RATP group Green Bond
impact report

JUNE 2020

RATP GROUP

Moving towards a better city

Green bonds: promoting an enhanced economic and environmental performance

In carrying out our functions, RATP Group continuously works to reconcile economic and environmental performance. Green bonds are an example of this. Over the past three years, RATP Group has issued green bonds amounting to €500 million on two separate occasions, the first in 2017 and the second in 2019. Both green bond issuances met with great success: in 2019, demand for them amounted to €2.6 billion, reaching a subscription rate five times greater than that of the initial issuance. These results demonstrate our credibility in terms of sustainable development; they also show how appealing RATP Group's signature is.

Thanks to the two green bond issuances, we are able to successfully carry out projects that are at the core of RATP Group's priorities: they contribute to the financing of rolling stock renewal and the automation of metro lines making journeys easier; they also finance projects regarding our real estate and the energy conversion of our bus fleet, which both play a part in making cities increasingly sustainable.

At a time when RATP Group and France are confronted with the aftermath of a historic crisis, I am convinced that economic recovery must be accomplished in conjunction with the ecological transition. Faced with this two-fold challenge, initiatives such as the issuance of our green bonds are highly relevant.

Our expertise

RATP Group has developed unique time-honoured expertise as a multimodal operator and is a world leader in urban mobility. RATP Group relies on 6 areas of expertise to build the city of tomorrow.

64,000
employees

16 M
daily journeys worldwide

4.8 billion
journeys per year including 1.5 billion outside Île-de-France

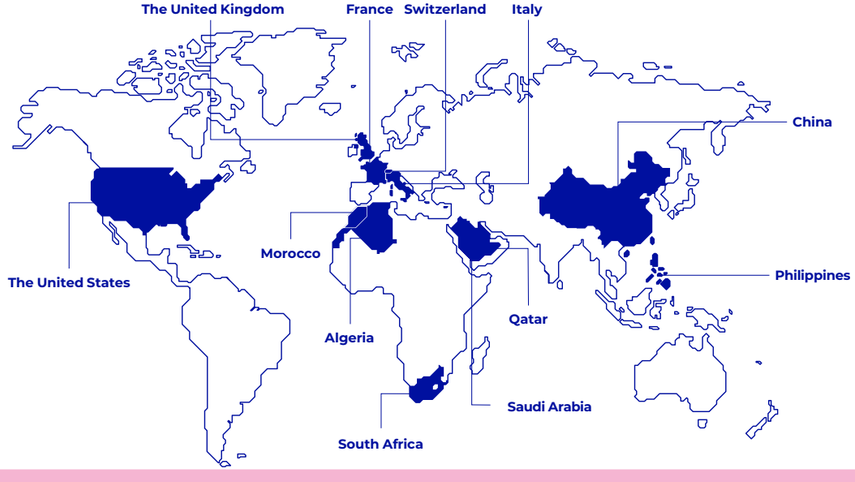
8 transport
modes operated

Metro · Urban and interurban buses · Demand Responsive Transport · Railway · Sightseeing · Tram · Maritime shuttle · Cable car

5 partnerships
in new forms of mobility

Autonomous vehicle · Scooter · Smart car parks · Carpooling · Car sharing

Urban mobility: 4 continents, 12 countries



Urban mobility

RATP is a major player in urban public transport in Île-de-France.

RATP Dev is the subsidiary that develops and manages contracts for operating transport networks outside of RATP's traditional area, in France and internationally.

Transport authorities
Delegate operations and maintenance. Define the pricing policy.

Advertising and businesses
Contribute to the Group's revenue derived from the use of spaces.

Group employees
Payment of wages, training, etc.

Suppliers
Energy purchases, chartering, materials, rolling stock, intellectual services, etc.

State and local authorities
Payment of taxes and duties.

Passengers
Buy transport tickets.

Mobility offering combining fluidity, high quality service, and safety.

Transport authorities, State, local authorities
Joint funding of investments.

State and investors
Shareholding and financing.

An economic model integrating a vast ecosystem of stakeholders

- "Traditional" revenues for a transport operator.
- Expenses (wages, payments to suppliers, taxes, etc.).
- Joint funding of investments.
- Other finance and cash flow sources.

Urban services

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

RATP Cooperation: technical assistance on behalf of public authorities operating public transport networks.

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

RATP Travel Retail: marketing and managing urban spaces.

