INTERNATIONAL UNION
OF RAILWAYS

WELCOME TO THE 3RD STANDARDISATION CONFERENCE

STANDARDISATION UNIT

16 March 2021

REMINDER Basic rules for using for using ZOOM

- **Turn off your micro when not speaking**
- Please use the **chat** functionality to write a message to everyone (for example to ask a question after a presentation).
- Two languages will be used : English and Russian
- You can mute the “original language” to listen only to English, Russian, etc
- Click on the language button located at the bottom right of your screen, and select the language you want to listen to during the meeting
- This meeting will be recorded to facilitate the production of the notes

AGENDA

11h35-11h45	Introduction to the Annual Standardisation Conference, François Davenne General Director UIC
11h45 – 12h00	Experiences, Challenges and Sustainability in railway standardisation *M. Kenji Murasaki, Deputy Director JR-East HQ*
12h00– 12h15	A review on Standardization in Iranian Railways Mr Sirous Sayyah Saharkhiz *Iranian Railways (RAI)*
12h15 – 12h30	Implementation of the Ecological Strategy of the JSC “Russian Railways” Mr Andrei Lisicyn Head of the Labor Protection, Industrial Safety and Ecological Control Department RZD
12h30 – 12h45	The role of standards in getting on track for sustainable mobility *Lucie Anderton, UIC Head of Sustainability*
12h45 – 13h00	North American Freight Railroads and Climate Change, Theresa Romanosky, Assistant General Counsel Association of American Railroads (AAR)
13h00-13h15	Q&A
13h15-13h20	Break
13h30 – 14h00	Excellence in Standardisation – Awards

INTERNATIONAL UNION
OF RAILWAYS

INTRODUCTION TO THE ANNUAL STANDARDISATION CONFERENCE

François Davenne, UIC General Director

INTERNATIONAL UNION
OF RAILWAYS

Experiences, Challenges and Sustainability in railway standardisation

Vitae Kenji MURASAKI, *Deputy Director*
JR-East HQ

Experiences, Challenges and Sustainability in railway standardisation

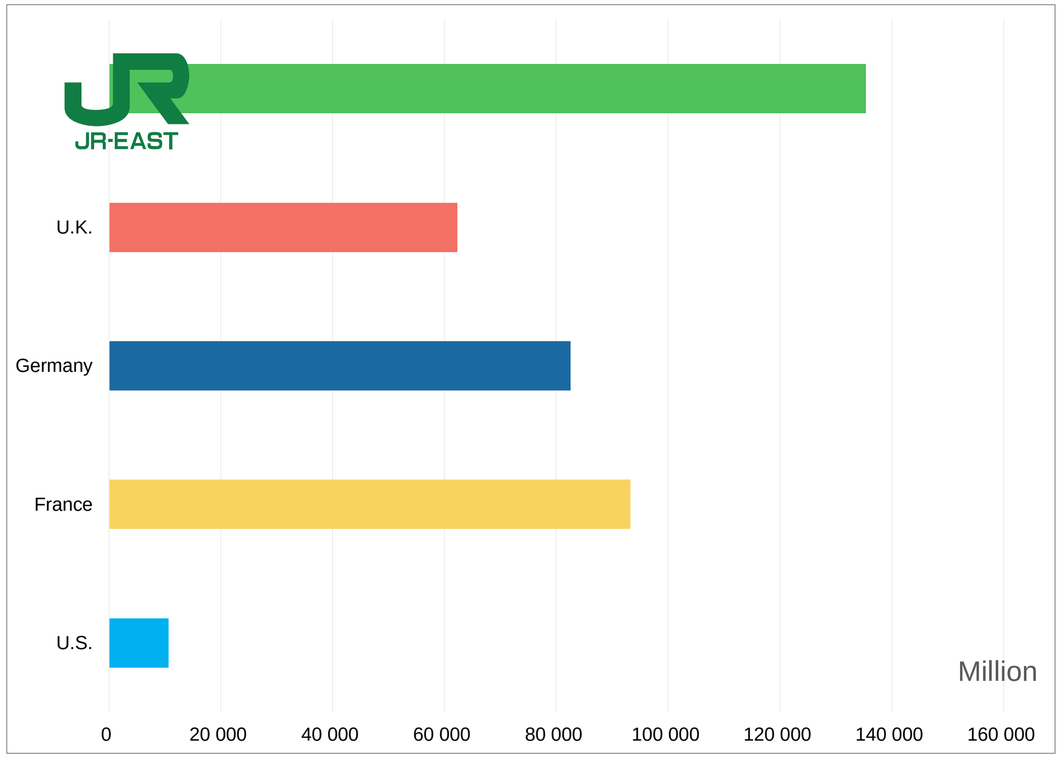
Kenji MURASAKI　Manager　International Affairs Headquarters

16 March 2021　3rd international conference on railway standardisation

CONTENTS

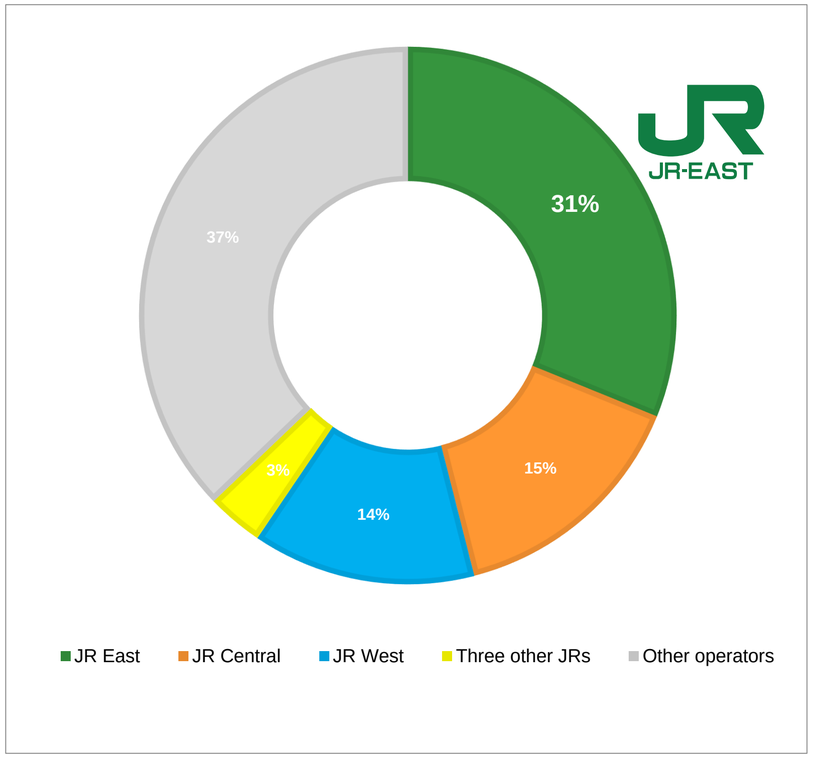
INTERNATIONAL RAILWAY COMPARISONS AND JR EAST IN JAPAN

The number of passengers-kilometers by railway



Source: Factsheet (FY2020), JR East

Domestic share of passenger railway operators based on the passengers-kilometers



Source: Transport result (FY 2018),
Ministry of Land, Infrastructure and Transport

- The number of passengers-kilometers of JR East is relatively larger than those of other countries.
- JR East has the largest share in Japan.

JR EAST AT A GLANCE

Metropolitan

High Speed

Regional

Network: **7.401 km**

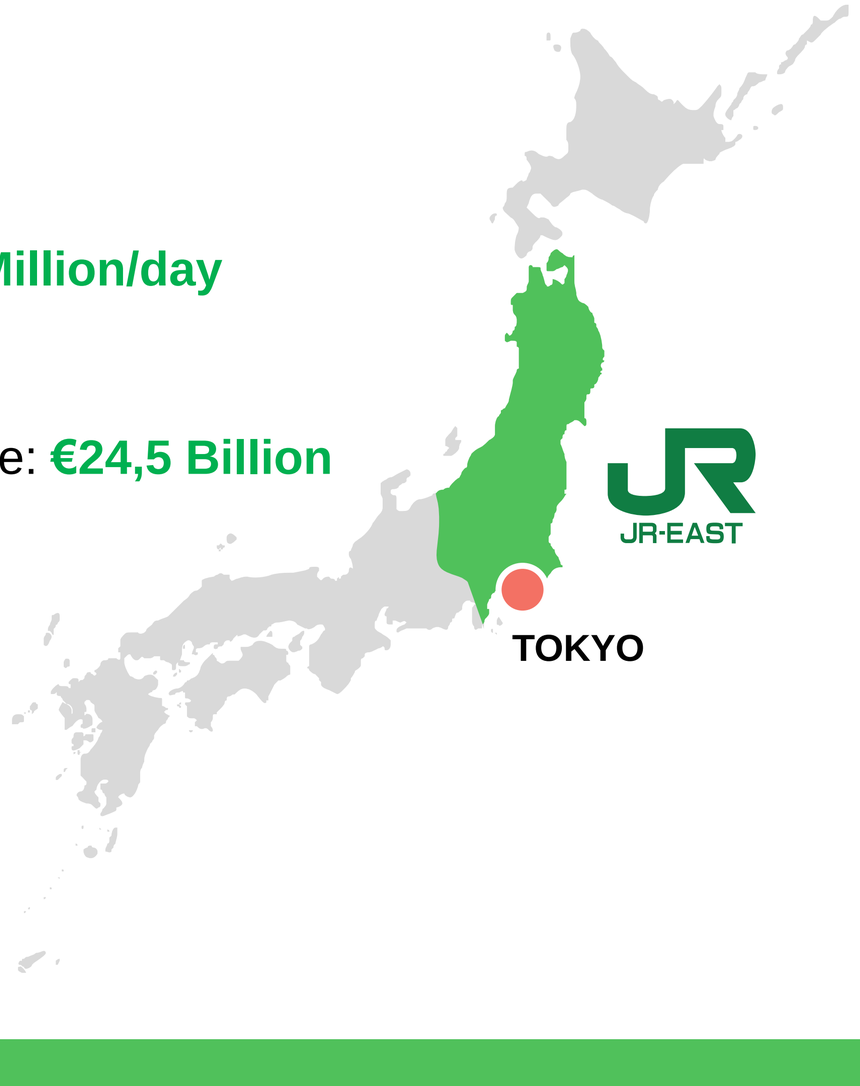
No. of Passengers: **17,8 Million/day**

No. of Trains: **12.296/day**

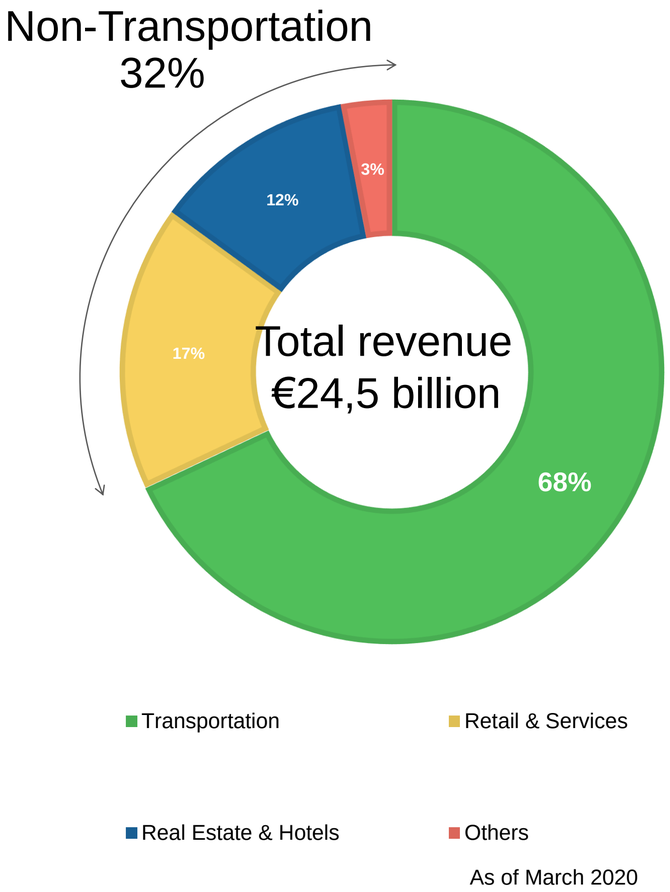
Annual Operating Revenue: **€24,5 Billion**

No. of Employees: **56.100**

*Data as of March 2020
**Calculated by 1 € = 120 JPY



JR EAST AT A GLANCE



- JR East is a private, dividend paying, vertically integrated railway company.
- Never in financial deficit
- No increase in fares
- No shares held by the government of Japan
- No subsidies from central or local governments
- No limitation on non-transportation businesses

JR East continues to focus more on non-transportation businesses.

