

# PROSPECTIVE STUDY OF THE IMPACTS OF CHANGES IN THE RAILWAY INDUSTRY ON EMPLOYMENT AND SKILLS' REQUIREMENTS

—  
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Material for oral presentation



*Credit: Alstom / Samuel Dhote*



Observatoire paritaire, prospectif et analytique  
des métiers et qualifications **de la Métallurgie**

## ACKNOWLEDGEMENTS

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## FRAMEWORK FOR USING THE DOCUMENT

This summary has been validated by a joint working group.

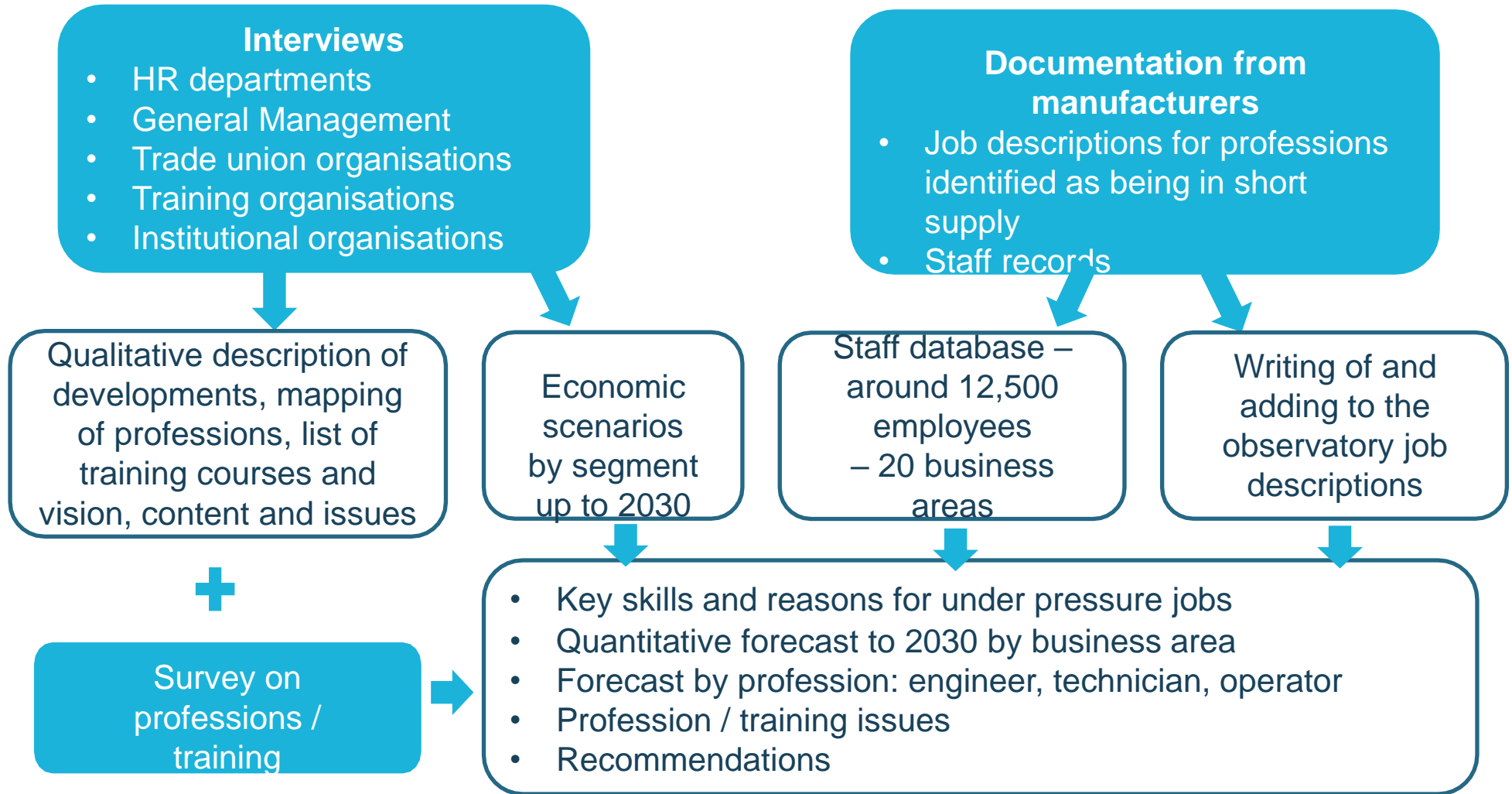
It is each person's responsibility to use it in its entirety in all circumstances and without modifying it.



## CONTEXT AND OBJECTIVES OF THE STUDY

- ◇ **DRAW UP AN INVENTORY OF THE SECTOR**
- ◇ **CREATE PROSPECTIVE SCENARIOS AND IDENTIFY EMPLOYMENT AND RECRUITMENT REQUIREMENTS**
- ◇ **DRAW UP A MAP OF PROFESSIONS, IN PARTICULAR THOSE IDENTIFIED AS CHANGING OR DEVELOPING**
- ◇ **ESTABLISH THE CORRELATION BETWEEN TRAINING SUPPLY AND FUTURE REQUIREMENTS AND WRITE RECOMMENDATIONS**

## OVERVIEW OF METHODS





## THE PROSPECTIVE SCENARIOS SELECTED (1/2)

### ◇ **INFRASTRUCTURE AND SIGNALLING: GROWTH PROSPECTS THAT HAVE NOT BEEN FUNDAMENTALLY CHALLENGED BY THE COVID 19 CRISIS**

- **To date, none of the European infrastructure managers has disputed the strategic outlines that they adopted in 2019**
- **Recovery plans that are known to date, in particular in France, are dedicating funding, previously put on hold, to strategic areas**
  - acceleration of network regeneration
  - acceleration of works on the Lyon-Turin section
  - acceleration of the start of construction work on the Roissy-Picardie high-speed line
  - support for development of urban transport

## THE PROSPECTIVE SCENARIOS SELECTED (2/2)

### ◇ ROLLING STOCK AND EQUIPMENT MANUFACTURERS: NO CHANGES IN FIRM ORDERS, OR INCREASING BY 2024, SPREAD OVER TIME AND WITH AN INCREASED RISK OF DEFERRAL / CANCELLATION OF OPTION EXERCISES

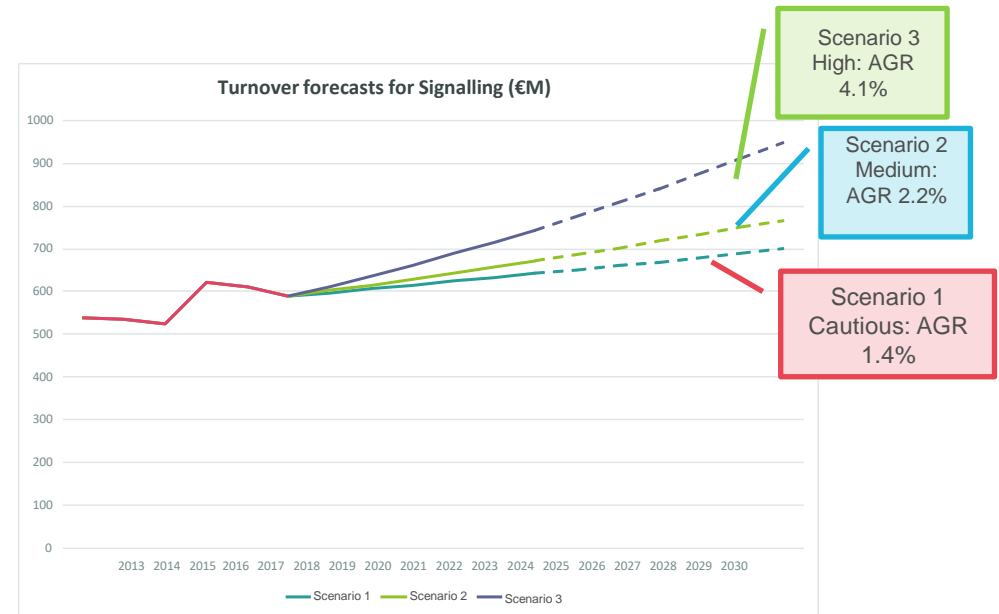
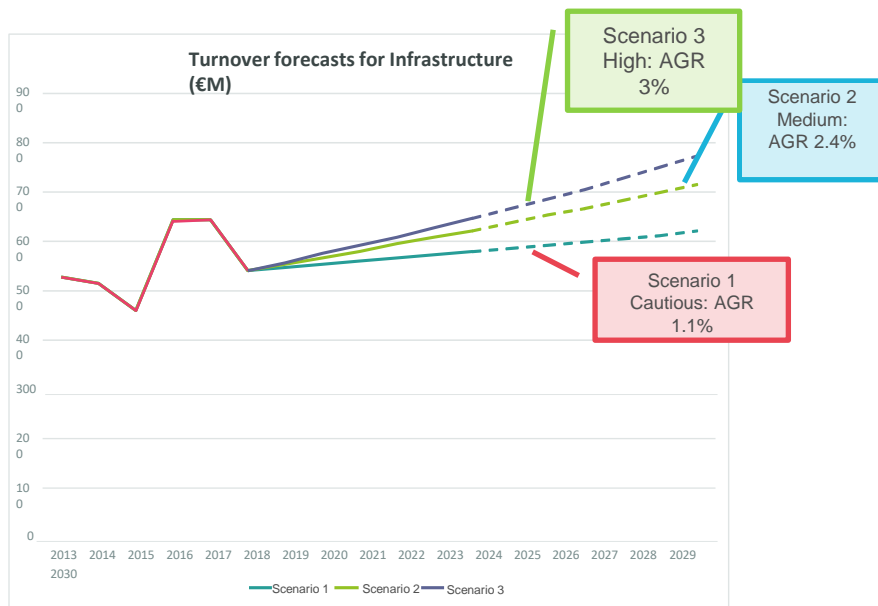
- For rolling stock, the cautious scenario = now the most probable, with a peak load in 2021 (deferrals from 2020 to 2021 following the closure of factories during the lockdown period), and high workloads in 2022, 2023 and 2024. The level of activity in 2020 will be much lower than expected, but largely equivalent to 2019.
  - The updated schedules of manufacturers in France remain at a high level, including an increased share of firm orders (74% compared to 62% one year earlier).
- For rolling stock equipment manufacturers, the “pessimistic” scenario seems the most probable (synergies from the Alstom/Bombardier Transportation merger on purchases)
  - An increased risk of sourcing / relocation to countries where labour is cheaper.