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

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

Engineering

The Group's expertise in engineering allows it to deliver safe solutions for all transport modes in a timely and cost-effective manner.

Systra: RATP participation with a 43.4% stake through RATP Cooperation.

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.

Investment funds

RATP Capital Innovation: 100% owned by the RATP Participations subsidiary, which invests in targeted companies or investment funds in line with key innovation and development areas: new forms of mobility and smart cities.

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 operate, in France and abroad.

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 emphasises the proactive and ambitious role that RATP is playing in energy transition and sustainable development.

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.

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

RATP Group naturally contributes to the UN's sustainable development goals. There is detailed information available in the 2019 Financial and CSR report.

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

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

1996
Creation of the first body for continuous communication with approved passenger associations

1999
Signing of the International Association of Public Transport (UITP) development charter

2003
UN Global Compact membership

2006
First energy policy

2009
First sustainable development policy

2011
Adoption of the first code of ethics

2014
Group's first CSR report

2015
Signing of the CSR charter for the Grand Paris contracts

2017
Update of the sustainable development policy

2018
"CSR Commitment" label, "confirmed" level obtained by RATP.
RATP Group joins the Forum of Committed Companies convened by Transparency International

2019
Second issuance of green bonds, new code of ethics and code of business conduct and corruption prevention

The Group CSR policy is based on three strategies

Be a major player in mobility and sustainable cities

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

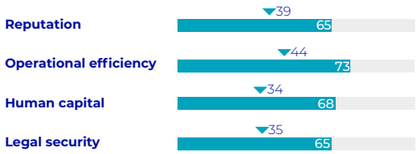
Promote management that encourages staff commitment

Ensure fair practices in its value chain

Extra financial ratings

• An external recognition in 2018: ISO 26000: RATP is the 1st multimodal transport operator in the world to be certified "Committed to CSR – confirmed level" by Afnor Certification
• 2019 Results of RATP's rating by Vigeo Eiris
Rank in sector: 2/22

Risk mitigation index (/100)



Analyst focus

Environnemental management

TREND RATP has allocated a comprehensive environmental strategy with an ISO 14001 certified management system. The company has set ambitious targets for its energy consumption and development of sustainable mobility services with extensive measures allocated in this regard.

Labour strikers

The company achieves advanced performances in its promotion of labour relations and the right to collective bargaining. In addition, RATP has signed several agreements with employee representatives including one on reorganisations. However, the company faces on-going labour strikes which may be a source of concern.

Customers

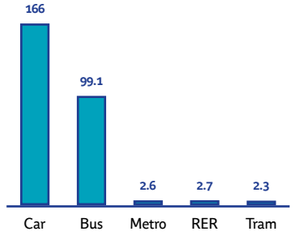
TREND RATP has set ambitious targets for its customer relations and provides extensive information to customers on several platforms. The company has also implemented exhaustive means to ensure customer safety and reports on mixed results in this regard. In contrast, RATP's performance is impacted due to the on-going labour strikes.

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 traveller using the metro, RER or tram emits 60 times less greenhouse gas than when they use a car.

1st network in the world to be 100% fitted with LEDs
1st multimodal network in the world to be ISO 50001 certified for all its operations
27% hybrid, electric or bio-NGV buses in the Île-de-France region fleet in 2019
1,084 managed bicycle parking spaces near metro and tram stations

Average greenhouse gas emissions per passenger-kilometre, RATP network in Île-de-France

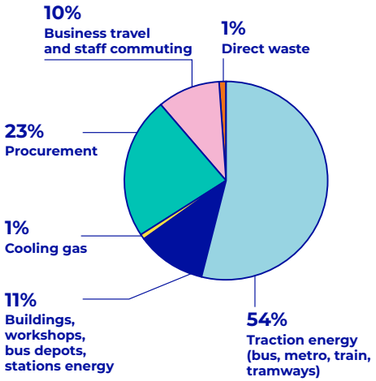


In gCO_2e/passenger-km

RATP has produced a carbon footprint report since 2005 (scopes 1, 2 and 3). This report is updated every three years. RATP's greenhouse gas emissions are broken down in the following way:

RATP's greenhouse gases emissions

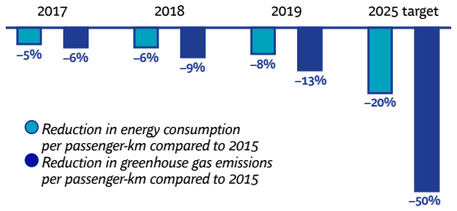
Source: 2017 RATP parent company carbon footprint



More details can be found on RATP's website: **ratp.fr.**

RATP is the first multimodal player in the world that has been certified ISO 50001 (in 2017). This certification stands for all of RATP's operations and recognises RATP's commitment to an ongoing strategy to improve its energy performance. And it continues its efforts to offer an ever more efficient, energy-saving and decarbonised transport offer.
RATP has set the goal to reduce its greenhouse gas emissions (GHG) by 50% between 2015 and 2025 and to reduce energy consumption by 20% within this same period.

