SFM '21 | SHAPING THE FUTURE OF MOBILITY

COMBOIOS DE PORTUGAL | CRP CENTRO RODOFERROVIÁRIO PORTUGUÊS | Infraestruturas de Portugal | UIC INTERNATIONAL UNION OF RAILWAYS

#EUYearofRail

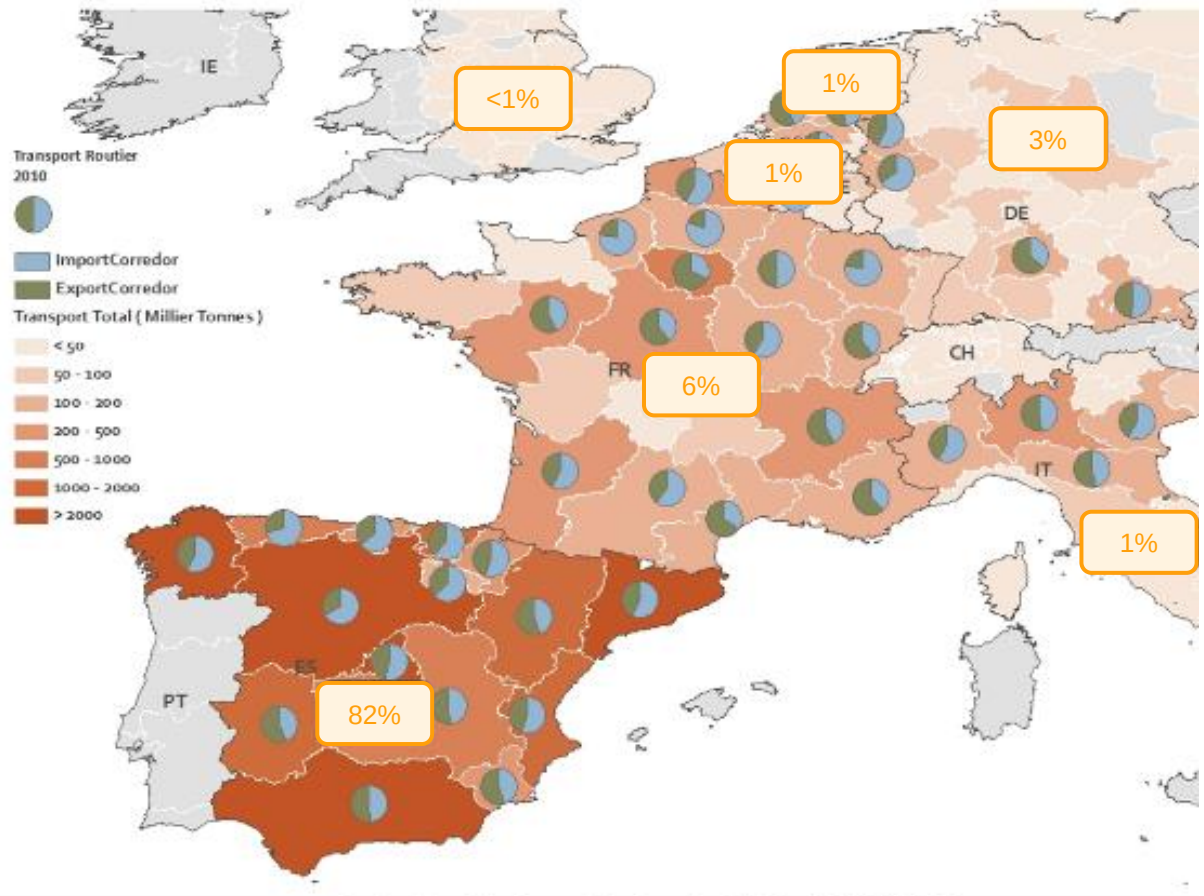
PANEL 1 – WHAT FUTURE FOR PASSENGERS AND FREIGHT RAIL TRANSPORT IN PORTUGAL AND SPAIN

Theme 2: Iberian Cooperation on Infrastructure Interoperability Vision for the Future