# ACTIVITY FORECASTS IN THE AREAS OF RAILWAY INFRASTRUCTURE AND SIGNALLING

These 3 scenarios are based on past developments, prospective elements and the latest UNIFE study which forecasts average annual growth of 3% in Western Europe and 3.1% in France for the railway infrastructure market for the 2021-23 period.

◇ These 3 scenarios are based on past developments, prospective elements and the latest UNIFE study which forecasts average annual growth of 1.9% in Western Europe and in France for the railway signalling market for the 2021-23 period.

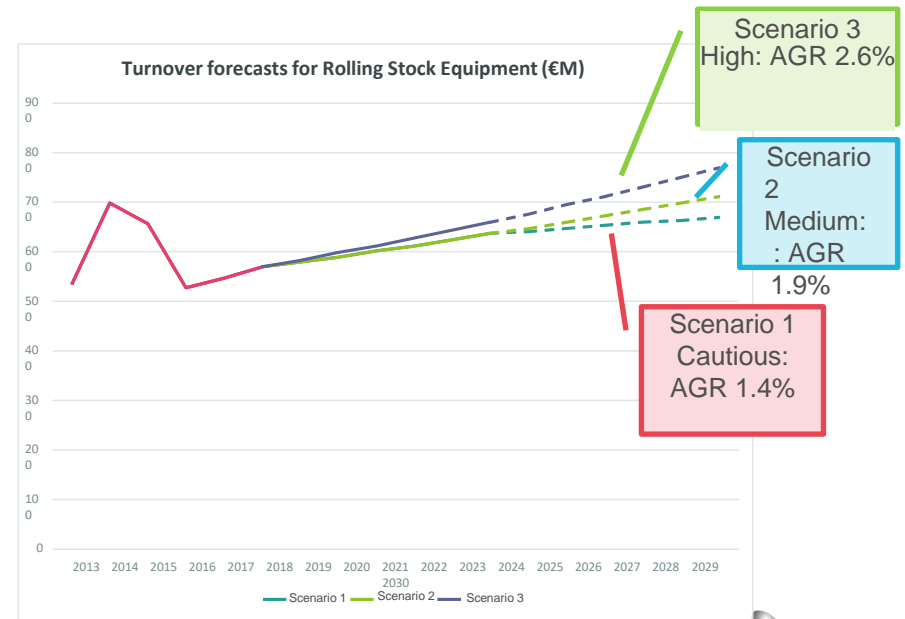
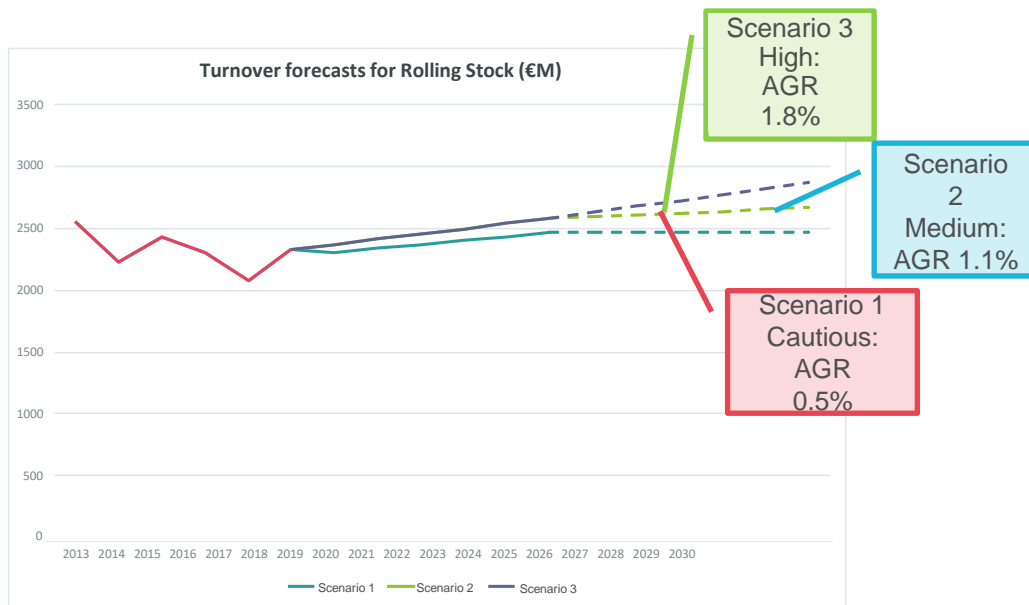




# ACTIVITY FORECASTS IN THE AREAS OF ROLLING STOCK AND ROLLING STOCK EQUIPMENT

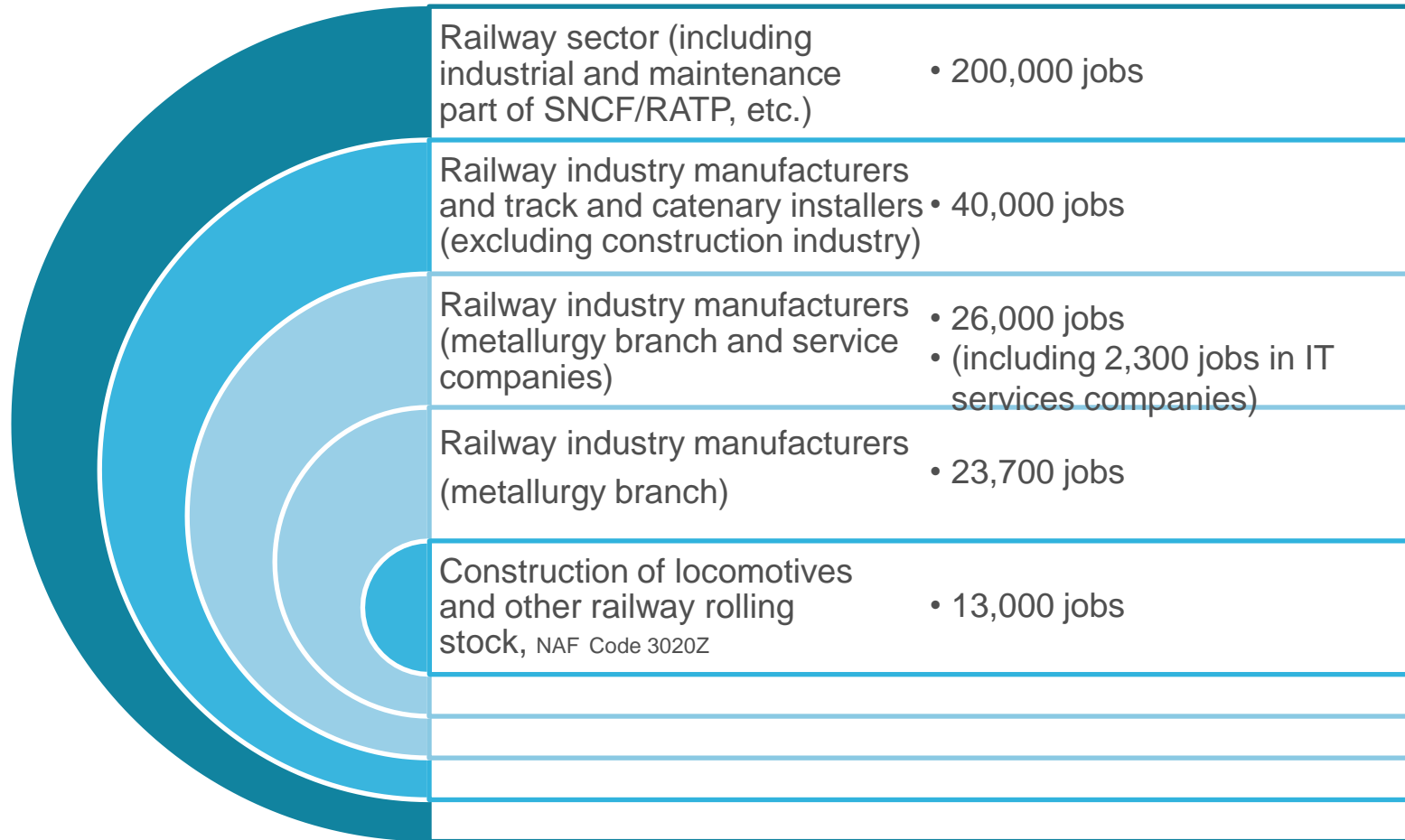
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For rolling stock equipment manufacturers, the “pessimistic” scenario seems the most probable, especially as the main synergies expected from the Alstom/Bombardier Transportation merger concern purchases.