Trends in energy consumption and GHG emissions – RATP



Between 2015 and 2019, RATP reduced its energy consumption by 8% and its associated GHG emissions by 13%.
To achieve these goals, the Group has adopted an action plan implemented across its operations: passenger transport (metro, bus, RER, tram), management of the rail infrastructure network, engineering, maintenance and management of its real estate.

The RATP Green Bond issuance, dedicated to low-carbon and sustainable transport, is an opportunity to emphasise the group's strategy in terms of sustainability and climate change. It also enables RATP to diversify its investor base, thanks to 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 Bonds also encourage project management teams to integrate the carbon and energy criterion at an earlier stage in the design phase.

Our green bond program

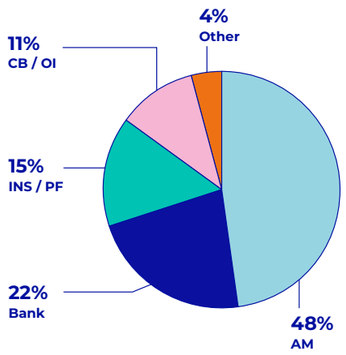
RATP is rated in compliance with standards from the French state on the following terms:

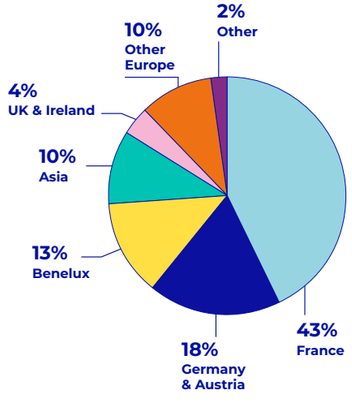
- Strategic importance as the owner and infrastructure manager of urban transport in Paris
- Strong state support – 100% state-ownership
- Legally protected from events such as insolvency and bankruptcy procedures by virtue of its EPIC status (industrial and commercial public undertaking)
- Resilient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

Aligned with the Green Bond Principles

The Green Bond Principles

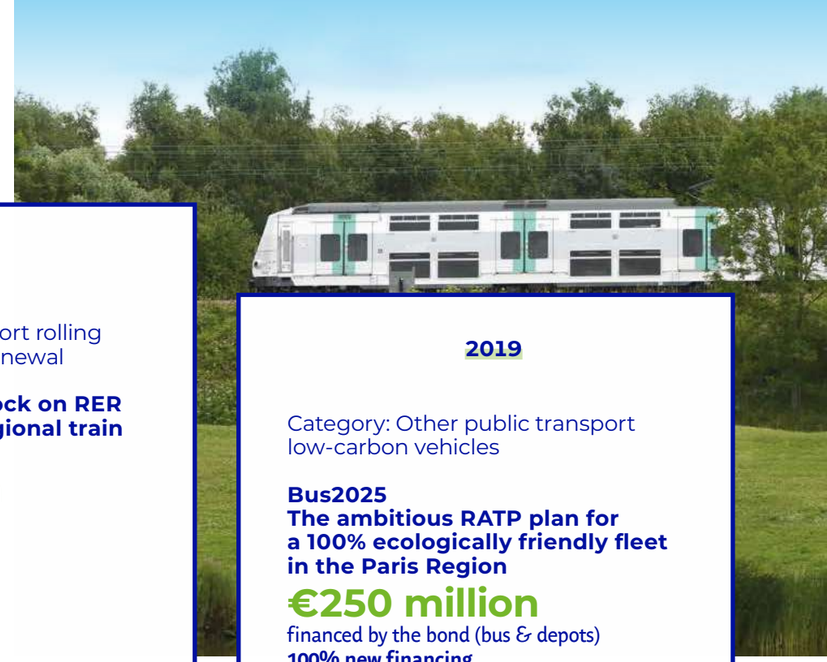
Typological and geographical distribution of investors





