



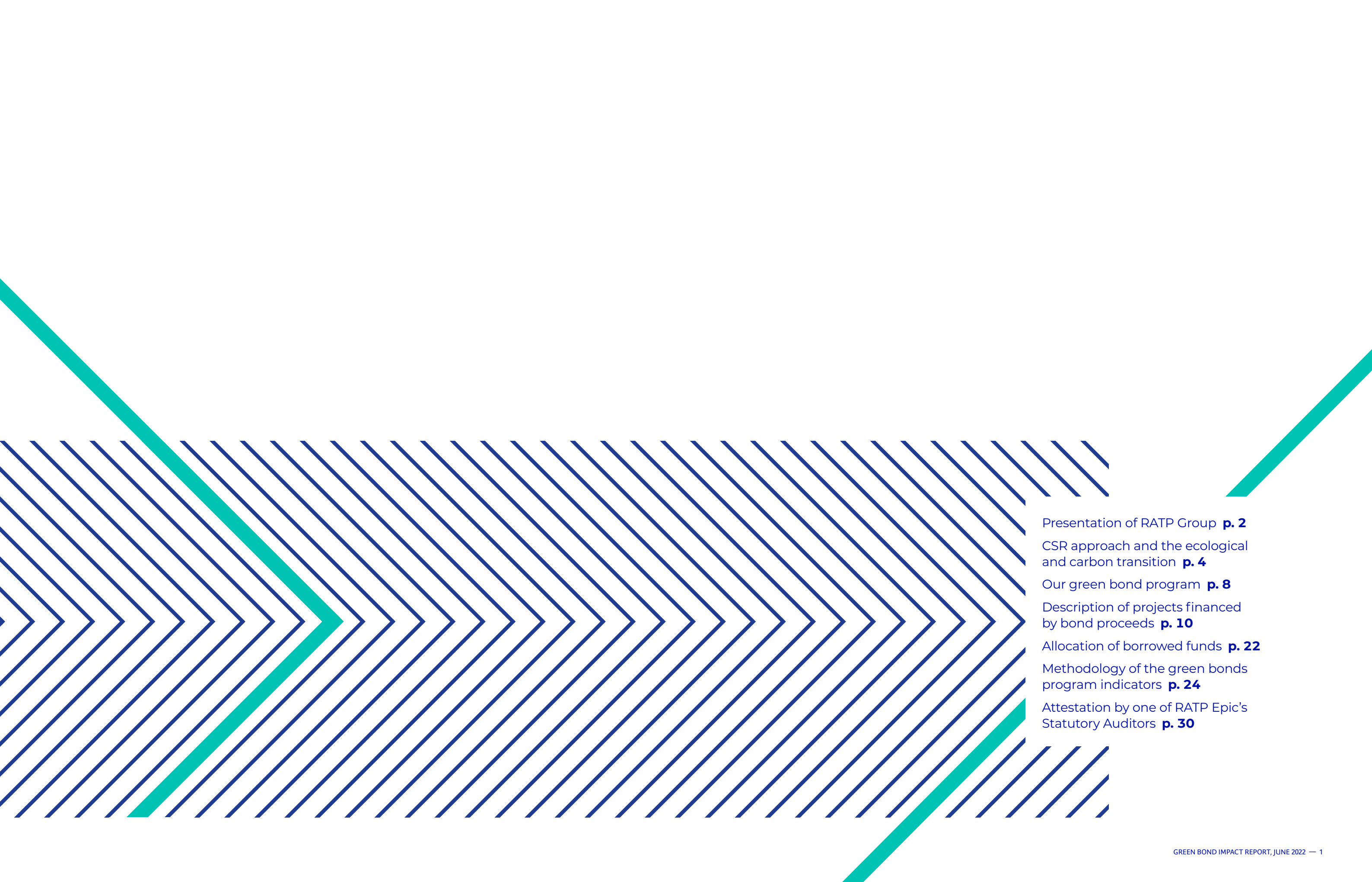
# RATP Green Bond

impact report

JUNE 2022

**RATP  
GROUP**

Moving towards  
a better city



Presentation of RATP Group	<b>p. 2</b>
CSR approach and the ecological and carbon transition	<b>p. 4</b>
Our green bond program	<b>p. 8</b>
Description of projects financed by bond proceeds	<b>p. 10</b>
Allocation of borrowed funds	<b>p. 22</b>
Methodology of the green bonds program indicators	<b>p. 24</b>
Attestation by one of RATP Epic's Statutory Auditors	<b>p. 30</b>

# A leading and committed group

RATP Group has developed unique long-standing expertise as a multimodal operator and is one of the world's top four leaders in urban mobility. RATP Group is drawing on six areas of expertise to build the city of tomorrow.

> Urban mobility > Urban services > Infrastructure management > Engineering > Sponsorship > Security

