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Hitachi Rail Italy
@
12th Florence Rail Forum
Florence School of Regulation

European University Institute

Hitachi Rail Italy

Arcangelo Fornelli
Vice President – Marketing Intelligence & New Initiatives
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Hitachi Business Overview

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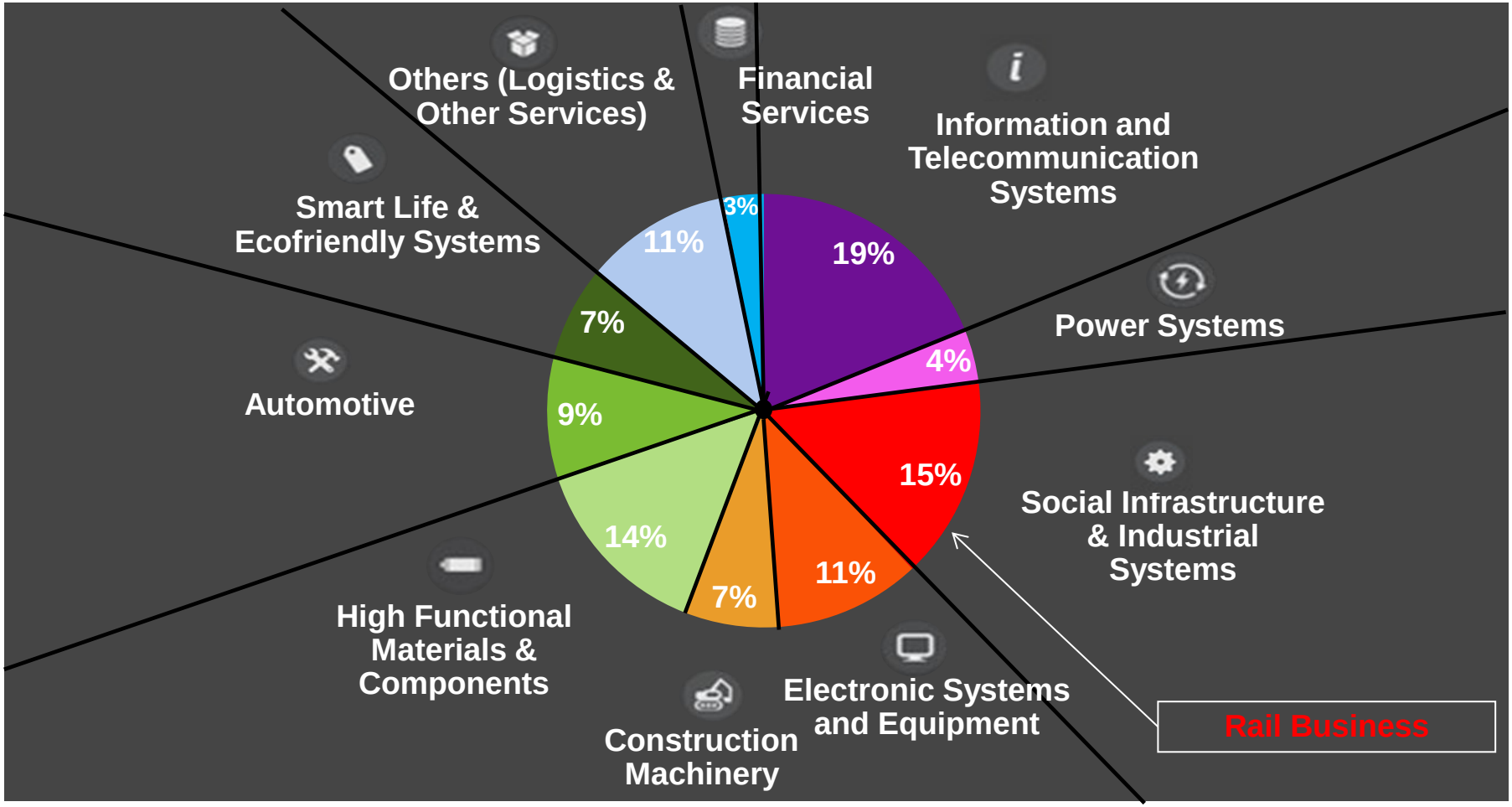
EMPLOYEES (CONSOLIDATED):	333,150