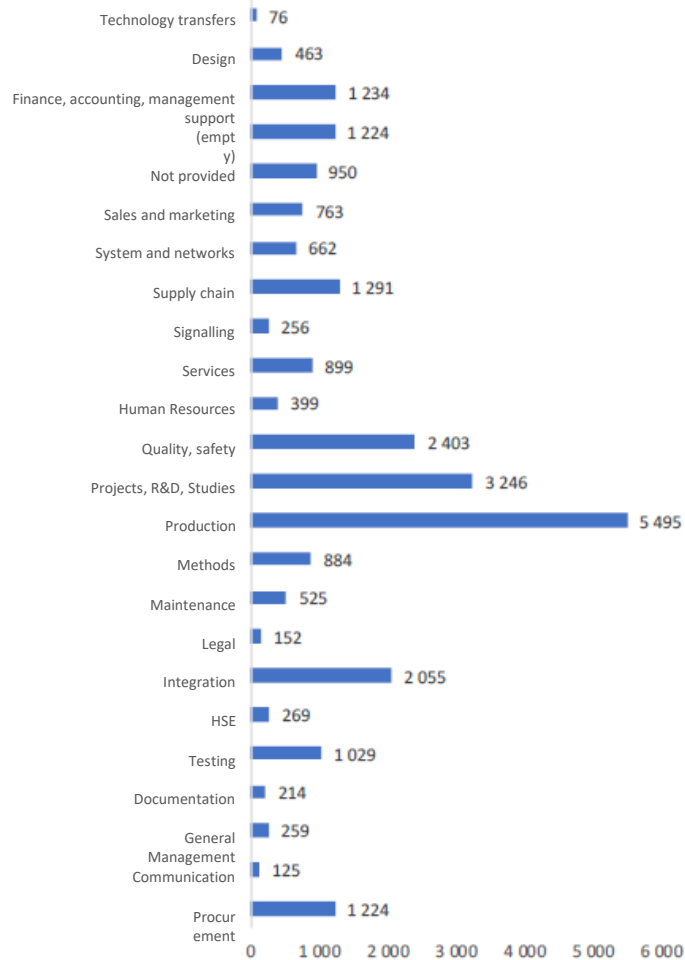


# THE DIFFERENT WAYS OF LOOKING AT EMPLOYMENT IN THE SECTOR

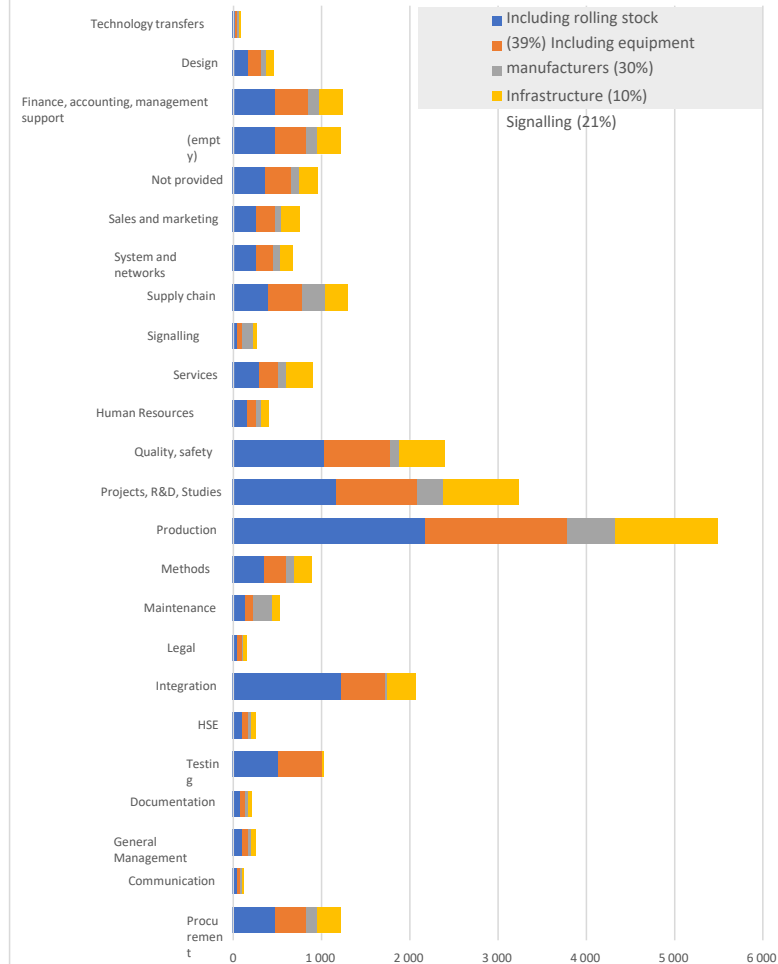


# POSITION OF WORKFORCE BY BUSINESS AREA

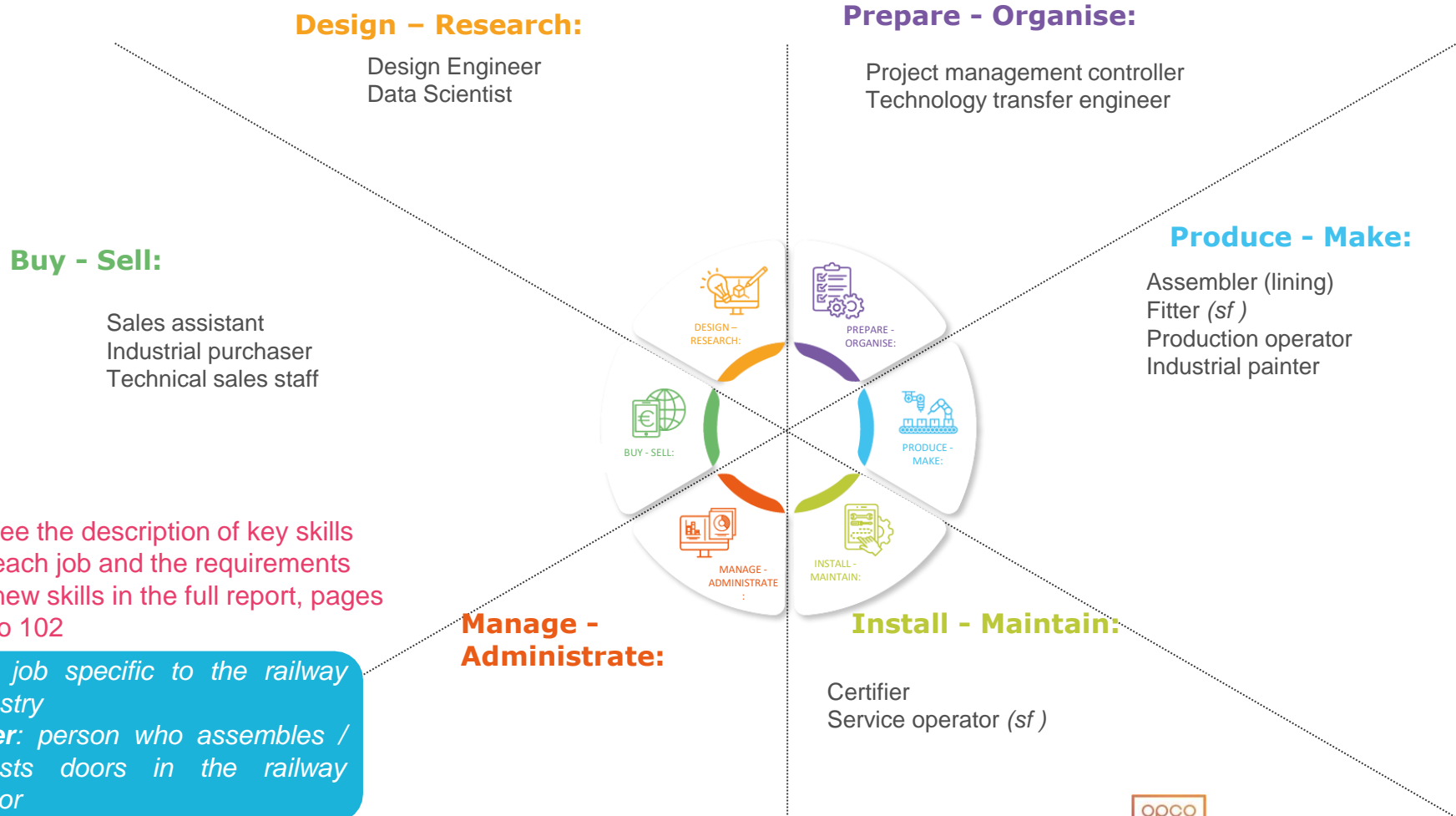
Total workforce in railway sector



2019 business areas: railway sector, metallurgy



# PROFESSIONS DESCRIBED AS DEVELOPING AND EMERGING IN 2020 AND IN THE SHORT AND MEDIUM TERM



## REQUIREMENTS FOR NEW SKILLS

The major trends generally mentioned in this framework are:

- **Digitisation** (in production, for customer comfort, for predictive maintenance, for supplier relations, for computer-aided design, for validations, etc.).
- **Sustainable development** (low-carbon engines, reduction of impact and consumption, weight of rolling stock, attention to life cycle management, ease of maintenance and servicing, start of the development towards the product-service system model – cost per kilometre, etc.)
- Developments in the industry (**internationalisation, interculturality, structuring, service development, competitiveness**).