REFORM OF JAPANESE NATIONAL RAILWAYS

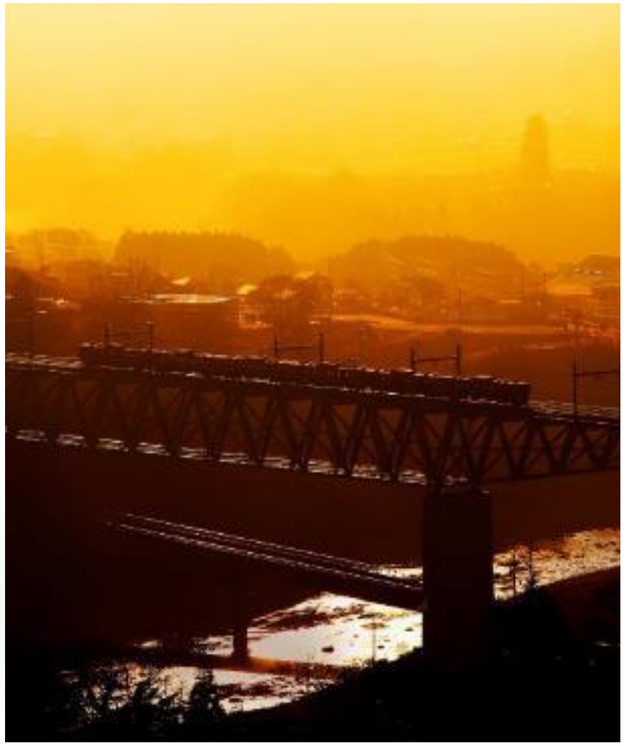
1949 **Japanese National Railways (JNR) was established**

From a government enterprise to a financially independent enterprise

Onwards JNR had considerable losses

Five major challenges which did not allow JNR to adapt to the new business environment.

1. Railway business was interfered with politically without taking into account benefit.
2. Poor employee-employer relationship.
3. Restrictions within the business realms.
4. Gigantic organization beyond limit of business management.
5. Lack of competitive business attitude.



REFORM OF JAPANESE NATIONAL RAILWAYS

1949 **Japanese National Railways (JNR) was established**

From government enterprise to financially independent enterprise

Onwards JNR had considerable losses

1987 **Reform of Japanese National Railways**

JNR was privatized and divided into 6 territorial passenger railway companies and 1 nationwide freight railway company.

The successful management model of private railways was adopted as a model for JNR's reform.

The **five major challenges** are improving steadily.

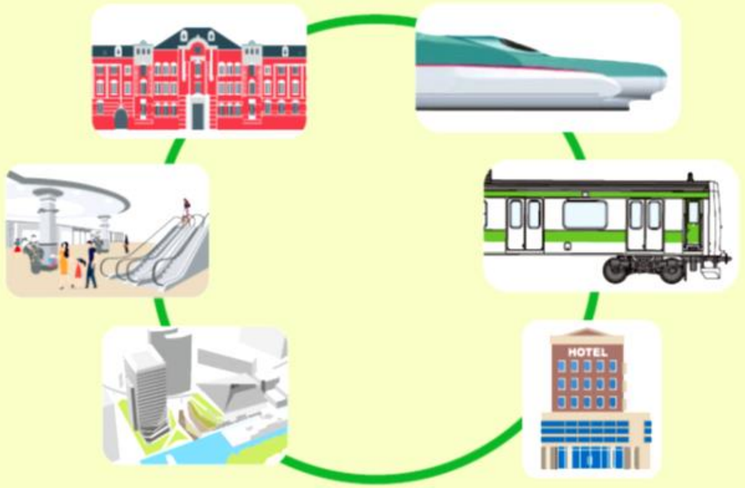
AFTER
REFORM OF JAPANESE NATIONAL RAILWAYS

Offering new values for our customers and people in regional communities

Integration and human perspective

Real network

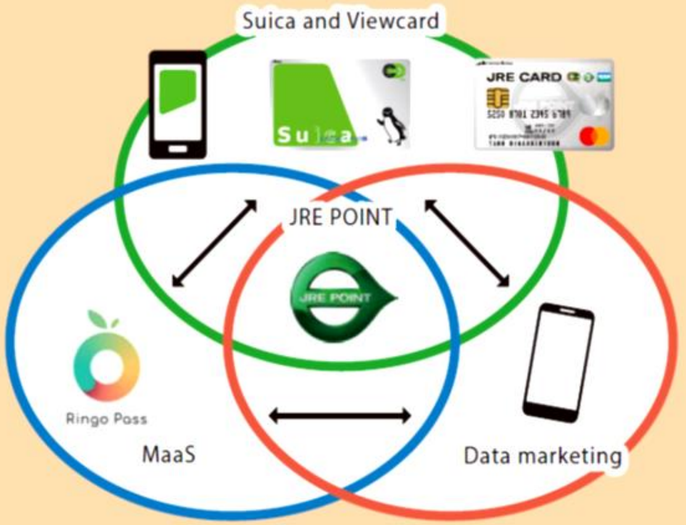
Transportation services × lifestyle services



Our strength is our real network that supports the digital network.

Digital network

MaaS × Suica × data marketing



The digital network can transform the real network.

Flexible coalition with external stakeholders

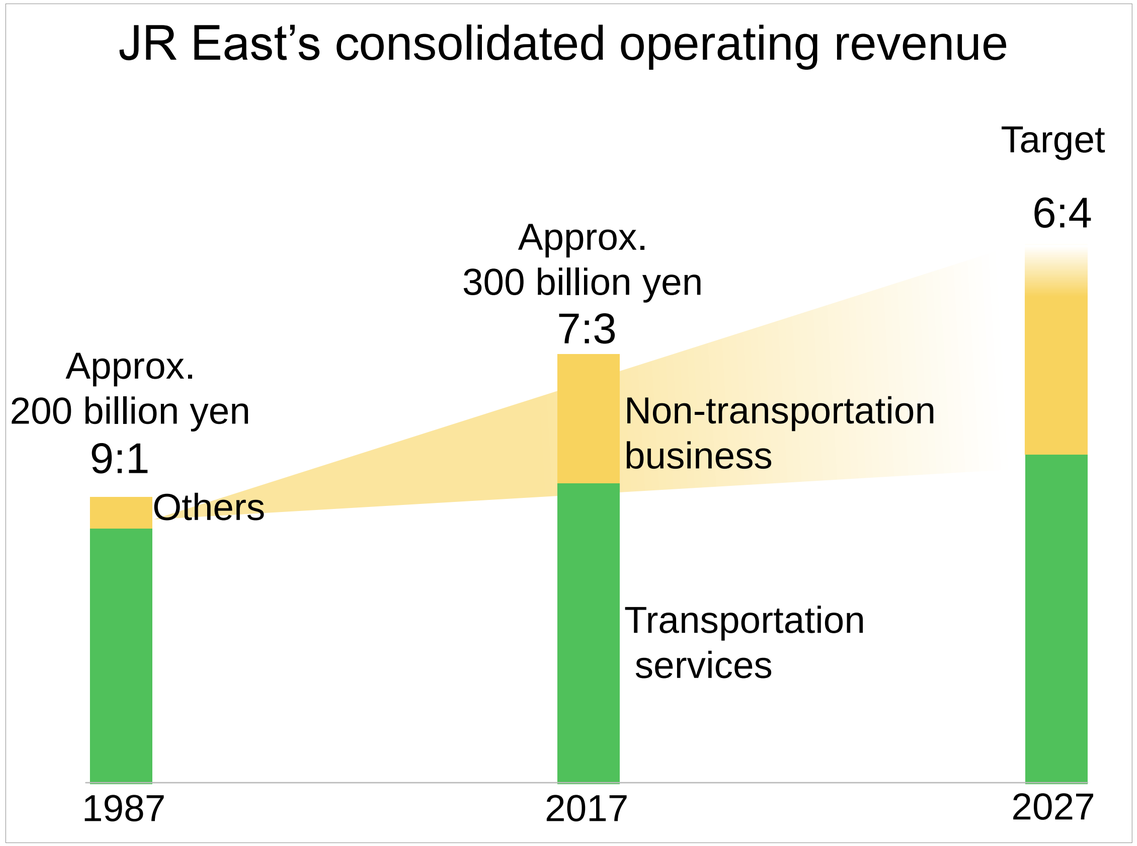
JR East further expand into other business fields based on the brand as "**PUBLIC TRUST**" has developed in the transportation business.

Why is JR East's "**PUBLIC TRUST**" so high?

PUBLIC TRUST IN JR EAST

The transportation in JR East utilizing the vast and detailed railway network are more trusted than other transportation services because not only **safety** but also **punctuality** levels are high.

- High safety and punctuality level contribute to high public trust.
- The public trust makes JR East an excellent brand, so that many passengers and customers choose JR East and its related companies.
- The operating revenue is increasing especially in non-transportation businesses.
- We must not lose trust from customers as it is our strength.



Why are Japanese trains not delayed?

WHY ARE JAPANESE TRAINS NOT DELAYED?

Because of two following reasons:

High quality of products

High performance of operation and maintenance

Four keys to success

A) Leader in design of railway systems and consistent application of good practice

B) Less restriction for improvement

C) Optimized solutions through whole railway system

D) High competence at field site

Based on Japanese technical standard system

JAPANESE TECHNICAL STANDARD SYSTEM IS OUR FOUNDATION

1949 **Japanese National Railways (JNR) was established**

The Japanese railway system was based on a "**Specification-based Standard**".

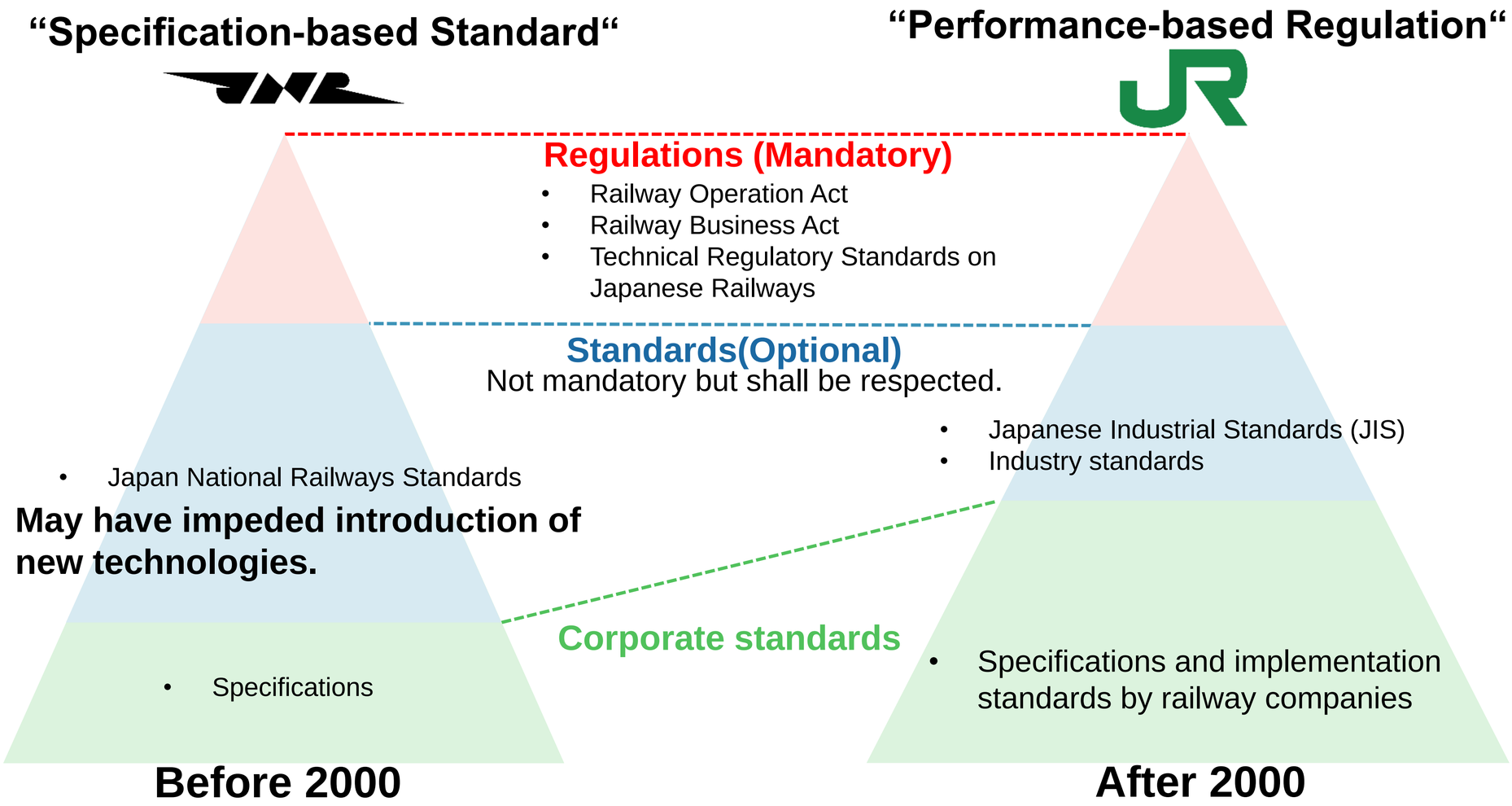
1987 **Reform of Japanese National Railways**

2000 **Deregulation of Japanese railway technical standard system**

To respond to technological evolution, the Japanese railway system adopted "**Performance-based Regulation**".