ANNUAL SALES (CONSOLIDATED):	US$ 81.3 BLS



*Revenues: FY2014, Employees: As of end of FY2014, 120Yen/US$

Hitachi Rail Business

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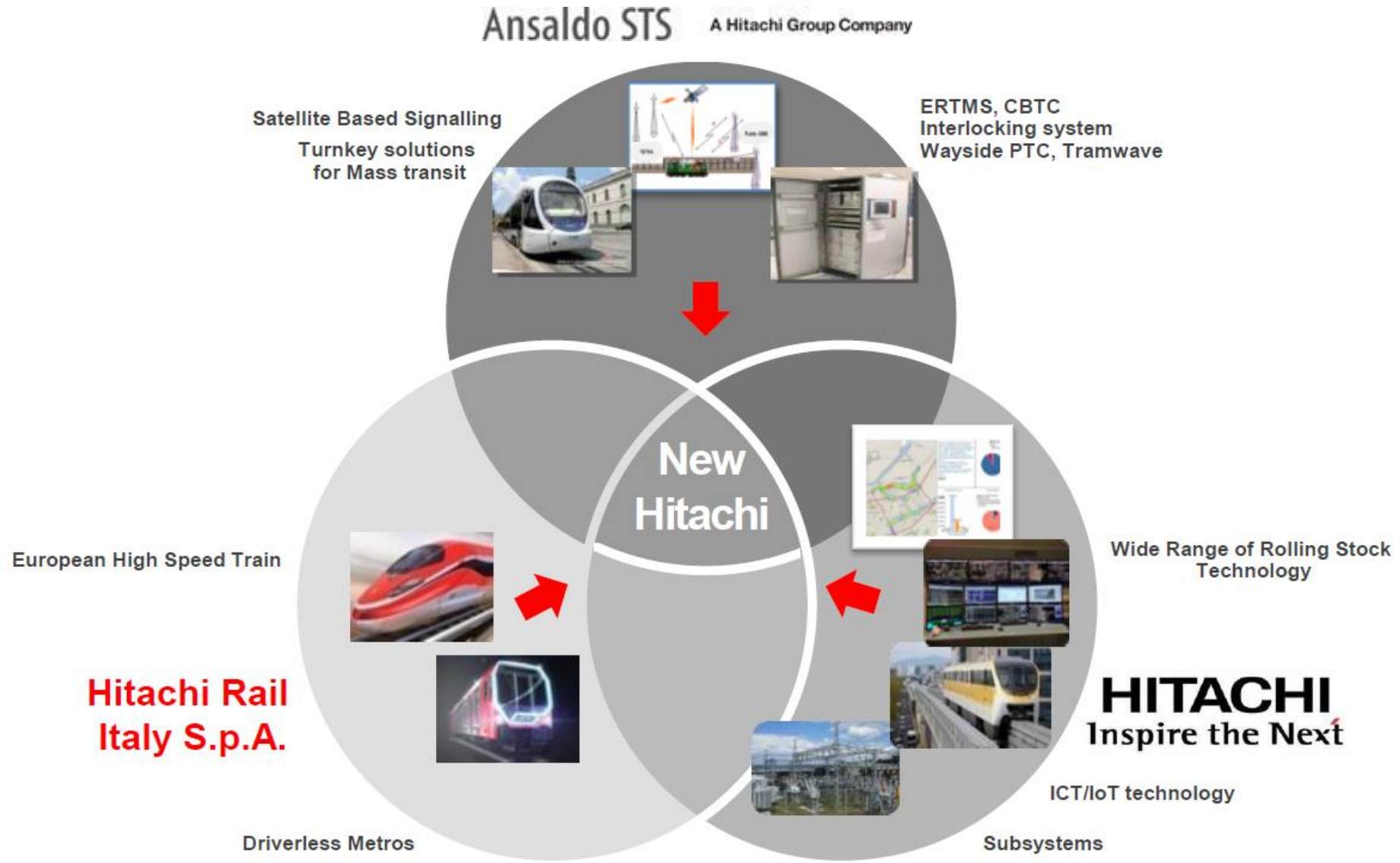