Main characteristics of the 2017 and 2019 operations

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



2017

Category: Public transport rolling stock renovation and renewal

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

€250 million
financed by the bond
100% refinancing

1 TWh energy savings
50,400 tCO_2e avoided

Category: Public transport infrastructures maintenance and renovation

Automation of Paris Metro line 4

€200 million
financed by the bond
100% new financing

140 GWh energy savings
6,700 tCO_2e avoided

Category: Public transport rolling stock renovation and renewal

Purchase of 100% electric maintenance RER shunters

€50 million
financed by the bond
100% new financing

32 GWh energy savings
14,000 tCO_2e avoided

2019

Category: Other public transport low-carbon vehicles

Bus2025
The ambitious RATP plan for a 100% ecologically friendly fleet in the Paris Region

€250 million
financed by the bond (bus & depots)
100% new financing

149,000 tCO_2e saved per year

Category: Public transport infrastructures maintenance and renovation

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

€100 million
financed by the bond (workshops)
23% refinancing

580 tCO_2e avoided

Category: Public transport rolling stock renovation and renewal

New vehicles for Metro lines
More ergonomic vehicles with more capacity for an extended line

€150 million
financed by the bond (vehicles)
17% refinancing

700 GWh
26,500 tCO_2e saved

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

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 line 4. The project should be completed in 2022. The project to automate line 4 can be divided into five subprojects: infrastructure upgrades, platforms and platform screen 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 they had been reinforced to install the platform screen doors. These steps were completed on schedule. More than half of the stations are now equipped with platform screen doors.

Unattended trains will be operated by a Communication Based Train Control system (CBTC) with a new Operation Control Center (OCC). The new OCC is now undergoing testing before being commissioned.
Concerning rolling stock, predisposition works are done for MP89C-MP05 trains, and the first new MP14CA train has been delivered on line 4 for testing.
Finally, technical progress brought about by automation should also serve social progress: several social agreements were signed with unions to organise the transition towards automation.

Major sustainable benefits

Line 4 main features

- North/south backbone of the Paris metro
- Built 1908-1910
- 1st sub-river crossing in 1910
- 14 km, 29 stations (27+2: extension in progress)
- The second busiest Parisian metro line after the 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 automatic 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 (thanks to 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 thanks to economic piloting of trains and the optimisation of regenerative breaking 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 by night on a reduced time
- 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 and reliability, and resilience
- Real time adaptability and/or tailoring the offer

140
GWh energy savings

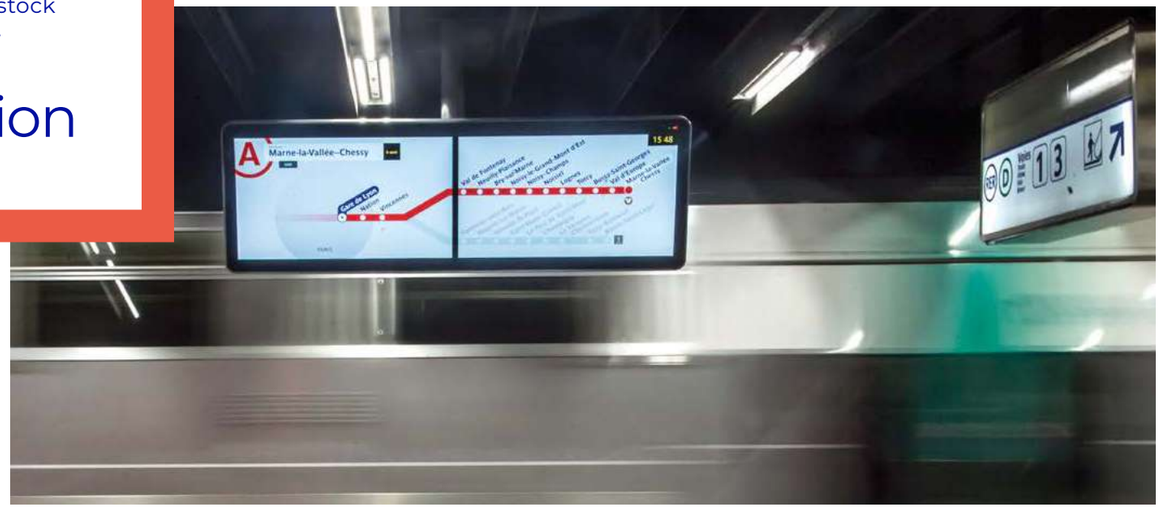
6,700
tCO_2e saved

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

Renewal of rolling stock on RER line A

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

€250 million
100% refinancing



The challenge of this project is to modernise the vehicle fleet of the urban train line that gets the most use 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 President of the French Republic occurred in December 2011. The Group placed an additional order of 10 items in July 2015.
The commercial operation of the 140th and last train ordered began in April 2017, i.e. six weeks ahead of contract schedule.