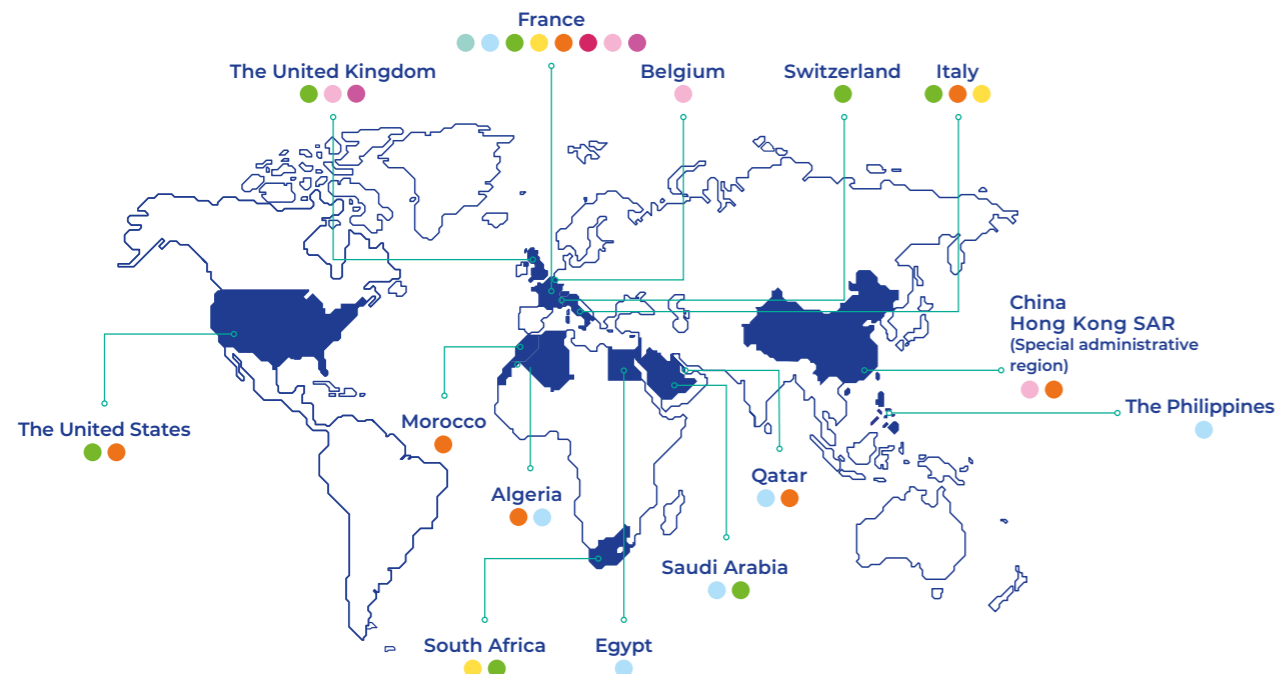
## 8 transport modes operated



## 5 partnerships in new forms of mobility



## 14 countries on 4 continents

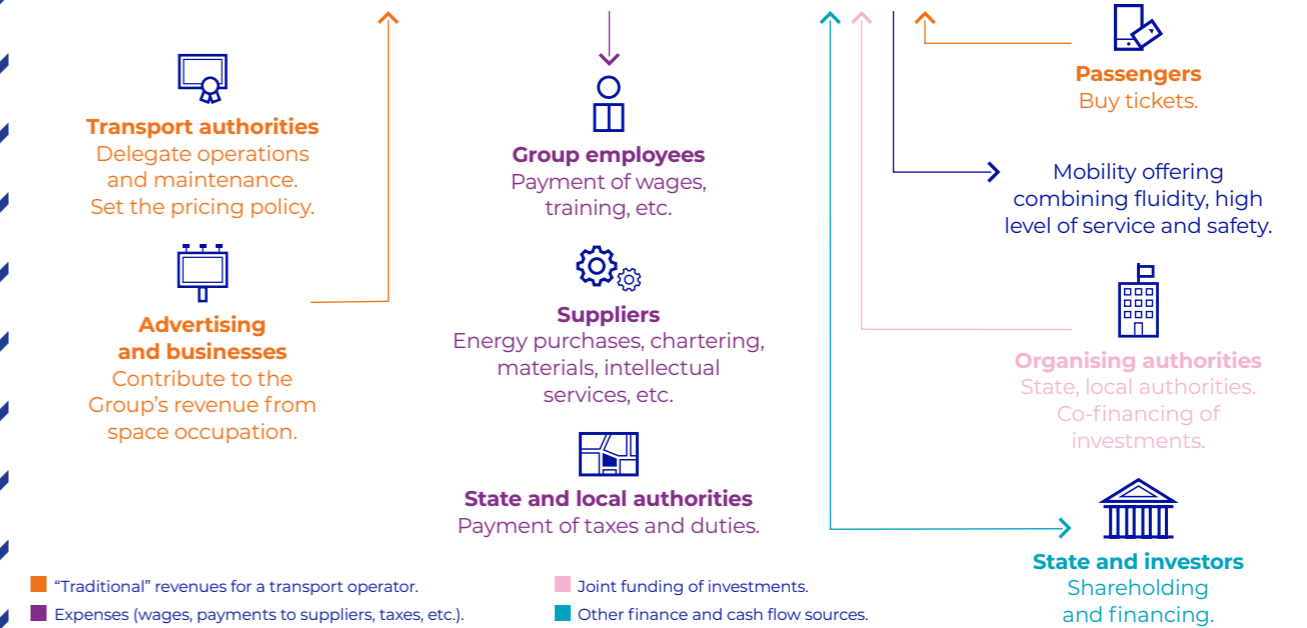


## Focus on our 6 areas of expertise

### Mobility

A business model integrating a broad ecosystem of stakeholders

- RATP** is a major player in urban public transport in the Île-de-France region, operating a multi-modal network currently under a monopoly.
- RATP CQP ÎLE-DE-FRANCE** is the subsidiary dedicated to the development and operation of new urban and suburban transport markets in the Île-de-France region.
- RATP DEV** is the subsidiary that develops and manages contracts for operating transport networks outside of RATP's long-standing market, in France and internationally, through approximately one hundred subsidiaries.



### Urban services

**RATP Solutions Ville** enhances and complements RATP Group's core expertise by combining city-related services run by four subsidiaries and by exploring new activities (energy, urban logistics, etc).

**RATP Real Estate:** real estate management and engineering for RATP Group.

**RATP Connect:** specialising in the roll-out of fibre optic.

**RATP Habitat:** management and construction of social housing in Île-de-France region.

**RATP Capital Innovation:** equity investments in targeted companies or investment funds, in line with the key areas of innovation and development: new forms of mobility and smart cities.

**RATP Smart Systems:** design, integration, operation, and maintenance of ticketing, multimodal information, and operational support systems.

**RATP Travel Retail:** marketing and management of commercial spaces in transport facilities.

**RATP Maintenance Services:** maintenance of lifts and escalators and installation of security systems (airports, hospitals, large developments, etc.).

### Infrastructure management

RATP manages the infrastructure of the metro and RER lines it operates. It is responsible for the maintenance and upgrading of existing infrastructure and for the technical management of the future Grand Paris Express network.

### Engineering

The Group has the engineering and know-how to deliver safe solutions in all transports modes while respecting costs and deadlines.

**Systra:** RATP's 43.3% holding via RATP Coopération.

### Sponsorship

For over twenty years, the RATP Group Foundation has embodied the human values of RATP Group. It supports general interest projects in the heart of the locations where we have a presence, in France and abroad.

### Safety

The group has recognised expertise in the field of safety, with the EPIC having a preventive and safety role for people and property on its networks and infrastructures under the terms of exclusive rights. Its organisation has recently evolved to meet the challenges of tomorrow, as part of the process of opening up to competition.

# RATP Group: a long-term commitment to Corporate Social Responsibility

RATP Group continues to demonstrate its commitment to being a world leader in urban, sustainable and connected mobility. Its drive is to be the privileged partner of smart cities.

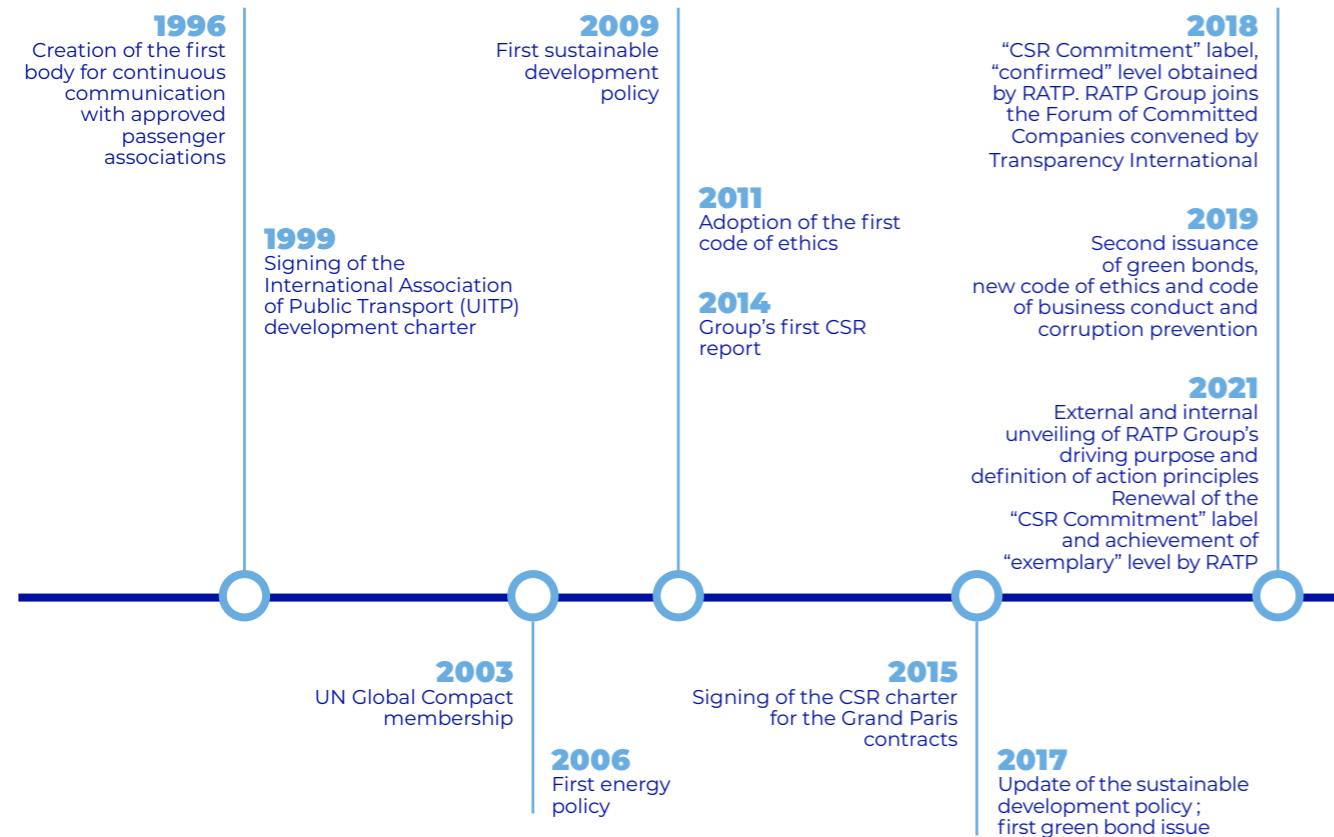
The Corporate Social Responsibility (CSR) policy is fully in line with this goal and emphasizes the proactive and ambitious role that RATP is playing in energy transition and sustainable development.

