

CITY OF PARIS

**Projects funded by the Climate Bond
issued on November 10th, 2015**

Reporting



2017

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The annual opinion review provided by the Vigeo Eiris agency can also be found in the appendix to the 2017 Reporting.

This document falls within the framework of the environmental and socially responsible bond issue carried out by City of Paris in 2015 and is exclusively for the use of investors.

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PRESENTATION OF THE PARIS CLIMATE BOND IN CONTEXT

City of Paris has been committed to the fight against climate change for a long time, both through its actions led on the ground in Paris and in its administrative activities.

In 2005, Paris was already aware of the environmental and social stakes, and resolved as a consequence to develop its territorial Climate Plan. The Plan was adopted in 2007 and updated in 2012 in consultation with the people of Paris to take social, economic, technical, environmental and legal changes into consideration.

In 2018 a new version of *Plan Climat Énergie de Paris* (Paris Climate and Energy Action Plan) was adopted, which aims at making Paris a carbon-neutral, resilient and inclusive City using 100% of renewable energy sources by 2050. In order to reach this goal, ambitious intermediate objectives which extend well beyond the European and national obligations stemming from the *Grenelle de l'Environnement*, have been set and should be fulfilled by 2030:

- To reduce greenhouse gas emissions by 50 % (compared with 2004);
- To reduce energy consumption by 35 % (compared with 2004);
- To have 45 % renewable and reusable energy in its energy consumption and at least 10% produced locally.
- To decrease the global footprint from its territory by 40%
- To become a zero fossil fuel and domestic fuel area.
- To abide by WHO recommendations regarding air quality

A commitment confirmed by an encouraging 10-year experience and external evaluations

The [2004-2014 Results](#), which summarize the actions undertaken by the city in the Paris Climate and Energy Action Plan for adaptation to climate change, demonstrate the following:

- A reduction of around 10 % in greenhouse gas emissions;
- A 15 % reduction in its use of energy;
- A 15 % share of renewable and reusable energy in its energy consumption.

Paris is consistently developing stronger public policies which combine solidarity, economic development, environmental conservation, biodiversity and a circular economy.

According to the assessment of the agency VIGEO-EIRIS Rating, Paris is a leader in the local authority sector with a rating of 64/100 in 2014* (against a sectoral average of 43/100) and enjoys the highest level in the grading system. In addition to this, Paris has received a “Positive Energy Territory” approval from the Ministry of Ecology, Sustainable Development and Energy.

* At the last grading in 2016 the rating of the City of Paris remained stable at 64/100.

2015, the year of increased Parisian mobilisation in the fight against climate change...

City of Paris was prominent in 2015 when it hosted the 21st international climate conference (COP21) which saw the signing of the historic agreement adopted on December 12th 2015, as well as by the many actions carried out on a territorial scale (adoption of plans for combating air pollution by road transport, the strategy of sustainable innovation for Paris, the plan for sustainable food in municipal catering, and the Paris climate change adaptation strategy). The City of Paris has also set up a number of partnerships (declaration from March 26th 2015 on the public procurement stakes as a lever for action in taking concrete steps to fight against climate change and the World Mayors’ and local representatives Summit on December 4th 2015). 31 major firms established on Parisian territories have signed the Paris Action Climat charter and are committed to reducing their carbon footprint by 2020.



... and the year of the Climate Bond: the first issue of a green-labelled and socially responsible bond by City of Paris

With the organisation of COP21 and the World Mayors' and local representatives Summit at the end of 2015, Paris has gained excellent visibility from an international point of view. The issuance of the Climate Bond in November 2015 falls within the context of supporting exemplary policies relative to sustainable development. Paris has thus asserted its continued commitment to the fight against climate change by choosing to specifically allocate the funds raised to the financing of projects with a noteworthy climate benefit.

Method: To carry out this green and socially responsible issue, the City of Paris asked for an extra-financial rating by the Vigeo Eiris agency in order to have its performances with regards to sustainable development evaluated by an independent body. This rating completes those carried out by Fitch and Standard & Poor's agencies on the City, at the highest level possible for a French local community (just as with its Euro Medium Term Note (EMTN) programme set up in 2004).

Vigeo Eiris also assisted the City of Paris in structuring its issue by certifying, from the start of the project selection procedure, their environmental and social goals and the responsible management of the bond issue. To do this, Vigeo Eiris used its ESG (Environment, Social and Governance) evaluation method and the recommendations of the Green Bond Principles (GBP, 2015 version) which aim at defining guidelines to encourage transparency, the dissemination of information, and integrity in the development of this contract. At the end of this process, the City was able to report to investors on the legitimacy of its approach by publishing the "Second Party opinion" on the subject of the Climate Bond established by Vigeo Eiris, which awarded a favourable verdict, matched with the best level of assurance («reasonable assurance»):

- On the environmental and social responsibility regarding the City («advanced» level of the issuer);
- On the relevance of the projects targeted by the issue in terms of contribution to sustainable development;
- On the framework of the issue in line with the recommendations of the Green Bond Principles.

The methodology of each of the four Green Bond Principles was as follows:

- "Use of proceeds" (funding of projects which contribute to climate change mitigation and adaptation): to enhance the diversity of its actions regarding the environment, the City has chosen to allocate funding to projects whose socially responsible environmental approaches cover all the goals listed on its Climate-Energy Plan.
- The project evaluation and selection process, coordinated by the *Direction des Finances et des Achats - DFA* (Finance and Procurement Department) was implicit in all operational management. Meetings were first organised on the substance of the projects in the 2014-2020 *Plan d'investissement de la mandature - PIM* (Mandate Investment Plan): accurate description, forecasted scheduling, costing and budgeting, available "monitoring" methods. The list is subsequently fine-tuned according to the data collected and their relevance with "Use of proceeds": validation on each project of the substantial and measurable benefits - this was effected by the *Agence d'écologie urbaine (AEU)* (Urban Ecology Agency), which is part of the *Direction de l'environnement et des espaces verts - DEVE* (Directorate for Green Spaces and the Environment) and whose agents are accredited for carbon evaluations, and of the results of the Vigeo Eiris evaluation on the scope of the defined issue.
- "Management of proceeds": in view of the monitoring and reporting of the projects, a collaborative approach between the *Direction des Finances et des Achats - DFA* (Finance and Procurement Department) and the directorates concerned was implemented. Thus, the budgetary contacts in the operational departments were notified so that the financing of the selected projects would be under close scrutiny, specifically to avoid any form of "double funding" of a project. The allocation of funds to the selected projects was then confirmed, using the City's accounting tool (*Alizé*) which associated any expenses with the authorisation of the programme concerned through the legal commitments attached to it and, on a second level, was monitored by the *Direction régionale des finances publiques - DRFiP* (Regional Directorate of Public Finance) which checks that the payment they are being requested to make actually corresponds to an expenditure properly entered into, scheduled and settled.

This annual report aims at synthesizing and confirming all of the commitments that the City has made within the scope of the issued Climate Bond.

SUMMARY OF PROJECTS FUNDED

2017

	Initial forecast of funds allocation	Invested throughout 2015-2016	Invested in 2017	Total invested
TOTAL :	€ 300m	€ 147.9m	€ 66.6m	€ 214.5m
Category 1. Reducing greenhouse gas emissions	€ 120m	€ 59.3m	€ 20.8m	€ 80.1m
Public transport				
Tram : T3 - Chapelle-Asnières Extension	€ 50m	€ 50m	€ 8.8m	€ 58.8m
Paris stations Ring Road (Surface transport)	€ 24m	€ 0.4m	-	€ 0.4m
Non-motorised traffic :Cycle paths	€ 40m	€ 5.7m	€ 9.7m	€ 15.4m
Electric vehicles :installation of Belib charging stations	€ 6m	€ 3.2m	€ 2.3m	€ 5.5m
Category 2. Reducing energy consumption	€ 115m	€ 78.3m	€ 41.9m	€ 120.2m
Sustainable social housing (HEQ construction, thermal insulation)	€ 55m	€ 55m	€ 34m	€ 89.0m
Energy performance contract concerning public lightning	€ 60m	€ 23.3m	€ 7.9m	€ 31.2m
Category 3. Producing renewable and waste energy	€ 5m	€ 4.0m	-	€ 4.0m
Photovoltaic solar panels	€ 5m	€ 4.0m	-	€ 4.0m
Category 4 . Strategy for territorial adaptation	€ 60m	€ 6.3m	€ 3.9m	€ 10.2m
30 new hectares of green areas	€ 45m	€ 4.9m	€ 2.3m	€ 7.2m
Programmes for planting 20,000 trees	€ 15m	€ 1.4m	€ 1.6m	€ 3.0m

A reminder of the commitments and targets of the reporting

In order to ensure transparency, and as evaluated independently by Vigeo Eiris, the City of Paris has committed to communicating on a yearly basis on the selected projects:

- allocation and progression indicators (work progress and investments made);
- their climate benefits;
- the ESG performance indicators.

The reporting is carried out at an operational (project) level and/or at a global (Bond) level for the transverse indicators which are often linked to the internal organisation of the community, particularly where responsible governance criteria are concerned. It will subsequently be necessary to consider these indicators as being common to all the projects.

Summary of the 2017 reporting relative to the projects funded by the Climate Bond

Since the Climate Bond was issued on November 2015, this reporting is the second one to cover a full year. It confirms and specifies the projects (the allocation of funds raised and their distribution), their state of progress and, where possible, the environmental benefits evaluated and quantified by the *Agence d'Écologie Urbaine - AEU* (Urban Ecology Agency, accredited for carbon evaluation).

All the projects are currently being realized, and some are at an advanced stage. Only one project - the stations ring road - is still in the design phase.

In order to better respond to the commitments for transparency that Paris has made in respect to their suppliers, this third reporting includes a note on the methodology, which can be found at the end of the document .

To sum up, as of 31 December 2017

- €214.5m of the €300m of the Climate Bond have been invested
- The data can be confirmed by the IT monitoring of the local authority accounts (Alizé), in connection with the *Direction régionale des Finances Publiques - DRFiP* (Regional Directorate of Public Finance)
- 18,522 t.CO2/year carbon equivalent have been avoided (this number does not include Tram 3, which should add 10,100 t.CO2/year to the total amount reported).
- 513 MWh/year produced thanks to 570 kW peak photovoltaic power units installed.
- 8,343 trees have been newly planted and 10.23hectares of green spaces created which allow carbon storage of 371t.CO2/year.
- At least 102,927 hours of integration work have been validated among the set of projects selected (this number is a minimum, since some departments have not reported the full amount of data on that topic).

Responsible governance indicators on a general level

<p>Social responsibility towards workers & respect for human rights</p>	<p>In addition to the already protective statutes of the civil service, human resources policies implemented by the City of Paris integrated the following principles:</p> <ul style="list-style-type: none"> • respect for “residual” private life (amendments to the charter for the use of computer resources taking this tolerance into consideration); • compliance with the French Data Protection Act to protect the personal data of users in the teleservices offered by the City; • fight against all forms of discrimination (generational, gender equality, people with disabilities, etc.); • reception facilities and anonymous, personalized and confidential support for all victims of sexual and moral harassment (an “At your service” unit: where callers will be directed towards one of the Support professionals from Mediation Services which are bound by professional and medical privacy). <p>Regarding public contracts: tender file documents (DCE) commit the firms winning the tenders to the fight against illegal labour, the obligation to employ disabled or disadvantaged workers, gender equality, and a healthy environment, in line with the French Public Procurement Code (CMP). For all its procurement City of Paris considers integrating sustainable development targets into its Specifications and in the contract award procedures, in the form of clauses relative to performance conditions and/or in the form of standards by which the proposals are judged (see Responsible Procurement indicator). On the 31st December 2016, analysis of the 3,302 questionnaires conducted since 2012 concluded that 55% of the firms had declared their commitment to an approach based on improvement in terms of diversity and have formalized these practices within their operations.</p> <p>In cases where the successful tenderers and/or their subcontractors have made incorrect declarations or breached their commitments, the administration uses its general powers of control and management over the performance of the contract to remind the firm of its obligations (with a view to correct them) or to impose monetary fines and even terminate the contract according to the clauses systematically provided in the specifications. No such case has ever occurred on any of the projects funded by the «Climate Bond».</p> <p>Over all the City’s public contracts, Awareness of Health and Safety is included in the contractual specifications and is reinforced according to the purpose of the operations: to reduce the risks on construction sites, maintenance sites etc., a general plan, imposed by French regulations, covering coordination of safety and health protection, defining all the measures which must be put in place; for contracts working on green spaces, generalized and local Prevention Plans are applied.</p> <p>In the case of failure to apply the safety and health protection measures, the <i>Cahier des Clauses Administratives particulières</i> (CCAP) includes monetary penalties.</p>
<p>Responsible procurement</p>	<p>As required by the Act of the 31st July 2014 on social and solidarity economy and the Act of the 17th August 2015 on ecological transition for green growth, in 2016 the city prepared the <i>Schéma Parisien de la Commande Publique Responsable</i> (Responsible Public Ordering Plan) which makes circular economy a cornerstone and sets ambitious targets regarding the environment: with reflection on the development of a carbon footprint indicator, the enhancement of reemployment and recycling, the fight against planned obsolescence, economy of use and functionality, minimizing grey energy, etc.</p> <p>Facilitating access to public procurement for SMEs is another vital focus which falls within this socially responsible rationale:</p> <ul style="list-style-type: none"> • in 2017, 41% of expenditure resulted from contracts attributed directly to SMEs (not including subcontractors), this number is unchanged compared to 2016. • Frequent dialogue with firms: briefings on different topics (7 in 2016), B-to-B (business to business) meetings, “Sourcing” by procurement departments to understand the economic fabric and identify avenues for innovations, “procurement” contacts made possible by registration through a single registration facility (319 requests in 2016); • more straightforward processes and more information available, outlined specifications, regulations for tender criteria, sub-criteria and weightings, reasoned responses for unsuccessful candidates to help them to improve their proposals during subsequent tenders, lowering of the requested minimum turnover, etc. • Allotting of tenders.