JAPANESE TECHNICAL STANDARD SYSTEM IS OUR FOUNDATION

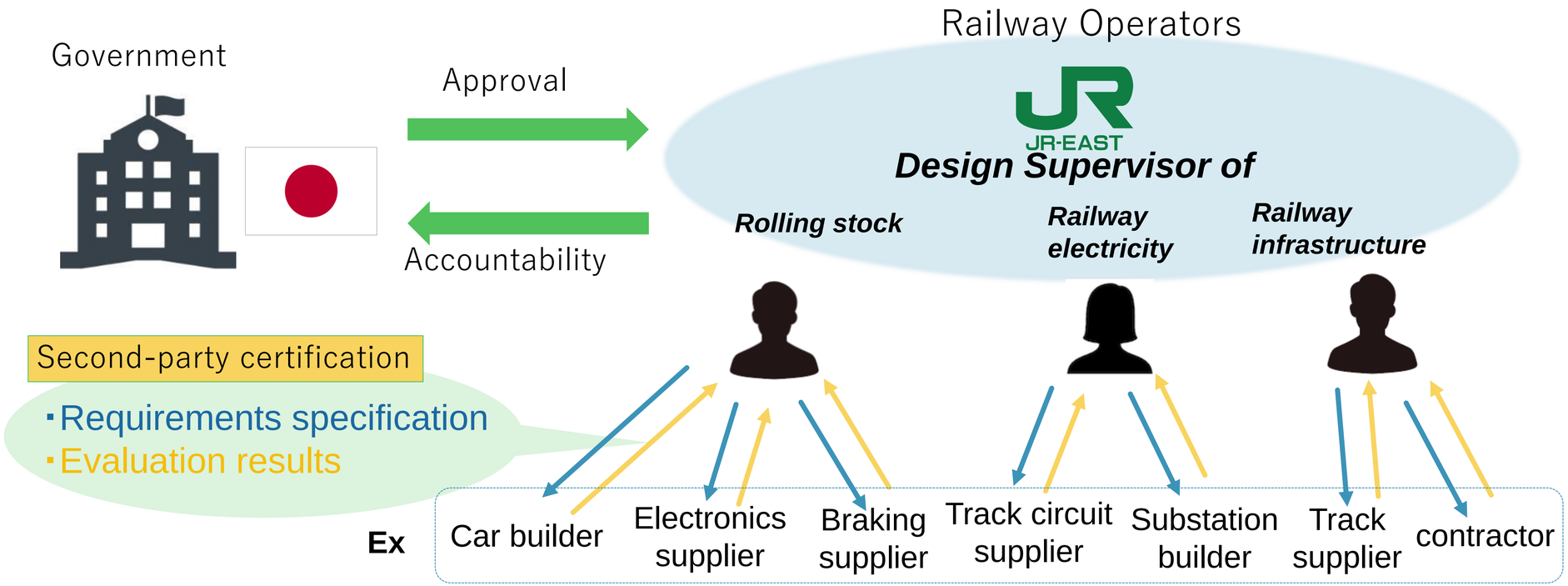
- The means to implement specific technology are left to the discretion of railway companies under the current system.
- Promotion of various technical developments improves technical level.



JAPANESE TECHNICAL STANDARD SYSTEM IS OUR FOUNDATION

Procedures for Certified Railway Business Operators

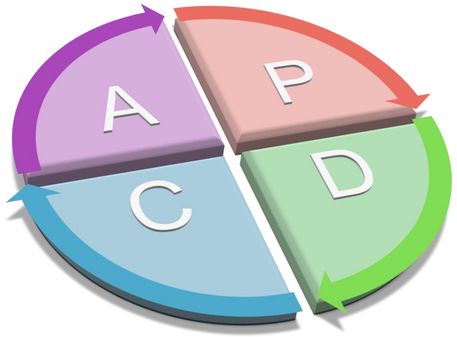
- The government checks whether operators meet the legislations and have sufficient capacity by examining their safety management systems.
- The operator shall be responsible for safety verification of rolling stock and completion of facilities.



FOUR KEYS TO SUCCESS

A) Leader in design of railway systems and consistent application of good practice

Railway company maintains own technological capabilities because Railway company has significant responsibility for safety and reliability.



*PDCA: Plan, Do, Check, Action

- JR East conducts design of railway systems and carries out maintenance and repairs as much as possible.
- JR East lead thorough investigation of defects and failures and improve quality of management by addressing PDCA cycle with the manufacturers.
- Good practices from past failure events can be implemented when following operator-led design.

FOUR KEYS TO SUCCESS

B) Less restriction for improvement

Railway company can specify how to implement the technology according to their own standards.

- Since operators have abundant in-house know-how, it is possible to incorporate countermeasures of accidents quickly into the internal documents.

- Various solutions and approaches against issues can be accepted.

FOUR KEYS TO SUCCESS

C) Optimized solutions through whole railway system

Railway company is involved with the whole railway systems through its entire life cycle from “Concept” phase to “Disposal” phase

- It is possible to take measures quickly and widely against accidents and failures.
- It is crucial to avoid design of a system that is only focused on the cost of operations and fails to consider the negative effects to O&M.

FOUR KEYS TO SUCCESS

D) High competence at field site

Railway company seek to increase capabilities and motivation for employees.

- The training program for field employees is substantial in JR East.
- JR East has adopted “改善: KAIZEN” activities to increase the capabilities and motivation at the field site.
- There are sufficient high quality manuals which are created at the field level.

“改善: KAIZEN”
One of our cultural term that flows continuously at Japanese field sites. “KAIZEN” is activities where each employee is aware of the problem, reconsiders the work for himself / herself and the organization, and improves the current situation.

JR EAST DEVELOPS SUSTAINABLY

JR East increase “PUBLIC TRUST” from our stakeholders, which is the foundation of all our businesses, and continue to providing new value to society.

- For sustainable growth, JR East aims to be a selected company among other transportation services by providing high quality services.
- JR East works to develop local communities and achieve the SDGs by solving social issues through our businesses.

SDGs: Sustainable Development Goals

JR EAST CONTRIBUTES TO SUSTAINABILITY

Toward the realization of a carbon-free society, the entire JR East Group will aim for “substantially zero” CO2 emissions by 2050.

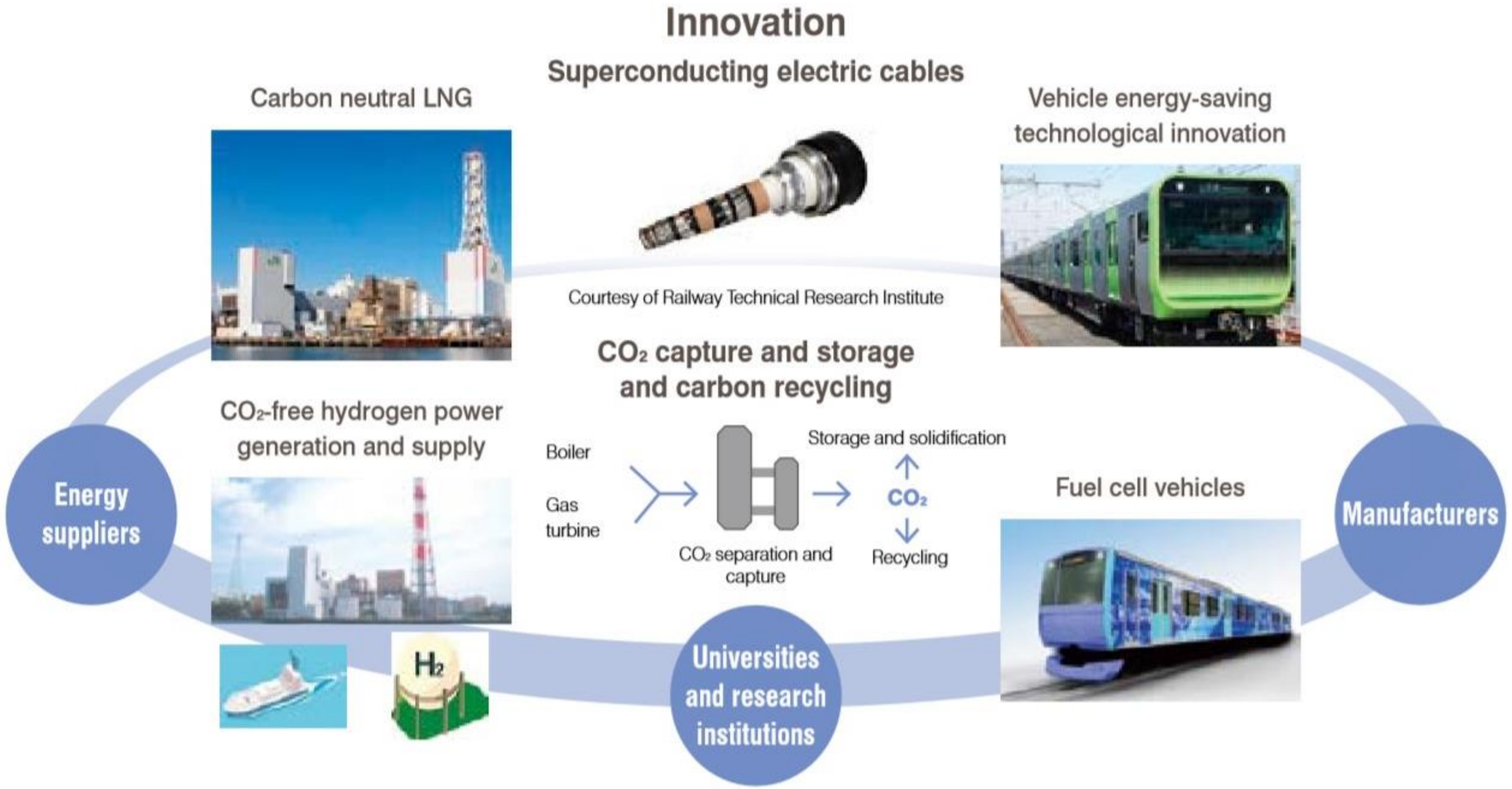
Subject	Value in 2013	Target value in 2030
CO2 emissions in the railway business	2.15 million ton-CO_2	5 0 % reduction (compared with 2013)

- Hydrogen fuel cell Hybrid vehicle ”HYBARI”
- Energy-saving vehicle
- Hydrogen station
- Fuel Cell bus
- Accumulator vehicle
- Electric storage system
- Developing of renewable energy source(wind power / mega solar)

and more!

JR EAST CONTRIBUTES TO SUSTAINABILITY

JR East will actively introduce new technologies in all phases of the energy network of the Group, from “Generation” to “Use”.



CONCLUSION

- **Brand power** is indispensable for prosperity of a company. The brand power for railway companies can be built on the basis of **high safety and reliability**.
- Railway companies must **take the lead** in developing the railway industry.
- Railway business is difficult to develop on its own, it can be successful through **interaction with related businesses** and maximize its potential.
  - Railway companies have a mission as public transportation to fulfill their social responsibilities by **actively contributing to the SDGs**.

JR East intends to contribute to the development of railways around the world by documenting and standardising our solutions.

Experiences, Challenges and Sustainability in railway standardisation

Kenji MURASAKI　Manager　International Affairs Headquarters

16 March 2021　3rd international conference on railway standardisation

INTERNATIONAL UNION
OF RAILWAYS

A review on Standardization in Iranian Railways

Sirous (Sayahi) Saharkhiz
Head of Engineering and Design Department - Development, Training and Technology Center - Iranian railway (RAI)

3rd International Railway Standardisation Conference
Tue March 16 2021

RAI

A review on Standardization in Iranian railways

Sirous (Sayahi) Saharkhiz

Head of Design and Engineering Dept.

Development, Training & Technology Center- RAI

Contents

Parts of the goal of RAI

Creating a modern, progressive, and efficient rail transport system

Achieve management development and unique technologies at global level.

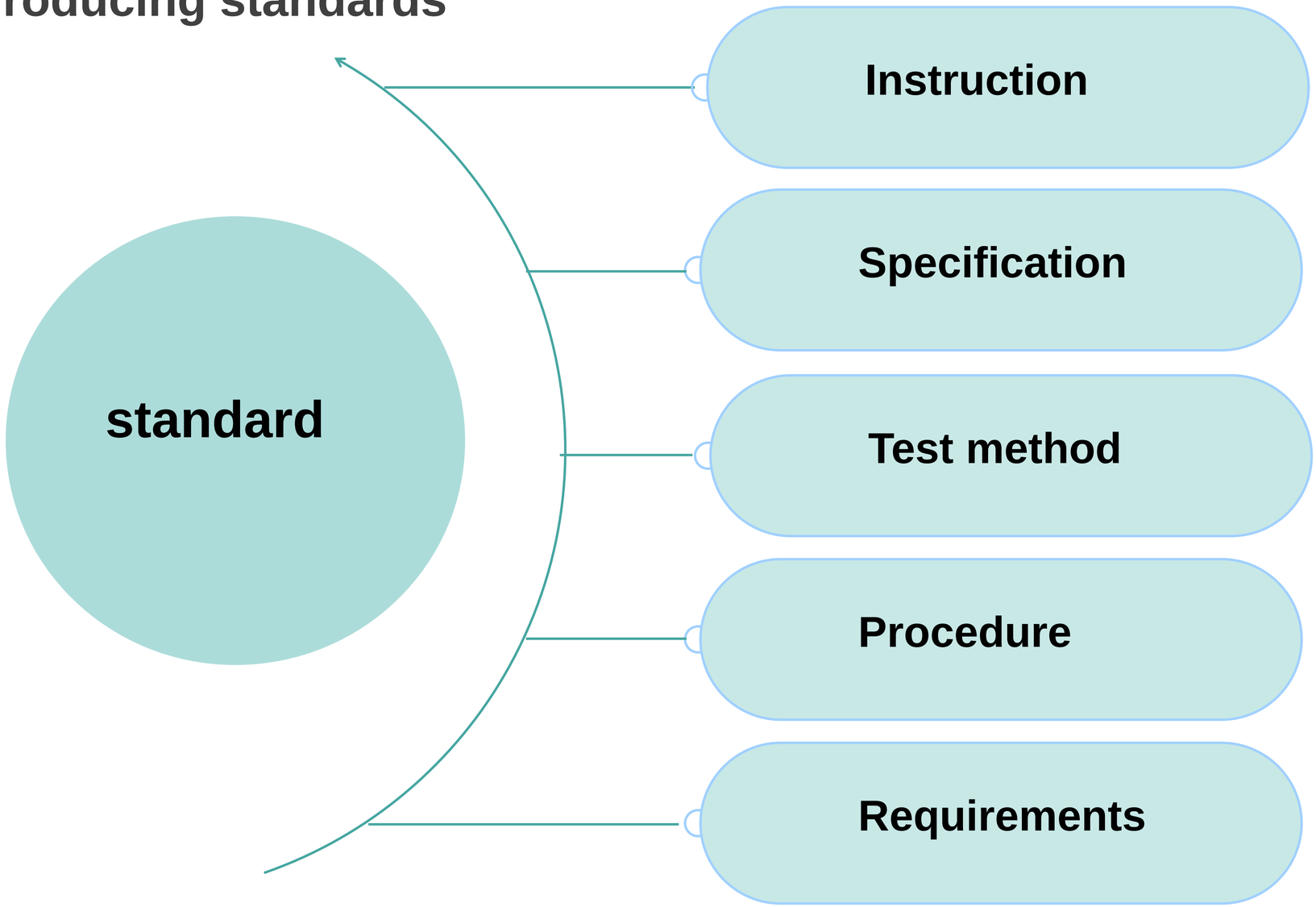
Maximum use of the rail related international organizations.