RATP Group naturally contributes to the UN's sustainable development goals. Detailed information available in the 2020 Financial and CSR report.



The Group's CSR commitment has always been long-term and on a voluntary basis. It has shown promising results in its performance so far. In 2017, in addition to a new and even more ambitious CSR policy, it was natural for the Group to consider launching an inaugural Green Bond. The operation was renewed in 2019.

Below, are some of the emblematic dates regarding this commitment:



## The Group CSR policy is based on three strategies

**Be a major player in mobility and sustainable cities**

It is set out in a roadmap that is made available to our internal stakeholders and regularly updated:

- Establish a connected and accessible mobility offering
- Act in favour of environmental health
- Encourage urban integration and functional diversity

**Reduce our environmental footprint**

- Reduce the carbon footprint and save resources
- Develop the circular economy
- Promote continuous improvement and eco-design measures

**Confirm our social responsibility**

- Contribute to the economic vitality and solidarity in regions
- Promote management that encourages staff commitment
- Ensure fair practices in its value chain

# Extra-financial ratings

**• ISO 26000, an external recognition:**

In 2021, RATP renewed its Afnor Certification "CSR Commitment" label, obtained for the first time in 2018, and significantly increased its score, enabling it to reach "exemplary" level, the highest in the standard. This label rewards its sustainable development performance level in its long-standing presence in the Île-de-France region. RATP was the first transport company in the world to achieve "confirmed" maturity level in 2018 with such a broad scope from the first assessment. Today, it is the only one in its sector to be recognized as "exemplary" under this label.

**• 2021 Results of RATP's rating by Vigeo Eiris**

Rank in sector: 2/20  
At the request of investors, RATP Group is assessed every two years by the Vigeo Eiris rating agency. In 2021, it maintained its Advanced level with an overall score of 66/100, which remains stable. The Group is part of the "Transport and Tourism" panel, which includes 20 European companies, and ranks second in its sector.

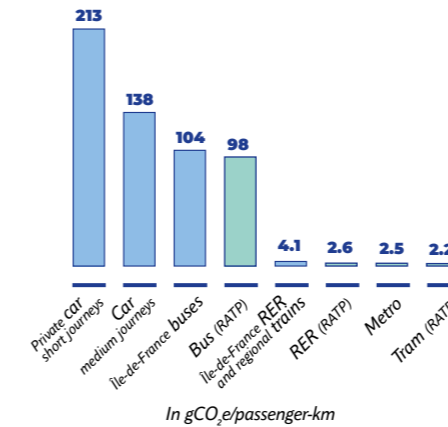


# Energy transition and low carbon

Public transport is in and of itself the most ecological way to go from one place to another. Opting for public transport in the Île-de-France region means using only a fifth of the energy needed for the same trip by car. An RATP traveler using the metro, RER or tram emits 60 times less greenhouse gas than when they use a car.

- 1<sup>st</sup> network** in the world to be 100% fitted with LEDs
- 1<sup>st</sup> multimodal network** in the world to be ISO 50001 certified for all its operations
- 43%** hybrid, electric or bio-NGV buses in the Île-de-France region fleet in 2020
- 2010** managed bicycle parking spaces near metro and tram stations

## Encouraging shared low-carbon mobility



RATP has produced a carbon footprint report since 2005 (scopes 1, 2 and 3). This report is updated every three years.

In order to contribute to carbon neutrality, RATP Group gives priority to reducing its GHG emissions and developing low-carbon services.

In 2021, RATP updated its Bilan Carbone® (Carbon Footprint). It makes it possible to estimate the GHG emissions generated directly and indirectly by the company's activity (scopes 1, 2 and 3). Within this area, overall emissions are estimated to be 890,000 tCO<sub>2</sub>e. The most significant GHG emission item for RATP is energy. Energy accounts for 99% of the emissions of scopes 1 and 2, 44% if we consider overall emissions, scopes 1, 2 and 3.

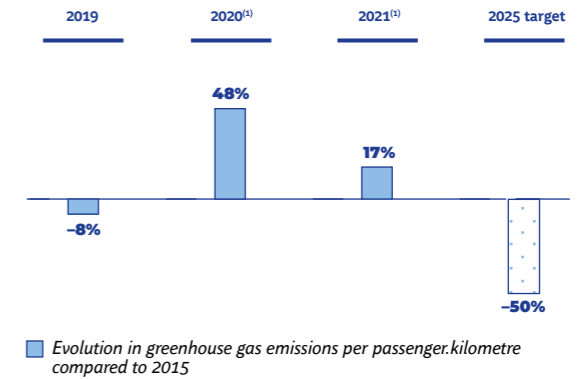
**RATP is committed to reducing the GHG emissions associated with its energy consumption (scopes 1, 2 and 3; all uses) by 50% per passenger-kilometre by 2025 compared to 2015.**

RATP wishes to act on all of its direct and indirect emissions (scopes 1, 2 and 3). In addition to the emissions associated with its energy consumption, the other significant items are fixed assets (emissions estimated to be 33%) and purchases (emissions estimated to be 14%). A major challenge remains the reliability of the calculation of Scope 3 emissions.

In order to reduce Scope 3 emissions, RATP is committed to its responsible purchasing approach, by involving its partners and suppliers in the search for low-carbon solutions and by including carbon criteria in its contracts. For example, contracts for the purchase of rolling stock (bus, metro, tram, RER) systematically include a carbon criterion.

RATP introduced its energy policy in 2006. RATP Group obtained ISO 50001 certification for its energy management system for the first time in 2017 and became the first multi-modal transport operator in the world to receive this certification for all its activities. In 2020, it reconfirmed its commitment and renewed its energy management certification (ISO 50001), confirmed by an audit in 2021.

## Trends in GHG emissions – RATP



The 2020 and 2021 indicators are not representative of the energy and carbon performance actions undertaken. These indicators measure the company's overall carbon performance (scopes 1, 2 and 3) in relation to the number of passenger kilometre transported. As a result of the pandemic, RATP maintained its transport services at a high level to allow public transport mobility. However, network passenger numbers (passenger.kilometre travelled) fell drastically 17 billion in 2019, 9 billion in 2020 and 12 billion in 2021. RATP is continuing to implement its actions to reduce GHG emissions in all its areas of use (transport, buildings, service vehicles). These indicators should decrease again once the situation stabilizes (return to rideship levels equivalent to 2019).

The RATP Green Bond issuance, dedicated to low-carbon and sustainable transport, is an opportunity to emphasize the group's strategy in terms of sustainability and climate change. It also enables RATP to diversify its investor base, through a more action-oriented dialogue with Socially Responsible Investors. Moreover, the RATP Green Bond will encourage other public transportation providers to fund rail investments and other low-carbon and sustainable transport investments, while complying with the highest standards of the Green Bond market. The RATP Green Bond also encourage project management teams to integrate the carbon and energy criterion at an earlier stage in the design phase.

(1) Covid-19 health crisis leading to a historic drop in network use.