Good business practices

& Ethics

Thanks in particular to a reorganisation of the departments in charge of payments, the **average payment time of suppliers** for the City of Paris has remained at **20 calendar days in 2017** (statutory time limit: 30 days, this accounts for the City of Paris receiving the “*Prix Spécial du Jury des délais de paiement, toutes catégories confondues*” in June 2015) in spite of the volume of invoices to be paid (almost 500,000/year). For additional transparency suppliers have been able to follow their payments via the supplier portal since September 2014.

In addition to this, the *Sous-Direction des Achats - SDA* (Procurement Division) is implementing an ethical guide entitled *Charte de déontologie Achats* (Charter of Procurement Ethics) in order to comply with the French Public Procurement Code.

- Thus, concerning procurement in 2017, only 10 actions were brought against the City of Paris out of 899 contracts awarded (vs 11 actions out of 898 contracts in 2016). Of these, 7 were won by the City, none were lost and 3 are pending judgement. None of the actions concerned projects funded by the Climate Bond.
- Within the framework of the prevention of conflict of interest, all agents taking part in a public procurement operation (public contract, delegation of a public service or concession, partnership contract, etc.) must be careful not to find themselves in a position of conflicting interests; if this were to be the case, they would be obliged to report this immediately. Failing to do so would be considered a breach of contract and may be subject to disciplinary action.

The mechanisms for ethical control are ensured through procedures including formal decision makers (Committees and Commissions), individual responsibility (punished in case of default: re-locating the dossier, cancelling the contract), possible case for criminal responsibility) and work approvals (confirming that the current regulations have been respected at each stage).

All members belonging to elected members’ cabinets and new supervisory staff are notified of the procurement ethics and the various violations in this field (corruption, insider influence, unlawful involved interest and/or favouritism). Compliance with the **ethical charter for the city’s elected officials**, which was acclaimed by the *Haute Autorité pour la Transparence de la Vie Publique - HATVP* (High Authority for Transparency in Public Life) which encourages this type of practice, is entrusted to an ethics commission. This commission is made up of five independent persons, and acts in an advisory capacity. Since publication of the last reporting, no new procedures concerning the City or its representatives has been recorded.

1. Reducing greenhouse gas emission

Public transport: T3 tram line - Chapelle-Asnières Extension

<http://www.tramway.paris.fr/>

Project description

The extension of the T3 Tram line between Porte de la Chapelle and Porte d'Asnières is part of the 2015-2020 State-Region Plan (development of the network, multimodal access section, Grand Paris, etc.)

This 4.3 kilometre extension will include 8 new stations:

It follows the northern *boulevards des Maréchaux* (Ney, Bessières and Berthier) which go through the 17th and 18th arrondissements of Paris.

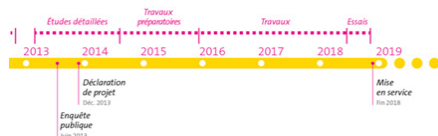
This sector has a considerable number of urban projects, for example the ZAC Clichy-Batignolles (17th), where the future location «*Cité judiciaire*» de Paris will be, as well as the ZAC Chapelle International (18th). This extension is expected to serve over 600,000 people and 300,000 salaried workers (including the passengers from neighbouring municipalities).

The project will be delivered by the end of 2018.

Key data

Forecasts :

- 4.3 km. extension of Tram T3 will be delivered by the end of 2018, allowing:
- Service for 89,000 passengers/day
- 10,100 t.CO2/year avoided
- 60,323 hours of social integration work



Completed:

- First laying of tracks in December 2016.
- 36,161 hours of integration work as of 31/12/2017.
- Full project expected to be delivered by the end of 2018.

Timetable of proceeds invested since 2015

€58.8 m from the proceeds of the Climate Bond were allocated to this project, which accounts for more than 27% of the total budget needed, and more than the initial amount expected to contribute to this extension from the proceeds of the Climate Bond.

€8.8 m were invested in 2017 from the proceeds of the Climate Bond issue.



Funds invested from the proceeds of the Climate Bond since 2015

(Data extracted from the Administrative accounts throughout 2015-2016-2017)

Governance

Operational management of the project: a dedicated team with a nominated project manager was set up in the *Direction de la Voirie et des Déplacements - DVD* (Directorate of Roads and Travel) to monitor the project and report on its progress:

- Through biannual follow-up committees to present the project's progress to the funding partners
- Through annual presentations to the *Conseil de Paris* in the form of a report on the operations

Social Responsibility

Responsible Procurement

Social clauses included in the works contracts provide for a total of 60,323 hours of integration work for long-term unemployed persons.

To ensure the correct performance of these clauses, City of Paris signed a partnership with *Ensemble Paris Emploi Compétences*, a body in charge of validating the number of such hours.

As of 31 December 2017, **36,161 hours of integration work** had been carried out, with outstanding participation by certain service providers who presented results well beyond their contractual obligations.

Awareness on Safety and Health issues has been reinforced by a Coordination compact relative to the Safety and Health Protection of Workers (Category 1) which has been declared for a duration of 63 months, starting in September 2013 (i.e. up to December 2018) specifically for urban integration and support work on the one hand and related administrative operations on the other.

Social cohesion

PRM accessibility is an intrinsic component of the project, principally along its route and in the immediate vicinity of the stations:

according to the *Cahier des Clauses environnementales des chantiers - CCEc* (works site environmental clauses), the temporary pedestrian and disabled routes, and the existing ones modified for the duration of the works, must meet all regulation and be in line with the *Schéma directeur d'accessibilité de la voie publique* (plan for accessibility to public roads) for persons with reduced mobility, and must meet the NF P 98-351 standard of August 2010. In order to do this, clear signposting on the ground is planned, sufficiently upstream of the proposed modifications to the existing provisions, and with the addition of tactile paving stones (in compliance with legislation) designed to mark and secure the mobility chain for blind or visually impaired persons.

Communication with users and residents

In addition to the information channels between users and the tram mission which have been available since the beginning of the project (Flash info, T3 Mag, website www.tramway.paris.fr), meetings are organized regularly to inform the residents about the project and answer their questions.

In July 2017, 8 “Totems” (2 meters high) have been installed on the location of each station under construction. The informations they display should allow residents and future users to understand where connections and stations will be available as well as the city planning linked to the Tram development.

7 explanatory panels were also installed along the fences of Lycée Utrillo and then of Lycée Balzac to explain how the project development will be conducted up to the moment it is delivered.

The Tram mission also organised presentations for as much as 50 elementary or secondary classes but also for leisure centres for children around the 17th and 18th arrondissements, in order to raise awareness regarding the proper way to safely walk around the construction sites.

The **CCAP (Special conditions) for road works contracts** contain an article relative to the **Protection of residents against all forms of pollution** during the operation.

On top of daily presence of local communications officers all along the line of the future T3, Infotram (dedicated telephone number and email address for answers to questions from residents and traders) was set up in order to create a link between the residents and “Tram Mission”.

This website received 114,000 connections and 318,000 pages were visited as of 15th October 2017, ie 25% and 20% more when compared with 15th October 2016.

On two sites at « Porte de Saint-Ouen and Porte d’Asnières » a system of timelapse pictures footage was installed.

People connecting to “Télé Tram” website can therefore view the different steps of the works conducted on road tunnels built on these sites.

Environmental Responsibility

Energy consumption

Choosing to develop a Tram line is part of the answer to “Plan de déplacement de Paris” and “Plan de déplacements Île-de-France” but also to new local rules regarding air quality and rational use of energy, since it should contribute to a better allocation of public space and profit non-motorized transports(bikes, pedestrians).

The survey for the T3 extension route was carried out with a view to create hubs with Métro lines, Mobiliens lines, and Paris and Paris outskirts bus lines, to improve this redistribution of public space (Travel Plans for Paris and Île-de-France) and final consumption by a **rational use of energy**. This focus on mobility is even more important because, while this project anticipates the integration of services to rapidly urbanizing areas, a survey carried out by Idfm has shown that from this point of view half the T3 users are inhabitants of the municipalities bordering Paris.

Air quality

The underlying principle of a project focusing on the Tram option (choice of equipment, exploitation, speed, safety) consists of redistributing the available public space, in this case on a regional basis, by reducing the modal share of the automobile in favour of non-motorized traffic (pedestrians, bicycles etc.). In this respect, air quality through the **reduction of pollutant emissions** is intrinsic to the project.

Eco-design

Besides the **environmental clauses**, a landscaping project (in the 17th and 18th arrondissements of Paris) will accompany the arrival of the tramway to enhance the city’s heritage and green spaces through a focus on biodiversity (the introduction of additional species: deciduous trees and flowering or fruit trees).

Waste Management :

The project is particularly committed to the maximum level of reusable or recycled waste material which goes beyond the **legal and regulatory recommendations relating to the elimination of waste and the recovery of materials** along with the facilities classified for environmental protection: from the site at Bonneuil-sur-Marne, the *Centre de Maintenance et d’Approvisionnement* (CMA) of the DVD manages the recycling of elements in natural stone or concrete (in this instance paving stones), of metal urban furniture (posts, fencing, benches, tree grates, glazed enamel street nameplates, etc.) and bituminous cold-mix recovered during work to supply the building sites in Paris:

- 15 to 20,000 tonnes/year extracted from the 2.5 million tonnes of granite on site in Paris;
- Granite borders and paving slabs split into sample paving or bush hammered (to restore their original appearance).

Moreover, concerning **hazardous waste**, the CCAP of road work contracts contain a specific article on the Processing of Asbestos Waste.

Evaluation of climate benefit

Reduction of greenhouse gases

The evaluation of the reduction in greenhouse gases, which could be validated after delivery, is based on the hypothesis that the potential modal shift of transport from bus to tram would be 108,499,900 travellers.km/year. The **T3 extension is therefore expected to save 10,000 t.CO2/year**.

(see note on methodology at the end of the report)

1. Reducing greenhouse gas emission

Public transport: Rocade des gares - Paris stations ring road (Surface transport)

Project description

As the development of a clean-engine public transport line linking the main SNCF railway stations of Paris is rolled out this 16 km-long circular line of stations will operate in two East and West arcs, with a phased East arc. The initial forecast for investment of Bond Climate proceeds was €24 m.

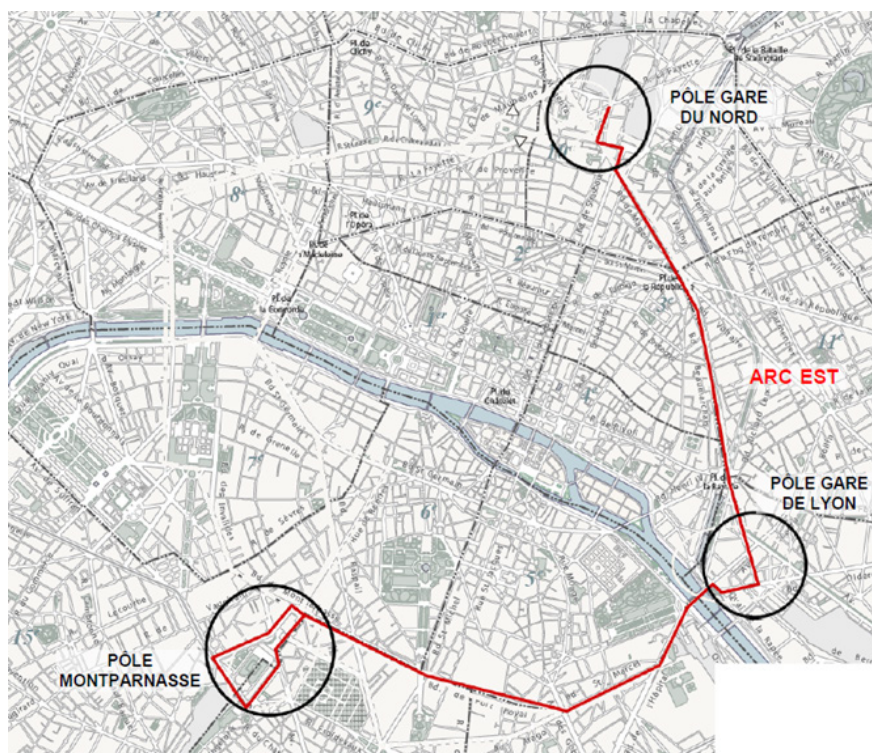
The steering committee met in April 2016 to discuss the preferred development scenario on a section-by-section basis:

- The collaboration with the town hall of each arrondissement in order to arrive at a definitive planning solution.
- Following the technical progress with STIF, RATP and the Direction de l'Urbanisme (town planning office) in the search for a maintenance and storage site adapted to the new clean locomotion (electric or gas)

The steering committee of 28 February 2017 decided to realise the arc between Montparnasse station and the Gare du Nord station.