Some of these developments are leading to the emergence of identified professions, but for the most part, those interviewed highlight skills sets without necessarily associating them with a new profession; it is therefore sometimes difficult to associate these new skills sets with a particular profession, which will in fact be built over time.

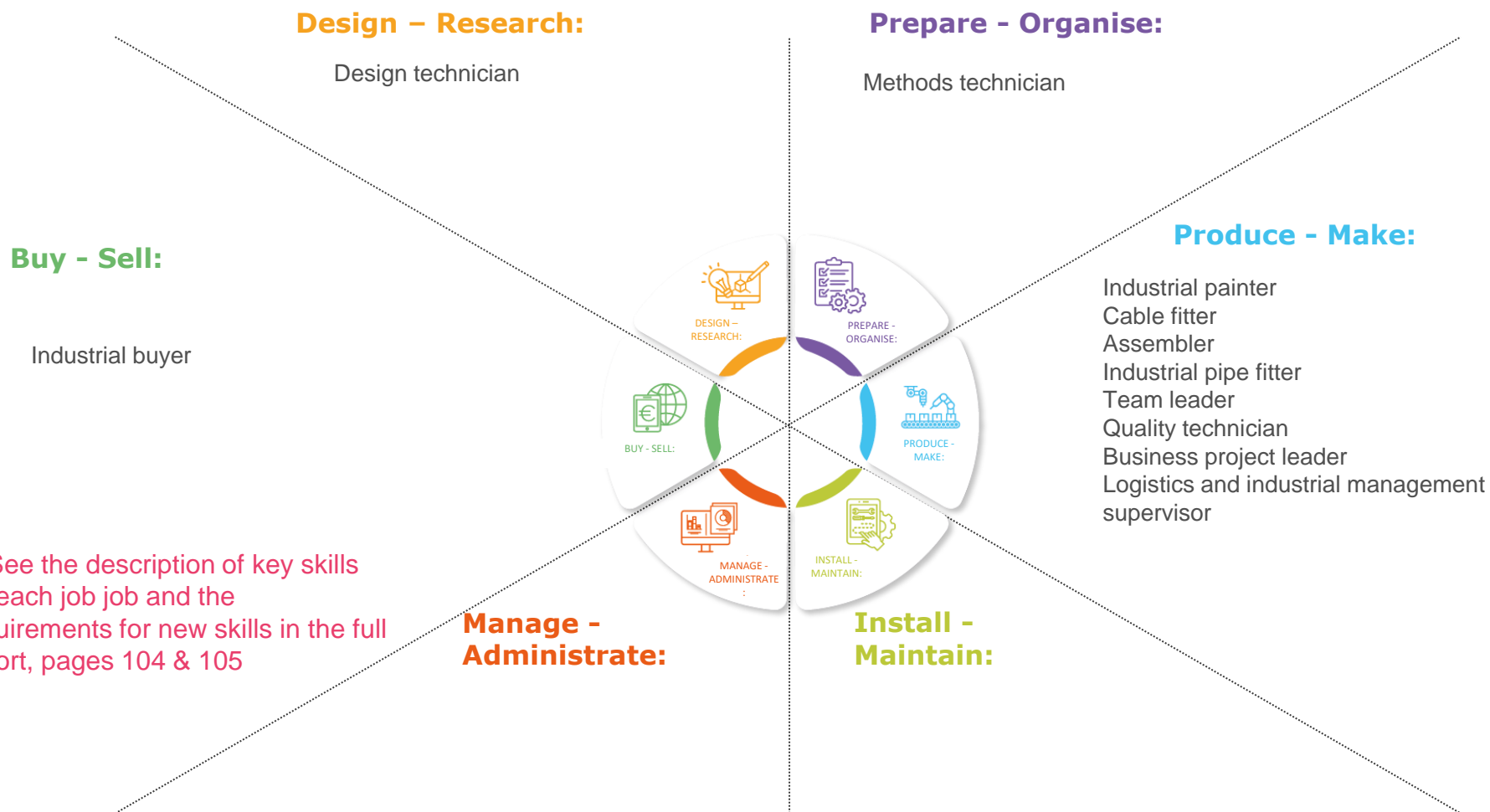
Among the emerging skills, some have not yet been incorporated but are being identified for the future:

- 3D printing (particularly for maintenance parts)
- Predictive maintenance
- Cybersecurity

Others are starting to take shape and have been identified for future development:

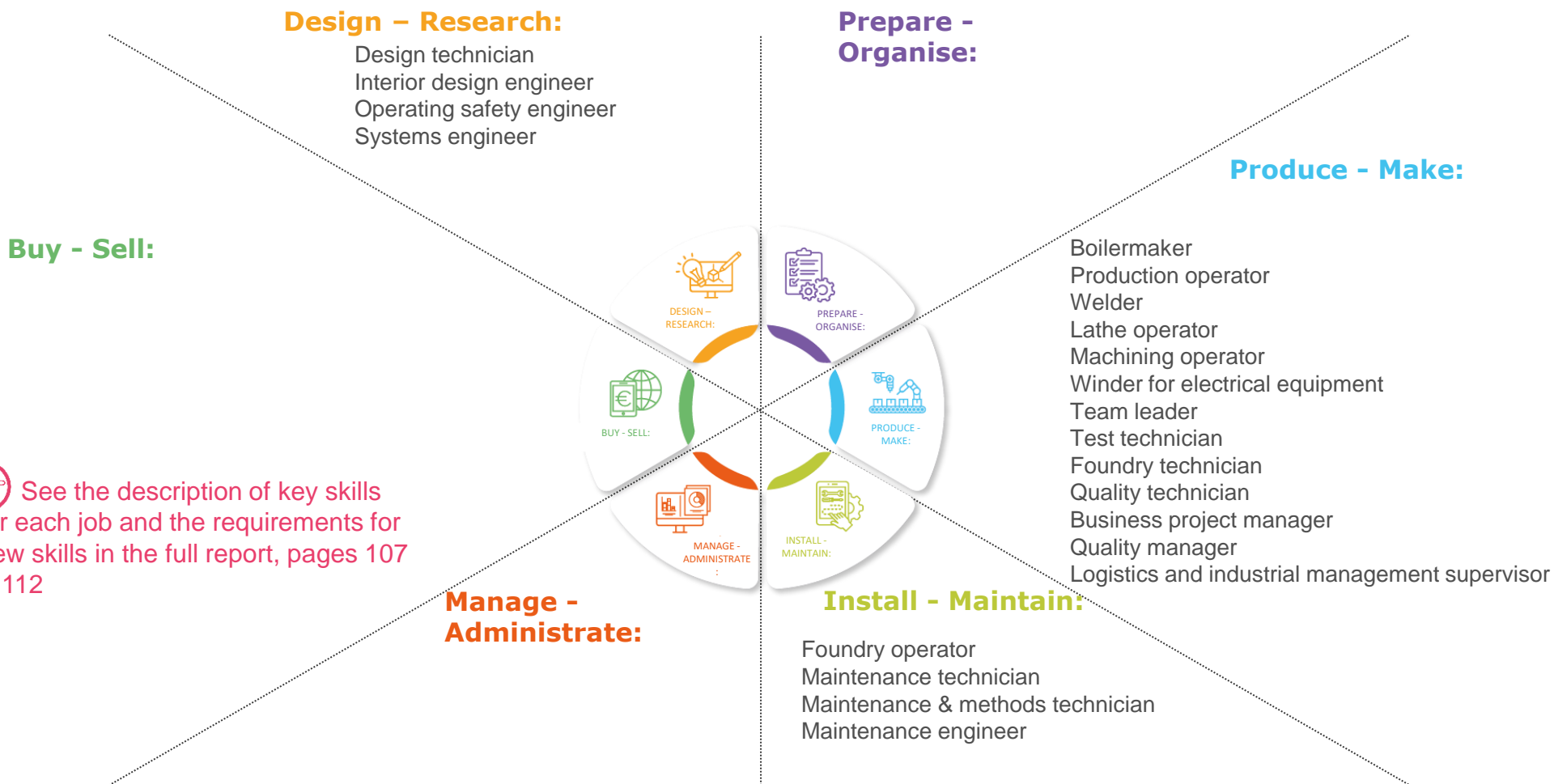
- Certifiers and drivers for the service part
- Technology transfers (multicultural)
- Project cost control (competitiveness)
- Customer / supplier software interoperability
- Foreign languages
- Forecasts and processes on the maintainability of rolling stock (with time savings)