# Our green bond program

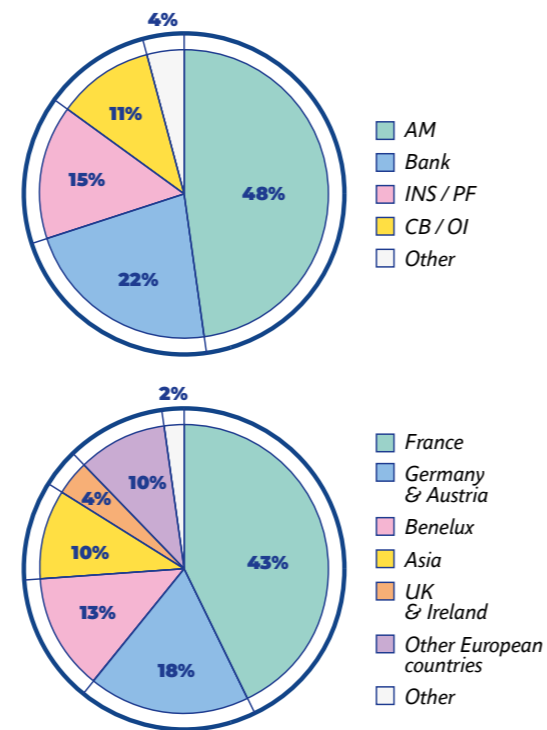
## RATP is rated in compliance with standards from the French state on the following terms:

- Strategic importance as the owner and infrastructure manager of urban transport in Paris
- Strong state support – 100% state-ownership
- Legally protected from events such as insolvency and bankruptcy procedures by virtue of its EPIC status (industrial and commercial public undertaking)
- Resilient budgetary performance and medium-term debt stabilization

## Aligned with the Green Bond Principles



Typological and geographical distribution of investors



## Main characteristics of the 2017 and 2019 operations

	2017	2019
ISSUER	RATP	RATP
RATING	Moody's: Aa2(St) Fitch: AA(St)	Moody's: Aa2(St) Fitch: AA(St)
ORDER BOOK	€1.6 billion	€1.8 billion
FINAL SIZE	€500 million	€500 million
ISSUE DATE	2017-06-22	2019-06-13
SETTLEMENT DATE	2027-06-29	2029-06-20
MATURITY DATE	2027-05-25	2029-06-20
PRICE/REOFFER YIELD	99.736% / 0.9030%	99.696% / 0.381%
COUPON	0.875%	0.350%
SPREAD	OAT interp + 30 bps	OAT interp + 26 bps

## Eligible green projects summary

### Projects financed by the RATP Green Bond in 2017

Renewal of rolling stock on RER line A, the busiest regional train in Europe

**€250 million**

financed by the bond  
100% refinancing

Category: public transport rolling stock renovation and renewal

1 TWh energy savings  
50,400 tCO<sub>2</sub>e avoided

Automation of Paris metro line 4

**€200 million**

financed by the bond  
100% new financing

Category: public transport infrastructures maintenance and renovation

140 GWh energy savings  
6,700 tCO<sub>2</sub>e avoided

Purchase of 100% electric maintenance RER shunters

**€50 million**

financed by the bond  
100% new financing

Category: public transport rolling stock renovation and renewal

32 GWh energy savings  
14,000 tCO<sub>2</sub>e avoided

### Projects financed by the RATP Green Bond in 2019

Bus2025: the ambitious RATP plan for a 100% ecologically friendly fleet in the Paris region

**€250 million**

financed by the bond (bus and depots)  
56% new financing  
44% refinancing

Category: other public transport low-carbon vehicles

143,000 tCO<sub>2</sub>e avoided per year

Vaugirard Workshops: an industrial and urban project, an exemplary urban mix operation

**€100 million**

financed by the bond (workshops)  
72% new financing  
28% refinancing

Category: public transport infrastructures maintenance and renovation

Not available

New vehicles for metro line 14: more ergonomic vehicles with more capacity for an extended line

**€150 million**

financed by the bond (vehicles)  
76% new financing  
24% refinancing

Category: public transport rolling stock renovation and renewal

340 GWh energy savings  
13,140 tCO<sub>2</sub>e avoided

Description of projects financed and major benefits financed by bond proceeds in 2017

# Project: automation of Paris metro line 4

**Category 1**  
Public transport infrastructures maintenance and renovation  
**One project financed**

**€200 million**  
100% new financing



In the summer of 2013, RATP, the project owner, and Île-de-France Mobilités, the public transport authority, began the automation of metro line 4. The project is set to be completed in 2023. This automation project can be divided into five subprojects: infrastructure upgrades, platforms and platform doors, the automated system, rolling stock, and change management. At the end of 2019, the infrastructure upgrades were complete: all the platforms had their height adapted and were reinforced to install platform doors. These steps were completed on schedule. Since March 2021, each station is equipped with platform doors; the early benefits are already visible regarding line 4 traffic. By 13 January 2022, line 4 was extended with new stations on its southern section.

Unattended trains will be operated by a Communication Based Train Control system (CBTC) with a new Operation Control Center (OCC). The new OCC has been operational since May 2020. Concerning rolling stock, predisposition works are finished for the first MP89C-MP05 and MP14 trains and automation mode trials have begun and have been pursued during the extension trial period. The first automated trains will be seen on line 4 in 2022. Finally, technical progress brought about by automation should also benefit social progress: several social agreements were signed with the unions to organize the transition to automation.

## Major sustainable benefits

### Line 4 main features

- North/south backbone of the Paris metro
- Built 1908-1910
- 1<sup>st</sup> below-river crossing in 1910
- 14 km, 29 stations (27+2: extension in progress)
- The second busiest Parisian metro line after line 1 with more than 700,000 passengers per day (172 million trips per year)
- Connected to all metro lines (13) and suburban lines (5)
- Sudden peaks in traffic demand
- Tourist areas, 3 major railway stations (TGV)

### Project opportunities for line 4

- Redeployment of automated 6-car trains from line 14
- Short-term renewal and/or modernisation needed on line 4 infrastructure
- Improvement of service quality offered by an automatic system (through improved reliability, capacity, resilience and adaptability), for a line with an irregular and atypical traffic
- An opportunity that makes sense in the context of the Grand Paris Express project with its future connection to the south
- The project will improve the energy savings through the economic piloting of trains and the optimisation of regenerative braking enabled by the automated system
- The project will reduce GHG emissions thanks to internal energy savings and modal shift

### Project challenges

- A 100-year-old line and/or sensitive infrastructure
- No traffic interruption or works at night during a limited time schedule
- 3 different generations of automated rolling stock
- Line extension in parallel
- Difficult transition stages
- Exceptional concentration of worksites between 2015 and 2020
- Reduced schedule compared to line 1 automation
- Change management: technical progress should lead to social
- Progress and better service

### Project benefits

- Improved safety (with platform screen doors and CBTC for train speed control)
- Improved security with CCTV in trains and stations
- Direct operational savings, energy savings
- Fewer delay related economic losses
- Improved capacity, reliability and resilience
- Real time adaptability and/or tailor-made offers

**140**  
GWh energy savings

**6,700**  
tCO<sub>2</sub>e saved

Description of projects financed and major benefits financed by bond proceeds in 2017

# Project: renewal of rolling stock on RER line A

Category 2  
Public transport rolling stock renovation and renewal.  
Two projects financed

€250 million  
100% refinancing



## Major sustainable benefits

### RER line A main features

- East/west backbone of the Paris regional train
- 1,200,000 passengers per day
- 109 km, 46 stations
- Connected to all the main metro and train station in the Paris region

### Project opportunities for line A

- Decongestion of a line which became a victim of its own success, due to the increased urbanism in the Paris region
- Further enhance the capacity of the line, in addition to the increased performance already made possible by automatic train control
- Modernise and standardise the materials used on the line
- Facilitate the operations in real time of trains injection in the network and maintenance, via a fleet of interchangeable rolling stock

### Project challenges

- Renew the fleet in a minimal amount of time
- Adapting the infrastructure at the same time as the arrival of new vehicles

### Project benefits

- Reduction of energy consumption  
→ Energy savings and better regeneration (breaking energy recovery)  
By transported passenger:  
– 31% to 55% decrease in consumption of energy compared to the replaced trains  
– 20% drop compared to the previous generation of trains at two levels of the RER A
- Reduction of consumption of used materials  
→ Recyclability studies and analysis of the life cycle for what has changed compared to the previous generation of equipment to two levels according to ISO 22628  
→ Recyclability rate reached
- 91.5%: reduction of noise emissions  
→ Compliance with the TSI noise
- Several areas for wheelchair users
- Reducing the impact on the air  
→ Work on the rate of wear of the friction material and braking by energy recovery privileged
- Controlled waste production  
→ Sealing of the organs requiring grease – reduction of waste in general

The challenge of this project is to modernize the vehicle fleet of the urban train line that is the most frequented in Europe, with 305,000,000 passengers per year.

It consists of designing and supplying self-propelled elements with the group Alstom/Bombardier. The first order of 130 pieces was placed in April 2009.