HRI Roots: more than 160 years of experience

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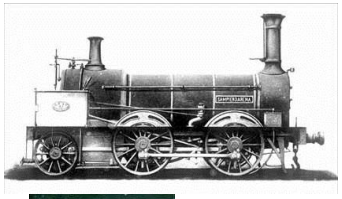
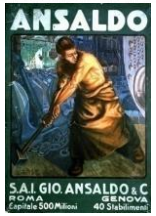


1854



AnsaldoBreda
A Finmeccanica Company

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BREDA

1853 — Giovanni Ansaldo's company established in Genoa

1886 — Ernesto Breda's company established in Milan

1952 — « Settebello » 200 km/h commercial speed for regular services

1970 — **Start of revenue service of the 1st aluminium Train (Milan Metro Line 2)**

2001 — Establishment of the company ANSALDOBREDA

2002 — **Start of revenue service of the 1st Driverless Train (Copenhagen M1/M2)**

2006 — ETR500 starts regular operations at 300 km/h

2010 — **First EPD (*) certification for a railway product (Brescia Metro)**

2014 — Start of operation of Milan Expo metro trains

1000+ driverless cars on order (Milan Line 4)

2015 — **Start of operation of new Italian Very High Speed train ETR 1000**

2015 — **Establishment of Hitahi Rail Italy SpA**

( ) EPD: Environmental Product Declaration*

Pistoia Plant - Tuscany

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Summary:
- Carshell manufacturing, Vehicle Assembly and Testing.

Description:
- Vehicle System Engineering, development, design, production and testing of the rail vehicles
- Coordination of the activities of commissioning, servicing, and contract management.
- Manufacturing of high speed trains, electric multiple units, metro vehicles
- Testing (carbody structural testing, bogies fatigue testing, climate chamber testing, low speed dynamic testing)

Total surface	**290,000 sqm**
Covered surface	**113,870 sqm**

HRI Products

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MASS TRANSIT

METRO | **UNMANNED METRO** | **TRAMWAY**

Ankara, Athens, Atlanta, Beijing, Birmingham, Boston, Brescia, Buffalo, Chongqing, Cleveland, Copenhagen, Florence, Fortaleza, Genoa, Gothenburg, Honolulu, Kayseri, Lille, Lima, Los Angeles, Madrid, Manchester, Miami, Milan, Naples, Oslo, Paris, Riyadh, Rome, Samsun, San Francisco, Sassari, Seattle, Taipei, Thessaloniki, Washington, Zhuhai

MAIN LINE

HIGH SPEED | ***INTERCITY*** | **REGIONAL / SUBURBAN**

Denmark, Italy, Morocco, Norway

HRI Projects

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WASHINGTON

GENOA

ITALY - VHS/Double-deck coaches & EMUs

MADRID
Series 7000
Series 9000

ATLANTA

CIRCUMVESUVIANA

LOS ANGELES
LRV/HRV

TAIPEI

MIAMI

MILAN
L 4/5, Meneghino, Leonardo

HONOLULU

HS
Regional
Metro
Driverless
LRV

LIMA

FORTALEZA

COPENHAGEN
M1-M2-
Cityringen

THESSALONIKI

RIYADH

BRESCIA

ROME Line C

Very High Speed Train «ETR1000»

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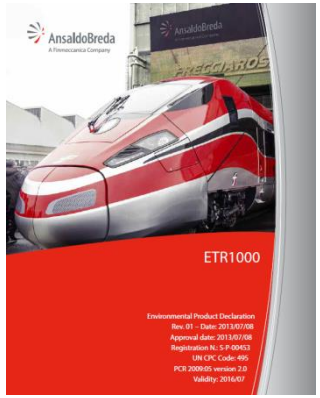
Design
BERTONE