# PROFESSIONS DESCRIBED AS CHANGING IN 2020 AND IN THE SHORT AND MEDIUM TERM



See the description of key skills for each job and the requirements for new skills in the full report, pages 104 & 105

# PROFESSIONS DESCRIBED AS BEING IN SHORT SUPPLY IN 2020 AND IN THE SHORT AND MEDIUM TERM



See the description of key skills for each job and the requirements for new skills in the full report, pages 107 & 112

# PROFESSIONS DESCRIBED AS BEING IN SHORT SUPPLY: TECHNICIANS

example

 See the description of key skills for each job in the full report, pages 107 & 112

Professions in short supply	Reasons mentioned – Key factors	Key skills
Logistics and industrial management supervisor	Key skill for the company, seeking very good logistics specialists, but the sector does not appeal to this profession	Planning and management of rail routes on construction sites, slot management (available tracks), management of owned and rented wagons.
Design technician	Recruitment difficulties, competition from other sectors + changes in the profession: New contractual requirements, customer requirements increasingly included in specifications	Estimation of normative product life in the offer phase, working in the design office on product characteristics to facilitate maintenance and servicing
Test technicians	Little relevant training available, high versatility and experience required – range of rare and specific skills	Electrical, climate, pneumatic, hydraulic testing, malfunction analysis, troubleshooting; overall expertise in train operation + digital, IT, networks, interface, customer relations and possible troubleshooting assignments on customer sites.
Maintenance technician (workshop)	Rare, few students trained, unappealing shift work	Electrical and automation skills; expertise in production automatons; automaton adjustment and maintenance
Maintenance technician (service)	Service development, need for strong, railway-specific skills; multi-skilled (mechanics, electrics, electronics) and the ability to integrate new technologies, with on-call duties: few candidates	Maintenance and revamping of locomotives, accident repairs; integration of new technologies; multi-skilled (mechanics, electrics, electronics); travelling and on-call duties
Methods & Maintenance Technician	Development (service), on-call duties, mobility	Method and maintenance engineering of the rolling stock fleet, modernisations, etc.
Quality technician	Advanced technical specificities –	Supplier relations, plans, process audits, scheduling



## TWO ASSUMPTIONS TAKEN FROM THE DIFFERENT SCENARIOS

Assumption 1:  
Creation of medium  
scenarios

### ◇ CREATION OF MEDIUM SCENARIOS FOR THE 4 SEGMENTS

- + 2.4% / year in infrastructure
- + 2.2% / year in signalling
- + 1.1% / year in rolling stock
- + 1.9% / year in equipment

A first “average”  
assumption as a  
benchmark

Assumption 2:  
Creation of  
differentiated  
scenarios

### ◇ INFRASTRUCTURE AND SIGNALLING SEGMENTS: HIGH SCENARIO

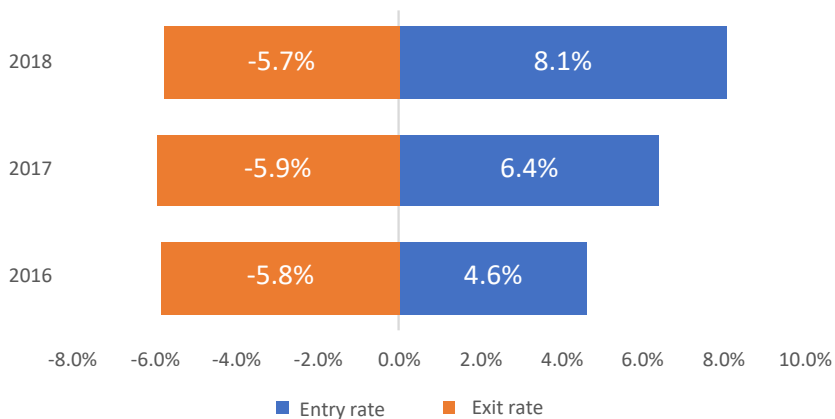
- + 3% in infrastructure
- + 4.1% in signalling

### ◇ ROLLING STOCK AND EQUIPMENT SEGMENTS: LOW SCENARIO

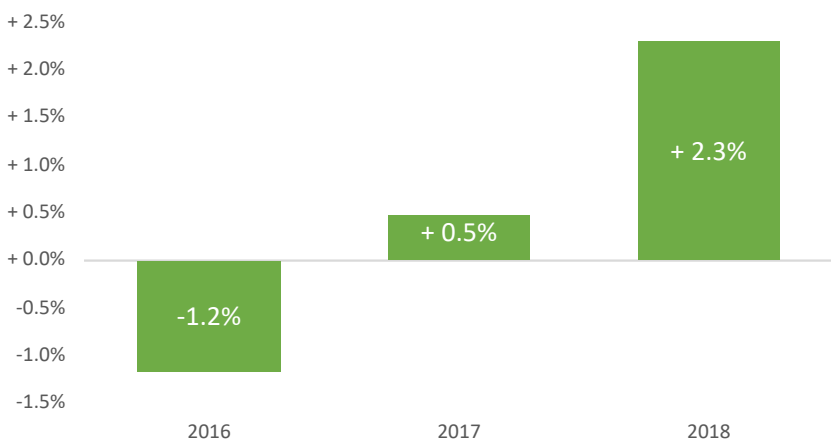
- + 0.5 % / year in rolling stock
- + 1.4% / year in equipment

# WE APPLY ASSUMPTIONS RESULTING FROM OBSERVATIONS TO THE CHOSEN SCENARIOS

Entry rate and exit rate for the sector



Net renewal rate



## ◇ THE STATISTICAL OBSERVATIONS FOR THE SECTOR SHOW, OVER A 3- YEAR PERIOD:

- A relatively stable exit rate; 5.8% per year (of which 1.7% for retirements).
- A progressive net renewal rate over the period due to growing entry rates.

## WE ALSO INCORPORATE AN ELEMENT OF PRODUCTIVITY.

- Assumption: productivity rate of 1.75% over the 2020-2030 period. (see most recent INSEE studies).
- The productivity assumption integrates the sharp decrease in 2020/2021.