For the first time, RATP decided to draft a specification incorporating all the environmental issues considered necessary, going even beyond the regulatory constraints.

The first commercial commissioning in the presence of the French President occurred in December 2011.

The Group placed an additional order for 10 items in July 2015.

The commercial operation of the 140<sup>th</sup> and last train ordered began in April 2017, i.e. six weeks ahead of contract schedule.





Description of projects financed and major benefits financed by bond proceeds in 2017

# Project: purchase of 100% electric maintenance RER shunters

**Category 2**  
Public transport rolling stock renovation and renewal.  
**Two projects financed**

**€50 million**  
100% new financing



To improve the internal air quality in transport infrastructure, RATP Group decided to purchase fully-electric maintenance shunters for RER operations. Shunters are the locomotives used to tow the work trains in order to maintain the tracks and tunnels.

In March 2017, this led to the autonomous shunter contract for the design and the supply of 12 shunters with CAF/CAF France, and to placing an order for these 12 items.

CAF finished the studies at the end of 2021. Manufacturing is now underway: CAF has committed to finalize production of the first 2 shunters for September 2022 and, after a mandatory testing phase, to deliver them to RATP in May 2023.

The delivery of the last 10 shunters is scheduled at the rate of one per month in 2024. This will mark the end of the project, as far as the Green Bond proceeds extend.

## Major sustainable benefits

### Project opportunities

- Ensure coherence with the company's virtuous and eco-responsible approach towards air quality improvement and the environmental impact of public transport in Paris region reduction program
- Participation to the Paris City policy "diesel fuel eradication by 2020"
- Anticipation of future indoor air quality regulations
- Studies and manufacturing of tractors are carried out by the French subsidiary of CAF based in Bagnères-de-Bigorre (Hautes-Pyrénées). This contract has allowed a hundred jobs to be saved in France for three years on the site and among subcontractors

### Project challenges

- The development of a completely electric dual mode shunters: catenary 1,5 kV and embedded traction batteries
- At the time of the definition of the needs, there was no equipment available to be carried out on RATP sites
- Those devices are intended to intervene on the building rights that the catenary fed or not, they can also evolve on infrastructures not equipped with catenary
- Routings and set-ups are carried out with the catenary feed whenever it is possible
- The capacity of the traction batteries allows the execution of circulations on an infrastructure site. These circulations take place mainly during the period of interruption of the operation i.e. at night

### Project environmental benefits

- Pollution prevention and control by a total eradication of diesel engine pollutant gas due to the actual shunters – 4 different diesel engines types – especially in tunnels
- Total suppression of diesel pollution in tunnels
- Improvement of the air quality to all passengers
- Improvement of health and safety and employment conditions by the reduction of RATP staff exposure to pollutant gas



Description of financed projects and major benefits financed by bond proceeds in 2019

# Project: Bus2025

Category 4  
Other public transport  
low-carbon vehicles  
**One project financed**

**€250 million**

56% new financing  
44% refinancing

The European Commission granted a €23 million subvention for the purchase of electric buses and the conversion of bus depots to electric power (for the Lagny, Corentin, Pleyel, Lilas and Lebrun bus depots) and to NGV power (for the Massy, Bussy, Thiais and Nanterre bus depots) by 2025. With the funding, the Commission supports Île-de-France Mobilités' and RATP's commitment to their energy transition set out in the Bus2025 program.

It is a 3-phase project:

- 2015: real-life trials;
- 2017: first deployment with the first huge bid to acquire electric buses;
- 2019: large scale deployment.

This is a double challenge: the depots must be transformed, and the mitigation of the impact on the electric grid must be taken into account.

After the study phase, the site conversion projects are launched: since 2021, 24 out of the 25 sites are in the project phase, with the aim of completing construction by mid-2024 (except for the Charlebourg site, which is undergoing a property development project):

- Construction in Creteil, Massy, Thiais, Bussy (CNG), and Lagny and Corentin (electric) are completed. Works in Nanterre (CNG) Pleyel (electric): the depots are almost 50% operational.

- Construction will start in few weeks on 6 additional sites: Flandres, St Maur (CNG), Lilas, Lebrun and Malakoff, Croix Nivert (electric).
- The other sites are undergoing a design process, from the planning and AVP phases to the purchasing phases. Rapid deployment of buses (600 buses per year from 2021 to 2025) is currently in progress. RATP has implemented the necessary changes in the organization of operation and maintenance at the level of operational teams and central support teams to allow this process.

At the end of December 2021, the RATP bus fleet is comprised of 1,105 hybrid buses, 400 electric and 600 CNG-powered buses.



## Major sustainable benefits

- To stand out by meeting increasingly higher expectations in terms of service level, performance and environmental impact.
- To be a pioneer in the operation of a fleet of large-scale clean energy buses.
- To offer a reliable, comfortable service, in line with passenger expectations.

**143,000**  
tCO<sub>2</sub>e saved per year

Description of financed projects and major benefits financed by bond proceeds in 2019

# Project: Vaugirard workshops

**Category 1**  
Public transport infrastructures  
maintenance and renovation

**€100 million**

**72% new financing**  
**28% refinancing**

The Vaugirard project involves redeveloping the maintenance workshops for metro line 12 while allowing them to continue their activities. The workshops will combine housing (including social housing), local shops, green spaces, and public and cultural facilities.

The innovative proposals devised by RATP will lead to the birth of a new district, with the creation of an urban road and a pedestrian walkway:

- two maintenance workshops: rolling stock and equipment;
- 285 housing units (50% social housing);
- a daycare center for children, food shops;
- 700 m<sup>2</sup> dedicated to urban agriculture and the largest green rooftop in Paris with 15,000 m<sup>2</sup>.

The main phases of the project are:

- February 2019: laying the cornerstone;
- end of 2022: delivery of social housing, equipment maintenance workshops;
- 2023/2024: delivery of private dwellings;
- 2029: restructuring the train maintenance workshop, and delivery of other parts of the social housing units.

Work on phase 1 is in progress (12,000 m<sup>2</sup> of equipment maintenance workshop, a building with 35 private housing units, another with 100 private housing also comprising a daycare center, and 104 social housing units). Phase 2 will consist of building the train maintenance workshop and a final set of 50 social housing units.



## Major sustainable benefits

- A decrease to one third of the regular energy consumption between the new RATP workshops and the old ones, i.e. approximately 580 tCO<sub>2</sub>e GHG emissions prevented per year.
- The entire project is part of an “Environmental approach to urban planning” implemented by RATP Group in partnership with the Ademe (French Agency for the Environment and Energy Management).
- Thermic Regulation (RT 2012): -30% targeted energy consumption for housing units
- Housing units are certified “habitat environment” and meet the requirements of eco-design. 50% are social housing.
- The project maintains employment of blue-collar workers in dense areas and the urban mix.

DESCRIPTION OF PROJECTS  
FINANCED BY BOND PROCEEDS

Description of financed projects and major benefits financed by bond proceeds in 2019

# Project: new vehicles for metro lines

**Category 2**

Public transport rolling stock renovation and renewal

€150 million

76% new financing

24% refinancing

Metro line 14 was the first high-capacity automated metro line commissioned worldwide in 1998.

As the line is the backbone of the future Grand Paris Express, and on the occasion of its extension to Mairie de Saint-Ouen in 2020 (Covid-19 impact), its rolling stock will be renewed across the entire line (first order of 35 trains).

Three trains were put into service in 2020 and 11 in 2021.



40%

quieter: -2dBA inside

Recyclability:

95%

## Major sustainable benefits

### Energy savings

Thanks to the new generation of energy recovery braking systems and motors, 17% energy will be recovered on the line with the new vehicles.

### Air quality

Thanks to electrical braking, there is a reduction in the emission of particles.

### Social impacts and comfort

Each train will offer 48 seats for people with reduced mobility and 2 areas for wheelchair users. The vehicles will be completely accessible (wide circulation areas, new ergonomic seats).

