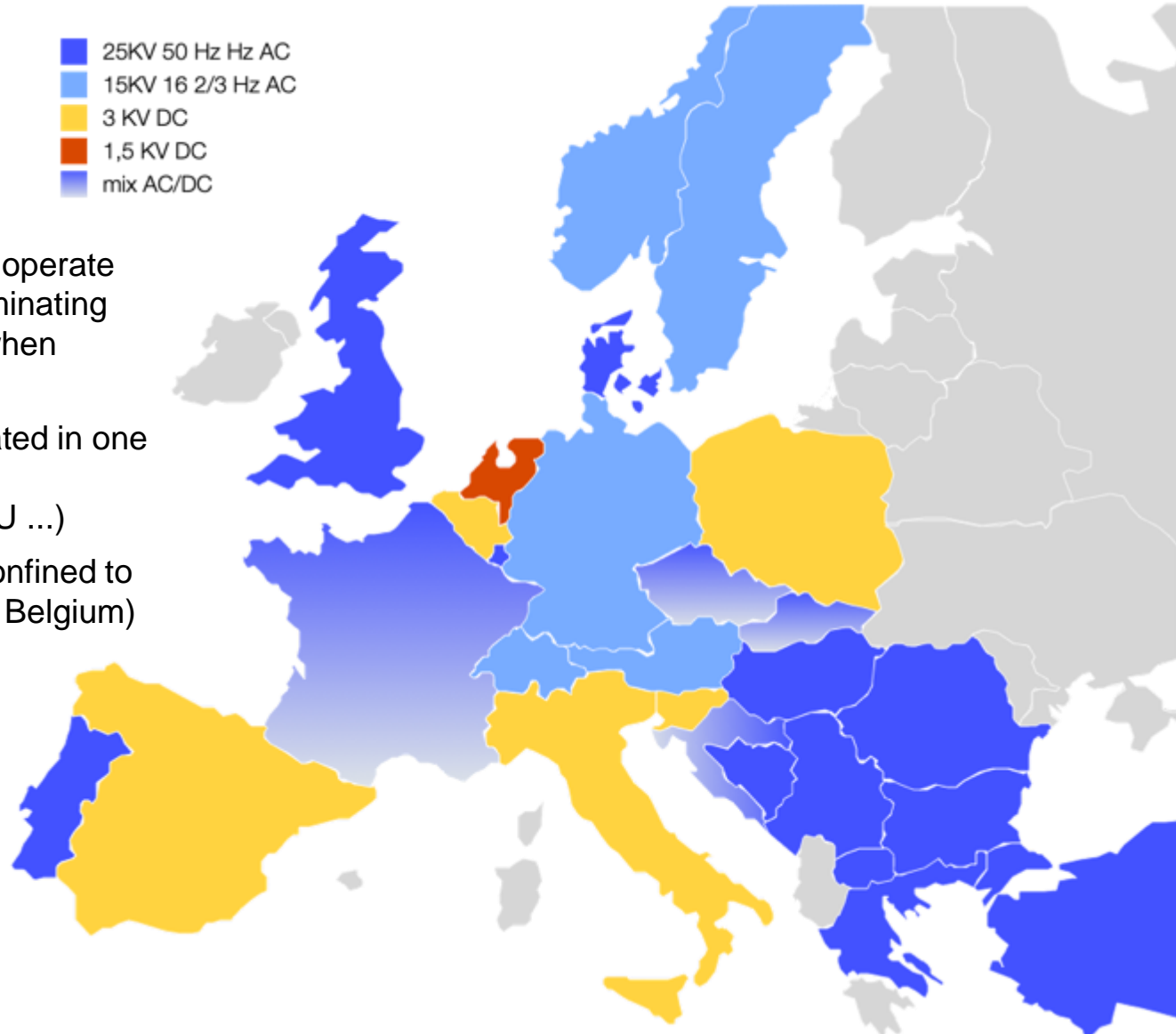
\* Iberian countries are excluded because of wide track gauge (1,676 mm) as well as the Baltic States and Finland due to Russian broad gauge. UK is excluded because of loading gauge differences. Locomotive types in isolated countries: 50% freight mainline, 21% passenger mainline, 29% shunting.