STIF has included this information as they work on the "Grand Paris des Bus".

The decision of whether the buses will be charged at the depot or the terminus will be made according to the constructors' advances in achieving autonomy.



Key data

Forecasts:

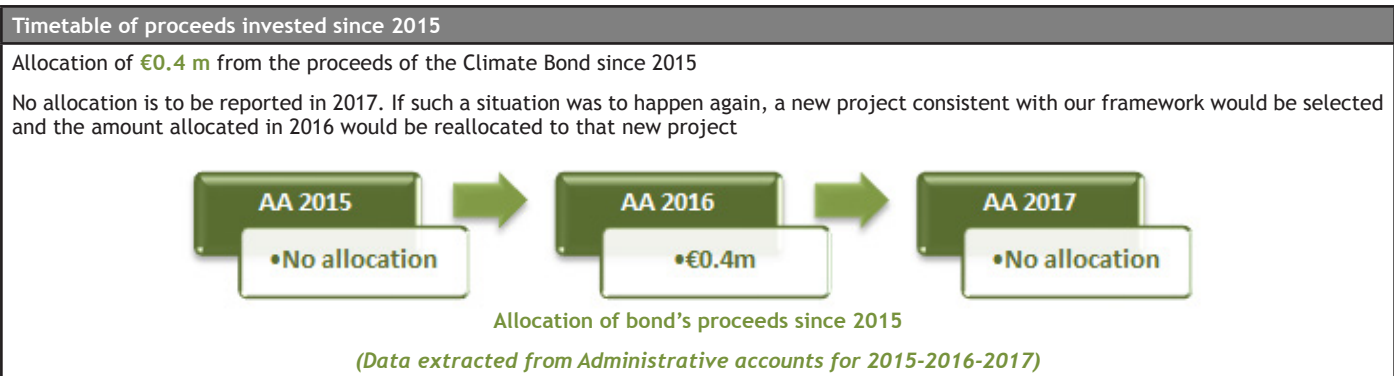
- Development of a clean transportation route linking the main Train stations of City of Paris
- Pre-planning of the Bus de Haut-Niveau de Service, BHNS (high service level buses, HSLB) ring road by extending Line 91 to the Gare du Nord;
- Platform development for a clean site specifically for buses (and parallel development for cycles) for the Boulevard Saint-Marcel and Boulevard de l'Hôpital;
- Reutilisation, with improvements and additions along the route, of bus corridors open to cyclists for the rest

Completed:

No spending on this project in 2017. The design phase, representing an expenditure of €0.4m, has resulted in:

- Making a decision on the planning scenarios

Choosing the different options for each section with an implementation schedule which has to take into account the contracting process, constructors' development time and the implementation of the work.



Governance

Operational management of the project: a dedicated team headed by a project manager will be set up in the *Direction de la Voirie et des Déplacements - DVD* (Directorate of Roads and Travel) to follow the project, as is the custom at the Mobility Agency; however at this stage of the project this has yet to be realised.

Social Responsibility

Sustainable procurement

As no contract has yet been awarded, reporting on this aspect is not applicable.

Social cohesion

PRM accessibility is a legislative performance constraint (obligation under Act No 2005-102 of 11 February 2005 for equal rights and equality of opportunities and the inclusion and citizenship of persons with disabilities) which is by definition complied with during the project design phase. This point will be further confirmed during later reports.

The basic rationale of this project is the ecologically responsible networking between stations in order to **facilitate users' transport between these centres safely, quickly and qualitatively**. The user is therefore central to this project.

To calibrate this project with the needs which have been identified, a **consultation** on this project has been carried out with the following public or semi-public bodies: STIF, RATP, Préfecture de Police, DRIEA (*Direction régionale et interdépartementale de l'équipement et de l'aménagement d'Île-de-France*), Région and SNCF.

Environmental Responsibility

Air quality

Improving air quality through the reduction of greenhouse gas emissions is an essential component of a project focusing on the choice of high service level buses (HSLB) to replace more polluting means of transport.

Energy consumption

Likewise, replacing more polluting buses with (electric) HSLB with differentiated Terminus / Depot scenarios places the management of energy consumption at the heart of the project.

Eco-design

Observing the technical developments offered by the manufacturers, and even encouraging them to make such developments, constitutes an **eco-design approach** which should be strengthened as the project becomes more clearly defined. A relevant example of this is that, the issue of respecting the impacts, particularly on trees and plants, was integrated during the feasibility studies: thus, for example, on the Boulevard Saint-Marcel and the Boulevard de l'Hôpital, the unavoidable removal of trees will be compensated by a replanting which is already planned and guarantees that the demands of **biodiversity** will be met.

The **environmental clauses** will be finalised during the process of awarding contracts for the work. Nevertheless, the contracts for the ring road projects have been identified as a core target among the 54 % of contracts awarded by the City which contain a clause and/or a standard for judging environmentally related proposals. The lack of certainty is therefore not so much due to their existence, but more a question of their size.

Waste Management :

In view of the state of progress of the project, we can only point out that waste management is considered within the **legal and regulatory recommendations relative to the elimination of waste and the recovery of materials** and those pertaining to facilities classified for environmental protection.

Moreover, **hazardous waste** is also regularly subject to an article of the CCAP of road work contracts.

Evaluation of climate benefit

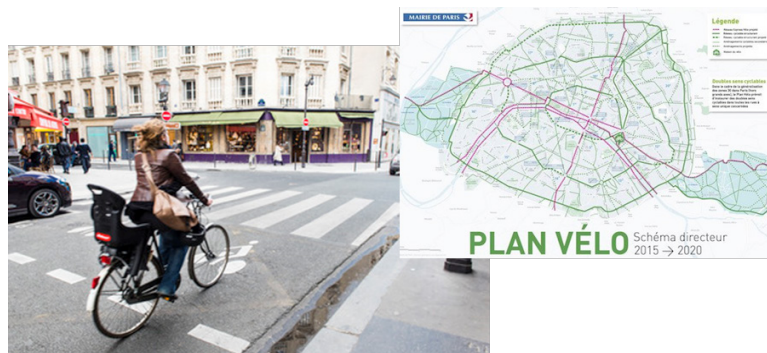
This evaluation can only be carried out following a more precise advancement of the project, but its realisation will be based on the hypothesis of a modal shift

1. Reducing greenhouse gas emission

Non-motorized traffic: Cycle paths

Project description

In the course of developing cycle use in the region, besides promoting a true cycle-based culture (cycle-tourism, cycling festivals, etc.) by making bicycles available to all (cycling schools, cycle training in schools, repair workshops, etc.) the project consists of linking and completing the 730 km of cycling network already created. This means creating an express cycling network which would make it possible to cross Paris from West to East and from North to South; to standardize a 30km/h speed limit throughout Paris and create a network of two-way bicycle paths; to continue the development of parking areas, including secure parking, over the whole territory; to close the main gaps in urban fragmentation and provide a cycling continuity between Paris and its inner suburbs by improving the “cyclability” of the entrances into Paris.



Map of the Plan Vélo

Key data

Forecasts:

By the end of 2020 670 km of Cycle paths should be created including the cycles created in the limited speed areas (30km/h)

- 1,400 km of cycle paths (670km would be added to the already 730km existing paths)
- 67,000 t.CO2/year should prevented
- 6,686 hours of social integration work

Completed:

- 6 km created in 2015
- 25 km created in 2016 (cumulated amount of 31 km)
- 26 km created in 2017 (cumulated amount of 57 km)
- 5,700 t.CO2/year emissions have been prevented thanks to the cumulative work done since 2015 (out of which 2,600 relate to work done in 2017)
- 35,183 cumulated hours of social integration work as of 31st december 2017

(cf. methodological notice at the end of the report)

Timetable of proceeds invested since 2015

€15.4 m from the Climate Bond proceeds have been allocated since 2015, which is 38.5% of the initial forecast amount.

€ 9.7m have been allocated in 2017



Allocation Bond's proceeds since 2015

(Data extracted from Administrative accounts for 2015-2016-2017)

Governance

Operational management of the project: a dedicated team has been set up in the Service des Déplacements of the Direction de la Voirie et des Déplacements - DVD (Directorate of Roads and Travel) to follow the project and report on its progress:

- Through monthly cycle plan monitoring committees, internally and with the associations
- Through presentations with the supervising deputy of the Town Hall of Paris

Social Responsibility

Responsible Procurement

The development of the Plan Vélo (Cycle Plan) contains social clauses for subcontracting to the unemployed. 6,686 hours of social integration work are thus expected to be carried out in the financially significant parts of the contract; these will be monitored by the society EPEC (Ensemble Paris Emploi Compétence).

There is a list of fines (which therefore involve a monitoring system) in the event of non-compliance with the provisions of the labour code relating to undeclared labour or the non-transmission of the diversity report. It should be stressed that the sampling on which the eventual application of penalties and reductions is based are realised by the materials testing laboratory of Paris (*laboratoire d'essais des matériaux de la ville de Paris - LEM VP*) by means of at least one sample per construction site, except for the bituminous cold-mixes for which at least two samples are taken.

Social cohesion

PRM accessibility is a component in any project for the development of public space (including during the construction period). In this respect, the creation of cyclable developments meets the conditions of the *Plan de Mise en Accessibilité de la Voirie et de l'espace public parisien* (Plan for the development of accessibility to roads and public space) which is part of the improvement of accessibility on the perimeter of the projects.

The CCAP of the road works contract also contains an article relating to the **Protection of residents against pollution** of all kinds throughout the operation.

Communication with users is constant: from the development of the Cycle Plan to its improvement

- Citizen consultation on the internet (from 15 December 2014 to 11 January 2015, with 7,004 participants) incorporated during meetings with the town halls of the arrondissements and partners of the City (STIF, RATP, Préfecture de Police) and 8 local bicycle and transport committees.
- Proposals received in the framework of the participative budget
- Use of diversified communication channels
- Information to citizens' associations by means of the press or through cycle committees



Feedback or grievances via the Cycling associations (participant in the cycle committees) and the «dans ma rue» Smartphone application.

To give an example, in the sector of « boulevards des Maréchaux » in the 13th and 14th arrondissements, the system helped to report a relative discomfort linked to the discontinuity of the installation of the existing paths. These grievances were taken into account and an improvement of the installations is being conducted in collaboration with associations of users (this is included in the "Participation Budget").

Environmental Responsibility

Air quality

Air quality through the proposal of non-motorized traffic modes, which aims to reduce automobile traffic and **associated greenhouse gas emissions**, is central to the project. Among the **environmental clauses** contained in the CCAP, a clean vehicle clause, with inspection of vehicle registration documents, has been inserted.

Eco-design

The project is linked with the objectives of the mandate (creation of 20,000 trees, rainfall zoning and the creation or sustainability of ecological corridors): at the very least, **biodiversity** (according to the compulsory impact study carried out during preliminary studies) and that natural spaces are preserved (the removal of trees or flower-tubs is only considered in exceptional circumstances and as a last resort). For example, the CCTP specifies that the root collar of a tree must imperatively be protected during the work, whatever the type of tree. In addition to this, the cycling developments integrate sustainable development (planting, accessibility, etc.) and those costs, by integration, are negligible.

Energy Consumption

With the clauses enforcing constraints on contract holders, the latter are encouraged to **employ the most efficient means of managing the energy and resources** (in particular water) necessary to the realisation of the work.

Waste Management:

Besides the **legal and regulatory requirements** of the CCAP of works contracts (see general indicators of responsible governance) relating to the production of the *Plan Assurance Environnement - PAE* (Environment quality assurance plan) and the *Schéma d'organisation et de suivi de l'élimination des déchets de chantier - SOSED* (Organisation and monitoring of Waste management Plan), the *Centre de Maintenance et d'Approvisionnement (CMA)* of the DVD is piloting a new **initiative managing the recycling of elements in natural stone** from their site at Bonneuil-sur-Marne. The CCTP contains a vast list of requirements regarding the reemployment of diverse materials.

Moreover, concerning **hazardous waste**, the CCAP for road works contracts contain a specific article on the Processing of Asbestos Waste.

Evaluation of climate benefit

Reduction of greenhouse gases

The estimation of the reduction in greenhouse gases for the cycle paths is based on a modal shift compared to similar traffic by conventional private car. Over the 57 km of cycle paths realised since 2015 this equates to a gain of **5,700 t CO2/year**.

(see methodological note y at the end of the report)

1. Reducing greenhouse gas emission

Electric vehicles: Installation of BéliB' charging stations

Project description

The political will to encourage the development of the fleet of electric vehicles which are more respectful of the environment, has led to planning, in addition to the normal 3 kW charge of the Autolib stations, the deployment of a network of accelerated charging stations (maximum power: 22 kW or 50 kW in some petrol stations) accessible to private vehicles. The initial budget of € 6.1 m is financed only through the proceeds of the Climate bond.