# Allocation of borrowed funds

## Allocation report at category level

	Total amount of proceeds Target 2017	Total allocated amount in 2017 and %	Total allocated amount in 2018 and %	Total amount of proceeds Target 2019	Total allocated amount in 2019 and %	Total allocated amount in 2020 and %	Total allocated amount in 2021 and %
Category 1: public transport infrastructures maintenance and renovation	€200 million	€44.85 million 22%	€104.52 million 52%	€300 million	€186.81 million 62%	€242.29 million 81%	€261.97 million 87%
Category 2: public transport rolling stock renovation and renewal	€300 million	€255.24 million 85%	€258.17 million 86,06%	€450 million	€298.55 million 66,35%	€301.98 million 67%	€450 million 100%
Category 3: modernisation of public transport stations and facilities	-	-	-	-	-	-	-
Category 4: other public transport low-carbon vehicles	-	-	-	€250 million	€110.12 million 44.04%	€250 million 100.00%	€250 million 100.00%
<b>TOTAL inaugural Green Bond</b>	<b>€500 million</b>	<b>€300 million 60%</b>	<b>€362.69 million 73%</b>	<b>€1,000 million</b>	<b>€595.48 million 59%</b>	<b>€794.27 million 80%</b>	<b>€961.97 million 96%</b>

## Allocation report at project level

INVESTMENTS	2017	2018	2019	2020	2021					
	Total amount of proceeds	Total allocated amount in 2017 and %	Total amount of proceeds	Total allocated amount in 2018 and %	Total amount of proceeds	Total allocated amount in 2019 and %	Total amount of proceeds	Total allocated amount in 2020 and %	Total amount of proceeds	Total allocated amount in 2021 and %
Automation of Paris metro line 4	€200 million	€44.85 million 22%	€104.52 million 52%	-	€158.54 million 79%	-	€200 million 100%	-	€200.00 million 100%	-
100% new financing										
Renewal of rolling stock on RER line A, the busiest regional train in Europe	€250 million	€250 million 100%	€250 million 100%	-	€250 million 100%	-	€250 million 100%	-	€250 million 100%	€250 million 100%
100% refinancing										
Purchase of 100% electric maintenance RER shunters	€50 million	€5.24 million 10%	€8.17 million 16%	-	€13.16 million 26%	-	€17 million 34%	-	€50 million	-
Refinancing substitution MIO9 <sup>(1)</sup>	-	-	-	-	-	-	€33 million	-	-	-
Bus2025	-	-	-	-	€250 million	€110.12 million 44.05%	-	€250 million 100%	-	€250.00 million 100%
Vaugirard workshops	-	-	-	-	€100 million	€28.27 million 28%	-	€42.29 million 42%	-	€61.97 million 62%
New vehicles for metro lines	-	-	-	-	€150 million	€35.40 million 24%	-	€33 million 22%	-	€150 million
Refinancing substitution MIO9 <sup>(1)</sup>	-	-	-	-	-	-	-	€117 million	-	-
<b>TOTAL inaugural Green Bond</b>	<b>€500 million</b>	<b>€300 million 60%</b>	<b>€362 million 73%</b>	<b>€1,000 million</b>	<b>€595.49 million 59%</b>	<b>€794.27 million 80%</b>	<b>€961.97 million 96%</b>			

(1) Since 2020, the rolling stock has been 100% financed by Île-de-France Mobilités, in accordance with the terms of the contract concluded between RATP and Île-de-France Mobilités.  
The remaining balance of funding for new vehicles for metro lines and electric maintenance RER shunters are carried over to the project Renewal of rolling stock on RER line A, following the development of these projects.

# Methodology of the green bonds program indicators

## Disclaimer

For each investment, the potential energy savings and greenhouse gas (GHG) emissions avoidance was estimated. The aim is to highlight the impact of each investment on the reduction of greenhouse gas (GHG) emissions and the energy transition.

Only the direct effects of the operation phase of the projects were taken into account. Thus, indirect effects such as emissions avoided when a passenger uses public transport instead of using their car are not included.

In the absence of reliable data, the GHG emissions and energy consumption associated with the equipment and rolling stock construction phase were not included in the calculation.

GHG emissions measured are emissions associated with energy use.

## Project: automation of Paris metro line 4

140

GWh energy savings

6,700

tCO<sub>2</sub>e avoided

The automation of metro lines can generate direct energy savings. The automation offers the opportunity to create various types of circulating depending on the needs: "tight running" for peak hours and "coasting" for off-peak hours. These changes are aimed at optimising:

- the acceleration and braking phases (eco-driving) and
- the synchronisation of the trains' departures and arrivals in stations in order to recover braking energy.

This impact has been estimated at:

- energy savings of 5 GWh per year;
- avoidance of 220 tCO<sub>2</sub>e per year;
- 34 tCO<sub>2</sub>e avoided/euro million invested.

## Methodology

### Ex ante evaluation

The evaluation is carried out ex-ante since the automation project for line 4 is currently being implemented.

The evaluation is based on RATP's experience in operating automatic lines. On metro line 14, RATP measured the impact of similar implementations (eco-driving on an automatic line), based on its actual energy consumption.

Three measurement campaigns were carried out by RATP in 2010 to assess the energy consumption of metro line 14. The energy savings resulting from the implementation of these measures on metro line 14 is estimated at 16%.

By analogy, the potential gain associated with the automation of metro line 4 is estimated at 10% of the consumption of the line (low hypothesis). Direct and indirect emissions associated with energy consumption have been considered.

### Air quality

The automation of line 4 improves air quality by enhancing electric braking and also reducing rolling stock particle emissions.

In this way, automation offers the opportunity to energy recovery, with electric braking as a substitute for mechanical braking. In the braking phase, trains are able to restore their kinetic energy in the form of electricity directed to other trains: this is the electric braking energy recovery. Synchronism (train pulling while another one is braking) is necessary for the energy exchanges to take place.

An ex-ante evaluation is carried out based on the feedback from RATP following the automation of metro line 14.

On line 14, RATP measured the impact of the wear of friction materials (the main source of dust in underground railway enclosed areas) before and after implementing eco-driving. According to calculations, the implementation of eco-driving reduces the number of braking equipment by 53%.

Therefore, this calculation highlights a reduction of more than 50% of the main particle sources on metro line 14. By analogy, following the automation of line 4, a significant decrease in the wear of friction materials is expected and therefore a reduction of the concentration of associated particles in stations.

### Social benefits

Many social co-benefits are also created as part of the metro automation projects "by RATP". In fact, the success of the automation of metro line 4 relies on its technical quality as much as on the control of the social subject associated with the project.

The implementation of automatic systems is more reliable but can also be more complex. Consequently, new technical skills need to be acquired both at the level of operations and maintenance. Therefore, the automated metro induces new work organizations creating new and more rewarding professions, with a greater variety of tasks. These jobs are higher-skilled and therefore better paid.

Metro line 14 was designed as fully autonomous and inaugurated in 1998. Since it was a successful "managerial experiment", the automatic system has been integrated into the modernization program of the Paris metro as a whole.

In regard to the unions, network upgrade was approached on a general level, which integrated the automation of metro line 1 in 2011 and metro line 4, currently underway.

In addition, RATP is able to implement the automation without any major interruption of operations. Jobs must be adapted as work progresses. In addition to negotiations with the trade unions, a constructive dialogue has been set up between the engineering, operations and maintenance departments. Staff members of the line benefit from an ongoing training program and specific supervision while they acquire the necessary skills to perform their new duties in a constantly evolving context.

## Project: renewal of rolling stock of the RER A

**1** | **50,400**  
TWh energy savings | tCO<sub>2</sub>e avoided

Rolling stock fleet modernization is an important lever for continuing to improve the energy performance of the transport networks operated by RATP.

The upgrade of the RER line A rolling stock fleet with the arrival of MI09 has led to very significant benefits both in terms of energy consumption and associated GHG emissions.

The recovery and reuse of braking energy on the line is made possible thanks to the new equipment.

The environmental balance sheet on the depreciation period of the investment (30 years and 140 elements) is estimated at:

- energy savings of 1 TWh;
- 50,400 tCO<sub>2</sub>e avoided;
- 202 tCO<sub>2</sub>e avoided/euro million invested.

### Methodology

#### Ex post evaluation

The evaluation is carried out ex-post. Energy savings and GHG emissions avoided by replacing the arrival of MI09 equipment had been estimated from measurements on a fleet sample. Direct and indirect emissions associated with energy consumption have been considered.