Projects description and major 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 Paris region

Project opportunities for line A

- Desaturation of a line victim of its success linked to the growing urbanism of 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 minimum 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 traveller:
– 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 oil/fat – reduction of waste in general

1
GWh energy savings

50,400
tCO_2e saved

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

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 infrastructures, RATP Group decided to purchase of 100% electric maintenance shuntershunters for RER worksoperations. The shunters are the locomotives used to tow the work trains for the maintenance of in order to maintain the tracks and tunnels.
In March 2017, this resulted in the signing oflead to the autonomous shunter contract for the design and the supply of 12 shunters with CAF France, and ordering of to placing an order for the first 12 items (6 more will be ordered later, if needed).
The structuring stage of the project has been was finalised mid-2019 (with about 1 year of extra delay because of lots of studies difficulties behind schedule due to numerous research challenges) and the preliminary and detailed studies are planned scheduled to be ended complete before the end of 2020.

The first 2 shunters are expected around to be complete mid-2021. The delivery of the 10 last shunters is scheduled at the rate of one per month in 2022. This represents will mark the end of the project, as far as the Green Bond proceeds are concerned extend.

Projects description and major 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 programme
- Participation to the Paris City policy "diesel fuel eradication by 2020"
- Anticipation in case 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 kept 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

32
GWh energy savings

14,000
tCO_2e saved

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

Bus2025

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

€250 million
100% new financing

Bus2025 is the ambitious RATP plan for a 100% ecologically friendly fleet in the Paris region.
It is a 3-phase project:
• 2015: real life trials
• 2017: first deployment with first huge bid to acquire electric buses
• 2019: large scale deployment
This is a double challenge: the depots must be transformed, and the minimisation of the impact on the electric grid taken into account.
After the study phase, the site conversion projects are now being launched: at the beginning of 2020, 20 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 Créteil (GNV) and construction of the first phase of Lagny and Corentin (electric) are completed.
• Construction has started on 5 additional sites: Massy and Bussy (GNV), Pleyel, Lilas and Lebrun (electric).
• The other sites are under study, from the program and AVP phases to the purchasing phases.

In order to ensure rapid deployment of buses from the end of 2020 (600 buses per year from 2021 to 2025), RATP is preparing changes in the organisation of operation and maintenance by implementing the necessary changes at the level of operational teams and central support teams.
At the end of January 2020, the fleet of own buses consisted of 1,011 hybrid buses, 122 electric buses and 189 CNG-powered buses.

Major sustainable benefits

• To stand out by meeting increasingly high 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 the expectations of the passenger.

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

Vaugirard workshops

Category 1
Public transport infrastructures maintenance and renovation

€100 million
23% refinancing

February 2019: laying the first stone
Delivery from 2022: social housing, private housing, equipment maintenance workshops
Delivery 2023: private dwellings
2027: restructuring the train maintenance workshop, other parts of the housing units
Birth of a new district with the creation of an urban road and:
• 2 maintenance workshops: rolling stock and equipment;
• 400 housing units (50% social housing);
• a daycare for children, food shops;
• 700 m² dedicated to urban agriculture and the largest green roof in Paris with 15,000 m².

Work on phase 1 is in progress (12,000 m² of equipment maintenance workshop, a building with 50 private dwellings, another with 100 private dwellings also comprising a daycare centre, and 104 social housing units); phase 2, consisting of the train maintenance workshop and a final tranche of social housing, is undergoing preliminary design studies for 2019.