Train length	202m
Seats	· Executive: 10 · Business: 69 + 2 flip-up · Premium: 76 · Standard: 300 Total: 455 + 2 flip-up
Max power	9,8 MW
Speed	360 km/h in service – max 400 km/h
Interoperability	Possibility of operation on 7 European corridors. Compliance with TSI standards

Line	Italian Railways High Speed Lines
Quantity	50 trains
Date of revenue service	June 2015
Configuration	8-car Electric Multiple Units, with distributed power (50% of motorised axles) – multiple coupling of 2 trains
Power supply	25kVac - 3kVdc – 1.5 kVdc (15 kVac option)



Copenhagen, M1/M2 - Unmanned

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Copenhagen Metro	
2010 Winner:	World Best Metro of the Year
2010 Winner:	World Best Driverless Metro of the Year
2009 Winner:	World Best Driverless Metro of the Year
2008 Winner:	World Best Metro of the Year

Line	1, 2
Quantity	34 trains, 102 cars
Revenue Service	2002
Configuration	3-car articulated, with 4 bogies
Gauge	1435mm
Power supply	750 Vdc

Train width/length	2.65m /39m
Passengers/car [6 p/m2]	123, 24 seats (average)
Passengers/train [6 p/m2]	369, 72 seats
Speed	80 km/h
Carshell material	Aluminium
Signaling	ATO driverless (GoA 4) [ASTS]

Milan, Line 5 - Unmanned


PFI AWARDS 2015

IN RECOGNITION OF OUTSTANDING ACHIEVEMENT AND SUCCESS IN THE CATEGORY OF

European Transport Deal of the Year

THE PROJECT FINANCE INTERNATIONAL 2015 AWARD IS PRESENTED TO

Milan Metro 5

&

Alstom, Ansaldo STS, AnsaldoBreda, AON, Astaldi, ATM, Aviva, BBVA, BNP Paribas, Bonelli Erede Pappalardo, CBA, CDP, Credit Agricole CIB, D'Appollonia, DLA Piper, Intesa Sanpaolo, KPMG, La Banque Postale Asset Management, MPS, Natixis, PricewaterhouseCoopers, Scor Global Investments, Societe Generale, UBI Banca, UniCredit, Unipol

Rod Morrison
Editor

THOMSON REUTERS

P70

"TRANSPORT DEAL OF THE YEAR 2015"

On 20 January 2016 the Line 5 of the Milan Metro was selected as «***Transport Deal of the Year 2015***» within the PFI Award, the prestigious event sponsored by the Reuters group's «Project Finance International Magazine» that honors the world excellence in the financial sector.

The Lilac Metro Line has enhanced the sustainable mobility in Milan.

The Technological Rail District of Tuscany & 'DITECFER District for Rail Tecnologies, High Speed, Safety & Security S.c.a.r.l.'

DITECFER

DISTRETTO PER LE TECNOLOGIE FERROVIARIE L'ALTA VELOCITA' E LA SICUREZZA DELLE RETI

1. Birth and Purpose of the Rail Technological District

BIRTH: **March 2011** with **Decree n. 137 of the Regional Government**.

PURPOSE: To improve the Regional Tuscan Railway Industry and make it **more competitive.**

WHY A TECHNOLOGICAL DISTRICT: Tuscany is the only Italian Region with the complete railway production chain

WHAT WE DO: We promote mutual **partnership between Companies and Universities/ Public Research Centres,** with the purpose of increasing the level of R&D in products and services «made in Tuscany».

WHO ARE THE MEMBERS: 125 Enterprises, 14 Universities/Research Bodies, 13 Laboratories; all of them do operate in Tuscany.