The calculation is made over the life of the investment, i.e. 30 years.

## Project: purchase of 100% electric maintenance RER shunters

**32** | **14,000**  
GWh energy savings | tCO<sub>2</sub>e avoided

RATP currently maintains the RER rail lines (line A and line B) with maintenance equipment running on diesel. With this investment, all of this maintenance will now be performed by electric locomotives. The project will therefore have a direct benefit in terms of both energy transition and GHG reduction.

The environmental balance sheet on the depreciation period of the investment (“30 years and 12 locomotives”) is estimated at:

- energy savings of 32 GWh;
- 14,000 tCO<sub>2</sub>e avoided;
- 279 tCO<sub>2</sub>e avoided/euro million invested.

### Methodology

#### Ex ante evaluation

The evaluation is carried-out ex-ante. Energy savings and avoided GHG emissions due to the replacement of diesel locomotives by electric locomotives are based on theoretical calculations. These calculations are carried out at the preliminary design studies stage. Direct and indirect emissions associated with energy consumption have been considered. The calculation is made over the life of the investment, i.e. 30 years.

#### Air quality

By replacing the diesel shunt fleet with electrical shunters, we obtain a 100% reduction in carbon monoxide, hydrocarbons, nitrogen oxides and particles emissions. Consequently, the impact is significant and immediate on air quality; especially underground (the main place of use of electrical shunters).

Indeed, the standard<sup>(1)</sup> emission on “phase 2” of diesel shunters in the current RATP fleet gives a maximum threshold of the net power category comprised between 130 and 560 KW:

Phase II: 01/2002	Mass of carbon monoxide - CO (g/kWh)	Mass of hydrocarbons - HC (g/kWh)	Mass nitrogen oxides - NOx (g/kWh)	Mass of particles (g/kWh)
<b>Threshold</b>	<b>3.5</b>	<b>1</b>	<b>6</b>	<b>0.2</b>
<b>For 12 locotractors respecting the standard</b>	<b>42</b>	<b>12</b>	<b>72</b>	<b>2</b>
<b>Impact of the 12 electric locators of the investment as soon as they are used</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, amending Regulations (EU) no. 1024/2012 and (EU) no. 167/2013, and amending and repealing Directive 97/68/EC.

## Project: MP14

Rolling stock fleet upgrades are an important lever for continuing to improve energy performance on the transport networks operated by RATP.

The upgrade of the metro rolling stock fleet with the arrival of MP14 has led to very significant benefits both in terms of energy consumption and associated GHG emissions. The new generation MP14-tyre rolling stock will be operated on lines 4, 11 and 14. The first trainsets were commissioned on metro line 14 in 2020.

The recovery and reuse of braking energy on the line is made possible thanks to the new equipment.

The environmental balance sheet on the depreciation period of the investment (30 years) is estimated at:

- energy savings of 340 GWh;
- 13,140 tCO<sub>2</sub>e avoided;
- 178 tCO<sub>2</sub>e saved/euro million invested.

### Methodology

#### Ex ante evaluation

The evaluation is carried-out ex-ante. Energy savings and avoided GHG emissions due to the replacement of rolling stock are based on theoretical calculations. These calculations are made at the design study stage. Direct and indirect emissions associated with energy consumption have been considered. The calculation is made over the life of the investment, i.e. 30 years.

## Project: Bus2025

As a pioneer in energy and climate issues, RATP contributes to the energy transition and to improving outdoor air quality with the Bus2025 plan, which aims to provide a 100% low-carbon bus fleet. It is the first transport operator of this size to implement such an ambitious action plan. In the long term, approximately half of the bus fleet will be electric, and the other half powered by renewable gas. Bus GHG emissions represent around 72% of RATP's energy consumption-related GHG emissions. The Bus2025 plan, which is part of the Île-de-France region urban travel plan, thus has a big impact on RATP's carbon footprint.

**Strictly considering the electric part of Bus2025 plan,** the environmental balance sheet is estimated at 143,000 tCO<sub>2</sub>e saved per year once the bus fleet is fully converted (compared to the initial diesel bus fleet).

### Methodology

#### Ex ante evaluation

The evaluation is carried-out ex-ante. Avoided GHG emissions due to the replacement of buses are calculated based on estimations. The study is based on actual energy consumption data observed on transport lines operated by RATP. Direct and indirect emissions associated with energy consumption (including electricity) have been considered.

## Project: Vaugirard

The Vaugirard workshops adaptation project should make it possible to accommodate new, more efficient rolling stock, particularly in terms of energy consumption, on metro line 12. An eco-design approach has been implemented for this project.

Eco-socio-design is an approach that integrates environmental and social criteria from the design phase of a project. This project is based on two approaches:

- infrastructure life cycle analysis;
- the integration of stakeholders.

This approach not only seeks to reduce negative impacts throughout the life cycle of the infrastructure, it must also make it possible to work on positive outcomes for its stakeholders and the environment.

In the case of the Vaugirard project, the 4 main lines of action of the approach are:

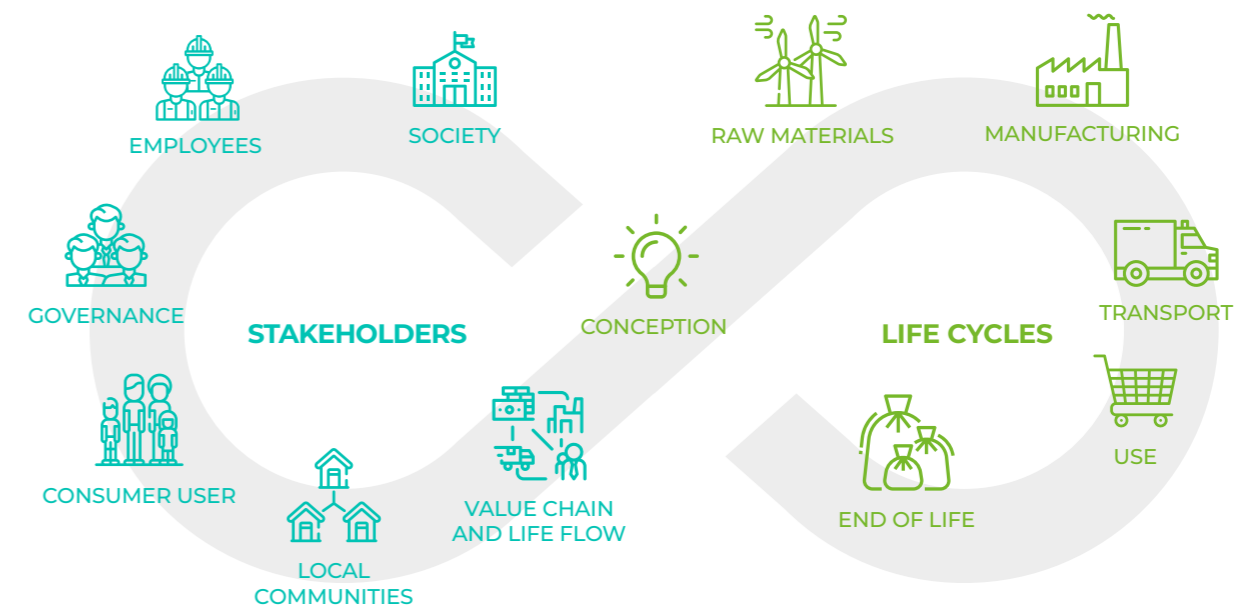
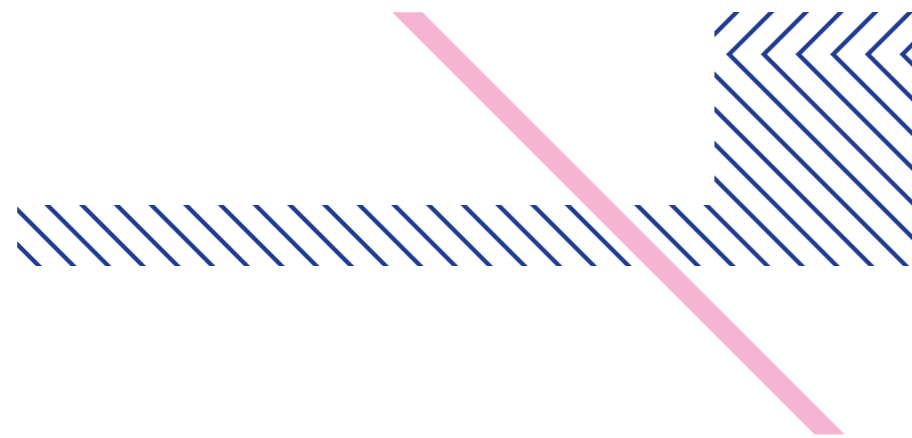
- quality of life at work (*qualité de vie au travail*);
- enhanced thermal comfort in summer in the workshop, integrating the effects of climate change;
- improvement of the workshop's natural lighting conditions;
- eco-design;
- improving the future building's energy performance;
- limiting the carbon impact on the future building's life cycle.