Major sustainable benefits

Positive impacts related to RATP proactive CSR policy:
A decrease to one third of the regular energy consumption between the new RATP workshops and the old ones, i.e. avoided GHG emissions of around 580 tCO_2e 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)
Housing units are certified "habitat environment" and meet the requirements of eco-design, 50% social housing (dedicated to RATP staff)
• Thermic Regulation (RT 2012): –30% targeted energy consumption for dwellings
Project that maintains employment of blue-collar workers in dense areas and the urban mix

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

New vehicles for Metro lines

Category 3
Public transport rolling stock renovation and renewal
One project financed

€150 million
17% refinancing

First high-capacity automatic metro line commissioned worldwide in 1998.
Future backbone of the Grand Paris Express, on the occasion of the extension of line 14 to the Town Hall of Saint-Ouen in 2020 (Covid-19 impact), rolling stock will be renewed across the entire line (first order of 35 trains).

Major sustainable benefits

Energy savings
Thanks to the new generation of energy recovery breaking systems and motors: 20% energy savings on the line overall.
Air quality: Thanks to the electrical breaking, there is a reduction in the emission of particles.

Social impacts & comfort
Each train will offer 48 seats for people with reduced mobility and 8 for wheelchairs, a completely accessible train (wide circulation areas, new ergonomic seats).

40%
quieter: –2dBA inside

95%
Recyclability

Allocation
of borrowed funds

Date of fundraising: June 6, 2019
The amounts allocated are expenses affected to the projects for the calendar year 2019, net of grants requested over the year.
All funds raised have not yet fully allocated for the calendar year 2019.

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 %
Category 1: Public transport infrastructures maintenance and renovation	€200 million	€44.85 million 22%	€104.52 million 52%	€300 million	€186.81 million 62%
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%
Category 3: Modernisation of public transport stations and facilities	–	–	–	–	–
Category 4: Other public transport low-carbon vehicles	–	–	–	€250 million	€21.53 million 9%
TOTAL green bond	€500 million	€300 million 60%	€362.69 million 73%	€1,000 million	€506.89 million 51%

Allocation report at project level

INVESTMENTS	2017		2018		2019	
	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 %
Automation of Paris Metro line 4 100% new financing	€200 million	€44.85 million 22%		€104.52 million 52%	–	€158.54 million 79%
Renewal of rolling stock on RER line A, the busiest regional train in Europe 100% refinancing	€250 million	€250 million 100%		€250 million 100%	–	€250 million 100%
Purchase of 100% electric maintenance RER shunters 100% new financing	€50 million	€5.24 million 10%		€8.17 million 16%	–	€13.16 million 26%
Bus2025 100% new financing	–	–	–	–	€250 million	€21.53 million 9%
Vaugirard workshops 23% refinancing	–	–	–	–	€100 million	€28.27 million 28%
New vehicles for Metro lines 17% refinancing	–	–	–	–	€150 million	€35.40 million 24%
TOTAL green bond	€500 million	€300 million 60%			€500 million	€85.2 million 17%

Methodology
of the green bonds program indicators

For each investment, the potential energy savings and greenhouse gas (GHG) emissions avoidance has been estimated. The aim is to highlight the impact of each investment on the reduction of greenhouse gas (GHG) emissions and on the energy transition.
Only the direct effects of the operation phase of the projects have been 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 have not been included in the calculation.
GHG emissions measured are emissions associated with energy use

Project: automation of Paris metro line 4

140	6,700
GWh energy savings	tCO_2e avoided

The automation of metro lines can directly generate 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 train's 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_2e per year;
• 34 tCO_2e avoided/€ million invested.

Methodology

Ex ante evaluation
The evaluation is done 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 Paris 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 evaluate the energy consumption of line 14. The energy savings resulting from the implementation of these provisions on line 14 is estimated at 16%.
By analogy, the potential gain associated with the automation of line 4 is estimated at 10% of the consumption of the line (low hypothesis).

Emission factors used
Electricity consumption (France, transport use):
48 gCO_2e/kWh
Source: Ademe, April 2018, http://www.bilans-ges.ademe.fr/.

Air quality
The automation of line 4 improves air quality by reducing the particles emissions of rolling stock.
In this way, automation offers the opportunity to increase electric braking with energy recovery, as a substitute for mechanical braking. In the braking phase, trains are able to restore their kinetic energy in the form of electricity 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 line 14.
On line 14, RATP measured the impact of the consumption of friction materials (the main source of dust in underground railway enclosures) before and after implementing eco-driving. According to the calculations made, 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 line 14. By analogy, following the automation of line 4, a significant decrease in the consumption of friction materials is expected and therefore a reduction of the concentration of particles associated in the station.