This Parisian network, known as BéliB' (3 charging terminals/ station) was inaugurated on 12 January 2016.

The development was split in three phases:

1. Phase 1: 17 stations (3 charging terminals / station) were in progress as of 2015
2. Phase 2: 36 additional stations were in progress as of 2016
2. Phase 3: 37 additional stations were in progress as of 2017 and should be delivered by July 2018

BéliB's data is available on data.gouv and opendata.paris. Thanks to interoperability, a smartphone app has also been developed to give access to these data.

Examples of BéliB' terminals



Key data

Forecasts:

90 stations are planned to be delivered by July 2018:

- Equivalent to the installation of **270 terminals**

This equates to a reduction of **2,887 tCO2/year**.

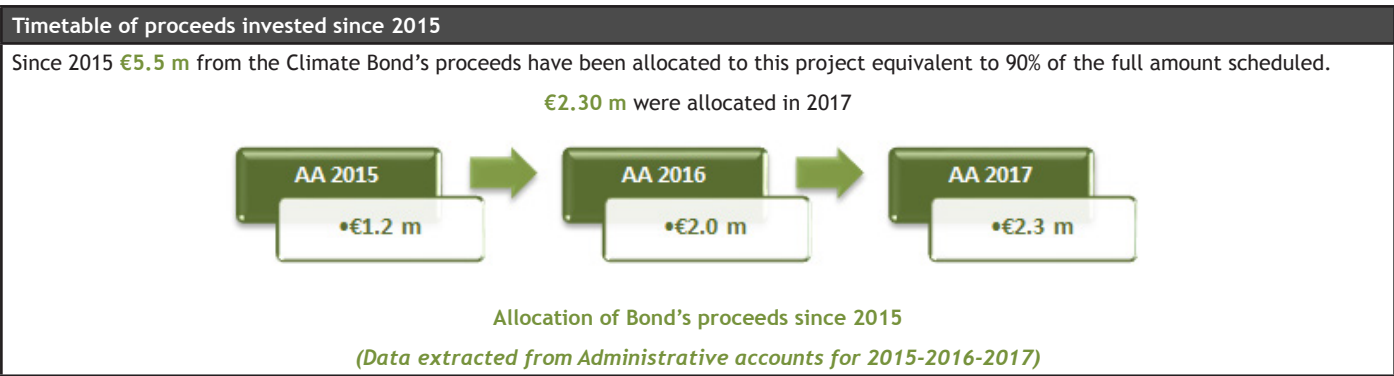
The delivery of BéliB's stations includes both spending for supplies and workmanship for installation. As a consequence the spending and delivery schedule may display a mismatch

Completed:

Work is in progress

- **17** stations in 2015
- **36** stations in 2016 (for a cumulated number of **53** stations)
- **7** stations in 2017 (for a cumulated number of **60** stations)
- **30** stations are expected to be delivered by the end of S2 2018.
- **2,000 tCO2/year** are expected to be saved thanks to cumulated installations since 2015 out of which 233 are directly linked to installations delivered in 2017

As of 31st December 2017, **60** stations have been delivered equivalent to 180 terminals.



Governance

Operational management of the project:

The “Agency for Mobility” monitors the strategic direction of Belib service (price, interoperability ...) and the mapping of stations. A dedicated team headed by a project manager was set up in the Direction de la Voirie et des Déplacements - DVD (Directorate of Roads and Travel) to follow-up on the project and its progress.

A new contract for supervision was signed with contractor Sodetrel for 4 years in October 2016. The monitoring of operations and the accounting part is done by a department within the Direction in charge of Traffic and Roadways (DVD)

Social Responsibility

Social cohesion

In this incentive project, **the user (trader or not) is the actual target for the project**. There has been a consultation with a working group headed by the DVD bringing together professionals and representatives from various professions, the Chamber of commerce and Industry (CCI) and the *Chambre de Métiers et de l'Artisanat* (CMA).

- Firstly, a consultation with the mayors of the arrondissements concerning the setting up of BéliB' charging stations was conducted, with the aim of covering in a more or less homogeneous manner the whole Parisian region.
- Following this, the areas identified as showing a higher need (given the number of electric vehicles listed), using the charging statistics on the Autolib' network, have been densified.

By definition, **accessibility for all** to these facilities is not specifically PRM, apart from the fact that their setting-up is such that it in no way impedes their mobility.

Responsible Procurement

Clauses relative to the **Protection of residents against pollution** of all kinds throughout the duration of the road works operations and to the **Safety and Health Protection of Workers**, as in all the City's contracts, are integrated into the CCAP.

Local development

The mapping of stations installations is decided in cooperation with mayors of arrondissements, in order to:

- achieve homogeneous coverage within Paris' territory;
- then identify areas where densification of charging units is needed thanks to recharge data and identification of electrical vehicles within the area.

Environmental responsibility

Air quality

Air quality is the ultimate goal of the project: the incentive (through an available accessible offer) to use private electric vehicles targets the **reduction of greenhouse gas emissions**. The charging terminal contract is fully consistent with this, and its environmental clauses contain a clean vehicle clause and a clause encouraging eco-driving.

Eco-design

The BéliB' terminals have been specifically developed in collaboration with the City of Paris via the bringing together of service providers, between August 2014 and July 2015. The conditions for the execution of services contain the following environmental elements:

- The materials used are **preferably recycled and are recyclable** with zero impact on biodiversity;
- **Traceability of the sourcing of materials** must be justifiable at any time during the execution of services.

Moreover, the design of the charging station (number of openings, accessibility of the components) has taken into consideration the need for rapid maintenance).

Energy consumption

The Eco-design approach also takes the form of the **smart management of the available energy** by the Belib' station: according to demand (1 to 3 vehicles at the same time), the power is distributed to each of the terminals:

- the accumulated power of the 3 terminals in the station is a potential 47 kW (22 + 22 + 3);
- on average, 1 hour is sufficient to charge a vehicle up to 80 %.

The system is designed to be **upgradable**: in its current state, the terminal is connected to the 36 kW network (which implies a capping of the power distributed if 3 vehicles are charging at the same time). In the long term, the energy management software will, for example, be able to limit charging in peak periods.

Other **methods of regulation** are also already being considered, such as pricing to encourage night charging. Moreover this mechanism has been reinforced by a 4-year supervision contract with Sodetrel.

In average, 1 hour is enough to fill up to 80% of a 25 kWh vehicle's battery.

Waste Management:

Besides the **legal and regulatory recommendations relating to the elimination of waste and the recovery of materials** along with the facilities classified for environmental protection (see general indicators of responsible governance) the **recovery of waste at the end of its life cycle** is already a point of discussion and will be taken into account with respect to a future maintenance contract to be implemented from July 2018.

This process is completed by the inclusion of an **environmental dematerialisation clause** requiring that all deliverable documents are provided in either a dematerialised format (e.g. xls, pdf or equivalent) and/or on paper which is recycled or carries an ecolabel which guarantees it is produced from wood from sustainably managed forests (e.g. FSC, PEFC or equivalent labels).

The estimated average lifespan of a Belib terminal is a decade.

Evaluation of climate benefit

Reduction of greenhouse gases

Compared to fossil fuel consumption, by means of a base assumption (pending the real consumption reading of the terminals) of 2 complete charges per terminal per day, corresponding to an electricity unit consumption of 60 kWh. The installation of 7 stations in 2017 is estimated to help save **233 tCO2/year**, in total the gain is estimated to be **2000 tCO2/year** (thanks to 17 stations delivered in 2015 and 53 in 2016).

(see note on methodology at the end of this report)

2. Reducing energy consumption

Sustainable buildings: Sustainable social housing (HEQ constructions, thermal insulation)

Project description

Since 2009, the energy renovation of existing social housing aims to assist housing associations in reaching a 30% reduction in the energy consumption from social housing by 2020.

The goal set is the funding of the overall renovation of 4,500 housing units per year. The estimated budget for these projects is €225m. Over the period 2009-2016, more than 36,000 social housing units have been renovated.

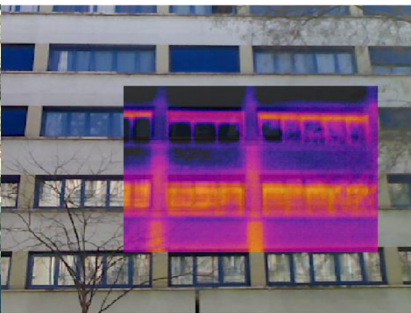
Overall renovation is understood to mean an energy renovation which acts on all the items on which intervention is possible. The level of performance is nevertheless adapted to the technical and architectural qualities of the buildings, in order to be able to benefit all segments of the housing units and in particular those with heritage value.

Example of 140-142 rue des Pyrénées (20ème)

Including a thermic camera capture of the front of the building



Thanks to energy renovation of these 31 building units the global power consumption was brought down to 103 kWhEP/m²/year from 264 kWhEP/m²/year which means a global energy saving of 71%.
The global cost of renovation was €1.6 m ex VAT.



Key data

Forecast:

Renovation of 4,500 social housing units /year

- To approach as far as possible the primary energy coefficient (PEC) outlined by the BBC-Effinergie renovation label, i.e. 80 kWhEP/m²/year.
- Increase the organic surfaces .

Completed:

During the period 2009-2016, 36,185 social housing units were renovated, 5,037 more units were renovated throughout 2017, leading to:

- 24,131 MWh/year saved in 2017 equivalent to 3,934 tCO₂
- Cumulated 10,323 tCO₂/year saved thanks to the operations financed since 2015 from the proceeds of the Climate (cf methodology at the end of the report)
- 3,923 m² new organic surfaces created in 2017
- 53% average improvement in energy consumption (ie: 154 kWhEP/m²/year)

Timetable of proceeds invested since 2015

The initial estimated amount of €55m was fully allocated in 2015 and 2016. Taking into consideration the total cost of this renovation projects since 2015 (€139 m), we have decided to allocate €34m for the operations conducted in 2017.

Funding of €89 m from the Climate Bond's proceeds, equivalent to 62% more than the initial estimated allocation

€34m allocated in 2017



Allocation of Bond's proceeds since 2015

(Data extracted from Administrative accounts for 2015-2016-2017)

Evaluation of climate benefit

In 2017 **24,131 MWh** were saved thanks to the renovation of 43 sites (totaling 5,037 units renovated). As a consequence, the global energy consumption prevented thanks to these energy renovation projects is brought up to **102,905 MWh** since 2015 and 16,094 t.CO2e will be saved annually as soon as work is completed.

In average in 2017, the primary energy consumption of renovated buildings within the project is as low as **134 kWh/m²/year**, vs 288 kWh/m²/year before the job was carried out, equivalent to 53% of energy saved.

Moreover in 2017 3,923 m² of vegetal surfaces have been delivered which add to the 25,687 m² already delivered since 2015.

(cf. note on methodology at the end of this report)

Governance

Operational management of the project: a dedicated team headed by a project manager in the Housing and Funding Department of the *Direction du Logement et de l'Habitat - DLH* (Directorate of Housing and Habitat) monitors this multi-annual project and its progress:

- **Day-to-day management:** An IT tool which makes it possible to complete the financial and technical characteristics of the operations of the funding request files as they arrive, including the works packages planned and the energy performance targeted by the works. The administrative progress of the files is thus monitored right up to the vote in the *Conseil de Paris*.
- **Monthly quantitative reporting** in the framework of the Directorate's management control in such a way as to allow monitoring of the development of the goal of 4,500 housing units funded per year;
- **Yearly qualitative reporting** for the "*bleu budgétaire logement*" (at the end of the year).

Social responsibility

Responsible procurement

The funding of the energy renovations of the social housing engages with an idea of partnership (including subsidy and regular evaluations) with the housing associations, not public procurement. The circular financing determines the renovation operations and financing rules, ensuring that social and environmental responsibility is incurred by the funders.

- In this respect the certification (see section on Eco-design) guarantees the **Système de Management Responsable - SMR** (System of Responsible Management) implemented, including the Responsible procurement policy for project managers, and Security and Safety.
- Since 2016 the funders themselves have been subject to the Codes for Public Works Contracts.

Social cohesion

The actions of the City of Paris regarding social housing target social diversity, which provide this project with a socially responsible character particularly where social cohesion is concerned. Furthermore, as this is aimed mainly at increasing comfort for users, the users are central to this system: the consultation with the inhabitants (information meetings and consultation meetings with voting by the tenants on the successful project) is conducted by regulatory obligation by the funder, who prioritizes the projects according to the actions pursued within the framework of the City's Policy and its stated aims.

As to PRM accessibility to common areas, this is provided for in the requested certification.

Air quality

The obligation for certification specifically sets out the aims regarding the **renewal of air in living quarters and VOC releases from the wall coverings** installed.

Biodiversity

Besides minimizing the impacts of renovation operations, including the disturbance created by the project, the greening of buildings is being studied within the framework of the **biodiversity** plan and the mandate's objective of 100 ha of revegetation on the built environment. These installations must meet the recommended technical specifications for green roofs and the "greening of walls and roofs" drafted by City of Paris.

In 2017, 3,923 m² of greened surfaces were funded (out of which 3,844 m² were horizontal surfaces and 79 m² were vertical), they add to the 25,687 m² already delivered since 2015.