Source: SCI Verkehr, 2020

# Different electrification and signaling systems set barriers that need to be overcome by multisystem locomotives



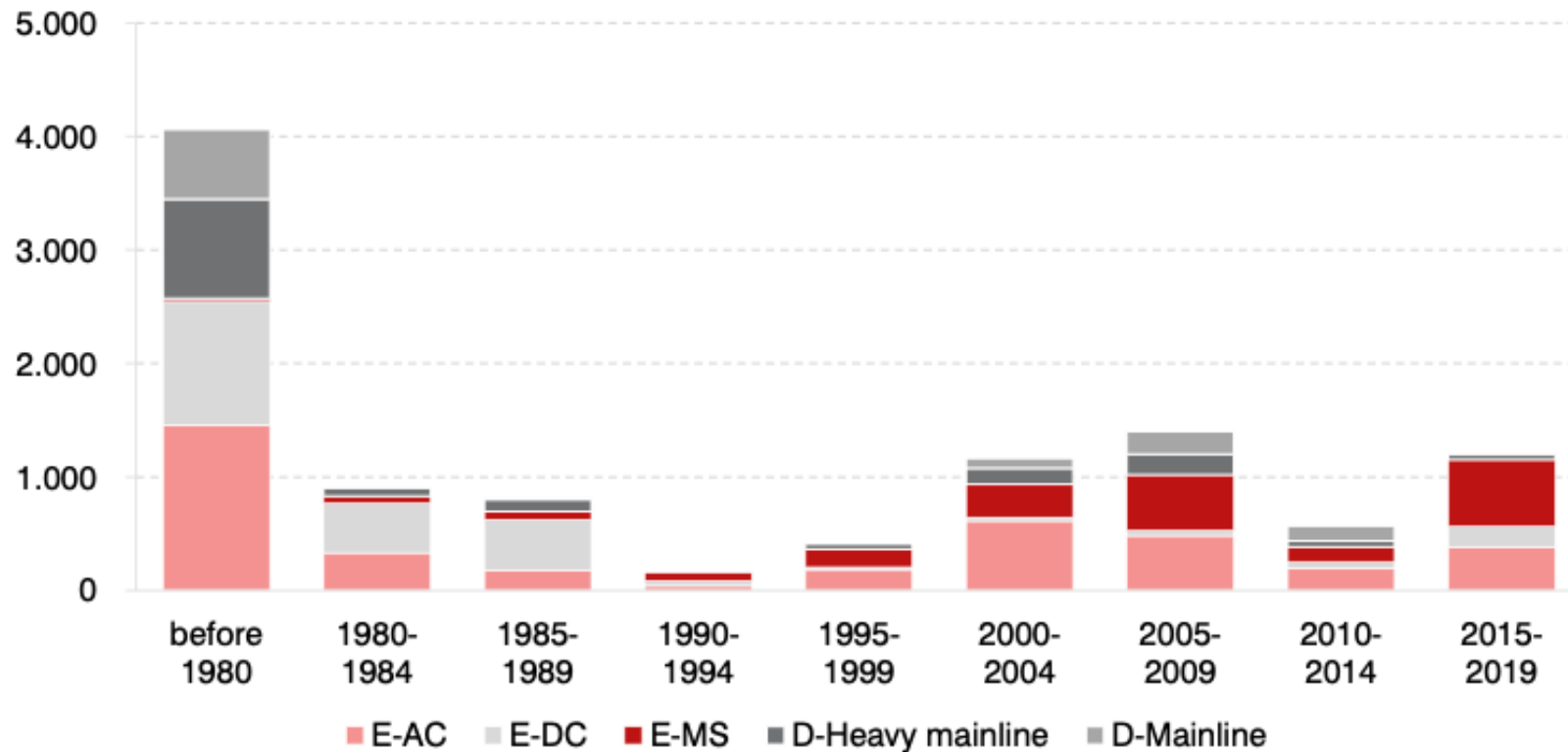
- Multisystem (MS) locomotives can operate on AC and DC electrified lines, eliminating the need for locomotive changes when crossing borders
- AC only locomotives are homologated in one or sometimes more countries (i.e. D/A/CH, D/F, D/DK/SE, D/A/HU ...)
- DC only locomotives are usually confined to only one country (i.e. Poland, Italy, Belgium)



Introduction of modern locomotives and availability of lease finance have driven fleet renewal since 2000