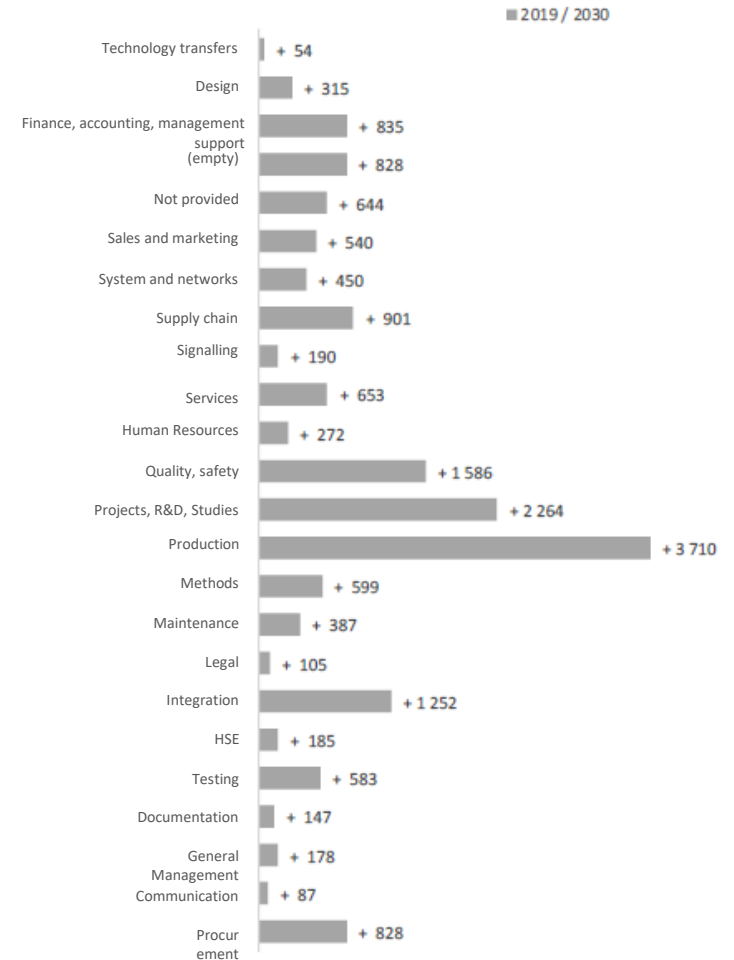


## NET RECRUITMENT NEEDS

### ◇ USING THE SAME ASSUMPTIONS FOR EXIT AND PRODUCTIVITY RATES, PARTICULAR CHANGES ACCOMPANY ASSUMPTION 2

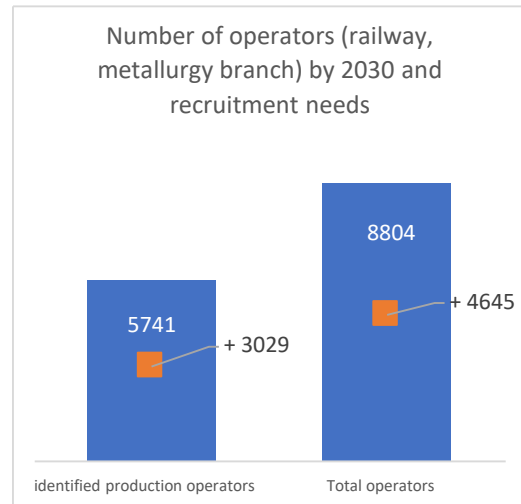
- Changes in workforce in the fields of integration, legal, systems and networks, sales and marketing, services, technology transfer
- More restricted changes concerning production staff, including methods and maintenance
- High demand for projects, operational safety, testing, the logistics chain and production

Assumption 2: Recruitment needs by 2030



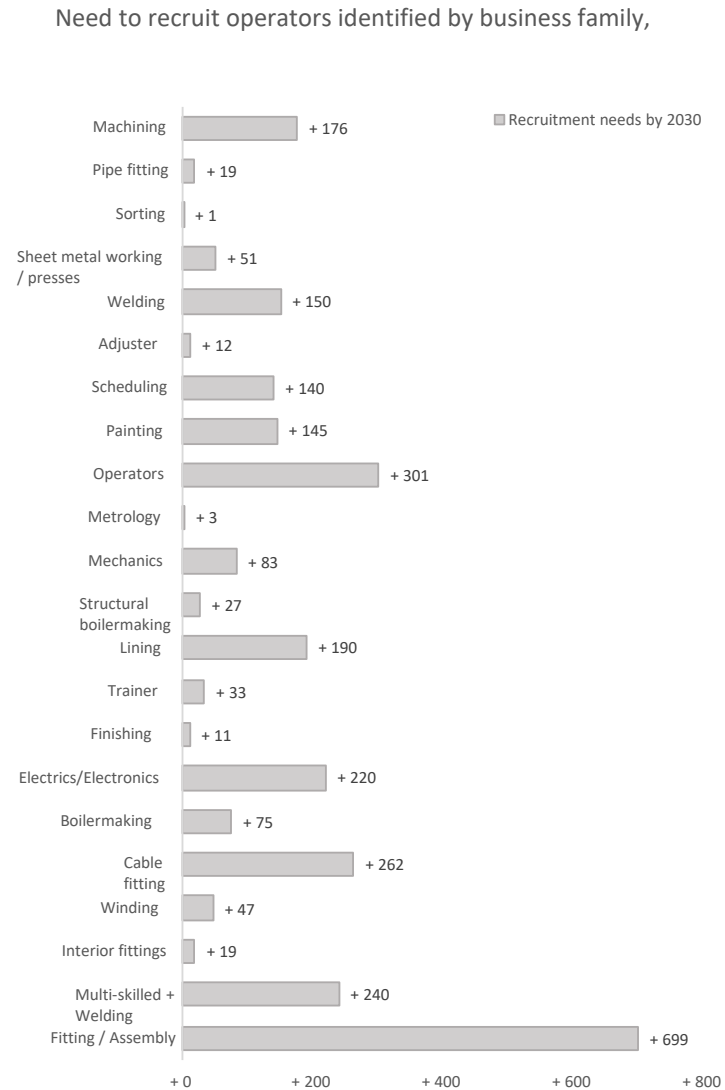
# EFFECTS OF RETIREMENTS ON OPERATORS – ESTIMATION OF FUTURE REQUIREMENTS (2030)

Need to recruit around 4,650 operators by 2030 (due to natural departures)



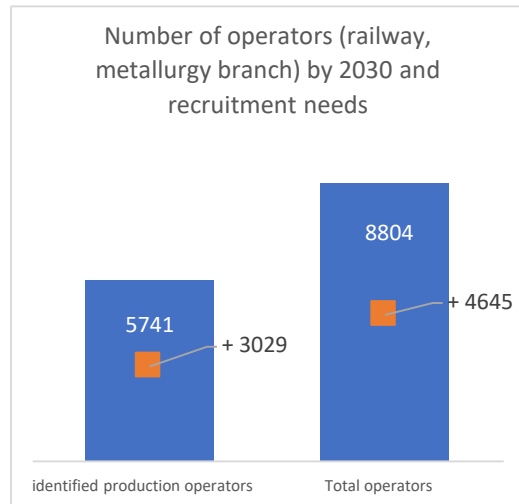
## ◇ REQUIREMENTS FOR OPERATORS PER BUSINESS AREA

In fact, although growth in production is more limited than other business areas, **it requires recruitments, particularly in fitting / assembling, lining, cable fitting, welding and machining.**



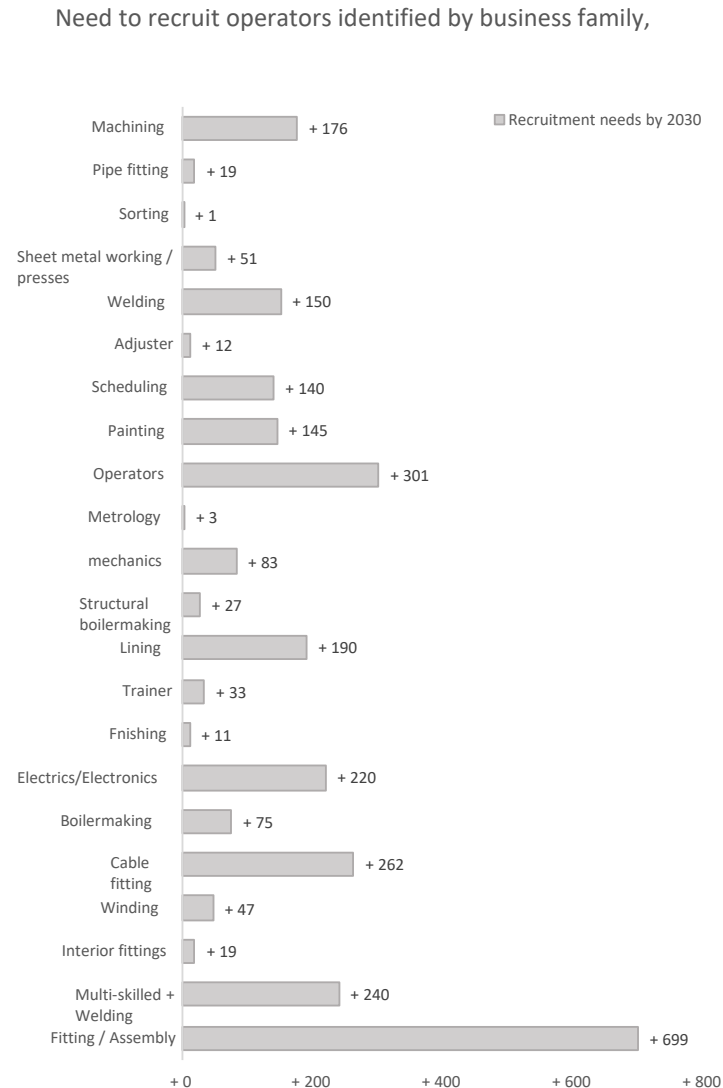
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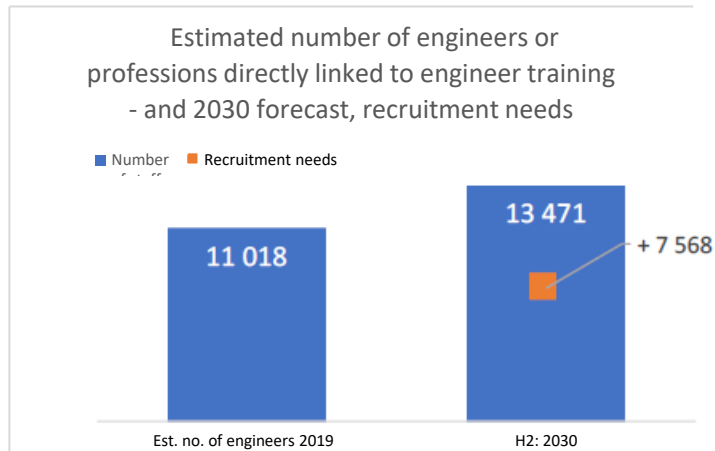