Eco-design

Since 2014, the **NF Habitat (HQE) certification** and the **Energy Performance Label** are required for all funded energy renovation operations, except for small scale operations (e.g. insulation of a gable wall which only concerns 10% of the operations, a figure which continues to decrease). The certification process is fundamental because it is then validated by a third party (CERQUAL), in terms of respect for the commitment to "Sustainable Buildings" (from Quality of Life to respect for the environment through to Energy Performance).

Energy consumption

Likewise, these certifications are completed on a continuous basis during the delivery through investigations carried out by the funders: DLH monitors thermal regulation performances on the delivery conditioning the payment of the subsidy. Following verification of compliance with the specifications accepted by the projects managers and housing associations:

- If the installations are collective, the funder **ensures best use of heat production once the work has been completed.**

In this case, the energy-related charges can be recovered from the tenants of the housing stock.

- If the installations are private, the management of energy consumption is incurred by the tenant who often benefits from **information** by the funder on the best way to manage the facilities.

Waste management :

The actual operations (of various kinds in the case of renovation) provide for the implementation of **sorting for recycling** whenever possible. This work item is inspected within the framework of the certification. In addition to this, the question of premises dedicated to sorting for recycling (setting up of three recycling bins) is included. Finally, the *Direction de la Proprete et de l'Entretien - DPE* (Cleanliness and Maintenance Service) of the City of Paris constantly works to heighten awareness of this issue among the funders and their tenants.

In view of the nature of the project, the **management of hazardous waste** is not included. However, if relevant, the NF Habitat certification validates the respect for these specific clauses regarding waste treatment.

2. Reducing energy consumption

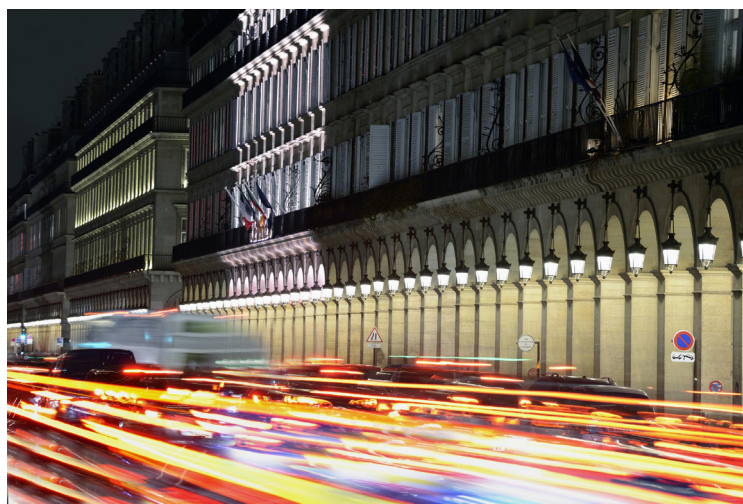
Public lighting: Energy Performance Contract (MPE)

Project description

The main target of the *Marché de Performance Énergétique - MPE* (Energy Performance Contract) consists of reducing the electricity consumption of public lighting and light-signalling devices by replacing less efficient lights and the highest energy-consuming sources.

This contract contains a performance requirement: yearly energy performance objectives. This results in operations having to reach an imperative target yield in KW/€ every year. This part of MPE is estimated to need a total budget of **61 M€** in order to change as many as 175,000 city lights, 63,000 lighting poles, 30,000 lighting consoles, 21,000 traffic light supports and 313 lighting sites.

It is therefore the successful tenderer's responsibility to understand the installations in Paris and to offer the City energy renovation «Climate Plan» operations which are compatible with these yields. Successful tenderers must therefore always find the best technical and environmental solutions to meet the targets of the contract.



Key data

Forecast:

This MPE tranche targets:

- Annual saving targets of **4,617 MWh**
- **32,637 hours** of social integration work
- **50%** cut in GHG emissions compared to 2004

Completed :

Jobs are completed or at an advanced step :

- **15,279 MWh** saved since 2015 out of which **5,310 MWh** in 2017
- This is equivalent to **1,406 tCO2e** since 2015 and **499 tCO2e** for 2017 only.
- **568 t** of wastes were recycled in 2017
- **31,583 hours** of social integration work were distributed (which is as much as 10.44% of the total of hours worked on that project)

Timetable of proceeds invested since 2015

Funding of **€31.2m** from the Climate Bond's proceeds which counts for **52%** of the initial estimated amount.

€7.9 m were allocated to the project in 2017



Allocation of Bond's proceeds since 2015

(Data extracted from Administrative accounts for 2015-2016-2017)

Governance

Operational management of the project: a dedicated team headed by a project manager in the Public Lighting Section of the Directorate of Roads and Travel (DVD) monitors this multi-annual project and its progress:

- Weekly reporting of the Climate Plan operations with progress report on financial commitments, work site preparation, the development and delivery of sites and financial settlement.
- Quarterly & yearly reporting on the operations of the contractual year and forecasts for the following year

Social Responsibility

Responsible Procurement

The MPE holder, through a social integration clause, has a fixed obligation in the percentage of hours worked (10%) in social integration work compared to the total number of hours worked. In 2017, the rate was 10.44 or 31,583 hours of social integration work for a total number of 306,144 hours worked on the project.

Moreover, some people were offered the opportunity of serving community service orders and in penal work («SMA Insertion» label).

The MPE holder has a prevention charter which defines the permanent stakes relative to prevention and an organisation which makes it possible to collect and record the third-party accidents on sites, providing feed back the near accidents and risk situations. In 2017, 16 minor accidents were identified.

Social cohesion

As an administrative project, increased comfort for users is a key aim. Following the satisfaction survey conducted with the users in the 13th arrondissement to find out how they feel about the installation of new lighting with presence detection (contributing to energy saving), the information programme has continued in 2017.

The **interaction with users** relies on

- the «dansmarue» phone application which also makes it possible to notify the contractor of all the problems users encounter with the lighting installations, so that suitable rapid and corrective action can be implemented;
- a complaints collection procedure has been installed (1,340 were dealt with in 2016 and 2017).

Environmental Responsibility

Eco-design

ISO9001 / ISO14001 / OHSAS 18001 certifications are applied to MPE. In this framework, in addition to the request for *Profil Environnemental Produit - PEP* (Product Environmental Profile) from suppliers, a life-cycle analysis was conducted among 13 of the suppliers on around thirty products, which represent 15.4% of the total purchases.

Air quality

Air quality is treated from the point of view of the greenhouse gas emissions released: the carbon footprint linked to public lighting activities is surveyed every year and this shows a 25 % decrease in emissions since 2012. In addition, as the contractor must achieve a determined rate of clean cars in their fleet, following a test in 2015, the fleet has since included one completely electric lift, and another is already in the design stage.

Biodiversity

Biodiversity is a permanent element of the project. The renovation of lighting will be an opportunity to optimise the orientation of the light flow on the areas to be lit (and not towards the green spaces or towards the sky, for example), conforming to action 20 of the Biodiversity Plan «adapting lighting». In this case, an experimentation of lighting respectful of biodiversity was carried out in a square in Paris with an inventory of targeted species upstream in order to measure more efficiently the consequences of light and adapt the innovative equipment.

Energy consumption

The reduction of **energy consumption is the basis** of this energy performance contract:

- Each project is subject to a photometric study, which is validated by the client
- The estimated gain is then validated, following the work
- The new financial flow data update the data base and the accumulated energy gain in real-time.

Waste management:

Successful tenderers are **contractually obliged** to aim at reducing the impact of their waste on the environment by an enhancement which remains at 91 % in 2017 (including 93 % for public lighting), i.e. **568 t. recycled waste**.

Likewise, where hazardous waste is concerned, 97 % has been processed by recycling or recovering materials and 3 % by end-of-life recovery.

Evaluation of climate benefit

5,310 MWh energy saved in 2017 combined with the amounts saved in 2015 and 2016, for a total amount of 15,279 MWh. This figure is equivalent to a global savings of **1,406 t.CO2e** using the proper multiplier.

(cf. methodological note at the end of the report)

3. Producing renewable and waste energy

Solar energy: Photovoltaic solar panels

Project description

In its approach to energy transition Paris is committed in substituting, as much as possible, fossil energies (oil, coal and gas) with renewable and recoverable energies (EnR2). Developing renewable energies allows us to bring the Paris territory more autonomy in the case of an energy crisis or volatility in the energy prices. Paris «Plan Climat» has set up the target of using as much as 45% of renewable and recoverable energy in its energy mix by 2030 out of which 10% should be produced locally.

The City of Paris wants to increase the implementation of solar panels in its territory through a program of installation for 200,000m². Today, more than 50,000m² have already been delivered. To help the extension of that dynamic, Paris has developed a solar register which helps determine the solar potential of each building in Paris.

Paris has integrated mechanisms into its *Plan local d'urbanisme - PLU* (Local Urban Planning Scheme) which promote converting to renewable energies. For instance, such equipment has been authorised to exceed the surface covered by usual rooftops as long as they blend harmoniously in the surrounding buildings. New buildings are also incentivised to choose renewable energy.

In 2015 and 2016, 4 schools, 3 kindergartens, 2 stadiums and 1 community centre have been equipped with around 5,000m² of photovoltaic panels providing a peak-power of 570kW for a global investment of 3.97M€ .

No new installations were delivered in 2017



Key data

Forecast:

- The deployment of solar PV panels is carried out following the identification of opportunities, and each time the feasibility conditions are fulfilled. The Climate Bond devotes €5m to the financing of these installations.

Completed:

- Installations completed or in advanced stages.
- No new installations in 2017.
- **4M€** allocated (80% of the estimated amount)
- **5,000m²** of solar PV panels with a peak power of **570kW**
- 513MWh per year produced

Amenities	Address	Arrondissement
Community centre	63 rue Buzenval	75020
Community crèche	154 rue de Crimée	75019
Infant school	60 rue Binet	75018
Jules Ladoumègue stadium	39/43 rue des petits Ponts	75019
Primary school	60 rue Binet	75018
Saussure Middle school	34 rue Marie-Georges Picquart	75017
Community crèche	38 rue Liancourt	75014
Community crèche	11 quai de l'Oise	75019
Educational campus	99 rue Olivier de Serres	75015
Jean Bouin stadium	20-40 Avenue du Général Sarrail	75016

Timetable for the allocation of proceeds since 2015

Installation of solar panels is conducted depending on identification of opportunities, and each time the technical feasibility has been proved. Thus over the period:

€4m was funded thanks to Climate bond's proceeds since 2015, which accounts for more than 90% of the initial estimated amount for this project.

No allocation of proceeds in 2017

Allocation of Bond's proceeds since 2015
(Data extracted from Administrative accounts for 2015-2016-2017)

Evaluation of Climate benefits

Photovoltaic energy production is measured year on year, starting from the date the installation comes into service. However for a peak power of **570 kW** installed, an energy production of about **513 MWh/year** is estimated. This is equivalent to a savings of **5 t.CO2e/year** of power grid consumption.

(see note on methodology at the end of the report)

Governance

Operational management of the project: Every operation for which the total investment exceeds €1m is presented to the *Comité de Lancement des Etudes - CLE* (Study Launch Committee). The principal mission of a CLE is to steer the preliminary studies and validate the progress of the operations being supervised; it brings together the Secretary General, the Policy Executive and the operational directives. The energy aspects are the subject of this particular study:

- The City of Paris has implemented a [solar register](#). In principle a thermal or photovoltaic solar installation is considered pertinent when there is an average sunlight threshold of **more than 800 kWh/m2/year**. If the sunlight threshold is reached, the operation leader refers the study, via the MOE contract, in order to have a solar panel installation included.

The management of these operations is carried out within the *Service de l'Architecture et de la Maîtrise Ouvrage - SAMO* (Architecture and Project Management Department), the *Service des Équipements Recevant du Public - SERP* (Public Access Amenities Department) or the *Service des Locaux de Travail - SeLT* (Work Premises Department) and the installation of solar panels is overseen by DCPA (Department for Energy, Architecture and Heritage).

The mechanisms concerning the installation of solar PV panels for certain operations are therefore integral to many of the contracts relating to the various operations involved. City of Paris requires all tenderers to submit to strict environmental and social clauses. The processes concerning the installation of solar PV panels for certain operations are therefore identical to those applied to all the work operations concerned.

Social Responsibility

Responsible Procurement

The **social clauses** specifically provide for the employment of people experiencing particular difficulties in finding employment. As an example, the operations at the community centre at Buzenval 75020 and at the community crèche at rue de Liancourt in the 14th arrondissement of Paris aim to provide 3% and 5% of job opportunities respectively for those in difficulty.

Awareness of Health and Safety issues also falls within the contractual specifications.

Social cohesion

Clauses relative to **Protecting Residents from Disturbance** of all kinds for the whole duration of the work are integrated into the CCAP and the **Green and Minimal Disturbance Site charters**, which are attached and co-signed by all the actors in the operation. The aim of the charters is to establish the rules and regulations to be enforced in respect of all the actors involved in the operation in question, so as to limit the negative environmental impacts of the work and to improve staff working conditions.

The **Green and Minimal Disturbance Site charters** also provide for an "Environment Officer" to be designated within the project in order to ensure that the **environmental clauses of the CCAP** are respected.