Standardization is an important key component for reaching the goal of RAI

Standardization

Standardization is the process of producing and implementing standards.

Producing standards



Benefits


Efficiency
Safety
Consistency
Harmonization
Compatibility
Innovation

Over decades

Development of national railway standards

Participation in Technical Committees.

More than 400 national railway standards were developed by national standard organization of Iran-ISIRI

UIC

Cooperation with UIC

Office of International Affairs of RAI is in close contact with UIC and aware of the last UIC IRSs, New researches and projects.

Use of UIC leaflets and researches:
Study for assessment of in-service rail defects (rail defects management) in Iranian railway network for preventing rail breaks.

Over decades

RAME

Cooperation with UIC

“UIC Regional Office for Middle East, working under supervision of UIC headquarters, is located in Railway headquarters in Tehran.”

“Cooperation among the railways and rail transport companies of the region”

“Improvement of interoperability between Middle East Railways”

ISO TC 269

ISO TC 269 -Railway applications

Secretariat for national mirror committee of ISO TC 269 -Railway applications is located in Development, Training & Technology Center of RAI

Contribution to the development of international standards.

Over decades

Review on instructions

Review, Edit and production of instructions, Regulations, specifications

Derived from standards

Implementation of standards

Implementation of NDT instructions for Testing and Inspection of wagon axles in-service, with the application of instructions derived from UIC, and ISO standards.

Improves safety
Prevents accidents

Training of experts

Trainers explain standards and application of standards to railway experts

skills improvement

Investigating the certification process of railway products and services

Study and review of Testing and Technical inspection Standards and Instructions for rail goods and services.

Testing, specification, performance, safety standards

Identification of Accredited labs and Inspection companies.

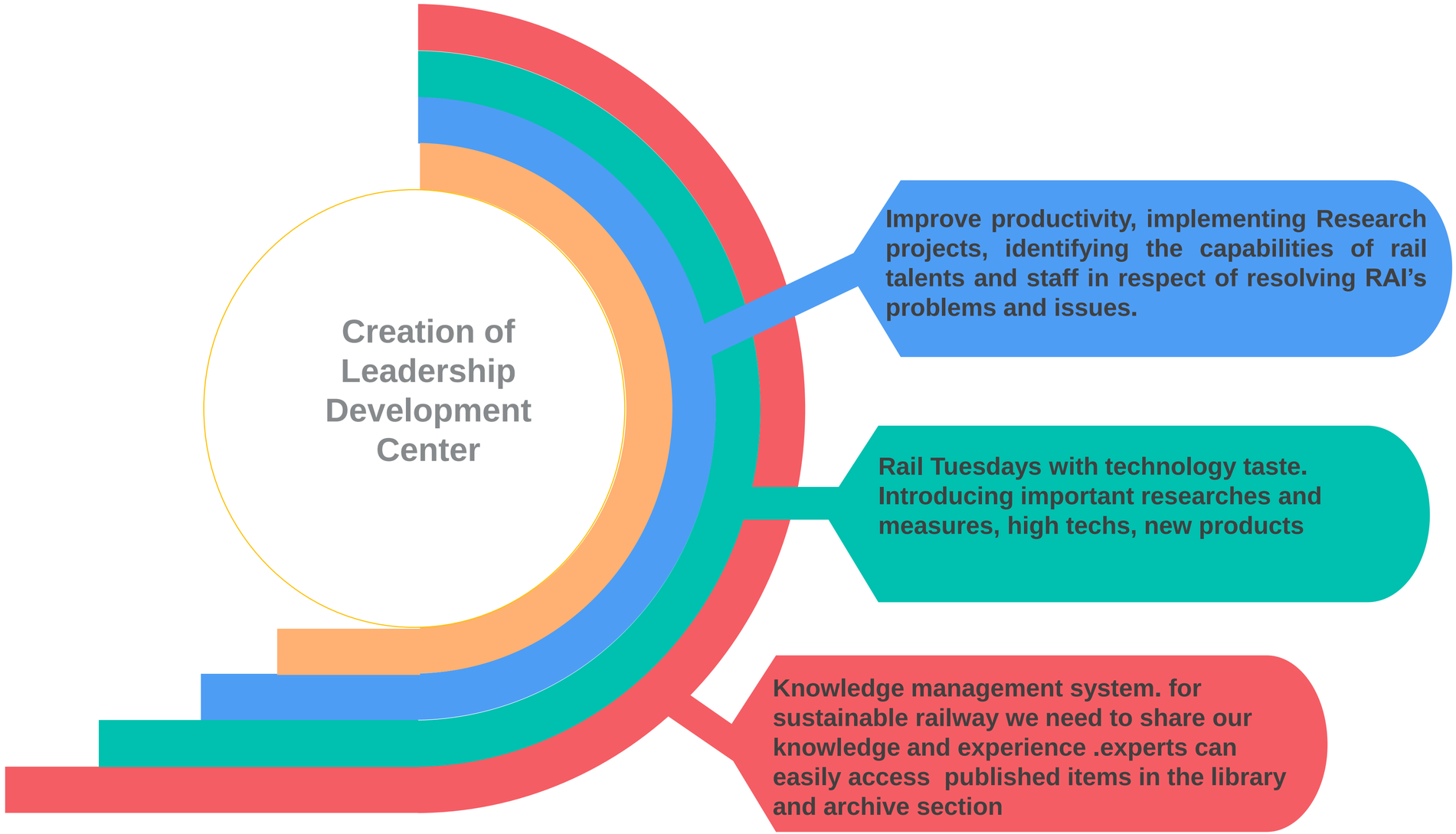
ISO 17025
ISO 17020

Certification of Product (good, service, process) for national and international use in the rail system.

Accreditation Body AB
ISO 17011
Conformity Assessment Body

Recent developments

Iran, on rail, towards the future



Recent developments

Standardization and technology

New research recently developed for assessment of a fire retardant coating, produced by an Iranian company, for a passenger wagon's seat shell.

EN and UIC standards introduce the test methods, also give important parameters and acceptance criteria.

Assessment of new material
And technologies

Recent developments

Holding the 8th international exhibition of rail transportation and related industries equipment.

Last word

Standardization does not necessarily mean taking big steps, but any action that is done in accordance with established guidelines and criteria is valuable. Therefore, in order to standardize the railway system, the culture of using and observing standards must be spread throughout the system.


THANK
YOU

INTERNATIONAL UNION
OF RAILWAYS

Implementation of the Ecological Strategy of the JSC “Russian Railways”.

Mr Andrei Lisicyn
Head of the Labour Protection, Industrial Safety and Ecological Control
RZD

Implementation of Environmental Strategy at JSC Russian Railways

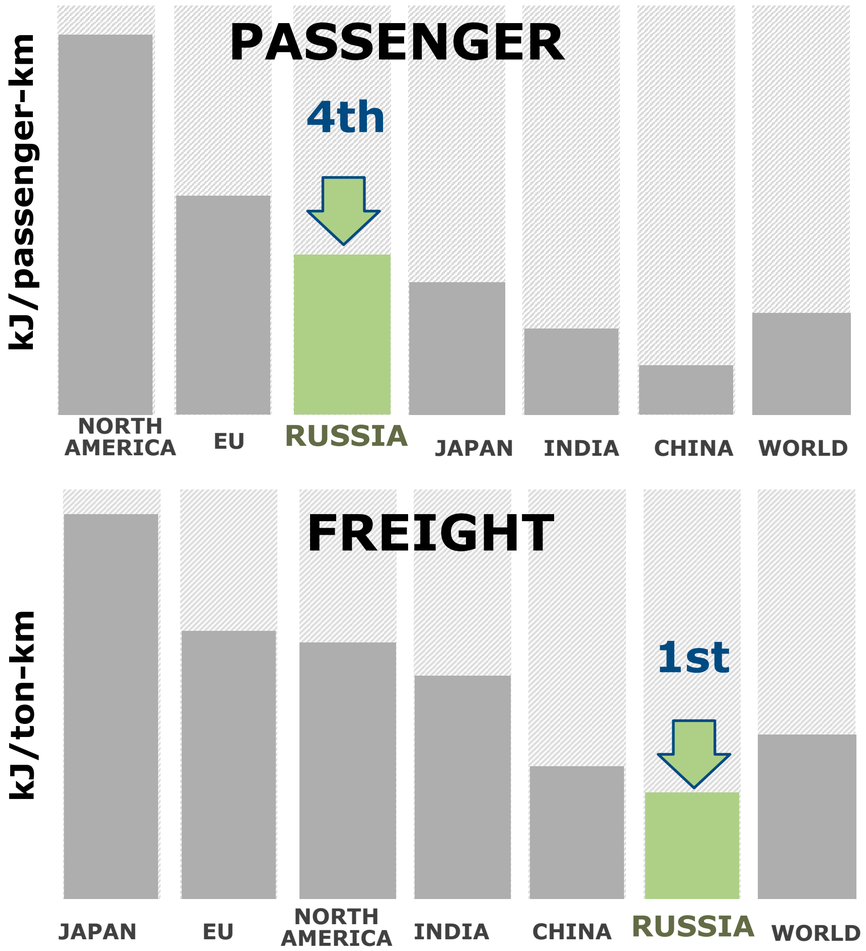
Head of Ecology, Labor Protection and Industrial Safety Department

Andrey Lisicyn

16 March 2021

IMPLEMENTATION OF GLOBAL SUSTAINABLE DEVELOPMENT GOALS

ENERGY EFFICIENCY OF RAILWAY TRANSPORTATION*



Декларация железнодорожного сектора в отношении вклада в решение проблем изменения климата

На пути к низкоуглеродному будущему

Мировое железнодорожное сообщество осознает, что достижение согласованной на международном уровне

Железная дорога — самый экологически чистый с точки зрения углеродосодержащих выбросов вид

масштабные, но достижимые цели, определяющие тот вклад, который железнодорожный сектор намерен внести в

Как член

обязуюсь взять на себя значимую роль в рамках деятельности по предотвращению изменения климата,

предпринимая все необходимое для снижения объема углеродосодержащих выбросов, обусловленных работой

моей компании, а также содействуя перераспределению акцентов в целях достижения более устойчивого баланса

между видами транспорта.

Для достижения этих целей я обязуюсь:

1. *Обеспечить снижение*

2. *На национальном и*

транспорта в пользу

3. *Активно продвигать способствующие решению климатической проблемы инициативы моей компании в 2015 году и в последующие годы — в целях повышения осознания, принятия и признания роли устойчивого транспорта в решении проблемы изменения климата;*

4. *Регулярно отчитываться перед МСЖД по таким показателям, как удельное энергопотребление и удельный объем выбросов CO_2 — в целях обеспечения и демонстрации постоянного совершенствования железнодорожного сектора на международном уровне.*

Москва, «30» сентября 2015 г.