Mário Fernandes | Infraestruturas de Portugal SA

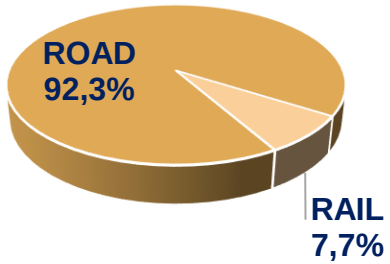
SFM '21 | Lisbon | November 10-12, 2021

CONTEXT



Source: Market Study, Atlantic *Corridor (CFM4), 2013*

FREIGHT TRANSPORT
(Ton share)



Source: Market Study, Atlantic *Corridor (CFM3), 2013*
Updated with INE data, 2019

PASSENGERS TRANSPORT
Porto / Vigo: 4 trains / day
Entroncamento / Badajoz: 2 Trains / day

Destinations in Spain

Source: Medway, Takargo

- **Destinations for international freight in Spain**

- **Vigo and Badajoz are the only destinations for passengers**

NATIONAL NETWORK DEVELOPMENT MUST ALWAYS PROMOTE IBERIC CONNECTIONS

Constrains in the Freight Corridor

Rail performance and competitiveness can be affected by multiple factors:

- NON ELECTRIFIED BRANCHES
- LIMITATIONS TO TRAIN LENGHT
- LIMITATIONS TO MAX LOAD
- LACK OF AVAILABLE CAPACITY
- GAUGE CHANGE
- GENERALIZED ABSENSE OS ERTMS