Environmental Responsibility

Eco-design and Biodiversity

Conducting a biodiversity impact study during preliminary planning stages is obligatory.

To limit degradation of the natural environment, trees are only to be removed when absolutely necessary; trees are to be protected for the duration of the work and cleaned when the work is complete.

Water and soil protection measures are also demanded, particularly through: designing sealed areas with a system for recovering accidental effluents (flushing and leakage from parked vehicles, and storing of dangerous primary materials); washing vehicle wheels on leaving the site; using biodegradable formwork; and recovering run-off water.

Air Quality

In order to avoid air pollution the following precautions must be observed: disposal bins must be covered, light materials must not be used for the transport, ground must be dampened in dry weather to limit dust dispersion, and vehicle speed must be limited on the site.

Waste Management:

Besides the **legal and regulatory recommendations relating to the elimination of waste and the recovery of materials** (cf. general indicators of responsible governance) the CCAP and CCTP of the contracts always contain an article on the treatment and storage of dangerous waste, requiring specific mechanisms.

4. Strategy for territorial adaptation

30 new hectares of green spaces

Project description

The development of nature in cities, which specifically includes the creation of green spaces, is a powerful lever for adapting to climate change. This makes it possible to combat heat islands by cooling the densely built Parisian territory, and to offer permeability and therefore a capacity for soil absorption in the case of heavy rainfall (less risk of flooding). It integrates plants which are beneficial in the fight against greenhouse gases and creates areas for the development of biodiversity (pollinating insects, wildlife).

The City of Paris has already delivered more than 62 ha of new green spaces during the last 2 terms of office between 2001 and 2014, and has launched an ambitious programme for the creation of 30 ha of additional green spaces open to the general public over the period 2014-2020.

The table below displays the surfaces delivered throughout 2017:

Delivered in	Location	Surface (in ha)	Cumulated surface per year in ha	Arrondissement
2015	jardin des combattants de la Nueve	0.20	1.87	4
2015	PC 13-ZAC de Rungis à rue des Peupliers	0.90		13
2015	Jardin Charles Trenet-ZAC Gare de Rungis	0.50		13
2015	Placette Lourmel-Eglise	0.03		15
2015	Jardin Rebière-GPRU Porte Pouchet	0.14		17
2015	Halle Pajol-Jardin Sud	0.10		18
2016	Clos des Blancs Manteaux	0.10	4.01	4
2016	Villa Marcès	0.02		11
2016	Bois de Vincennes -Route du Lac Daumesnil -Phase 1	0.64		12
2016	Bois de Vincennes -Jardins de l'Ecole du Breuil	1.00		12
2016	Bois de Vincennes -Route du Lac Daumesnil -Phase 2	2.25		12
2017	Square Alexis Biscarre	0.05	4.35	9
2017	Jardi Yilmaz Güney rue de l'Echiquier	0.10		10
2017	Halle Freyssinet-Paris Rive Gauche/Tolbiac Chevaleret	0.12		13
2017	Paul Bourget-Entrée Kelemann	0.10		13
2017	Jardin Boucicaut	0.34		15
2017	Parc des Expositions-Phases 1&2-Viparis	0.40		15
2017	Jardin Castagnary-Bessin	0.13		15
2017	Domaine de Longchamp	3.00		16
2017	Jardin Rue du Soleil-Pixerécourt	0.11		20
TOTAL				10.23

Key data

Forecast

Part of a global project aiming at delivering

30 ha of new green spaces

State of progress

10.23 ha delivered since 2015 :

- 4.35 ha in 2017
- 4.01 ha in 2016
- 1.87 ha in 2015

Carbon storage of 67.25 tCO₂:

- 6.88 t in 2015
- 21.99 t in 2016
- 38.26 t in 2017

(cf. methodological note at the end of the document)

Timetable for the allocation of proceeds since 2015

Allocation of €7.4 m from the Climate Bond's proceeds corresponding to 16% of the estimated amount needed for the project.

€2.5 m were allocated in 2017



Allocation of the Climate Bond's proceeds since 2015

(Data extracted from Administrative accounts for 2015-2016-2017)

Evaluation of climate benefit

Territorial adaptation to climate change in compliance with the City's reporting commitments is not demonstrated only by a carbon evaluation but also by the number and type of green spaces created.

Governance

A Steering committee (COFIL 30 ha) session is conducted at least once a year (twice in 2015) under the authority of the Secretary General, in the presence of the elected representatives. This COFIL is in charge of the governance of the project, during the session, the detailed state of progress of the programme and the provisional schedule of delivery are presented and validated.

The third COFIL session was conducted in January 2017.

A geographical information systems (SIG-V) was developed in order to monitor all the revegetation projects conducted by the Department for Green Spaces and Environment (DEVE) including the "30 hectares project".

Reinforcement of budgetary monitoring is overseen by a committee for scheduling public space operations (CoPOEP).

Social Responsibility

Responsible Procurement

Without being specific to these contracts, **social clauses** and **Awareness on Safety and Health issues** are systematically included. Also, from an operational perspective, the horticultural maintenance of certain green spaces is entrusted to *associations d'insertion par travail* [societies for integration through work] (ACI or managed by the local community).

Social cohesion

PRM accessibility, which is included in a **wider brief of accessibility to all persons with disabilities** (visually and hearing impaired, etc.), is always integrated into all the projects for the creation of new green spaces from the design stage onwards.

The creation, followed by the use of green spaces incorporates all **users**:

From the design stage:

- Identification of the expectations from the people of Paris during consultations: public meetings organised by the town halls in the arrondissements and open to all (neighbourhood associations, collectives, individuals, etc.) which are an opportunity to define certain uses to be set up in the new space: playground definition (surface, type of games, age groups, etc.), routes etc.
- The interactive application which enables direct on-line design of the future development of the park (as for the Chapelle Charbon project).
- Finally the participative budget and "planting permit" systems are encouraging Parisians to suggest projects which will increase the place of vegetation in the city or to create plots of public land directly.

During the works stage: as all the green spaces carry the QualiParis label (a standard constructed with AFNOR), even if the referential for an improved response to users' expectations is still being developed, the following are guaranteed:

- Information for and responsiveness to users (www.paris.fr, 3975, etc.)
- A commitment to clear, up-to-date signposting on the sites
- Reception and information by field agents



A satisfaction survey is conducted regularly in order to get users' feedback.

Local development and interactions

The DEVE Department is always committed to promote cooperation thanks to the implementation of public meetings that are set up by arrondissement mayors. These meetings are open to all (local associations, individuals, groups...) they provide an opportunity to define the best use for new spaces: definition of playgrounds areas (surface, types of games, age groups), paths.

DEVE recently enriched the cooperation process by giving access to an interactive application for the Chapelle Charbon project (18th arrondissement). The site gives users the possibility to take part in the creation of the space planning for the new park.

Through « Participative budget », « planting permits », or « platform for revegetation », the City of Paris gives citizens the opportunity to bring forward projects which will result in increasing the public areas dedicated to green space or to plant surfaces which are part of public space.

Environmental Responsibility

Eco-design & Biodiversity

The creation of green spaces falls by definition within the Biodiversity plan (green belt) of the City because the new green spaces are **biodiversity reservoirs** and because all newly created spaces help improve the **ecological continuity** which is favourable to the development of wildlife in densely built urban environments. Moreover, from its design stage, the creation of green spaces integrates an ecological and sustainable dimension (indigenous plants, water circuit, differentiated management, limited lighting, etc.). 78% of municipal gardens carry the **Ecojardin** label (a national label first awarded in 2013, which attests to the ecological management of the sites concerned) and the Bois de Boulogne and the Bois de Vincennes carry the **ISO 14001** label.

In the City of Paris works contracts, **specific clauses** impose obligations of conduct and result in terms of eco-design on the project managers and contractors. For example, for the wood used, the clause inserted in the contracts is as follows: «The contractor must supply all the certificates and supporting documents proving that the woods proposed are from sustainably managed forests, with FSC, PEFC, OLB or equivalent **certification**.»

Air quality

By integrating beneficial plants, green spaces combat **greenhouse gases**: the growth of the plants by photosynthesis absorbs carbon and produces oxygen, thus reducing greenhouse gas emissions. For example, the 2,000 ha of the Bois de Vincennes and Bois de Boulogne represent 11,000 tonnes of «stored» carbon (source 2009 City of Paris carbon footprint).

Waste management :

During the works phase, in addition to the various **legal and regulatory recommendations relative to the elimination of waste and the recovery of materials** along with the facilities classified for environmental protection (see general indicators of responsible governance), the DEVE optimises on-the-spot reuse of the waste produced (earth extracted when digging foundations is used as backfill or complement to model the terrain).

During the works period, the gardens operation department recycles the green waste produced at over 70% (mulching, composting, etc.).

Moreover, as far as the **waste from polluted sites** is concerned (due to the historic presence of industrial activity), depending on the level and type of pollution, the DEVE repurposes or confines the polluted soil, or sends it to dedicated treatment centres.

4. Strategy for territorial adaptation

20,000 trees

Project description

Planting of 20,000 additional trees over the whole territory of Paris between 2014 and 2020, for an estimated amount of 18M€:

in the streets, roadway public spaces whose redevelopment is identified for this mandate, on the banks of the river Seine and the borders of the Boulevard Périphérique in connection with the *Schéma régional de cohérence écologique - SRCE* (regional scheme of ecological coherence) which are identified as biodiversity corridors, in gardens, in streets, in sports facilities, for the most part located in the SRCE biodiversity belt, in the scope of major urban redevelopment operations and even on private properties, in the scope of building permits or with the “un arbre dans mon jardin” [“a tree in my garden”] operation.



Key data

Forecasts:

Planting more trees within Paris area:

- 20,000 trees,
- 1,050 hours of social integration work,
- 14,600 t CO2 during the lifespan of newly planted trees

Completed:

8,343 trees were planted since 2015, allowing global sequestration of 6,090 tCO2 over their life span:

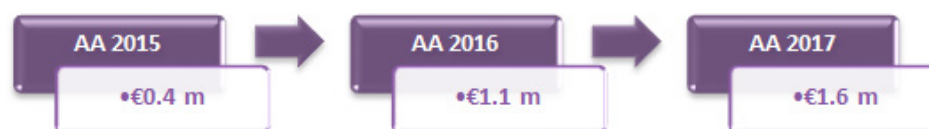
- 1,826 trees planted in 2017 leading to the sequestration of 1,333 tCO2 during their life span,
- 1,500 trees planted in 2016,
- 700 trees planted in 2015,
- 4,321 trees ex-ante,
- 415 hours of social integration work have been carried out during the period (october 2015 - mars 2017)

(cf. methodological note at the end of the report)

Timetable for the allocation of proceeds 2015

Allocation of €3 m from the Climate bond's proceeds corresponding to 17% of the estimated amount needed for the project .

€1.6 m were allocated in 2017



Allocation of the Climate bond's proceeds since 2015

(Data extracted from the AA for 2015-2016-2017)

Evaluation of climate benefit

The 8,343 trees that were planted will contribute to the carbon storage of 6,090 tCO2 during their life time.

(cf. note on methodology at the end of the document)

Governance

Operational management of the project: a dedicated team headed by an appointed project manager was set up in the *Service Arbre et Bois* of the *Direction des Espaces Verts et de l'Environnement* (DEVE) to monitor the project and report on its progress, making specific use of the geographical information system (SIG-V) which was developed to:

- identify the potential for planting trees: 1,200 projects have been identified,
- monitor the progress of the different tree-planting projects.

Social Responsibility

Responsible Procurement

In addition to the contractual specification related to **Awareness of Health and Safety** (see responsible governance indicators at global level - no accidents have been documented on this site), the contract for planting new trees in municipal public facilities, signed for a duration of 18 months from October 2015, contains a **social clause** in article 14 of the *Code des Marchés Publics* and a target of 1,050 hours of social integration work. In the event of this objective not being respected, financial penalties are in place.

Social cohesion

PRM accessibility is taken into consideration from the design phase of the planting of trees to ensure that accessibility to PRM is maintained once the tree has been planted, and also in the transitional phase.

Even though there has been no overall consultation on the total 20,000-tree programme, the clause “low pollution site” and **information for residents** on tree planting means they are fully included:

- Regular ad hoc meetings with residents to present the planting projects.
- Information on the website paris.fr/arbres on all operations regarding trees and new plantations.

Besides these information procedures, the **call for participation** is organised:

- via the “*permis de végétaliser*” (planting permits): the people of Paris are invited to take part in planting programmes;
- In the scope of the “*programme des vergers dans les écoles*” [orchards in schools], projects are co-established with the different actors and future users (teachers, ARE mediators and recreation centres);
- Tree-planting events are organised with the user-schools.

In addition to this, a **procedure for receiving complaints from users**, specific requests and satisfaction feedback is set up via the 3975 (City of Paris call centre), with the commitment to answer all questions.

Environmental Responsibility

Eco-design & Biodiversity

The programme falls within the Biodiversity plan, with a **reinforcement of ecological corridors**. However, this respect for biodiversity, which has an incentive to plant native species (of regional plants), to protect the environment and the ecological system, limits the choice of species which is made according to the conditions for planting. There is also the distance from facades and the future pruning constraints as well as the state of the sapling or the soil type and water requirements to be considered.