DITECFER
DISTRETTO PER LE TECNOLOGIE FERROVIARIE L'ALTA VELOCITA' E LA SICUREZZA DELLE RETI

2. The management

HOW THE DISTRICT WORKS: The District has no legal status and operates through a "Technological Committee" composed by the President of the District and 8 members.
For the period 2015-2018 the President is Mr Arcangelo Fornelli, ***VP Strategic Marketing*** at Hitachi Rail Italy.
4 members are representatives of Enterprises (2 for Large, 2 for SMEs), 4 members are representatives of Universities/Research Bodies.
All members are appointed according to a procedure defined by the Tuscany Regional Administration.

SINCE JULY 2014 THE DISTRICT HAS AN OPERATIONAL ARM: "DITECFER S.c.ar.l." (Consortium), having – to date – 32 Enterprises, 3 Universities/Research Bodies and 3 Trade Unions as Associates.

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DISTRETTO PER LE TECNOLOGIE FERROVIARIE L'ALTA VELOCITA' E LA SICUREZZA DELLE RETI

3. The members

The members of the Regional District

The members of the Regional District being also Associates of DITECFER Consortium

DITECFER

DISTRETTO PER LE TECNOLOGIE FERROVIARIE L'ALTA VELOCITA' E LA SICUREZZA DELLE RETI

4. The District overall figures

Turnover	~ 1,5 MLD €
Employees	> 5.000
Average age	40
R&D Employees	> 1.100
University degree	31%
High School diploma	43%
Patents	> 210

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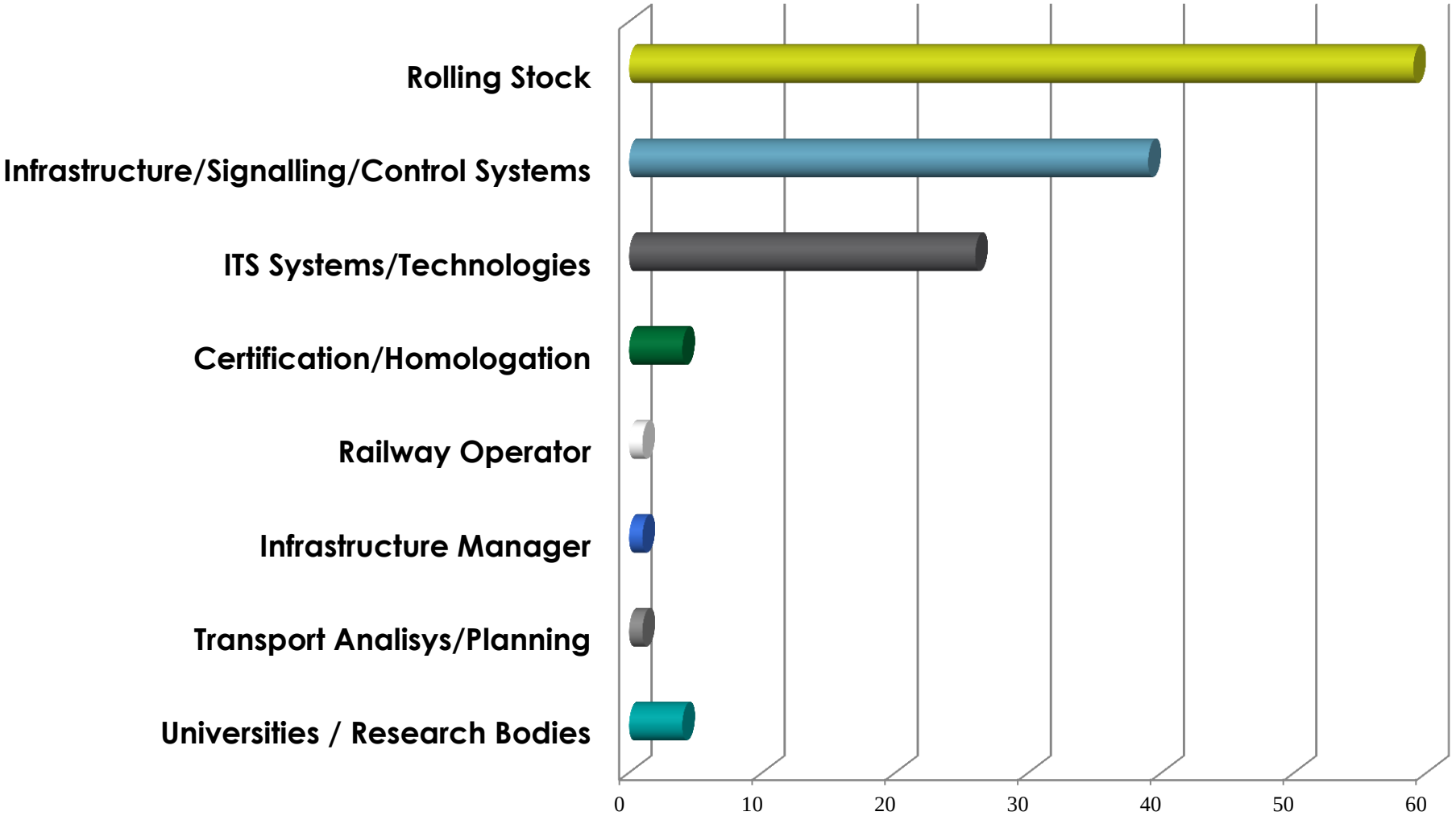
DISTRETTO PER LE TECNOLOGIE FERROVIARIE L'ALTA VELOCITA' E LA SICUREZZA DELLE RETI