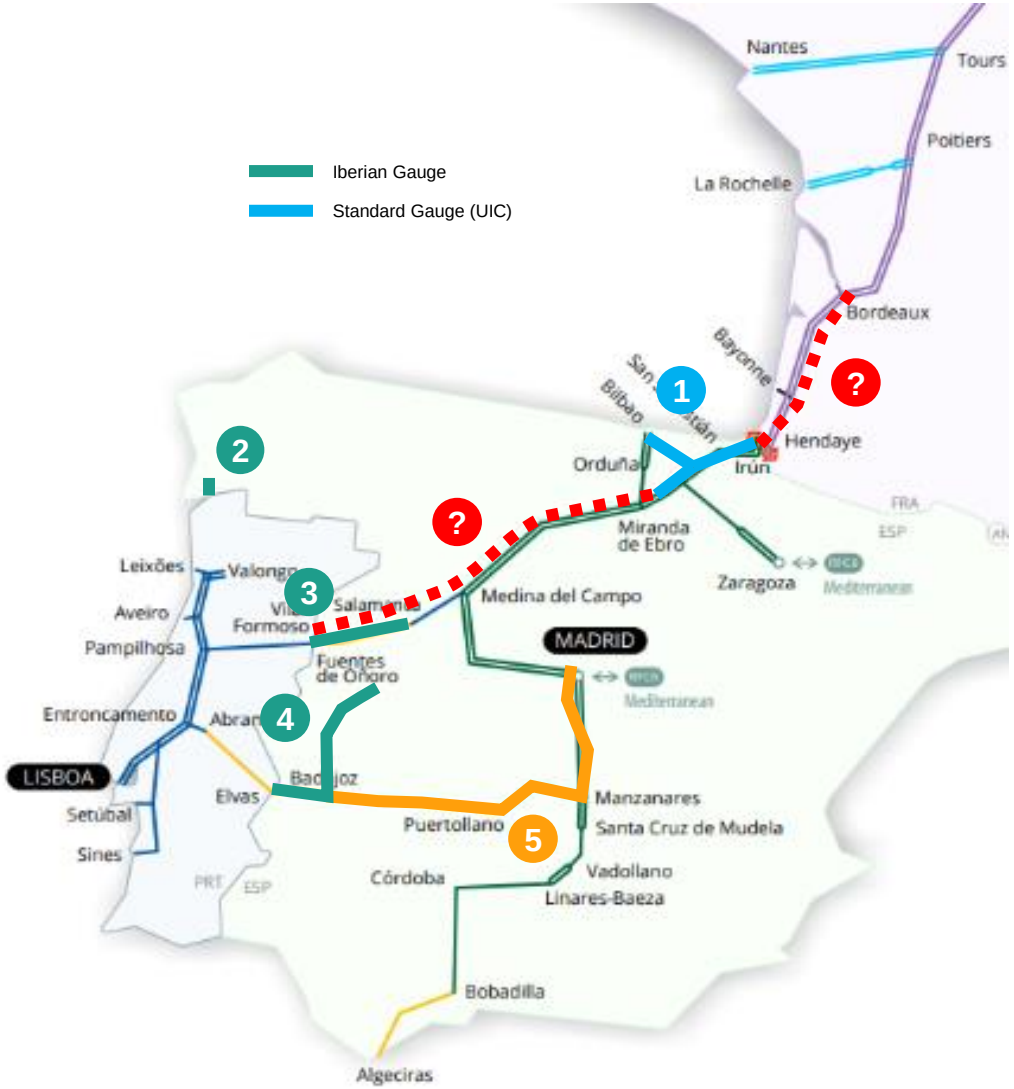
Source: Medway, Takargo

Perspectives in Spain and France

1. Construction of Y Basque (mix traffic / UIC Gauge) **(2028/2029)**
2. Eletrification 3 kV between Guillarei and Valença/Tuy border **(2021/2022)**
3. Eletrification 25 kV between Salamanca and Vilar Formoso / Fuentes de Oñoro border **(2022)**
4. Construction Badajoz / Placencia, of new AVE Madrid / Badajoz **(2021)** (mix traffic / Iberian Gauge / 25 kV 2022)
5. Improvement of the connection to Madrid via Puertollano / Ciudad Real