### Age structure of mainline freight locomotives in Continental Europe

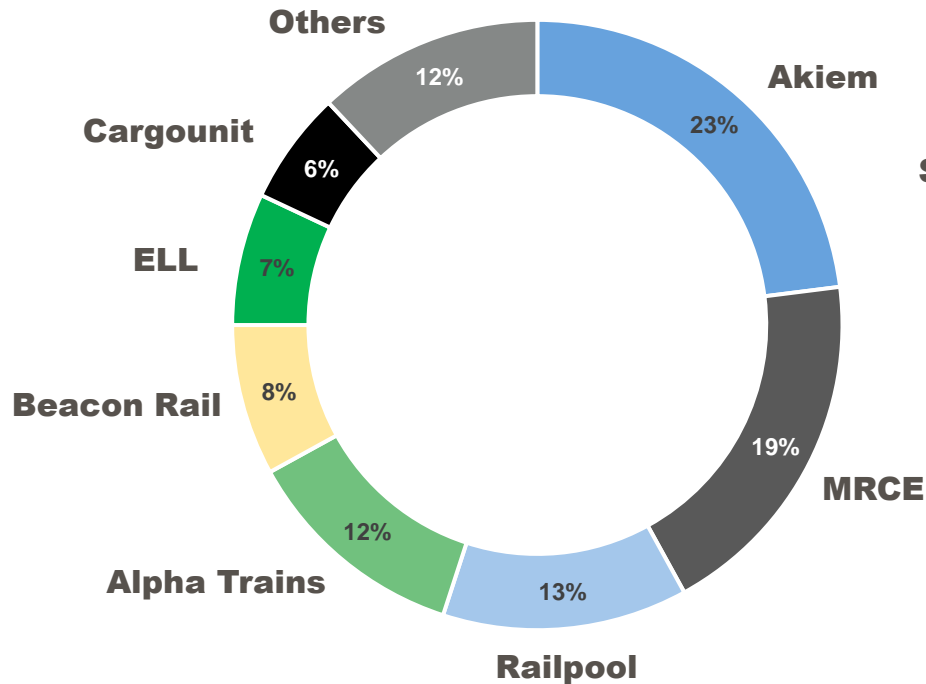
[~10,700 units]



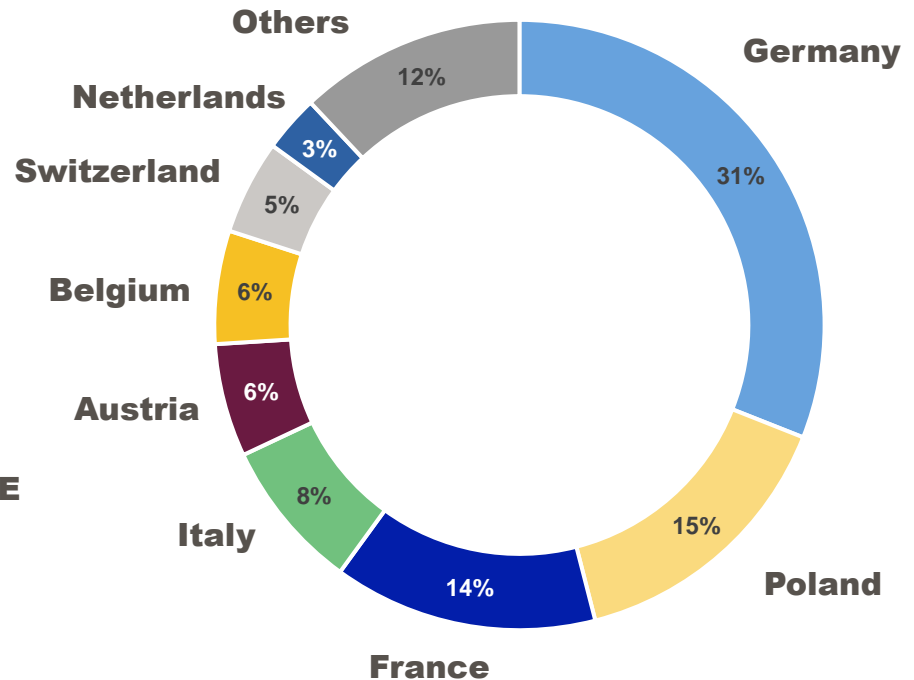
Source: SCI Verkehr, 2020

By the end of 2019 the European Mainline Leasing fleet consisted of approximately 1,700 Freight locomotives