О.В.Белозёров,
Президент ОАО «РЖД»

RAILWAY CLIMATE DECLARATION SIGNED BY RUSSIAN RAILWAYS ON 30 SEPTEMBER 2015

RAILWAY CLIMATE DECLARATION New 2019 Pledge SIGNED BY RUSSIAN RAILWAYS ON 15 JULY 2020

17 GLOBAL GOALS ARE IMPLEMENTED BY 193 COUNTRIES

** The Future of Rail report by International Energy Agency, New-Delhi, January 2019.*

RUSSIA'S NATIONAL DEVELOPMENT GOALS THROUGH 2030 AND JSC RUSSIAN RAILWAYS ENVIRONMENTAL STRATEGY

PRESIDENTIAL DECREE
AS OF 21 JULY 2020 NO. 474
ON THE NATIONAL DEVELOPMENT GOALS OF THE RUSSIAN FEDERATION FOR THE PERIOD UP TO 2030

PRESIDENTIAL DECREE
AS OF MAY 2018 NO. 204
ON THE NATIONAL GOALS AND STRATEGIC TASKS OF THE DEVELOPMENT OF THE RUSSIAN FEDERATION FOR THE PERIOD UP TO 2024

PRESIDENTIAL DECREE
AS OF 4 NOVEMBER 2020 NO. 666
ON GHG EMISSION REDUCTION

DECREE NO. 1228 OF THE GOVERNMENT OF THE RUSSIAN FEDERATION AS OF SEPTEMBER 21, 2019 ON THE RATIFICATION OF THE PARIS AGREEMENT

Reducing GHG emissions up to 70 percent compared to the 1990 level

Elimination of the most dangerous facilities with accumulated environmental damage and ecological recovery of waterbodies

Reducing the emissions of hazardous pollutants

Creating a sustainable system for solid waste management

ENVIRONMENTAL STRATEGY TARGET PARAMETERS - 2030

GHG emission reduction

(-5 %) (-11.7 %)

Reduced water use

(-28 %) (-33 %)

Reduced wastewater volumes

(-50 %) (-70 %)

Reduced stationary source pollution

(-35 %) (- 40 %)

Reduced mobile source pollution

(-3.5 %) (-7.4 %)

Dumped waste reduction

(-12 %) (-50 %)

CONSERVATIVE SCENARIO

INNOVATIVE SCENARIO

ECOLOGICAL SAFETY REGULATIONS

FEDERAL LEGISLATION

FEDERAL LAW	FEDERAL LAW	FEDERAL LAW	FEDERAL LAW	LAW OF THE RUSSIAN FEDERATION	FEDERAL LAW
7-FZ of 10 January 2002 on Environmental Protection	96-FZ of 4 May 1999 on the Protection of Atmospheric Air	89-FZ of 24 June 1998 on Production and Consumption Waste	167-FZ of 16 November 1995 Water Code	No. 2395-1 of 21 February 1992 on Subsoil	33-FZ of 14 March 1995 On Specially Protected Natural Territories

JSC RUSSIAN RAILWAYS MANAGEMENT SYSTEM POLICIES

45 REGULATORY DOCUMENTS ON ENVIRONMENTAL PROTECTION DEVELOPED SINCE 2007

8 COMPANY STANDARDS 10 STANDARD PROCEDURES 8 OPERATIONAL PROCEDURES 19 GUIDELINES AND ACTION PLANS

POLICY	ENVIRONMENTAL STRATEGY	CONCEPT	COMPANY STANDARDS 16.001-2011	COMPANY STANDARDS 16.002-2017	COMPANY STANDARDS 16.004-2017	COMPANY STANDARDS 16.005-2017
on labour and environmental protection and industrial and fire safety	up to 2030	of Environmental Management System Development at JSC Russian Railways	Environment Management System	Environmental Control. General Provisions	Conducting Environmental Audit	Waste Management. General Provisions
2007, 2013, 2020	2009, 2016, 2020	2012, 2021 (reviewed)	2011	2017	2017	2018

Documents establishing requirements for environmental responsibility assessment and performance

Documents defining environmental requirements

ECOLOGICAL SAFETY REGULATIONS

STANDARDS
to be approved in 2021

Russian National Standard Draft Compliance assessment. Environmental Requirements for High Speed Railway Transport Infrastructure (Green Standard)

Russian Railways Company Standard Draft Occupational Safety Management System. General Provisions (reviewed Russian Railways Company Standard 16.001–2016)

Russian Railways Environment Management System Draft Environmental Control. General Provisions (reviewed Russian Railways Company Standard 16.002-2017)

Russian Railways Company Standard Draft Environment Management System at JSC Russian Railways. Guidelines for implementation and conduct of internal audits and inspections (reviewed Russian Railways Company Standard 16.004-2017)

Russian Railways Company Standard Draft Territories of Russian Railways infrastructure objects. Environmental requirements

ENVIRONMENTAL CONTROL AND MONITORING SYSTEM

RUSSIAN FEDERAL SERVICE FOR HYDROMETEOROLOGY AND ENVIRONMENTAL MONITORING LICENSE R/2020/4095/100/L OF SEPTEMBER 8, 2020

- IN 2020 FEDERAL SERVICE FOR HYDROMETEOROLOGY AND ENVIRONMENTAL MONITORING GRANTED A **PERPETUAL** LICENSE TO RUSSIAN RAILWAYS FOR IMPLEMENTATION OF ACTIVITIES IN HYDROMETEOROLOGY AND RELATED FIELDS
- ECOLOGICAL CERTIFICATES ARE BEING DEVELOPED FOR EACH RUSSIAN RAILWAYS FACILITY

12 ECOLAB TRAIN CARS

56 STATIONARY ENVIRONMENTAL LABORATORIES

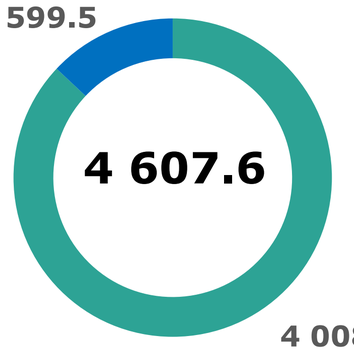
53 VEHICLE ENVIRONMENTAL LABORATORIES

ENERGY INTENSITY REDUCTION AND CLEAN ENERGY USE

ENVIRONMENTAL STRATEGY through 2030

Russian Railways Long-Term Development Programme until 2030

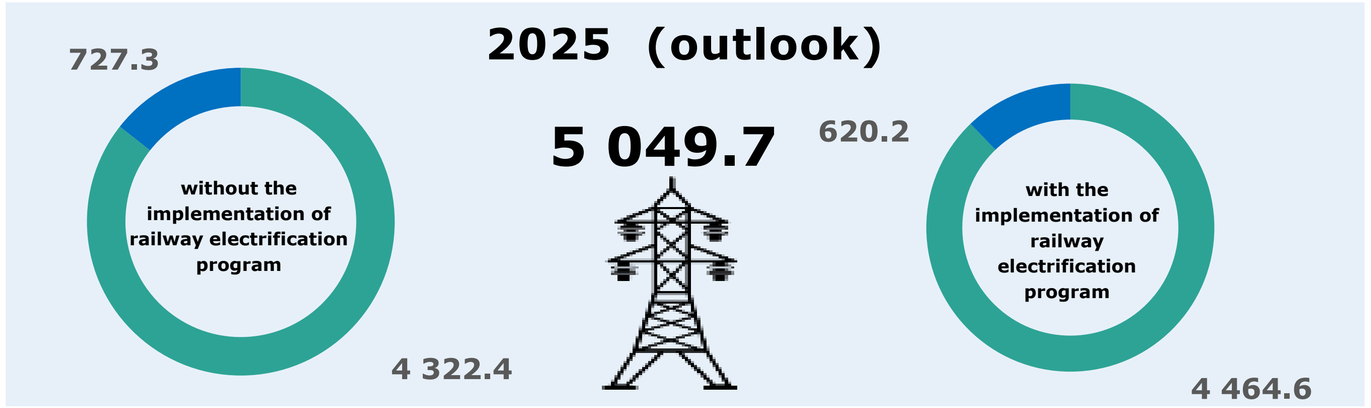
2020



RAILWAY ELECTRIFICATION

TRAFFIC INDICATORS, BILLION TONNES KM GROSS

2025 (outlook)



FREIGHT TURNOVER **ELECTRIC TRACTION**

FREIGHT TURNOVER **DIESEL TRACTION**

USING RENEWABLE ENERGY SOURCES AT RUSSIAN RAILWAYS FACILITIES

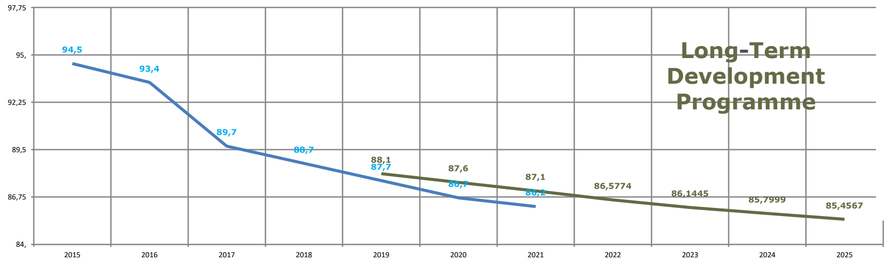
EMISSION REDUCTION by 2025

by 458

thousand tonnes of CO_2-equiv.

(-5.7% compared to the 2020 level)

INDUSTRIAL ENERGY CONSUMPTION



2020	2021
- 1.0%	- 0.6%
REDUCTION OF ENERGY INTENSITY OF PRODUCTION IN 2020	REDUCTION OF ENERGY INTENSITY OF PRODUCTION IN 2021

4.0 PJ

IMPROVING ENERGY EFFICIENCY IN MANUFACTURING

RUR 3.1 BILLION

IMPLEMENTATION OF ENERGY EFFICIENCY MEASURES SAVINGS PLAN

MAIN ACTIVITIES ON THE REDUCTION OF NEGATIVE IMPACT ON THE ENVIRONMENT

ACTIVITIES WITH **COMMERCIAL AND ENVIRONMENTAL** EFFICIENCY

REDUCING DIRECT IMPACT ON THE ENVIRONMENT

TRANSFER OF FUEL OIL, DIESEL AND COAL BOILER HOUSES TO PURE FUELS

2021–2023 – **10** units
2021 – **8** units

EQUIPPING LOCOMOTIVES WITH RESOURCE-SAVING ONBOARD SYSTEMS (REDUCING THE CONSUMPTION OF DIESEL FUEL)

2021–2023 – **1 589** units
2021 – **351** units

REDUCING INDIRECT IMPACT ON THE ENVIRONMENT

IMPLEMENTATION OF LED LIGHTING AT THE COMPANY'S FACILITIES

2021–2023 – **26** units
2021 – **6** units

EQUIPPING LOCOMOTIVES WITH RESOURCE-SAVING ONBOARD SYSTEMS (REDUCING THE ELECTRIC POWER CONSUMPTION)

2021–2023 – **4 186** units
2021 – **42** units

INSTALLATION OF ENERGY METERING DEVICES

2021–2023 – **64** units
2021 – **74** units

ACTIVITIES WITH **ENVIRONMENTAL AND LOW COMMERCIAL** EFFICIENCY

REDUCING DIRECT IMPACT ON THE ENVIRONMENT

INSTALLATION OF POWER SOURCES BASED ON RENEWABLE ENERGY SOURCES

2021–2023 – **133** units
2021 – **0** units

TRANSFER OF SMALL COAL BOILERS TO ELECTROTHERMIC/ THERMAL PUMPS

2021–2023 – **49** units
2021 – **0** units

INSTALLATION OF WASTEWATER ACCOUNTING DEVICES

2021–2023 – **98** units
2021 – **0** units

REDUCING INDIRECT IMPACT ON THE ENVIRONMENT

REPLACING OIL-FILLED EQUIPMENT WITH DRY (TRANSFORMERS, SWITCHES)

2021–2023 – **7 988** units
2021 – **0** units

INSTALLATION OF SOLAR POWER GENERATION DEVICES

2021–2023 – **13** units
2021 – **0** units

INTRODUCTION OF REACTIVE POWER COMPENSATION DEVICES IN THE TRACTION POWER SUPPLY SYSTEM

2021–2023 – **53** units
2021 – **0** units

NEW INVESTMENT FINANCING TOOL – RZD GREEN BOND FRAMEWORK

ECO-FRIENDLY TRACTION EQUIPMENT

AS PART OF THE INVESTMENT PROGRAM, RUSSIAN RAILWAYS ACQUIRES MODERN ELECTRIC LOCOMOTIVES AND DIESEL LOCOMOTIVES WITH IMPROVED ENERGY EFFICIENCY, FUEL EFFICIENCY, AND REDUCED EMISSION CHARACTERISTICS

NATURAL GAS

- Creating new locomotives working on natural gas
- Modernization of locomotives for gas and diesel

2022
supply of shunting gas and diesel locomotives

2024
supply of mainline gas and diesel locomotives

RECHARGEABLE BATTERIES

EMKA2 - Hybrid contact-battery electric locomotive of direct current with asynchronous drive and onboard energy storage

2021
Development of engineering documentation. Production of EMKA2 No. 001

2022
Maintenance testing

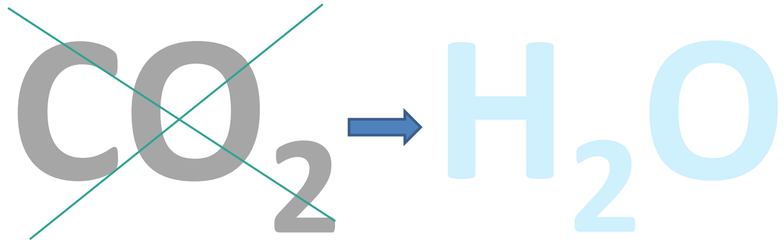
2023
Start of serial locomotives delivery

DEVELOPMENT OF HYBRID ELECTRIC LOCOMOTIVE WITH ELECTRIC BATTERY BASED ON ES2G *LASTOCHKA*

HYDROGEN CELLS

Complex hydrogen technology, which includes hydrogen production and transportation, refueling, operation and maintenance in **hydrogen powered trains**