FRANCE DELAIED FOR AFTER 2037 THE NEW LINE HENDAYE / BORDEAUX

SPAIN HAS NO PLANS TO INTRODUCE UIC GAUGE FOR GOODS BETWEEN PORTUGAL AND VITORIA



FERROVIA 2020

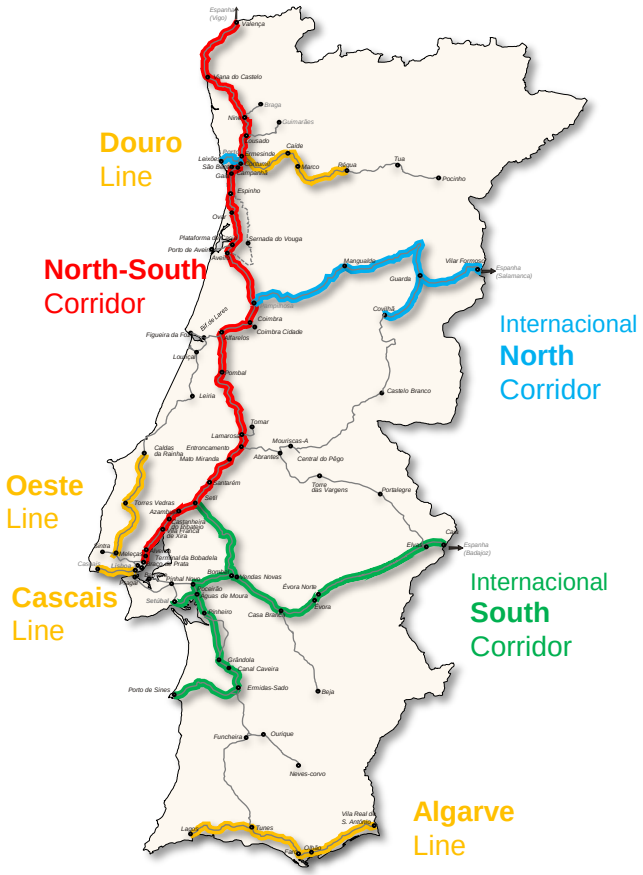
Ferrovia 2020

GENERAL VIEW

~ 1000 km under intervention

> 2000 M€ investment

> 50% EU funding

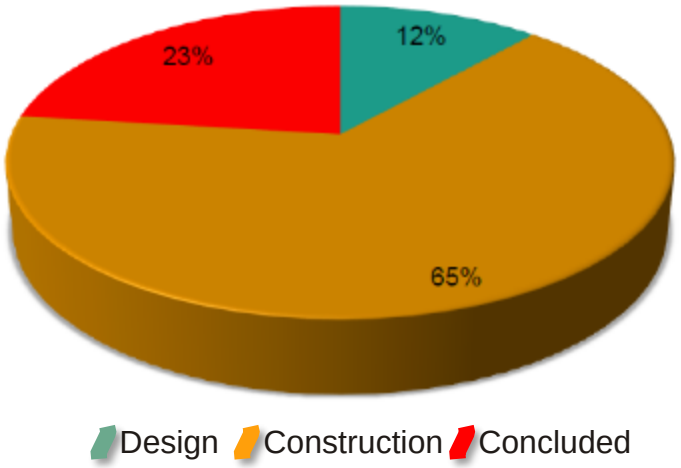


Internacional South Corridor	650 M€	North-South Corridor	420 M€
Internacional North Corridor	560 M€	Complementary Corridors	460 M€

Ferrovia 2020

STATE OF PLAY

FERROVIA 2020 IN NRN (KM)



THE PLAN FERROVIA 2020

Focused on solving the more relevant constrains

Compatible, coherent and syncronized with Spain's investments

Ferrovia 2020

BORDER CHARACTERISTICS AFTER PROGRAMME IMPLEMENTATION

	Linha do Minho (Valença / Tui)	Linha da Beira Alta (V. Formoso / F. Oñoro)	Linha Évora – Caia & Leste (Elvas / Badajoz)
Tipology	Single line (existing)	Single line (existing)	Single line (plataform for double line in Évora-Caia)
Contorno Cinemático	PTb+ (existing)	PTb+ (existing)	PTc
Eletrification	25 kV CA	25 kV CA (existing)	25 kV CA
Signaling	Sinalização eletrónica e ATP nacional (Convel) (3º trim. de 2022)	ETCS N2/ Baseline 3/Release 2 + ATP Nacional (Convel) (final 2023)	ETCS N2/ Baseline 3/Release 2 + ATP Nacional (Convel)
Comunication ground train	GSM-R	GSM-R (end 2023)	GSM-R
Max. train lenght	750 m (3rd quart. 2022)	750 m (end 2023)	750 m

FERROVIA 2020
COMPETE 2020 PORTUGAL 2020 COMPETE 2020 PORTUGAL 2020 Co-financiado pela União Europeia O Mecanismo Interligar a Europa

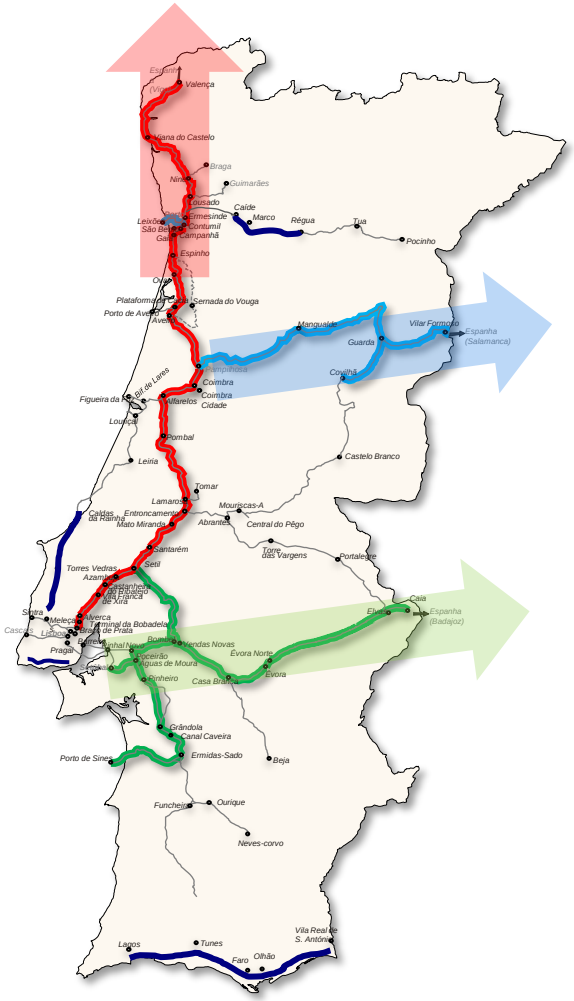
Ferrovia 2020

MAIN OUTCOMES (INTERNATIONAL FLOWS)