Nevertheless, whenever possible, i.e. when there are fewer constraints regarding landscaping criteria and the development of the public spaces, on certain sites such as the university halls of residence, environmental management is set up which takes into consideration the diversity of species and their adaptation to the territory.

Air quality

Plantations **combat greenhouse gases**: the growth of the plants through the activity of photosynthesis helps to fix carbon and produce oxygen thereby reducing greenhouse gas emissions.

Energy consumption

From the design stage to the works stage, DEVE integrates sustainable energy management (i.e., with adapted light sources and low consumption lighting, rational use of water, implementation of differentiated management). Moreover, in its contracts, respect for current environmental standards leads to imposing additional restrictions (e.g. use on the worksite of NGV vehicles or recent mechanical equipment and the clean vehicle clause.).

Waste management:

A relatively rare issue with respect to green waste as this is not the replacement of trees but the planting of new ones. As with green spaces, in a reemployment approach which is part of SOSED (Plan for organising and monitoring the elimination of site waste), DEVE optimizes **on-the-spot reuse of the waste produced**. For example, the soil extracted when digging foundations can serve as backfill.

In addition to this, the contract clauses provide for a differentiated processing according to the type of **waste**:

- asphalt: reintroduced into a **recycling channel**,
- stumps: sorted and separated to be **reused** (example: wood for heating)

NOTE ON METHODOLOGY

Greenhouse gas reduction

- **Public transport:** Tram T3 - Chapelle-Asnières extension

The evaluation of greenhouse gas reduction is based on the hypothesis of a modal shift from buses to trams as the T3 extension will, in the long term, replace a portion of the bus line.

Using the experience gained from the 14.5 km covered by the tram on the Southern arc of the T3 line, the North arc project (more widely used) provides for 89,000 travellers/day to use this extension. The *Observatoire de la mobilité en Île-de-France (OMNIL)* (Mobility Research Centre for Île-de-France)¹ estimates that each day the average citizen travels 3.34 km by tram in the Île-de-France, giving a potential modal shift of: 108,499,900 travellers.km/year.

According to the calculation methodology of the RATP's 2017 CO2 information², the emission factors relate to the mode of transport operated by RATP:

Bus	95.4 gCO2e/travellers.km.
Tram	3.10 gCO2e/travellers.km

By digital application, 10, 000 tCO2e/year could be avoided with the T3 extension

- **Public transport:** Paris stations ring road (Surface transport)

The evaluation of greenhouse gas reduction is carried out following the hypothesis of a modal shift which can only be fine-tuned with a more precise definition of the options chosen and the technical progress of constructors' bids.

- **Non-motorised traffic:** Cycle paths

The gain for cycle paths has been estimated from similar conventional private car traffic, at around 100 t.CO2/km/year. Therefore, thanks to 57 km of cycle paths realized since 2015, close to 5,700 t.CO2/year has been avoided.

This hypothesis is based on what has been observed for earlier developments of cycle paths (730 km). These estimations will be fine-tuned following the mobility and attendance studies of the cycle sections and 30 km/h zones which will be conducted when the volume is significant.

- **Electric vehicles:** Installation of BéliB' charging stations

The evaluation of greenhouse gas reduction is carried out according to the hypothesis (pending consumption readings) that each terminal carries out the equivalent of 2 full charges of 60kWh/day each, thus avoiding an equivalent consumption of fossil fuel.

If we retain on the one hand the emission factors from ADEME's (French Ministry of Environment and energy) carbon base, version of 13/06/2018³ and, on the other hand, the shares of diesel and petrol vehicles from INSEE data for January 1 2015⁴, as follows:

Average 2014 electricity mix*	0.0647 kgCO2e/kWh.	
Petrol at the pump	0.312 kgCO2e/kWh.	37.6 % of the fleet
Diesel fuel at the pump	0.322 kgCO2e/kWh.	61.6 % of the fleet

It is estimated that the deployment of 90 stations would make it possible to avoid 3,000 t.CO2/year.

Reducing energy consumption

- **Sustainable buildings:** Sustainable social housing (HEQ constructions, thermal insulation)

Calculation of the greenhouse gas emissions avoided is based on energy performance diagnostics (EPD) carried out for each operation financed by the City of Paris.

1 <http://www.omnil.fr/spip.php?article119>

2 http://www.ratp.fr/fr/upload/docs/application/pdf/2016-01/information_co2_juin_2015.pdf

3 <https://www.data.gouv.fr/fr/datasets/base-carbone/>

4 <https://www.insee.fr/fr/statistiques/2045167#tableau-Tableau1>

La *Direction du Logement et de l'Habitat - DLH* (Directorate of Housing and Habitat) of the City of Paris indicates that in 2016, the energy renovations financed will make it possible to reduce the energy consumption of the existing social housing stock by 39 GWhep/year which will bring the consumption reduction financed through energy renovation operations since 2015 to 79 GWhep/year.

Energy savings financed since 2015 will make it possible to avoid the emission of 16,094 t.CO2e/year (for a global City of Paris budget on that program of 138.75M€)

We have decided to report the impact for the proportion of the amount financed through the Climate Bonds proceeds allocated to this project(ie: 89M€) .

As a consequence 10,323 tCo2/year will be avoided thanks to Climate Bonds proceeds (10,323=16,094*89/138.75)

- **Public lighting: Energy Performance Contract (Marché de Performance énergétique - MPE)**

The emission factor retained is from ADEME's (French Ministry of Environment and energy) carbon base, version dated 13/06/2018⁵

Electricity for public lighting	0.094 kgCO2e/kWh.
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Which means that the accumulated energy savings of 15,279 MWh have made it possible to avoid 1,406 t.CO2e.

The above calculation is the consequence of applying the ADEME 2016 factor for years 2015-2016 and the updated ADEME 2018 factor for year 2017 (ie: 1,406=9.969*0.091+5,310*0.094 for the cumulated amount and 499= 5,310*0.094 for 2017 only)

Production of renewable and waste energy

- **Solar energy: Photovoltaic solar panels**

Taking the emission factors from the ADEME's (French Ministry of Environment and energy) carbon base, version dated 13April 2018⁶ :

Average 2016 electricity mix*	0.0647 kgCO2e/kWh.
Photovoltaic electricity	0.055 kgCO2e/kWh.

* Latest information available in the base

The information from the *Institut National de l'Énergie Solaire* (National Solar Energy institute) makes it possible to retain a **kW-peak electrical productivity of 900kWh/year** which is equivalent, for 570 kW-peak installed, to a production of approximately 513 MWh/year, meaning this much grid power can be avoided.

The deployment of 570 kW-peak solar PV panels would enable 5 t.CO2e/year to be avoided.

Strategy for territorial adaptation

- **30 new hectares of green spaces**

As part of the preparation of Paris area Carbon Assessment, an evaluation method was built in order to include the impact of forested areas, parcs and new green spaces located within Paris' territory.

This work lead to the conclusion that 1 hectare of forested area had a carbon storage capacity of 11 t CO2/year and that each hectare of wooden area within Paris territory had 34% of its surface covered by trees (mainly «Bois de Vincennes» and «Bois de Boulogne»).

As a consequence each hectare of Paris' park area has a carbon storage capacity of 3.74tCO2/year .

The following table displays the historical data for carbon storage allowed thanks to the creation of new green spaces for the period 2015-2017.

5 <https://www.data.gouv.fr/fr/datasets/base-carbone/>
 6 <https://www.data.gouv.fr/fr/datasets/base-carbone/>

Year	Number of Hectares created	Cumulated surface	Cumulated amount of tCO ₂
2015	1.87	1.87	6.99
2016	4.01	5.88	21.99
2017	4.35	10.23	38.26
Total	10.23		67.24

Sequestration factor (tCo2/ha/year)
3.74

- **20,000 trees**

According to the 2006 GIEC Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry & Other Land Use⁷⁷, the **average carbon storage factor for a tree in a temperate zone is 0.01 tC/year**, i.e. 0.0367 tCO₂/year over its normal maximum growth period of 20 years. The average carbon storage capacity of a tree is therefore around **730 kg.CO₂ during its lifespan**.

Under these conditions, the **1,826 trees** which have been planted will allow the equivalent of **1,333 t.CO₂ to be stored during their lifespan**.

7 http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_08_Ch8_Settlements.pdf

VIGEO EIRIS

Opinion Review⁸ on the CITY OF PARIS «Climate Bond» Reporting

⁸ This review must be understood as a “Second Party Opinion review” under the Green Bond Principles (in the 2016 edition of the ‘External review’ section). Green Bond Principles include the Voluntary Process Guidelines for Issuing Green Bond and the Guidance for Issuers of Social Bonds www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/



SCOPE

Vigeo Eiris was commissioned to provide an independent opinion on the sustainability credentials and management of the Climate Bond (the "Bond") issued by the City of Paris (the "Issuer"), according to Vigeo Eiris' Environmental, Social and Governance (ESG) assessment methodology, in line with the Green Bond Principles guidelines.

The opinion is based on the annual review of the two following components:

- ▶ Issuer: update of the document-based evaluation of City of Paris' ESG performance, controversies and capacity to mitigate these risks.
- ▶ Issuance: update of the document-based review of the implementation and transparency of the City of Paris' Climate Bond framework, including:
 - ▶ Project review: evaluation of the Issuer's capacity to use the bond proceeds to finance projects with climate benefits, in line with its initial commitments, and to report on the projects results; analysis of the projects results.
 - ▶ Bond review: evaluation of the Issuer's capacity to implement the Bond processes, in line with its initial commitments (evaluation and selection process and allocation process) and to report on the Bond results; analysis of the aggregated Bond results.

Vigeo Eiris' sources of information are gathered from our rating database, from the City of Paris' data, press content providers and stakeholders. Vigeo Eiris has carried out its due diligence from June 28th to December 3rd, 2018.

VIGEO EIRIS' OPINION

Vigeo Eiris remains of the opinion that the Bond issued by the City of Paris is a "Climate Bond", aligned with the Green Bond Principles.

Vigeo Eiris maintains its reasonable² level of assurance on the on the Bond contribution to sustainability.

- The City of Paris continues to display an overall advanced² ESG performance (see Part I.).
- We provide a reasonable level of assurance on the implementation of the City of Paris's Climate Bond framework and on the transparency and relevance on the reporting (see Part II.)
 - Up to date, 71.5% of the net proceeds of the issuance have been used to finance 9 projects, corresponding to all the categories and sub categories initially defined by the City of Paris. We provide an overall reasonable level of assurance regarding the Issuer's capacity to use the Bond proceeds to finance projects with climate benefits, in line with its initial commitments and our previous review.
 - The overall implementation of the Issuer's commitments in terms of projects' ESG management and evaluation, selection and allocation processes is robust.
 - The assessment and reporting framework appears relevant. We provide an overall reasonable level of assurance on the Issuer's capacity to report on fund allocation and on projects results (i.e. climate benefits and ESG performance), in line with its initial commitments, and on results aggregated at Bond level. We consider that the project results in terms of climate benefits and ESG performance range from limited to robust.
 - No ESG controversy have been observed related to the selected projects.

¹ This opinion is to be considered as the "Second Party Opinion" described by the International Capital Market Association (Green Bond Principle 2018 version).

² Definition of Vigeo Eiris' scales of assessment (as detailed on the last page of this document):
Level of Performance: Advanced, Robust, Limited, Weak.
Level of Assurance: Reasonable, Moderate, Weak.

Part I. ISSUER

Level of the Issuer's ESG performance

As of December 2017, the City of Paris' overall sustainability performance has been stable since Vigeo Eiris' last rating review (December 2016) and continues to be advanced, above average scores in all domains. The City leads the sector out of 29 in the "Local authorities" Vigeo Eiris sector.

City of Paris achieves advanced performance in the Social and Environmental pillars, while in the Governance pillar, its score is robust. In particular, performance is advanced on all domains under review, but Procurement and Services and Human Rights for which it is considered as robust.

The City registers its best performances (strength areas) on some environmental issues: environmental strategy, management of green areas and protection of biodiversity and management of environmental impacts from both transportation and energy use. The City also performs in an advanced way on some social issues: social cohesion and fair development, non-discrimination and improvement of health and safety. Reversely, room for improvement lies in the fields of integration of environmental and social factors in the supply chain, as well as in water management.

Stakeholder-related ESG controversies and involvement in controversial activities

As of December 3rd 2018, the City of Paris faces 7 controversies related to the "Environment" (2 controversies) , to the "Procurement and services"³ (4 controversies) an the "Governance" (1 controversy) domains. The overall frequency is occasional and the overall severity is high. The City is overall reactive: it reported transparently and provided some corrective measures on 3 cases.

Part II. ISSUANCE

Use of proceeds

Up to date, 9 projects have been selected as eligible by the Issuer, corresponding to all the eligible categories (reduction of GHG emissions, energy efficiency, renewable energy and adaptation to climate change), representing 300 m€ of proceeds planned to be invested in these projects, i.e. 100% of the total proceeds. In 2017, 214.5M€ has been allocated, i.e. 71.5% of the net proceeds.