Market Share by Lessor



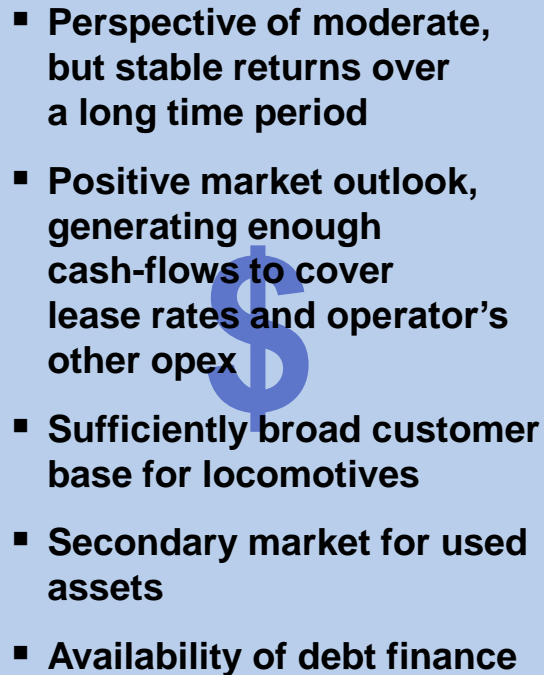
Market Share by Country





Source: SCI Verkehr, 2020

- 80% of this fleet are leased to new operators, only 20% to incumbents
- Some incumbents like Fret SNCF, Lineas or SBB Cargo have switched to leasing their fleets completely or to a large extent

# Attracting private investors into locomotive leasing has a number of important prerequisites

- 
- Perspective of moderate, but stable returns over a long time period
  - Positive market outlook, generating enough cash-flows to cover lease rates and operator's other opex
  - Sufficiently broad customer base for locomotives
  - Secondary market for used assets
  - Availability of debt finance

- 
- Stable legal and regulatory framework
  - Absence of artificial technical barriers and limitations
  - Homologation across operators and countries

- 
- Availability of versatile, proven locomotive designs at reasonable prices
  - Secured long-term technical support
  - Maintenance infrastructure (workshops for major overhauls and repairs, current and field maintenance)



Modern locomotives are expensive.  
Thus, the ability to recover lease rates from the market is key through ...

### **Containing cost by professional purchasing and maintenance**

- Buying the right locomotive – "fit" to market and for purpose
- Purchase price and commercial conditions
- Claims and warranty management
- Assuring maintenance
- Assuring availability of re-engineering capacities and competencies
- Assure longevity of the assets



**Example: two locomotives of the same age !**

Example: modern KZ8A double locomotives have 38% more power than a WL80 –



### WL80

- 8 axles
- 6.400 kW
- kN initial tractive effort
- 110 km/h max speed
- 184 t weight
- Electro-mechanical transmission

**Fleet partially worn out**

**No capital cost, high opex, low availability & reliability**

**Designed to haul 5,000 – 6,000 t trains**



### KZ8A

- 8 axles
- 8.800 kW
- 833 kN initial tractive effort
- 120 km/h max speed
- 200 t weight
- AC inverter transmission (only GTO)