# RECRUITMENT NEEDS FOR ENGINEERS

## Estimation

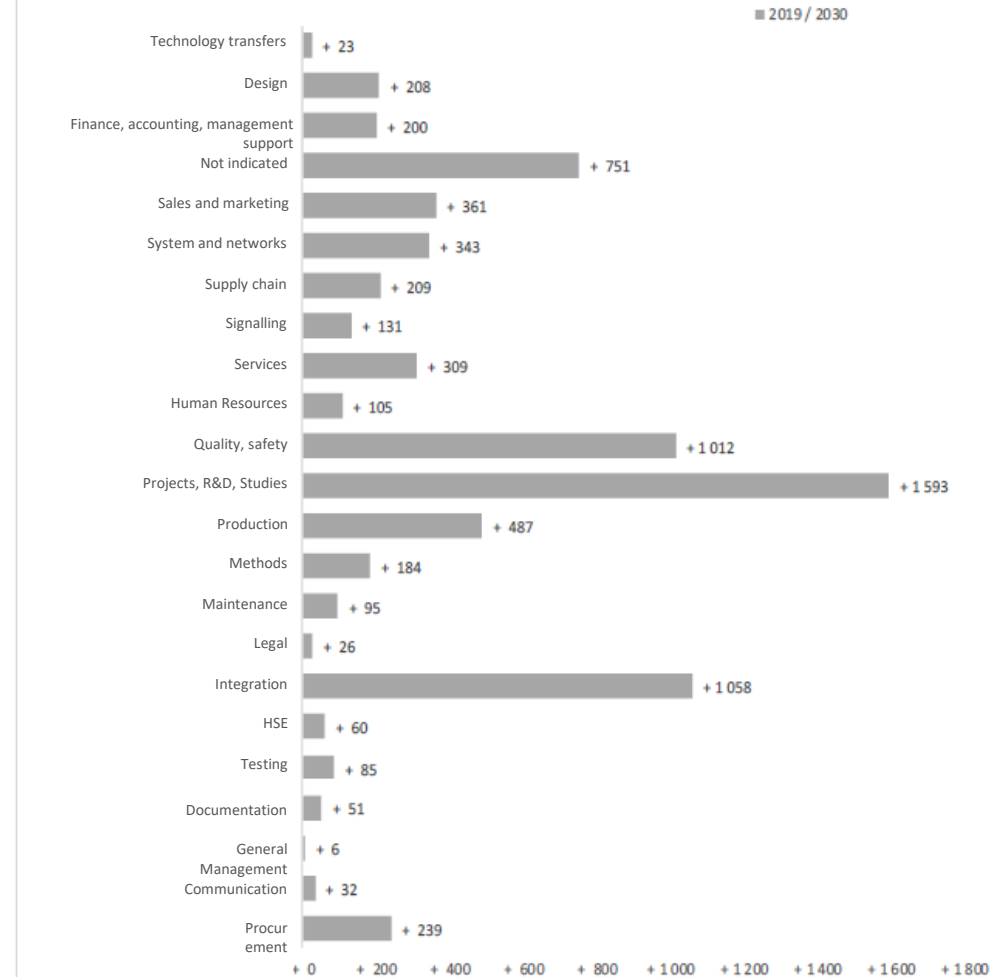
◇ **AROUND 4,000 PEOPLE HAVE THE TITLE OF ENGINEER, BUT THERE ARE THOUGHT TO BE 11,000 EMPLOYEES FROM ENGINEERING SCHOOLS IN THE SECTOR**

- People who have been trained as engineers work in many other roles



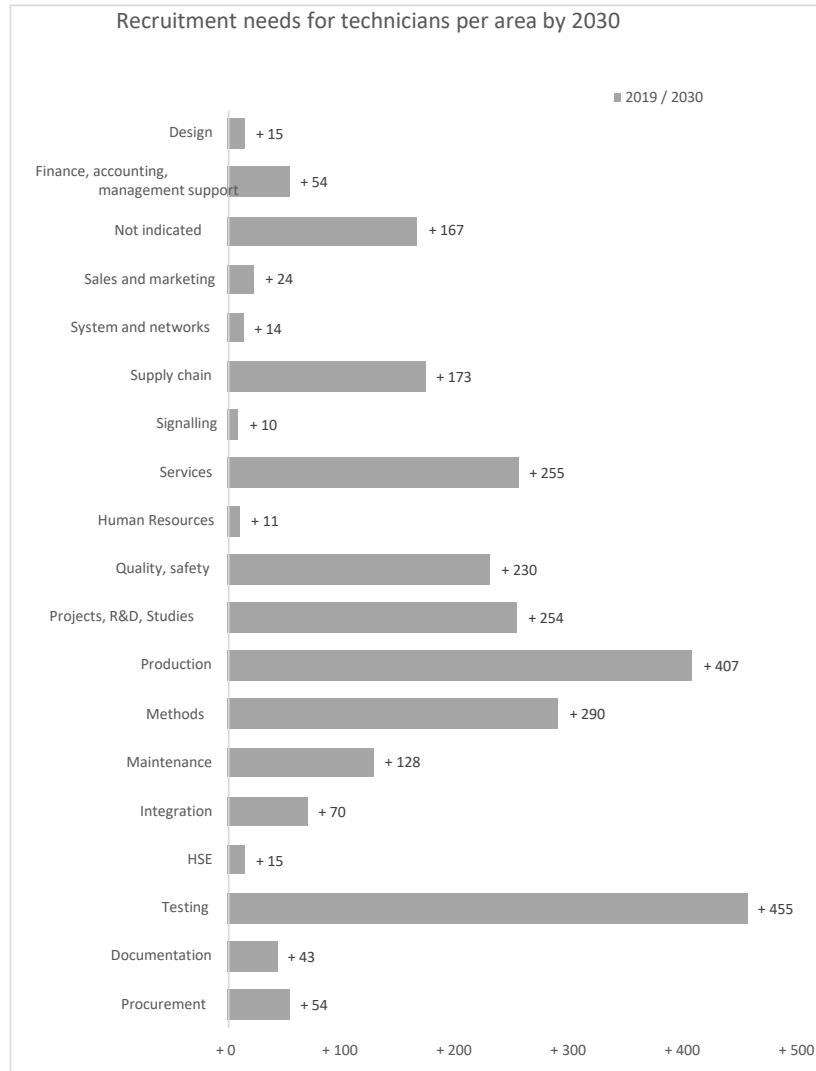
The outlook is almost 14,000 engineers or operational functions directly linked to engineer training, thus requiring over 7,900 recruitments by 2030 in consideration of our exit rate assumptions.

Recruitment needs for engineers for operational functions by 2030

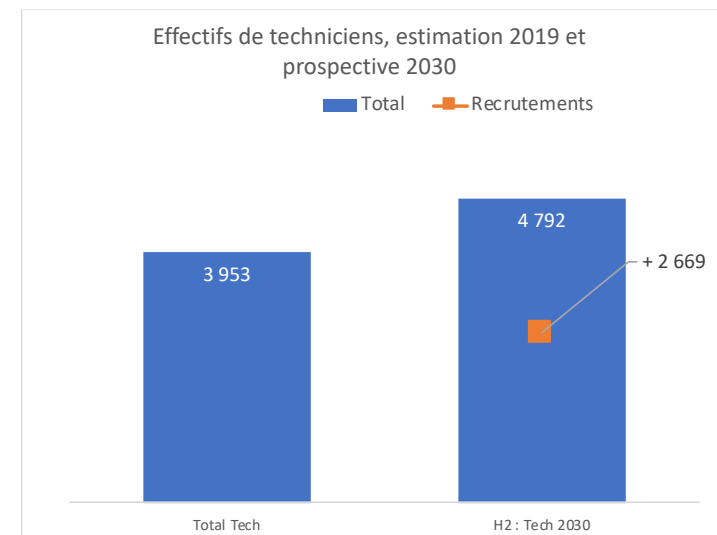


# RECRUITMENT NEEDS FOR TECHNICIANS

## Estimation



The outlook is almost 5,000 technicians, thus requiring nearly 2,800 recruitments by 2030 in consideration of our exit rate assumptions.