North-South Corridor

Specially oriented to freight :

- Transportation cost: -30%
- Capacity: +120%



Internacional North Corridor

Specially oriented to freight:

- Transportation cost: -30%
- Capacity: +130%

Corredor Internacional Sul

Passengers:

- Time travel Lisboa - Madrid**:** 5 hrs

Freight:

- Transportation cost: -50%
- Capacity: +100%

- Electrifified national railway network (NRN) increases from 65% to 85%
- Electronic signaling ERTMS compatible in 30% of NRN
- 750 m lenght trains in every main axel of NRN

FERROVIA 2020

Co-financiado pela União Europeia
O Mecanismo Interligar a Europa

PNI 2030

National Investment Program | PNI 2030

GENERAL VIEW

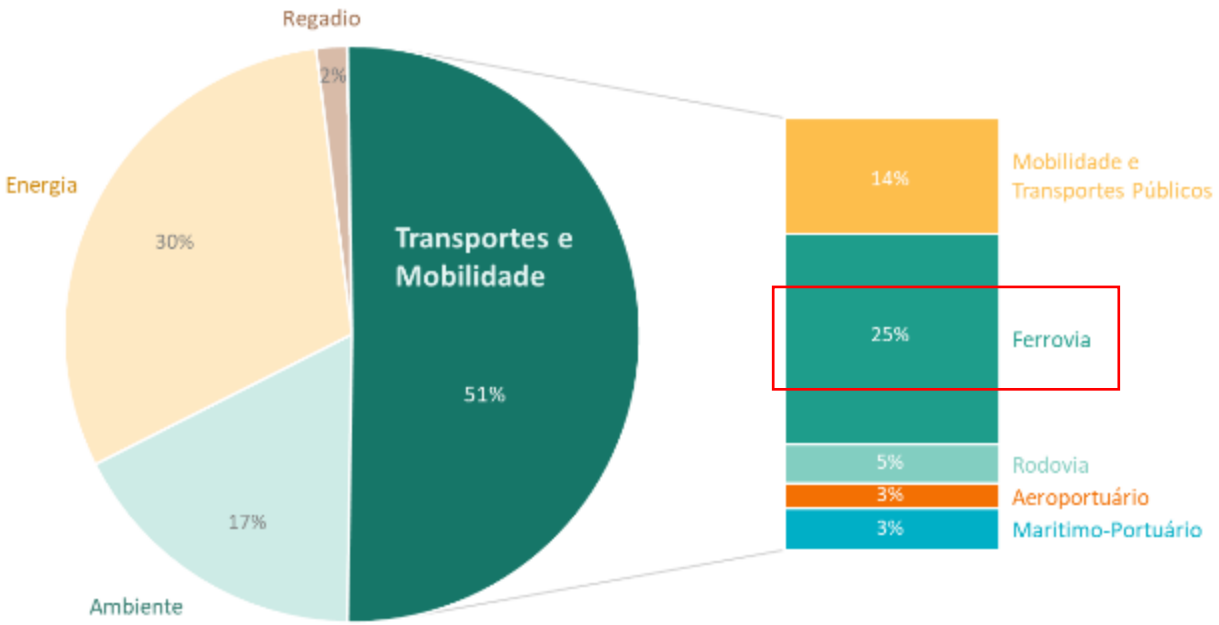
MAIN CHARACTERISTICS

Multisectoral Program

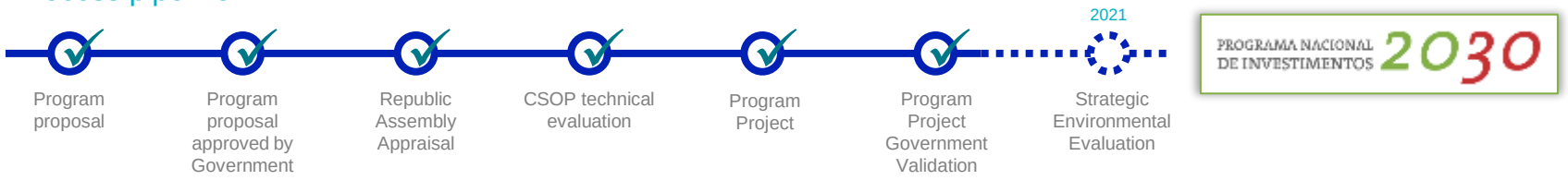
Major Projects (≥ 75 M€)