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 line 4 relies as much on its technical quality as on the control of the social subject associated with the project.
The installation of automatic systems is more reliable but can also be more complex. Consequently, new skills and technicality need to be acquired both at the level of operations and maintenance. Therefore, the automated metro induces new work organisations creating new and more rewarding professions, with a greater variety of tasks. These jobs are higher-skilled and therefore better paid.
Line 14 was designed without a driver and inaugurated in 1998. Since it was a successful "managerial experiment", the automatic system has been integrated into the modernisation program of the Paris metro as a whole.
In regard to the unions, the modernisation of the network was apprehended at a global level in which the automation of line 1 – in 2011 –, and the one of line 4 – currently taking place, was integrated.
In addition, RATP is able to carry out the automation without 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 engineering, operations and maintenance departments. Staff members of the line benefit from an ongoing training program and specific supervision during the time they acquire the necessary skills to exercise their new profession in a constantly evolving context.

Project: Renewal of rolling stock of the RER A

1	50,400
TWh energy savings	tCO_2e avoided

Rolling stock fleet modernisation is an important lever for continuing to improve the energy performance of the transport networks operated by RATP.
The modernisation of the RER line A rolling stock fleet with the arrival of MI09 has led to very significant advantages 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_2e avoided;
- 202 tCO_2e avoided/€ million invested.

Methodology

Ex post evaluation

The evaluation is done ex post. Energy savings and GHG emissions avoided by replacing the arrival of MI09 equipment had been estimated from measurements on a sample of the fleet. 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_2e 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_2e avoided;
- 279 tCO_2e avoided/€ million invested.

Methodology

Ex ante evaluation

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

Air quality

By replacing the fleet of diesel tractors with electrical tractors, we obtain a 100% reduction in carbon monoxide emissions, hydrocarbons emissions, nitrogen oxides emissions and particles. Consequently, the impact is significant and immediate on air quality; especially underground (the main place of use of electrical tractors).
Indeed, the standard(1) emission on "phase 2" of diesel tractors in the current RATP fleet gives a maximum threshold of the net power category comprised between 130 kWand 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)
Threshold	3,5	1	6	0,2
For 12 locotractors respecting the standard	42	12	72	2
Impact of the 12 electric locators of the investment as soon as they are used	0	0	0	0

(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.

METHODOLOGY OF THE GREEN BONDS PROGRAM INDICATORS

Project: MP14

Rolling stock fleet modernisation is an important lever for continuing to improve energy performance of the transport networks operated by RATP.
The modernisation of the fleet of metro rolling stock with the arrival of MP14 has led to very significant advantages both in terms of energy consumption and associated GHG emissions.
The new generation MP14 tire rolling stock will circulate from 2019 on lines 4, 11 and 14.
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 690 GWh;
- 26,500 tCO_2e avoided.

Methodology

Ex ante evaluation

The evaluation is done ex ante. Energy savings and avoided GHG emissions due to the replacement of rolling stocks are based on theoretical calculations. These calculations are made at the design study stage. 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 149,000 tCO_2e saved per year.

Methodology

Ex ante evaluation

The evaluation is done ex ante. Avoided GHG emissions due to the replacement of buses are based on theoretical calculations.

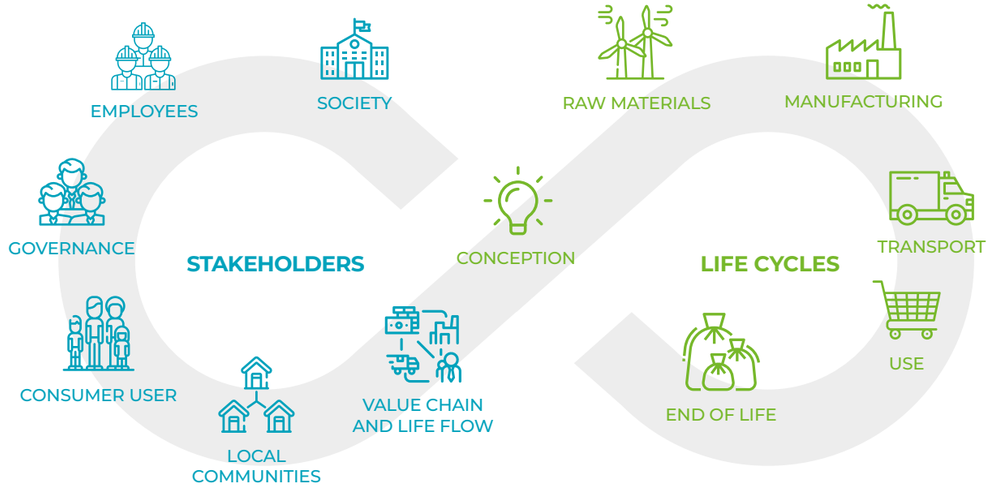
Project: Vaugirard

The Vaugirard workshops adaptation project should make it possible to accommodate new, more efficient rolling stock, particularly in terms of energy consumption, on Paris metro line 12.