During the design stage, the measures envisaged include the green roofs or the integration of equipment (BMS) allowing to regulate the installations and thus to reduce energy consumption.

The project is designed in accordance with the prescriptions of the low carbon E + C- label.

A forecast carbon assessment was carried out. Overall, and over its entire lifespan, including deconstruction, the workshop restructuring project presents a greenhouse gas emission balance of approximately 23,000 tons of CO<sub>2</sub> equivalent (direct and indirect).

RATP wishes to optimize this carbon impact as much as possible. It includes taking action during the design phase to reduce the CO<sub>2</sub>e emissions that will be generated as a result of the site's energy consumptions during the operation phase and the products and materials used in its construction.





# Attestation by one of RATP EPIC Statutory Auditors

Attestation by one of RATP EPIC Statutory Auditors on the Allocation of Proceeds, as at December 31, 2021 from the Green Bonds issuances of June 22, 2017 and June 13, 2019

In our capacity as Statutory Auditor of RATP EPIC and in response to your request, we have prepared this attestation on information relating to the allocation, on December 31, 2021, of the proceeds from the Green Bonds issuances of June 22, 2017 and June 13, 2019 (the Green Bonds), as reported in the document "RATP Green Bond Impact Report – June 2022" (the Document), attached to this attestation.

This Document, including the information regarding the Green Bonds of RATP Epic according to the terms and conditions of the issuance agreement and the *Green Bond Framework* (the Framework), is intended for green bond holders.

This Document states that €961.97 million of proceeds have been allocated (the Allocated Funds) to eligible projects as at December 31, 2021.

The Document was prepared under your responsibility. The methods and eligibility criteria used to determine the Allocated Funds are defined in the Framework.

We draw your attention on the following specific note page 23 of the Document:

— "Since 2020, the rolling stock has been 100% financed by Île-de-France Mobilités, in accordance with the terms of the contract concluded between RATP and Île-de-France Mobilités. The remaining balance of funding for new vehicles for metro lines and electric maintenance RER shunters are carried over to the project Renewal of rolling stock on RER line A, following the development of these projects."

It is our responsibility to report on the following information presented on page 9 and 23 of the Document regarding:

- the appropriate allocation of proceeds from the green bond issuances and the amount allocated to each Eligible Green Project;
- the share of proceeds allocated to financing or refinancing each project.

However, it is not our responsibility to provide an opinion on the:

- eligibility criteria of projects, which were validated in the Second Party Opinion by Vigeo Eiris prior to the inaugural issuance;
- compliance, in all significant aspects, of projects with the eligibility criteria defined by RATP Epic in the Green Bond Framework;

- effective enforcement of the policy for managing proceeds before being earmarked or allocated to the identified projects;
- use of proceeds allocated to eligible projects after allocation;
- non-financial indicators specific to projects.

Our assignment, which constitutes neither an audit nor a review, was performed in accordance with the professional doctrine of the French national auditing body (Compagnie nationale des commissaires aux comptes).

Our work consisted in:

- identifying the people responsible for the data collection disclosed in the Document within RATP Epic and, where appropriate, for the internal control and risk management procedures implemented;
- assessing the appropriateness of the data collection procedures in terms of their relevance, completeness, reliability, neutrality and understandability;
- verifying the existence of internal control and risk management procedures implemented by RATP Epic;
- verifying the concordance of the information disclosed in the Document, with the accounting and the underlying accounting data, as at 31 December 2021;
- examining the processes used for data collection, compilation, processing and control, particularly the procedures relating to the allocation of the Allocated Funds set out as at 31 December 2021.
- based on a representative sample of eligible projects:
  - verifying the concordance of the allocation of the net proceeds to the eligible projects with the accounting and the underlying accounting data, as at 31 December 2021;
  - verifying the share of proceeds allocated to financing or refinancing each project.

Based on our work, we have no comments on the following information presented on page 9 and 23 of the Document regarding:

- the statement of allocation of proceeds presented on page 23 of the Report;
- the share of proceeds allocated to financing or refinancing each project presented on page 9 of the Report;

This attestation has been prepared for you in connection with the context mentioned in the first paragraph and it may not be used, disclosed or referred to for any other purpose.

In our capacity as Statutory Auditor of RATP Epic, our responsibility towards RATP Epic is defined by French law and we do not accept any extension of our responsibility beyond that set out in French law. We do not owe or accept any duty of care to any third party, including green bond holders, in connection with the Green Bond final terms agreement (including the Green Bond Framework) to which we are not party. In no event, we shall be liable neither for the execution of the Green Bond final terms agreement (including the Green Bond Framework) nor for any resulting damage, loss, cost or expense.

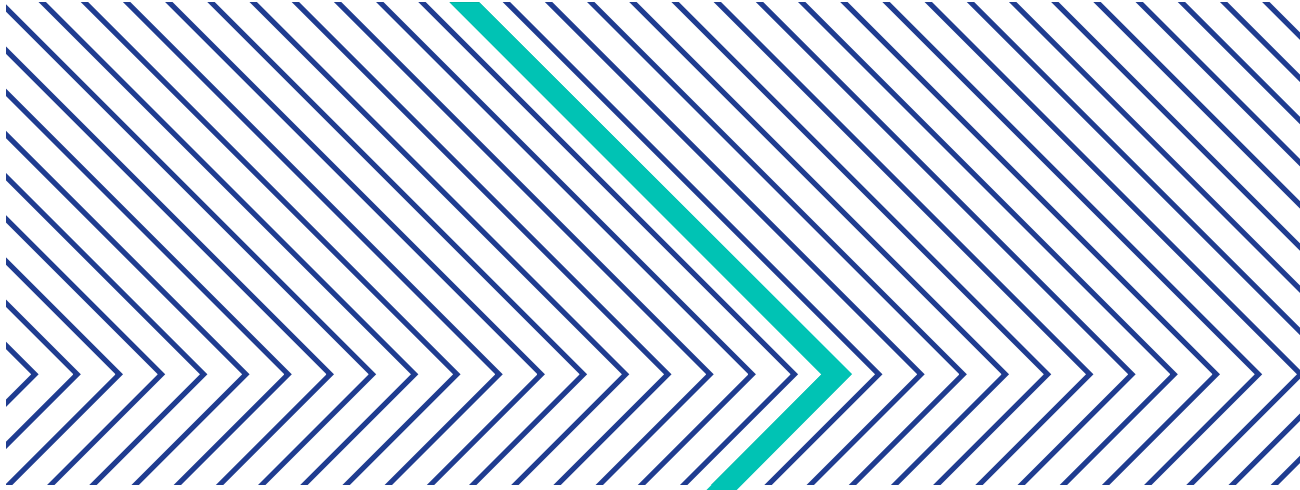
This attestation is governed by French law. The French courts shall have exclusive jurisdiction in relation to any claim, difference or dispute which may arise out of or in connection with our engagement letter or this attestation report.

Each party irrevocably waives any right it may have to object to an action being brought in any of those Courts, to claim that the action has been brought in an illegitimate court or to claim that those Courts do not have jurisdiction.

Paris-la Défense, June 29, 2022  
KPMG SA

**Stéphanie Millet**  
Partner

**Anne Garans**  
Partner Sustainability Services



[ratpgroup.com](http://ratpgroup.com)