Horizon 2021-2030

Total Investment **43 B€**



Process pipeline



National Investment Program | PNI 2030

RAIL

	Designação	Entidade Promotora	Investimento	Eixos Estratégicos	Periodo
F1	Nova Linha Porto - Lisboa	AP (IP)	4500 M€		2021 - 2030
F2	Programa de aumento de capacidade na rede ferroviária das áreas metropolitanas	AP (IP)	290 M€		2021 - 2026
F3	Prog. de segurança, renov. e reabilit., redução de ruido e adapt. às alt. climáticas	AP (IP)	375 M€		2021 - 2030
F4	Programa de sinalização e implementação do ERTMS/ETCS + GSM-R	AP (IP)	270 M€		2021 - 2030
F5	Programa de Eletrificação e Reforço da Rede Ferroviária Nacional	AP (IP)	740 M€		2021 - 2030
F6	Programa de telemática, estações e segurança da operação	AP (IP)	165 M€		2021 - 2030
F7	Programa de melhoria de terminais multimodais	AP (IP)	200 M€		2021 - 2030
F8	Modernização das ligações ferroviárias a Beja e a Faro	AP (IP)	230 M€		2021 - 2025
F9	Modernização da Linha do Vouga	AP (IP)	100 M€		2021 - 2025
F10	Ligação da Linha de Cascais à Linha de Cintura	AP (IP)	200 M€		2023 - 2027
F11	Nova Linha Porto - Valença - Vigo (1ª Fase)	AP (IP)	900 M€		2021 - 2030
F12	Corredor Internacional Sul (2ª Fase)	AP (IP)	150 M€		2021 - 2030
F13	Corredor Internacional Norte (2ª Fase)	AP (IP)	600 M€		2026 - 2030
F14	Novo Material Circulante: Comboios Urbanos	AP (CP)	680 M€		2021 - 2030
F15	Novo Material Circulante: Comboios de Longo Curso	AP (CP)	650 M€		2021 - 2030
F16	Novo Material Circulante: Comboios Regionais	AP (CP)	385 M€		2021 - 2030
TOTAL			10510 M€		

Chave: AP - Administração Pública; IP - Infraestruturas de Portugal; CP - Comboios de Portugal

Source: Programa Nacional de Investimentos 2030, available at https://www.portugal.gov.pt/pt/gc22/comunicacao/documento?i=apresentacao-do-programa-nacional-de-investimentos-para-2030

National Investment Program | PNI 2030

RAIL INFRASTUCTURE INVESTMENTS

NORTH / SOUTH CORRIDOR

1. New High Speed Line PORTO – LISBOA
2. 2 Lines → 4 lines Linha do Minho • CONTUMIL - ERMESINDE
3. New High Speed Line BRAGA – VALENÇA (– VIGO)