An eco-design approach is implemented for this project.
Eco-socio-design is an approach to integrate 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 does not only seek 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 (QVT);
- 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.

At the design stage, the measures envisaged include the green roofs or the installation of equipment (BMS) allowing the regulation of installations and thus the reduction of 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_2 equivalent (direct and indirect).
RATP wishes to optimise this carbon impact as much as possible. It includes taking action during the design phase to reduce the CO_2e 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 the Statutory Auditors of RATP EPIC

Attestation by one of the Statutory Auditors of RATP EPIC on the Allocation of Proceeds from the Green Bond issuances of June 22, 2017 and June 13, 2019

In our capacity as Independent Third Party and Statutory Auditor of RATP EPIC and in response to your request, we have prepared this attestation on information relating to the allocation at December 31, 2019 of proceeds amounting to €500 million from each Green Bond issuance of June 22, 2017 and June 13, 2019 (hereinafter the "Issuances"), as reported in the accompanying document entitled "Green Bond Impact Report" (June 2020, hereinafter the "Report"), which was prepared in accordance with the terms and conditions of the issuance agreement dated June 22, 2017 (hereinafter the "Green Bond Framework").

The Report, which is intended for green bondholders, states that €506.89 million of proceeds had been allocated to eligible projects as at December 31, 2019.

The information was prepared by your finance department based on the accounting records used to prepare the non-consolidated financial statements for the year ended December 31, 2019. The accompanying document specifies the methods and eligibility criteria used to prepare the information.

It is our responsibility to provide an opinion on the following information presented on page 23 of the Report 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.

As part of our statutory audit engagement, we conducted a joint audit of RATP EPIC's non-consolidated financial statements for the year ended December 31, 2019. The purpose of our audit, which was conducted in accordance with the professional standards applicable in France, was to express an opinion on the non-consolidated financial statements as a whole rather than on the specific items used to obtain the information. Consequently, we did not carry out any tests of details or sampling for that purpose and we do not express an opinion on those individual items. The non-consolidated financial statements were approved by the Board of Directors on March 6, 2020 and our unqualified audit report was issued on March 10, 2020.

Moreover, we have not implemented procedures to identify any events that may have occurred since we issued our audit report on the financial statements dated March 10, 2020.

Our assignment, which did not constitute an audit or a review, was performed in accordance with the professional standards applicable in France. Our work included:

- identifying the people responsible for data collection within the company 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 the company;
- examining, using sampling techniques, the processes used for data collection, compilation, processing and verification, particularly the procedures relating to the allocation of proceeds set out in the Green Bond Framework;
- based on a representative sample of eligible projects as at December 31, 2019:
  - verifying the calculation of proceeds allocated to each project, and the share allocated to financing and refinancing Eligible Green Projects;
  - reconciling the information with the supporting documents.
- implementing analytical procedures on the allocation of proceeds and verifying their consistency with information provided in reporting documents.

Based on our work, we have no matters to report concerning the consistency of:

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

with accounting information or the information on which the RATP EPIC's financial statements for the year ended December 31, 2019 were based.

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 to RATP EPIC is defined by French law and we do not accept any extension of our responsibility beyond that specified by French law. We shall not be liable to any third parties, including green bondholders, and we are not party to the Green Bond Framework agreement. We shall not be held liable for the execution of the Green Bond Framework or for any resulting damages, loss, cost or expense.

This attestation is governed by French law. All disputes, claims, or disagreements arising from our engagement letter or this attestation fall under the exclusive jurisdiction of the French courts. Both parties irrevocably forego their right to oppose any case brought before the French courts, or to argue that the case has been brought before a court that lacks jurisdiction, or that the French courts do not have jurisdiction.

Paris-la Défense, June 29, 2020
KPMG SA

Stéphanie Millet
Partner

Anne Garans
Partner Sustainability Services