PILOT PROJECT IS IMPLEMENTED AT SAKHALIN TEST SITE



2021 – 2023
train creation, prototype testing

2024
commissioning with passengers

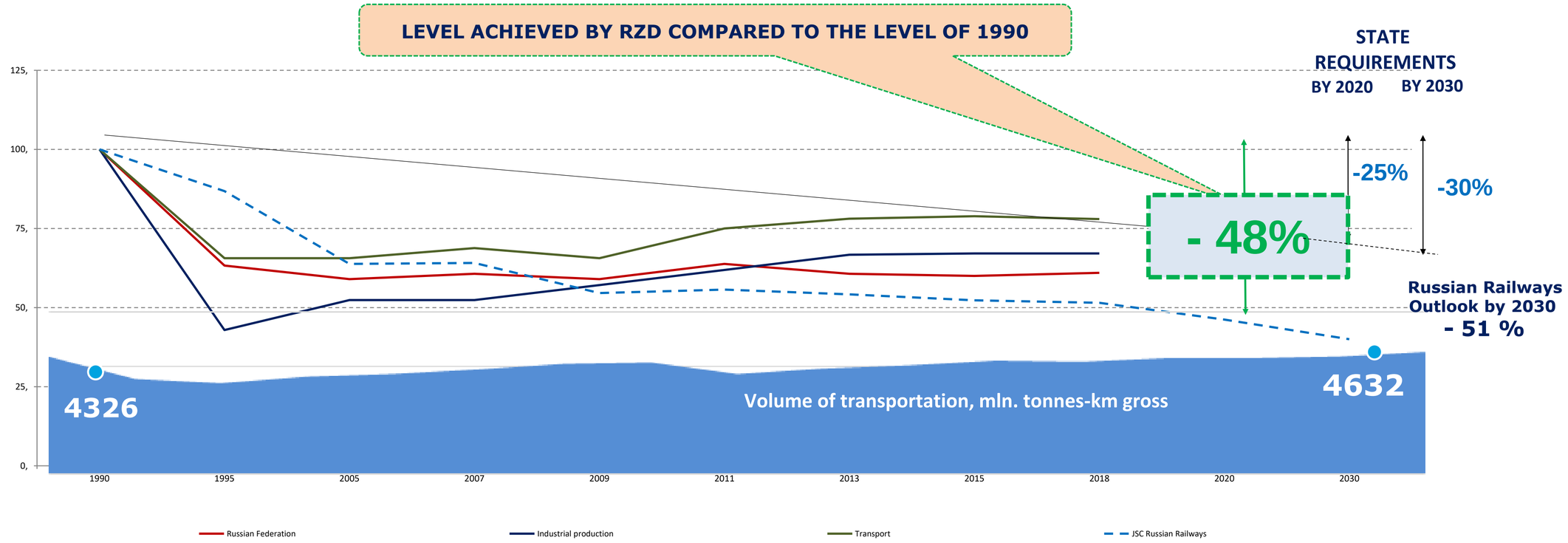
REDUCING CARBON INTENSITY OF RUSSIAN RAILWAYS SERVICES

ACCOUNTING AND MANAGEMENT SYSTEM

- ✓ OBLIGATIONS
- ✓ WORKING GROUP
- ✓ METHODS
- ✓ AUTOMATION
- ✓ PROGRAMME

RESULTS OF CARBON TRACE REDUCTION*

Russian Railways ACHIEVED the national GOAL on reducing the emission of GHG to 75% of the level indicated in 1990 by 2020**



NEW GOAL on reducing the emission of GHG to 70% of the level indicated in 1990 by 2030***

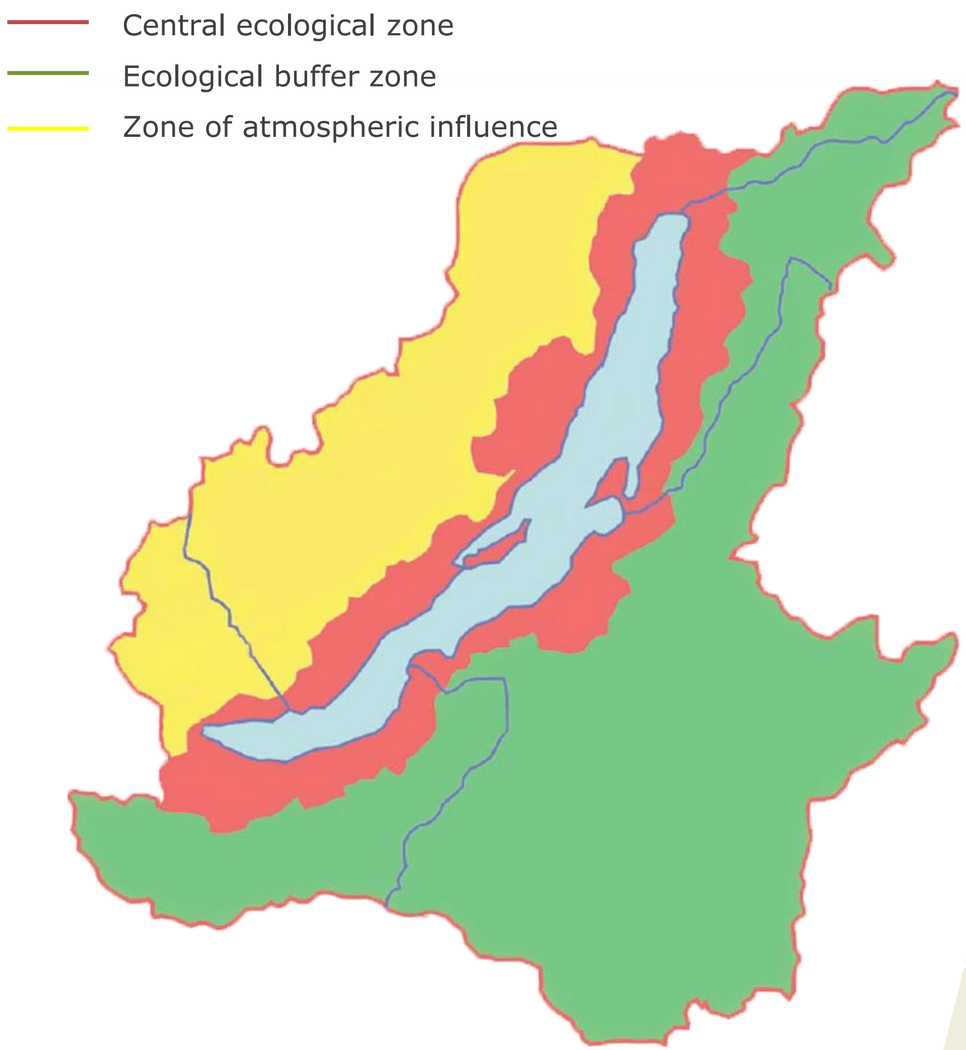
** - according to the National Report of the Russian Federation 1990–2018*

*** Decree of the President of the Russian Federation, 2013 No. 752*

**** Decree of the President of the Russian Federation, 2020 No. 666*

RECONSTRUCTION AND CONSTRUCTION SITES OF BAIKAL-AMUR MAINLINE AND TRANS-SIBERIAN RAILWAY IN THE BAIKAL NATURAL TERRITORY

Ecological zones of the Baikal Natural Territory



144 *sites* — ***RECONSTRUCTION AND CONSTRUCTION***

CENTRAL ECOLOGICAL ZONE	ECOLOGICAL BUFFER ZONE	ZONE OF ATMOSPHERIC INFLUENCE
53	68	23

81 *sites* — ***APPROVED BY STATE ENVIRONMENTAL EXPERT REVIEW***

CENTRAL ECOLOGICAL ZONE	ECOLOGICAL BUFFER ZONE	ZONE OF ATMOSPHERIC INFLUENCE
34	36	11

80 *sites* — ***APPROVED BY STATE TECHNICAL EVALUATION GROUP***

CENTRAL ECOLOGICAL ZONE	ECOLOGICAL BUFFER ZONE	ZONE OF ATMOSPHERIC INFLUENCE
33	35	12

at **69** *sites* — ***CONSTRUCTION AND INSTALLATION WORKS IN PROGRESS***

CENTRAL ECOLOGICAL ZONE	ECOLOGICAL BUFFER ZONE*	ZONE OF ATMOSPHERIC INFLUENCE
18	41	10

SEE – State Ecological Expertise

STE – State Technical Expertise

*** 5 projects do not require expert review**

TASKS FOR IMPLEMENTATION OF ENVIRONMENTAL PROTECTION ACTIVITIES

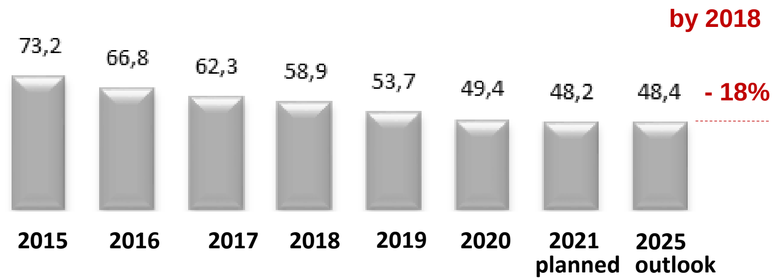
KEY INDICATORS OF NEGATIVE ENVIRONMENTAL IMPACT

2020 compared to 2019		2021 compared to 2020
4 thousand tonnes -8 %	Reduced stationary source air pollution	1.3 thousand tonnes - 2,5 %
0.6 $kgCO_2$/change -0,8 %	GHG emission reduction	0.7 $kgCO_2$/change - 1 %
248 thousand m^3	Reduction of discharges of contaminated wastewater into water bodies and terrain	160 thousand m^3
1.6 mln. m^3	Reduced water use	1.7 mln.m^3
5 sites	Elimination of facilities with accumulated environmental damage	2 unfinished sites

MAIN AREAS OF WORK ON PROTECTION OF THE ENVIRONMENT PERFORMED BY RUSSIAN RAILWAYS

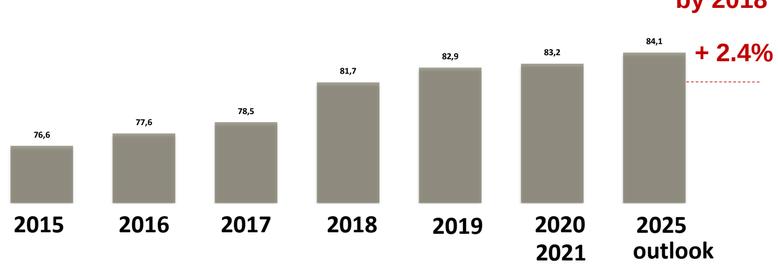
1. ***MEASURES TO REDUCE THE NEGATIVE IMPACT ON THE ENVIRONMENT***
2. ***IMPLEMENTATION OF THE BEST AVAILABLE TECHNOLOGIES AND SCIENTIFIC DEVELOPMENTS***
3. ***ELIMINATION OF FACILITIES WITH ACCUMULATED ENVIRONMENTAL DAMAGE***
4. ***ENVIRONMENTAL AWARENESS AND ECOLOGICAL EDUCATION AND LEARNING ACTIVITIES***
5. ***MEASURES AIMED AT CONSERVATION OF SPECIALLY PROTECTED NATURAL AREAS***

EMISSIONS OF POLLUTANTS, THOUSAND T



DISCHARGE OF CONTAMINATED WASTEWATER, MLN M3 (discharge into surface water bodies and terrain)

WASTE DECOMPOSITION AND CIRCULAR ECONOMY PRACTICES %



THANK YOU FOR YOUR ATTENTION!

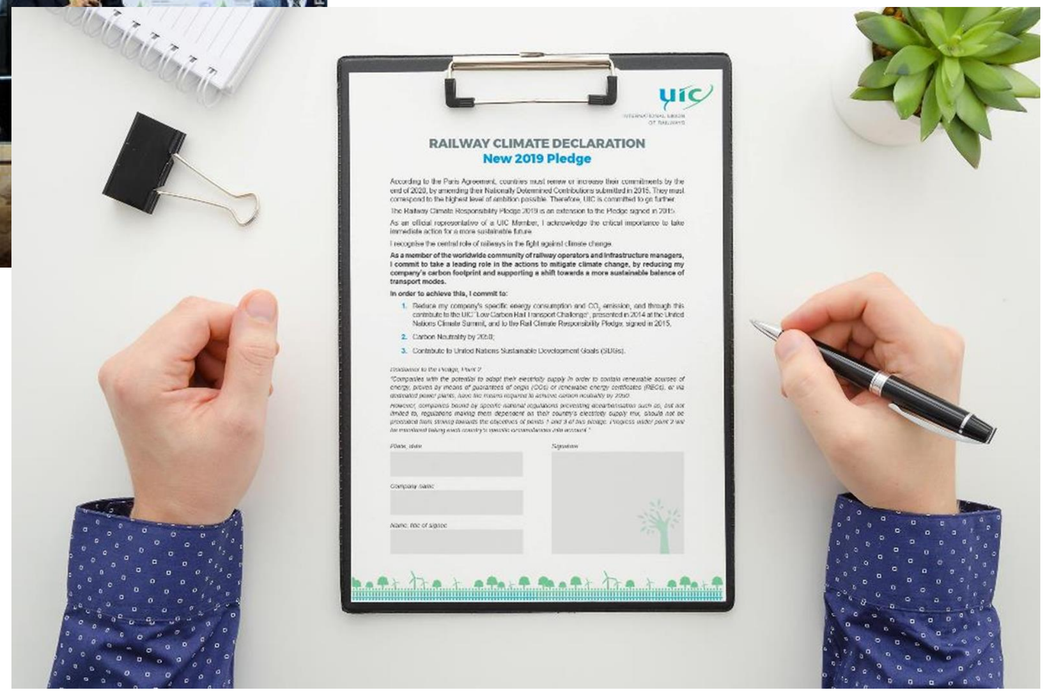
INTERNATIONAL UNION
OF RAILWAYS

The role of standards in getting on track for sustainable mobility

Mrs Lucie Anderton

UIC Head of Sustainability


Nations Unies
Conférence sur les Changements Climatiques 2015
COP21/CMP11
Paris, France
PRESIDENT
PRESIDENT