INTERNACIONAL SOUTH CORRIDOR

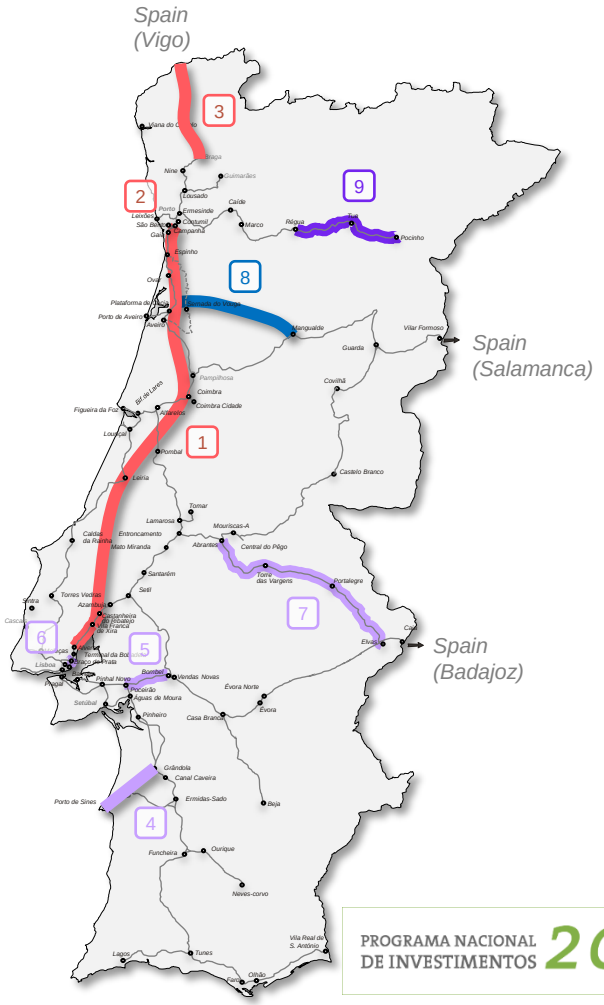
4. New line SINES / GRÂNDOLA
5. Duplication and Upgrade AV POCEIRÃO – BOMBEL
6. Four lines in Cintura • AREEIRO – BRAÇO DE PRATA
7. ERTMS East Line (+ electrification studies)

INTERNACIONAL NORTH CORREDOR

8. New line High Speed AVEIRO / MANGUALDE

COMPLEMENTARY CORRIDORS

9. Eletrification Douro Line • RÉGUA / POCINHO



PROGRAMA NACIONAL DE INVESTIMENTOS 2030

INTEROPERABILITY

Barriers to free rail circulation in Europe

- **Gauge**
  (UIC - 1435 mm vs Iberic - 1668 mm)

- **Electrification**
  (25 kV vs 15000 V)

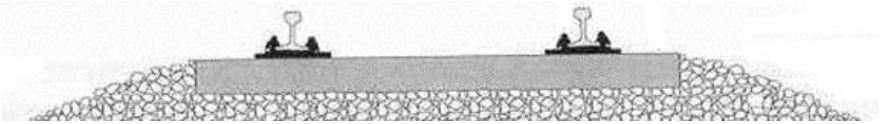
- **Signalling**
  (Each country has it's own - ERTMS)

- **Drivers**
  (Each country requires it's own certification)

- **Trains (rolling stock)**
  (adapted to each country specific characteristics)

- **Traffic management**
  (asynchronous channel assignment)

GAUGE
(DISTANCE BETWEEN RAILS)



Barriers to free rail circulation in Europe

SOLUTIONS APROACH

INFRASTRUCTURAL STRATEGIES :

- **Third rail**
  To be used by different gauges trains
  Causes technical difficulties (e.g. lane changers, catenary eccentricity, distance to platforms, etc.)
- **Gauge migration**
  rail lifting and repositioning and lane changers replacement. May also require changes in stations and platforms
- **Construction of new lines**
  more expensive option
  can produce excess of capacity

INFRASTRUCTURAL SOLUTIONS ARE, GENERALY, MUCH MORE EXPENSIVE

ROLLING STOCK STRATEGIES:

- **Transhipment / Load rupture**
  Transhipment of passengers or goods
- **Variable gauge trains**
  Requires infrastructure equipment that can be replaced or reused
  Tecnology not available yet for freight

IBERIAN COOPERATION

Iberian Cooperation

IBERIAN COMMITMENT

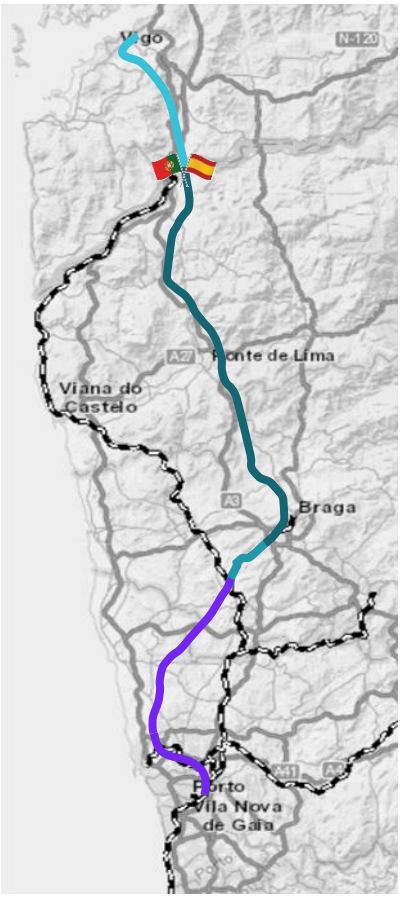
Deal between PT and ES regarding time travel goals, Schedule and technical characteristics