5. The competences



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6. Collaboration networks

CTN-National Technological Cluster "Trasporti Italia 2020"

Rail players: 15 Enterprises, 7 Universities, National Research Council, 2 Technological Districts

ERCI – European Railway Clusters Initiative

Players: 10 Rail Clusters/Districts from 8 EU Countries

KPIs

- ✓ KPIs are largely adopted by Industry to measure own performances, to benchmark competition and best practices, to fix objectives
- ✓ KPIs must be clearly defined and quantifiable, they should target long period results and allow continuous progress evaluation
- ✓ KPIs are usually established within all Company processes, fixing strategic and operational goals

Topic KPIs in Rolling Stock

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- ✓ Toward effective Operations: RAMS
  - ➢ Reliability: the ability of an item to perform a required function for a stated period of time (continuity for correct service)
  - ➢ Availability: the percent of time an item is in a state to perform a required function under given conditions (readiness for correct service)
  - ➢ Maintainability: the abillity of an item to be retained in – or restored to – a specific condition when maintenance is performed
  - ➢ Safety: absence of catastrophic consequences on users and enviroment

- ✓ Design to RAMS: Tools and methods to have final product getting RAMS targets

- ✓ Lean Maintenance: from Scheduled Maintenance to Condition Based Maintenance, a push for Onboard Digitalization and IoT

Topic KPIs in Rolling Stock

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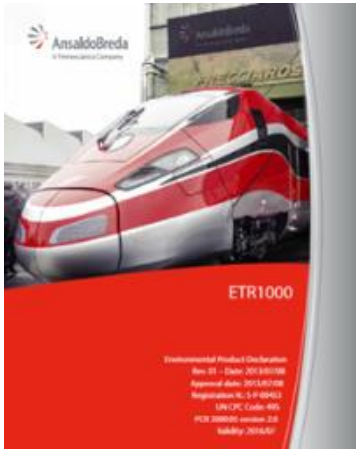
- ✓ Toward efficient Operations
  - ➢ Energy consumption
  - ➢ Life Cycle Cost LCC
  - ➢ Train to Rail exploitation

- ✓ Toward Enviroment: Enviromental Product Declaration EPD
  - ➢ Indipendently verified and registered document
  - ➢ Communicate transparent and comparable information about the enviromental impact of the product
  - ➢ Enviromental performances are quantified by Life Cycle Assessment LCA: from extraction of raw material to product final disposal
    - ❖ ETR1000 EPD:



	Recyclability	Recoverability
End of life	94,4%	95,8%
Maintenance	92,2%	98%
Total life cycle	93,1%	97,1%

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Thank You For Your Attention

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