RAILWAY CLIMATE DECLARATION
New 2019 Pledge
According to the Paris Agreement, countries must renew or increase their commitments by the end of 2020, by amending their Nationally Determined Contributions submitted in 2015. They must correspond to the highest level of ambition possible. Therefore, UIC is committed to go further
The Railway Climate Responsibility Pledge 2019 is an extension to the Pledge signed in 2015.
As an official representative of a UIC Member, I acknowledge the critical importance to take immediate action for a more sustainable future.
I recognise the central role of railways in the fight against climate change.
As a member of the worldwide community of railway operators and infrastructure managers, I commit to take a leading role in the actions to mitigate climate change, by reducing my company's carbon footprint and supporting a shift towards a more sustainable balance of transport modes.
In order to achieve this, I commit to:
1. Reduce my company's specific energy consumption and CO_2 emission, and through this contribute to the UIC 'Low Carbon Rail Transport Challenge', presented in 2014 at the United Nations Climate Summit, and to the Rail Climate Responsibility Pledge signed in 2015.
2. Carbon Neutrality by 2050;
3. Contribute to United Nations Sustainable Development Goals (SDGs).
Company name:

COP26: A Decade to Deliver

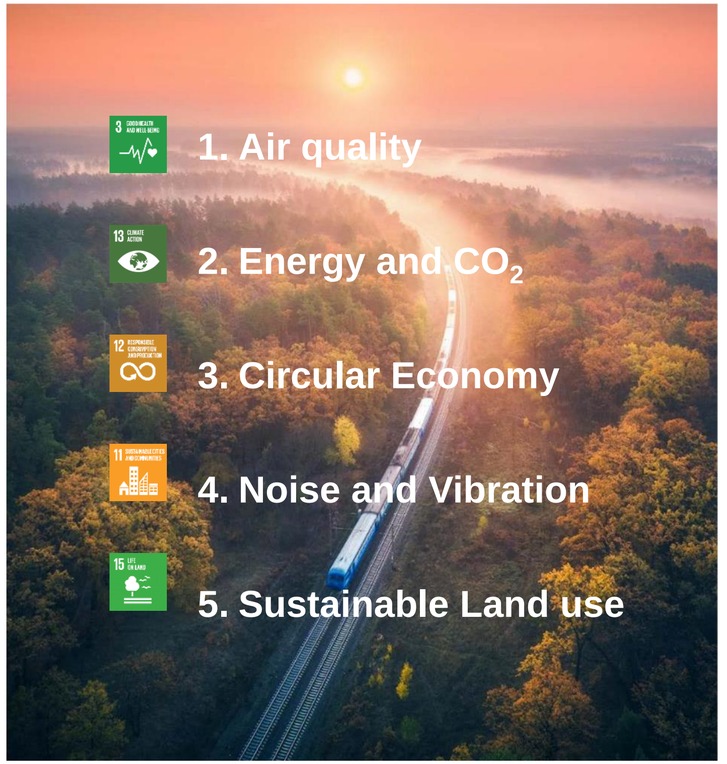
Ten years to transform our world

The time is now to accelerate sustainable solutions to all the world's biggest challenges

The UIC Sustainability Platform

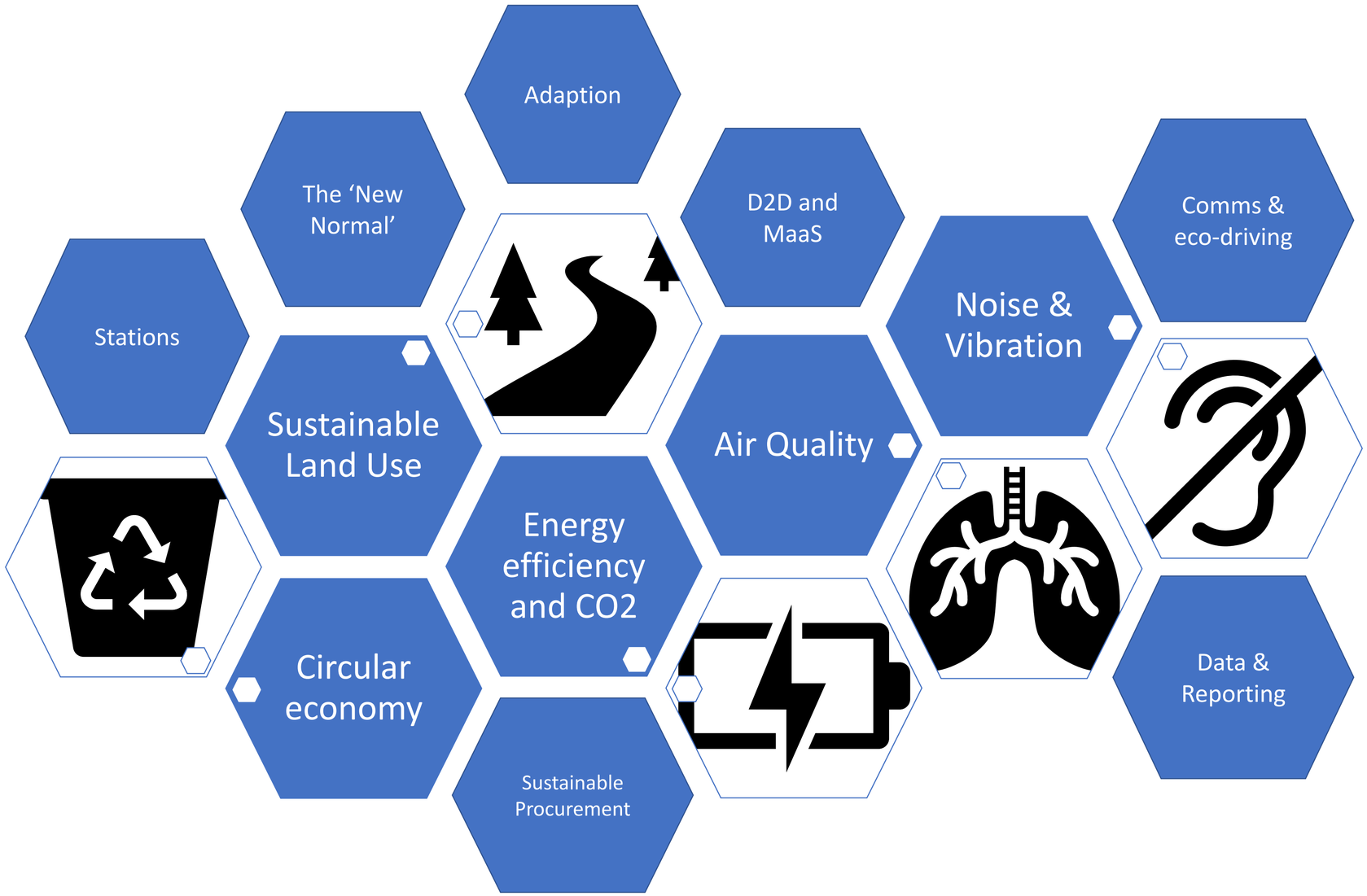
- Set **the vision,**
- Provide **the tools and**
- Convene **the community.**

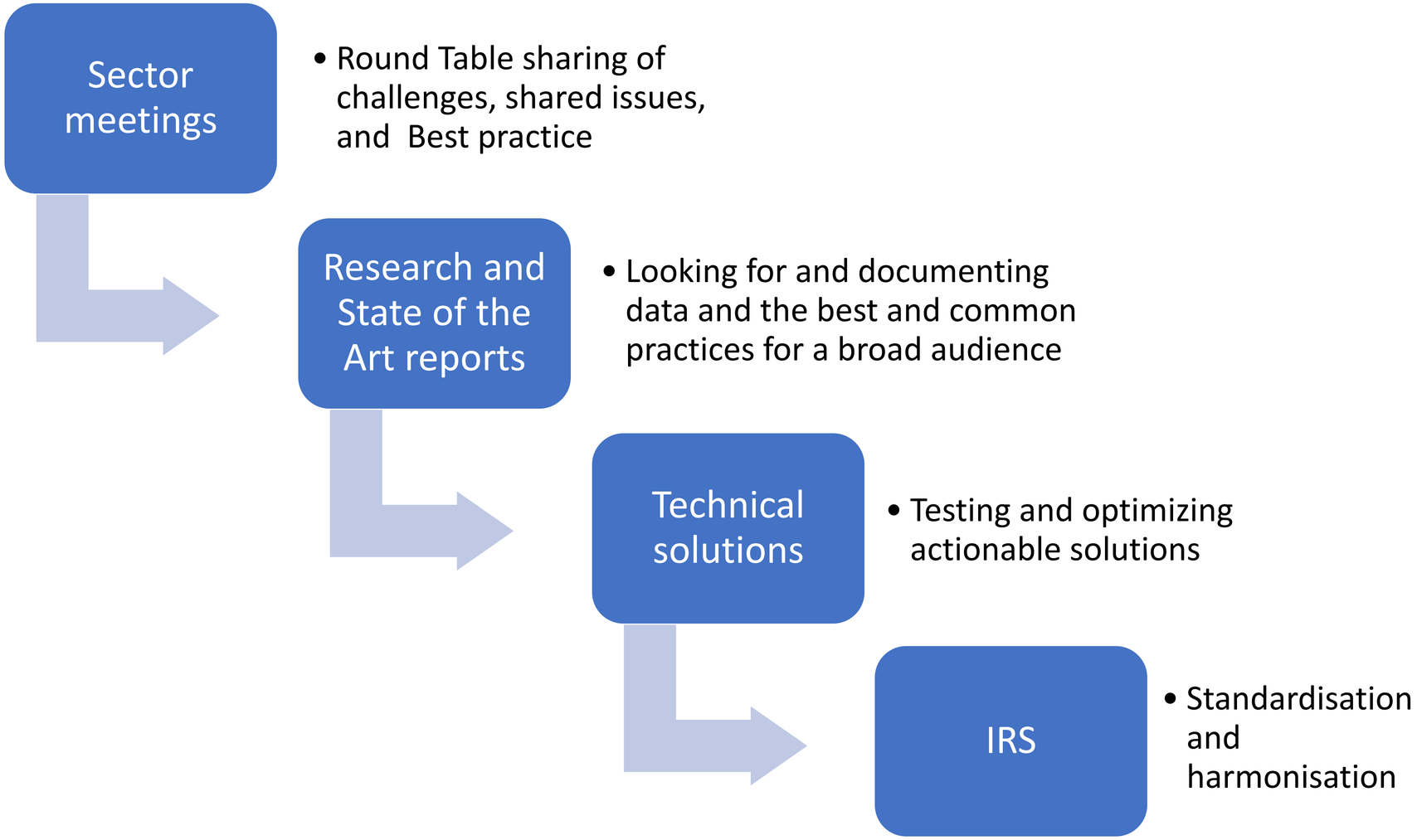
To empower the global railway community to be a driving force in a green recovery through collaborative knowledge and advocacy.



Our Vision

A railway that supports a green recovery as the **backbone of sustainable mobility**. Connectivity that contributes to healthy and sustainable lifestyles and economies on every continent – that is zero emissions, a community hub, accessible for all, and is both biodiverse and a good neighbour.


Adaption
The ‘New Normal’
D2D and MaaS
Comms & eco-driving
Stations
Sustainable Land Use
Noise & Vibration
Air Quality
Energy efficiency and CO2
Circular economy
Sustainable Procurement
Data & Reporting


Sector meetings
• Round Table sharing of challenges, shared issues, and Best practice
Research and State of the Art reports
• Looking for and documenting data and the best and common practices for a broad audience
Technical solutions
• Testing and optimizing actionable solutions
IRS
• Standardisation and harmonisation

Sustainability published

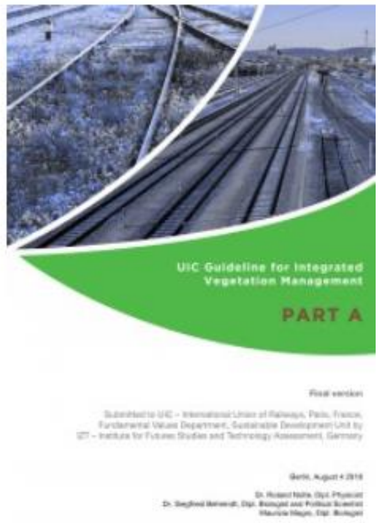
Sustainable Land Use

- TRISTRAM to be publish soon

IRS 70723

- IRS 70723: Technical aspects of vegetation control and tree risk management guidance and recommendation –2020

- Herbie - UIC Guideline for Integrated Vegetation Management - 2018



ECOLOGICAL EFFECTS OF RAILWAYS ON WILDLIFE
REVERSE

TRISTRAM
TRANSITION STRATEGY ON VEGETATION MANAGEMENT

https://uic.org/IMG/pdf/uic_tristram_strategy_on_the_future_of_vegetation_control.pdf

Energy Efficiency and CO2 emissions

- https://www.shop-etf.com/en/traction-energy-settlement-and-data-exchange

Traction Energy Settlement and Data Exchange
IRS 90930

https://uic.org/IMG/pdf/uic_rail_infrastructure_111104.pdf


Matthias Tuchschmid

ifeu

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Carbon Footprint and environmental impact of Railway Infrastructure