JOINT APPLICATION TO EU FUNDING

PT and ES presented a joint application to CEF General, regarding Braga - Vigo cross border branch

TEN-T

Proposal to include Porto - Braga - Valença HS new line to TEN-T Core



IBERIAN CONNECTIONS

TIME TRAVEL GOALS

Porto – Vigo

2020: 1h50
2023: 1h40
2030: 1h00
2050: 0h45

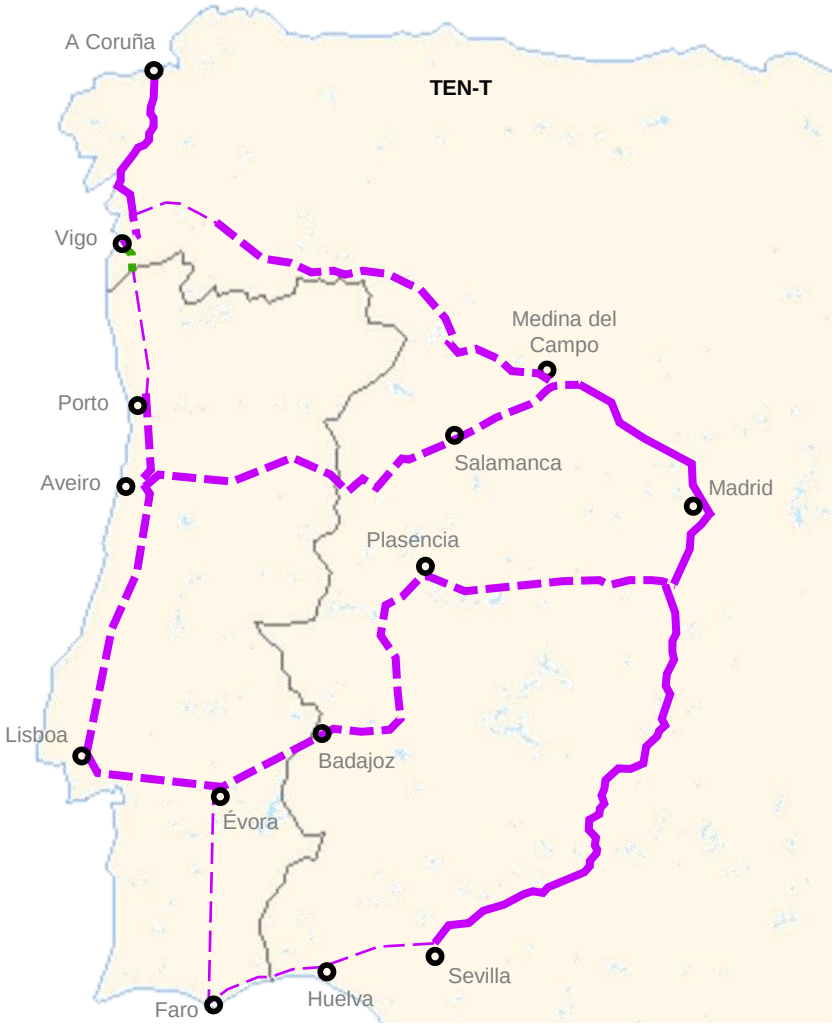
Border (Valença / Tui)

Porto – Madrid

2020: 4h45
2023: 4h00
2030: 2h30
2050: 1h15

Border (V. Formoso / F. Oñoro)

Lisboa – Madrid

2020: 4h55
2023: 2h00
2030: 1h55
2050: 0h50

Border (Elvas / Badajoz)