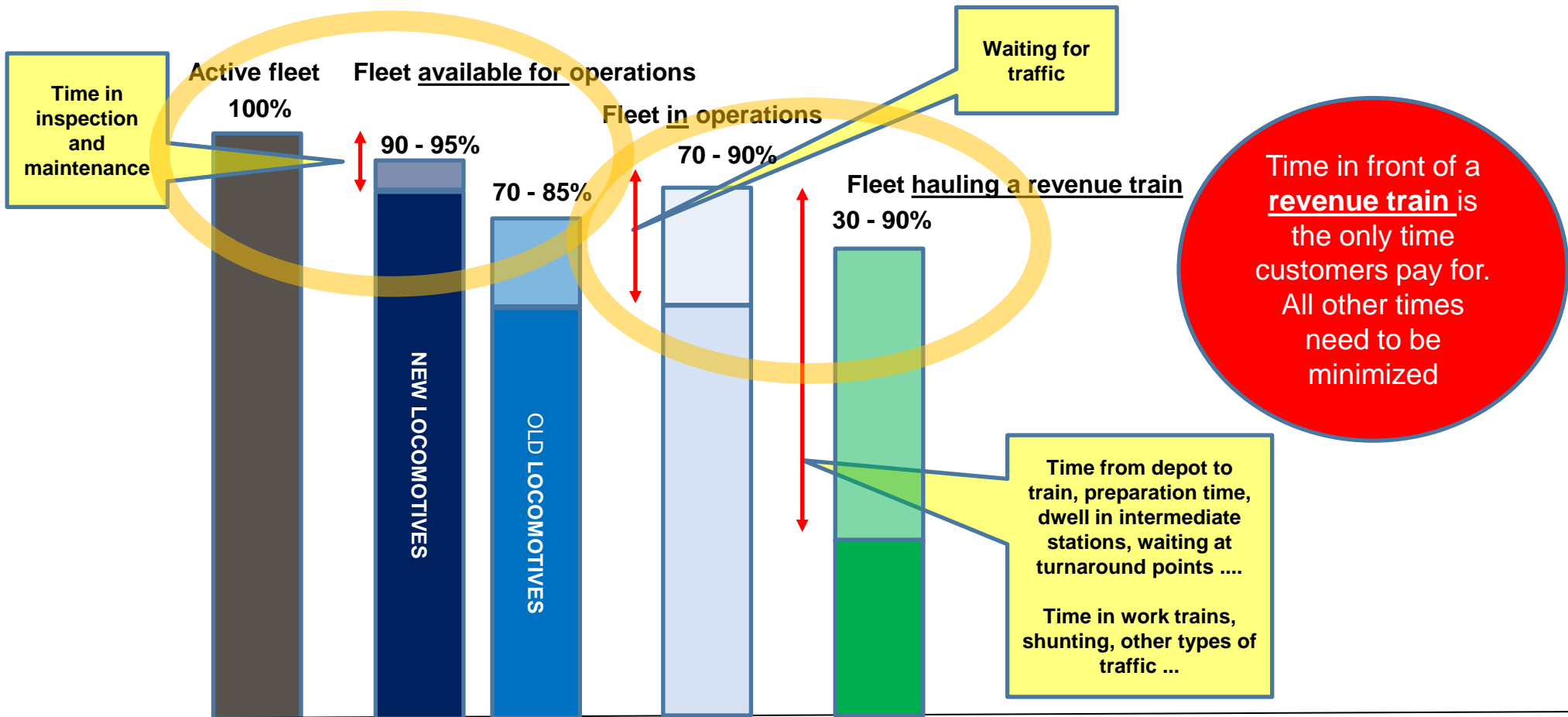
**New Locomotives (built since 2012)**

**Significant capex, opex in foreign currency**

**Can haul up to 8,000 t**

Modern locomotives are expensive.  
 Thus, the ability to recover lease rates from the market is key through ...

**using locomotives efficiently with high productivity**



# In order to increase productivity asset management and operations must work hand-in-hand

## Asset Management must

- Make use of very high availability of modern locomotives
- Avoid workshop visits outside of scheduled maintenance intervals – currently every 35 – 40.000 km for modern electrics, 90 days for modern diesel locomotives
- Centralize maintenance planning and ordering, abandon "home depots"

## Operations must

- Centralize locomotive planning and dispatch
- Through running of locomotives across crew districts, regional districts and even country borders
- Accelerate crew changes
- To increase average train speed from 35 – 40 km/h to 55 – 60 km/h



European locomotive leasing is moving from dry to wet lease, with increased scope of the lessor's offering

	Dry lease	Wet lease
Ownership	✓	✓
Major overhauls	✓*	✓*
Current Maintenance	✗	✓**
Insurance	✗	✓

\* Outsourced to big workshops

\*\* Usually done by 3<sup>rd</sup> parties, but increasingly by lessors themselves

# Summary: Chances and risks

## Chances

- + Attraction of private capital for the rail sector
- + Drive for modern, standardized assets
- + Long-term view on rail assets
- + Professional purchasing
- + High availability and reliability
- + Energy and maintenance cost savings
- + Push for productivity increases

## Risks

- Pricing and life-cycle cost
- Ability to absorb long-term capex and opex, including currency risk
- Purchase of outdated technology
- Dependency on lessor until a competitive market is established ("single sourcing")
- "fit" of new locomotives to established operational patterns
- Loss of technical skills of rail operators

# Implications for CAREC countries

## **Which are the key questions for introducing locomotive leasing?**

- How to meet investment criteria?
  - Country risks (i.e. OECD membership)
  - Market stability
- Which assets to invest in?
  - Availability of locomotives interesting for a multitude of customers (in one or more countries)
  - Standard products with big enough overall fleet size
- Is there a stable regulatory framework?
- Can proper maintenance be assured?
  - Maintenance facilities
  - Supply of spare parts
- Are railways ready to change their operations for higher productivity?

Thank you for your attention



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