- *Tramway T3 – Extension Chappelle-Asnières*
- *Rocade des gares parisiennes*
- *Pistes cyclables*
- *Implantations de bornes de recharge Belib'*
- *Logement sociaux durables*
- *Marché de Performance énergétique*
- *Panneaux solaires photovoltaïques*
- *30 nouveaux hectares d'espaces verts*
- *20 000 arbres*

Vigeo Eiris' level of assurance regarding the Issuer's capacity to use the Bond proceeds to finance projects with climate benefits, in line with its initial commitments, is reasonable. All projects are in coherence with the categories and sub-categories initially defined by the City of Paris, in line with Paris' "climate & energy Plan for 2020", and overall level of assurance related to ESG selection criteria is reasonable, in line with our previous review.

³ One of these controversies is related to the condemnation, on March 3rd 2015, of Mr Tibéri (Mr Tibéri was mayor of the 5th arrondissement of Paris) for fraudulent voters' registrations in the 5th arrondissement of Paris.

Process for project evaluation and selection

The process for evaluation and selection of projects appears to be efficiently implemented, based on internal expertise, including the Direction des Finances et des Achats and the Agence d'Ecologie Urbaine, as well as operational services.

We have an overall reasonable level of assurance on the Issuer's capacity to implement the evaluation and selection process, in line with its initial commitments.

Management of proceeds

The net proceeds of the Climate Bond issuance are managed within City of Paris' treasury liquidity portfolio, in cash or other liquidity instruments.

No project divestment has been observed within the year under review. We note that all the projects are been implemented except for the "Rocade des gares parisiennes" project still being under study.

We have an overall reasonable level of assurance on the Issuer's capacity to implement the allocation process, in line with its initial commitments and our previous review.

Reporting

The reporting framework appears relevant for the majority of the indicators. We have recommended to review the definition or collection method to ensure the systematic collection of some indicators.

- Issuer's capacity to report
 - The indicators on fund allocation are well reported both at project and Bond levels: the list of projects financed includes their description and the corresponding allocated amount, and the allocated amounts versus total amounts of each project are disclosed. We provide a reasonable level of assurance on the Issuer's capacity to report on fund allocation for all selected projects.
 - Regarding project results, the Issuer disclosed information at project level and aggregated information on climate benefits at Bond level (except for 1 project - "Rocade des gares parisiennes" - still at early stage). Our level of assurance regarding the Issuer's capacity to report on projects results (i.e. climate benefits and ESG performance), in line with its initial commitments, is reasonable. In particular, we have a reasonable assurance on 8 projects which correspond to 99.8% of the allocated proceeds. The project "Rocade des gares parisiennes" being at early stage, the City of Paris doesn't want to make a statement nor disclosure on uncertain information: as a consequence, Vigeo Eiris does not express any opinion on the issuer's capacity to report on the project climate benefits nor on the ESG indicators of this project.
- Project results
 - Based on disclosed information on projects results, we consider that the project results in terms of climate benefits range from limited to robust. In particular, we consider the project results to be robust for 7 projects (representing 72.4% of allocated proceeds), in line with the annual objectives (and above the annual objectives for 2 projects in terms of number of housings - "Logement sociaux durables" - and energy saving - "Marché de Performance énergétique"), and to be limited for 1 project ("Tramway T3 – Extension Chapelle-Asnières", accounting for 27.4% of allocated proceeds) due to the low level of achievement of the projects or lack of trend / comparison data. Of note, the Issuer did not disclose any information on climate benefits for 1 project ("Rocade des gares parisiennes", representing 0.2% of allocated proceeds).
 - In terms of ESG performance, we consider the level of ESG performance to be robust for 8 projects (99.8% of allocated proceeds). Of note, the Issuer did not disclose any information on ESG management for 1 project ("Rocade des gares parisiennes", accounting for 0.2% of allocated proceeds).
 - No controversy have been identified on all projects which are already selected.

Project	Level of assurance on the issuer's capacity to use the bond proceeds to finance projects with climate benefits	Level of assurance on the capacity of the issuer to report on fund allocation	Level of assurance on the capacity of the issuer to report on climate benefits	Project results in terms of climate benefits	Level of assurance on the issuer's capacity to report on the project ESG management	Level of ESG performance
<i>Tramway T3 – Extension Chapelle-Asnières</i>	Reasonable	Reasonable	Reasonable	Limited	Reasonable	Robust
<i>Rocade des gares parisiennes</i>	Reasonable	Reasonable	NA	NA	NA	NA
<i>Pistes cyclables</i>	Reasonable	Reasonable	Reasonable	Robust	Reasonable	Robust
<i>Implantations de bornes de recharge Belib'</i>	Reasonable	Reasonable	Reasonable	Robust	Reasonable	Robust
<i>Logement sociaux durables</i>	Reasonable	Reasonable	Reasonable	Robust	Reasonable	Robust
<i>Marché de Performance énergétique</i>	Reasonable	Reasonable	Reasonable	Robust	Reasonable	Robust
<i>Panneaux solaires photovoltaïques</i>	Reasonable	Reasonable	Reasonable	Robust	Reasonable	Robust
<i>30 nouveaux hectares d'espaces verts</i>	Reasonable	Reasonable	Reasonable	Robust	Reasonable	Robust
<i>20 000 arbres</i>	Reasonable	Reasonable	Reasonable	Robust	Reasonable	Robust

Paris, December 3rd 2018



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Disclaimer

Transparency on the relation between Vigeo Eiris and the Issuer: Vigeo Eiris has executed previous audit activities for the City of Paris until so far (as Climate Bond Second Party Opinion provider in September 2015, and Second Party Opinion reviewer in December 2016 and June 2017 and as Sustainable Bond Second Party Opinion provider in November 2017). No established relationship (financial or others) exists between Vigeo Eiris and the City of Paris.

This opinion aims to explain for investors why the Climate Bond is considered as sustainable and responsible, based on the information which has been made available to Vigeo Eiris and which has been analyzed by Vigeo Eiris. Providing this opinion does not mean that Vigeo Eiris certifies the materiality, the excellence or the irreversibility of the projects financed by the Climate Bond. The City of Paris is fully responsible for attesting the compliance with its commitments defined in its policies, for their implementation and their monitoring. The opinion delivered by Vigeo Eiris neither focuses on financial performance of the Climate Bond, nor on the effective allocation of its proceeds. Vigeo Eiris is not liable for the induced consequences when third parties use this opinion either to make investments decisions or to make any kind of business transaction. The opinion delivered on stakeholder-related ESG controversies is not a conclusion on the creditworthiness of the City of Paris or its financial obligations.

Restriction on distribution and use of this Opinion: the opinion is provided by Vigeo Eiris to the Issuer and can only be used by the Issuer. The distribution and publication is at the discretion of the Issuer, submitted to Vigeo Eiris approval.

METHODOLOGY

In Vigeo Eiris' view, Environmental, Social and Governance (ESG) factors are intertwined and complementary. As such they cannot be separated in the assessment of ESG management in any organization, activity or transaction. In this sense, Vigeo Eiris writes an opinion on the Issuer's Corporate Social Responsibility as an organization, and on the objectives, management and reporting of the projects to be (re)financed by this transaction.

Vigeo Eiris' methodology to define and to assess corporate's ESG performance is based on criteria aligned with public international standards, in compliance with the ISO 26000 guidelines, and organized in 6 domains: Environment, Human Resources, Human Rights, Community Involvement, Business Behavior and Corporate Governance. The evaluation framework has been customized regarding material issues, based on the Local Authorities assessment framework, projects specificities and emerging issues.

Vigeo Eiris reviewed information provided by the Issuer, press content providers and stakeholders (partnership with Factiva Dow Jones: access to the content of 28,500 publications worldwide from reference financial newspapers to sector-focused magazines, local publications or Non-Government Organizations). Information gathered from these sources will be considered as long as they are public, documented and traceable. Vigeo Eiris has reviewed documents related to the Bond reporting (project description, environmental and social indicators, climate benefits ...).

Part I. ISSUER

NB : The Issuer performance, i.e., commitments, processes, results of the Issuer, related to ESG issues have been assessed through a complete process of rating and benchmark developed by Vigeo Eiris Rating.

Level of the Issuer's ESG performance:

City of Paris has been evaluated by Vigeo Eiris, during December 2016 on its social responsibility performance, based on 24 relevant ESG drivers organized in the 6 sustainability domains, according to the Local Authorities assessment framework. City of Paris' sustainability performance have been assessed by Vigeo Eiris on the basis of three "items":

- Leadership: relevance of the commitments (content, visibility and ownership)
- Implementation: coherence of the implementation (process, means, control/reporting)
- Results: indicators, stakeholders feedbacks and controversies
 - Scale for assessment of ESG performance: Advanced, Robust, Limited, Weak.

Stakeholder-related ESG controversies:

A controversy is an information, a flow of information, or a contradictory opinion that is public, documented and traceable, allegation against an Issuer on corporate responsibility issues. Such allegations can relate to tangible facts, be an interpretation of these facts, or constitute an allegation on unproven facts.

Vigeo Eiris provides an opinion on companies' controversies risk mitigation based on the analysis of three factors :

- Severity: the more a controversy will relate to stakeholders' fundamental interests, will prove actual corporate responsibility in its occurrence, and will have adverse impacts for stakeholders and the company, the highest its severity. Severity assigned at corporate level will reflect the highest severity of all cases faced by the company (scale: Minor, Significant, High, Critical).
- Responsiveness: ability demonstrated by an Issuer to dialogue with its stakeholders in a risk management perspective and based on explanatory, preventative, remediating or corrective measures. At corporate level, this factor will reflect the overall responsiveness of the company for all cases faced (scale: Proactive, Remediate, Reactive, Non Communicative).
- Frequency: reflects for each ESG challenge the number of controversies faced. At corporate level, this factor reflects on the overall number of controversies faced and scope of ESG issues impacted (scale: Isolated, Occasional, Frequent, Persistent).

The impact of a controversy on a company's reputation reduces with time, depending on the severity of the event and the company's responsiveness to this event. Conventionally, Vigeo Eiris' controversy database covers any controversy with Minor or Significant severity during 24 months after the last event registered and during 48 months for High and Critical controversies.

Part II. ISSUANCE

The Climate Bond framework has been evaluated by Vigeo Eiris according to the Green Bond Principles and our methodology based on international standards and sector guidelines applying in terms of ESG management and assessment.

Project review

The analysis of the conformance with initial commitments covers both the eligibility criteria, based on the definition of eligible project categories (use of proceeds requirements), and the selection criteria, based on the ESG commitments defined in the Climate Bond framework.

The analysis of the existence and completeness of reporting, according to initial commitments defined at project level, based on the three following components:

- Fund allocation, reporting on the use of proceeds, considered as a primary component and mandatory to achieve reasonable level of assurance at project level
- Climate benefits, reporting on output and impact indicators, considered as a primary component and mandatory to achieve reasonable level of assurance at project level
- ESG management, reporting on additional qualitative and quantitative indicators, considered as a best-practice effort and less optional to achieve reasonable level of assurance at project level

Bond review

The analysis of the implementation of Bond processes covers both

- The evaluation and selection process, i.e. evaluation of the coherence and efficiency of the implemented process, and exhaustiveness of the ESG issues covered
- The allocation process, based on the definition of the rules for management of proceeds

The analysis of the existence and completeness of reporting, according to initial commitments defined at Bond level, based on the three following components:

- Fund allocation, reporting on the aggregated use of proceeds, considered as a primary component and mandatory to achieve reasonable level of assurance at bond level
- Climate benefits, reporting on aggregated output and impact indicators, considered as a primary component and mandatory to achieve reasonable level of assurance at bond level
- ESG management, reporting on transversal additional indicators, considered as a best-practice effort and less optional to achieve reasonable level of assurance at bond level

Reporting

The analysis of the relevance of reporting indicators covers the three reporting components, i.e. fund allocation, climate benefits and ESG management, evaluated the relevance of these indicators according to three principles (transparency, exhaustiveness and effectiveness), and the reporting conditions, i.e. format, visibility, data collection,...

The evaluation of project results is conducted both at project and Bond levels, including reporting per project and aggregated reporting, based on both climate benefits, considered as essential to achieve robust performance, and ESG management, considered as a best-practice effort and less optional to achieve robust performance.

- Scale for level of relevance: not relevant, partially relevant, relevant
- Scale for assessment of performance: weak, limited, robust, advanced.
- Scale for assessment of level of assurance: weak, moderate, reasonable

VIGEO EIRIS' ASSESSMENT SCALES

Performance evaluation	
Advanced	Advanced commitment; strong evidence of command over the issues dedicated to achieving the objective of social responsibility. Reasonable level of risk management and using innovative methods to anticipate emerging risks
Robust	Convincing commitment; significant and consistent evidence of command over the issues. Reasonable level of risk management
Limited	Commitment to the objective of social responsibility has been initiated or partially achieved; fragmentary evidence of command over the issues. Limited to weak level of risk management
Weak	Commitment to social responsibility is non-tangible; no evidence of command over the issues. Level of insurance of risk management is weak to very weak

Level of assurance	
Reasonable	Able to convincingly conform to the prescribed principles and objectives of the evaluation framework
Moderate	Compatibility or partial convergence with the prescribed principles and objectives of the evaluation framework
Weak	Lack or unawareness of, or incompatibility with the prescribed principles and objectives of the evaluation framework