- Particular recruitment needs
  - In production, methods and maintenance, despite our assumption for this sphere
  - In testing, design office, quality and safety, services (maintenance) and supply chain

# INDICATIONS RESULTING FROM THE ONLINE SURVEY ON THE CORRELATION BETWEEN PROFESSIONS AND TRAINING

## For professions under pressure Initial training...

### ... *must evolve for*

- Operating safety engineer
- IT security manager (cybersecurity)
- Maintenance technician
- Industrial buyer
- Electronics technician
- Machining operator
- Setting operator
- Welder
- Maintenance worker
- Foundry operator

### Excluding Observatoire professions:

- Track layer
- Machine operator (driver)

### ... *or must be significantly changed for*

- Signalling engineer
- Service maintenance technician (railway maintenance machines)
- Maintenance technician
- Hydraulics worker
- Team leader, production unit manager
- Lathe hand
- Setting operator
- Machining operator
- Welder
- Boilermaker



# INDICATIONS RESULTING FROM THE ONLINE SURVEY ON THE CORRELATION BETWEEN PROFESSIONS AND TRAINING

## For professions under pressure

### Ongoing training...

*... must evolve for*

- Business manager
- Design and electronic development technician / draughtsperson (electrical draughtsperson)
- Production operator

*... or must be significantly changed for*

- Business manager
- Design engineer

# Overall recommendations - summary



# SUMMARY OF RECOMMENDATIONS

## Line 1: Promote the sector

- Promote the sector in view of its good image and a favorable context
- Develop communication and improve visibility around certifying training courses
- Implement tools to be used throughout the sector

## Line 2: Adapt training content

- Study the feasibility of the CQPM (joint metallurgy qualification certificate) for production professions
- Provide for a system to link recognition of professional experience and the CQPM (joint metallurgy qualification certificate), and AFEST (training action in work situations) and CQPM
- Create a specialisation, such as Master 2, for the railway sector with a common core and specialities

## Line 3: Adjust training needs in a concerted manner

- Train more engineers
- Organise meetings between manufacturers and training organisations
- Organise meetings between training organisations and trainers

## Line 4: Improve training needs (initial and ongoing) in each employment area

- Strengthen ties in employment catchment areas with training facilities
- Adjust training needs to employment catchment areas

## Line 5: Encourage gateways between professions to adapt better to changing contexts

## IMPACT



# LINE 1: PROMOTE THE SECTOR, WHICH STILL HAS SOLID PROSPECTS

## ◇ OBSERVATION:

Lack of appeal.

The current crisis has not changed the sector's promising prospects. There is a window of opportunity for the sector faced with sectors which are suddenly less appealing as they are being completely restructured, for an industry in which the fundamentals are in line with the times (low-carbon transition, high level of technology, varied industrial fabric)

## ◇ RECOMMENDATIONS:

- **Promote the sector with campaigns to attract candidates by targeting certain schools (engineering schools in particular)**
- **Develop communication and improve visibility around certifying training courses**
  - ⇒ To companies in the sector
  - ⇒ By working with opinion leaders and trade union organisations
- **Implement tools to be used throughout the sector**
  - ⇒ Develop use of the employment hub “l’industrie recrute”
  - ⇒ Update a railway training database (single point of entry)
  - ⇒ Use the website La Bonne Compétence Pro <https://labonnecompetencepro.pole-emploi.fr/>

## LINE 2: ADAPT TRAINING CONTENT

### ◇ OBSERVATION:

Training courses are considered inadequate by HR departments, in terms of capacity or number of graduates, or in terms of skills acquired, at every level.

### ◇ RECOMMENDATION

- Study the feasibility of the joint metallurgy qualification certificate (CQPM) qualification for production professions in short supply with the specificities of the railway sector (with links between recognition of professional experience / CQPM or AFEST (training action in work situations) / CQPM)
- Create a specialisation, such as Master 2, for the railway sector with a common core and speciality areas, for example:
  - Signalling
  - Railway safety
  - Braking systems
  - Systems integration
  - Railway business project manager

## LINE 3: ADJUST TRAINING NEEDS IN A CONCERTED MANNER

### ◇ OBSERVATION:

Training courses are sometimes inadequate, and training organisations are not always well informed of the industrial needs of the sector (at least not methodically).

### ◇ RECOMMENDATION

- Train more engineers. There is a need for 750 to 800 per year until 2030. It is necessary to ramp up from 200 engineers trained per year to at least 500 within 3 years!
- Organise meetings between manufacturers and training organisations but also between training organisations that prepare for railway professions.

## LINE 4: IMPROVE TRAINING NEEDS (INITIAL AND ONGOING) IN EACH EMPLOYMENT AREA

### ◇ OBSERVATION:

In some professional categories, people are not very mobile. Some training courses, such as CQPM, therefore need to be adjusted to the employment catchment area where particular needs emerge.

### ◇ RECOMMENDATION

- Strengthen ties in employment catchment areas with training facilities
- Adjust training needs in each employment catchment area according to the requirements detailed below.

## LINE 5: ENCOURAGE GATEWAYS TO ADAPT BETTER TO CHANGING CONTEXTS

### ◇ OBSERVATION:

The current crisis is affecting some sectors more than the railway sector.

These sectors affected by the crisis share a number of professions and certain key skills with the railway sector. Some of these professions are already in short supply in the railway sector.

### ◇ RECOMMENDATION

- Encourage gateways between professions by providing joint skills or training courses (in particular due to the proximity of some professions to the aeronautics field, or the sharing of structural elements for these professions - standards, safety, maintenance, etc.).



# Recommendations by employment area => details of line 4





## WHY TAKE AN APPROACH BASED ON EMPLOYMENT AREAS?

Thanks to the very detailed data updated through exploiting the database, it has been possible to highlight which professions are in short supply by employment area.

An approach based on employment area for workers and technicians has been selected due to the lower rate of mobility of these categories.

### ◇ PROPOSAL:

Develop training courses in regions in line with the requirements for professions in short supply in the railway sector.

The following pages list the professions in short supply held by operators and technicians by employment area.

### Organisation proposal:

**Pilot:** the FIF (within the framework of an Employment and Skills Development Project)

**Participants:** the branch, the FIF, regional metallurgy industry employer trade unions, steering committee for Employment and Skills Development Project, regional actors, Pôle emploi, etc.

# TRAINING COURSES TO SET UP OR TO REINFORCE BY EMPLOYMENT AREA - 1

A geographical approach to the main professions in short supply

## Belfort

Boilermaker  
Winder for electrical equipment  
Team leader  
Maintenance technician (workshop)  
Maintenance technician (service)  
Methods & Maintenance technician

## La Rochelle

Welder  
Team leader  
Test technicians

## Grand Est - Moselle

Foundry operator  
Logistics and industrial management supervisor  
Foundry technician  
Maintenance technician (workshop)  
Lathe operator

## Grand Est - Marne

Design technician  
Methods & Maintenance technician  
Methods technician (workshop)  
Refrigeration and air conditioning technician

## Grand Est - Ardennes

Blacksmith  
Setting machinist  
Setting-lathe operator  
Production manager

# TRAINING COURSES TO SET UP OR TO REINFORCE BY EMPLOYMENT AREA - 2



## Touraine

Business project manager  
Quality manager  
Quality technician

## Le Doubs

Winder for electrical equipment  
Boilermaker  
Maintenance technician (workshop)  
Team leader  
Methods & Maintenance technician

## Hauts-de-France Nord and Pas de Calais

Welder  
Thermite welder  
Machinist, CN machinist  
Boilermaker  
Production operator  
Maintenance worker  
Maintenance technician  
Draughtsperson (electrical)  
Test technicians  
Machine driver  
Wire drawer

## Bourgogne Franche-Comté

Automation technician  
Maintenance technician (workshop)  
Hydraulics technician

# TRAINING COURSES TO SET UP OR TO REINFORCE BY EMPLOYMENT AREA - 3



## Pays de la Loire

Electronics technician  
Electronics technician  
Works manager (signalling)\*

## Ile-de-France

Business manager  
Technical sales staff  
Maintenance technician (infrastructure)  
Works manager (infrastructure)

## Haute-Vienne

Setting machinist  
Buyer

## Occitanie

Project Manager (electronics)  
Electronics technician

## Isère

Maintenance technician (mechanics and electrics)  
Production manager

### N.B.:

This list is not exhaustive and will need to be completed with the requirements related to the extension of the CAF establishment in Bagnères de Bigorre which announces 250 new jobs in the years to come.

**THANK YOU FOR YOUR ATTENTION**