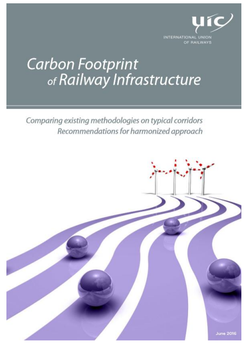
Heidelberg – Zürich – Berlin
04.11.2011

Matthias Tuchschmid
Fellenbergweg 14
CH-8057 Zürich
info@mtuchschmid.ch

commissioned by
International Union of Railways (UIC

- https://www.shop-etf.com/en/data-exchange-with-driver-advisory-systems-das-following-the-sfera-protocol

Data Exchanges with Driver Advisory Systems: SFERA
IRS 90940



https://uic.org/IMG/pdf/carbon_footprint_of_railway_infrastructure.pdf

Noise and Vibration

https://www.shop-etf.com/en/freight-noise-focus-uic-noise-network-uic-action-programme-noise-reduction-freight-traffic

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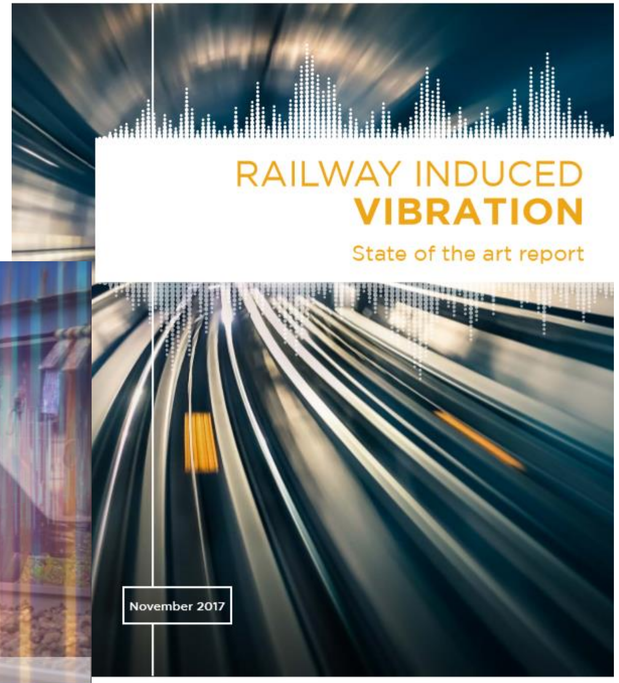
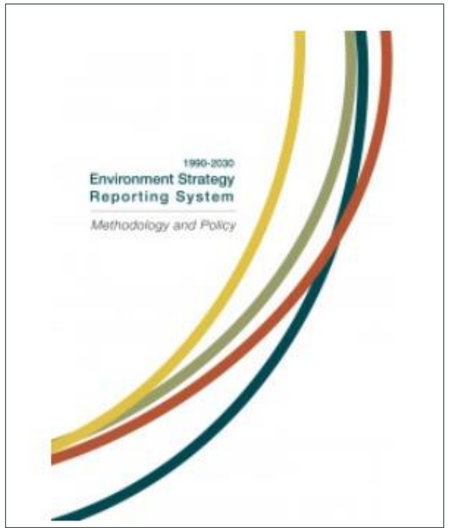


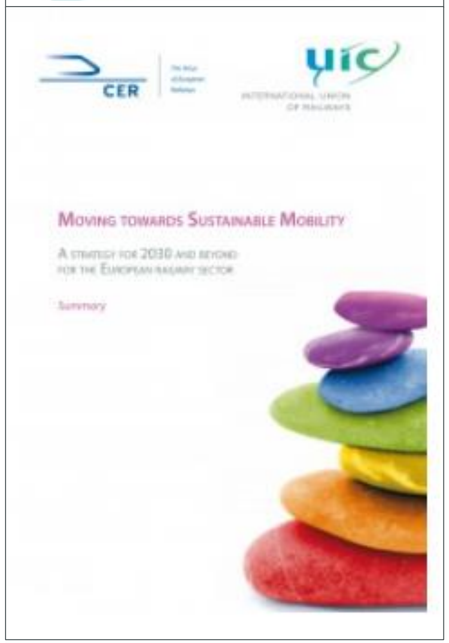
https://uic.org/IMG/pdf/uic-railway-induced-vibration-report-2017.pdf

Sustainability data and reporting for rail

New IRS in the making…

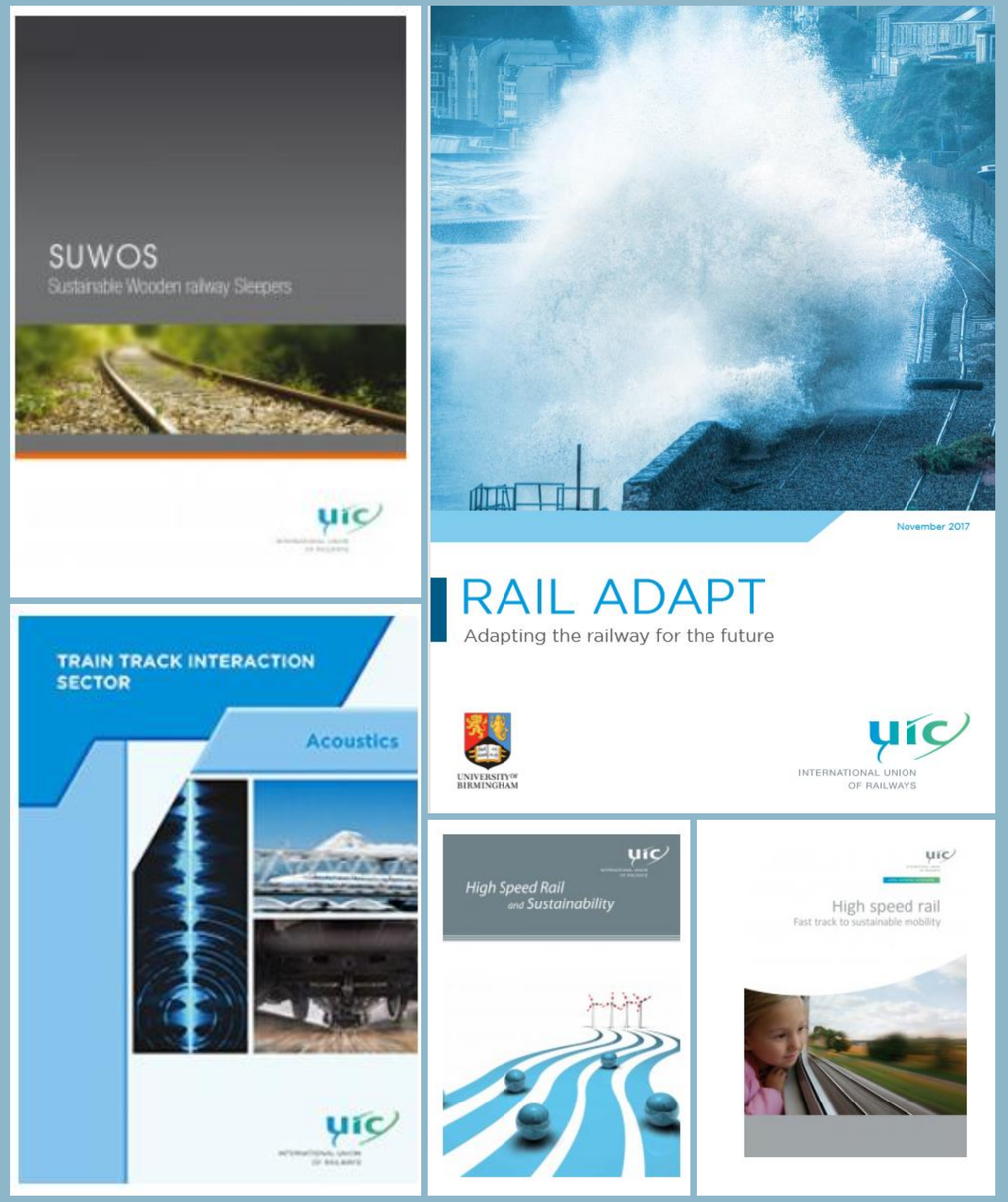
- Creating a document that helps Sustainability managers of railway companies (IM or RU) to make the right assessment and report it in a standardised structure.
- UIC launched in 2020, a project dedicated to revaluate and gather broad sustainability reporting Key Performance Indicators and create or update the methodology into new guidelines.





- This project will align to the SDG RAILindex
- The project shall propose a revised guide for reporting railway KPIs against SDGs with a methodology background

Embedding Sustainability



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Stay in touch with UIC:

www.uic.org

#UICrail

Thank you for your attention.

INTERNATIONAL UNION OF RAILWAYS

North American Freight Railroads and Climate Change.”

Theresa L. Romanosky; Assistant General Counsel
Association of American Railroads

How North American Freight Railroads are Combatting Climate Change

March 16, 2021

ASSOCIATION OF AMERICAN RAILROADS

Read Our New Report at
AAR.org/Climate-Change

The Association of American Railroads

Helping Keep Railroads Safe & Productive Since 1934

- ✓ Policy making
- ✓ Standard setting, research and tech
- ✓ Data, reports and publications

Supporting the rail industry

- ✓ 7 North American Class I railroads
- ✓ Amtrak, commuter railroads and short lines
- ✓ Rail supply companies
- ✓ Engineering, signal and communications firms
- ✓ Rail car owners

AAR's Role in Sustainability & Climate Change

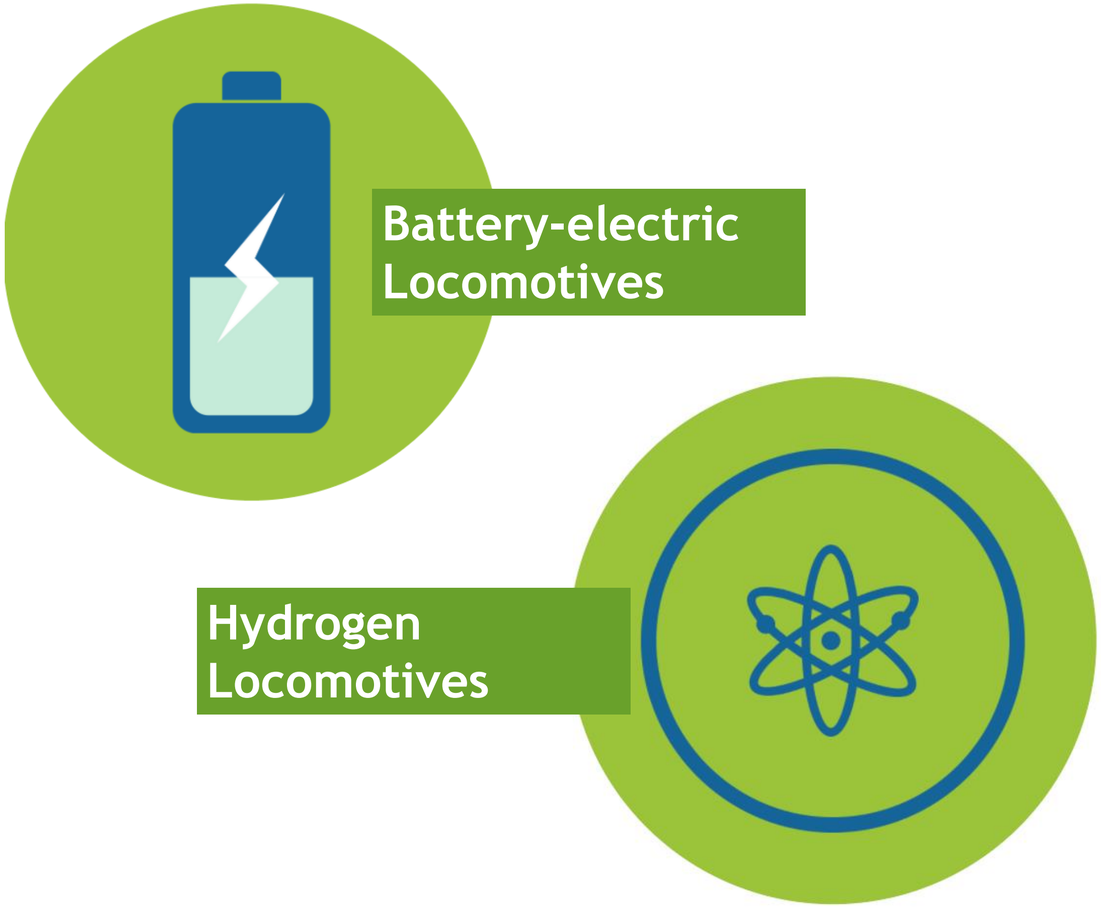
Communicate with policymakers and the public about sustainable industry practices

Collect and distribute data about North American rail industry environmental benefits and fuel efficiency

Provide forums to inform our members about technology and innovation related to sustainability

Planning for a Lower Carbon Future

Several Class I railroads are involved in prototype testing and proof-of-concept testing programs for new locomotive technologies



Committed to Reducing GHG Emissions

CP, CN, CSX, KCS and UP are participating in the Science Based Targets Initiative (SBTi)

Other AAR members report emissions to the Climate Disclosure Project (CDP)

Railroads are also taking creative approaches to combatting climate change

Supporting Policies to Fight Climate Change

Questions?

AAR.ORG

BI-WEEKLY NEWSLETTER
AAR.ORG/SIGNAL

@AAR_FREIGHTRAIL

FREIGHTRAIL

ASSOCIATION OF AMERICAN RAILROADS

INTERNATIONAL UNION
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Questions

&

Answers

INTERNATIONAL UNION
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CONCLUSION AND CLOSE

INTERNATIONAL UNION
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BREAK

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standardisdation@uic.org

Thank you for your attention.